Product Technical Statement

PRODUCT NAME: MADRID DELUXE BALUSTRADE SYSTEM

ISSUE DATE: 29/08/2025

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PRODUCT NAME	MADRID DELUXE BALUSTRADE SYSTEM

This Product Technical Statement (PTS) outlines the product and system specifications, test reports, and compliance documentation required for standard installations. Applications outside the parameters defined herein may require further engineering assessment, which Glass Outlet can assist with if required.

When installing the product in accordance with the technical details provided Glass Outlet confirms that the system has been designed and tested to meet the current Building Code of Australia.

1. Product Description

Product Name	**Madrid Deluxe Balustrade System**
Product Group	Glass Balustrade
Description	Frameless Structural 15 mm Glass Balustrade System
Manufacturer / Supplier	Glass Outlet Pty Ltd
PTS Reference Number	PTS-002
Issue Date of PTS	29/08/2025
Expiry of PTS	30/06/2026

2. Statement of NCC Compliance

Statement	This statement has been prepared by Glass Outlet Pty Ltd based on the supporting compliance documentation provided herein, in accordance with the relevant Deemed-to-Satisfy provisions of the National Construction Code (NCC). Any alterations, modifications, or installations that do not align with the specifications detailed in this document fall outside the scope of this statement. Where such deviations occur, the product or system may no longer meet compliance requirements and could be classified as a non-conforming building product.

Compliance Scope	This product has been designed and tested to comply with the Deemed-to-Satisfy (DTS) provisions of the National Construction Code (NCC) 2022, Volume Two, when installed in accordance with the manufacturer's instructions and within the conditions and specifications set out in this document. Compliance is demonstrated against the following NCC provisions and referenced Australian Standards:	
	NCC Volume Two	Part H5P2 *Fall prevention barriers*, Part H5D3 *Barriers and handrails,* and Part 11.3 of the *ABCB Housing Provisions*
	AS/NZS 1170.0:2002	*Structural design actions – Part 0: General principles.*
	AS/NZS 1170.1:2002	*Structural design actions – Part 1: Permanent, Imposed and other actions. Section 3.6 – Barriers, A, C3*
	AS/NZS 1170.2:2021	Structural design actions – Part 2: Wind actions
	AS/NZS 4055:2012	Wind loads for housing, N3
	AS/NZS 1288:2021	*Glass in buildings – Selection and Installation, Section 7 - Barriers or Balustrades*
	AS/NZS 2208:1996	Safety glazing materials in buildings
	AS 1720.1:2010	Timber substrate connections
	AS 3600:2018	Concrete structures
	AS 4100:2020	Steel structures
	AS/NZS 4673:2001	Cold-formed stainless-steel structures
	AS/NZS 5216:2021	Design of post-installed and cast-in fastenings in concrete
Test Reports	**RB23-10558-01** **RB24-10821-01 Rev 1** **RB24-10959-01**	Structural Glass Barrier Load Test Report (Core drilled) Structural Glass Barrier Load Test Report (Base plated to timber) Structural Glass Barrier Load Test Report (Top Fix to steel beam)

	RB24-10959-02	Structural Glass Barrier Load Test Report (Base plated to concrete)
Engineering Drawings	**DRG NO: 25 – 05MADDEL12 - S01-S06 REV D**	Typical Madrid Deluxe Balustrade System
Other References	**J20518 – Madrid Deluxe Balustrade - Certification letter - 6 June 2025**	Signed structural certification letter for a standard balustrade design (Madrid Deluxe Standard System), issued by a registered practising structural engineer, confirming compliance with the relevant provisions of the NCC.

3. Application and Intended Use

Certified Product Type	**Glass Barrier**
Intended Use	The Madrid Deluxe Frameless Glass Balustrade System is designed as a permanent safety barrier to prevent falls from elevated platforms, raised floor levels, balconies, decks, stair landings, or the like in residential buildings where the fall height exceeds 1 meter as defined by the NCC.
Installation Conditions (Wind Region, Terrain etc)	• Designed to be used as a “C3” and “A” classification barrier in accordance with AS 1170.1:2002, Section 3.6, Table 3.3. • Only for installation in Wind Regions A, B and C and not rated for more than wind classification N3 or C1, as defined in AS 4055:2012. Refer to DRG NO: 24 - 11MADDEL15 - S01-S06 REV C (attached to the PTS) for the maximum specifications permitted under these parameters for wind region, terrain category, and installation heights (measured from natural ground level to the top of the handrail when installed), depending on the substrate and fixing details as shown in the drawing and the conditions set within it.
Specification Drawing	DRG NO: 24 - 11MADDEL15 - S01-S06 REV C: Detailed engineering drawings and installation schematics illustrating dimensions, fixing methods, glass thickness, spigot locations, and the specified conditions under which the Madrid Deluxe Frameless Glass Balustrade System may be installed.

