NATIONAL CERTIFIED TESTING LABORATORIES

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

ASTM E283-04(12)
ASTM E330-14
ASTM E331-00(09)
ASTM E547-00(09)

STRUCTURAL PERFORMANCE TEST REPORT SUMMARY

RENDERED TO:
Alumin Techno LLC
Silitskogo Str. 12-211 220075 FEZ Minsk
Minsk area, Minsk region
The Republic of Belarus

MODEL/TYPE: "CW1" Fixed Curtain Wall

TITLE	SUMMARY OF RESULTS
Air Infiltration 75 Pa (1.57 psf)	0.10 L/s/m^2 (0.02 cfm/ft^2 measured)
Air Infiltration 300 Pa (6.24 psf)	0.15 L/s/m^2 (0.03 cfm/ft^2 measured)
Water Penetration Resistance	574.6 Pa (12.0 psf)
Design Pressure	± 3351.6 Pa (70.0 psf)
Uniform Load Structural Test	± 5027.4 Pa (105.0 psf)

Test Completion Date: 06/11/14

Reference must be made to Report Number NCTL-110-16400-1 dated 08/20/14 for complete test sample description and data.

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DIGITAL SIGNATURE

Jay Leader
Technician

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STRUCTURAL PERFORMANCE TEST REPORT

Report Number	NCTL-110-16400-1
Report Date	08/20/14
Report To	Alumin Techno LLC Selitskogostr. 12-211220075 FEZ Minsk Minsk area, Minsk region The Republic of Belarus
Starting Test Date	05/20/14
Ending Test Date	06/11/14
Specification	ASTM E283-04(12), "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen." ASTM E331-00(09), "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference." ASTM E547-00(09), "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cyclic Static Air Pressure Difference." ASTM E330-14, "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference."

Description of Sample Tested

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

Model/Type	"CW1"
Configuration	Fixed Curtain Wall
Frame Size	2438 mm x 2438 mm (96" x 96")
Fixed Viewing Area	(2) 1149 mm x 2343 mm (45.25" x 92.25")
Frame & Sash Type	Extruded aluminum with vinyl-wrapped foam thermal breaks
Joint Construction	Frame/ Intermediate Butt-type aluminum clip (4) screw
Glazing Components	
Overall	24 mm (1") nominal
Glass Thickness	(2) Lites of 6 mm (0.225") nominal tempered glass
Spacer Type/ Size	13.97 mm (0.550") Desiccant-filled aluminum spacer (Type A1-D)
Glazing System	Exterior glazed against EPDM hollow bulb single-leaf gasket and held-in-place with an aluminum pressure plate with evenly spaced screws with a EPDM multi-fin gasket.

Auxiliary

Type	Rigid vinyl insert
Location	All frame members secured with evenly spaced screws
Type	Rigid vinyl joinery cover
Location	Frame and intermediate joinery
Type	Aluminum shim
Location	Evenly spaced at the glazing perimeter
Type	Aluminum cover
Location	Snap-fitted to pressure plates at the exterior of the frame and intermediate

Reinforcement

Type	Extruded aluminum tube
Thickness	2.16 mm (0.085")
Location	Jambs and intermediate

Interior & Exterior Surface Finish White painted aluminum

Installation Method The window was installed in a 50.8 mm by 254 mm (2" x 10") spruce-pine-fir lumber test buck with (1) 16 gauge 50.8 mm (2") by 152.4 mm (6") by 152 mm (0.060") thick steel strap located at the ends of each jamb and intermediate. Each strap was secured to the frame/ intermediate with (4) #12 x 19 mm (0.75") flat head screws and (4) #8 x 31.75 mm (1.25") drywall screws to the buck. The exterior perimeter was sealed with silicone.

