



# NATIONAL CERTIFIED TESTING LABORATORIES

FIVE LEIGH DRIVE • YORK, PENNSYLVANIA 17406 • TELEPHONE (717) 846-1200  
FAX (717) 767-4100  
www.nctlinc.com

**AAMA/WDMA/CSA 101/I.S.2/A440-17**

## TEST REPORT SUMMARY

**Rendered to:**

**GLASS FLOORING SYSTEMS INC.**

10 Leslie Court  
Whippany, NJ 07981

**PRODUCT TYPE: Fixed Skylight**

**SERIES/ MODEL: "2000"**

Title	Summary of Results
Primary Product Designator AAMA/WDMA/CSA 101/I.S.2/A440-17	Class CW-PG100: Size tested 1219 x 1219 mm (~48 x 48 in) - Type SKG
Design Pressure <sup>(17)</sup>	±4800 Pa (±100.25 psf)
Air Infiltration	0.1 L/s/m <sup>2</sup> (0.02 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	720 Pa (15.04 psf)
Uniform Load Structural Test Pressure <sup>(17)</sup>	+ 14390 Pa (±300.54 psf)
Uniform Load Structural Test Pressure <sup>(08)</sup>	- 7190 Pa (±150.17 psf)

Test Completed: 05/13/20

Reference must be made to Report No. NCTL-110-23339-1 dated 07/01/20 for complete test specimen description and data.

**For National Certified Testing Laboratories**



DIGITAL SIGNATURE

Justin L. Bupp  
Laboratory Manager



**NATIONAL CERTIFIED TESTING LABORATORIES**

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**AAMA/WDMA/CSA 101/I.S.2/A440-17**

**STRUCTURAL PERFORMANCE TEST REPORT**

**NCTL-110-23339-1**

REPORT TO:  
GLASS FLOORING SYSTEMS INC.  
10 LESLIE COURT  
WHIPPANY, NJ 07981

REPORT DATE: 07/01/20

**PRODUCT TYPE: FIXED SKYLIGHT**

**SERIES/ MODEL: "2000"**



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## STRUCTURAL PERFORMANCE TEST REPORT

**Report Number** NCTL-110-23339-1

**Report Date** 07/01/20

**Report To** Glass Flooring Systems Inc.  
10 Leslie Court  
Whippany, NJ 07981

**Date Testing Started** 05/12/20  
**Date Testing Completed** 05/13/20

**Specification** AAMA/WDMA/CSA 101/I.S.2/A440-2017  
NAFS - North American Fenestration Standard/Specification for  
windows, doors, and skylights

**Performance Results** Class CW-PG100: Size tested 1216 x 1216 mm (~48 x 48 in) - Type SKG

### Description of Specimen Tested

Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

**Model/ Series** "2000"

**Configuration** Fixed Skylight

**Pedestal Size** Overall  
1219 mm x 1219 mm (48" x 48")

**Skylight Size** 1219 mm x 1219 mm (48" x 48")

**Viewing Area** 1080 mm x 1080 mm (42.5" x 42.5")

**Pedestal & Skylight Type** Extruded aluminum

**Joint Construction** Pedestal  
Mitered & welded  
Skylight  
(1) Screw mitered  
Skylight to Pedestal  
Silicone and (5) evenly spaced screws per side

**Glazing Components**  
Overall 63 mm (2.464") nominal  
Glass Thickness Tempered glass to the exterior 0.390/0.060 PVB/0.390/0.060 PVB/0.390,  
0.150, 0.150/0.030 PVB/0.150  
Coating A Guardian Glass Industries "Climaguard SUNT" sputter-type low  
emissivity coating (e=.026 per client) was applied to glazing surface no. 4  
and 5.  
Laminated Glass Tempered glass to the exterior .390/.060 PVB/.390/.060 PVB/.390,  
0.150, 0.150/.030 PVB/0.150

<b>Spacer Type/Size</b>	9.40 mm (0.370") Silicone foam spacer (Type ZF-S)
Fill	Krypton 90% single probe per client
Fill	Krypton 90% single probe per client
<b>Glazing System</b>	Interior glazed with a silicone back-bedding and Ensinger insulbar/extruded aluminum glazing bead
<b>Weatherstrip</b>	No weatherseals employed
<b>Operating Hardware</b>	No operating hardware employed
<b>Auxiliary</b>	No auxiliary items employed
<b>Reinforcement</b>	No reinforcement employed
<b>Weep Description</b>	
Size	10.16 mm (0.4") Wide by 29 mm (1.125") hole with plastic cover
Location	165 mm (6.5") From each end and mid-span of each side
<b>Interior/ Exterior Surface Finish</b>	Black painted aluminum
<b>Sealant</b>	No apparent sealant applied
<b>Insect Screen</b>	No screen employed
<b>Installation Method</b>	The skylight was installed on the test chamber constructed of 19.05 mm (0.75") plywood and (10" x 10" x 0.100") steel tube. The skylight was fastened to the tube with (1) 9.53 mm (0.375") x 51 mm (2") bolt with washer and nut at each pre-punched flange hole. The exterior perimeter was sealed with silicone sealant.

### ***Test Results - AAMA/WDMA/CSA 101/I.S.2/A440-2017***

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<u>Paragraph</u>	<u>Test</u>
9.3.2	Air Leakage Resistance - Sample #1 ASTM E283-04(12)
	The tested specimen meets or exceeds the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-2017 for air infiltration at 75 Pa (1.57 psf).
	Maximum Allowable = 1.5 L/s/m <sup>2</sup> (0.3 cfm/ft <sup>2</sup> )
	<u>Infiltration</u>
	Total Air Leakage = 0.85 L/s (1.81 cfm)
	Extraneous Air Leakage <sub>Tare</sub> = 0.74 L/s (1.57 cfm)
	Net Air Leakage = 0.11 L/s (0.24 cfm)
	Air Infiltration Rate = 0.1 L/s/m <sup>2</sup> (0.02 cfm/ft <sup>2</sup> )

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<u>Paragraph</u>	<u>Test</u>
9.3.3	Water Penetration Resistance - Sample #1 ASTM E547-00(16)
	<u>3.4 L/ (min•m<sup>2</sup>) (5.0 gph/ft<sup>2</sup>)</u>
	No Leakage after 4 cycles of 5 minutes at 720 Pa (15.04 psf)

**NOTE:** Tested without insect screen

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<u>Paragraph</u>	<u>Test</u>
9.3.4.2	Uniform Load Deflection at Design Pressure - Sample #1 ASTM E330-14
	No damage after positive      4800 Pa (100.25 psf) held for 60 seconds
	No damage after negative      4800 Pa (100.25 psf) held for 10 seconds
	Measured Deflection <sup>Positive</sup> = 0.05 mm (0.002 inches)
	Measured Deflection <sup>Negative</sup> = 0.03 mm (0.001 inches)
	Maximum Allowed (L/175) = 6.96 mm (0.274 inches)

---

<u>Paragraph</u>	<u>Test</u>
9.3.4.3	Uniform Load Structural Test ASTM E330-14
	No damage after positive      14390 Pa (300.54 psf) held for 60 minutes
	No damage after negative      7190 Pa (150.17 psf) held for 10 seconds
	Measured Permanent Set <sup>Positive</sup> = 0.18 mm (0.007 inches)
	Measured Permanent Set <sup>Negative</sup> = < 0.03 mm (< 0.001 inches)
	Maximum Allowed (0.4%) = 3.66 mm (0.144 inches)
	<b>NOTE:</b> Deflection and Permanent Set measurements taken on the jamb over a 1219 mm (48") span.

---

<u>Test Method</u>	<u>Test</u>
ASTM E330-14	Uniform Load Deflection at Design Pressure - Sample #2
	No damage after positive      4800 Pa (100.25 psf) held for 60 seconds
	No damage after negative      4800 Pa (100.25 psf) held for 10 seconds
	Measured Deflection <sup>Positive</sup> = 0.05 mm (0.002 inches)
	Measured Deflection <sup>Negative</sup> = 0.10 mm (0.004 inches)

---

<u>Test Method</u>	<u>Test</u>
ASTM E330-14	Uniform Load Structural Test
	No damage after positive      14390 Pa (300.54 psf) held for 60 minutes
	No damage after negative      7190 Pa (150.17 psf) held for 10 seconds
	Measured Permanent Set <sup>Positive</sup> = 0.99 mm (0.039 inches)
	Measured Permanent Set <sup>Negative</sup> = 0.13 mm (0.005 inches)
	<b>NOTE:</b> Deflection and Permanent Set measurements taken on the meeting rail over a 1219 mm (46") span.

---

<u>Test Method</u>	<u>Test</u>
ASTM E330-14	Uniform Load Deflection at Design Pressure - Sample #3
	No damage after positive      4800 Pa (100.25 psf) held for 60 seconds
	No damage after negative      4800 Pa (100.25 psf) held for 10 seconds
	Measured Deflection <sup>Positive</sup> = 0.18 mm (0.007 inches)
	Measured Deflection <sup>Negative</sup> = 0.15 mm (0.006 inches)

Test Method  
ASTM E330-14Test  
Uniform Load Structural Test

No damage after positive 14390 Pa (300.54 psf) held for 60 minutes  
No damage after negative 7190 Pa (150.17 psf) held for 10 seconds

Measured Permanent Set <sub>Positive</sub> = 0.79 mm (0.031 inches)

Measured Permanent Set <sub>Negative</sub> = 0.05 mm (0.002 inches)

**NOTE:** Deflection and Permanent Set measurements taken on the meeting rail over a 1219 mm (48") span.

This test report was prepared by National Certified Testing Laboratory (NCTL), for the exclusive use of the above named client and it does not constitute certification of this product. The results are for the particular specimen tested and do not imply the quality of similar or identical products manufactured or installed from specifications identical to the tested product. The test specimen was supplied to NCTL by the above named client. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen are to be drawn from the ASTM E330 test. Foam tape is mounted to the perimeter of the test buck prior to clamping to the test wall. It is the assertion of this laboratory that any film employed during testing does not affect measurement values. NCTL is a testing lab and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed. The results in this report are actual tested values and are applicable to the specimen tested only, using the components and construction methods described herein.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. Component drawings were reviewed for product verification. The bill of materials contains details with any deviations noted. Ambient conditions during the referenced testing are available upon request. A copy of this report along with representative sections of the test specimen will be retained per applicable requirements by NCTL. This report does not constitute certification or approval of the product, which may only be granted by a certification program validator or recognized approval entity. All tests were conducted in full compliance with the referenced specifications and/or test methods. Tests were performed in the order set forth by the applicable standard or specification. This report is the joint property of NCTL and the client to whom it is issued. Permission to reproduce this report by anyone other than NCTL and the client must be granted in writing by both of the above parties. This report may not be reproduced, except its entirety, without the written consent of NCTL.

**For National Certified Testing Laboratories**

DIGITAL SIGNATURE

Justin L. Bupp  
Laboratory Manager

JLB/ klr

Attachments

Appendix A - Revision Summary

Appendix B - Drawings

## Appendix A

### Revision Log

<u>Identification</u>	<u>Date</u>	<u>Page &amp; Revision</u>
Original Issue	07/01/20	Not Applicable

## **Appendix B**

### **Drawings**

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were reviewed (as submitted) for Product Verification. Detailed assembly drawings showing wall thicknesses of all members, corner construction and hardware application are on file and have been compared to the test sample submitted.

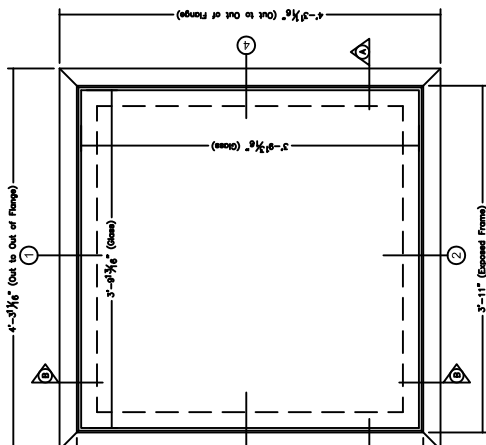
(Reference: NCTL-110-23339-1)

See Attached Documentation;  
any deviations noted.

