

ATLAS ARCHITECTURAL METALS, INC. COMPUTER SIMULATION REPORT

SCOPE OF WORK

2" X 4-1/2" 2000T SERIES STOREFRONT - AAMA 507

REPORT NUMBER

Q0325.01-116-45 R0

TEST DATE

10/13/23

ISSUE DATE

10/13/23

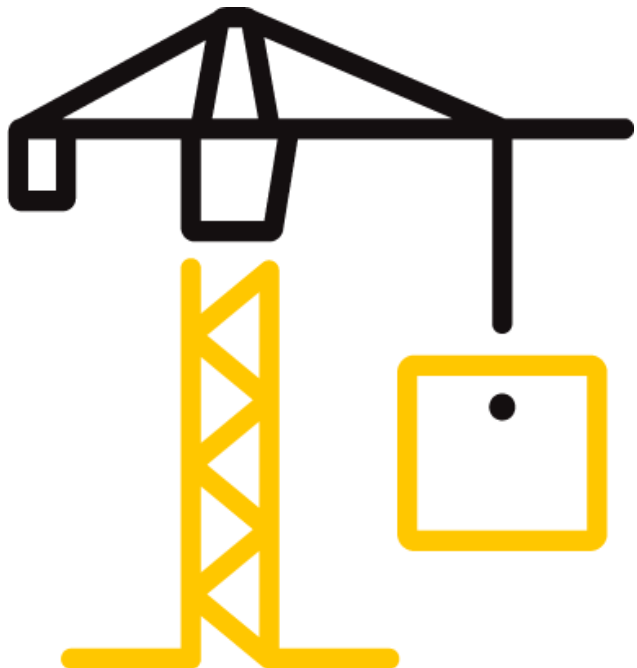
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TEST REPORT FOR ATLAS ARCHITECTURAL METALS, INC.

Report No.: Q0325.01-116-45 R0

Date: 10/13/23

REPORT ISSUED TO

ATLAS ARCHITECTURAL METALS, INC.

11940 Brittmore Park Drive

Houston, Texas 77041

SECTION 1

SUMMARY

SERIES/MODEL: 2" x 4-1/2" 2000T Series Storefront

Architectural Testing, Inc. (an Intertek company), dba Intertek Building & Construction (Intertek B&C) was contracted to perform AAMA 507 computer simulations utilizing thermal thermal modeling computer software developed by Lawrence Berkeley National Laboratory Laboratory (LBNL). Results obtained are simulated values and were secured using the designated test methods.

Intertek B&C is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. The record retention end date of this report is 10/13/28.

For INTERTEK B&C:

COMPLETED BY: Eric S. Leitner
TITLE: Manager - Simulations &
Thermal Testing, SIRC
SIGNATURE:
DATE: 10/13/23

REVIEWED BY: Allison M. Ford
TITLE: Technician Team Leader
SIGNATURE:
DATE: 10/13/23

ESL:esl

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SECTION 2

TEST METHODS

The products were evaluated in accordance with the following:

AAMA 507-15, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings

ANSI/NFRC 100-2020, Procedure for Determining Fenestration Product U-Factors

ANSI/NFRC 200-2020, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

SECTION 3

TEST PROCEDURE

The total product, including specific frame, spacer, and glass details, was modeled using NFRC approved software.

FRAME AND EDGE MODELING	THERM 7.8.71
CENTER-OF-GLASS MODELING	WINDOW 7.8.71
TOTAL PRODUCT CALCULATIONS	WINDOW 7.8.71
SPECTRAL DATA LIBRARY	IGDB 93.0

Modeling Assumptions / Technical Interpretations

Any modeling assumptions and technical interpretations required to model this product are listed below.

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) This product is available in either a painted or anodized finish. These two finish types may be grouped in accordance with ANSI/NFRC 100-2020, Section 4.2.1.L. The painted finish was simulated since it is the worst case (highest emissivity).
- 3) The center-line modeling approach was conducted using the horizontal intermediate for the head and sill members and the vertical intermediate for the jambs. This procedure is outlined in the NFRC Simulation Manual, Section 8.9.
- 4) Non-continuous hardware was not modeled.