4. Product Schedule

The following table outlines the specific components, materials, and configurations included within the scope of this (PTS). All listed items have been assessed in accordance with the supporting documentation referenced in this statement. Use of alternative components not listed may fall outside the certified scope and require further assessment.

Item No.	Part Number	Component Description
1	MADDEL-S (B/MW/P/S)	MADRID DELUXE – Core Drill Spigot (Black / White / Polish / Satin)
2	MADDEL-SBP (B/MW/P/S)	MADRID DELUXE – Base Plate Spigot (Black / White / Polish / Satin)
3	MADDEL-TF (B/MW/P/S)	MADRID DELUXE – Top Fix Spigot (Black / White / Polish / Satin)
4	Glass	For fall protections height of less than 5 m, 15 mm thick (min) grade A toughened monolithic safety glass with a minimum surface compression of 69 MPa. Maximum span of 1.4 m. For fall protections height of greater than 5 m, 16 mm thick (min) grade A toughened laminated safety glass with a minimum surface compression of 69 MPa. Maximum span of 1.4 m.
5	Nanorail Handrail Components	25 × 21 × 1.2 mm “NANORAIL” continuous interlinking stainless steel handrail, to be fitted over glass up to 15 mm thick with adjoining seal and installed using the corresponding connections and joiners. Stock codes are available at Glass Outlet, starting with the STG- prefix. Refer to DRG NO: 24 - 11MADDEL15 - S01-S06 REV C for configurations.
6	35 Series Handrail Components	35 × 35 mm “35 SERIES” continuous interlinking 6061 T6 aluminium handrail, to be fitted to the top of 15 mm minimum glass with adjoining seal and installed using the corresponding connections and joiners. Stock codes are available at Glass Outlet, starting with the SER35- prefix. Refer to DRG NO: 24 - 11MADDEL15 - S01-S06 REV C for configurations.

Note: All components must be installed as per the required specifications within this PTS

5. Limitations of Use

Limitations on the use of the product relevant to its certification (Wind Regions, Terrain, Height etc)	• Applicable only to C3 occupancy load classifications with equal or lower load specifications. For further guidance, see Table 3.3 of AS/NZS 1170.1:2002. Not suitable for C1, C2, or C5 occupancy loads (AS 1170.1:2002). • Not suitable for installation in Wind Regions D (AS/NZS 4055:2012). • Not suitable for wind classifications above N3 or C1 (AS/NZS 4055:2012). • The maximum installation height for each configuration is as specified in the DRG NO: 24 - 11MADDEL15 - S01-S06 REV C, up to a maximum of 10 m. Must be used only according to the specifications within this document. • Must be used only according to the specifications within this document. • Glass thickness and type must comply with AS 1288:2021 Deemed-To-Satisfy limits. • Installation must follow drawing specifications (Engineering documentation DRG NO: 24 - 11MADDEL15 - S01-S06 REV C). • Not suitable for use as a pool barrier (AS 1926.1:2024).

6. Conditions of Use

Conditions on the use of the product relevant to its certification.	• The system must be applied only to C3 and classifications with equal or lower load specifications, in accordance with Table 3.3 of AS/NZS 1170.1:2002. • Installations must be carried out only in Wind Regions A, B or C (AS/NZS 4055:2012). • The system must be installed for wind classifications up to and including N3 or C1, as defined in AS/NZS 4055:2012. • The maximum installation height for each configuration is as specified in DRG NO: 24 - 11MADDEL15 - S01-S06 REV C, up to a maximum of 10 m. • All installations must strictly follow the specifications and procedures outlined within the PTS document. • Glass used in the system must comply with AS 1288:2021 Deemed-To-Satisfy limits, for the specific installation (e.g., 15 mm monolithic toughened or 16 mm min laminated toughened). • Installation must follow drawing specifications (Engineering documentation DRG NO: 24 - 11MADDEL15 - S01-S06 REV C). • Should not be installed as a pool barrier AS 1926.1:2024 • The balustrade barrier must be inspected periodically to ensure its integrity and that it remains free from defects, damage, or deterioration that could compromise performance.

