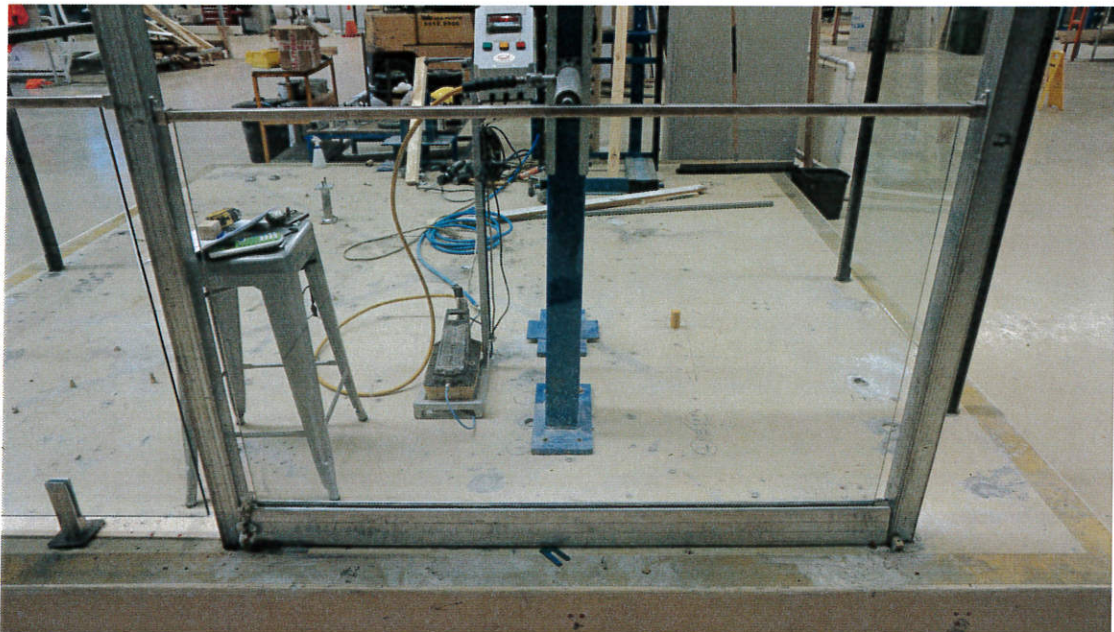

BALUSTRADE - GLASS



A TECH AUSTRALIA / SLOANE ACCESSORIES

FULLY FRAMELESS CHANNEL SYSTEM

TESTED BY
AZUMA DESIGN PTY LTD

AZT0379.16

NATA ACCREDITED LABORATORY No. 15147

This document shall not be reproduced, except in full.

The results of the tests, calibrations and/or measurements included
in this document are traceable to Australian/national standards.

1 Test Standards

The product is tested to the following standard only

- *AS/NZS 1170.1 - 2002 Structural design actions - Permanent, imposed and other actions*

2 Test Sample Description

2.1 General

Model No./Name	Fully Frameless Channel System
Customer	A Tech Australia / Sloane Accessories
Address	258 Milperra Road, Milperra NSW 2168 / 88 Stoney Creek Road, Bexley NSW 2207
Azuma Testing Number	AZT 0379.16
Date of Test	18/10/2016

2.2 Barrier

Glass Material	Toughened
Glass Thickness	12 mm
Glass Panel Size	Height = 1000 mm Width = 1500 mm
Overall Size	Height = 1040 mm Width = 1570 mm
Glass Installation Type	Cantilevered in 'U' Channel
Gap between bottom of barrier and ground level	0 mm
Complies with AS 2208	Yes
Handrail Used	Yes 25 x 25 mm stainless steel, Fixed off to 'wall' with brackets. Wall is simulated as two steel box sections anchored to the concrete using quick set concrete
Spacing Between Fixed Points	N/A

