



NATIONAL CERTIFIED TESTING LABORATORIES

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

AAMA/WDMA/CSA 101/I.S.2/A440-11
AAMA/WDMA/CSA 101/I.S.2/A440-08

TEST REPORT SUMMARY

Rendered to:

GLASS FLOORING SYSTEMS INC.
10 Leslie Court
Whippany, NJ 07981

PRODUCT TYPE: SkyFloor™ Walkable Skylight
SERIES/ MODEL: FA-TB 4x4

Title	Summary of Results
Primary Product Designator AAMA/WDMA/CSA 101/I.S.2/A440-11 AAMA/WDMA/CSA 101/I.S.2/A440-08 AAMA/WDMA/CSA 101/I.S.2/A440-05	SKG-PG120: Size tested 1216 x 1216 mm (~48 x 48 in) Class CW-PG120: Size tested 1216 x 1216 mm (48 x 48 in)- SKG
Positive Design Pressure	+5750 Pa (+120.09 psf)
Negative Design Pressure	-6710 Pa (-140.14 psf) ⁽¹¹⁾ -5750 Pa (-120.09 psf) ⁽⁰⁸⁾
Air Infiltration	0.1 L/s/m ² (<0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)
Uniform Load Structural Test Pressure	±11510 Pa (±240.39 psf)

Test Completed: 08/02/16

Reference must be made to Report No. NCTL-110-19383-1 dated 08/19/16 for complete test specimen description and data.

For National Certified Testing Laboratories

Justin L. Bupp
Laboratory Manager



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STRUCTURAL TEST REPORT

NCTL-110-19383-1

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

REPORT NUMBER: NCTL-110-19383-1
REPORT DATE: 08/19/16

PRODUCT:
SKYFLOOR™ WALKABLE SKYLIGHT

SERIES/ MODEL:
FA-TB 4X4



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Report Number	NCTL-110-19383-1
Report Date	08/19/16
Report To	Glass Flooring Systems, Inc. 10 Leslie Court Whippany, NJ 07981
Date Testing Started	07/28/16
Date Testing Completed	08/02/16
Specification	AAMA/WDMA/CSA 101/I.S.2/A440-11 NAFS 2011 - North American Fenestration Standard/Specification for windows, doors, and skylights AAMA/WDMA/CSA 101/I.S.2/A440-08 NAFS North American Fenestration Standard/Specification for windows, doors, and skylights
Performance Results	<u>AAMA/WDMA/CSA 101/I.S.2/A440-11</u> SKG-PG120: Size tested 1216 x 1216 mm (~48 x 48 in) <u>AAMA/WDMA/CSA 101/I.S.2/A440-08</u> Class CW-PG120: Size tested 1216 x 1216 mm (48 x 48 in)-SKG

Description of Specimen Tested

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

Model/ Series	SkyFloor™ Walkable Skylight FA-TB 4x4
Configuration	Fixed Skylight
Flange Size	1365 mm x 1365 mm (53.75" x 53.75")
Frame Size	1216 mm x 1216 mm (47.875" x 47.875")
Viewing Area	1054 mm x 1054 mm (41.5" x 41.5")
Frame Type	Extruded aluminum with poured urethane thermal breaks
Joint Construction	<u>Frame</u> Mitered, welded
Glazing Components	
Overall	50.67 mm (1.995") nominal
Glass Thickness	(1) Lite of 31.62 mm (1.245") nominal laminated glass to the exterior and (1) lite of 7.87 mm (0.310") laminated glass to the interior
Laminated Glass	<u>Interior</u> (3) Lites of 9.53 mm (0.375") nominal tempered glass and each lite was separated by (1) 1.52 mm (0.060") PVB interlayer
Laminated Glass (cont'd.)	<u>Exterior</u> (2) Lites of 3 mm (0.125") nominal tempered glass separated by a 0.76 mm (0.030") PVB interlayer
Spacer Type/Size	12.7 mm (0.50") Desiccant-filled aluminum spacer (Type A1-D)
Glazing System	Exterior glazed with a structural silicone back-fill