7. Instructions for Design, Construction or Installations

Instruction for the installation of the product relevant to its certification.	• Installation must be carried out only by trained and qualified personnel familiar with frameless glass balustrade systems. • Ensure substrate and fixing points comply with engineering documentation (24 - 11MADDEL15 - S01-S06 REV C). • Ensure installation adheres to all relevant limitations and conditions of use, as set out in the PTS document. • Follow specifications in DRG NO24 - 11MADDEL15 - S01-S06 REV C for fixing positions, glass panel placement, sealing, and finishing methods. • Ensure glass panels are properly supported and securely fixed using the supplied spigots. • Verify alignment, spacing, and panel openings comply with NCC limits. • Inspect all components prior to and during installation for defects or damage and remove any items that could compromise the barrier. • Ensure all fixings and spigots are secure and correctly positioned. • Confirm the system is installed strictly according to DRG NO: 24 - 11MADDEL15 - S01-S06 REV C • Conduct a final inspection to verify compliance with design, structural, and safety requirements. • Ensure all glass panels are intact, aligned, and free from defects.

8. Maintenance Instructions

Instruction for the Maintenance of the product relevant to its certification.	• Conduct regular visual inspections to check for damage, loose fixings, or compromised glass integrity. • Clean glass surfaces using non-abrasive cleaners; avoid harsh chemicals that could damage sealants or fixings. • Tighten any loose fixings using the recommended tools and procedures. • Replace damaged or chipped glass immediately, following the manufacturer's replacement guidelines. • Ensure drainage and weep holes remain clear to prevent water buildup and corrosion. • Report any issues or concerns to a qualified professional for assessment and corrective action.

9. Support and Contact Details

Company Name	**Glass Outlet Pty Ltd**
Business Phone Number	07 3267 7968
Email Address	cert@glassoutlet.com.au
Postal Address	PO Box 415 Banyo, QLD, 4014

Other Information

Confidentiality
Information provided is confidential and is intended only for the recipient and should only be shared with the Building Certifier.

What is the purpose of this form?
This form may be used in accordance with Part A5 of the Building Code of Australia (BCA) to:

(a) demonstrate that a material, product, or form of construction fulfils the specific requirements of the Building Code of Australia; and
(b) sets out the basis on which it is given and the extent to which relevant standards, specifications, rules, codes of practice or other publications have been relied upon to demonstrate it fulfils specific requirements of the BCA.

Product Technical Statement means a form of documentary evidence stating that the properties and performance of a building material, product or form of construction fulfil specific requirements of the NCC, and describes:

(a) the application and intended use of the building material, product, or form of construction: and
(b) how the use of the building material, product or form of construction complies with the requirements of the NCC Volume One and NCC Volume Two; and
(c) any limitations and conditions of the use of the building material, product, or form of construction relevant to (b).

Clive Steele Partners Pty. Ltd.
Consulting Structural & Civil Engineers

Telephone: (03) 9545 0223
Email: csp@clivesteele.com.au
Building 6, 62/195 Wellington Road Clayton, VIC 3168

IKF: CV 20518

18 November 2024

Glass Outlet
Building 9, 153 St Vincents Road,
Virginia, QLD 4014

RE: STANDARD BALUSTRADE DESIGN
MADRID DELUXE SYSTEM

This letter is to advise you that the structural design for the standard balustrade listed below was carried out under the direct supervision of the undersigned in accordance with the following:

Design Codes and Standards
NCC 2022 – Volume 1, Part B1 and Volume 2, Part H1
AS/NZS 1170.0:2002, AS/NZS 1170.1:2002, AS/NZS1170.2:2021, AS1288:2021, AS/NZS 2208:1996, AS1720.1:2010, AS 3600:2018, AS4100:2020, AS/NZS 4673:2001, AS5216:2021.

Design Documents
Drawing – Nos. 24-11MADDEL15-S01/C, S02/C, S03/C, S04/C, S05/C and S06/C.
Prepared by Glass Outlet Pty Ltd dated 18 November 2024.

Computations – Job No. 20518 - pages D-1 to D-9, E-1 to E-8 and F-1 to F-9 Incl.
Prepared by Clive Steele Partners Pty Ltd. dated 17 April 2024.