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SECTION 4

SIMULATION SPECIMEN DESCRIPTION

SERIES/MODEL	2" x 4-1/2" 2000T Series Storefront
PRODUCT TYPE	Glazed Wall System
FRAME MATERIAL	AT - Aluminum w/ Thermal Breaks - All Members
SASH MATERIAL	NA - Not Applicable

GLAZING OPTIONS					
	<i>OUTER PANE</i>	<i>MIDDLE PANE</i>	<i>INNER PANE</i>	<i>GAP SIZES</i>	<i>IG OVERALL</i>
GL1	1/4"	N/A	1/4"	0.500"	1"
GL2	1/4"	Heat Mirror	1/4"	0.250"	1"

GL1: Dual glazed IG unit (COG=0.48 - COG=0.20)

GL2: Dual glazed IG unit w/ heat mirror (COG=0.18 - COG=0.10)

SPACER OPTIONS			
<i>TYPE</i>	<i>PRIMARY SEAL</i>	<i>SECONDARY SEAL</i>	<i>CODE</i>
Aluminum Dual Seal Spacer	Butyl Rubber	Butyl Rubber	A1-D

SECTION 5

MEASURED SIMULATION DATA

U-FACTOR CALCULATIONS	
Exterior Air Temperature	-0.4°F
Exterior Wind Velocity	12.3 mph (Perpendicular Flow)
Interior Air Temperature	69.8°F

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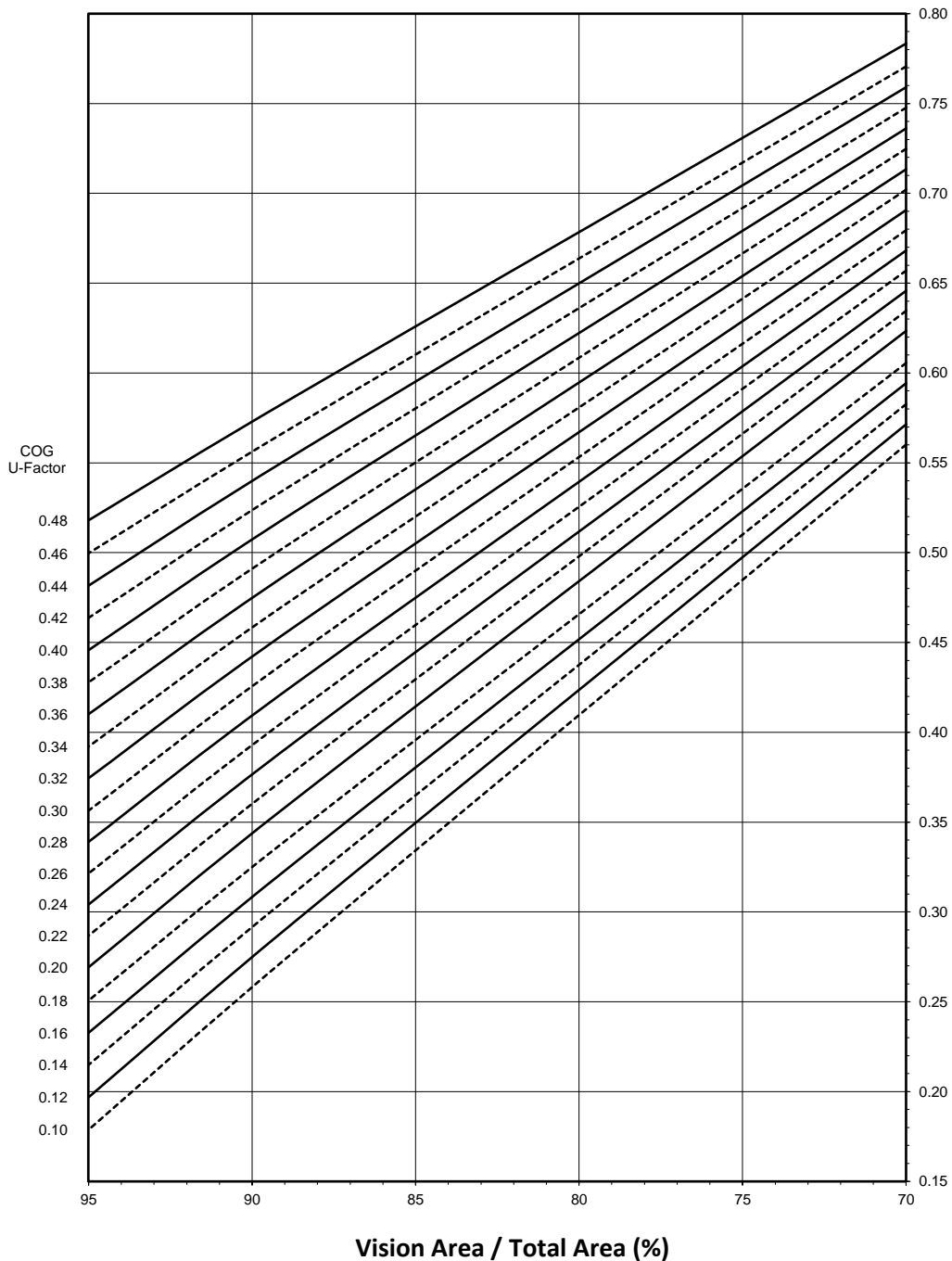
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SECTION 6

