Architectural Testing

ASTM E 90 SOUND TRANSMISSION LOSS TEST REPORT

Rendered to:

ALUMIN TECHNO

SERIES/MODEL: F50/SG

TYPE: Structurally Glazed Two-Lite Curtain Wall System

Summary of Test Results			
Data File No.	**Glazing (Nominal Dimensions)**	**STC**	**OITC**
D0489.01	1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)	32	27

Reference should be made to Architectural Testing, Inc. Report No. D0489.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

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Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

ALUMIN TECHNO
Selitskogo Str., 12
Minsk, 220075
BELARUS

Report No:	D0489.01-113-11
Test Date:	04/23/14
Report Date:	05/06/14
Record Retention End Date:	04/23/18

Test Sample Identification:

Series/Model: F50/SG

Type: Structurally Glazed Two-Lite Curtain Wall System

Overall Size: 80" by 80"

Glazing (Nominal Dimensions): 1" IG (1/4" Tempered, 1/2" Air Space, 1/4" Tempered)

Project Scope: Architectural Testing, Inc. was contracted by Alumin Techno to conduct sound transmission loss tests on a Series/Model F50/SG, structurally glazed two-lite curtain wall system. A summary of the results is listed in the Test Results section, and the complete test data is included as Appendix B of this report. The sample was provided by the client.

Test Methods: The acoustical tests were conducted in accordance with the following:

ASTM E 90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*.
ASTM E 413-10, *Classification for Rating Sound Insulation*.
ASTM E 1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation.*
ASTM E 2235-04 (Reapproved 2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*.

Test Equipment: The equipment used to conduct these tests meets the requirements of ASTM E 90. The microphones were calibrated before conducting sound transmission loss tests. The test equipment and test chamber descriptions are listed in Appendix A.

Sample Installation: Sound transmission loss tests were initially performed on a filler wall that was designed to test curtain wall specimens. The filler wall achieved an STC rating of 68.

The specimen plug was removed from the filler wall assembly. The curtain wall system was placed on an isolation pad in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the curtain wall frame, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing.

Test Procedure: The sound transmission loss test was performed in accordance with the ASTM E 90 test method using a single direction of measurement. The sound transmission loss test consisted of the following measurements: One background noise sound structurally level and five sound absorption measurements were conducted at each of the five microphone positions. Two sound structurally level measurements were made simultaneously in both rooms, at each of the five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

Sample Descriptions:

Frame Construction:

		Frame
Size		80" by 80"
Thickness		4-5/8"
Corners		Butted
	Fasteners	Screws
	Seal Method	None
Material		Aluminum
	Thermal Break Material	Insulbar
	Reinforcement	N/A
Daylight Opening Size		37" by 76"

N/A-Non Applicable

Sample Descriptions: (Continued)

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.991"
Spacer Type	Aluminum

	Exterior Sheet	**Gap**	**Interior Sheet**
Measured Thickness	0.228"	0.535"	0.228"
Muntin Pattern	N/A	N/A	N/A
Material	Tempered	Air*	Tempered
Laminate Material	N/A	N/A	N/A
Glazing Method	Structurally glazed		

Components:

	TYPE	**QUANTITY**	**LOCATION**
Weatherstrip			
	No weatherstrip		
Hardware			
	No hardware		
Drainage			
	No drainage		

** - Stated per Client/Manufacturer, N/A-Non Applicable*

Comments: The weight of the test sample was 306 lbs. The design drawings (included in Appendix C) supplied by the client, accurately describe the Series/Model F50/SG, structurally glazed two-lite curtain wall system. The dimensions on the drawings that are circled and/or checked were verified against the accessible components of the test specimen. The test specimen was returned per the client's request, so the internal components and dimensions could not be verified against the drawings. Photographs of the test specimen are included in Appendix D.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the sound transmission loss test results on the Series/Model F50/SG, structurally glazed two-lite curtain wall system is listed below.

Summary of Test Results			
Data File No.	**Glazing (Nominal Dimensions)**	**STC**	**OITC**
D0489.01	1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)	32	27

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Architectural Testing will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Architectural Testing for the entire test record retention period.