2.3 'U' Channel

Material	Aluminium
Overall Size	1570 mm (L) x 100 mm (H) x 100 mm (W)
Drawing supplied	Yes
Fixing Method	Bolted to Concrete, Glass held with quick set concrete



Figure 1: 'U' Channel

3 Minimum Imposed Actions for Barriers

3.1 Concentrated Load

3.1.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

3.1.2 Results

Direction	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
Outwards	600 N	436 mm	436 mm	0 mm
Downwards	600 N	702 mm	702 mm	0 mm

3.1.3 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1500}{60} = 25mm \quad (1)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Observation	Result
Outwards		
Deflection no more than 25 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
Downwards		
Deflection no more than 25 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		

3.1.4 Pictures

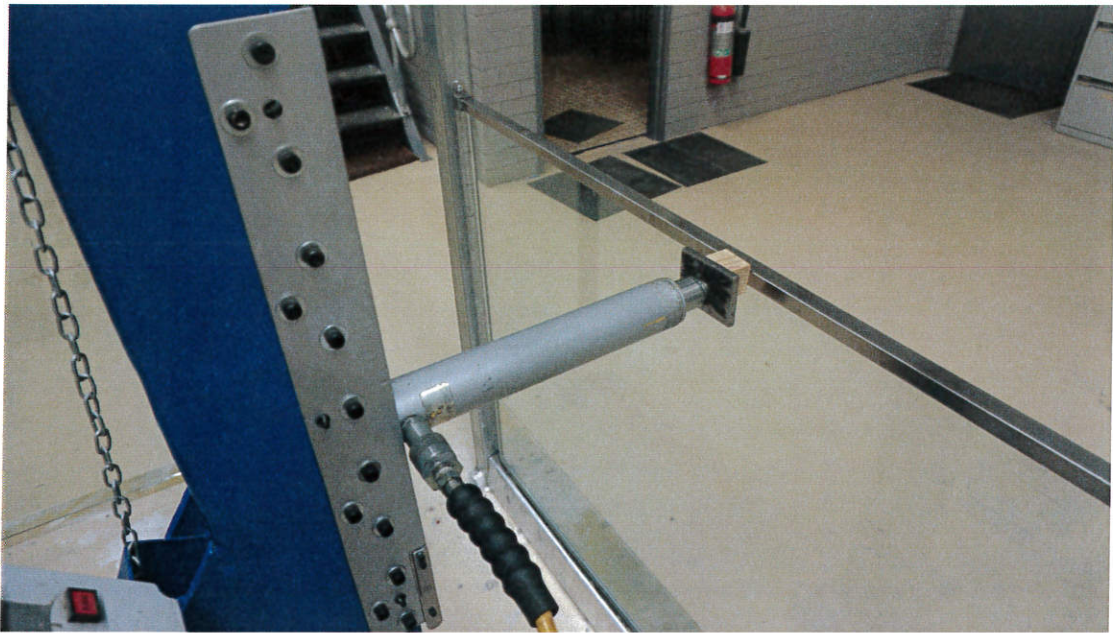


Figure 2: Outwards Push



Figure 3: Outwards Push - Bend



Figure 4: Downwards Push

3.2 Uniformly Distributed Load - VERTICAL

3.2.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

3.2.2 Calculation

The required uniformly distributed load for the glass panel is the imposed action multiplied by the width of the product:

$$\text{RequiredForce}(N) = \text{ImposedAction}(N/m) * \text{WidthofthePanel}(m) \quad (2)$$

Note: Width used in the above equation was 1500 mm.

3.2.3 Results

Uniformly Distributed Load	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
350 N/m	525 N	702 mm	702 mm	0 mm
750 N/m	1125 N	702 mm	703 mm	1 mm

3.2.4 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1500}{60} = 25mm \quad (3)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Result	Pass/Fail
350 N/m (525 N)		
Deflection no more than 25 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
750 N/m (1125 N)		
Deflection no more than 25 mm after load is removed	1 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
Total Deflection	1 mm	Pass



Figure 5: Vertical Uniform Distributed Load

3.3 Uniformly Distributed Load - HORIZONTAL

3.3.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

3.3.2 Calculation

The required uniformly distributed load for the glass panel is the imposed action multiplied by the width of the product:

$$\text{RequiredForce}(N) = \text{ImposedAction}(N/m) * \text{WidthofthePanel}(m) \quad (4)$$

Note: Width used in the above equation was 1500 mm.