Weatherstrip	No weatherseals employed
Operating Hardware	No operating hardware employed
Auxiliary	
Type	Extruded aluminum adjustable cap
Location	Exterior frame perimeter
Type	Aluminum block
Location	Glazing channel perimeter
Reinforcement	No reinforcement employed
Weep Description	No apparent weeps employed
Interior/ Exterior Surface Finish	Painted aluminum
Sealant	No apparent sealant applied
Insect Screen	No screen employed
Installation Method	The skylight was installed on the test chamber constructed of 19.05 mm (0.75") plywood and standard 51 mm x 152 mm (2" x 6") spruce-pine-fir studs and plates. The skylight was fastened to the top plate with (1) 9.53 mm (0.375") x 51 mm (2") lag bolt with washer at each pre-punched flange hole. The exterior perimeter was sealed with silicone sealant.

Test Results - AAMA/WDMA/CSA 101/I.S.2/A440-2011 & 2008

<u>Paragraph</u>	<u>Test</u>
5.3.2.1/ 9.3.2	Air Leakage Resistance ASTM E283-04(12)
	The tested specimen meets or exceeds the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-2011 and 2008 for air infiltration at 75 Pa (1.6 psf).
	Maximum Allowable = 1.5 L/s/m ² (0.3 cfm/ft ²)
	Extraneous Air Leakage = 0.5 L/s (1.1 cfm)
	Total Air Leakage = 0.5 L/s (1.1 cfm)
	Air Infiltration Rate = 0.1 L/s/m ² (<0.01 cfm/ft ²)

<u>Paragraph</u>	<u>Test</u>
5.3.3/ 9.3.3	Water Penetration Resistance ASTM E547-00(09)
	<u>3.4 L/ (min• m²) (5.0 gph/ft²)</u>
	No Leakage after 4 cycles of 5 minutes at 580 Pa (12.11 psf)
	NOTE: Tested without insect screen

Paragraph Test
 5.3.4.2/ 9.3.4.2 Uniform Load Deflection at Design Pressure
 ASTM E330-14

No damage after positive	5750 Pa (120.09 psf) held for 60 seconds ⁽⁰⁸⁾
No damage after negative	5750 Pa (120.09 psf) held for 60 seconds ⁽⁰⁸⁾
No damage after negative	6710 Pa (140.14 psf) held for 10 seconds ⁽¹¹⁾
Measured Deflection ^{Positive}	= 0.33 mm (0.012 inches) ⁽⁰⁸⁾
Measured Deflection ^{Negative}	= 0.03 mm (0.001 inches) ⁽⁰⁸⁾
Measured Deflection ^{Negative}	= 0.08 mm (0.003 inches) ⁽¹¹⁾
Maximum Allowed (L/175)	= 6.96 mm (0.274 inches)

NOTE: Deflection measurements held for 10 seconds per NAFS 2011 and 60 seconds per NAFS 2008

Paragraph Test
 5.3.4.3/ 9.3.4.3 Uniform Load Structural Test
 ASTM E330-14

No damage after positive	11510 Pa (240.09 psf) held for 60 seconds
No damage after negative	11510 Pa (240.09 psf) held for 10 or 60 seconds
Measured Permanent Set ^{Positive}	= 0.05 mm (0.002 inches)
Measured Permanent Set ^{Negative}	= 0.10 mm (0.004 inches)
Maximum Allowed (0.3%)	= 2.90 mm (0.114 inches)

NOTE: Deflection and Permanent Set measurements taken on the side over a 1216 mm (47.875") span.

NOTE: Permanent set measurements held for 10 seconds per NAFS 2011 and 60 seconds per NAFS 2008

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 National Certified Testing Laboratories Inc. and the Client to whom it is issued. Permission to reproduce this report by anyone other than National Certified Testing Laboratories Inc 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.

National Certified Testing Laboratories

A digital signature of Justin L. Bupp in cursive script, with a small NCTL logo and the text "DIGITAL SIGNATURE" below it.

Justin L. Bupp
Laboratory Manager

A digital signature of Robert H. Zeiders in cursive script, with a small NCTL logo and the text "DIGITAL SIGNATURE" below it.