Test Results

Test Method	Test
ASTM E283-04(12)	Air Leakage Resistance

Information at 75 Pa (1.6 psf)

Total Air Flow	= 0.74 L/s (2.0 cfm)
Extraneous Air Leakage $_{Tare}$	= 0.38 L/s (0.8 cfm)
Infiltration Rate/ Area	= 0.10 L/s/m^2 (0.02 cfm/ft^2)

Information at 300 Pa (6.24 psf)

Total Air Flow	= 2.31 L/s (4.9 cfm)
Extraneous Air Leakage $_{Tare}$	= 1.09 L/s (2.3 cfm)
Infiltration Rate/ Area	= 0.15 L/s/m^2 (0.03 cfm/ft^2)

Test Method	Test
ASTM E547-00(09) ASTM E331-00(09)	Water Resistance Test

3.4 L/ (min• m^2) (5.0 gph/ft^2)

No Leakage after 4 cycles of 5 minutes at 574.6 Pa (12.0 psf)
No Leakage after 1 cycle of 15 minutes at 574.6 Pa (12.0 psf)

Test Method	Test
ASTM E330-14	Uniform Load Deflection at Design Pressure

No damage after positive	3351.6 Pa (70.0 psf) held for 10 seconds
No damage after negative	3351.6 Pa (70.0 psf) held for 10 seconds
Measured Deflection $_{Positive}$	= 24.99 mm (0.984 inches)
Measured Deflection $_{Negative}$	= 25.35 mm (0.998 inches)

Test Method	Test
ASTM E330-14	Uniform Load Structural Test

No damage after positive 5027.4 Pa (105.0 psf) held for 10 seconds
No damage after negative 5027.4 Pa (105.0 psf) held for 10 seconds

Measured Permanent Set $_{Positive}$ = 4.37 mm (0.172 inches)
Measured Permanent Set $_{Negative}$ = 3.35 mm (0.132 inches)

NOTE: Deflection and Permanent Set measurements taken on the intermediate over a 2438 mm (96") 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. 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.

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 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. This report may not be reproduced, except in full, without the written consent of NCTL.

National Certified Testing Laboratories

DIGITAL SIGNATURE

Jay Leader
Technician

DIGITAL SIGNATURE

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

NJL/ drm
Attachments
Appendix A – Drawing & Revision Summary

APPENDIX A

Section 1:

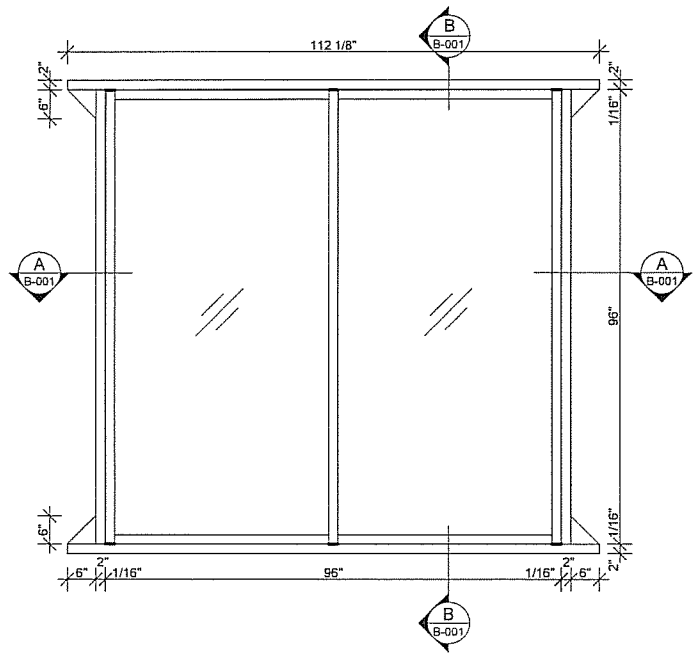
Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were reviewed (as submitted) for Product Verification
(Reference: NCTL-110-16400-1)

See Attached Documentation;
any deviations noted.