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 so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Kurt A. Golden
Digitally Signed by: Kurt A. Golden

Kurt A. Golden
Senior Technician - Acoustical Testing

Todd D. Kister
Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Design drawings (4)
- Appendix-D: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	05/06/14	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Analyzer	Hewlett Packard	HP35670A	Real time analyzer	004112	06/13 *
Data Acquisition Unit	Agilent	34970A	Data Acquisition Unit	62211	07/13
Receive Room Microphone	GRAS	40 AR	1/2" Microphone	Y003247	02/14
Source Room Microphone	GRAS	40 AR	1/2" Microphone	Y003239	02/14
Receive Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003251	09/13
Source Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	005656	06/13
Microphone Calibrator	Bruel & Kjaer	Type 4228	Pistonphone Calibrator	Y002816	02/14
Noise Source	Delta Electronics	SNG-1	Noise Generator	Y002181	N/A
Equalizer	Rane	RPE 228	Programmable Equalizer	Y002180	N/A
Power Amplifiers	Crown	Xti 2000	Two, Amplifiers	005769 005770	N/A
Receive Room Loudspeakers	Renkus-Heinz Inc.	Trap Jr./9	Two, Loudspeakers	Y001784 Y001785	N/A
Source Room Loudspeakers	Renkus-Heinz Inc.	Trap Jr./9	Two, Loudspeakers	Y002649 Y002650	N/A
Receive Room Environmental Indicator	Vaisala	HMW92	Temperature and Humidity Sensor	064286	05/13
Source Room Environemental Indicator	Vaisala	HMW60Y	Temperature and Humidity Sensor	Y002653	05/13
Weather Station	Davis Instruments	VantagePRO 6150C	Weather Station	Y003257	06/13

**- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.*

Test Chamber:

	Volume	Description
Receive Room	234 m^3 (8291.3 ft^3)	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
Source Room	206.6 m^3 (7296.3 ft^3)	Stationary diffusers only Temperature and humidity controlled

	Maximum Size	Description
TL Test Opening	4.27 m (14 ft) wide by 3.05 m (10 ft) high	Vibration break between source and receive rooms

N/A-Non Applicable

Appendix B

Complete Test Results

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ACCREDITED TL-144

SOUND TRANSMISSION LOSS

ASTM E 90

Test Date	04/23/14
ATI No.	D0489.01
Client	Alumin Techno
Specimen	Series/Model: F50/SG, structurally glazed two-lite curtain wall system with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)
Operator	Kurt Golden
Sample Area	4.13 m^2
Filler Area	8.87 m^2

	Source	Receive	Specimen
Temp C	22	22	22
RH %	48	47	47

Freq (Hz)	**Bkgrd SPL** (dB)	**Absorp** (m^2)	**Source SPL** (dB)	**Receive SPL** (dB)	**Filler TL** (dB)	**Specimen TL** (dB)	**95% Conf Limit**	**No. of Defi-ciencies**	**Trans Coef Diff**
80	39	6.0	90	68	29	22	2.1	-	5.3
100	35	6.0	93	64	35	28	3.0	-	5.4
125	37	5.4	96	68	45	27	1.6	0	14.7
160	37	4.9	97	72	47	23	1.2	0	20.7
200	34	5.0	102	85	56	16	1.0	6	36.6
250	32	5.4	102	81	60	20	0.8	5	36.5
315	29	5.6	103	78	66	24	1.1	4	38.6
400	27	5.7	103	73	69	28	1.0	3	37.3
500	22	6.1	103	70	68	31	0.8	1	33.5
630	23	5.6	104	70	69	33	0.5	0	32.7
800	19	5.8	105	70	70	34	0.5	0	32.7
1000	19	6.0	105	68	73	36	0.2	0	34.2
1250	19	6.7	104	63	72	39	0.5	0	29.8
1600	19	6.7	106	65	71	39	0.3	0	28.8
2000	14	7.5	105	70	71	32	0.3	4	35.7
2500	10	8.5	105	69	76	32	0.3	4	40.4
3150	9	10.1	106	65	78	37	0.3	0	37.9
4000	8	12.2	106	59	81	42	0.4	0	36.0
5000	9	16.2	105	53	84	46	0.7	-	34.4

STC Rating **32** *(Sound Transmission Class)*
Deficiencies 27 *(Number of deficiencies versus contour curve)*
OITC Rating **27** *(Outdoor Indoor Transmission Class)*

Notes:

1) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.

2) Transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. These cells are highlighted green.

3) Receive Room levels less than 5 dB above the background levels are highlighted in yellow.

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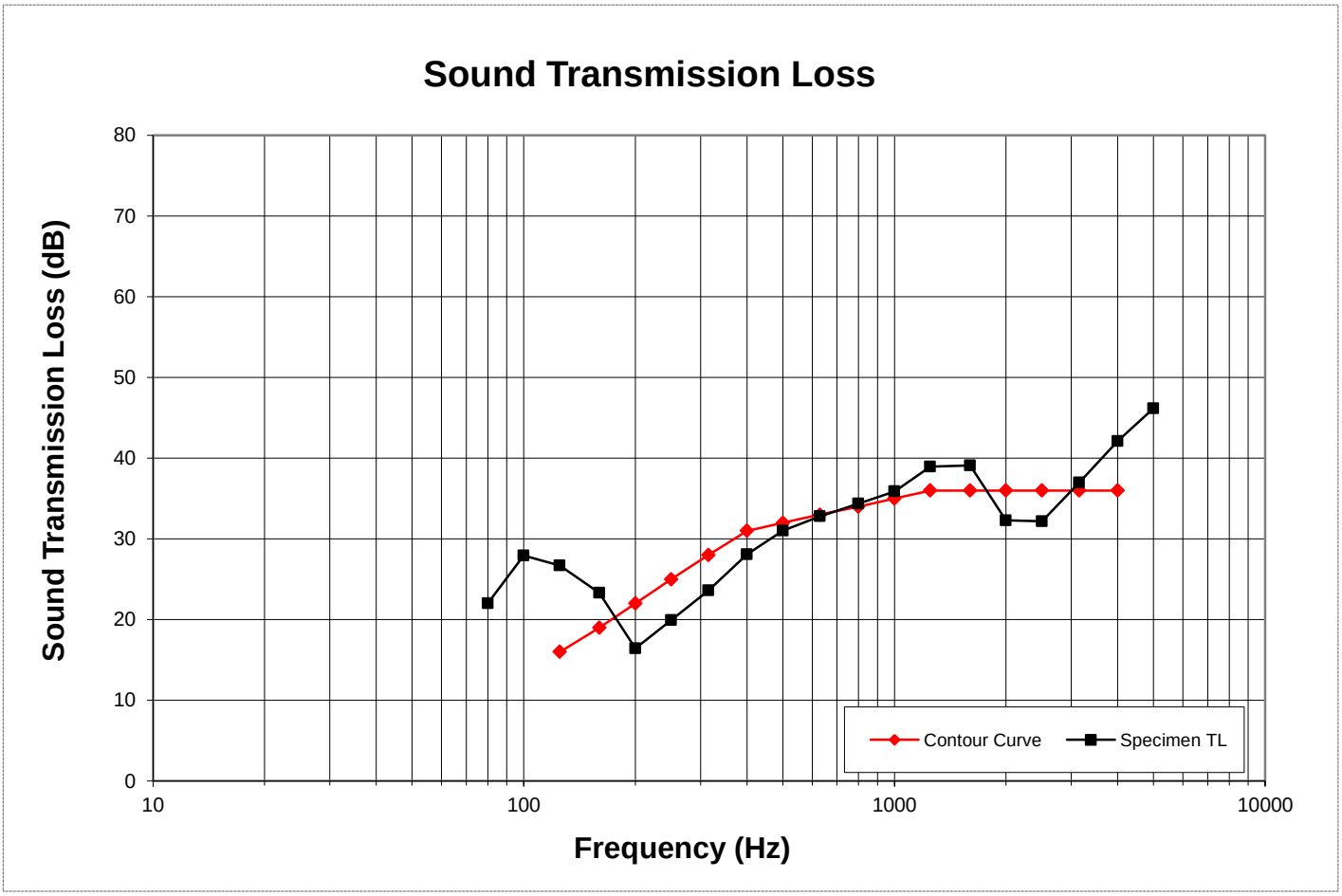
ACCREDITED TL-144