Note: The above referenced component drawings (if applicable) along with representative sections of the test specimen will be retained by NCTL per applicable retention requirements. This testing facility assumes that all information provided by the client is accurate.

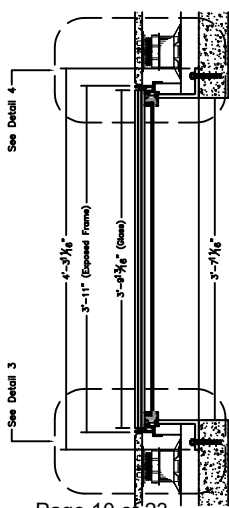
## **2.0 Skyfloor System BOM**

<b><u>Item #</u></b>	<b><u>Part Number</u></b>	<b><u>Part Name</u></b>	<b><u>Material</u></b>
1	dwg: 1	Perimeter Extrusion	Painted Aluminum
2	dwg: 2	Gutter Extrusion	Painted Aluminum
3	dwg: 3	Thermal Break	Insulbar
4	dwg: 4	Led Channel w/ Lens	Plexiglass
5	dwg: 5	Black EPDM Setting Block	EPDM
6	dwg: 6	Z-Flashing	Painted Aluminum

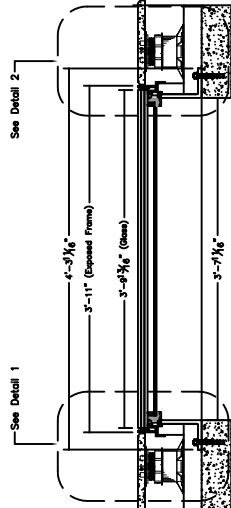


Test Specimen Complies With  
These Details. Any Deviation Is Noted.  
Report No. 23339-1 By: DF  
Test Date: 05/13/20