SIMULATION RESULTS

U-FACTOR CALCULATIONS: System U-Factor vs. Percentage of Vision Area



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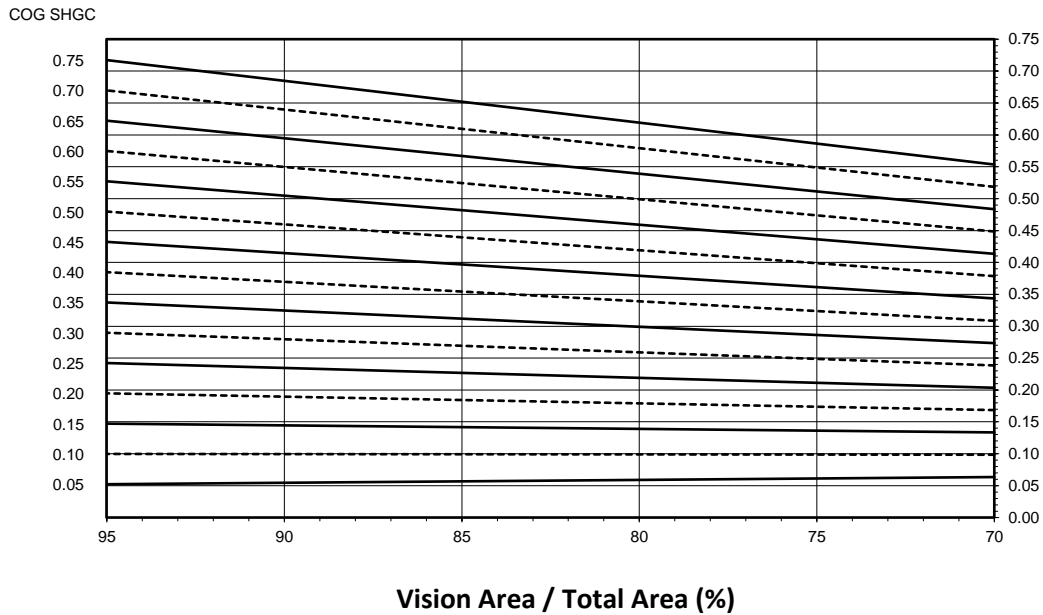
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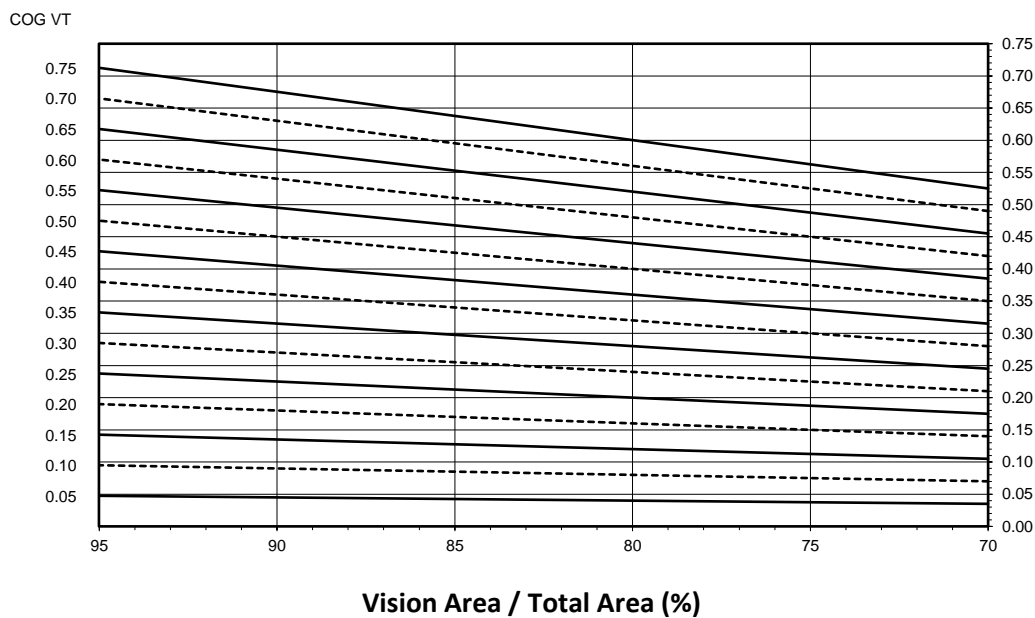
SECTION 6