SOUND TRANSMISSION LOSS

ASTM E 90

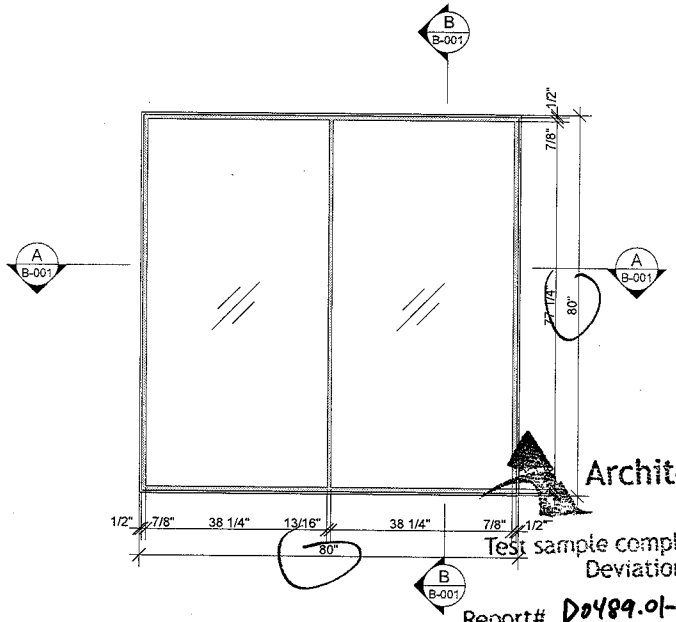
Test Date	04/23/14		
ATI No.	D0489.01		
Client	Alumin Techno		
Specimen	Series/Model: F50/SG, structurally glazed two-lite curtain wall system with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)		
Operator	Kurt Golden		
Sample Area	4.13 m^2		
Filler Area	8.87 m^2		
	Source	Receive	Sample
Temp C	22	22	22
RH %	48	47	47



Note: To obtain the Sound Transmission Class (STC), read the Sound Transmission Loss of the contour curve at 500 Hz. The sum of the deficiencies below the contour curve cannot exceed 32. The maximum deficiency at any one frequency cannot exceed 8.

Appendix C

Design Drawings



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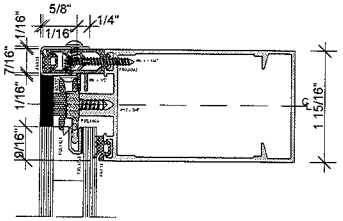
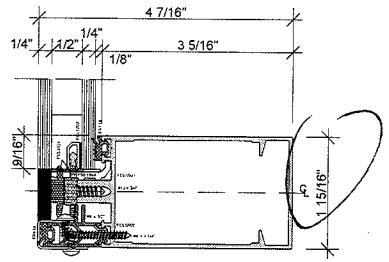
Test sample complies with these details.
Deviations are noted.

Report# D0489.01-113-11

Date 4/30/14 Tech KG.

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

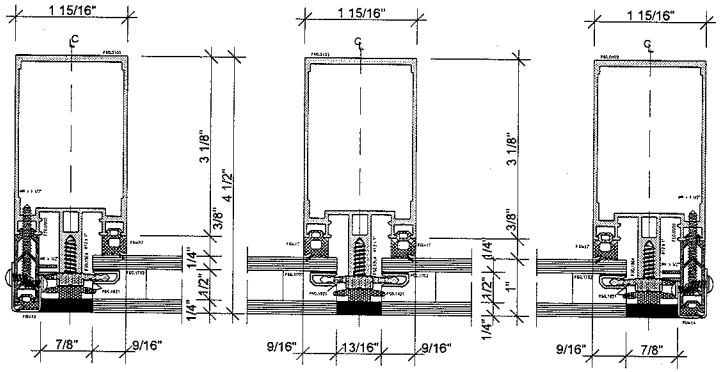




2 SECTION B-B
SCALE: 6" = 1'-0"

SYMBOL LEGEND:

- Glass
- Center line
- Section number / Sheet reference (A / B-002)



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:
130 Derry Court I
York, PA 17406

DATE	REVISION	#

APPROVED
APPROVED VIA E-MAIL
12 / 19 / 2013

SPECIAL NOTES:
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ASSEMBLY DRAWING

DATE: 12.12.2013
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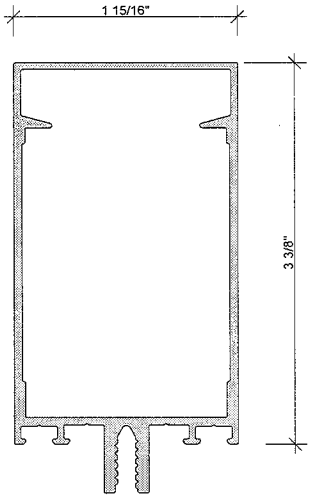
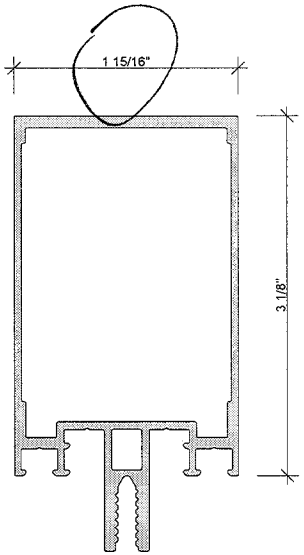
CHECKED BY: AA

DRAWING No: B-001
SIZE: B

File name: ACOUSTIC TESTS STRUCTURAL GLAZED CURTAIN WALL 80"x80" B-001 B-002.dwg



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"

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# D0489.01-113-11

Date 4/30/14 Tech 166.

CLIENT:

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DATE	REVISION	#

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CLIENT'S SIGNATURE APPROVED VIA E-MAIL

DATE 12 / 20 / 2013

SPECIAL NOTES:

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DRAWING TITLE:

CURTAIN WALL EXTRUSIONS

DATE: 12.12.2013

DRAWN BY: AG

CHECKED BY: AA

DRAWING No: SIZE: B

B-002

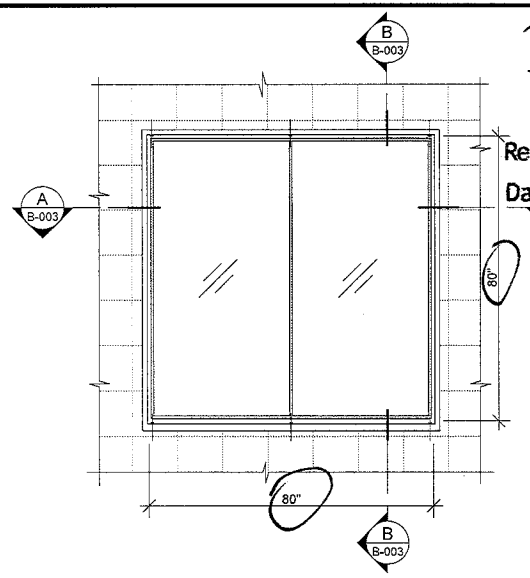
File name: ACOUSTIC TEST'S STRUCTURAL GLAZED CURTAIN WALL 90"x90" B-002 B-size.dwg

Architectural Testing

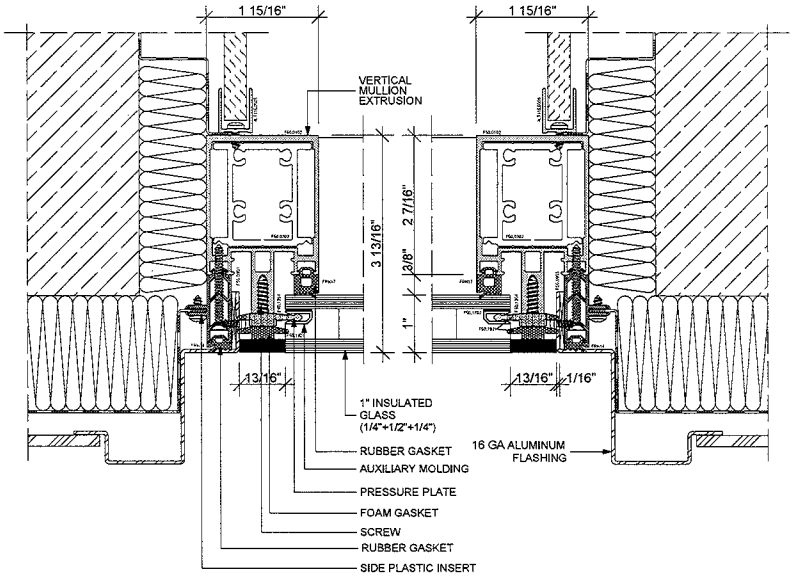
Test sample complies with these details.
Deviations are noted.