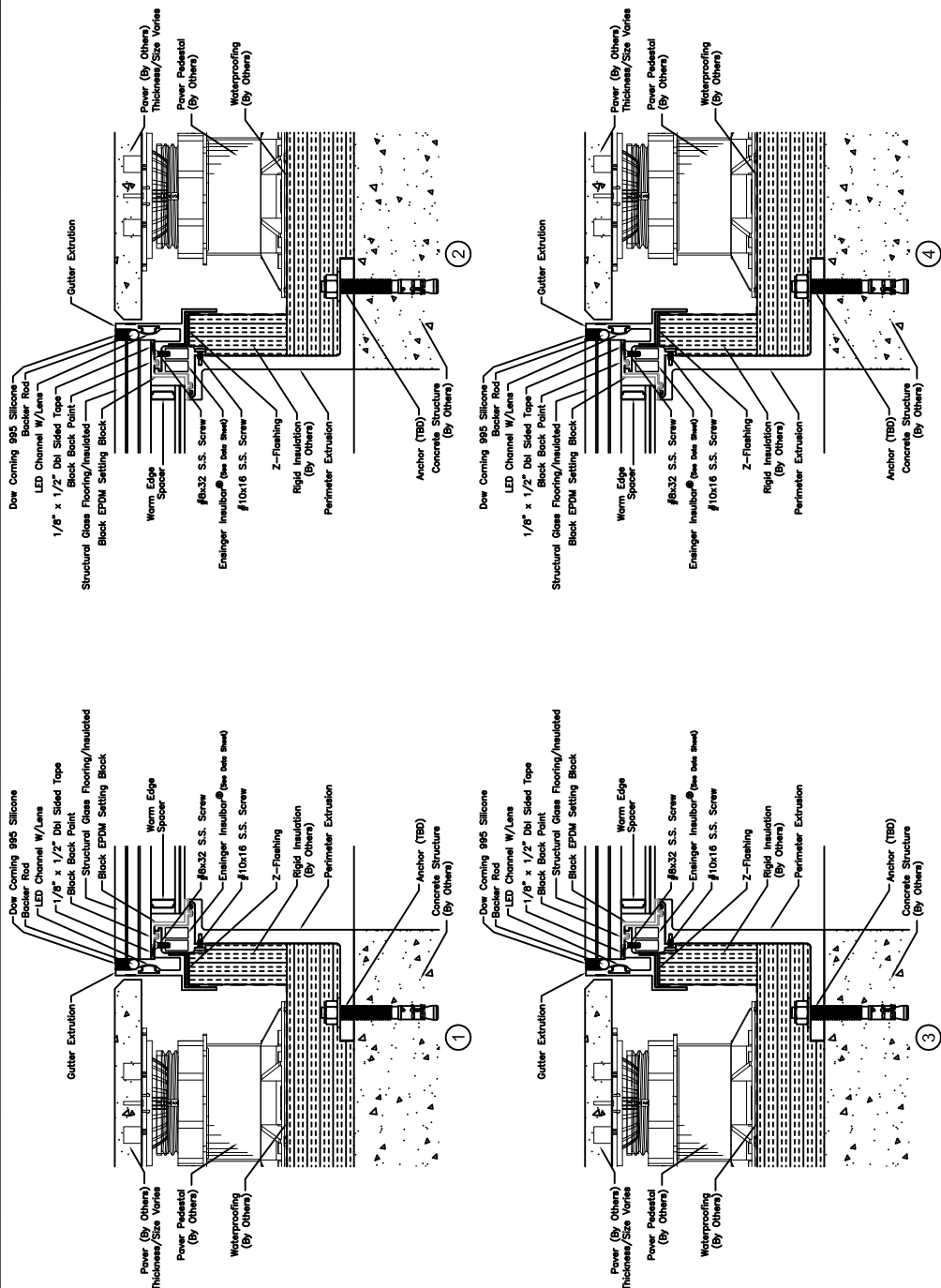
Elevation



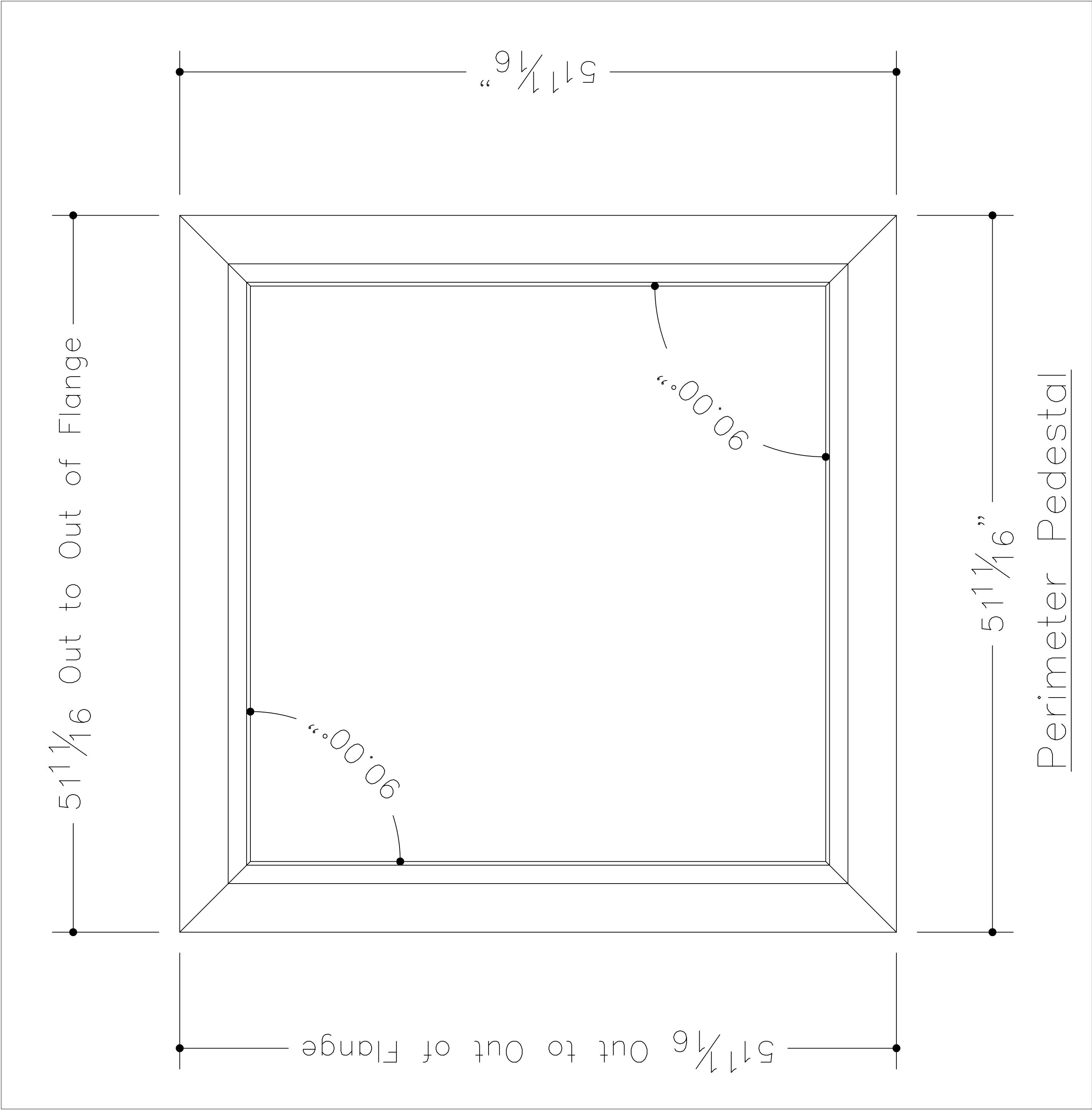
Section A - A



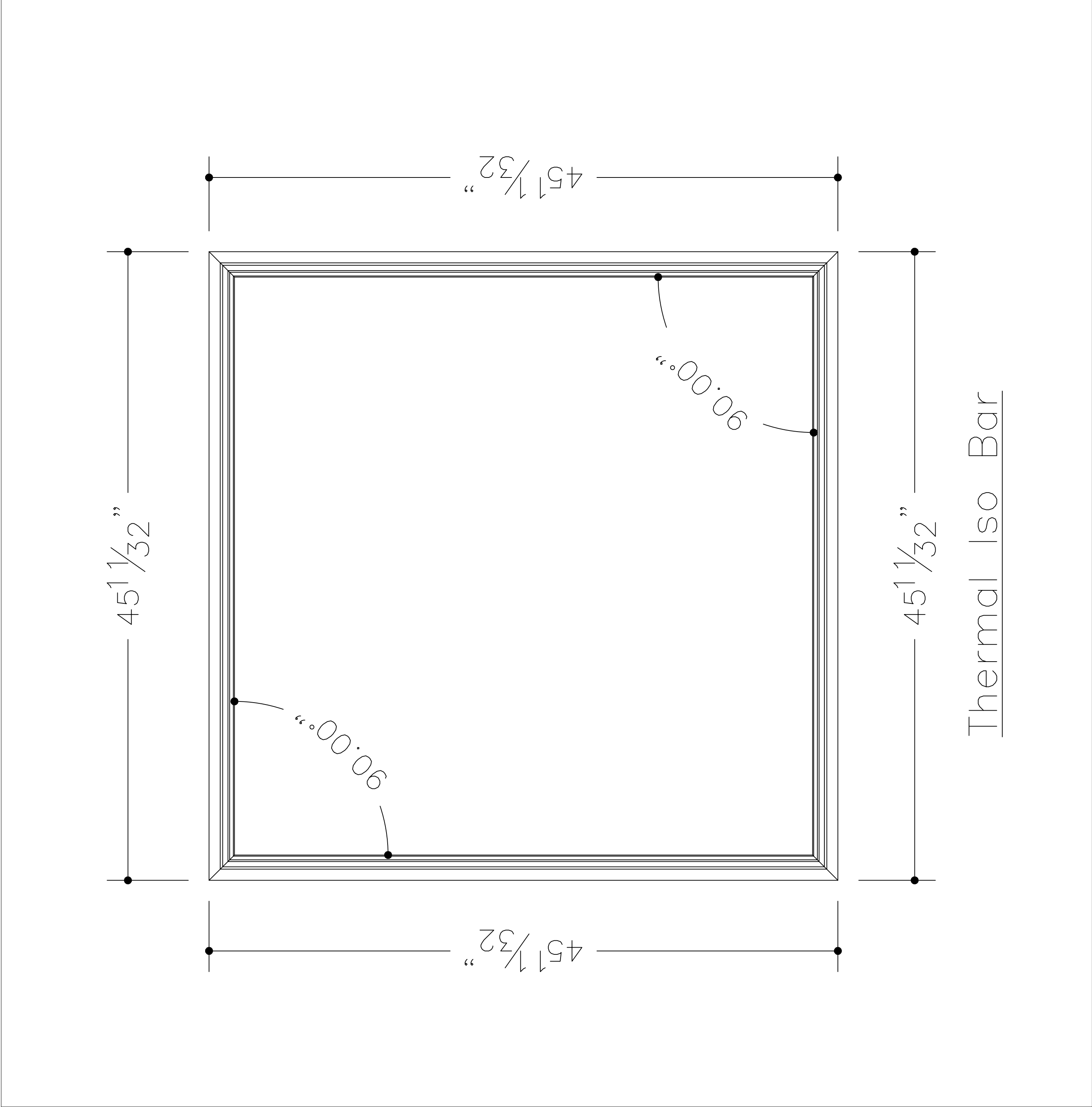
Section B - B



Rev.	No.	Date	Description	ARCHITECT
1	1/24/18		Revised per m/c/s report dtd. 01/24/18	
CONTRACTOR				
Specifications				
Frame: Painted Aluminum 6063-T6				
Glass: 3/8" Top Layer - Clear Tempered				
0.060 PVB Interlayer				
3/8" Middle Layer - Clear Tempered				
0.060 PVB Interlayer				
3/8" Bottom Layer - Clear Tempered				
0.060 PVB Interlayer				
1/8" Clear Tempered				
PROJECT: NCTL Testing of the Glass Flooring System's				
Skyfloor 2.0 48" x 48" Unit				
Air & Water Infiltration Test				
SCALE: 1/2" = 1'				
ALL ELEMENTS ARE VENDED FROM EXTERIOR				
DATE: 1/24/2018				
BY: NCTL Engineer 2.0 48x48 Unit				
SHEET 1 OF 1				

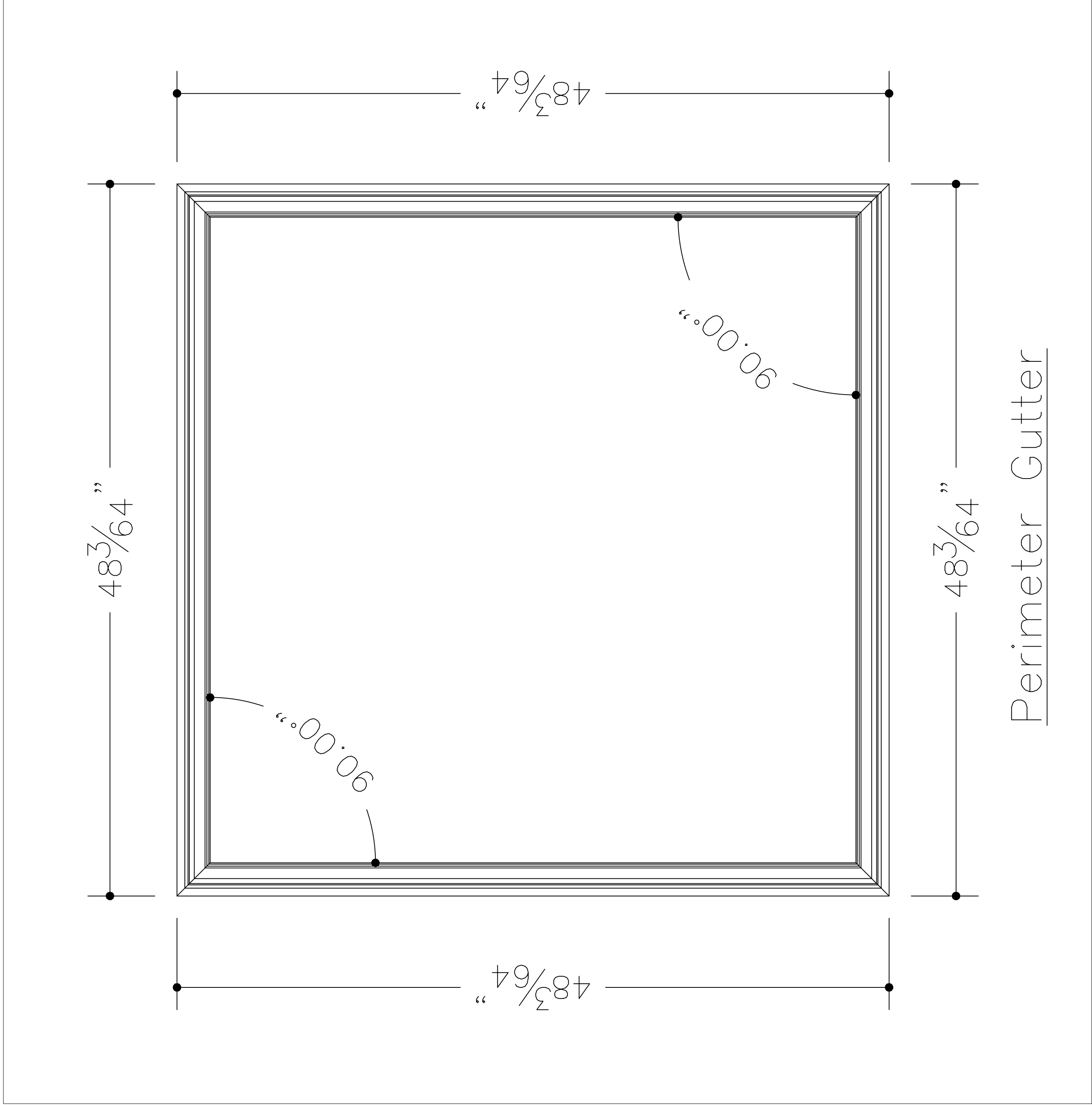
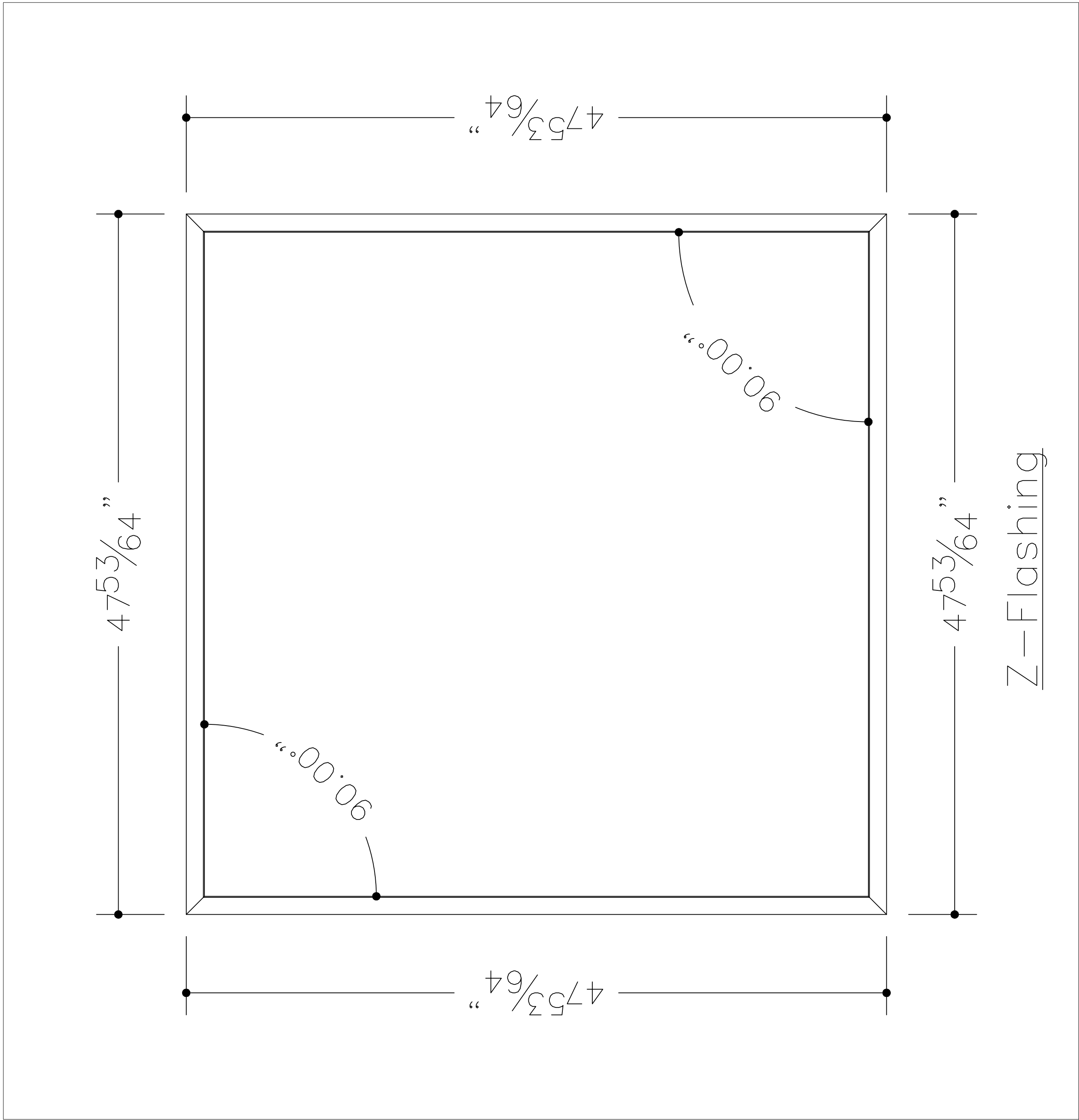