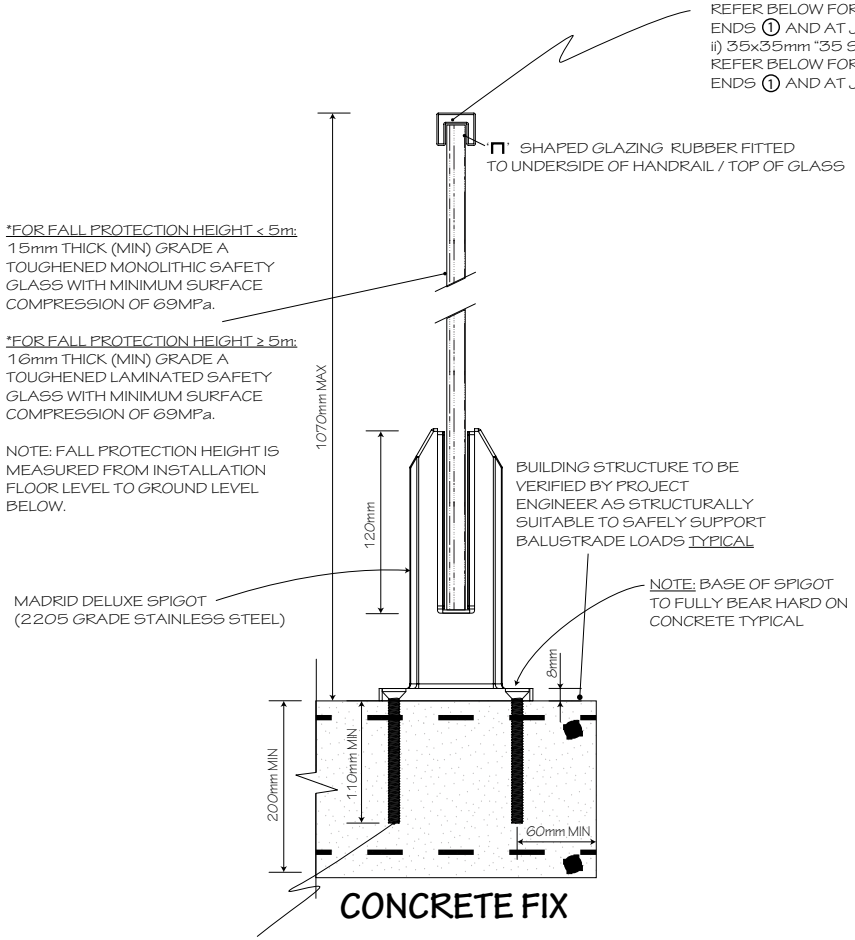
Note that the existing structure is to be verified by the project engineer as structurally sufficient to safely support the balustrade loads in each installation.

Yours faithfully,
CLIVE STEELE PARTNERS PTY. LTD.

I. K. FLANDERS, F.I.E. Aust.
Endorsed Building Engineer registration number (Vic): PE0001492
Registered Building Practitioner (NT) No. 103133ES
Registered Professional Engineer (Qld) No. 06076
Registered Building Services Provider (Tas) No. 508467305

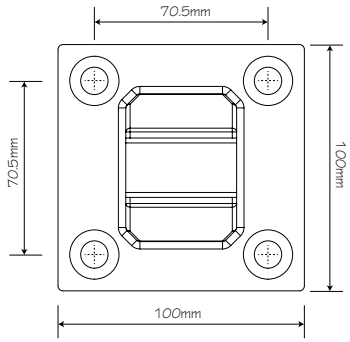
WIND REGION	TERRAIN CATEGORY	INSTALLATION HEIGHT
A	1	< 10m
	2	< 10m
	3	< 10m
B1	1	< 3m
	2	< 5m
	3	< 10m
B2	1	NOT SUITABLE FOR INSTALLATION
	2	< 5m
	3	< 10m
C	NOT SUITABLE FOR INSTALLATION IN WIND REGION C	