Robert H. Zeiders, P.E.
Vice-President Engineering & Quality

JLB/ dro

Attachments

Appendix A – Revision Summary

Appendix B – Drawings

Appendix A
Revision Log

<u>Identification</u>	<u>Date</u>	<u>Page & Revision</u>
Original Issue	08/19/16	Not Applicable

Appendix B

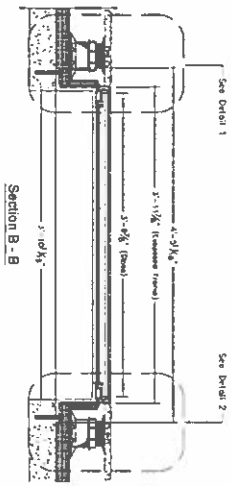
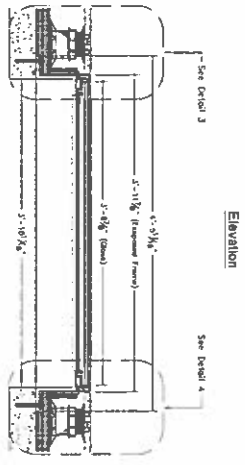
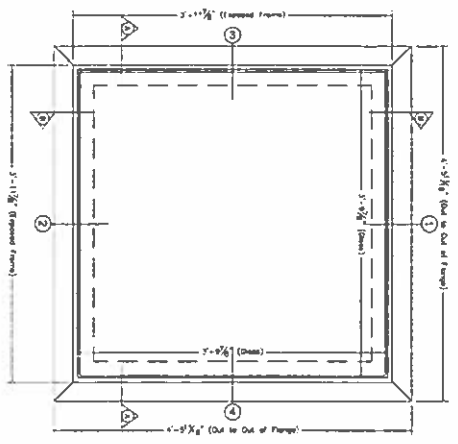
Drawings

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.

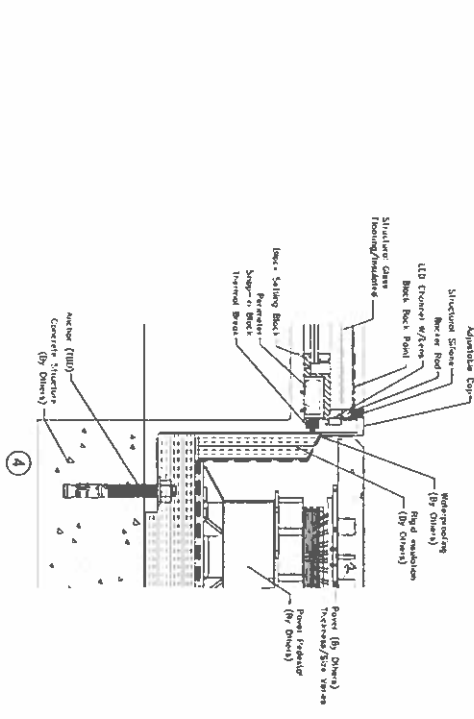
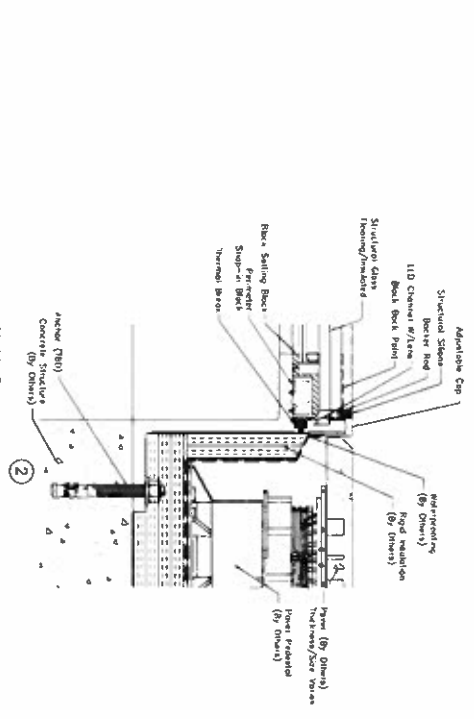
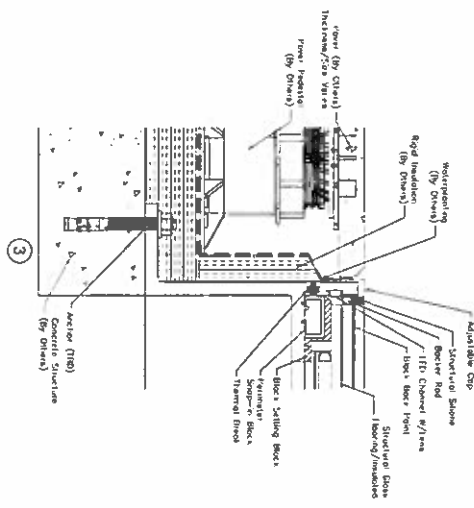
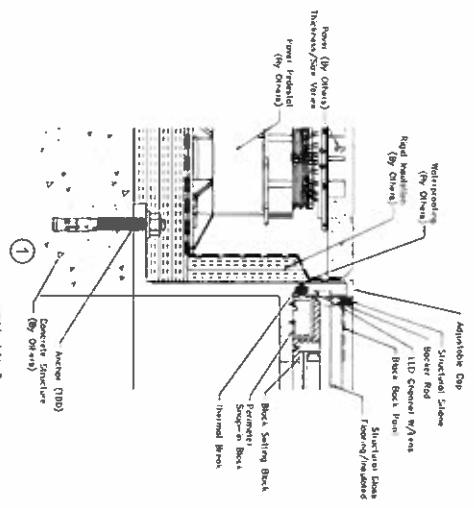
(Reference: NCTL-110-19383-1)