Report# D0489.01-113-11

Date 4/30/14 Tech KG.



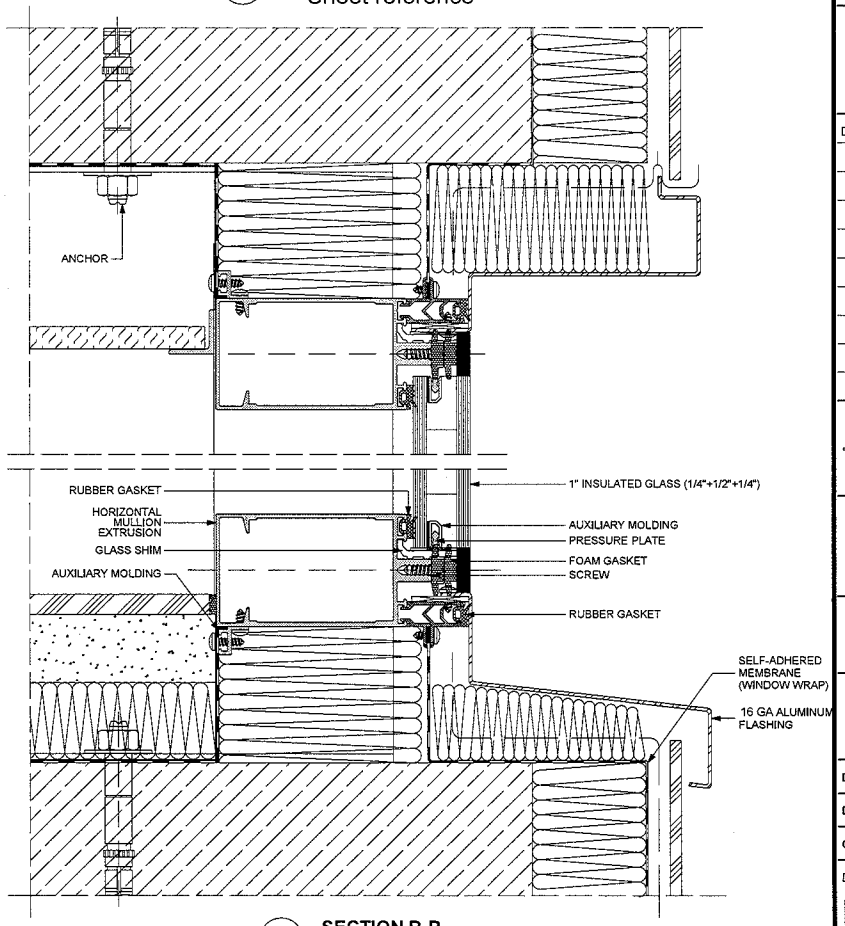
1 SCHEME OF ANCHORING
SCALE: 3/8" = 1'-0"



2 SECTION A-A
SCALE: 6" = 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



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

CLIENT:
ALUTECH SRO

PREPARED BY:
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701 39th St. Brooklyn, NY 11232
tel: 718.382.8400
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PROJECT ADDRESS:
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DATE	REVISION	#

APPROVED
APPROVED VIA E-MAIL
DATE 12 / 20 / 2013

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DRAWING TITLE:
INSTALLATION DRAWINGS

