



TEST REPORT

Rendered to:

PURE VISTA

For:

PRODUCT: *PosiGlaze*

TYPE: Glass Balustrade Systems

Report No.: G9513.01-119-19

Report Date: 10/18/17

Test Record Retention Date: 05/30/21



TEST REPORT

G9513.01-119-19

October 18, 2017

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TEST REPORT

Rendered to:

PURE VISTA
Pendewey Farm
Stoney Lane
Bodmin, Cornwall PL31 2QX
UNITED KINGDOM

Report No.: G9513.01-119-19

Test Dates: 05/02/17

Through: 05/30/17

Report Date: 10/18/17

Test Record Retention Date: 05/30/21

1.0 General Information

1.1 Product

PosiGlaze Glass Balustrade Systems

1.2 Project Description

Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by Pure Vista to conduct structural performance tests on the *PosiGlaze* glass balustrade systems. The system was evaluated for the design load requirements of the following building codes:

2012 International Building Code®, International Code Council

2012 International Residential Code®, International Code Council

Structural tests were performed to the loads noted within Section 1607.8.1 of the *2015 International Building Code*®, International Code Council. The system was also evaluated for the safety factor requirements noted within Section 2407.1.1 of the *2015 International Building Code*®, International Code Council.

1.3 Limitations

All tests performed were to evaluate structural performance of the guardrail assembly to carry and transfer imposed loads to the supporting structure. The test specimens evaluated included the glass panels, mounting shoes, and anchorage of the mounting shoes to the supporting structure. Anchorage of the rail mounting brackets to the supporting structure is not included in the scope of this testing and would need to be evaluated separately.

1.4 Qualifications

Intertek-ATI has demonstrated compliance with ISO/IEC International Standard 17025 and is consequently accredited as a Testing Laboratory (TL-144) by International Accreditation Service, Inc. (IAS).

1.5 Product Description

The *PosiGlaze* guardrail systems consisted of extruded aluminum support shoes with glass panels supporting the top rail. The glass panels were 59 in long with an overall rail height (deck surface to top of top rail) of 42 in. For configurations evaluated for use in less than 3-Panel applications, top rail ends were attached to rigid steel members via stainless steel brackets. See Section 1.7 Fastening Schedule for connection details. See drawings in **Error! Reference source not found.** and photographs in **Error! Reference source not found.** for additional details.

1.6 Component Description

The scope of testing performed and reported herein was intended to evaluate the *PosiGlaze* series railing system consisting of the following components:

Top Rail:

For 3/4 in and 7/8 in thick panels: 1-5/16 in high by 1-1/4 in wide stainless steel rail profile with 0.12 in thick wall

For 1/2 in thick panels: 1-5/16 in high by 1 in wide stainless steel rail profile with 0.12 in thick wall

Glass Panels: Reference Section 3.5, Summary and Conclusions for dimensional details of glass for various tested configurations. Panels used in surface mount applications measured 42 in high, and panels used in side mount applications measured 46 in high. The specimens used glass options with the following construction:

- 1/2 in thick tempered monolithic
- 1/2 in thick laminated constructed from two sheets of 7/32 in thick clear tempered and an 0.060 in thick PVB interlayer
- 3/4 in thick tempered monolithic
- 7/8 in laminated constructed from two sheets of 3/8 in thick clear tempered and an 0.060 in thick PVB interlayer

Mounting Shoe: 2-7/8 in wide by 4-3/8 in high U-shaped aluminum extrusion

Rail Brackets: 1 in wide by 1-5/16 in high by 0.12 in thick back plate welded to a 3/4 in wide by 1-3/16 in high by 1 in deep by 0.04 in thick U-shaped flange, stainless steel collar bracket

Slip Clamps: 3-3/8 in high by 3-1/16 in wide, two-piece molded nylon setting blocks with adjustable depth to fit each panel thickness

1.6 Component Description (Continued)

Glass Clamp Bar Fitting: 2-3/4 in long by 29/32 in wide aluminum bar with one flat surface, one contoured surface, and beveled edges

Top Seal Strip:

Top seal strip: Snap-fit extruded aluminum profile with a kerf-mounted rubber gasket, used on both sides of surface mount shoe and interior side of side mount shoe

Face cover: Snap-fit L-shaped aluminum extrusion with a kerf-mounted rubber gasket, used on exterior side of face mount shoe

1.7 Fastening Schedule

Connection	Fastener
Glass Panel to Support Shoe	Set onto slip clamps and secured in place with glass clamp bars, located 7 in from each end and spaced 9 in on center
	Slip clamp fit adjusted with a 3/8-13 hex head set screw threaded through the glass clamp bar
Rail Cap to Panel	No mechanical connection - pressure fit using rigid nylon channel
Wall Mount Bracket to Rail Cap	No mechanical connection - channel fit
Wall Mount Bracket to Steel Test Fixture	One 1/4 x 1-1/2" hex head bolt and nut
Support Shoe to Steel Fixture	1/2-13 hex head bolt and nut, located 4 in from each end and spaced 8 in on center
Support Shoe to Concrete Fixture	Hilti HSL-3 M8/20, 1/2 in by 3-5/8 in long heavy duty expansion anchors, located 4 in from each end and spaced 8 in on center

2.0 Compressive Strength of Cylindrical Concrete Specimens

2.1 General

The purpose of this testing was to determine the compressive strength of the concrete used to fabricate the concrete beam utilized for a portion of the testing reported herein.

2.2 Test Specimens

The compressive strength specimens were formed by a representative of Intertek-ATI during the construction of the concrete beam. The concrete used in the fabrication of the cylinders was removed from the same batch used to fabricate the beam.

2.3 Test Procedure

Compressive strength testing was performed prior to the structural performance test of assembled railing systems. Compressive strength testing was performed in a Forney Compression Test Machine using the methods described by ASTM C 39. The specimen was loaded in compression until failure occurred. See photographs in **Error! Reference source not found.** for test setup.

2.4 Test Results

Specimen No.	Diameter (in)	Area (in ²)	Maximum Load (lbs)	Defects ¹
1	6.076	28.995	53170	None
2	6.032	28.577	74470	None
3	6.061	28.852	90410	None
4	6.072	28.957	86070	None
5	6.054	28.786	96180	None
6	5.970	27.992	101790	None
7	5.988	28.161	102220	None
8	6.008	28.350	98210	None

¹ Observations made of specimen before testing.

Specimen No.	Date of Casting	Date of Testing	Age of Samples (days)	Compressive Strength (psi)
1	04/04/17	04/11/17	7	1834
2		04/18/17	14	2606
3		05/02/17	28	3134
4				2972
5				3341
6		05/11/17	37	3636
7				3630
8				3464
Average:				3077

3.0 Structural Performance Testing of Assembled Railing Systems

3.1 Test Equipment

The glass balustrade system was tested in a self-contained structural frame designed to accommodate anchorage of the base rail assembly on both steel and concrete mounting and application of the required test loads. The specimens were loaded using a hydraulic actuator attached to a forklift. Applied load was measured using an electronic load cell located in-line with the loading system. Electronic linear motion transducers were used to measure deflections.

3.2 Test Setup

The glass balustrade assemblies were installed and tested by directly securing the mounting system to a rigid steel or concrete test fixture. Transducers mounted to an independent reference frame were located to record movement of reference points on the guardrail system components (ends and mid-point) to determine net component deflections. See photographs in Appendix B for individual test setups.

3.3 Test Procedure

Each test specimen was inspected prior to testing to verify size and general condition of the materials, assembly, and installation. No potentially compromising defects were observed prior to testing. An initial load, not exceeding 50% of design load, was applied and transducers were zeroed. Load was then applied at a steady uniform rate until reaching 2.0 times design load in no less than 10 seconds. After reaching 2.0 times design load, the load was released. After allowing a minimum period of one minute for stabilization, load was reapplied to the initial load level used at the start of the loading procedure, and deflections were recorded and used to analyze recovery. Load was then increased at a steady uniform rate until reaching 2.5 times design load or 4.0 times design load or until failure occurred. The testing time was continually recorded from the application of initial test load until the ultimate test load was reached.

3.4 Test Results

The following tests were performed on the glass balustrade assemblies for the design load requirements of the codes referenced. Deflection and permanent set were component deflections relative to their end-points; they were not overall system displacements.

Key to Test Results Tables:

Load Level: Target test load

Test Load: Actual applied load at the designated load level (target).

Elapsed Time (E.T.): The amount of time into the test with zero established at the beginning of the loading procedure.

3.4 Test Results (Continued)

Test Series No. 1
PosiGlaze Surface Mount (Steel) with 1/2 in Monolithic Glass
and Wall Mount Brackets
IRC - One- and Two- Family Dwellings

Test No. 1 - Test Date: 05/04/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	102	00:25	0.01
Initial Load	12	01:56	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	339	02:04	0.04

Test No. 2 - Test Date: 05/04/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	400	00:50	0.80
Initial Load	40	03:06	0.01
99% Recovery from 2.0 x Design Load			
4.0x Design Load	815	03:59	1.75

Test No. 3 - Test Date: 05/04/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	405	00:29	0.08
Initial Load	40	02:19	0.01
88% Recovery from 2.0 x Design Load			
4.0x Design Load	803	02:51	0.18

3.4 Test Results (Continued)

Test Series No. 1 (Continued)

Test No. 4 - Test Date: 05/04/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	37	00:00	0.00
2.0x Design Load	405	00:22	0.07
Initial Load	40	01:43	0.07
Recovery N/A			
4.0x Design Load	805	02:14	0.10

Test Series No. 2

**PosiGlaze Surface Mount (Steel) with 1/2 in Monolithic Glass
and Wall Mount Brackets (One Panel Removed)¹
IRC - One- and Two- Family Dwellings**

¹ Test series qualifies handrail and mounting brackets for use across all configurations evaluated for less than 3-panel applications.

Test No. 1 - Test Date: 05/04/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Unsupported Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	401	00:29	1.51
Initial Load	0	00:38	0.04
97% Recovery from 2.0 x Design Load			
2.5x Design Load	503	01:23	1.96

Test No. 2 - Test Date: 05/04/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Unsupported Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	43	00:00	0.00
2.0x Design Load	404	00:40	0.12
Initial Load	45	02:20	0.00
100% Recovery from 2.0 x Design Load			
2.5x Design Load	501	02:51	0.14

3.4 Test Results (Continued)

Test Series No. 2 (Continued)

Test No. 3 - Test Date: 05/04/17			
Design Load: 200 lb Vertical Concentrated Load at Unsupported End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	42	00:00	0.00
2.0x Design Load	427	00:24	0.05
Initial Load	40	02:03	0.02
60% Recovery from 2.0 x Design Load			
2.5x Design Load	516	02:21	0.07

Test No. 4 - Test Date: 05/04/17			
Design Load: 200 lb Vertical Concentrated Load at Mid-Span of Unsupported Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	402	00:30	0.58
Initial Load	40	01:59	0.14
76% Recovery from 2.0 x Design Load			
2.5x Design Load	502	02:24	0.80

Test Series No. 3

**PosiGlaze Surface Mount (Steel) with 1/2 in Laminated Glass
and Wall Mount Brackets
IBC - Use All Groups**

Test No. 1 - Test Date: 05/04/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	100	00:32	0.02
Initial Load	10	02:26	0.01
50% Recovery from 2.0 x Design Load			
2.5x Design Load	328	02:35	0.07

3.4 Test Results (Continued)

Test Series No. 3 (Continued)

Test No. 2 - Test Date: 05/04/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (lb)
Initial Load	40	00:00	0.00
2.0x Design Load	401	00:34	1.26
Initial Load	40	02:46	0.06
95% Recovery from 2.0 x Design Load			
4.0x Design Load	801	03:35	2.74

Test No. 3 - Test Date: 05/04/17			
Design Load: 200 lb Vertical Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	404	00:25	0.02
Initial Load	49	01:33	0.02
Recovery N/A			
4.0x Design Load	822	02:14	0.16

Test No. 4 - Test Date: 05/04/17			
Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	98	00:00	0.00
2.0x Design Load	1042	00:52	0.11
Initial Load	100	02:10	0.03
Recovery N/A			
4.0x Design Load	2571	04:44	0.28

3.4 Test Results (Continued)

Test Series No. 3 (Continued)

Test No. 5 - Test Date: 05/04/17			
Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	99	00:00	0.00
2.0x Design Load	998	00:42	0.59
Initial Load	99	03:02	0.07
88% Recovery from 2.0 x Design Load			
4.0x Design Load	2025	12:26	1.27

Test Series No. 4

**PosiGlaze Surface Mount (Steel) with 3/4 in Monolithic Glass -
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups**

Test No. 1 - Test Date: 05/30/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	14	00:00	0.00
2.0x Design Load	101	00:40	0.01
Initial Load	12	02:42	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	286	02:59	0.04

Test No. 2 - Test Date: 05/30/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	401	00:32	1.02
Initial Load	40	03:20	0.12
88% Recovery from 2.0 x Design Load			
4.0x Design Load	800	04:16	2.19

3.4 Test Results (Continued)

Test Series No. 4 (Continued)

Test No. 3 - Test Date: 05/30/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	400	00:17	0.01
Initial Load	41	01:47	0.02
Recovery N/A			
4.0x Design Load	807	02:19	0.04

Test No. 4 - Test Date: 05/30/17			
Design Load: 50 plf x (59 in ÷ 12 in/ft) = 246 lb Horizontal Uniform Load on Top Rail			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	47	00:00	0.00
2.0x Design Load	501	00:28	0.02
Initial Load	51	03:02	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	998	04:12	0.01

Test No. 5 - Test Date: 05/30/17			
Design Load: 50 plf x (59 in ÷ 12 in/ft) = 246 lb Vertical Uniform Load on Top Rail			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	47	00:00	0.00
2.0x Design Load	501	00:22	0.01
Initial Load	50	01:56	0.01
Recovery N/A			
4.0x Design Load	1288	02:56	0.04

3.4 Test Results (Continued)

Test Series No. 5
PosiGlaze Surface Mount (Concrete) with 1/2 in Monolithic Glass
and Wall Mount Brackets
IRC - One- and Two- Family Dwellings

Test No. 1 - Test Date: 05/09/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Test Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	18	00:00	0.00
2.0x Design Load	99	01:02	0.01
Initial Load	17	04:16	0.01
0% Recovery from 2.0 x Design Load			
4.0x Design Load	200	04:52	0.03

Test No. 2 - Test Date: 05/09/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	39	00:00	0.00
2.0x Design Load	400	00:53	0.68
Initial Load	40	05:23	0.01
99% Recovery from 2.0 x Design Load			
4.0x Design Load	800	06:36	1.35

Test No. 3 - Test Date: 05/09/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	38	00:00	0.00
2.0x Design Load	400	00:30	0.13
Initial Load	41	03:18	0.01
92% Recovery from 2.0 x Design Load			
4.0x Design Load	800	03:54	0.26

3.4 Test Results (Continued)

Test Series No. 6
PosiGlaze Surface Mount (Concrete) with 1/2 in Laminated Glass
and Wall Mount Brackets
IBC - Use All Groups

Test No. 1 - Test Date: 05/09/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	100	1:10	0.01
Initial Load	13	3:27	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	200	4:06	0.03

Test No. 2 - Test Date: 05/09/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	39	00:00	0.00
2.0x Design Load	400	00:56	0.73
Initial Load	40	3:26	0.04
95% Recovery from 2.0 x Design Load			
4.0x Design Load	800	4:42	1.50

Test No. 3 - Test Date: 05/09/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.01
2.0x Design Load	402	00:12	0.13
Initial Load	41	2:48	0.02
85% Recovery from 2.0 x Design Load			
4.0x Design Load	804	3:21	0.26

3.4 Test Results (Continued)

Test Series No. 6 (Continued)

Test No. 4 - Test Date: 05/09/17 Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	79	00:00	0.00
2.0x Design Load	993	00:46	0.15
Initial Load	99	02:45	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	1983	03:43	0.38

Test Series No. 7

PosiGlaze Surface Mount (Concrete) with 7/8 in Laminated Glass - Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups

Test No. 1 - Test Date: 05/10/17 Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	8	00:00	0.00
2.0x Design Load	101	00:58	0.01
Initial Load	12	03:20	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	201	03:40	0.03

Test No. 2 - Test Date: 05/10/17 Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	37	00:00	0.00
2.0x Design Load	400	00:57	1.32
Initial Load	40	03:18	0.12
91% Recovery from 2.0 x Design Load			
4.0x Design Load	800	04:41	3.14