Perimeter Pedestal



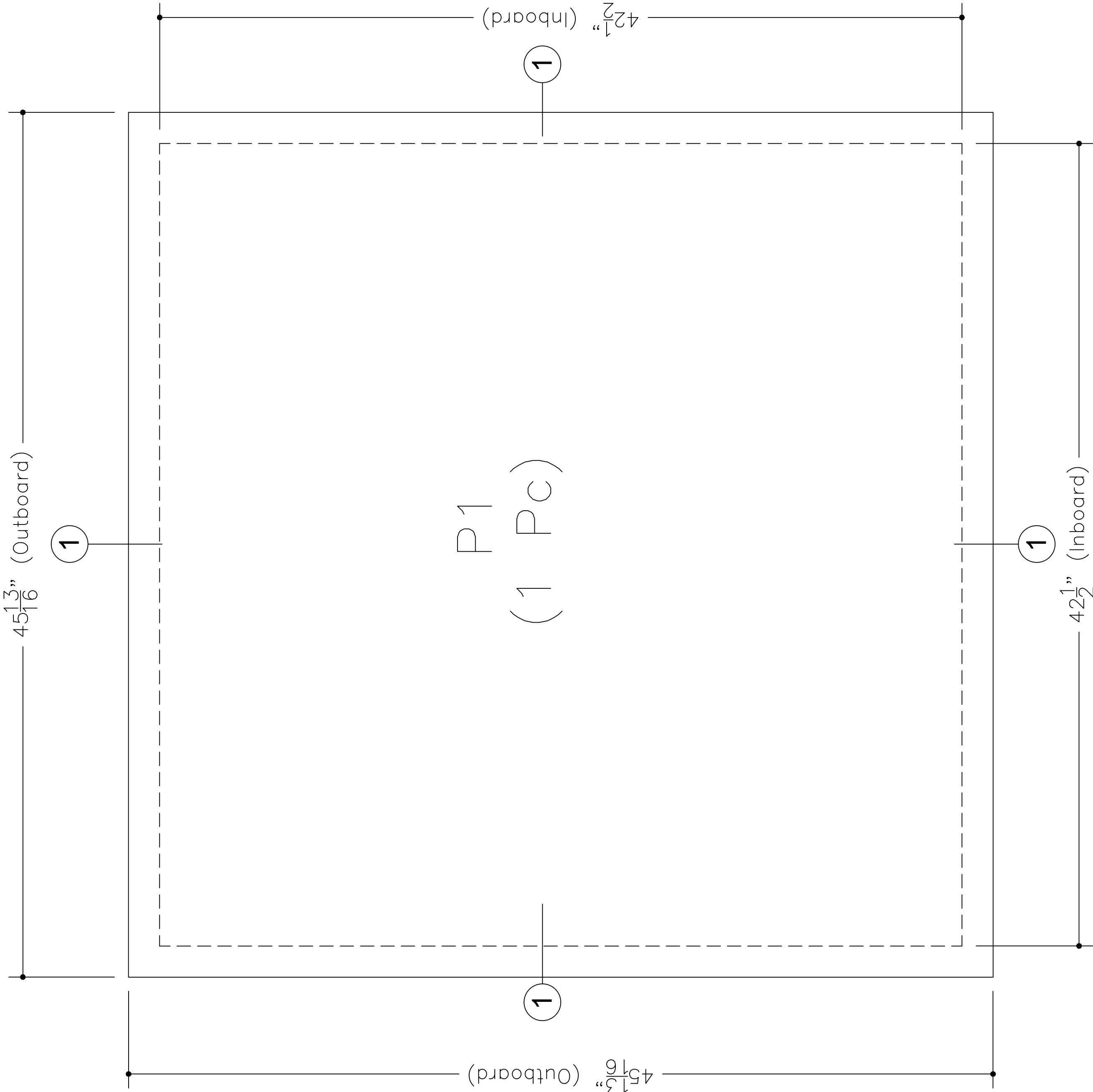
Thermal Iso Bar

Rev. No	Date	Description	ARCHITECT
1	1/24/18	Revised per m/u print dtd. 01/24/18	
Specifications			CONTRACTOR
Frame: Painted Aluminum 6063-T6			MANUFACTURER
Glazing: 3/8" Top Layer - Clear Tempered 0.060 PVB Interlayer 3/8" Middle layer - Clear Tempered 0.060 PVB Interlayer 3/8" Bottom layer - Clear Tempered 1/8" Clear Tempered with 0.030 PVB Interlayer 1/8" Clear Tempered			Glass Flooring Systems, Inc. 10 Leslie Court Whippany, NJ 07981
PROJECT			NCTL Testing of the Glass Flooring System's Skyfloor 2.0 48" x 48" Unit Air & Water Infiltration Test
SCALE: NTS			ALL ELEVATIONS ARE VIEWED FROM EXTERIOR
DRAWN	DATE	DWG. NO.	SHEET
JBW	1/9/2018	NCTL Skyfloor 2.0 48x48 Test Unit	M1

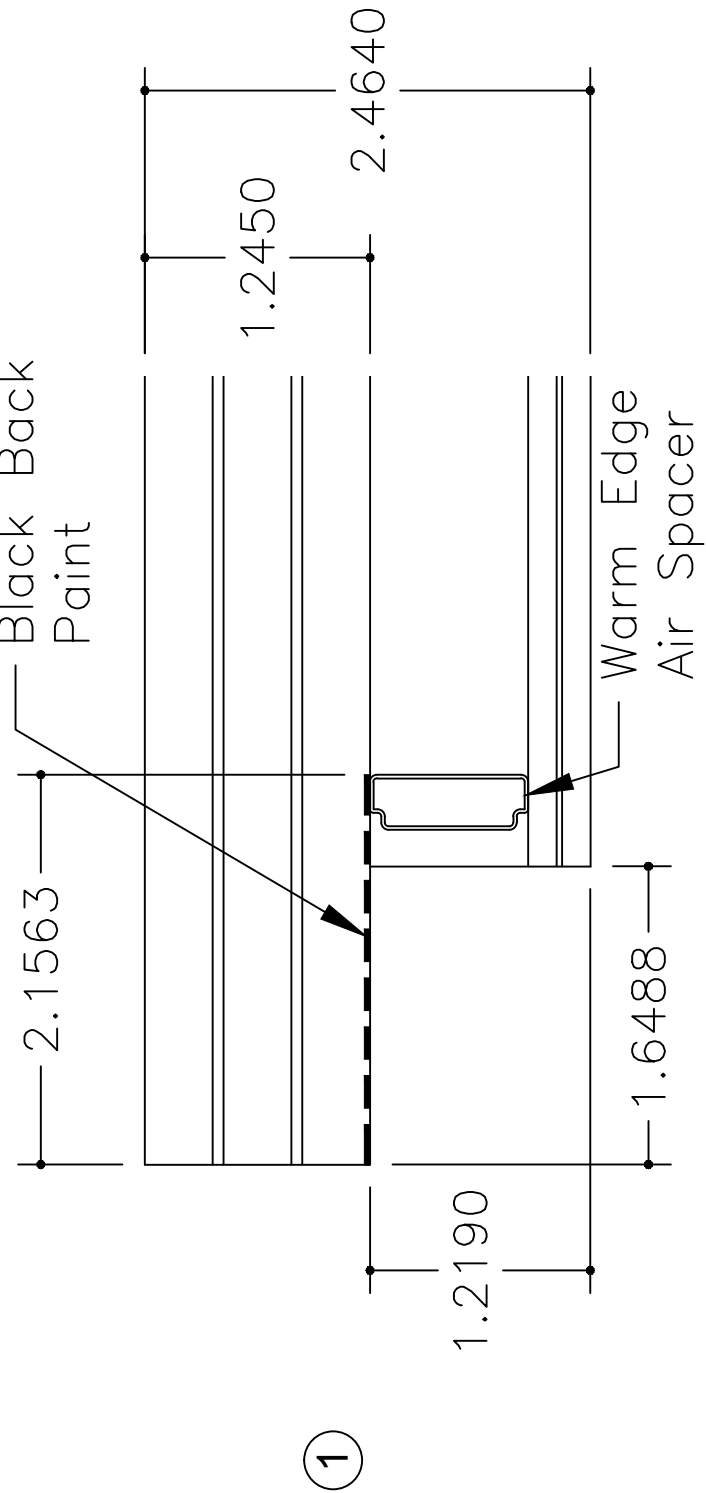


Rev. No.	Date	Description	ARCHITECT
1	1/24/18	Revised per m/u print. dtd. 01/24/18	
Specifications			CONTRACTOR
Frame: Painted Aluminum 6063-T6			MANUFACTURER
Glazing: 3/8" Top Layer - Clear Tempered 0.060 PVB Interlayer 3/8" Middle layer - Clear Tempered 0.060 PVB Interlayer 3/8" Bottom layer - Clear Tempered 1/8" Clear Tempered with 0.030 PVB Interlayer 1/8" Clear Tempered			Glass Flooring Systems, Inc. 10 Leslie Court Whippany, NJ 07981
PROJECT			NCTL Testing of the Glass Flooring System's Skyfloor 2.0 48" x 48" Unit Air & Water Infiltration Test
SCALE: NTS			ALL ELEVATIONS ARE VIEWED FROM EXTERIOR
DRAWN	DATE	DWG. NO.	SHEET
JBW	1/9/2018	NCTL Skyfloor 2.0 48x48 Test Unit	M2

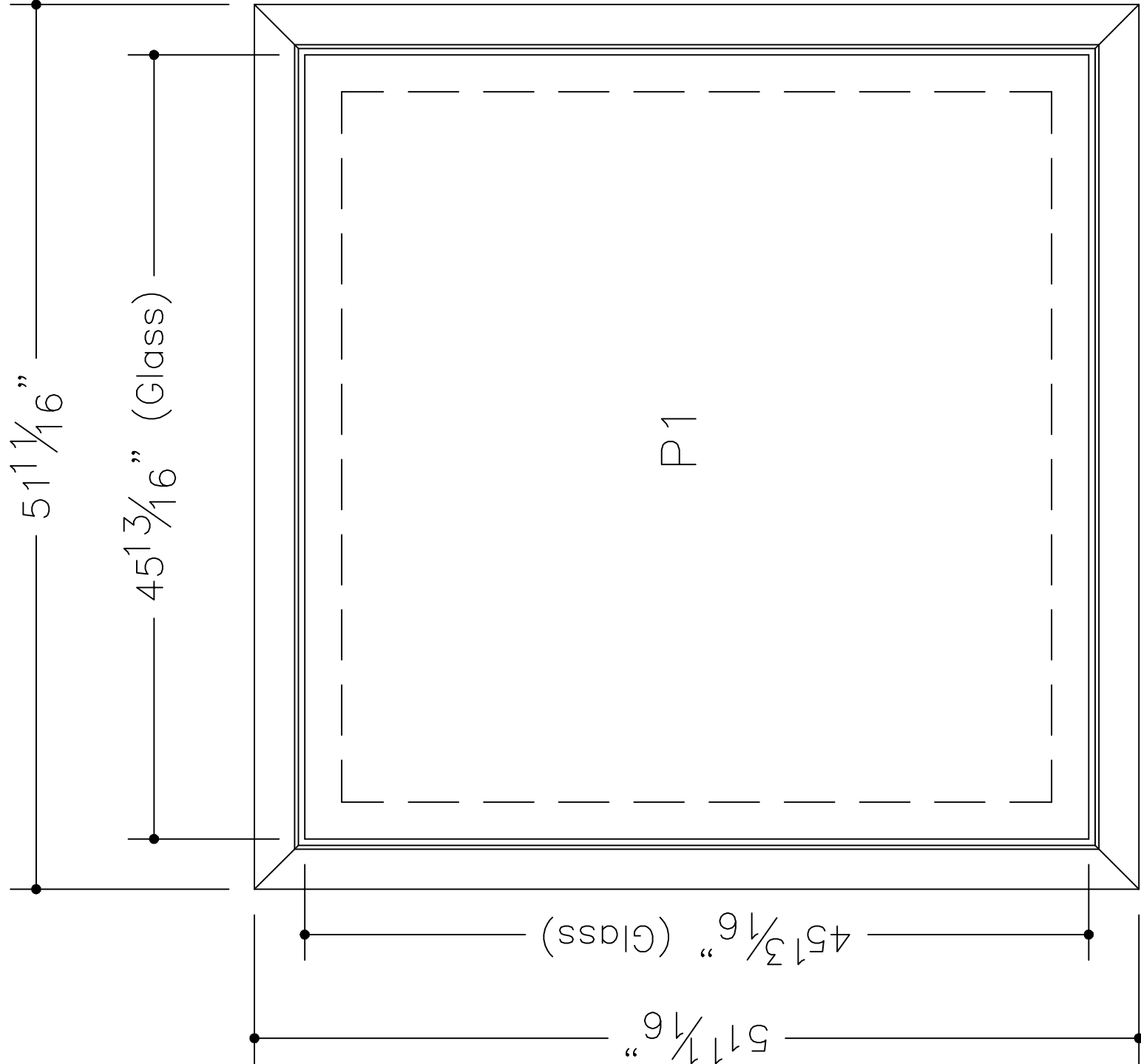
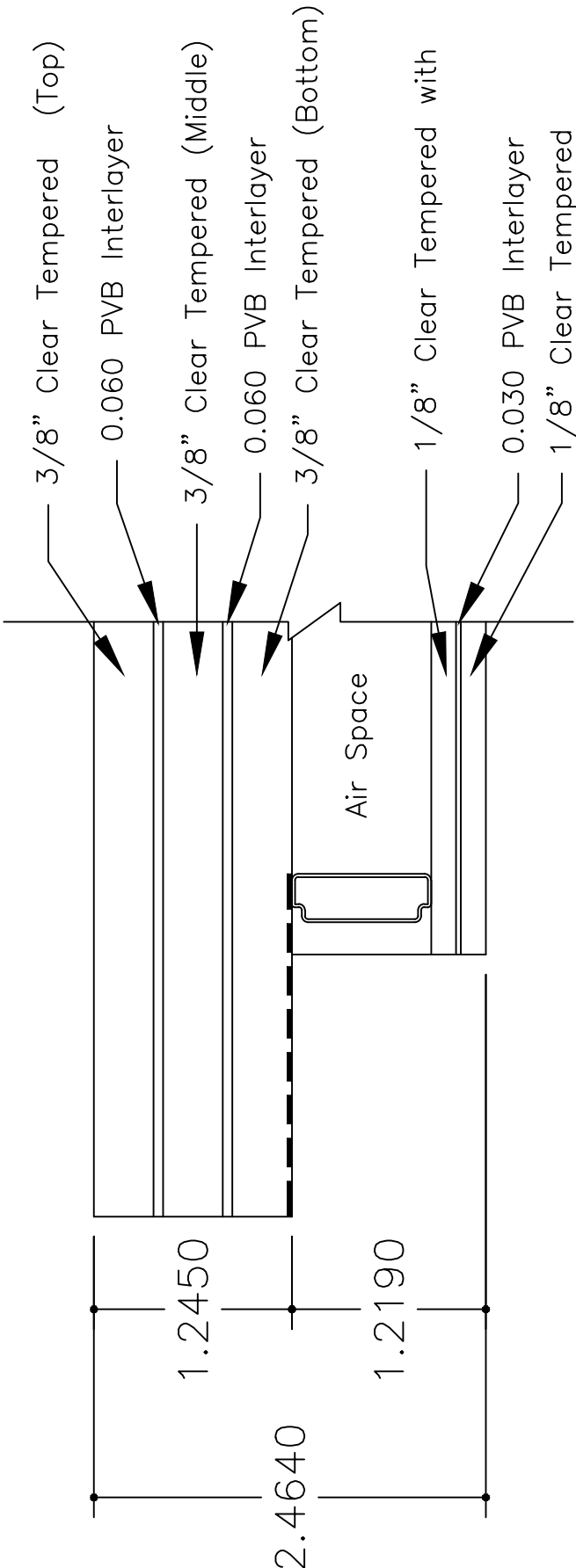
Glass Size (Outside View)