SIMULATION RESULTS

SHGC CALCULATIONS: System SHGC vs. Percentage of Vision Area



VT CALCULATIONS: System VT vs. Percentage of Vision Area



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SECTION 6

SIMULATION RESULTS

U-FACTOR CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)		
Size Specific U-Factor Matrix*		
Glazing Option	Center-of-Glass U-Factor	Overall U-Factor
1	0.48	0.59
2	0.46	0.57
3	0.44	0.56
4	0.42	0.54
5	0.40	0.52
6	0.38	0.51
7	0.36	0.49
8	0.34	0.48
9	0.32	0.46
10	0.30	0.44
11	0.28	0.43
12	0.26	0.41
13	0.24	0.40
14	0.22	0.38
15	0.20	0.36
16	0.18	0.35
17	0.16	0.33
18	0.14	0.31
19	0.12	0.30
20	0.10	0.28

*The size specific U-Factor matrix is based on the Glazed Wall System NFRC specimen size of 2000mm x 2000mm (78.75 in x 78.75 in). This represents 88.5% Vision Area / Total Area.

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SECTION 6

SIMULATION RESULTS

SHGC/VT CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)			
Size Specific SHGC Matrix*		Size Specific VT Matrix*	
Center-of-Glass SHGC	Overall SHGC	Center-of-Glass VT	Overall VT
0.75	0.67	0.75	0.66
0.70	0.63	0.70	0.62
0.65	0.59	0.65	0.58
0.60	0.54	0.60	0.53
0.55	0.50	0.55	0.49
0.50	0.45	0.50	0.44
0.45	0.41	0.45	0.40
0.40	0.37	0.40	0.35
0.35	0.32	0.35	0.31
0.30	0.28	0.30	0.27
0.25	0.23	0.25	0.22
0.20	0.19	0.20	0.18
0.15	0.14	0.15	0.13
0.10	0.10	0.10	0.09
0.05	0.06	0.05	0.04

*The size specific SHGC and VT matrices are based on the Glazed Wall System NFRC specimen size of 2000mm x 2000mm (78.75 in x 78.75 in). This represents 88.5% Vision Area / Total Area.