DATE: 12.12.2013
DRAWN BY: AG
CHECKED BY: AA

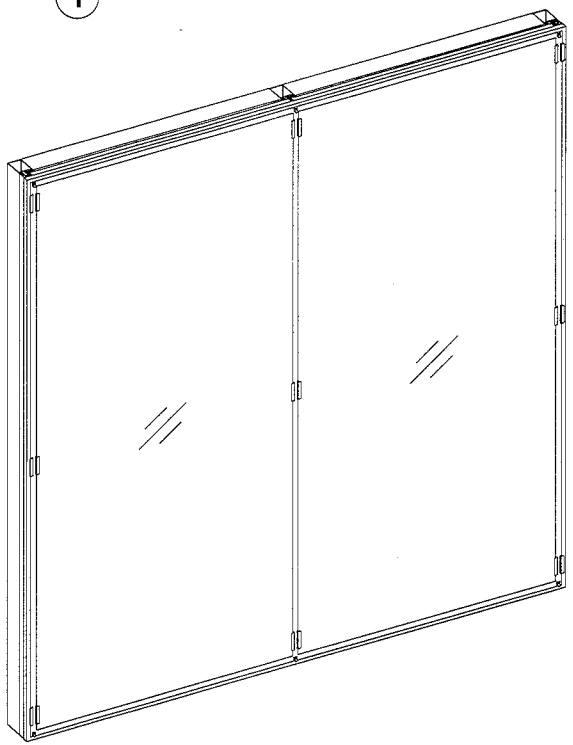
DRAWING No: B-003 SIZE: B

File name: ACOUSTIC TESTS STRUCTURAL GLAZED CURTAIN WALL 90"x80" B-003 B-003e.dwg

Illustration	Article	Description	Q-ty
	F50.0103	Horizontal mullion extrusion L= 38 1/4" ∠90°	4
	F50.0206	Vertical mullion extrusion L= 80" ∠90°	3
	F50.1702	Auxiliary molding L= 77 1/4" ∠45°	4
	F50.1702	Auxiliary molding L= 38 1/4" ∠45°	4
	F50.1964	Pressure plate	28
	IG unit	1" Insulated glass (1/4"x1/2"x1/4") 38 1/4" x 77 1/4"	2
	F50.0902	Side plastic insert L= 38 5/8" ∠90°	4
	F50.0903	Side plastic insert L= 80" ∠90°	2
	F50.1921	Foam gasket L= 779 5/8"	1
	FRK 17	Rubber gasket L= 320"	1
	FRK 14	Rubber gasket L= 468 1/4"	1
	FRK42	Rubber gasket	8
	F50.0941	Glass shim	4
	F50.1946	Fixator	9
	F50.1945	Shim	9
	F50.0943-03	Sheer block for F50.0206	8
	F50.0921	Horizontal mullion end cap	8
	F50.0923	Drain sleeve	6
	N/A	16 GA Aluminum flashing L= 320 1/2"	1
	N/A	Plastic shim	8

Illustration	Article	Description	Q-ty
	#8 x 1/2" Philips flat head, zinc plated steel screw	Screw	16
	#8 x 1/2" Philips pan head, zinc plated steel screw	Screw	72
	#8 x 1 1/4" Philips flat head, zinc plated steel screw	Screw	20
	#8 x 1 1/2" Philips flat head, zinc plated steel screw	Screw	18
	#12 x 1" Philips flat head, zinc plated steel screw	Screw	32
	#12 x 3/4" Philips flat head, zinc plated steel screw	Screw	24
	#8 x 5/8" Philips pan head, zinc plated steel screw	Screw	38
	#12 x 3/4" Philips pan head, zinc plated steel screw	Screw	18

1 BILL OF MATERIAL



2 CURTAIN WALL AXO VIEW

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# D0489.01-113-11

Date 4/30/14 Tech KG.

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ALUTECH SRO

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DATE 12 / 20 / 2013

SPECIAL NOTES:

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CHECKED BY: AA

DRAWING No: | SIZE: B

B-004

File name: ACOUSTIC TESTS STRUCTURAL GLAZED CURTAIN WALL 80"x90" B-004 B-004.dwg | 04 OF 04

Appendix D

Photographs

Receive Room View of Installed Test Specimen

Source Room View of Installed Test Specimen