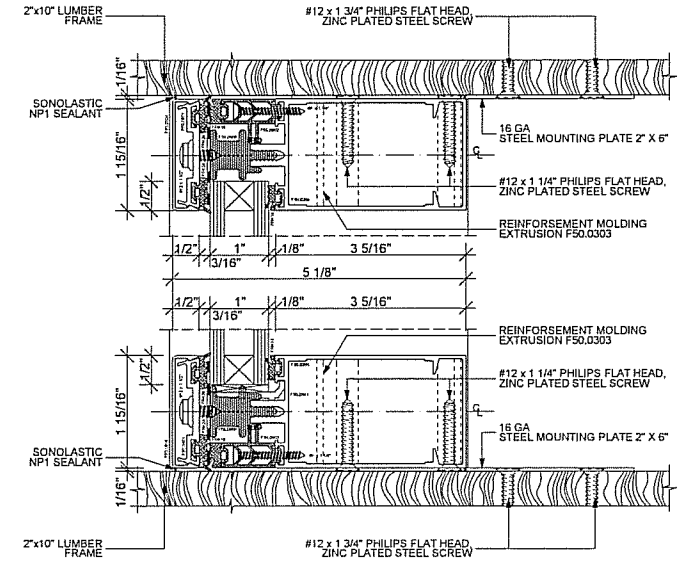
Note: The above referenced component drawings along with representative sections of the test specimen will be retained per procedure by NCTL. This testing facility assumes that all information provided by the client is accurate.

Section 2:

Identification	Date	Page & Revision
Original Issue	08/20/14	Not Applicable



1 CURTAIN WALL ELEVATION
SCALE 1/2" = 1' - 0"



2 SECTION B-B
SCALE: 6" = 1'-0"

SYMBOL LEGEND:

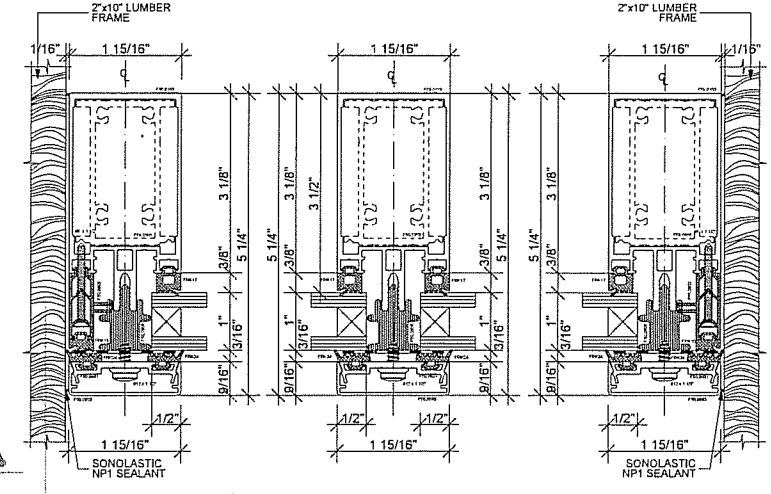
- 16 GA Steel mounting plate

- Glass

℄ - Center line

A / B-002 — Section number / Sheet reference

TEST SPECIMEN COMPLIES WITH THESE DETAILS. ANY DEVIATION IS NOTED
REPORT NO. NCTL-110-16400-1
TEST DATE 6/11/14



3 SECTION A-A
SCALE: 6" = 1'-0"

CLIENT:
ALUTECH SRO

PREPARED BY:
Professional Grade CONSTRUCTION GROUP INC
701 39th St, Brooklyn, NY 11232
tel: 718.382.8400
fax: 718.382.8401

PROJECT ADDRESS:
5 Leigh Drive
York, PA 1740

DATE	REVISION	#

APPROVED

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DRAWING TITLE:
ASSEMBLY DRAWING