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SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
1	0.48	43.7°F	Head	2.1457	1.2723	0.5157	0.7834	0.5885	0.5181
			L. Jamb	2.1457	1.2723	0.5157			
			R. Jamb	2.2915	1.7077	0.5197			
			Mullion	1.1457	1.7380	0.5195			
			Sill	2.5681	1.1263	0.5230			
2	0.46	44.8°F	Head	2.1457	1.2697	0.5021	0.7706	0.5722	0.4997
			L. Jamb	2.1457	1.2697	0.5021			
			R. Jamb	2.2915	1.7040	0.5062			
			Mullion	1.1457	1.7344	0.5059			
			Sill	2.5681	1.1220	0.5098			
3	0.44	45.8°F	Head	2.1457	1.2699	0.4887	0.7591	0.5563	0.4817
			L. Jamb	2.1457	1.2699	0.4887			
			R. Jamb	2.2915	1.7045	0.4927			
			Mullion	1.1457	1.7350	0.4925			
			Sill	2.5681	1.1222	0.4966			
4	0.42	46.8°F	Head	2.1457	1.2702	0.4755	0.7477	0.5404	0.4638
			L. Jamb	2.1457	1.2702	0.4755			
			R. Jamb	2.2915	1.7050	0.4796			
			Mullion	1.1457	1.7355	0.4793			
			Sill	2.5681	1.1224	0.4838			
5	0.40	47.9°F	Head	2.1457	1.2704	0.4620	0.7361	0.5245	0.4458
			L. Jamb	2.1457	1.2704	0.4620			
			R. Jamb	2.2915	1.7055	0.4661			
			Mullion	1.1457	1.7361	0.4659			
			Sill	2.5681	1.1226	0.4706			
6	0.38	48.9°F	Head	2.1457	1.2707	0.4490	0.7248	0.5086	0.4279
			L. Jamb	2.1457	1.2707	0.4490			
			R. Jamb	2.2915	1.7061	0.4531			
			Mullion	1.1457	1.7367	0.4528			
			Sill	2.5681	1.1228	0.4579			

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SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
7	0.36	50.0°F	Head	2.1457	1.2709	0.4358	0.7134	0.4927	0.4102
			L. Jamb	2.1457	1.2709	0.4358			
			R. Jamb	2.2915	1.7067	0.4400			
			Mullion	1.1457	1.7374	0.4397			
			Sill	2.5681	1.1231	0.4450			
8	0.34	51.0°F	Head	2.1457	1.2712	0.4227	0.7021	0.4767	0.3922
			L. Jamb	2.1457	1.2712	0.4227			
			R. Jamb	2.2915	1.7074	0.4268			
			Mullion	1.1457	1.7381	0.4265			
			Sill	2.5681	1.1234	0.4322			
9	0.32	52.0°F	Head	2.1457	1.2715	0.4096	0.6907	0.4608	0.3746
			L. Jamb	2.1457	1.2715	0.4096			
			R. Jamb	2.2915	1.7080	0.4138			
			Mullion	1.1457	1.7388	0.4135			
			Sill	2.5681	1.1236	0.4194			
10	0.30	53.1°F	Head	2.1457	1.2718	0.3967	0.6795	0.4447	0.3565
			L. Jamb	2.1457	1.2718	0.3967			
			R. Jamb	2.2915	1.7087	0.4009			
			Mullion	1.1457	1.7395	0.4006			
			Sill	2.5681	1.1239	0.4068			
11	0.28	54.2°F	Head	2.1457	1.2721	0.3838	0.6682	0.4288	0.3391
			L. Jamb	2.1457	1.2721	0.3838			
			R. Jamb	2.2915	1.7093	0.3880			
			Mullion	1.1457	1.7402	0.3877			
			Sill	2.5681	1.1242	0.3942			
12	0.26	55.2°F	Head	2.1457	1.2725	0.3708	0.6570	0.4127	0.3215
			L. Jamb	2.1457	1.2725	0.3708			
			R. Jamb	2.2915	1.7101	0.3750			
			Mullion	1.1457	1.7410	0.3747			
			Sill	2.5681	1.1245	0.3815			

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SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
13	0.24	56.3°F	Head	2.1457	1.2729	0.3580	0.6458	0.3967	0.3042
			L. Jamb	2.1457	1.2729	0.3580			
			R. Jamb	2.2915	1.7108	0.3622			
			Mullion	1.1457	1.7418	0.3619			
			Sill	2.5681	1.1249	0.3689			
14	0.22	57.3°F	Head	2.1457	1.2733	0.3450	0.6346	0.3807	0.2869
			L. Jamb	2.1457	1.2733	0.3450			
			R. Jamb	2.2915	1.7120	0.3491			
			Mullion	1.1457	1.7432	0.3488			
			Sill	2.5681	1.1253	0.3562			
15	0.20	58.4°F	Head	2.1457	1.2737	0.3322	0.6234	0.3646	0.2693
			L. Jamb	2.1457	1.2737	0.3322			
			R. Jamb	2.2915	1.7128	0.3363			
			Mullion	1.1457	1.7440	0.3359			
			Sill	2.5681	1.1256	0.3437			
16	0.18	59.5°F	Head	2.1457	1.2651	0.3110	0.6056	0.3459	0.2508
			L. Jamb	2.1457	1.2651	0.3110			
			R. Jamb	2.2915	1.6984	0.3155			
			Mullion	1.1457	1.7300	0.3150			
			Sill	2.5681	1.1178	0.3212			
17	0.16	60.6°F	Head	2.1457	1.2656	0.2978	0.5943	0.3296	0.2328
			L. Jamb	2.1457	1.2656	0.2978			
			R. Jamb	2.2915	1.6994	0.3023			
			Mullion	1.1457	1.7311	0.3018			
			Sill	2.5681	1.1182	0.3082			
18	0.14	61.6°F	Head	2.1457	1.2666	0.2838	0.5827	0.3132	0.2150
			L. Jamb	2.1457	1.2666	0.2838			
			R. Jamb	2.2915	1.7012	0.2882			
			Mullion	1.1457	1.7330	0.2878			
			Sill	2.5681	1.1163	0.2939			