3.4 Test Results (Continued)

Test Series No. 7 (Continued)

Test No. 3 - Test Date: 05/10/17			
Design Load: 50 plf x (59 in ÷ 12 in/ft) = 246 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	47	00:00	0.00
2.0x Design Load	491	00:44	0.01
Initial Load	50	03:08	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	984	04:31	0.17

Test Series No. 8

PosiGlaze Side Mount (Concrete) with 1/2 in Monolithic Glass
and Wall Mount Brackets
IRC- One- and Two- Family Dwellings

Test No. 1 - Test Date: 05/12/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	12	00:00	0.00
2.0x Design Load	99	00:33	0.00
Initial Load	10	03:06	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	200	03:24	0.01

Test No. 2 - Test Date: 05/12/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	400	00:36	0.65
Initial Load	40	03:05	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	801	04:01	1.35

3.4 Test Results (Continued)

Test Series No. 8 (Continued)

Test No. 3 - Test Date: 05/12/17 Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail Double Panel Assembly			
Load Level	Applied Load (lb)	E.T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	402	00:21	0.28
Initial Load	40	03:29	0.04
86% Recovery from 2.0 x Design Load			
4.0x Design Load	801	04:09	0.83

Test Series No. 9

***PosiGlaze* Side Mount (Concrete) with 1/2 in Laminated Glass**
and Wall Mount Brackets
IBC - Use All Groups

Test No. 1 - Test Date: 05/17/17 Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	99	00:44	0.03
Initial Load	13	02:47	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	201	03:07	0.04

Test No. 2 - Test Date: 05/17/17 Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	38	00:00	0.00
2.0x Design Load	400	00:49	1.21
Initial Load	40	03:06	0.02
98% Recovery from 2.0 x Design Load			
4.0x Design Load	801	04:25	2.41

3.4 Test Results (Continued)

Test Series No. 9 (Continued)

Test No. 3 - Test Date: 05/17/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	49	00:00	0.00
2.0x Design Load	400	00:21	0.14
Initial Load	43	02:12	0.00
100% Recovery from 2.0 Design Load			
4.0x Design Load	800	02:51	0.53

Test No. 4 - Test Date: 05/17/17			
Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	101	00:00	0.00
2.0x Design Load	993	00:45	0.18
Initial Load	99	02:52	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	1987	04:01	0.37

Test No. 5 - Test Date: 05/17/17			
Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	97	00:00	0.00
2.0x Design Load	991	00:29	0.01
Initial Load	101	02:14	0.02
Recovery N/A			
4.0x Design Load	1985	02:59	0.04

3.4 Test Results (Continued)

Test Series No. 10
PosiGlaze Side Mount (Concrete) with 7/8 in Laminated Glass
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups

Test No. 1 - Test Date: 05/16/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	102	00:53	0.02
Initial Load	10	03:04	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	203	03:25	0.04

Test No. 2 - Test Date: 05/16/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	37	00:00	0.00
2.0x Design Load	401	01:17	2.55
Initial Load	40	04:54	0.21
92% Recovery from 2.0 x Design Load			
4.0x Design Load	798	06:46	5.59

Test No. 3 - Test Date: 05/16/17			
Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	48	00:00	0.00
2.0x Design Load	350	00:52	1.76
Initial Load	42	03:33	0.06
97% Recovery from 2.0 x Design Load			
4.0x Design Load	701	05:13	3.72

3.4 Test Results (Continued)

Test Series No. 11

***PosiGlaze* Side Mount (Concrete) with 3/4 in Monolithic Glass -
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups**

Test No. 1 - Test Date: 05/16/17 Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	11	00:00	0.00
2.0x Design Load	100	00:40	0.02
Initial Load	12	02:50	0.00
100% Recovery from 2.0x Design Load			
4.0x Design Load	201	03:10	0.05

Test No. 2 - Test Date: 05/16/17 Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	39	00:00	0.00
2.0x Design Load	400	00:55	1.65
Initial Load	40	03:08	0.18
89% Recovery from 2.0x Design Load			
4.0x Design Load	798	04:32	3.96

Test No. 3 - Test Date: 05/16/17 Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	37	00:00	0.00
2.0x Design Load	350	00:45	1.34
Initial Load	31	03:17	0.24
82% Recovery from 2.0 x Design Load			
4.0x Design Load	700	04:25	2.87

3.4 Test Results (Continued)

Test Series No. 12
PosiGlaze Side Mount (Steel) with 1/2 in Laminated Glass
and Wall Mount Brackets
IBC - Use All Groups

Test No. 1 - Test Date: 05/18/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	11	00:00	0.00
2.0x Design Load	99	00:43	0.01
Initial Load	12	02:41	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	280	03:19	0.01

Test No. 2 - Test Date: 05/18/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	38	00:00	0.01
2.0x Design Load	401	00:59	1.50
Initial Load	41	03:44	0.16
89% Recovery from 2.0 x Design Load			
4.0x Design Load	800	04:49	2.70

Test No. 3 - Test Date: 05/18/17			
Design Load: 50 plf x (120.5 in ÷ 12 in/ft) = 502.1 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	101	00:00	0.00
2.0x Design Load	994	00:32	0.25
Initial Load	99	2:30	0.03
88% Recovery from 2.0 x Design Load			
4.0x Design Load	1989	3:28	0.61

3.4 Test Results (Continued)

Test Series No. 12 (Continued)

Test No. 4 - Test Date: 05/22/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	401	00:30	0.11
Initial Load	43	02:32	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	801	03:11	0.24

Test No. 5 - Test Date: 05/22/17			
Design Load: 50 plf x (120.5 ÷ 12 in/ft) = 502.1 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	86	00:00	0.00
2.0x Design Load	1022	00:26	0.02
Initial Load	99	02:19	0.03
Recovery N/A			
4.0x Design Load	2558	03:17	0.12

Test No. 6 - Test Date: 05/22/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	398	00:54	0.01
Initial Load	42	02:29	0.01
Recovery N/A			
4.0x Design Load	800	03:05	0.02

3.4 Test Results (Continued)

Test Series No. 13
PosiGlaze Side Mount (Steel) with 1/2 in Monolithic Glass
and Wall Mount Brackets
IRC- One- and Two- Family Dwellings

Test No. 1 - Test Date: 05/23/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	99	00:31	0.01
Initial Load	11	03:11	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	281	03:28	0.02

Test No. 2 - Test Date: 05/23/17			
Design Load: 200 lb Horizontal Concentrated Load at Mid-Span of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	400	00:39	0.81
Initial Load	40	03:10	0.04
95% Recovery from 2.0x Design Load			
4.0x Design Load	801	04:00	1.62

Test No. 3 - Test Date: 05/23/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	39	00:00	0.00
2.0x Design Load	400	00:15	0.12
Initial Load	41	02:35	0.03
75% Recovery from 2.0 x Design Load			
4.0x Design Load	801	03:01	0.23

3.4 Test Results (Continued)

Test Series No. 13 (Continued)

Test No. 4 - Test Date: 05/23/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	405	00:26	0.13
Initial Load	40	01:56	0.10
Recovery N/A			
4.0x Design Load	803	02:33	0.18

Test Series No. 14

PosiGlaze Side Mount (Steel) with 3/4 in Monolithic Glass -
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups

Test No. 1 - Test Date: 05/23/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	101	00:52	0.01
Initial Load	10	03:03	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	282	03:23	0.05

Test No. 2 - Test Date: 05/23/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	400	00:49	1.76
Initial Load	40	03:20	0.18
90% Recovery from 2.0 x Design Load			
4.0x Design Load	803	04:48	4.59

3.4 Test Results (Continued)

Test Series No. 14 (Continued)

Test No. 3 - Test Date: 05/23/17			
Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	36	00:00	0.00
2.0x Design Load	351	00:35	0.95
Initial Load	34	02:57	0.05
95% Recovery from 2.0 x Design Load			
4.0x Design Load	700	03:59	2.18

Test No. 4 - Test Date: 05/23/17			
Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	32	00:00	0.00
2.0x Design Load	349	00:21	0.00
Initial Load	36	01:58	0.04
Recovery N/A			
4.0x Design Load	955	07:54	0.07

Test No. 5 - Test Date: 05/23/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	44	00:00	0.00
2.0x Design Load	403	00:17	0.03
Initial Load	41	01:48	0.10
Recovery N/A			
4.0x Design Load	801	02:22	0.15

3.4 Test Results (Continued)

Test Series No. 14 (Continued)

Test No. 6 - Test Date: 05/24/17			
Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Horizontal Inward Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	36	00:00	0.00
2.0x Design Load	351	1:51	0.85
Initial Load	37	4:44	0.18
79% Recovery from 2.0 x Design Load			
4.0x Design Load	701	5:51	2.00

Test Series No. 15

**PosiGlaze Surface Mount (Steel) with 7/8 in Laminated Glass -
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups**

Test No. 1 - Test Date: 05/02/17			
Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	8	00:00	0.00
2.0x Design Load	101	00:19	0.01
Initial Load	17	03:01	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	284	03:17	0.02

Test No. 2 - Test Date: 05/02/17			
Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	37	00:00	0.00
2.0x Design Load	401	01:21	1.40
Initial Load	41	03:47	0.13
91% Recovery from 2.0 x Design Load			
4.0x Design Load	802	05:57	3.29

3.4 Test Results (Continued)

Test Series No. 15 (Continued)

Test No. 3 - Test Date: 05/02/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	399	00:34	0.02
Initial Load	44	01:58	0.02
Recovery N/A			
4.0x Design Load	809	02:16	0.02

Test No. 4 - Test Date: 05/02/17			
Design Load: 50 plf x (59 in ÷ 12 in/ft) = 245.8 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	59	00:00	0.00
2.0x Design Load	509	00:24	0.00
Initial Load	56	01:39	0.00
Recovery N/A			
4.0x Design Load	1286	02:12	0.00

Test No. 5 - Test Date: 05/02/17			
Design Load: 50 plf x (59 in ÷ 12 in/ft) = 245.8 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	50	00:00	0.00
2.0x Design Load	501	00:55	2.13
Initial Load	50	03:48	0.14
93% Recovery from 2.0 x Design Load			
4.0x Design Load	1003	05:28	5.52

3.4 Test Results (Continued)

Test Series No. 16

**PosiGlaze Side Mount (Steel) with 7/8 in Laminated Glass -
Rail Ends Unrestrained, Single Panel Assembly
IBC - Use All Groups**

Test No. 1 - Test Date: 05/24/17 Design Load: 50 lb / 1 Square Ft at Bottom of Infill (One Panel)			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	10	00:00	0.00
2.0x Design Load	101	00:51	0.00
Initial Load	10	2:50	0.00
100% Recovery from 2.0 x Design Load			
4.0x Design Load	337	3:01	0.02

Test No. 2 - Test Date: 05/24/17 Design Load: 200 lb Horizontal Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	38	00:00	0.00
2.0x Design Load	400	00:43	2.29
Initial Load	40	03:13	0.13
94% Recovery from 2.0 x Design Load			
4.0x Design Load	802	04:44	5.21

Test No. 3 - Test Date: 05/24/17 Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Horizontal Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	41	00:00	0.00
2.0x Design Load	350	00:35	1.63
Initial Load	37	03:00	0.03
98% Recovery from 2.0 x Design Load			
4.0x Design Load	700	04:12	3.73

3.4 Test Results (Continued)

Test Series No. 16 (Continued)

Test No. 4 - Test Date: 05/25/17			
Design Load: 200 lb Vertical Concentrated Load at End of Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	40	00:00	0.00
2.0x Design Load	401	00:38	0.01
Initial Load	40	02:32	0.01
Recovery N/A			
4.0x Design Load	814	02:56	0.05

Test No. 5 - Test Date: 05/25/17			
Design Load: 50 plf x (42 in ÷ 12 in/ft) = 175 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	33	00:00	0.00
2.0x Design Load	357	00:28	0.08
Initial Load	36	01:58	0.02
Recovery N/A			
4.0x Design Load	902	02:26	0.18

Test Series No. 17

**PosiGlaze Side Mount (Concrete) with 1/2 in Laminated Glass -
Rail Ends Unrestrained¹
IBC - Use All Groups**

Test No. 1 - Test Date: 05/18/17			
Design Load: 50 plf x (118.25 in ÷ 12 in/ft) = 492.7 lb Vertical Uniform Load on Top Rail			
Load Level	Applied Load (lb)	E. T. (min:sec)	Displacement (in)
Initial Load	101	00:00	0.00
2.0x Design Load	998	00:24	0.06
Initial Load	100	3:38	0.10
Recovery N/A			
4.0x Design Load	1986	4:42	0.13

¹ Series tested to qualify Vertical Uniform load condition only for IBC-All Use Group Side Mount systems.

3.5 Summary and Conclusions

Series/Model	Installation	Glass Panel Configuration ¹	Wall Mount Bracket	Configuration Qualified	Code Occupancy Classification
<i>PosiGlaze</i> Surface Mount	Steel	59 in long x 1/2 in thick Monolithic	Yes	<3-Panel / Handrail Required	IRC - One- and Two-Family Dwellings
	Concrete				
<i>PosiGlaze</i> Side Mount	Steel				
<i>PosiGlaze</i> Surface Mount	Steel	59 in long x 7/8 in thick Laminated	No	3-Panel +/- No Handrail Required	IBC - All Use Groups
		59 in long x 3/4 in thick Monolithic		3-Panel +/- Handrail Required	
	Concrete	59 in long x 1/2 in thick Laminated	Yes	<3-Panel / Handrail Required	
		59 in long x 7/8 in thick Laminated	No	3-Panel +/- No Handrail Required	
42 in long x 7/8 in thick Laminated		3-Panel +/- Handrail Required			
<i>PosiGlaze</i> Side Mount		Concrete	42 in long x 3/4 in thick Monolithic	Yes	
	59 in long x 1/2 in thick Laminated		3-Panel +/- No Handrail Required		
	Steel	42 in long x 7/8 in thick Laminated	No	3-Panel +/- No Handrail Required	
		42 in long x 3/4 in thick Monolithic		3-Panel +/- Handrail Required	

¹ All systems measured 42" high from surface of the deck to the top of the top rail.

Using performance criteria of 75% deflection recovery from 2.0 times design load (horizontal load applications only) and withstanding an ultimate load of 4.0 times design load, the test results substantiate compliance with the design load requirements of the referenced building code for the glass balustrade systems tested. Recovery criteria was not applied to vertical loading applications or loading conditions applied to unsupported rails (simulating failed glass). Where less than 3-Panel configurations were evaluated, the railing and its connections to the supporting structure withstood the applicable design loads after failure (with glass removed).

The railing supports were not included within the scope of this testing, and were included to facilitate anchorage of the rail brackets. These conclusions would apply only for a railing that is installed into adequate supports.