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.



GLASS FLOORING SYSTEMS INC.
 MULTIPLE PATENTS PENDING

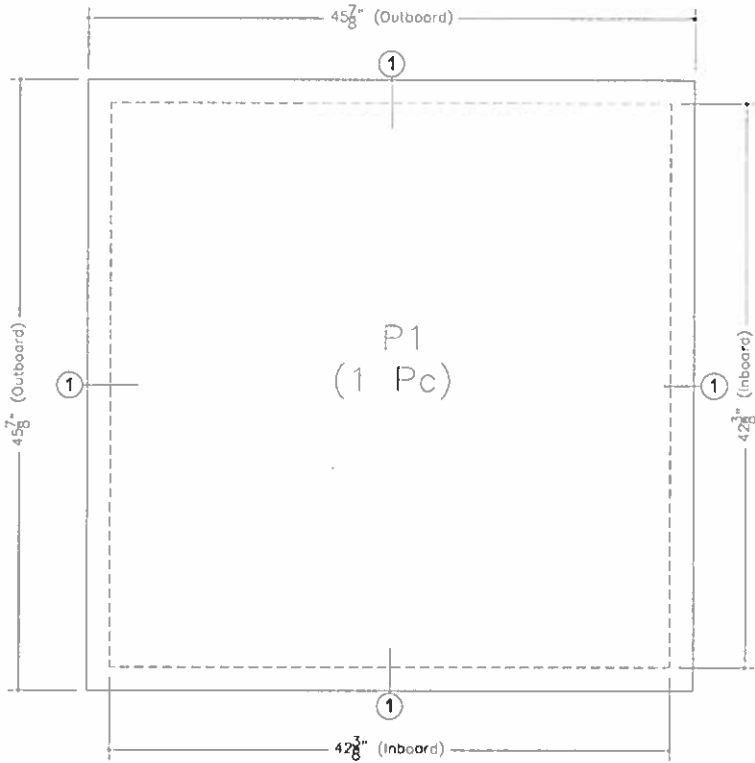


TEST SPECIMEN COMPLIES WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
REPORT NO. NCTL-110-15763-1
TEST DATE: 8-2-16