Glass Assembly Details



Glass Make-up Detail

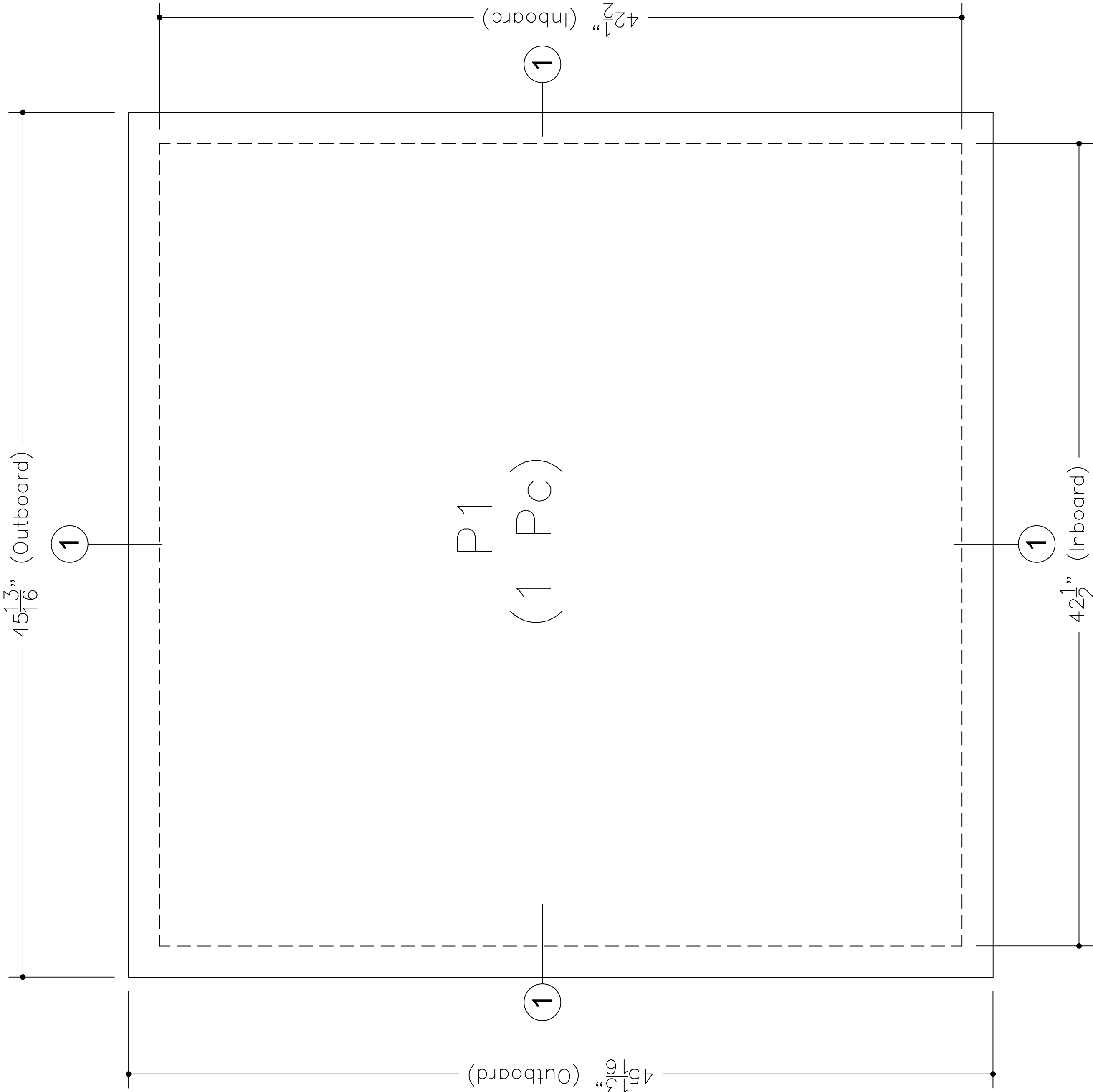


\* Outboard Glass Sizes  
P1 = 45 13/16" x 45 13/16"

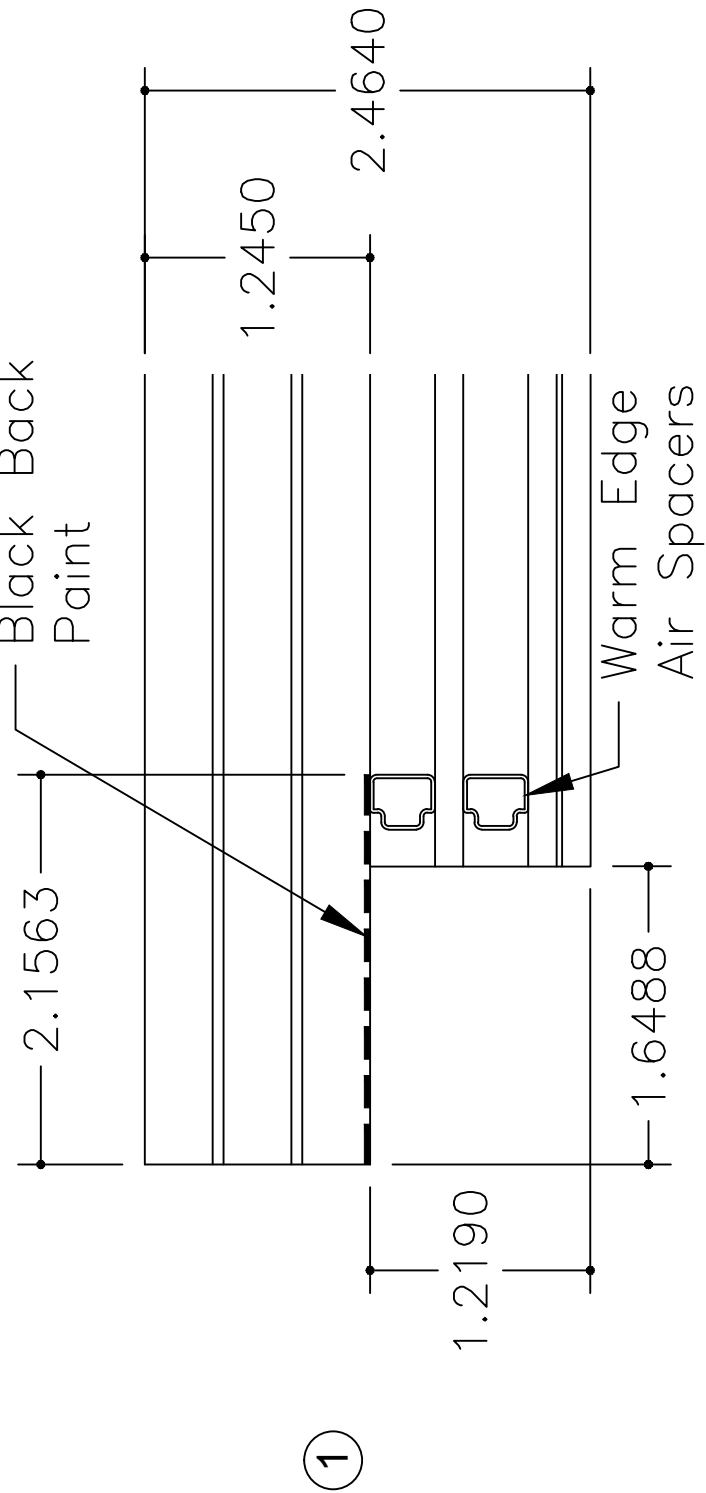
\* Inboard Glass Sizes  
P1 = 42 1/2" x 42 1/2"

Rev. No	Date	Description	ARCHITECT
1	1/24/18	Revised per m/u print dtd. 01/24/18	
Specifications			CONTRACTOR
Frame: Painted Aluminum 6063-T6			
Glazing: 3/8" Top Layer - Clear Tempered 0.060 PVB Interlayer 3/8" Middle layer - Clear Tempered 0.060 PVB Interlayer 3/8" Bottom layer - Clear Tempered 1/8" Clear Tempered with 0.030 PVB Interlayer 1/8" Clear Tempered			
MANUFACTURER			Glass Flooring Systems, Inc. 10 Leslie Court Whippany, NJ 07981
PROJECT			NCTL Testing of the Glass Flooring System's Skyfloor 2.0 48" x 48" Unit Air & Water Infiltration Test
SCALE: NTS			ALL ELEVATIONS ARE VIEWED FROM EXTERIOR
DRAWN JBW	DATE 1/9/2018	DWG. NO. NCTL Skyfloor 2.0 48x48 Test Unit	SHEET G1

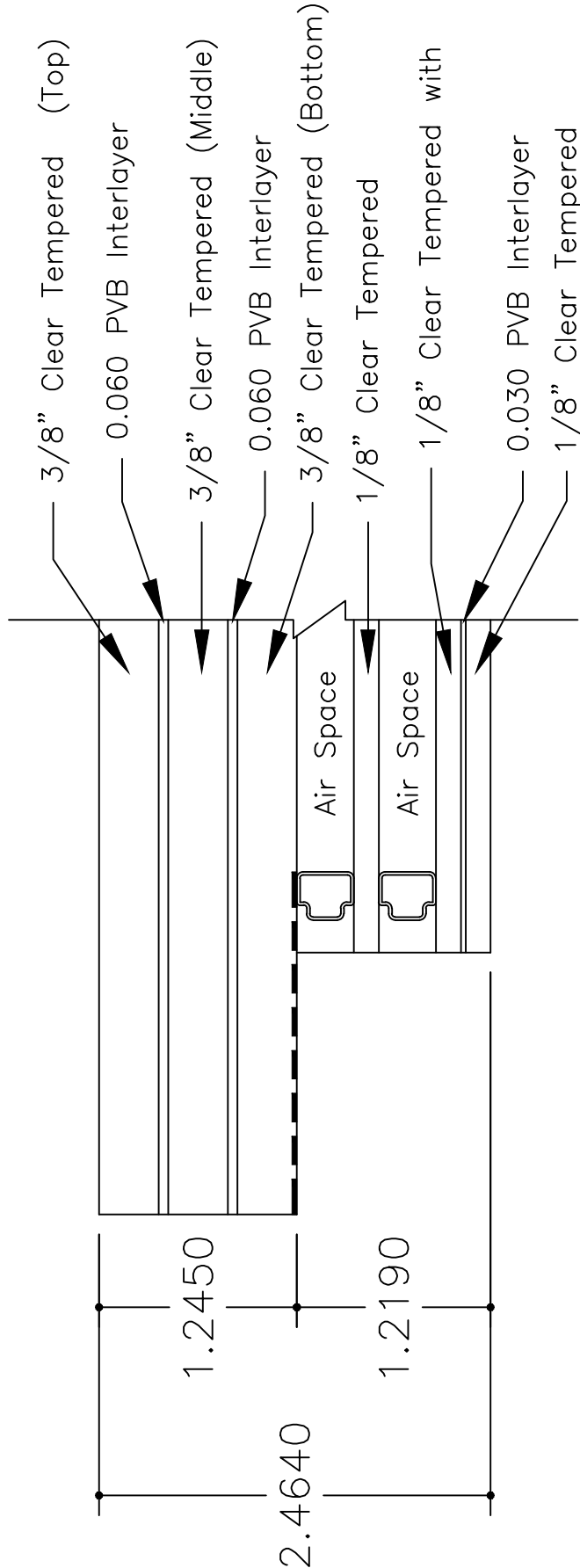
Glass Size (Outside View)