4.0 Closing Statement

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

Results obtained are tested values and were secured using the designated test methods. 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 specimens tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:

Alva R. Baker
Technician III

Tyler Westerling, P.E.
Senior Project Engineer

Virgal T. Mickley, Jr., P.E.
Senior Staff Engineer

ARB/vtm:aaa

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A - Drawings (22)
Appendix B - Photographs (12)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	10/18/17	N/A	Original report issue



G9513.01-119-19

APPENDIX A

Drawings

DO NOT SCALE DRAWING		REVISION
Purevista		
TITLE: Posiglaze with Side Cladding & Top Seal		
DWG NO.	25-10-16	A4
SCALE: 1:20	SHEET 1 OF 1	

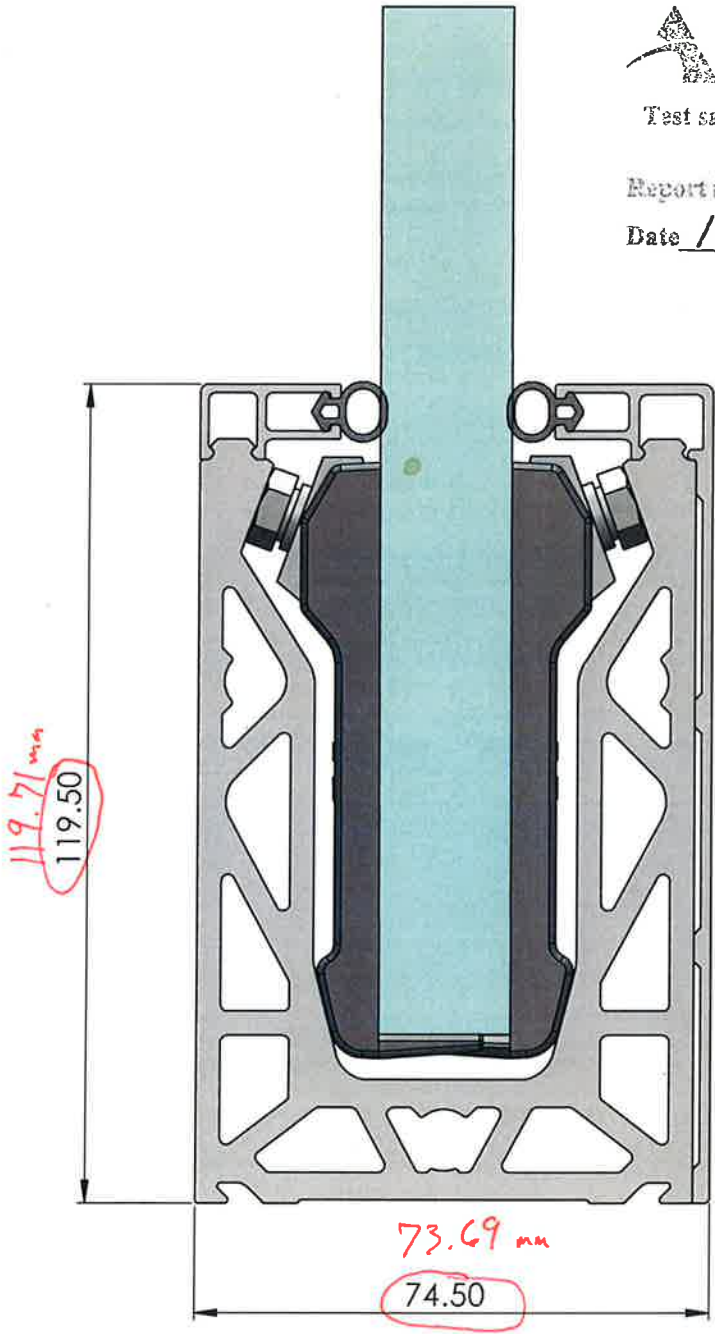


Architectural Testing

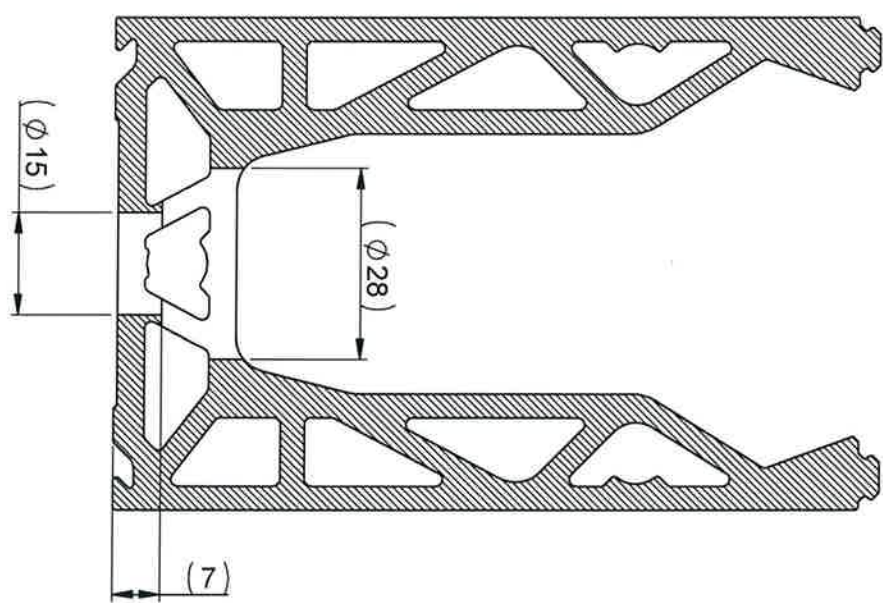
Test sample complies with these details.
Deviations are noted.

Report # 69513

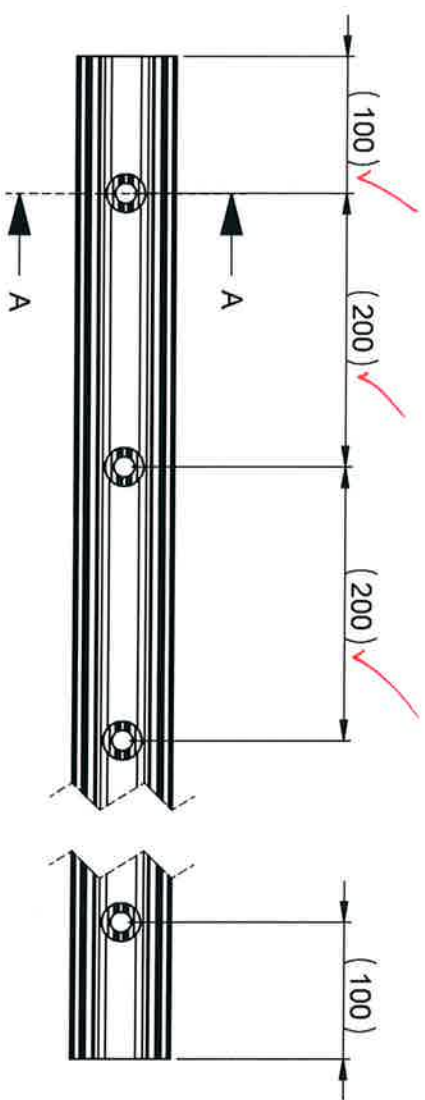
Date 10-8-17 Tech ARB



DO NOT SCALE DRAWING	REVISION
Purevista	
TITLE:	
G2623 Channel Base Drilling	
DWG NO.	A4
SCALE: 1:10	SHEET 1 OF 2



SECTION A-A
SCALE 1 : 1

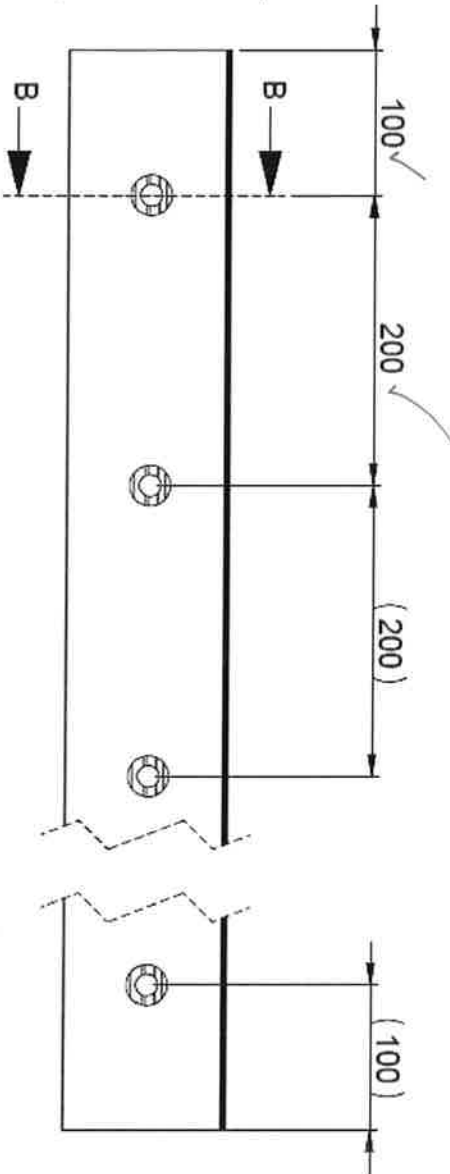
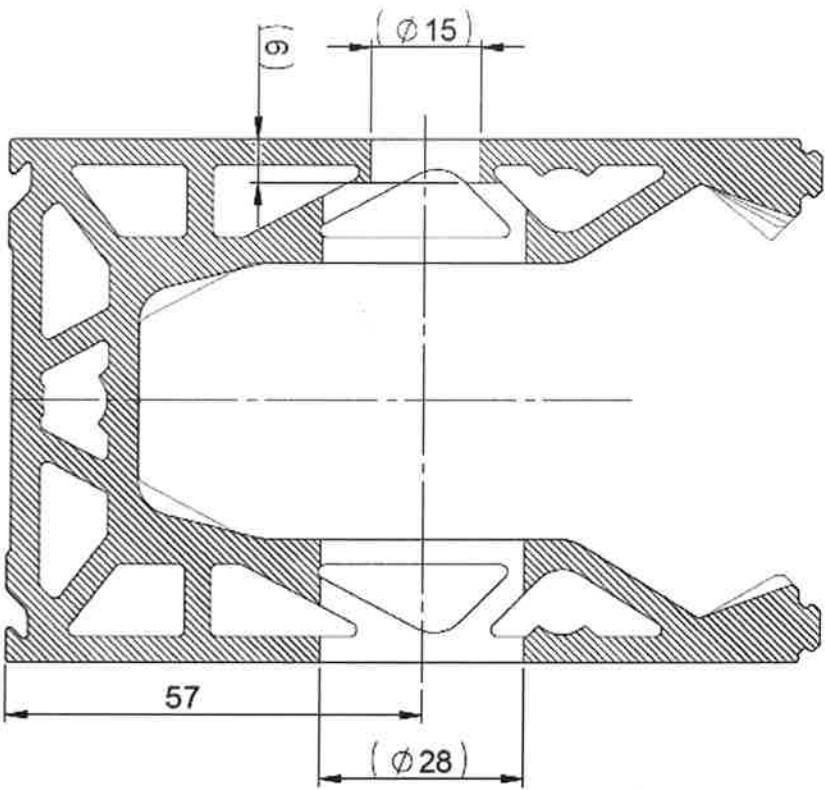


Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-16-17 Tech ARB

SECTION B-B
SCALE 1:1



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 69513

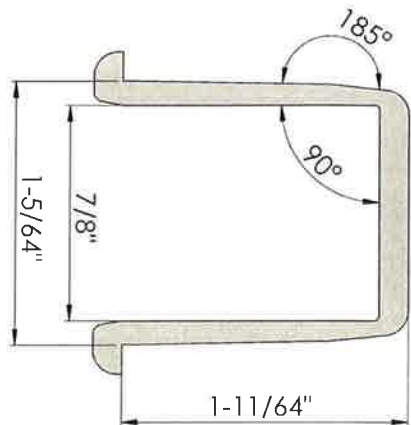
Date 10-18-17 Tech ARB

PUREVISTA

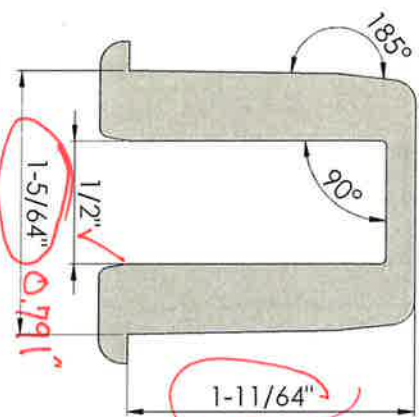
PureVista USA Testing Documentation		
title	Handrail Inner Liner	
DWG NO.	HR_02	A4

Handrail Plastic Liner

NOT TO SCALE
Approximate Imperial Dimensions



Profile for Plastic Handrail Liner,
7/8" Glass



Profile for Plastic Handrail Liner,
1/2" Glass

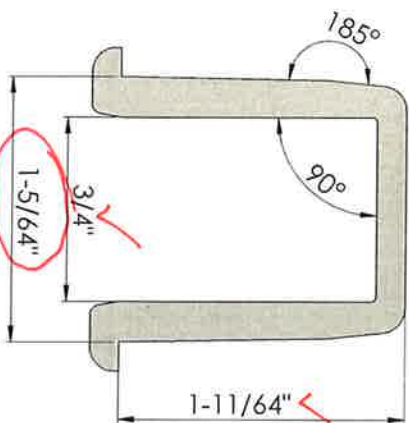
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-16-17 Tech ARB

Profile for Plastic Handrail Liner for
3/4" Glass



ISOMETRIC (3/4" Glass)



RIGHT VIEW (3/4" Glass)

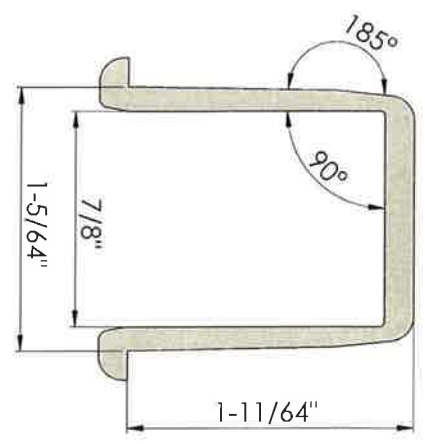




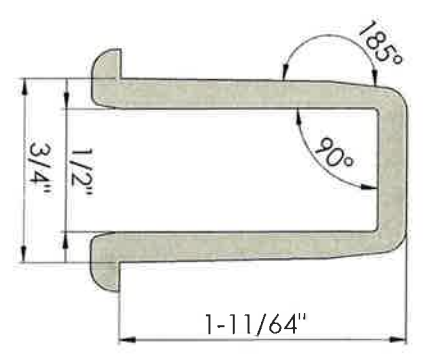
Title		PureVista USA Testing Documentation
Handrail Inner Liner		
DWG NO	HR_02	
		A4

Handrail Plastic Liner

NOT TO SCALE
Approximate Imperial Dimensions



Profile for Plastic Handrail Liner,
7/8" Glass



Profile for Plastic Handrail Liner,
1/2" Glass

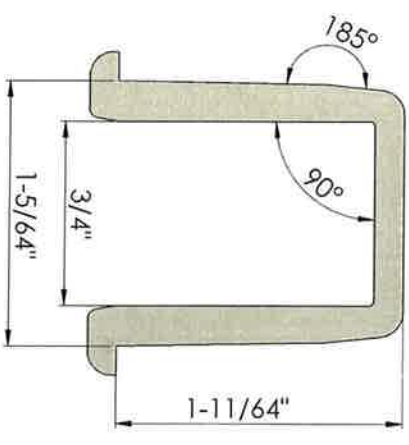


Test sample complies with these details.
Deviations are noted.