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SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (2" x 4-1/2" 2000T Series Storefront)									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
19	0.12	62.7°F	Head	2.1457	1.2670	0.2707	0.5714	0.2969	0.1969
			L. Jamb	2.1457	1.2670	0.2707			
			R. Jamb	2.2915	1.7021	0.2751			
			Mullion	1.1457	1.7339	0.2747			
			Sill	2.5681	1.1167	0.2810			
20	0.10	63.9°F	Head	2.1457	1.2675	0.2574	0.5602	0.2806	0.1789
			L. Jamb	2.1457	1.2675	0.2574			
			R. Jamb	2.2915	1.7030	0.2618			
			Mullion	1.1457	1.7348	0.2614			
			Sill	2.5681	1.1171	0.2680			

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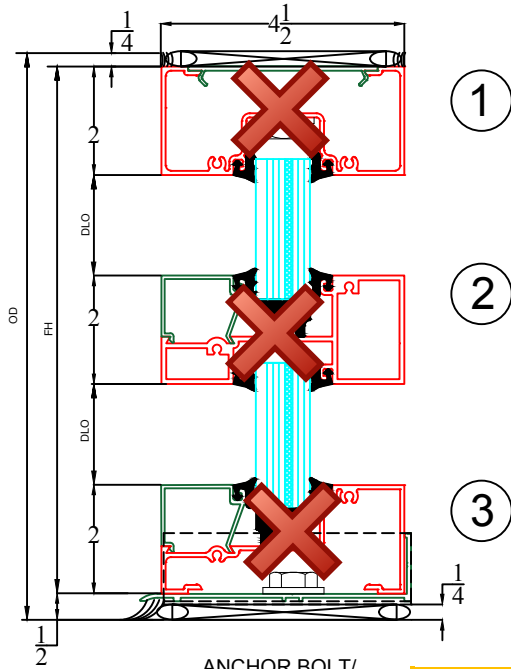
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SECTION 7

DRAWINGS / BILL OF MATERIALS

The drawings which follow have been reviewed by Intertek B&C and are representative of the simulation result(s) reported herein. Any deviations are documented herein or on the drawings.

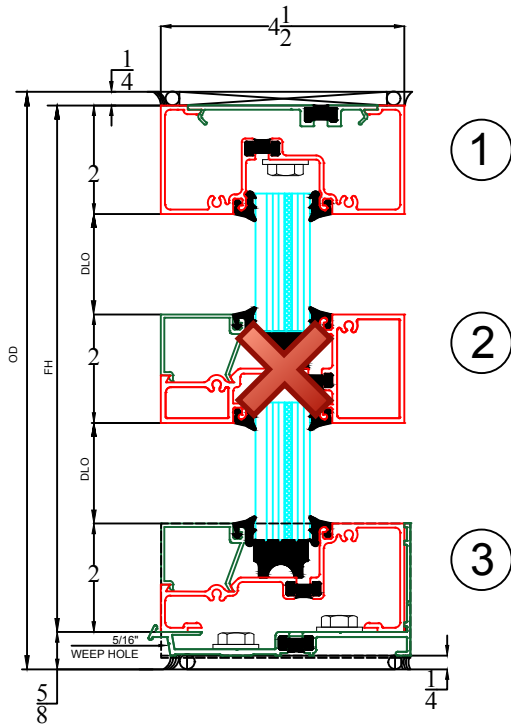
2" x 4-1/2" 2000 SERIES SYSTEM (1" GLAZING)



ANCHOR BOLT/
BACKER ROD/
SEALANT AND
SHIMS BY OTHERS.