Rev.	Date	Description
1	8/2/16	Issue

Section/Notes	Comments
Frame: Powder Aluminum 6063-T5 Clearing: 3/8" Top, Jammer, Cham, Tempored 0.000 PVB Interlayer 3/8" Middle Spacer - Cham Tempored 0.000 PVB Interlayer 1/8" Cham Tempored with 0.000 PVB Interlayer 1/8" Cham Tempored 1/8" Cham Tempored	Glass Flooring Systems, Inc. Wapping, NJ 07741 NCTL Testing of the Glass Flooring Systems (Sylphor) 7'48" x 48" Unit A/E & Vendor Installation Test Model: ALI-ELEV-INC-UB-07-03-1000-EXTRA Date: 8/2/16 Rev: 1.0

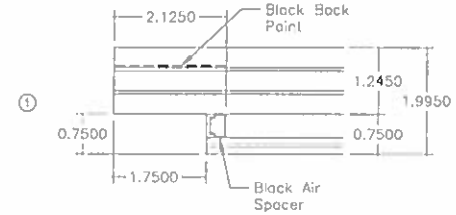
Glass Size (Outside View)



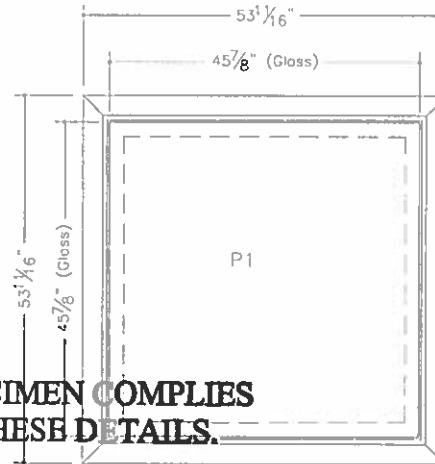
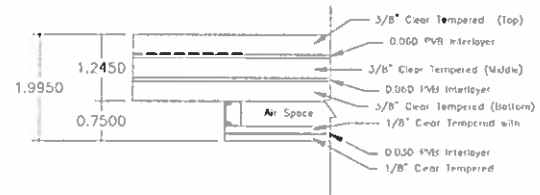
* Outboard Glass Sizes
P1 = 45 7/8" x 45 7/8"

* Inboard Glass Sizes
P1 = 42 3/8" x 42 3/8"

Glass Assembly Details



Glass Make-up Detail



TEST SPECIMEN COMPLIES WITH THESE DETAILS.

ANY DEVIATION IS NOTED.

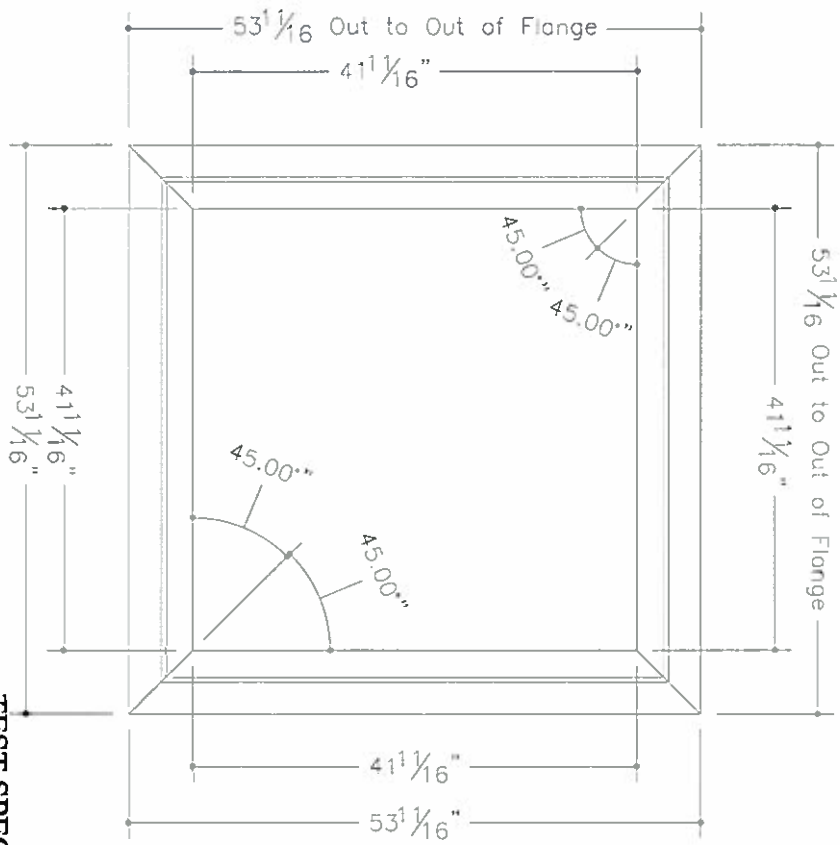
Rev. No./Date		Description		ARCHITECT	
Specifications				CONTRACTOR	
Frame: Painted Aluminum 6063-T6 Clearing: 3/8" Top Layer - Clear Tempered 0.060 PVB Interlayer 3/8" Middle layer - Clear Tempered 0.060 PVB Interlayer 3/8" Bottom layer - Clear Tempered 1/8" Clear Tempered with 0.030 PVB Interlayer 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) 48" x 48" Unit Air & Water Infiltration Test				SCALE: N/A ALL DIMENSIONS ARE GIVEN FROM CENTER	
DRAWN:	DATE:	CHECKED:	DATE:	BY:	DATE:
	8/29/16				