Glass Assembly Details

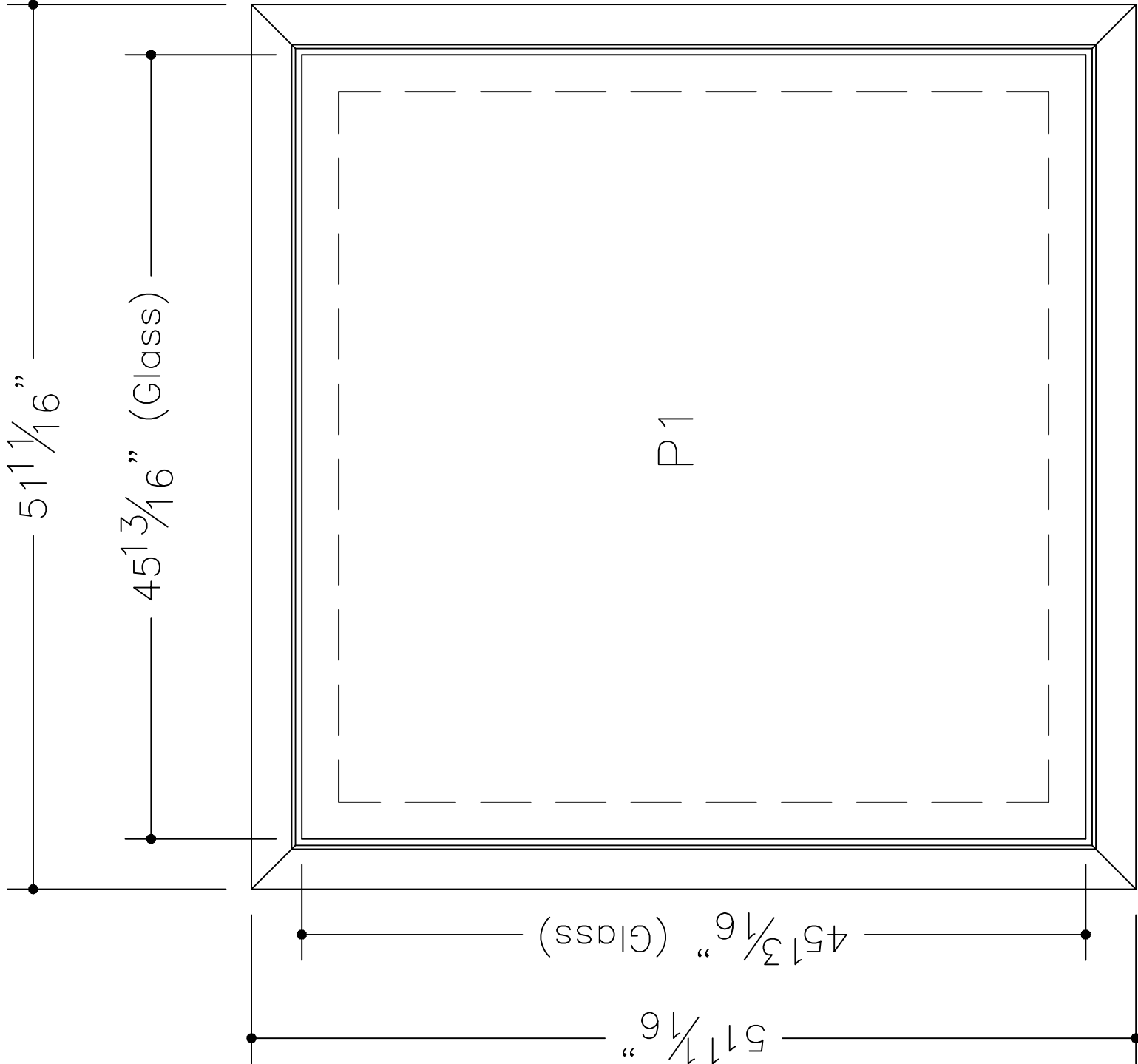


Glass Make-up Detail

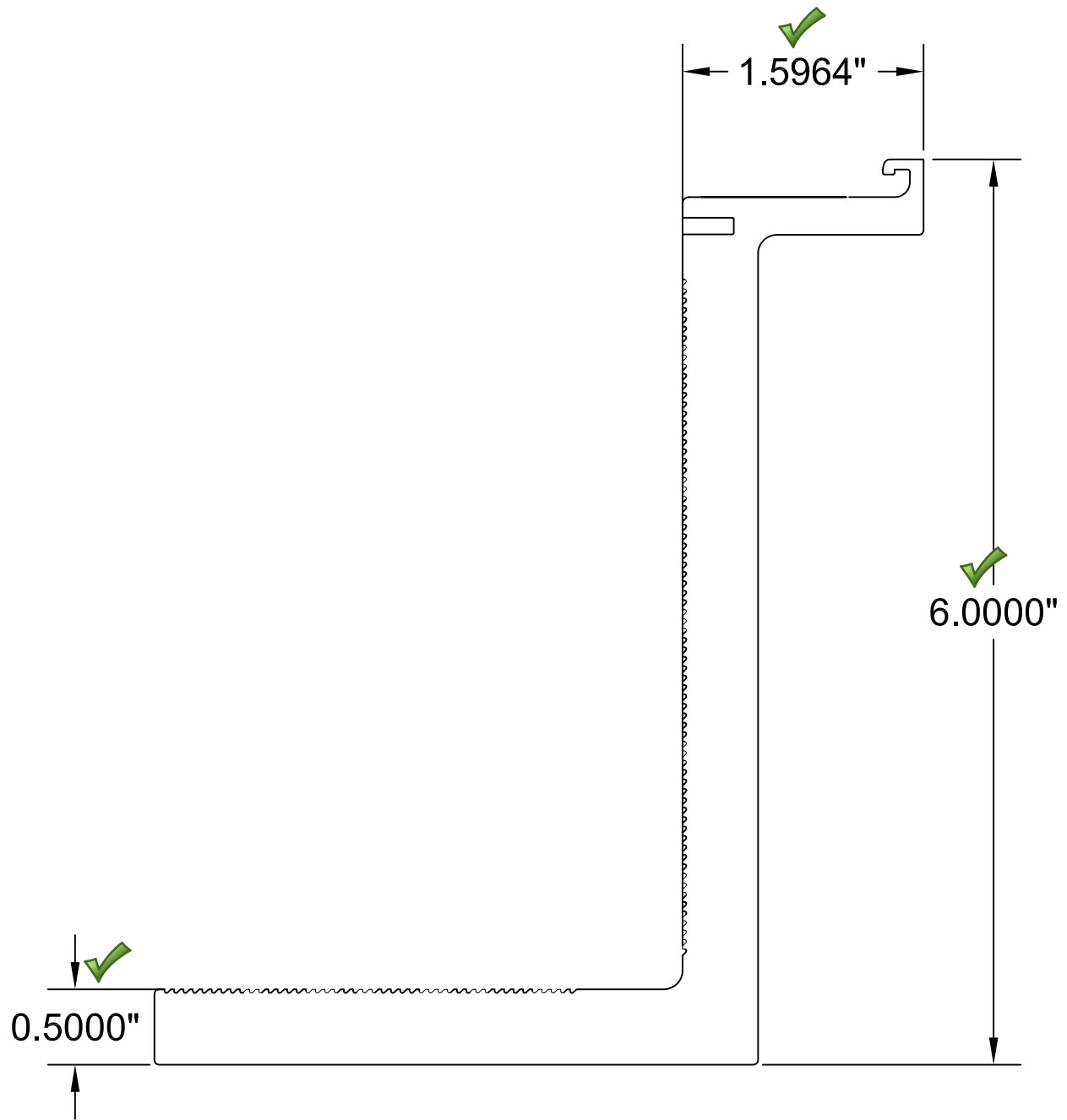


**\* Outboard Glass Sizes**  
P1 = 45 13/16" x 45 13/16"

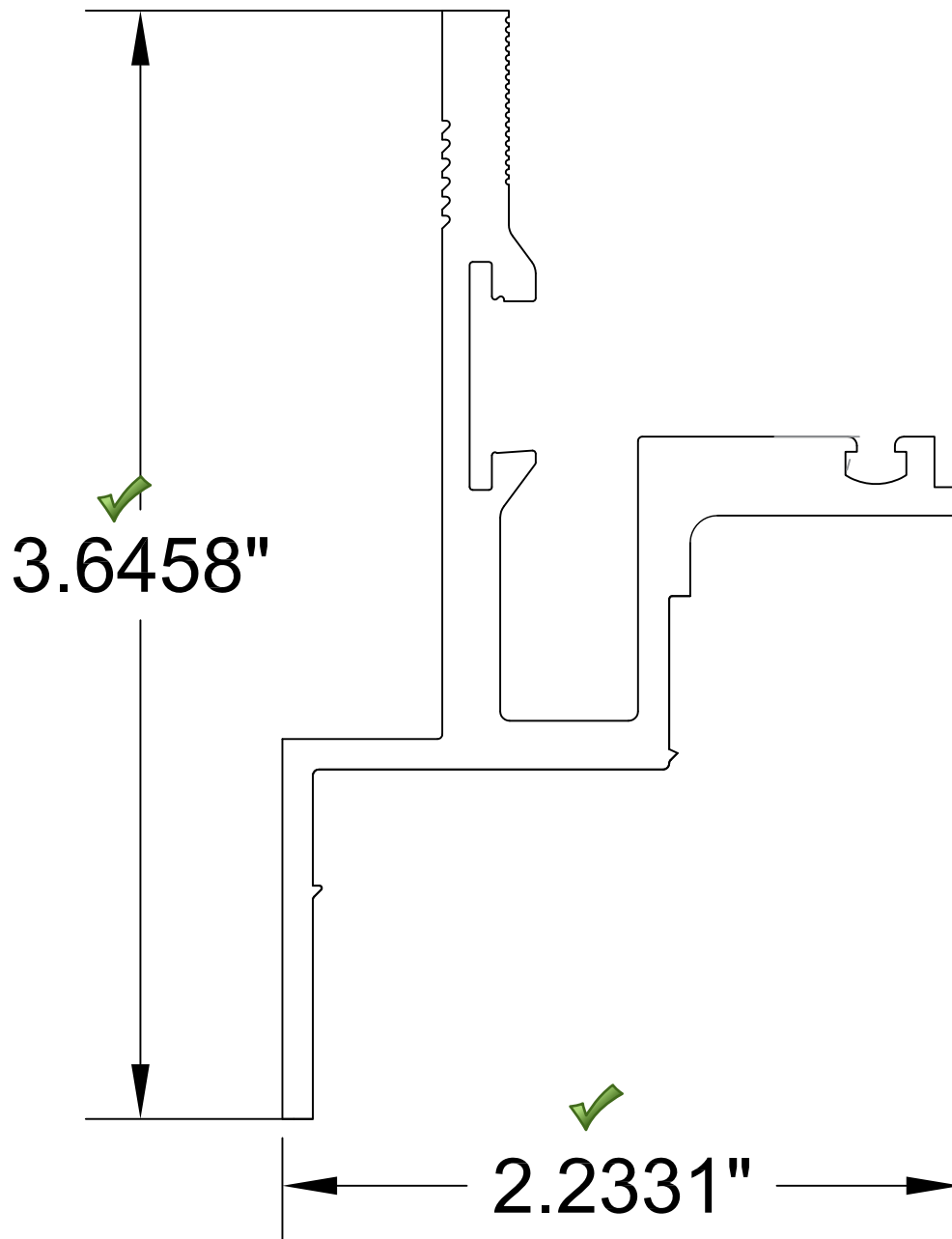
**\* Inboard Glass Sizes**  
P1 = 42 1/2" x 42 1/2"