DATE: 12.12.2013

DRAWN BY: AG

CHECKED BY: AA

DRAWING No: B-001 SIZE: B

File name: STRUCTURAL TESTS PRESSURE GLAZED CURTAIN WALL 96"x96" B-001 B-002.dwg

01 OF 04

TEST SPECIMEN COMPLIES
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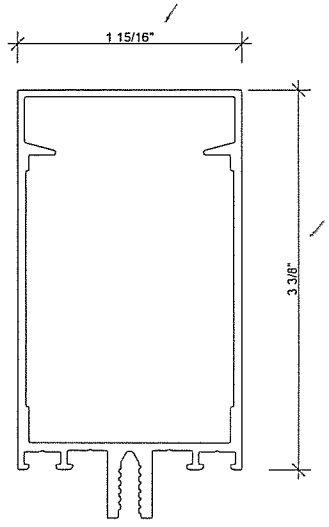
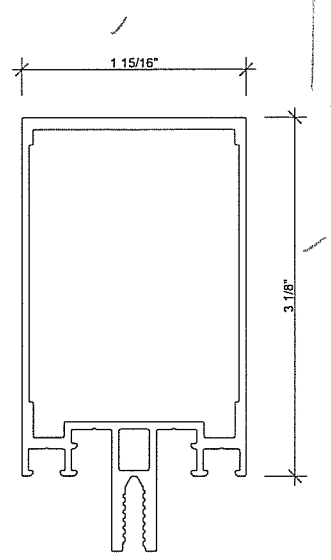
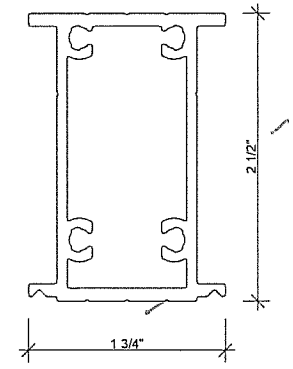
ANY DEVIATION IS NOTED
REPORT NO. NCTL-110- 104001
TEST DATE 6/11/14



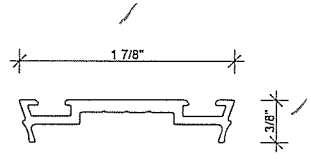
1 HORIZONTAL MULLION CURTAIN WALL EXTRUSION F50.0206
SCALE: 1'-0" = 1'-0"



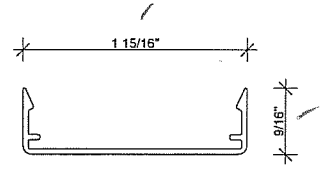
2 VERTICAL MULLION CURTAIN WALL EXTRUSION F50.0103
SCALE: 1'-0" = 1'-0"



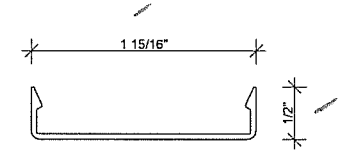
3 REINFORCEMENT MOLDING EXTRUSION F50.0303
SCALE: 1'-0" = 1'-0"



4 PRESSURE PLATE EXTRUSSION F50.0601
SCALE: 1'-0" = 1'-0"



5 COVER CAP EXTRUSION F50.0503
SCALE: 1'-0" = 1'-0"



6 COVER CAP EXTRUSION F50.0504
SCALE: 1'-0" = 1'-0"

CLIENT:
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PROJECT ADDRESS:
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DRAWING TITLE:
CURTAIN WALL EXTRUSIONS

DATE: 12.12.2013

DRAWN BY: AG

CHECKED BY: AA

DRAWING No: B-002 | SIZE: B

File name:
STRUCTURAL TESTS PRESSURE GLAZED CURTAIN WALL 95"x96" B-002 B-size.dwg