NOTE: INSTALLATION HEIGHT IS MEASURED FROM NATURAL GROUND LEVEL TO TOP OF HANDRAIL HEIGHT WHEN INSTALLED

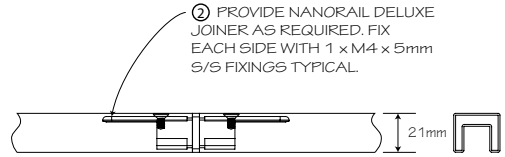


CONCRETE FIX

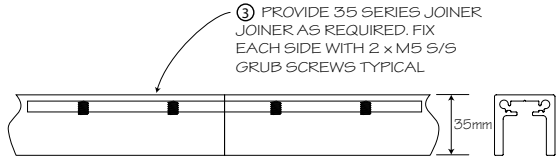
MADRID DELUXE BASEPLATE
N.T.S



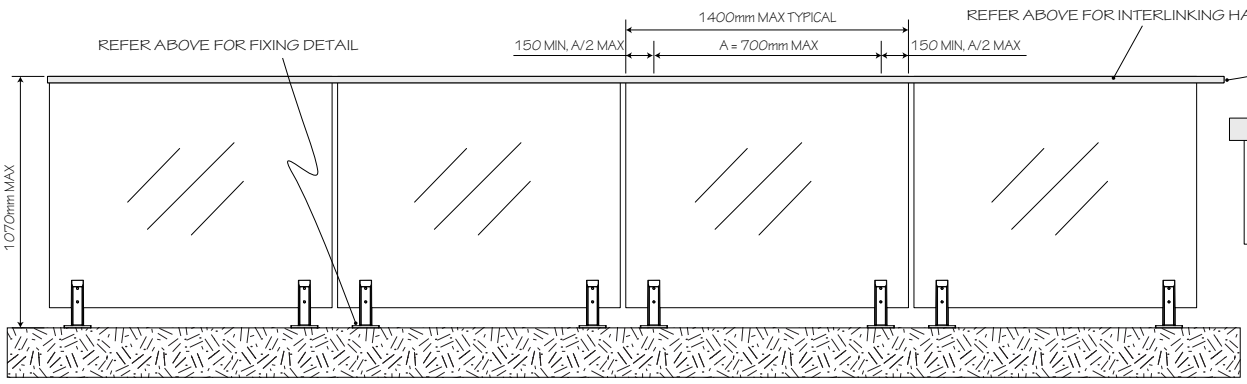
BASE DETAIL



DELUXE NANORAIL HANDRAIL JOINER DETAIL

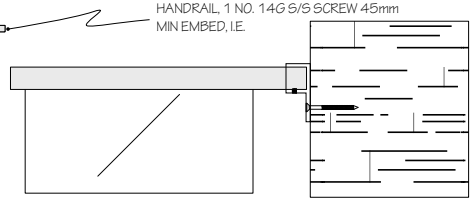


35 SERIES HANDRAIL JOINER DETAIL



TYPICAL MADRID DELUXE BASEPLATE ELEVATION
N.T.S

① HANDRAIL TO RETURN AT CORNERS OR FIX HANDRAIL TO STRUCTURE AT EACH END WITH NANORAIL DELUXE/35 SERIES END BRACKET, 1 NO. 10G GRUB SCREW TO HANDRAIL, 1 NO. 14G S/S SCREW 45mm MIN EMBED, I.E.



NOTE: TOP OF HANDRAIL TO BE 1000mm MIN FROM FFL

NOTE: U.N.O. ALL ALUMINIUM TO BE GRADE 6106-T6. U.N.O. ALL FIXINGS TO BE A4/316 STAINLESS STEEL

NOTE: ALL GLAZING TO BE IN ACCORDANCE WITH AS1288 AND AS/NZS2208. GLAZING PANELS TO BE BLOCKED AND SET INTO FRAME IN ACCORDANCE WITH AS1288 TO ENSURE GLASS CANNOT DISLODGE.

NOTE: THE INSTALLER IS RESPONSIBLE TO MAINTAIN THE INTEGRITY OF WATERPROOFING.

DESIGNED IN ACCORDANCE WITH NCC2022
DESIGNED FOR "C3" and "A" CLASSIFICATION BARRIER IN ACCORDANCE WITH AS1170.1
DESIGNED FOR WIND IN ACCORDANCE WITH AS1170.2 (REFER TABLE).
LOCAL PRESSURE FACTOR K_L = 1.5
TOPOGRAPHICAL MULTIPLIER = 1.0
PROJECT ENGINEER TO CONFIRM FOR JOB SPECIFIC CONDITIONS.