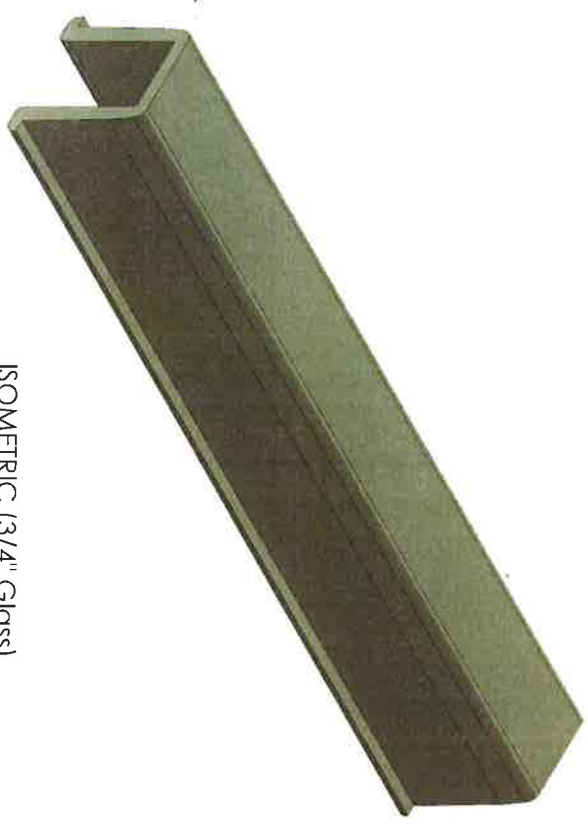
Report # 69513

Date 10-18-17 Tech ARB

Profile for Plastic Handrail Liner for
3/4" Glass



ISOMETRIC (3/4" Glass)



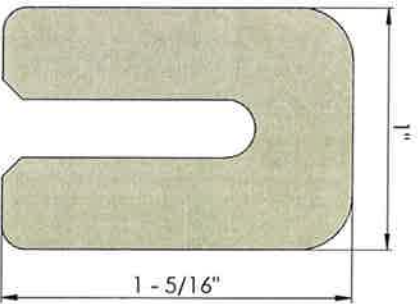
RIGHT VIEW (3/4" Glass)



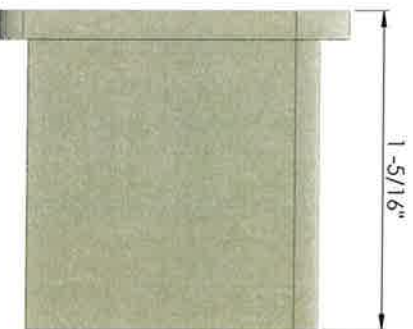
TOP VIEW



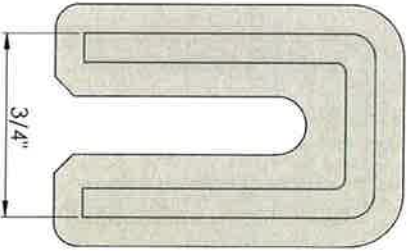
FRONT VIEW



RIGHT VIEW



BACK VIEW



Title	
PureVista USA Testing Documentation	
Handrail End Cap - 1/2"	
DWG NO	HR_05
A4	

NOT TO SCALE

Approximate Imperial Dimensions

Stainless Steel

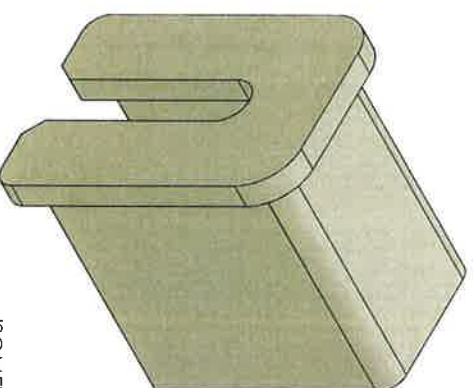


Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB



ISOMETRIC

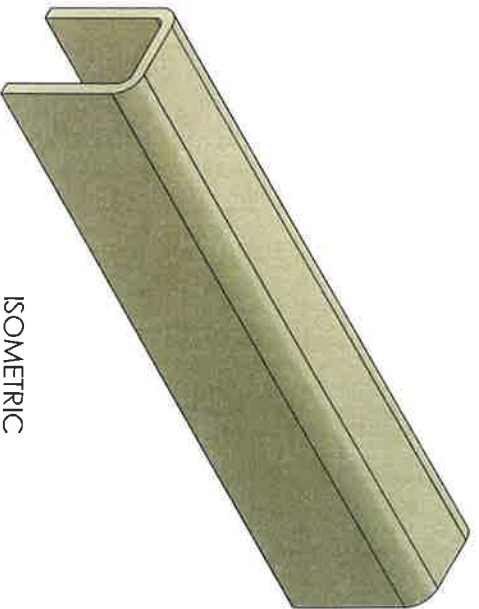


PureVista USA Testing Documentation	
Handrail Outer - 1/2" Glass	
DWG No	HR_06
	A4

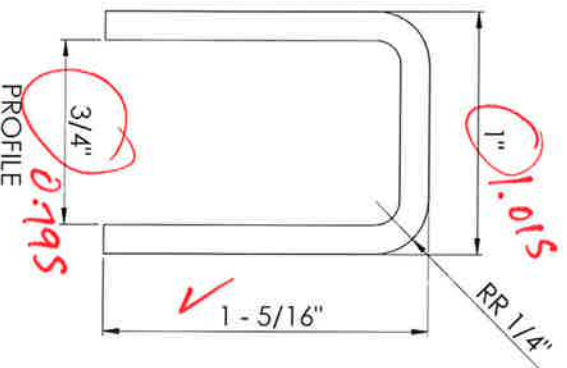
NOT TO SCALE

Brushed Stainless Steel Handrail

Approximate Imperial Dimensions



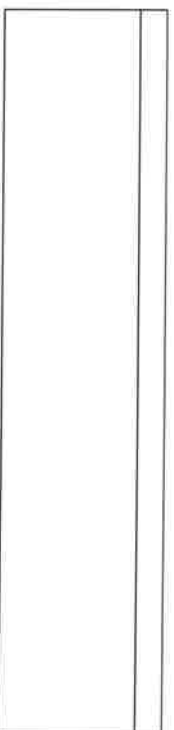
ISOMETRIC



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB



RIGHT VIEW

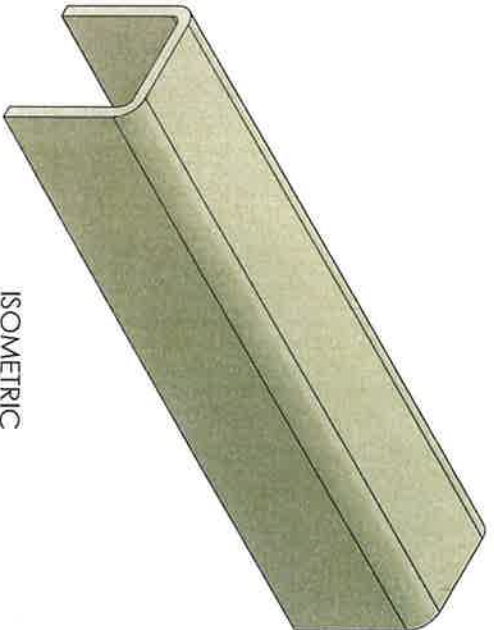


PureVista USA Testing Documentation	
TITLE	
Handrail Outter - Universal	
DWG NO	HR_01
	A4

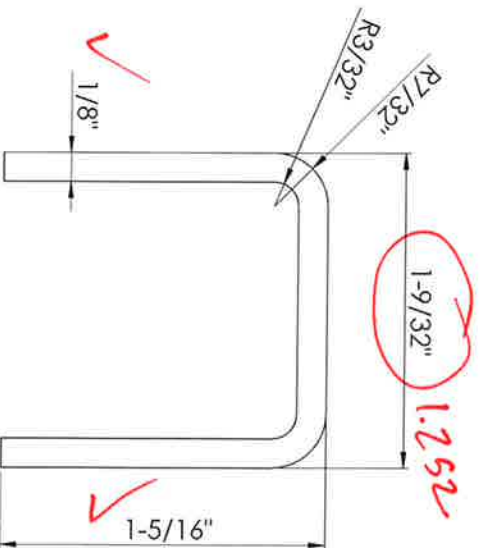
NOT TO SCALE

Brushed Stainless Steel Handrail

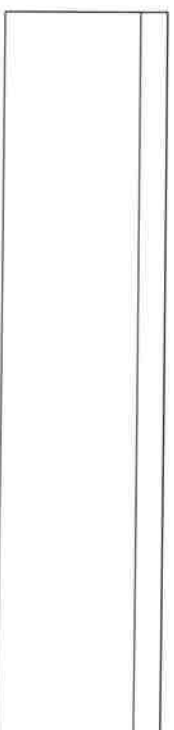
Approximate Imperial Dimensions



ISOMETRIC



PROFILE



RIGHT VIEW



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB

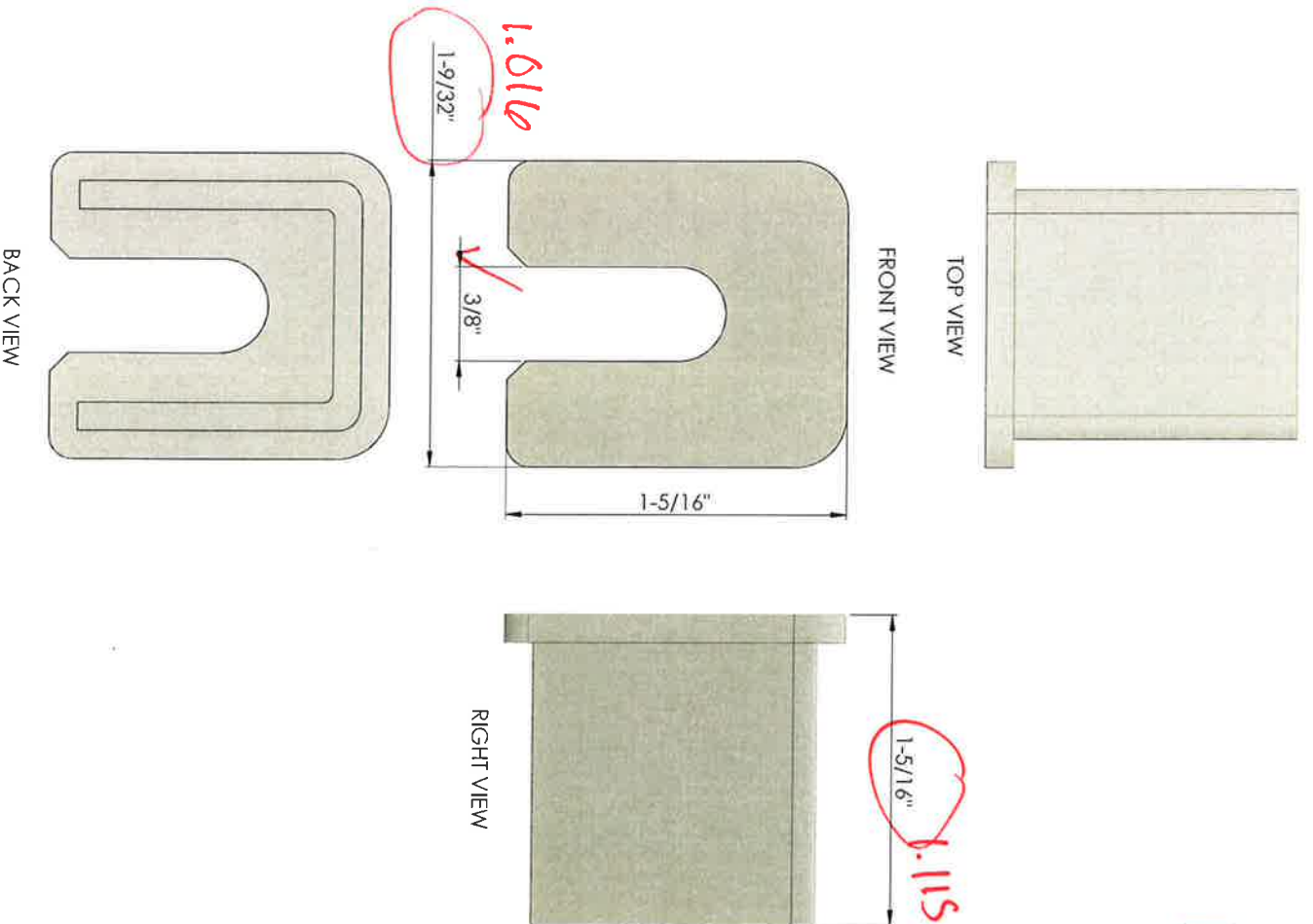


TITLE	
PureVista USA Testing Documentation	
Handrail End Cap	
DWG NO	HR_04
	A4

NOT TO SCALE

Approximate Imperial Dimensions

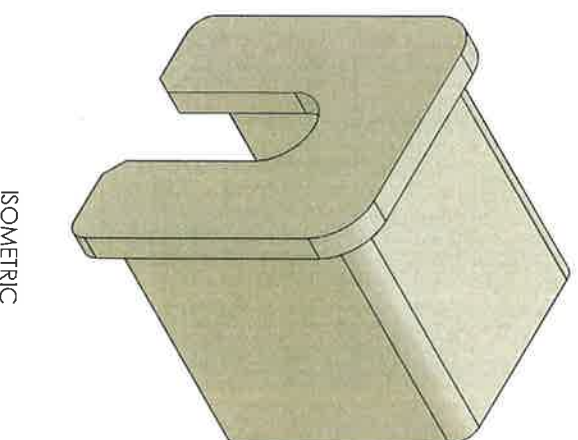
Stainless Steel



Test sample complies with these details.
Deviations are noted.

Report # 69513.

Date 10-18-17 Tech ARB



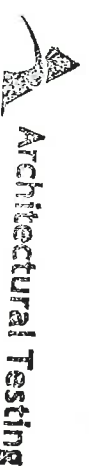
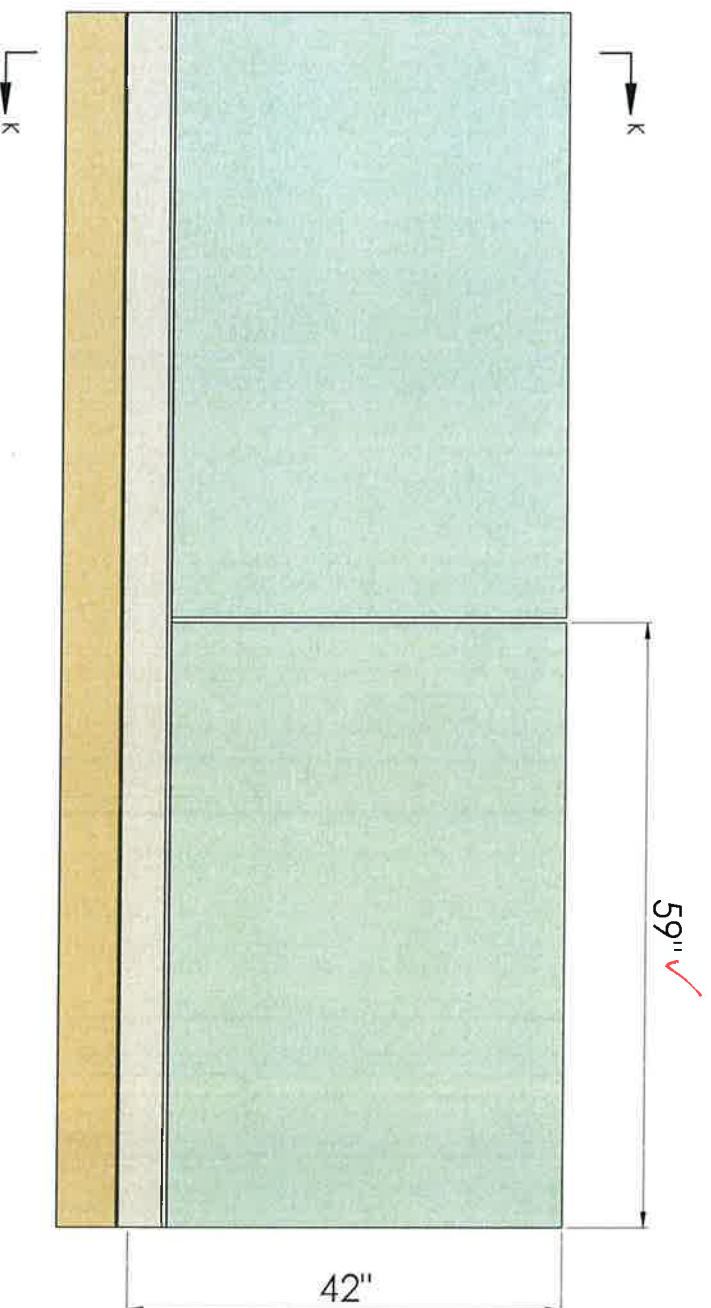
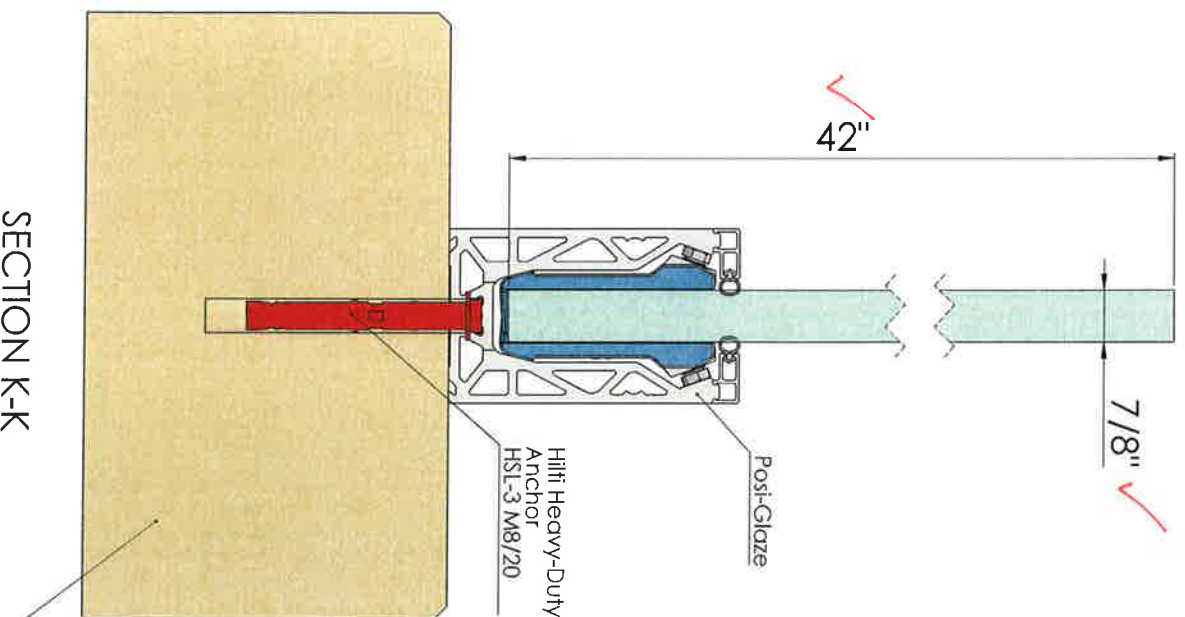
ISOMETRIC



PureVista USA Testing Documentation		
PosiGlaze - Concrete mounted.		
DWG NO.	POS_04	A4

NOT TO SCALE

Setup 1 - 7/8" Toughened Laminated Glass, PVB Interlayer.