02 OF 04

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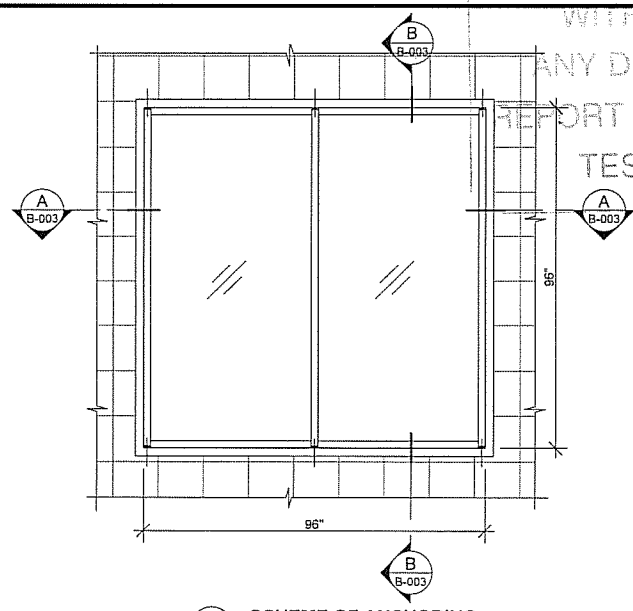
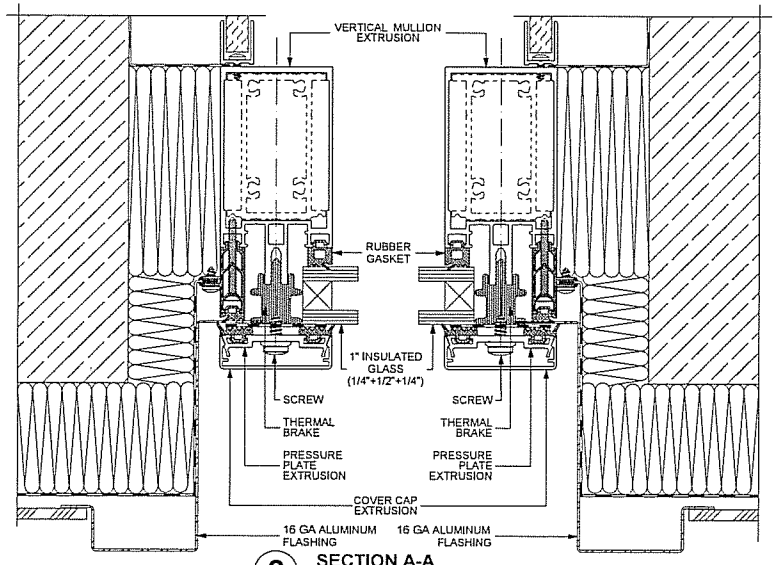
REPORT NO. NCTL-110-1649.1
TEST DATE 6/11/14



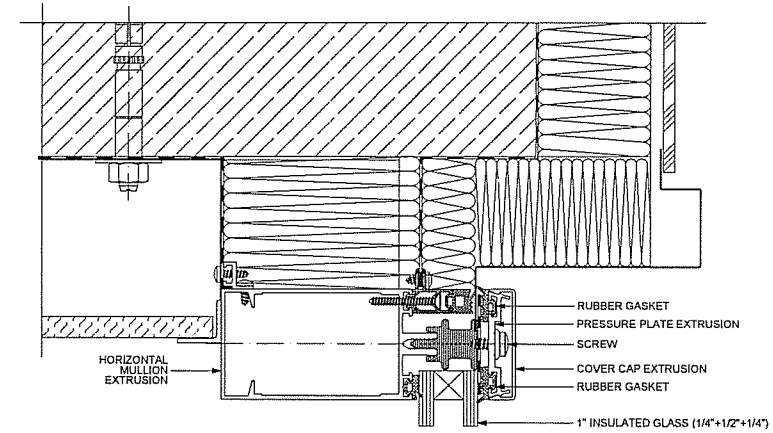
1 SCHEME OF ANCHORING
SCALE: 3/8" = 1'-0"

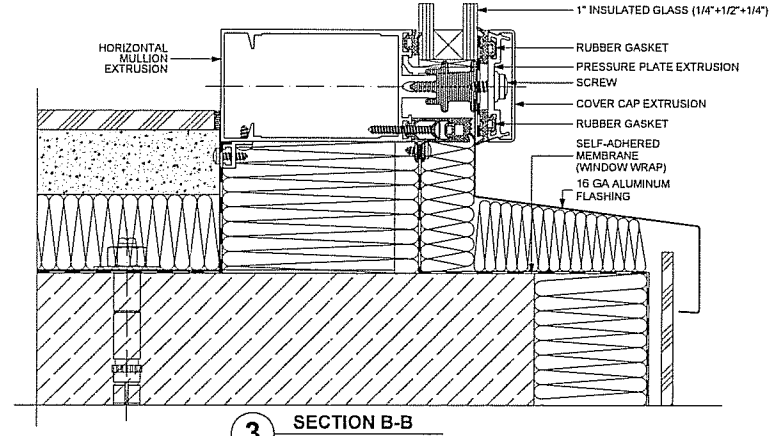
SYMBOL LEGEND:

- 3/8" x 1-7/8" HEAVY DUTY SLEEVE ANCHORS, HEX HEAD, CARBON STEEL ZINC PLATED
- Glass
- Center line
- Section number / Sheet reference (A / B-003)