glass outlet

TYPICAL MADRID DELUXE BALUSTRADE SYSTEM

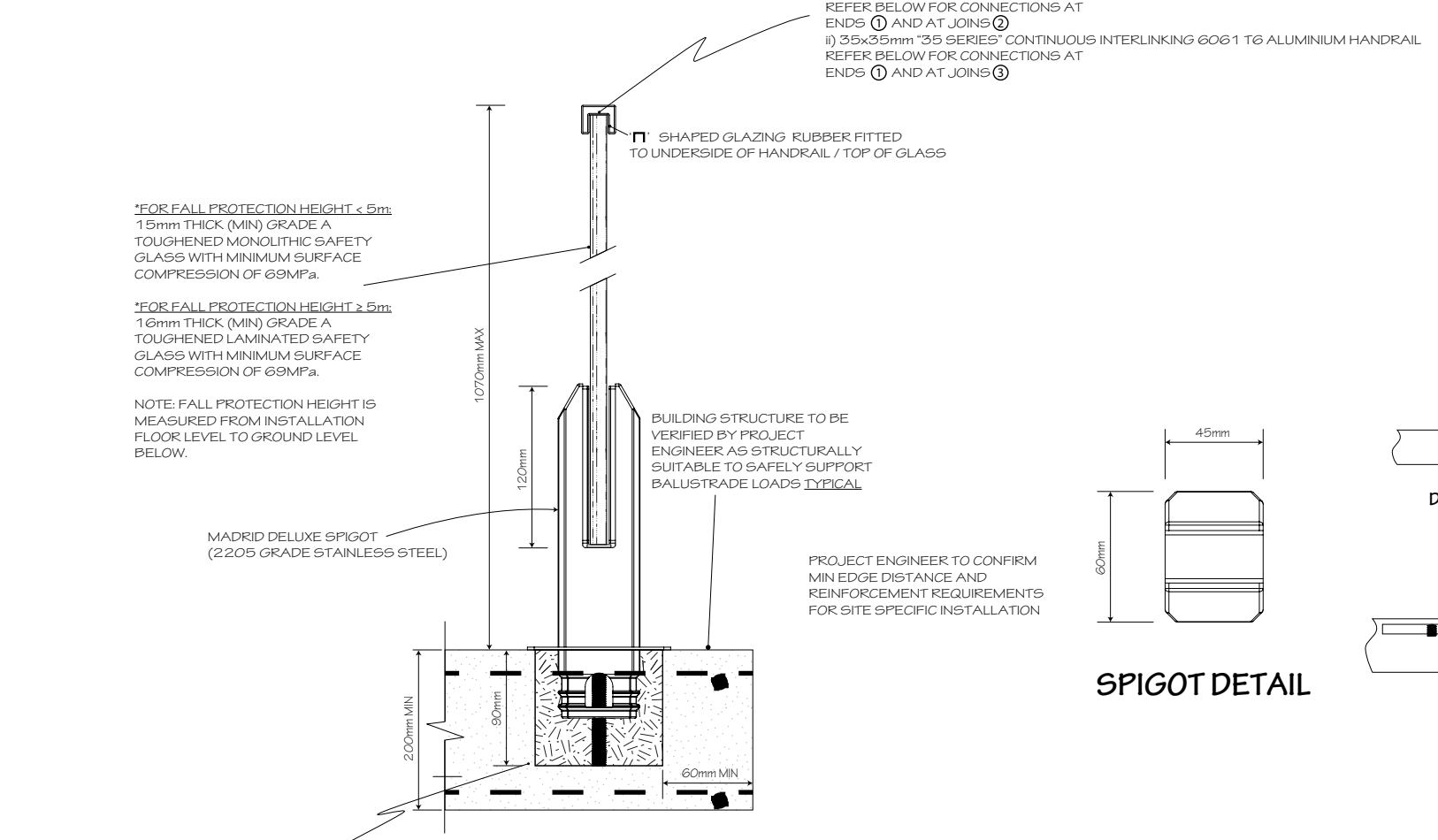
ANCHOR FIX TO CONCRETE

DATE: 18/11/2024

DRG NO: 24 - 11MADDEL15 - S01 | REV. C

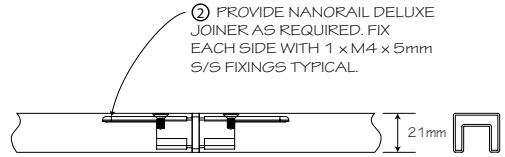
WIND REGION	TERRAIN CATEGORY	INSTALLATION HEIGHT
A	1	< 10m
	2	< 10m
	3	< 10m
B1	1	< 3m
	2	< 5m
	3	< 10m
B2	1	NOT SUITABLE FOR INSTALLATION
	2	< 5m
	3	< 10m
C	NOT SUITABLE FOR INSTALLATION IN WIND REGION C	