3.3.3 Results

Uniformly Distributed Load	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
350 N/m	525 N	436 mm	436 mm	0 mm
750 N/m	1125 N	436 mm	437 mm	1 mm
1500 N/m	2250 N	437 mm	437 mm	0 mm
3000 N/m	4500 N	N/A	N/A	N/A

3.3.4 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1500}{60} = 25mm \quad (5)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Result	Pass/Fail
350 N/m (525 N)		
Deflection no more than 25 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
750 N/m (1125 N)		
Deflection no more than 25 mm after load is removed	1 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
1500 N/m (2250 N)		
Deflection no more than 25 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
Notes: Nil		
3000 N/m (4500 N)		
Deflection no more than 25 mm after load is removed	N/A	Not Tested
Any damage, signs of breakage or fracture observed	N/A	Not Tested
Notes: Nil		
Total Deflection at 1500 N/m Rating	1 mm	Pass

3.3.5 Pictures



Figure 6: Horizontal Uniform Load - 750 N/m

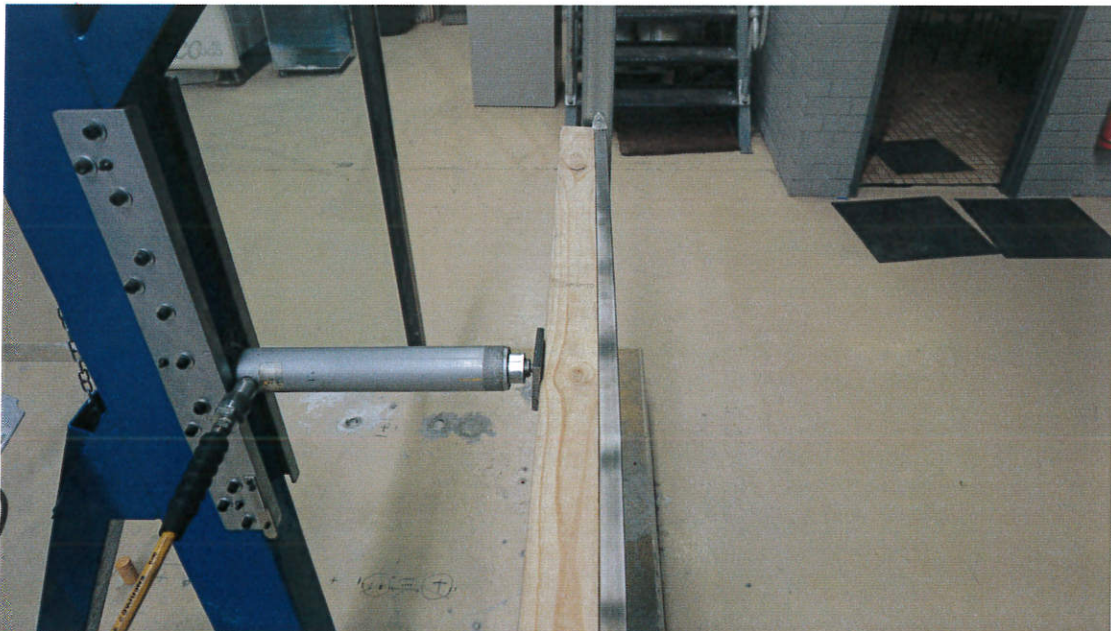


Figure 7: Horizontal Uniform Load - 1500 N/m

4 Conclusion and Signatories

4.1 Conclusion

From the results achieved the sample is deemed to satisfy the loading requirements as per table 3.3 of AS1170.1- 2002 for the following classification:

- for a Category 'A' Domestic and residential activities - All areas within or serving exclusively one dwelling including stairs, landings, etc. but excluding external balconies and edges of roofs;
- for a Category 'B, E' Offices and work areas not included elsewhere including storage areas - Areas not susceptible to overcrowding in office and institutional buildings also industrial and storage buildings
- for a Category 'C1/C2' Areas with tables or fixed seating - Areas with fixed seating adjacent to a balustrade, restaurants, bars, etc.
- for a Category 'D' Retail Areas - All retail areas including public areas of banks/building societies, (see C5 for areas where overcrowding may occur)
- for a Category 'F/G' Vehicular - Pedestrian areas in car parks including stairs, landings, ramps, edges of internal floors, foot-ways, edges of roofs

NOTE: All classifications with equal or lower load specifications may be applied to this sample. For more information as to their specific use please see table 3.3 of AS1170.1 - 2002.

NOTE 2: This usage (under B,E) is for access to and safe working places normally used by operating, inspection, maintenance and servicing personnel.

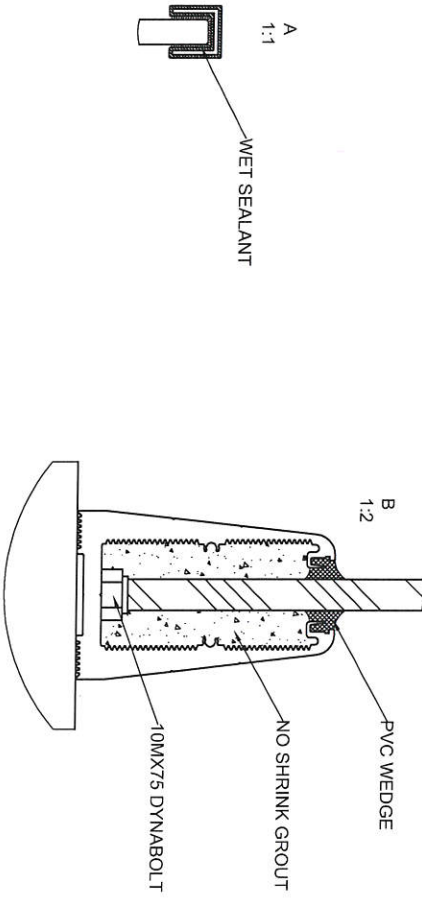
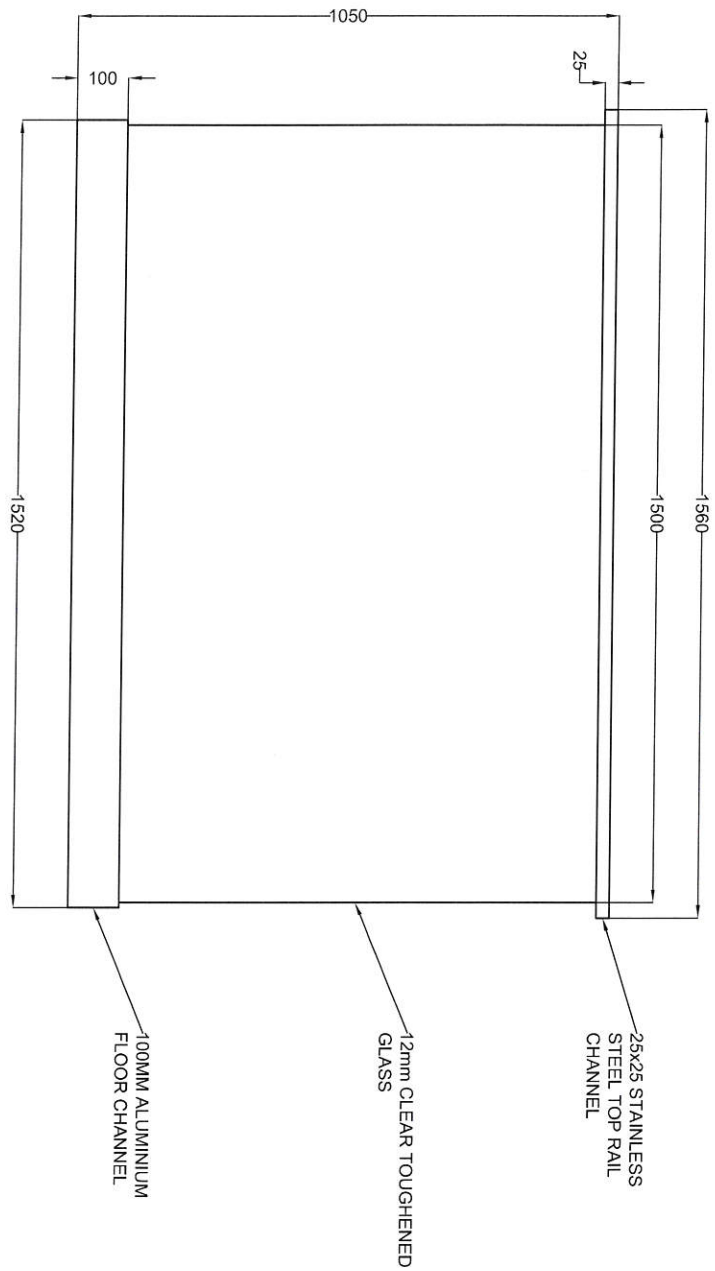
4.2 Signatories