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17

Tech ARB

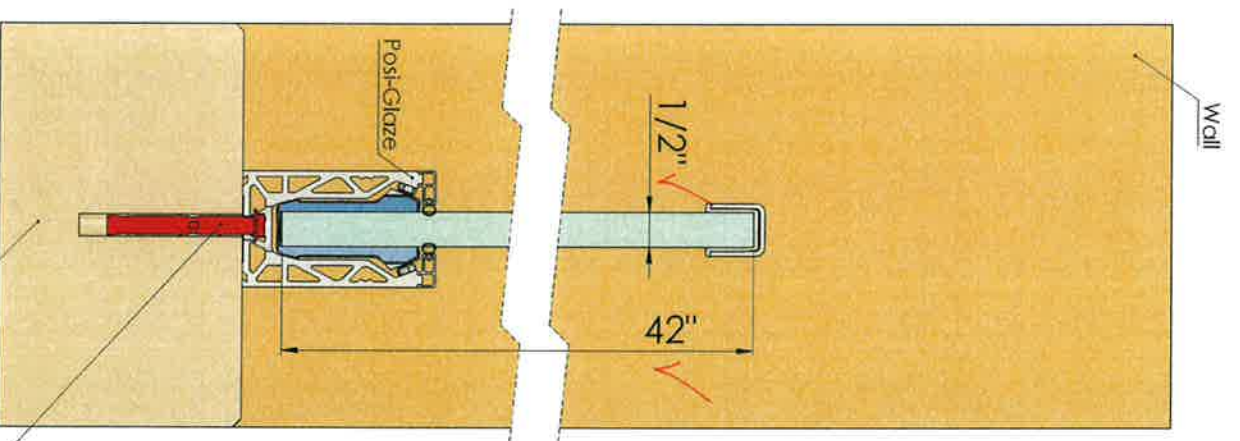


PureVista USA Testing Documentation		
Title		
PostGlaze - Concrete mounted, fixed handrail.		
DWG NO.	POST_05	A4

NOT TO SCALE

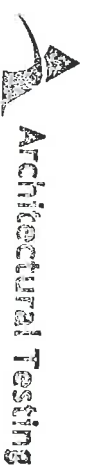
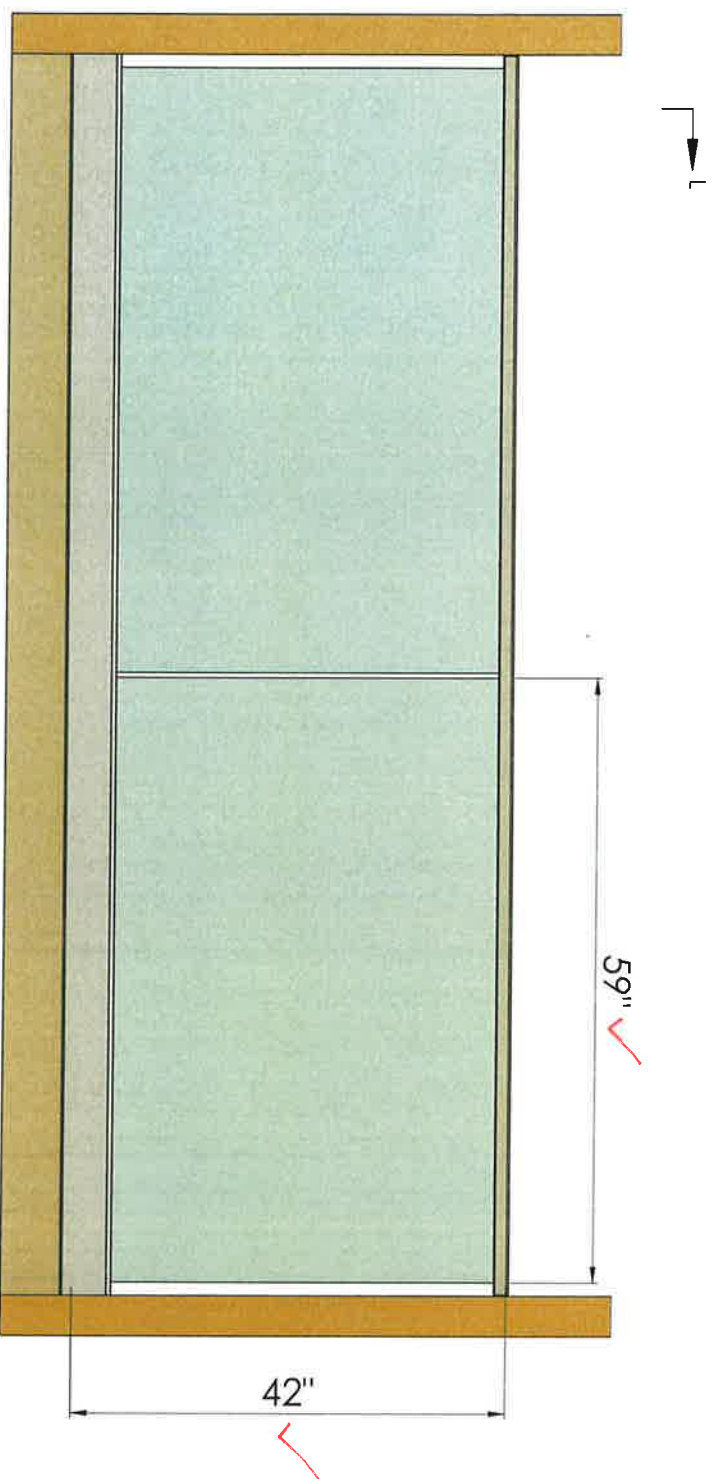
Setup 1 - 1/2" Monolithic Glass.

Setup 2 - 1/2" Toughened Laminated Glass, PVB interlayer.



Hilti Heavy-Duty Anchor
HSL-3 M8/20

FRONT VIEW



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB

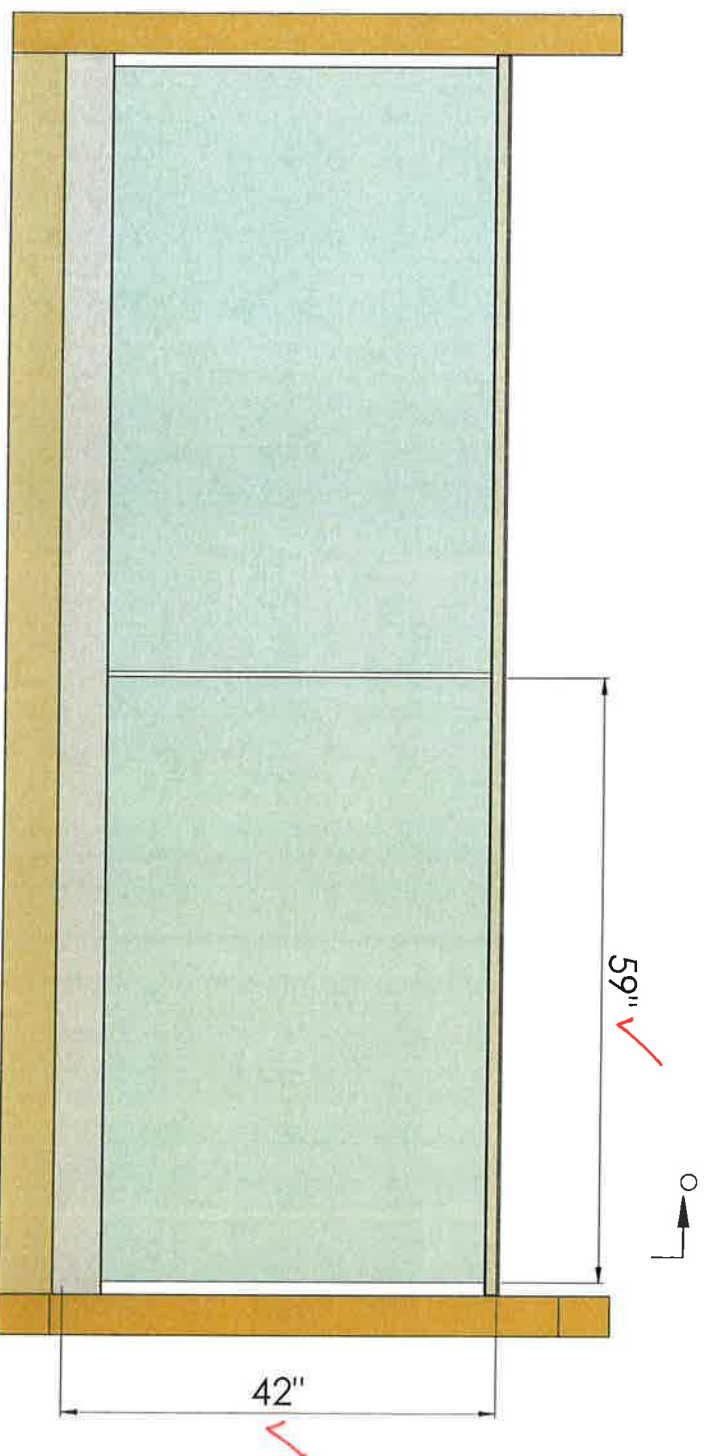
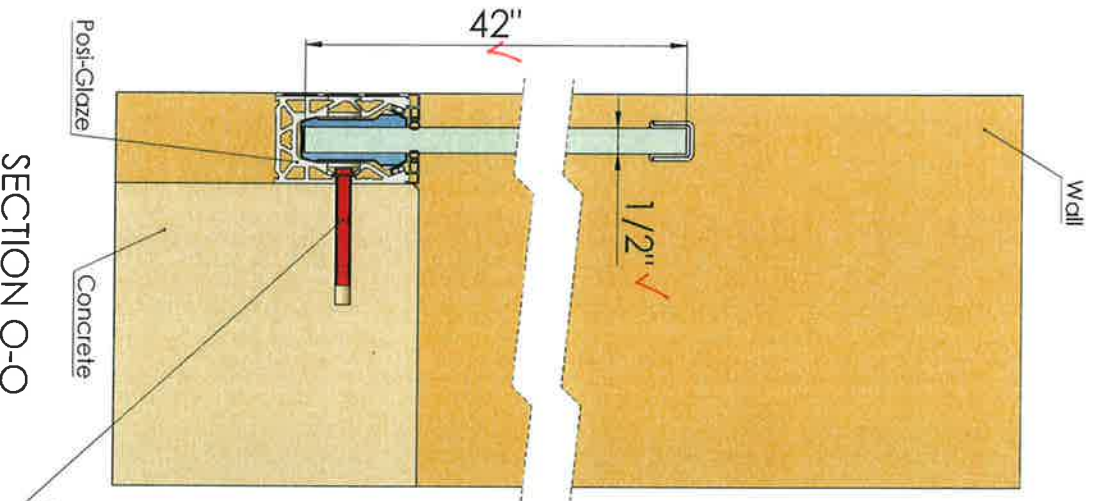


PureVista USA Testing Documentation	
Title	
PosiGlaze - Concrete side-mounted, fixed handrail.	
DWG NO	POSIL06
A4	

NOT TO SCALE

Setup 1 - 1/2" Monolithic Glass.

Setup 2 - 1/2" Toughened Laminated Glass, PVB interlayer.



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB



Architectural Testing

Test sample complies with these details.

Deviations are noted.

Report # 69513

Date 10/18/17 Tech ARB



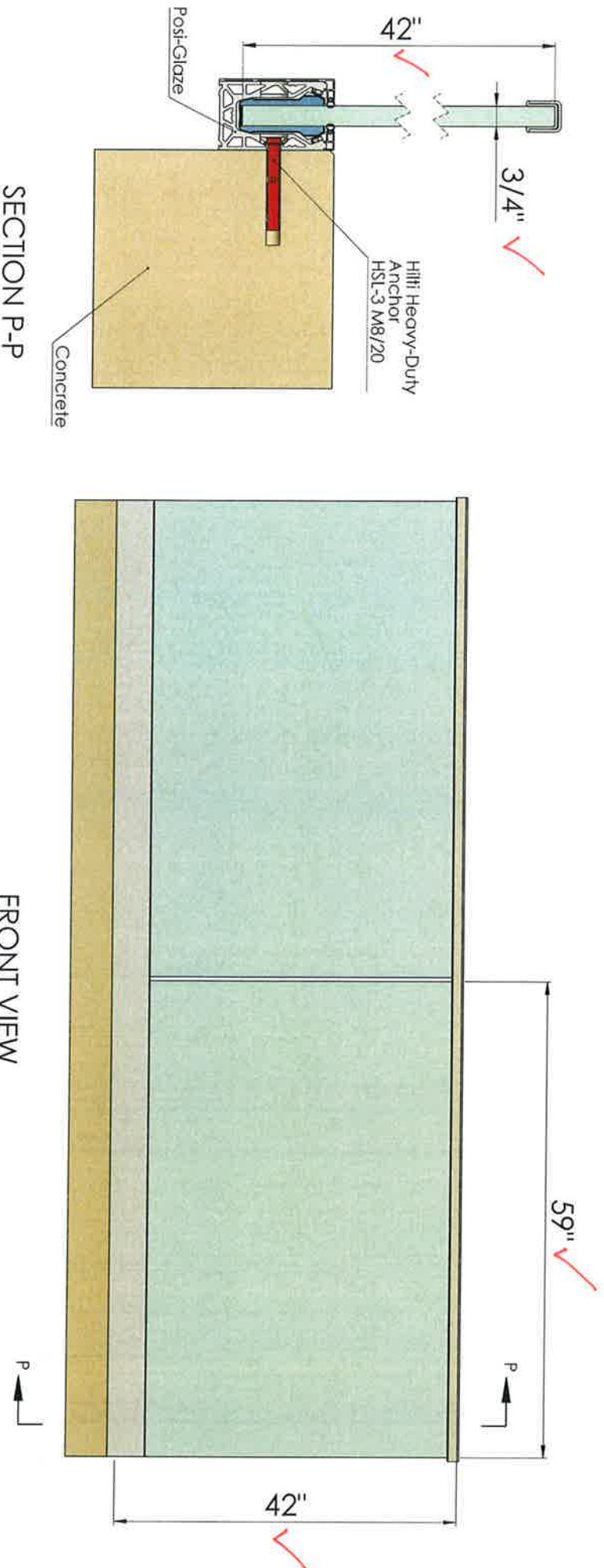
PUREVISTA

SHEET 8 OF 12

Title		PureVista USA Testing Documentation
Description		PosiGlaze - Concrete side-mounted, handrail.
Drawn By	POSL_07	A4

NOT TO SCALE

Setup 1 - 3/4" Monolithic Glass.





Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 69613

Date 10-18-17 Tech ARB

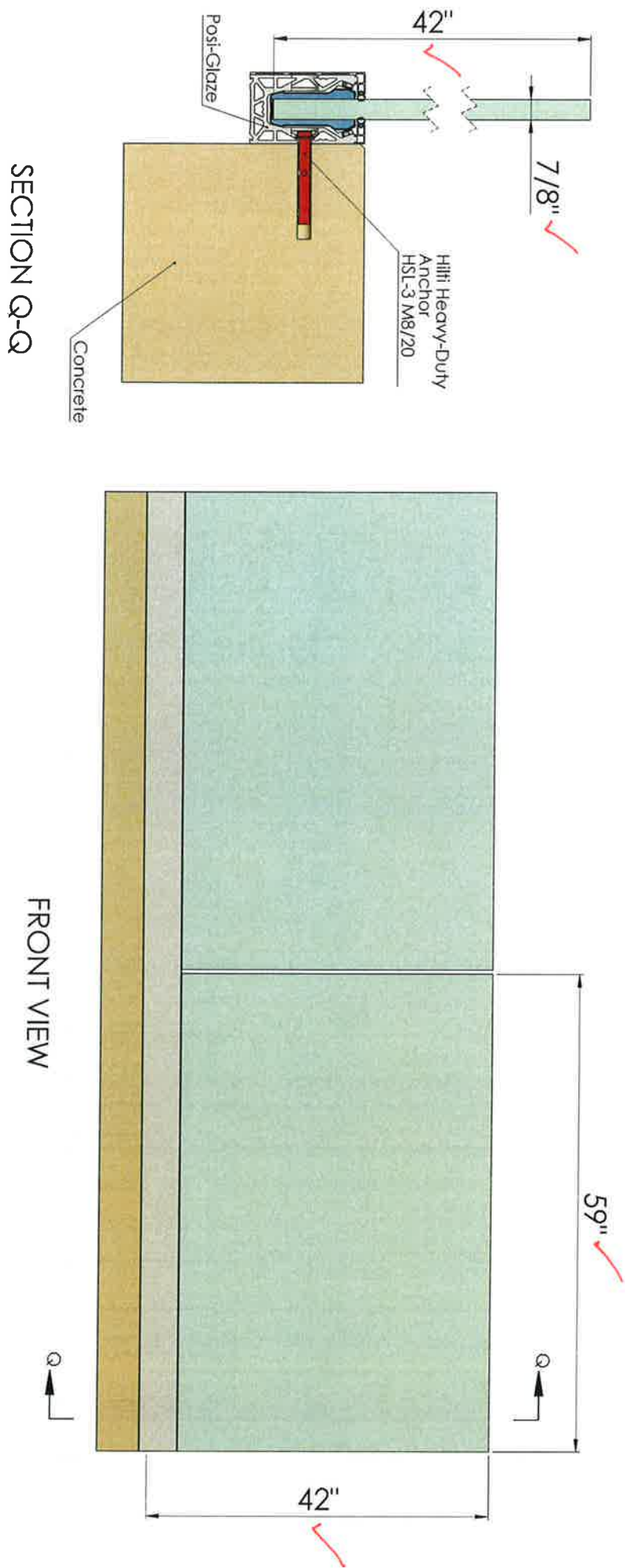


PUREVISTA

Title			PureVista USA Testing Documentation
DWG NO.			POS1_08
A4			

NOT TO SCALE

Setup 1 - 7/8" Toughened Laminated Glass, PVB Interlayer.



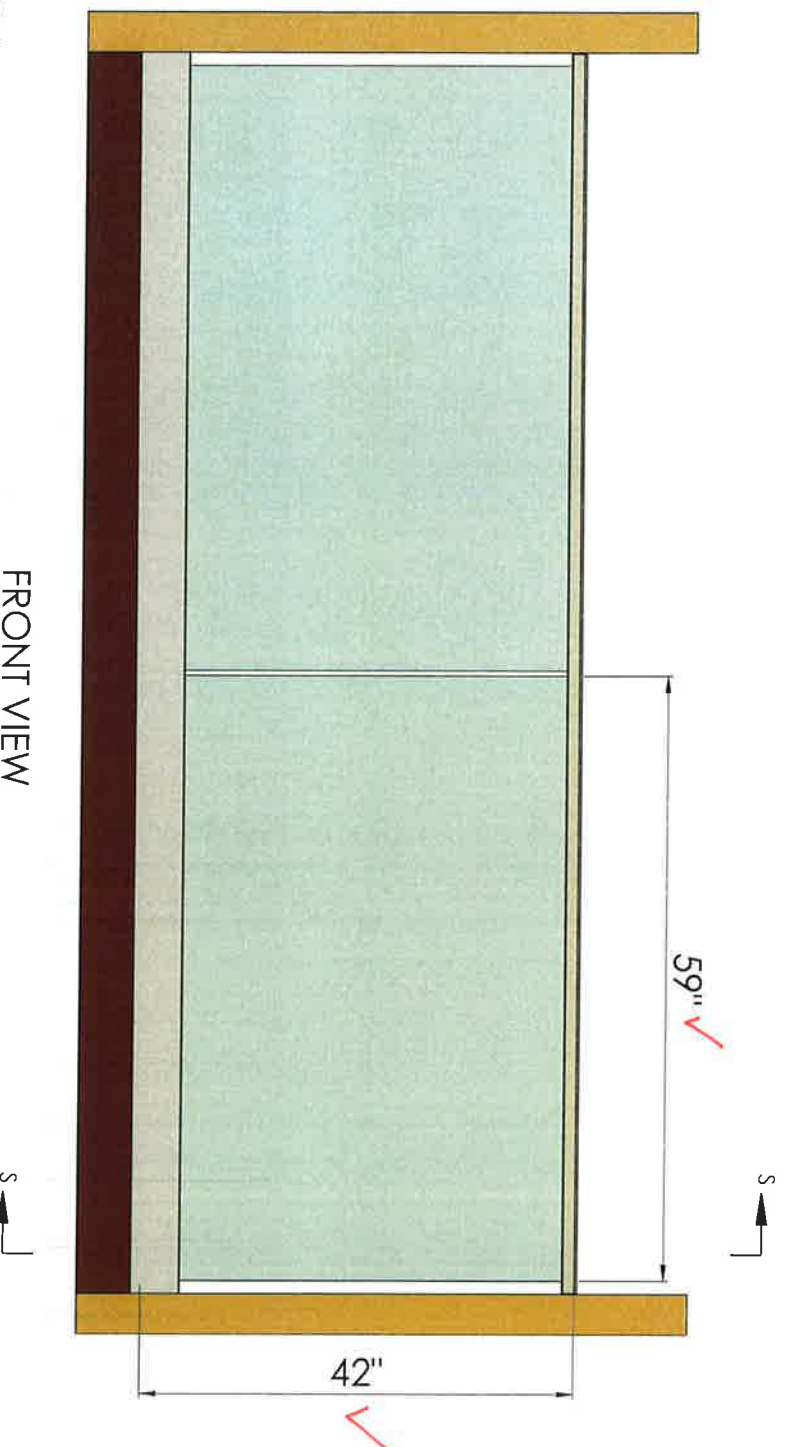
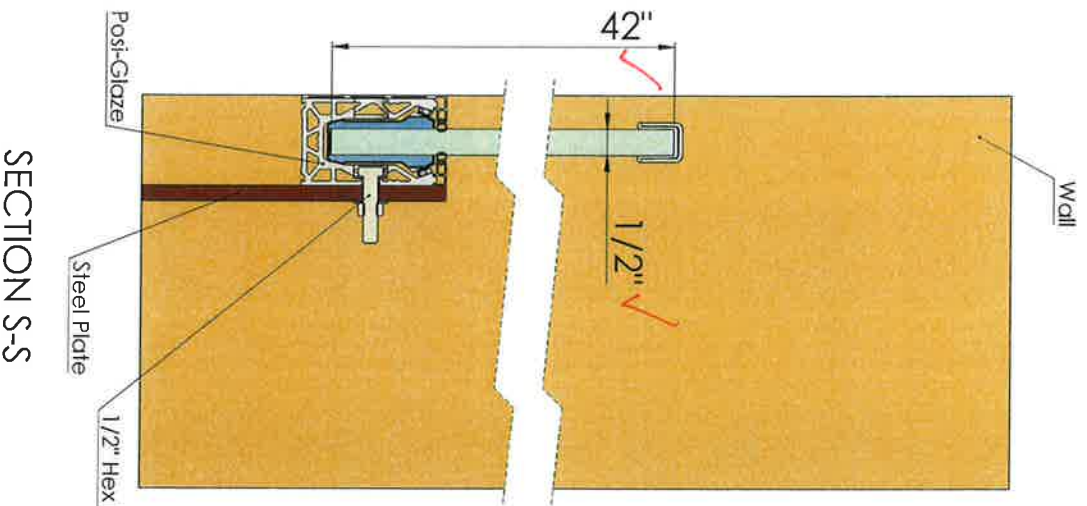


Title		PureVista USA Testing Documentation
Description		PosiGlaze - Steel side-mounted, fixed handrail.
DWG NO.	POS1_09	A4

NOT TO SCALE

Setup 1 - 1/2" Monolithic Glass.

Setup 2 - 1/2" Toughened Laminated Glass, PVB interlayer.



FRONT VIEW

**Architectural Testing**

Test sample complies with these details.
Deviations are noted.

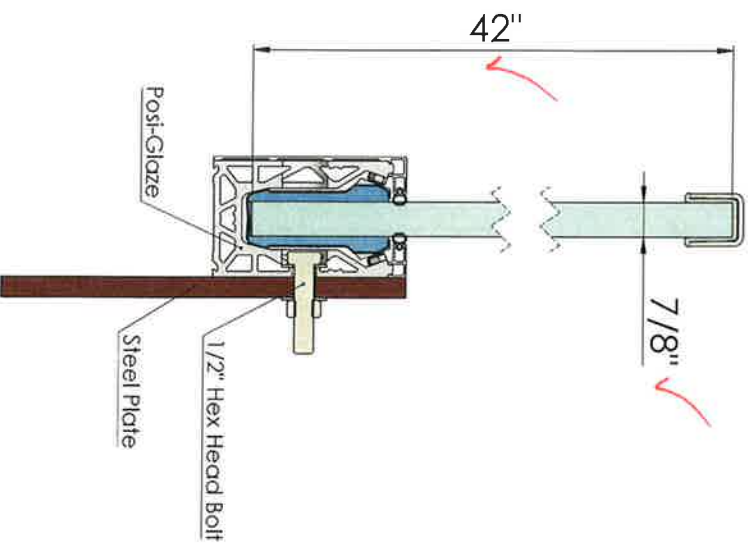
Report # 69513Date 10-18-17 Tech ARB



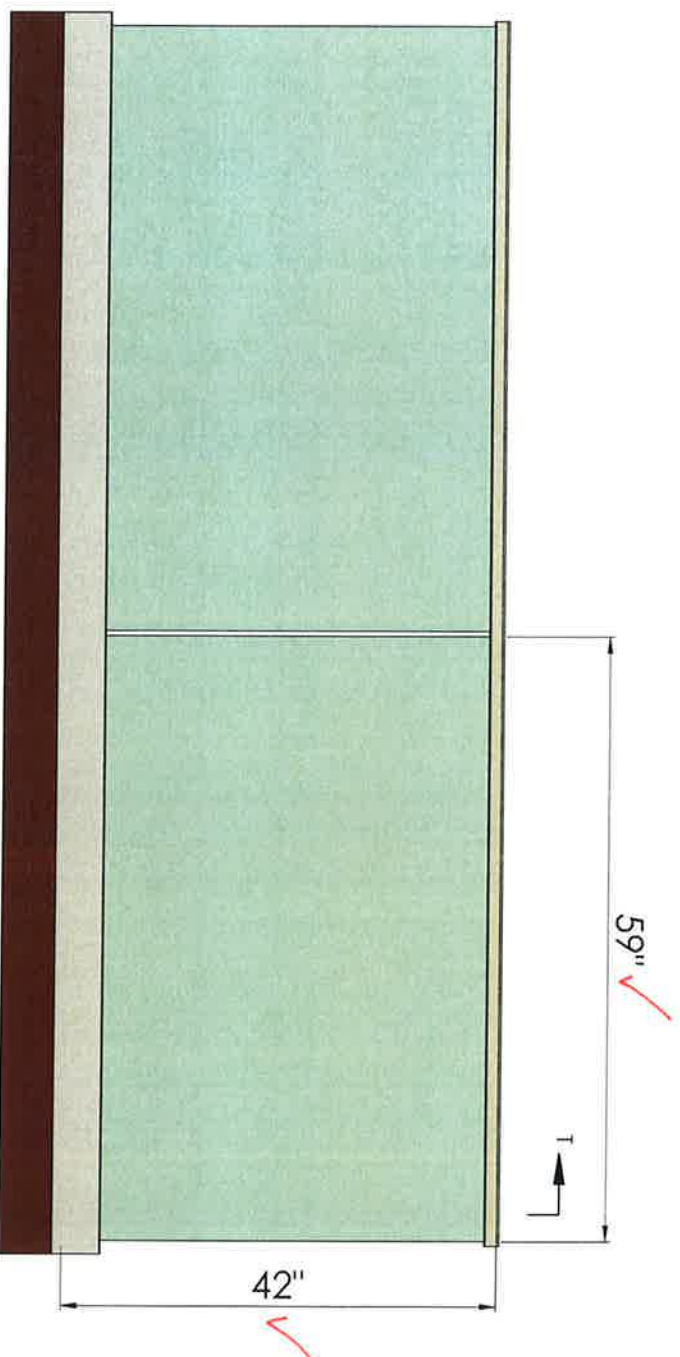
PureVista USA Testing Documentation		
DATE	PosiGlaze - Steel side-mounted, handrail.	
DWG NO.	PSL_10	A4

NOT TO SCALE

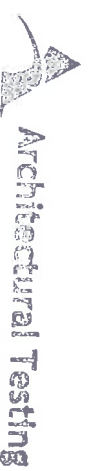
Set up 1 - 7/8" Toughened Laminated Glass, PVB Interlayer.



SECTION T-T



FRONT VIEW



Test sample complies with these details.
Deviations are noted.

Report # 69513

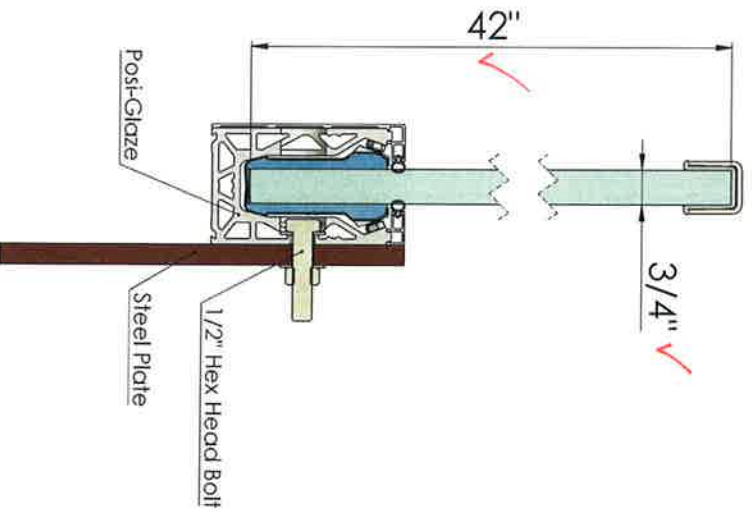
Date 10-18-17 Tech ARP



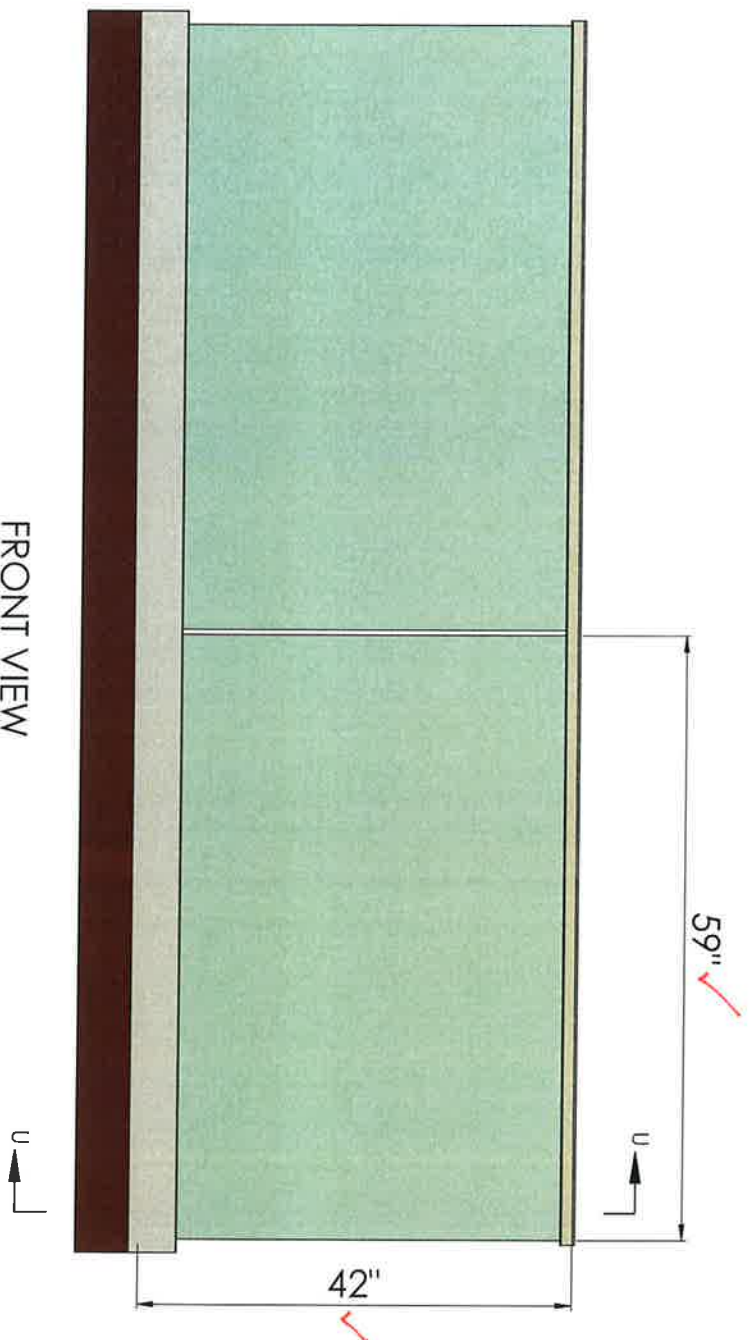
TITLE		PureVista USA Testing Documentation
PostGlaze - Steel side-mounted, handrail.		
DWG NO	POSL_11	
		A4

NOT TO SCALE

Setup 1 - 3/4" Monolithic Glass



SECTION U-U



FRONT VIEW



Test sample complies with these details.
Deviations are noted.