NOTE: INSTALLATION HEIGHT IS MEASURED FROM NATURAL GROUND LEVEL TO TOP OF HANDRAIL HEIGHT WHEN INSTALLED

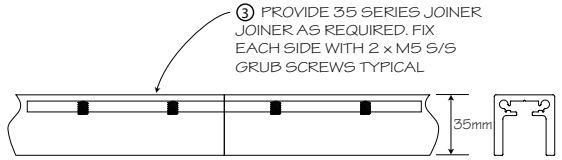


MADRID DELUXE CORE DRILL
N.T.S

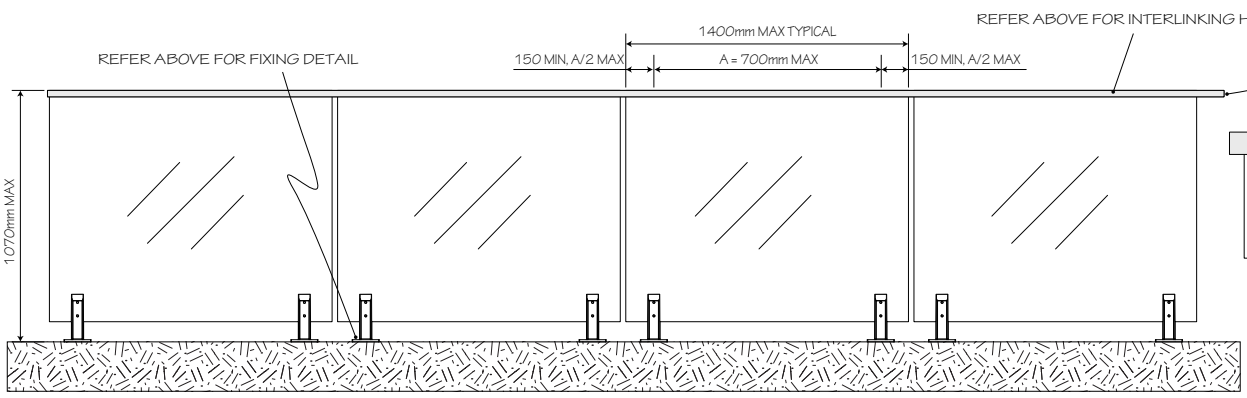
SPIGOT DETAIL



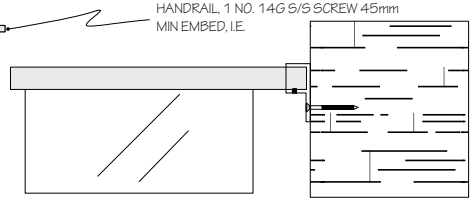
DELUXE NANORAIL HANDRAIL JOINER DETAIL



35 SERIES HANDRAIL JOINER DETAIL



TYPICAL MADRID DELUXE CORE DRILL ELEVATION
N.T.S



NOTE: TOP OF HANDRAIL TO BE 1000mm MIN FROM FFL

NOTE: U.N.O. ALL ALUMINIUM TO BE GRADE 6106-T6. U.N.O. ALL FIXINGS TO BE A4/316 STAINLESS STEEL

NOTE: ALL GLAZING TO BE IN ACCORDANCE WITH AS1288 AND AS/NZS2208. GLAZING PANELS TO BE BLOCKED AND SET INTO FRAME IN ACCORDANCE WITH AS1288 TO ENSURE GLASS CANNOT DISLODGE.

NOTE: THE INSTALLER IS RESPONSIBLE TO MAINTAIN THE INTEGRITY OF WATERPROOFING.

DESIGNED IN ACCORDANCE WITH NCC2022
DESIGNED FOR "C3" and "A" CLASSIFICATION BARRIER IN ACCORDANCE WITH AS1170.1
DESIGNED FOR WIND IN ACCORDANCE WITH AS1170.2 (REFER TABLE).
LOCAL PRESSURE FACTOR K_L = 1.5
TOPOGRAPHICAL MULTIPLIER = 1.0
PROJECT ENGINEER TO CONFIRM FOR JOB SPECIFIC CONDITIONS.