2 SECTION A-A
SCALE: 6" = 1'-0"





3 SECTION B-B
SCALE: 6" = 1'-0"

CLIENT:
ALUTECH SRO

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DATE	REVISION	#

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INSTALLATION DRAWINGS

DATE: 12.12.2013

DRAWN BY: AG

CHECKED BY: AA

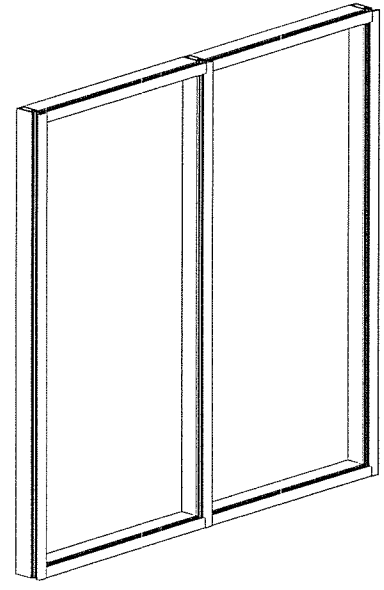
DRAWING No: B-003 | SIZE: B

File name: STRUCTURAL TESTS PRESSURE GLAZED CURTAIN WALL 96"x96" B-003 B-003.dwg | 03 OF 04

Illustration	Article	Description	Q-ty
	F50.0103	Horizontal mullion extrusion L= 46 1/4" ∠90°	4
	F50.0206	Vertical mullion extrusion L= 96" ∠90°	3
	F50.0303	Reinforcement molding extrusion L= 12" ∠90°	6
	F50.0601	Pressure plate extrusion L= 96" ∠90°	3
	F50.0601	Pressure plate extrusion L= 45 1/8" ∠90°	4
	F50.0503	Cover cap extrusion L= 96" ∠90°	3
	F50.0504	Cover cap extrusion L= 45 1/8" ∠90°	4
	IG unit	1" Insulated glass (1/4"x1/2"x1/4") 46 1/8" x 93 1/8"	2
	FRK 24	Rubber gasket L= 960"	1
	F50.0902	Side plastic insert L= 46 5/8" ∠90°	4
	F50.0903	Side plastic insert L= 96" ∠90°	2
	F50.0908	Thermal brake L= 473"	1
	FRK 17	Rubber gasket L= 384"	1
	FRK 15	Rubber gasket L= 384"	1
	FRK 14	Rubber gasket L= 181"	1
	FRK42	Rubber gasket	8
	F50.0941	Glass shim	4
	F50.0943-03	Sheer block for F50.0206	8
	F50.0921	Horizontal mullion end cap	8
	F50.0923	Drain sleeve	6
	N/A	Shim	8

Illustration	Article	Description	Q-ty
	#12 x 1 1/2" Philips pan head, zinc plated steel screw	Screw	57
	#8 x 1 1/4" Philips flat head, zinc plated steel screw	Screw	24
	#8 x 1 1/2" Philips flat head, zinc plated steel screw	Screw	22
	#8 x 5/8" Philips pan head, zinc plated steel screw	Screw	38
	#8 x 1/2" Philips flat head, zinc plated steel screw	Screw	16
	#12 x 1 1/4" Philips flat head, zinc plated steel screw	Screw	24
	#12 x 1 3/4" Philips flat head, zinc plated steel screw	Screw	12
	#12 Zinc plated steel washer	Washer	57
	N/A	Self-adhered vapour membrane L= 480"	1
	N/A	16 GA Steel mounting plate 2" x 6"	6

1 BILL OF MATERIAL



2 CURTAIN WALL AXO VIEW

TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED
REPORT NO. NCTL-110-16400.1
TEST DATE 6/11/14

CLIENT:

ALUTECH SRO

PREPARED BY:

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PROJECT ADDRESS:

5 Leigh Drive
York, PA 1740

DATE	REVISION	#

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DATE: 12.12.2013

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CHECKED BY: AA

DRAWING No: B-004 | SIZE: B

File name: STRUCTURAL TESTS PRESSURE GLAZED CURTAIN WALL 96"x96" B-004 B-xxx.dwg | 04 OF 04