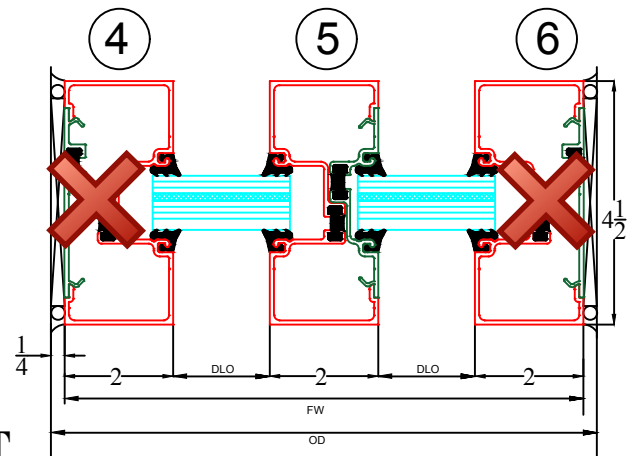
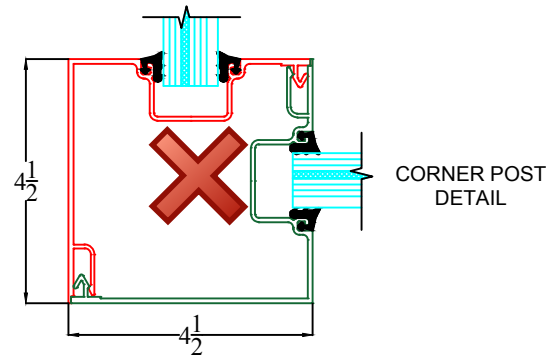
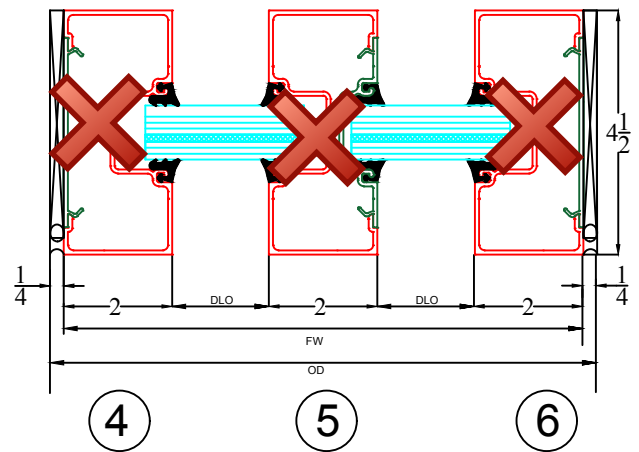
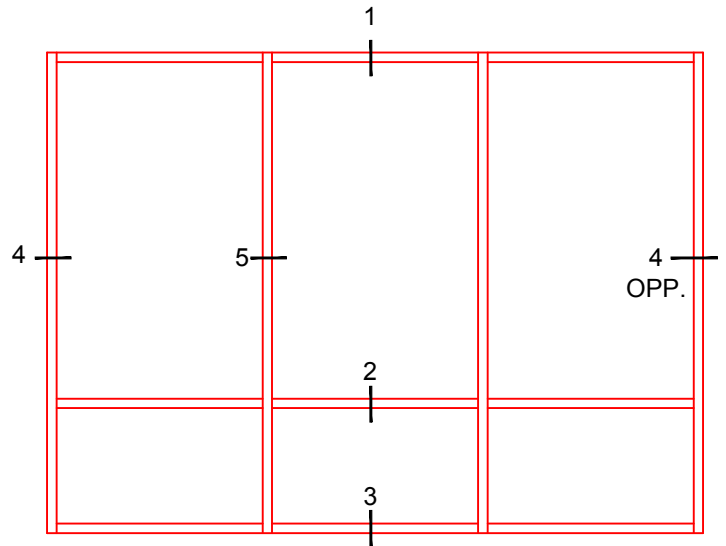