Report # 68513Date 10-18-17 Tech ARR

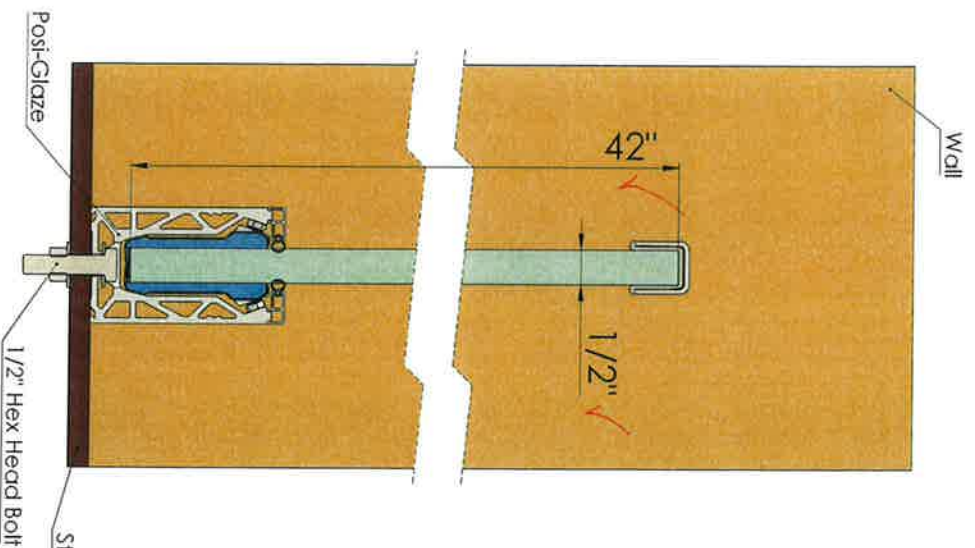


Title		PureVista USA Testing Documentation
Description		PosiGlaze - Steel mounted, fixed handrail.
DWG NO	POS_L01	A4

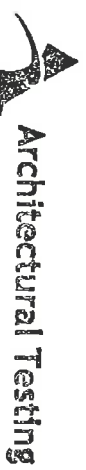
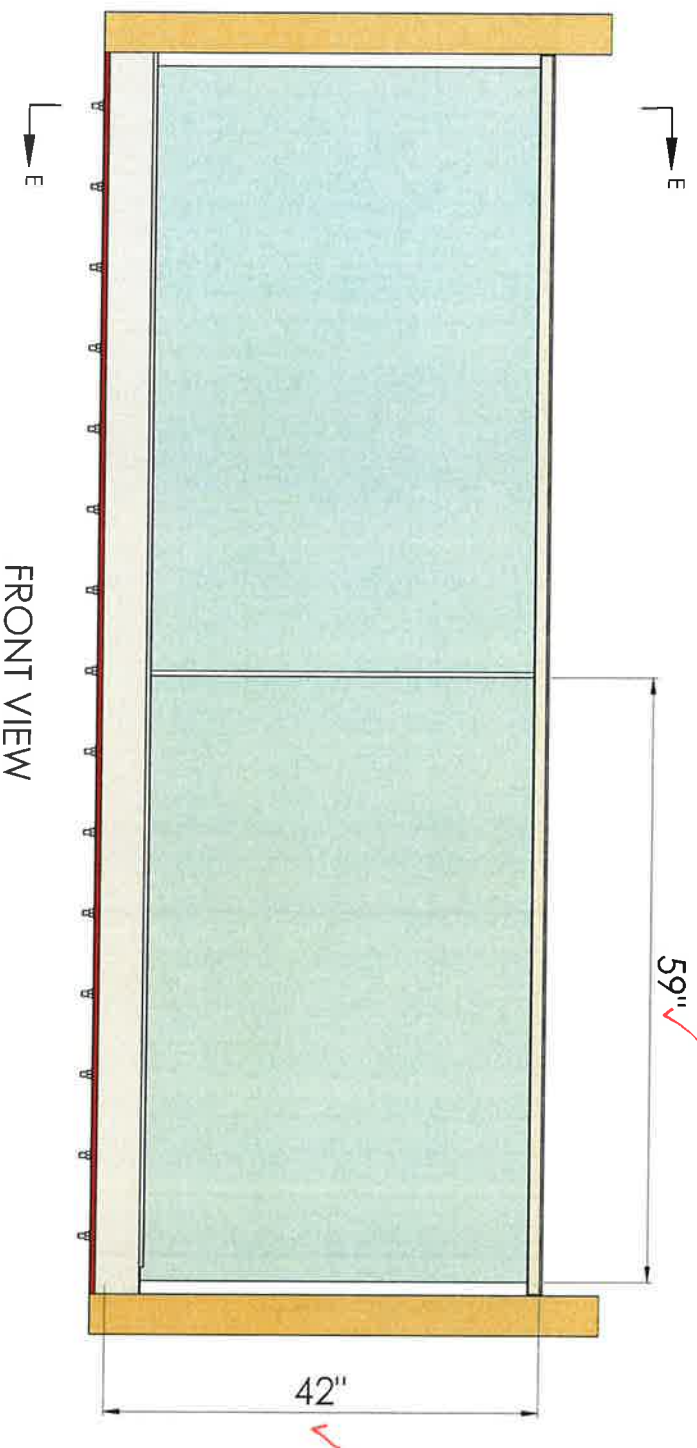
NOT TO SCALE

Setup 1 - 1/2" Monolithic Glass.

Setup 2 - 1/2" Toughened Laminated Glass, PVB interlayer.



SECTION E-E



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ARB



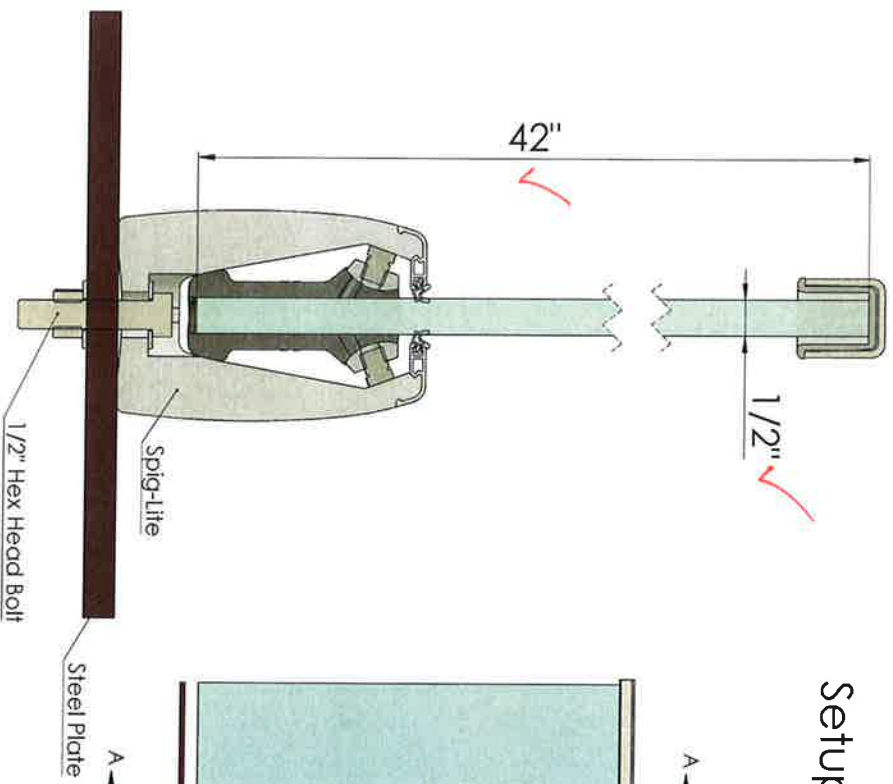
PureVista USA Testing Documentation		
FILE	Spig-Lite Pro - Steel Mounted, handrail.	
DWG NO	SPIG_01	A4

NOT TO SCALE

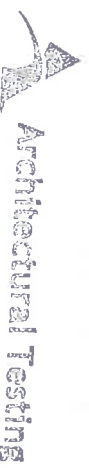
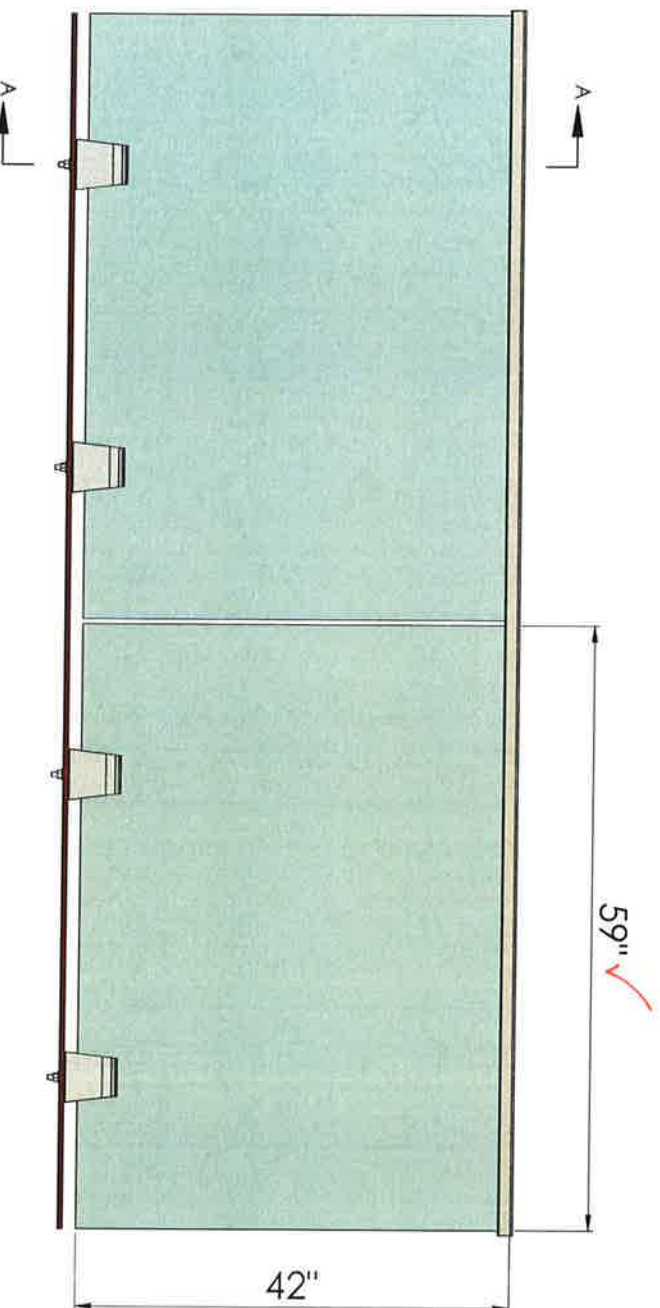
Setup 1 - 1/2" Monolithic Glass.

Setup 2 - 1/2" Toughened Laminated Glass, PVB interlayer.

SECTION A-A



FRONT VIEW



Test sample complies with these details.
Deviations are noted.

Report # 69513.

Date 10-16-17 Tech ARB

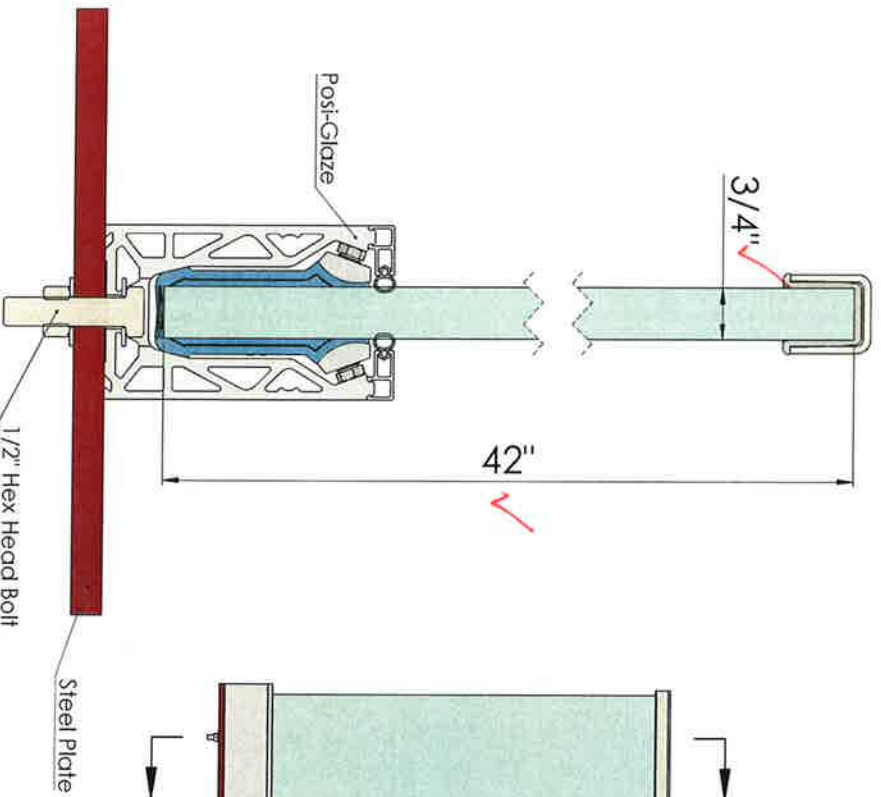


PureVista USA Testing Documentation		
DATE	PostGlaze - Steel mounted, Handrail.	
DWG NO	POSTL02	A4

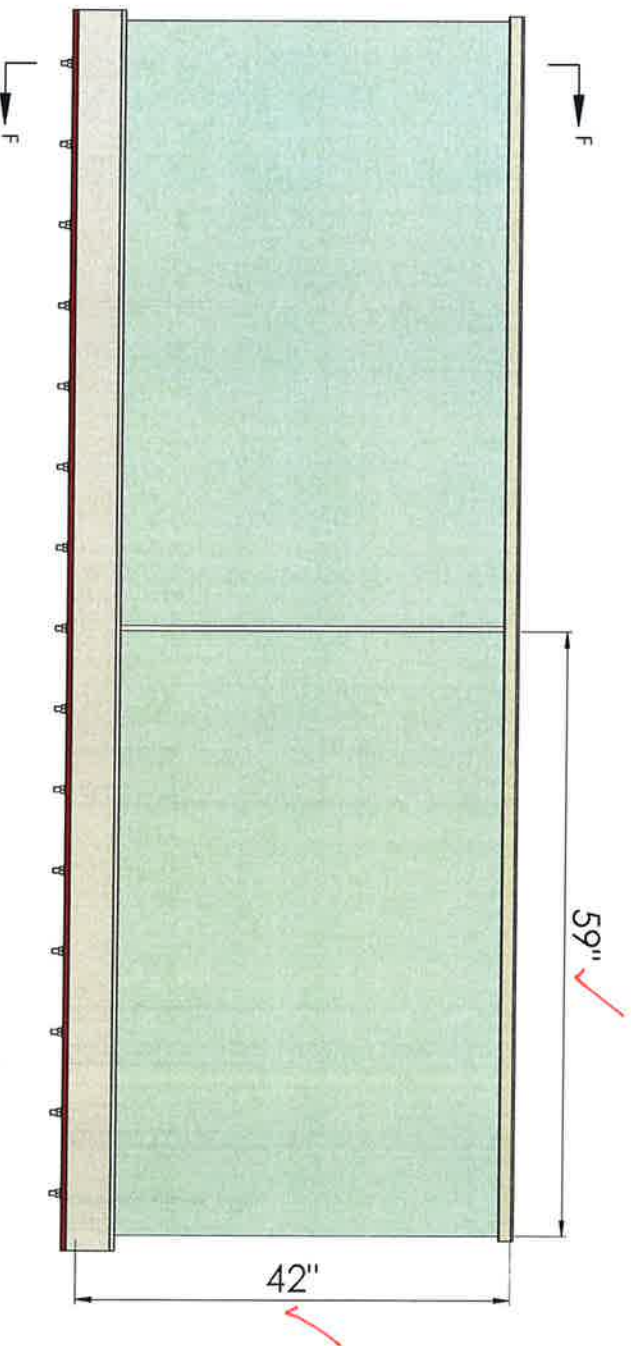
NOT TO SCALE

Setup 1 - 3/4" Monolithic Glass.