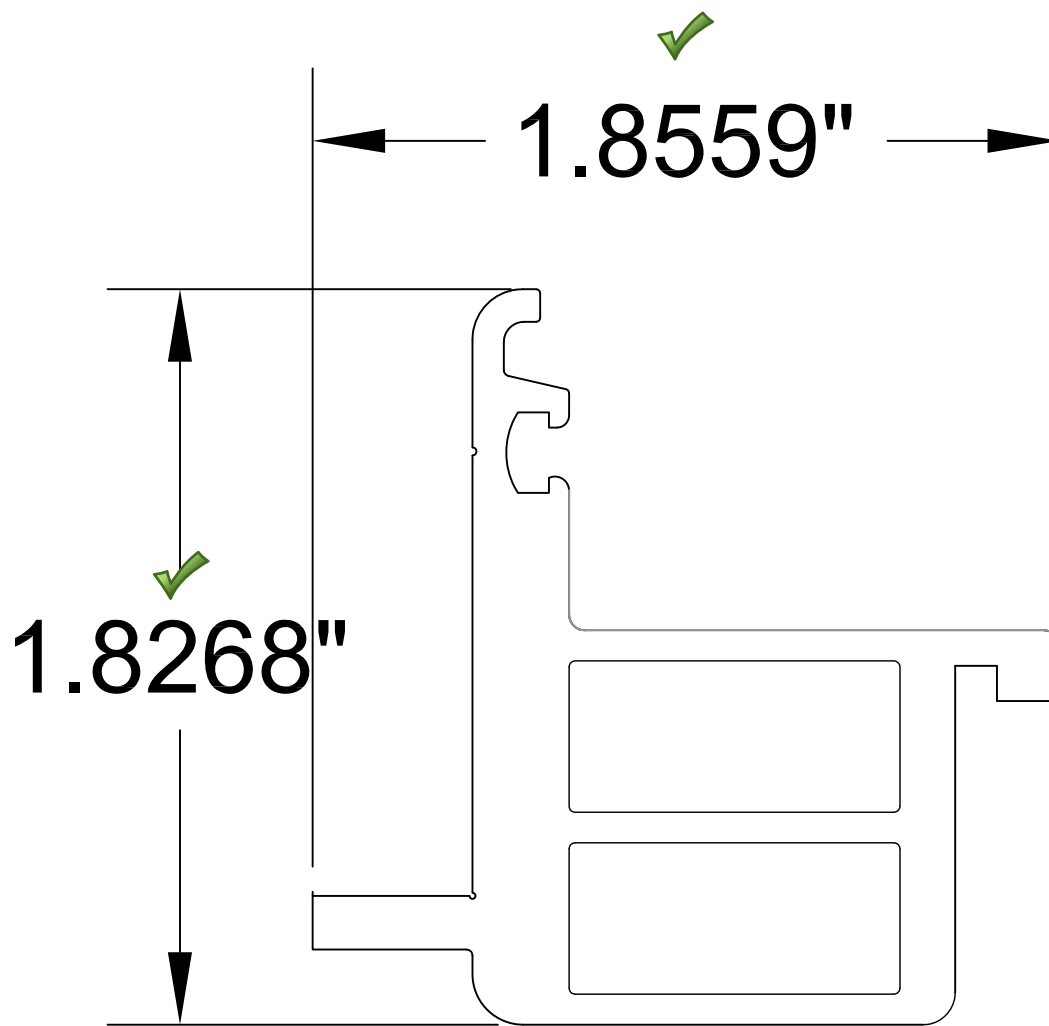
Rev. No.	Date	Description	ARCHITECT
1	1/24/18	Revised per m/u print dtd. 01/24/18	
Specifications			CONTRACTOR
Frame: Painted Aluminum 6063-T6			
Glazing: 3/8" Top Layer - Clear Tempered			
0.060 PVB Interlayer			
3/8" Middle layer - Clear Tempered			
0.060 PVB Interlayer			
3/8" Bottom layer - Clear Tempered			
1/8" Clear Tempered			
1/8" Clear Tempered with			
0.030 PVB Interlayer			
1/8" Clear Tempered			
MANUFACTURER			Glass Flooring Systems, Inc.
PROJECT			10 Leslie Court
NCTL Testing of the Glass Flooring System's			Whippany, NJ 07981
Skyfloor 2.0 48" x 48" Unit (Double Insulated)			
Air & Water Infiltration Test			
SCALE: NTS			
ALL ELEVATIONS ARE VIEWED FROM EXTERIOR			
DRAWN	DATE	DWG. NO.	SHEET
JBW	1/9/2018	NCTL Skyfloor 2.0 48x48 Test Unit	G2