GLASS FLOORING SYSTEMS INC

MULTIPLE PATENTS PENDING

REPORT NO. NCTL-110- 197E2-1

TEST DATE: 8-2-16

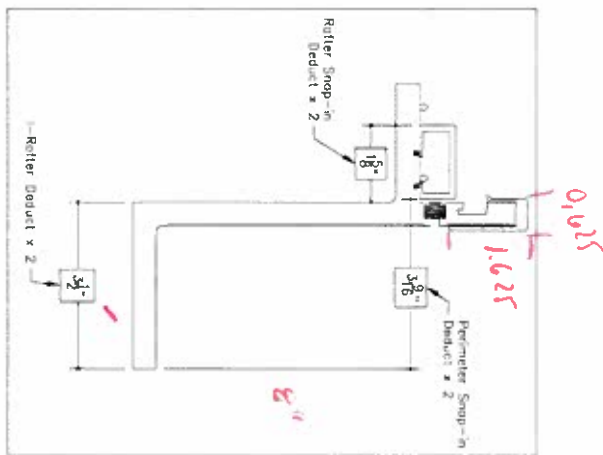


TEST SPECIMEN COMPLIES WITH THESE DETAILS.

ANY DEVIATION IS NOTED.

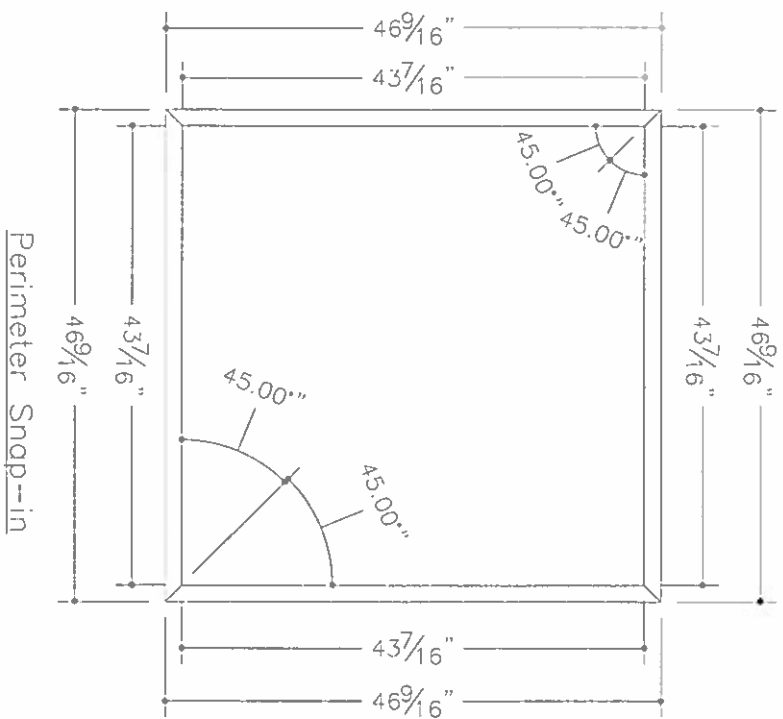
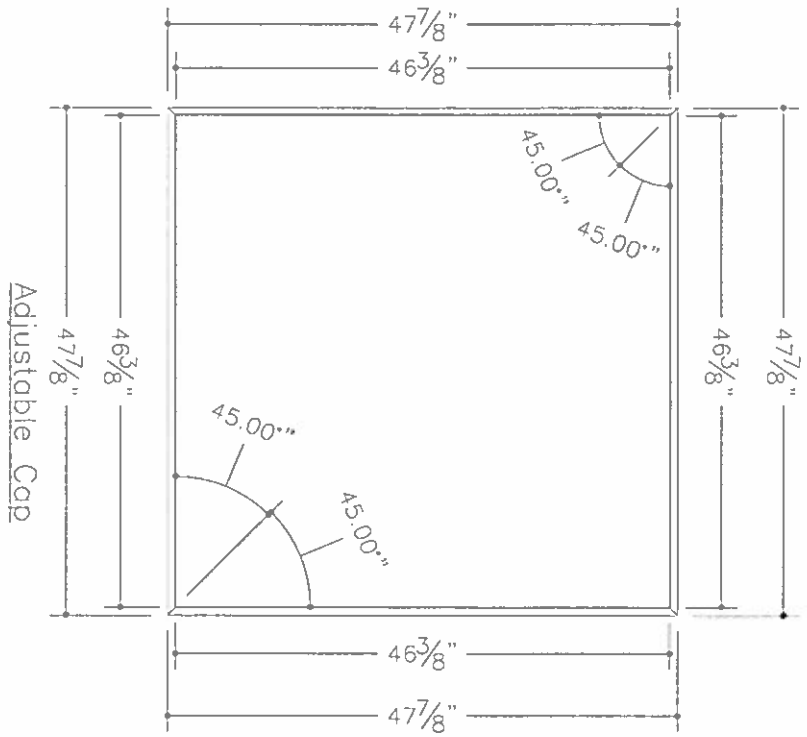
REPORT NO. NCTL-110-193631

TEST DATE: 8-2-16



Section	Description
Specifications	Frame: Painted Aluminum 6063 T6 Glazing: 3/8" Clear, Clear, Tempered 0.000 PVG Interlayer 3/8" Multi-Layer, Clear, Tempered 0.000 PVG Interlayer 1/8" Clear, Tempered 0.000 PVG Interlayer 1/8" Clear, Tempered
Contractor	Glass Fixing Systems, Inc. 1000 N. 10th St. Waynesville, NC 27681
Inspector	NCTL Testing of the Glass Fixing Systems (Shelby) 1487 7487 Unit At 8 (NCTL) Installation Team
Scale	AS BUILT
Date	8/2/16
Drawn	AS BUILT
Checked	AS BUILT
Approved	AS BUILT