SECTION F-F



FRONT VIEW



Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10-18-17 Tech ABB

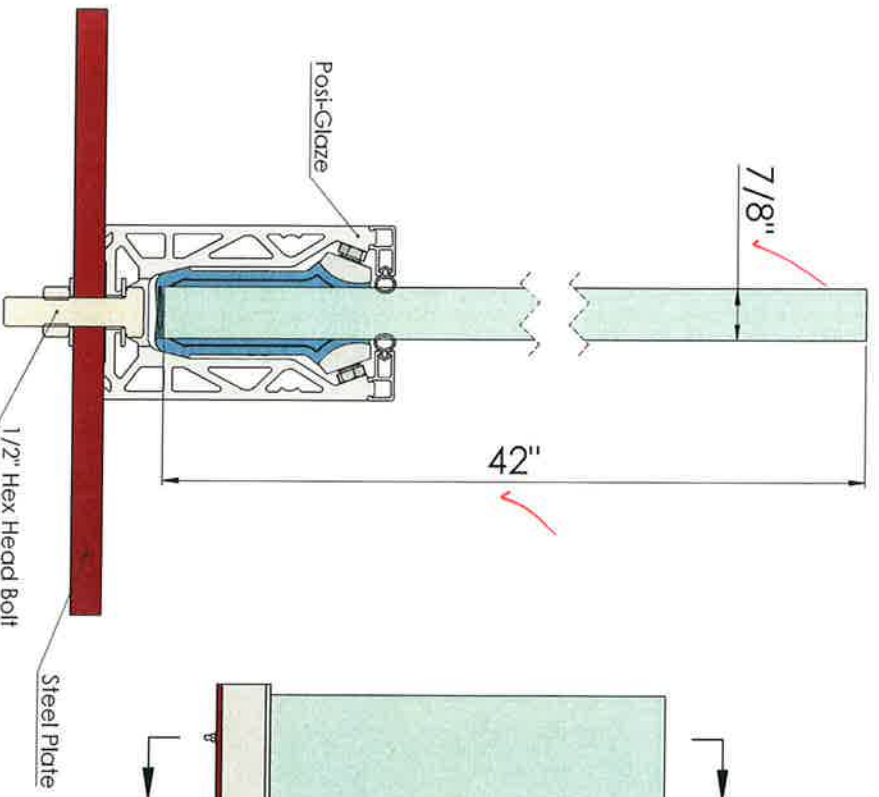


Title		
PureVista USA Testing Documentation		
Description		
PosiGlaze - Steel mounted.		
DWG NO	POS1_03	A4

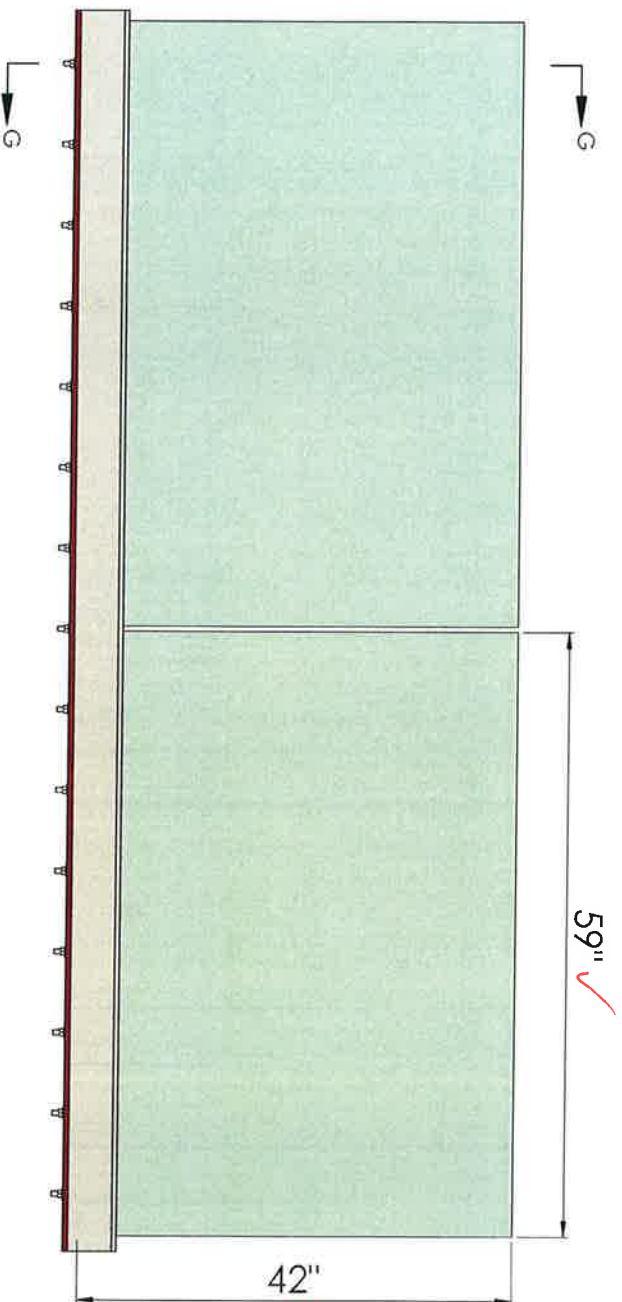
NOT TO SCALE

Setup 1 - 7/8" Toughened Laminated Glass, PVB Interlayer.

SECTION G-G



FRONT VIEW



Test sample complies with these details.
Deviations are noted.

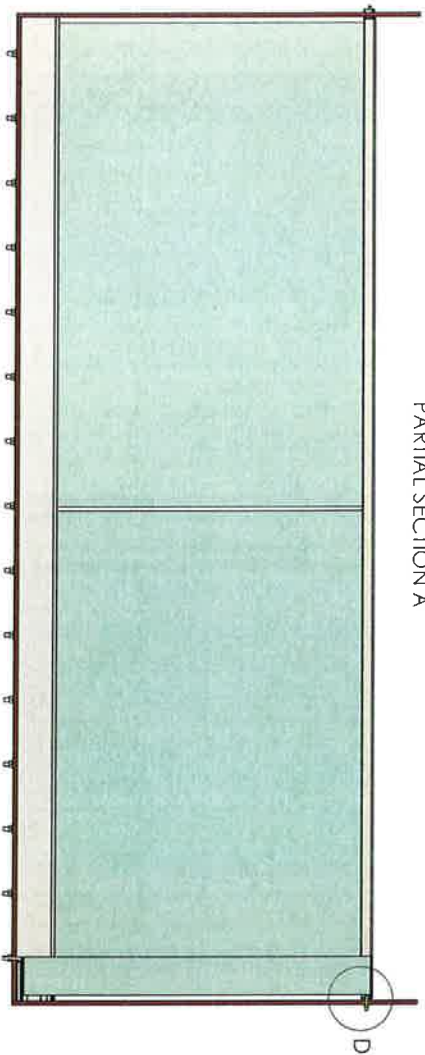
Report # 69513

Date 10-18-17 Tech ARP



PureVista USA Testing Documentation		
TITLE	Handrail Wall Fixture - Page 1	
DWG NO.	HR_03	A4

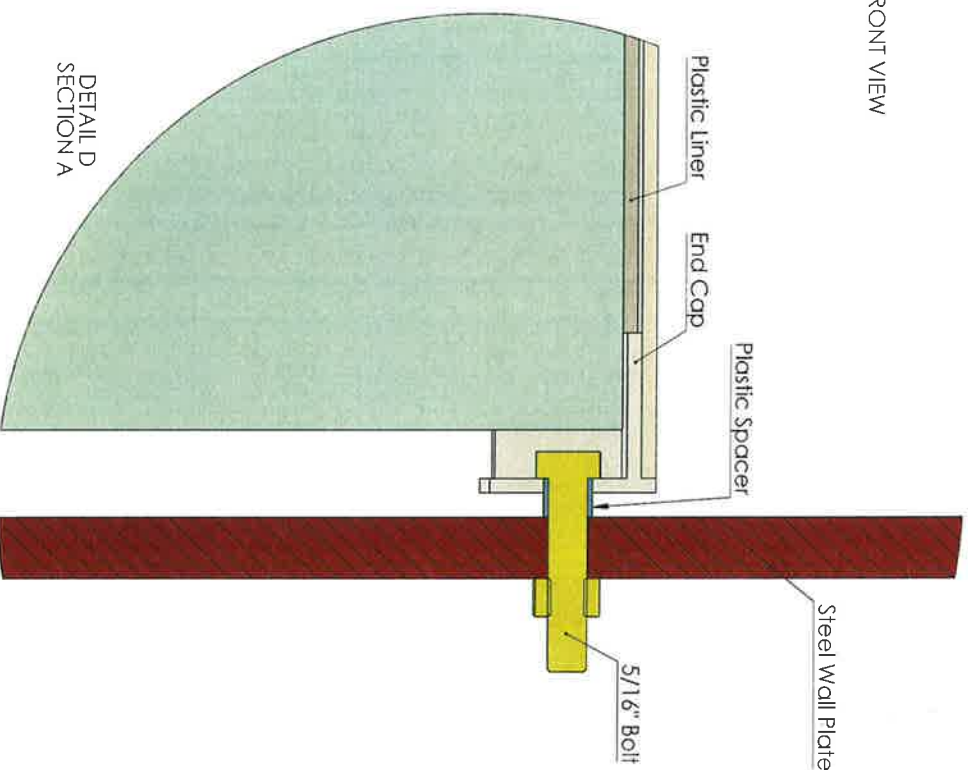
RIGHT VIEW
PARTIAL SECTION A



SECTION VIEW A



FRONT VIEW



DETAIL D
SECTION A



Architectural Testing

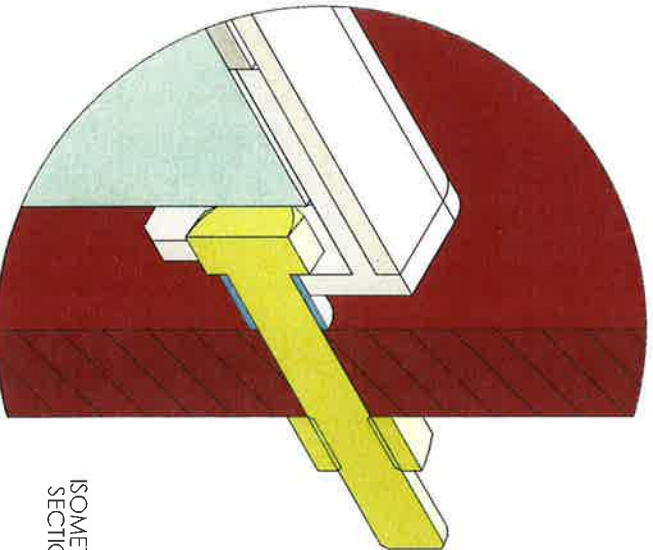
Test sample complies with these details.
Deviations are noted.

Report # 69513

Date 10/18-17

Tech APB

ISOMETRIC DETAIL
SECTION A VIEW



NOT TO SCALE

Approximate Imperial Dimensions



G9513.01-119-19

APPENDIX B

Photographs



Photo No. 1
Typical Test Setup for Compressive Strength of Cylindrical Concrete Specimens



Photo No. 2
In-Fill Load Test at Bottom of Glass along Shoe



Photo No. 3
Horizontal Concentrated Load Test at End of Top Rail (Bracket)



Photo No. 4
Vertical Concentrated Load at End of Top Rail (Bracket)



Photo No. 5
Vertical Uniform Load on Top Rail



Photo No. 6
Vertical Concentrated Load at End of Unsupported Top Rail

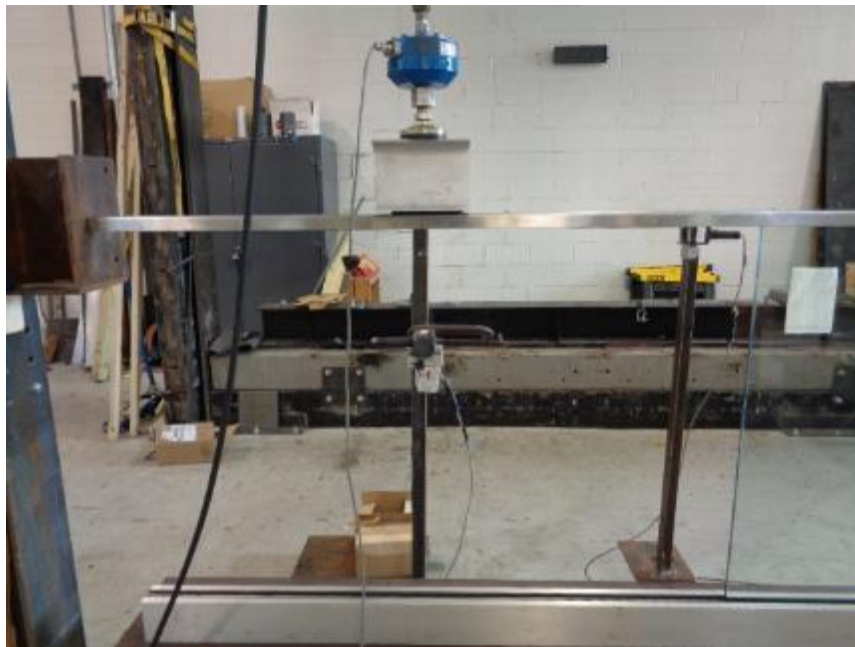


Photo No. 7
Vertical Concentrated Load at Mid-Span of Unsupported Top Rail



Photo No. 8
Horizontal Concentrated Load at End of Unsupported Top Rail



Photo No. 9
Horizontal Uniform Load on Unsupported Top Rail



Photo No. 10
Horizontal Concentrated Load at End of Unrestrained Top Rail



Photo No. 11
Horizontal Concentrated Load at Mid-Span of Top Rail



Photo No. 12
Horizontal Uniform at Top Rail



Photo No. 13
Support Rail with Rubber Gasket



Photo No. 14
Vertical Concentrated Load at Mid-Span of Top Rail



Photo No. 15
Horizontal Inward Uniform Load at 42 in (Top Rail)



Photo No. 16
Support Rail with Bar Clamps Installed



Photo No. 17
Support Rail Side Mounted to Steel



Photo No. 18
Rail Bracket at Wall Mount



Photo No. 19
Rail Bracket Shown Under Rail Mount



Photo No. 20
Support Rail Bolt, Washers and Nut



Photo No. 21
Rail Bracket Assembly with Fastener



Photo No. 22
Bar Clamp with Screw



Photo No. 23
Glass Slip Clamp Fitting