Tested By: Ash Horne

Signatory Name: Ash Horne

Signatory Signature: Ash Horne

Date: 13/10/16




NATA Accredited Laboratory
 Number: 15147
 This laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its scope of accreditation. This document shall not be reproduced, except in full.

Checked by: AW

<input type="checkbox"/>	PRELIMINARY
<input type="checkbox"/>	FOR APPROVAL
<input type="checkbox"/>	FOR CONSTRUCTION
<input checked="" type="checkbox"/>	AS BUILT

GLASS TYPE

12MM CLEAR TOUGHENED

DETAIL

FRAMELESS BALUSTRADE WITH FLOOR CHANNEL AND STAINLESS STEEL SQUARE TOP RAIL

DRAFTSMAN

BARTOSZ MAZUR

LABORATORY

AZUMA DESIGN

PROJECT NAME
FRAMELESS BALUSTRADE TEST

CHECKED/DRAWN/DATE	
FORMAT	B.M. 30/01/2017
SCALE	1:10
DRAWING NO.	REV.
B-1	01





STANDARDSMARK LICENCE

SAI Global hereby grants:

Australia Landson Glass (Qingdao) Co ., Ltd

70-2#, Huanghe Xi Road, Qingdao Economic & Technology Development Zone, Qingdao, China

StandardsMark Licence

Manufactured to:

AS/NZS 2208:1996 - Safety glazing materials in buildings

"the StandardsMark Licensee" the right to use the STANDARDSMARK as shown below only in respect of the goods described and detailed in the Schedule which are produced by the Licensee or on behalf of the Licensee* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.

Certificate No:SMK40095

Issued: 27 September 2016

Originally Certified: 8 April 2013

Expires: 7 April 2018

Current Certification: 27 September 2016

Paul Simpson
Global Policy Risk and Certification Manager

	NATA Accredited Laboratory Number: 15147
	<small>This laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its scope of accreditation. This document shall not be reproduced, except in full.</small>
Checked by:	<i>AL</i>



* For details of manufacture, refer to the licensee

The STANDARDSMARK is a registered certification trademark of SAI Global Limited (A.C.N. 050 644 642) and is issued under licence by SAI Global Certification Services Pty Limited (ACN 108 716 669) ("SAI Global") 680 George Street, Sydney NSW 2000, GPO Box 5420 Sydney NSW 2001. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. Refer to www.saiglobal.com, for the list of product models.