GLASS FLOORING SYSTEMS INC



TEST SPECIMEN COMPLIES WITH THESE DETAILS.

ANY DEVIATION IS NOTED.

REPORT NO. NCTL-110-19383-1

TEST DATE: 8-2-16

GLASS FLOORING SYSTEMS INC
MULTIPLE PATENTS PENDING

Proof Of Size:
Perimeter O.A. Flange=5.5625=Perimeter Snap--in)
(4) Long = 55.6875=5.5625=5.5625 = 46 9/16" (5'-10 9/16")

Rev	Date	Description

Specifications	Frame Powder Aluminum 6063-T5
	Cladding 3/8" 100 Series Clear Tempered
	0.000 PVB Interlayer
	3/8" Middle Layer Clear Tempered
	0.000 PVB Interlayer
	1/8" Clear Tempered web
	1/8" Clear Tempered web
	1/8" Clear Tempered web
	1/8" Clear Tempered web

Manufacturer	Glass Flooring Systems, Inc.
	One Oakwood Court, 07981
	Moorestown, NJ
PROJECT	NCTL Testing of the Glass Flooring Systems
	(Sightbox) 7.48" x 48" Unit
	As E. Water Distribution Test
Scale	1/4" = 1'-0"
Drawn By	
Checked By	
Date	