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2000T

(THERMAL OPTION)

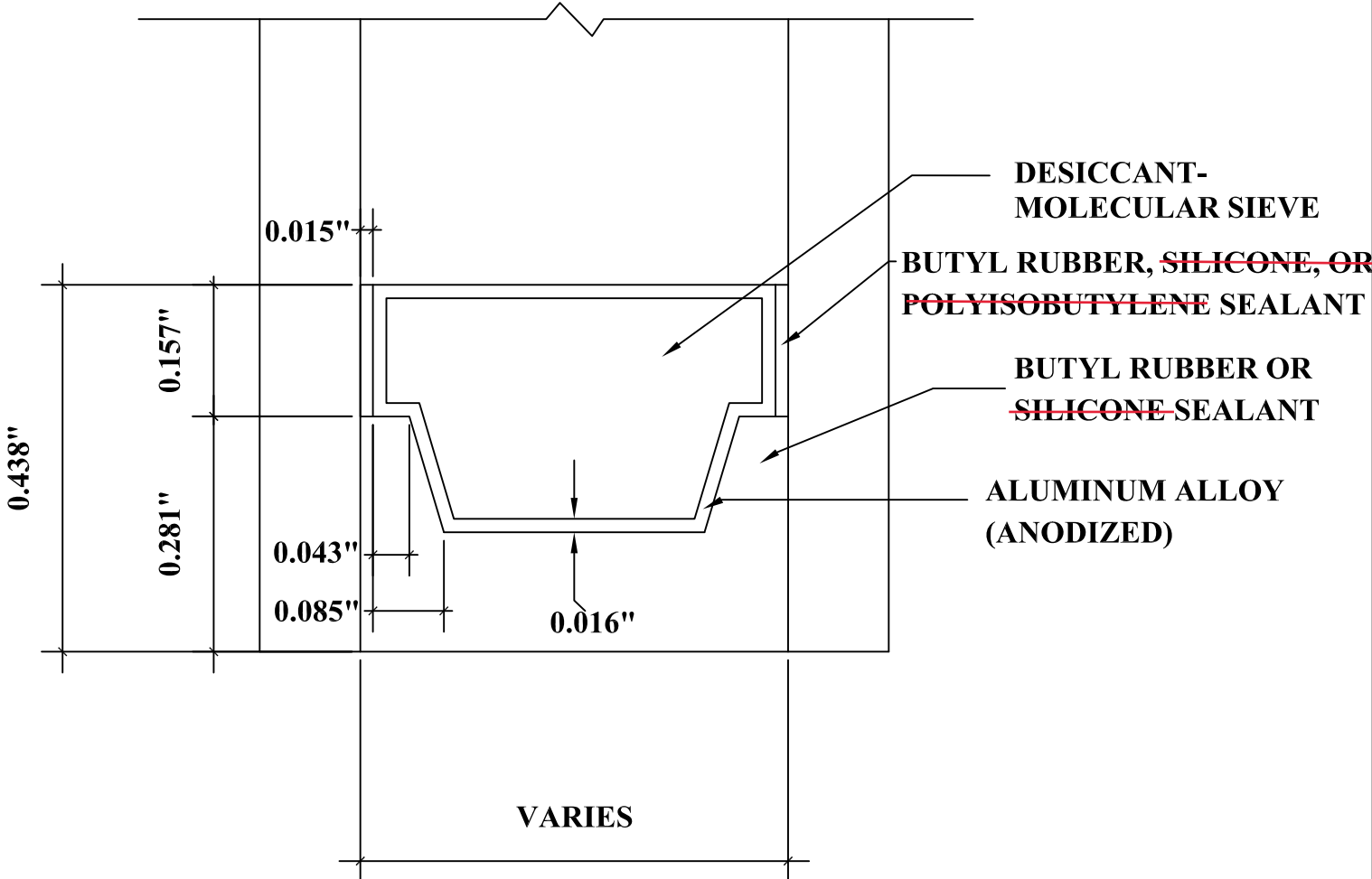




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DETAIL FOR THERMAL MODELING OF ALUMINUM SPACER (A1-D)



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SECTION 8

REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01R0	10/13/23	N/A	Original Report Issued to Atlas Architectural