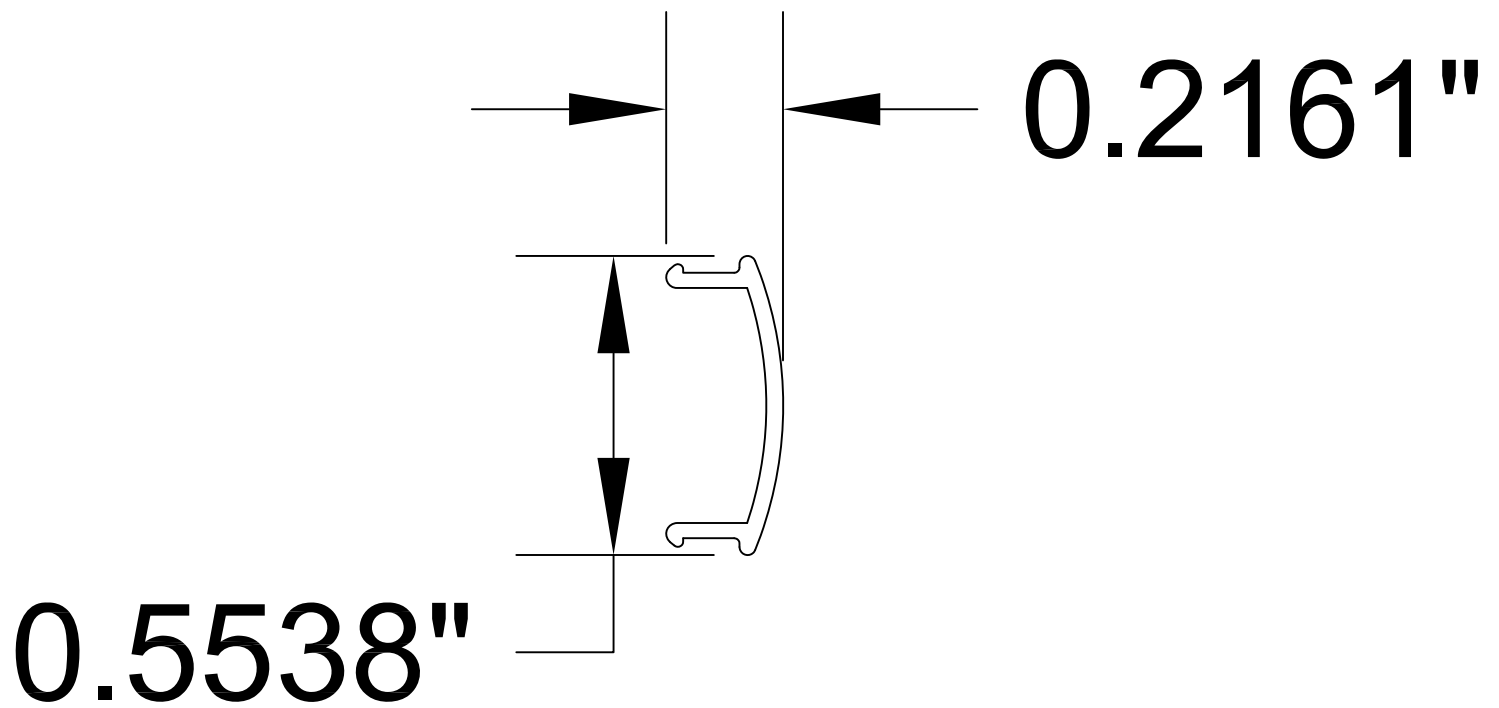
dwg: 1



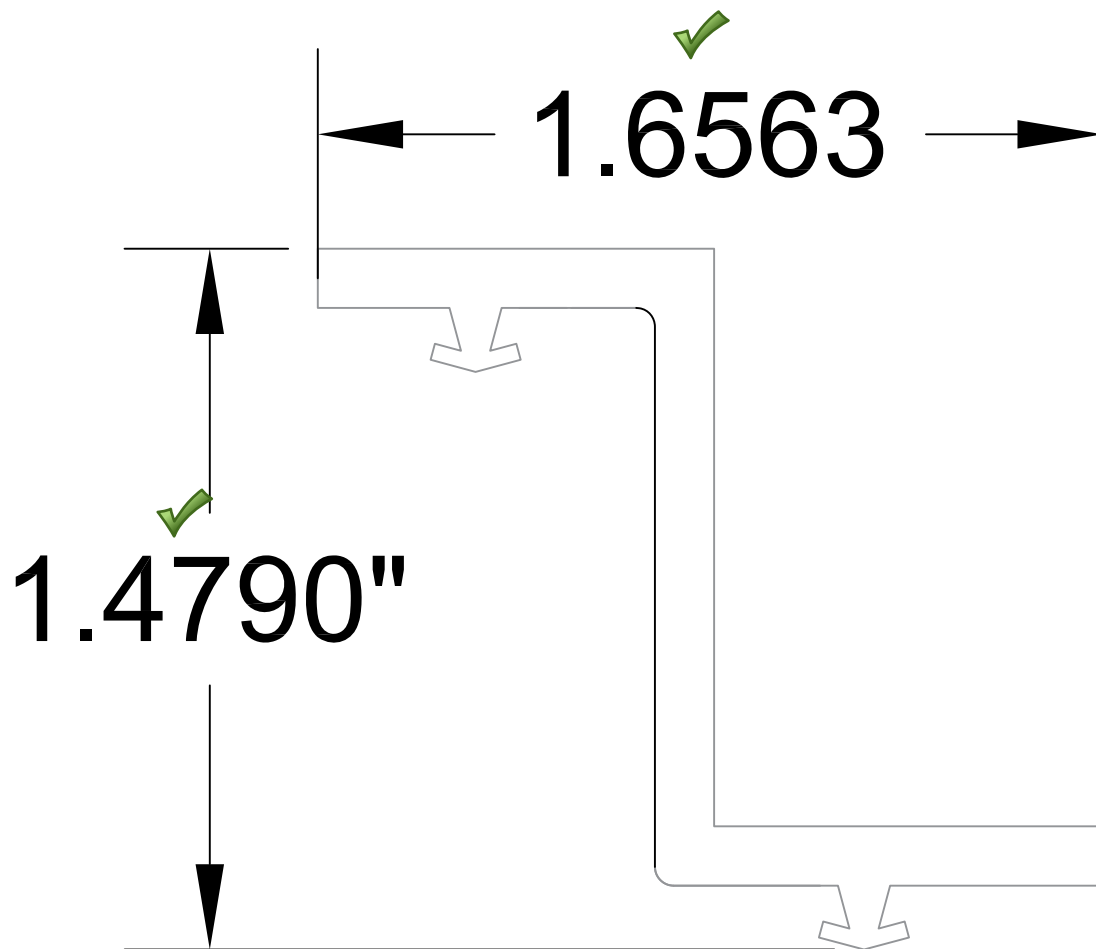
dwg: 2



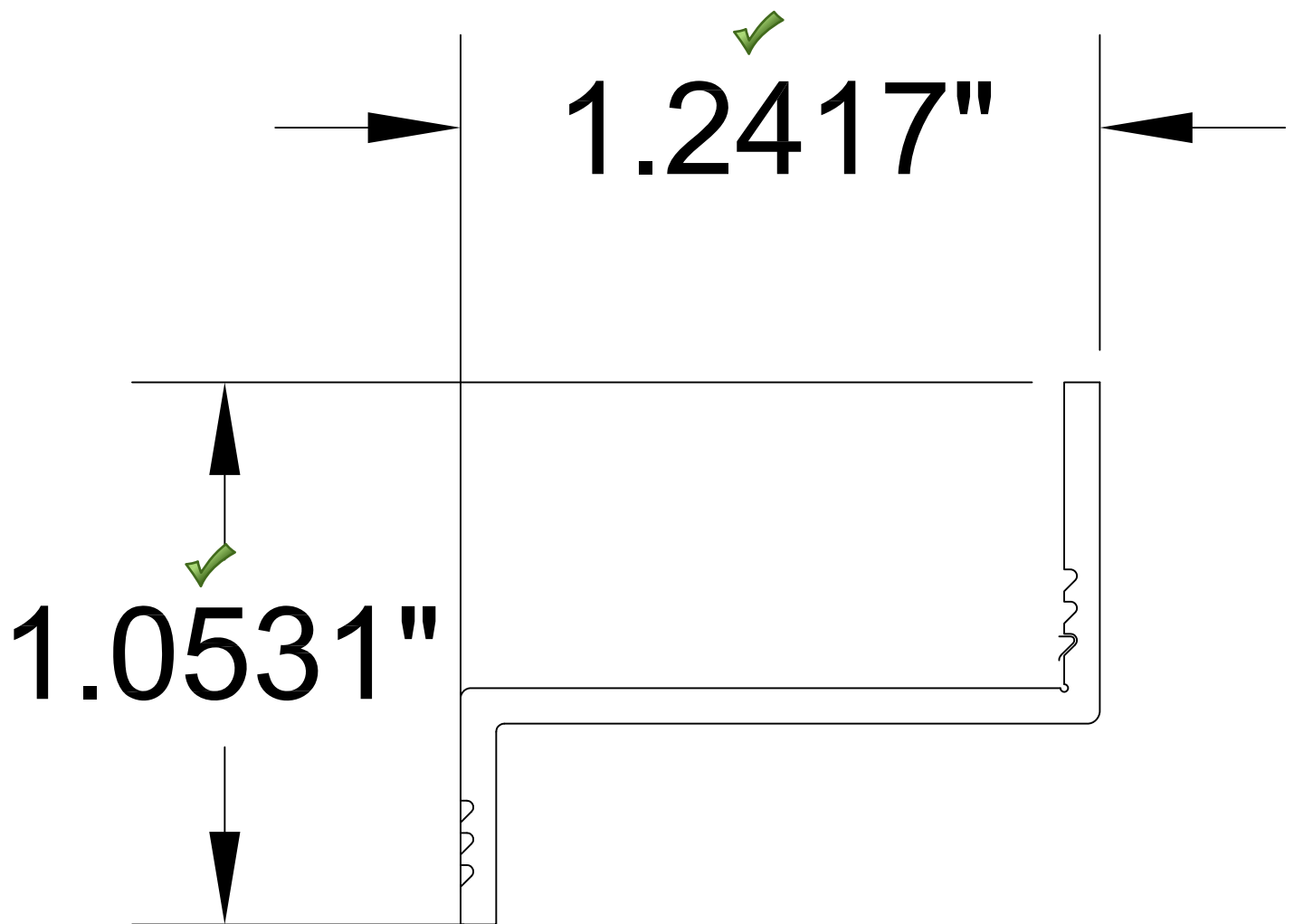
dwg: 3



dwg: 4

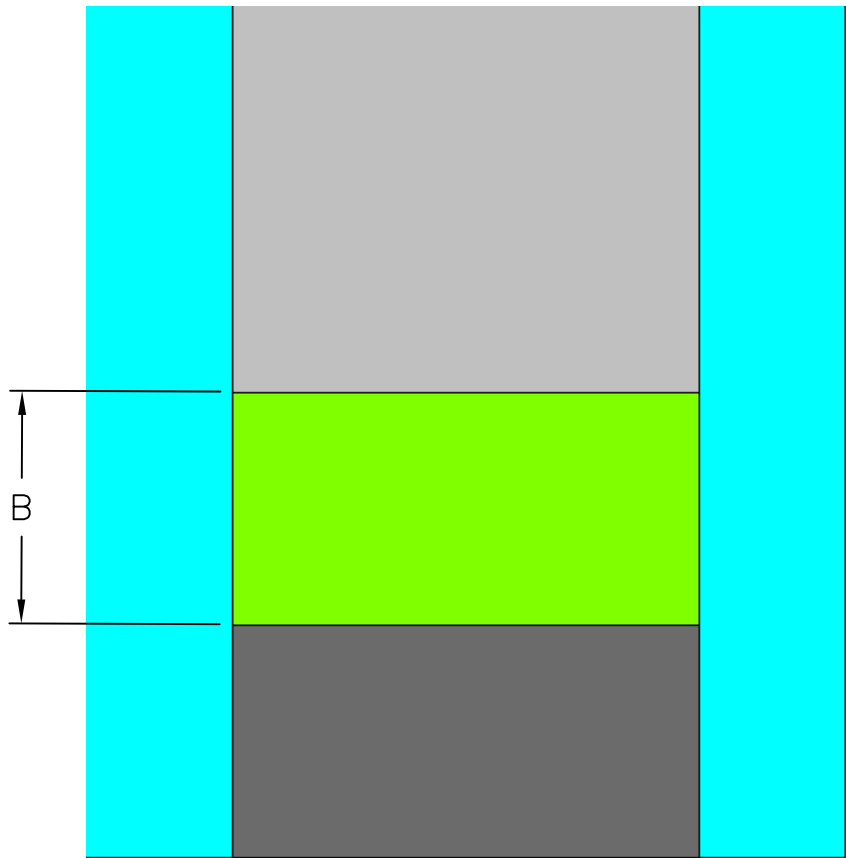


dwg: 5



dwg: 6

MANUFACTURER:		QUANEX		SPACER:		PREMIUM SUPER SPACER (ZF-S)	
SHEET:	1/1	REV:	00	GAS & PERCENTAGE:			
				KRYPTON: 90%			
GAP WIDTHS:							
.370"							



SPACER MATERIAL: SILICONE FOAM (.125 W/Mk)

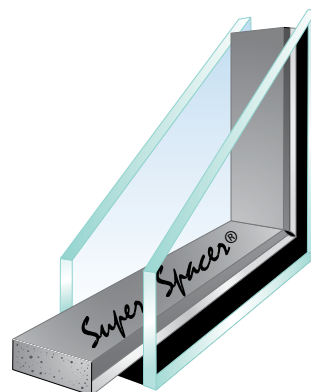
PRIMARY SEALANT: BUTYL RUBBER (ISOBUTENE SOLID, HOT METAL)

SECONDARY SEALANT: N/A

B) SPACER HEIGHT: .187"

## Super Spacer® Premium Enhanced

Super Spacer® Premium is a flexible, silicone foam spacer product that provides the maximum in perimeter insulation for sealed glazing units. Desiccant-filled with pre-applied side adhesive, the structural foam spacer significantly simplifies insulating glass (IG) production.



### Basic Use

Super Spacer is a dual seal insulating glass spacer system that uses a high-performance acrylic adhesive for its structural seal and is backed with a proprietary multi-layer moisture vapor seal.

Featuring a vapor barrier backing, the spacer must be used in combination with conventional IG sealants.

### Colors

Super Spacer Premium is available in Black, Aluminum, Grey and Almond.

### Composition

Silicone foam base with desiccant pre-fill.

### Desiccant Fill

3A molecular-sieve; 47% minimum by weight.

### Continuous Packaged Length

For regular insulating glass production, Super Spacer Premium is supplied on reels with the continuous packaged length varying depending on the spacer width.

### Protective Packaging

To provide desiccant protection, the reels are vacuum-sealed in moisture-proof foil bags. The reels are then shipped in recyclable cardboard boxes.

Performance	Norm
<b>Thermal conductivity</b> 0.125 W/m <sup>2</sup> K	ASTM C 518
<b>Gas / Moisture vapor barrier</b> WVTR < 0.020 gm/m <sup>2</sup> /day Oxygen < 0.009 cc/m <sup>2</sup> /day	ASTM F 1249 ASTM D 3985
<b>Primary structural seal</b> Acrylic adhesive	
<b>Fogging</b> No fog in visual area.	ASTM E 2190 EN 1279 - 6 CAN/CGSB 12.8
<b>Gas Retention</b> Pass with hot-melt butyl or curative butyl	EN 1279 - 3
<b>I.G. Durability</b> Pass with hot-melt butyl or curative butyl	ASTM E 2190 EN 1279 - 2

### Warm-Edge Silicone Foam Features & Benefits

- Superior silicone foam insulation
- Low thermal conductivity
- Substantially reduced perimeter condensation
- Typical overall 0.2 W/m<sup>2</sup>K (0.04 BTU/h-ft<sup>2</sup>-°F) U-value window improvement (vs. aluminum)
- Excellent UV resistance
- Extreme temperature performance
- Fast dew-point drop
- Superior compression-set resistance
- Excellent color stability
- Enhanced sound dampening

### Edge-Seal Durability

- Continuous vapor barrier at corners
- No chemical fogging
- High desiccant content
- Same spacer material and edge-seal technology as the proven Premium Plus product.

### Unique Dual-Seal Design

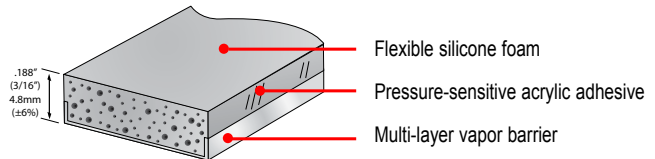
- Outer hot-melt butyl sealant for enhanced gas retention
- Inner structural acrylic side adhesive
- Immediate unit handling
- No cold flow or spacer/seal migration problems

### Improved Productivity

- Fast application
- Elimination of desiccant filling
- No corner key assembly
- Simplified production of shaped units
- Limited equipment investment
- High-volume production with reduced labor force

### Pleasing Aesthetic Appearance

- Black, Aluminum, Grey or Almond colors
- Smooth matte surface finish
- No surface blistering or bubbling
- Straight-line application with sharp 90° corners



### Reel Sizes

Width mm	Width inches	Meter/ Reel	Feet/ Reel	Meter/ Auto Reel	Feet/ Auto Reel
4.8 mm	0.188"	610	2000	N/A	N/A
6.4 mm	0.250"	457	1500	1372	4500
7.9 mm	0.313"	335	1100	1006	3300
9.5 mm	0.375"	305	1000	914	3000
11.1 mm	0.438"	274	900	823	2700
11.9 mm	0.469"	244	800	731	2400
12.7 mm	0.500"	244	800	731	2400
14.3 mm	0.563"	213	700	640	2100
15.9 mm	0.625"	206	675	617	2025
17.5 mm	0.688"	183	600	549	1800
19.1 mm	0.750"	175	575	526	1725
20 mm*	0.787"	152	500	457	1500

\* All even metric sizes are not available in North American market.

Note: Nominal sizes larger than 0.375" (3/8") have a tolerance of +/- 3% for the width (airspace) and +/- 6% for the height (thickness).

For nominal sizes 0.375" (3/8") and lower the tolerance is +/- 0.010" on the width (airspace) and +/- 6% for the height (thickness).

Note: All metric dimension equivalent sizes are for reference only.

Quanex's Quality Management System is certified to ISO 9001 by Smithers Quality Assessments

Rev. #	Revisions Made	Rev. Date
1	Smithers mark removed per Ashton Rentsch , W/mK performance changed per Vince Warne, Energy star mark removed per Lori Postak.	1/6/17

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