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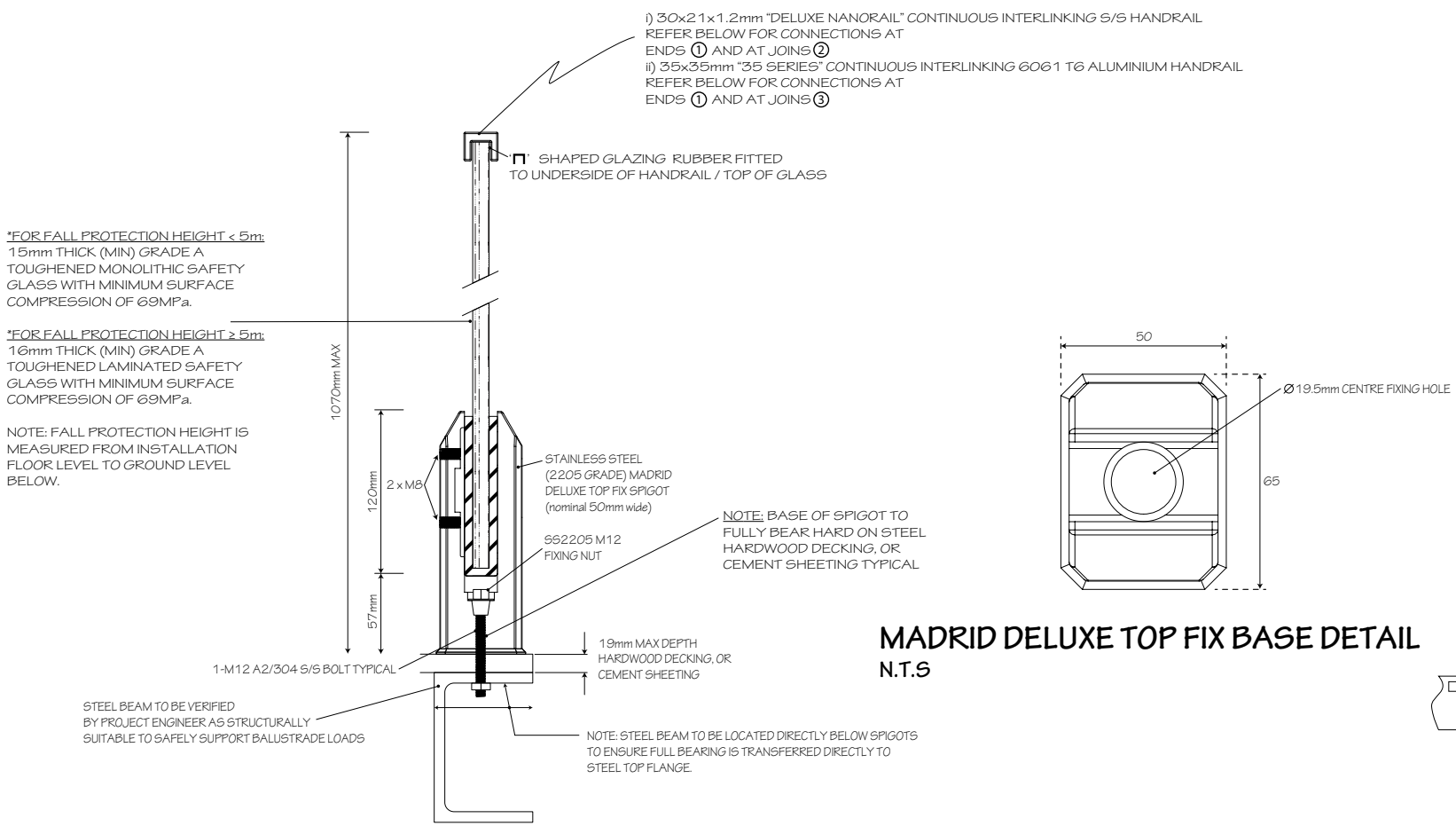
TYPICAL MADRID DELUXE BALUSTRADE SYSTEM

CORE DRILL INTO CONCRETE

DATE: 18/11/2024 | DRG NO: 24 - 11MADDEL15 - S02 | REV. C

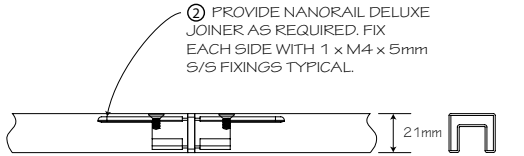
WIND REGION	TERRAIN CATEGORY	INSTALLATION HEIGHT
A	1	< 10m
	2	< 10m
	3	< 10m
B1	1	< 3m
	2	< 5m
	3	< 10m
B2	1	< 3m
	2	< 5m
	3	< 10m
C	1	NOT SUITABLE FOR INSTALLATION
	2	NOT SUITABLE FOR INSTALLATION
	3	< 10m

NOTE: INSTALLATION HEIGHT IS MEASURED FROM NATURAL GROUND LEVEL TO TOP OF HANDRAIL HEIGHT WHEN INSTALLED

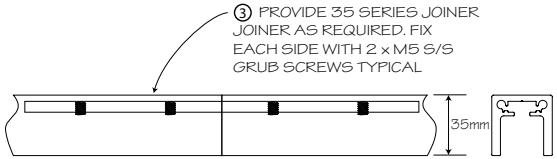


MADRID DELUXE TOP FIX TO STEEL
N.T.S

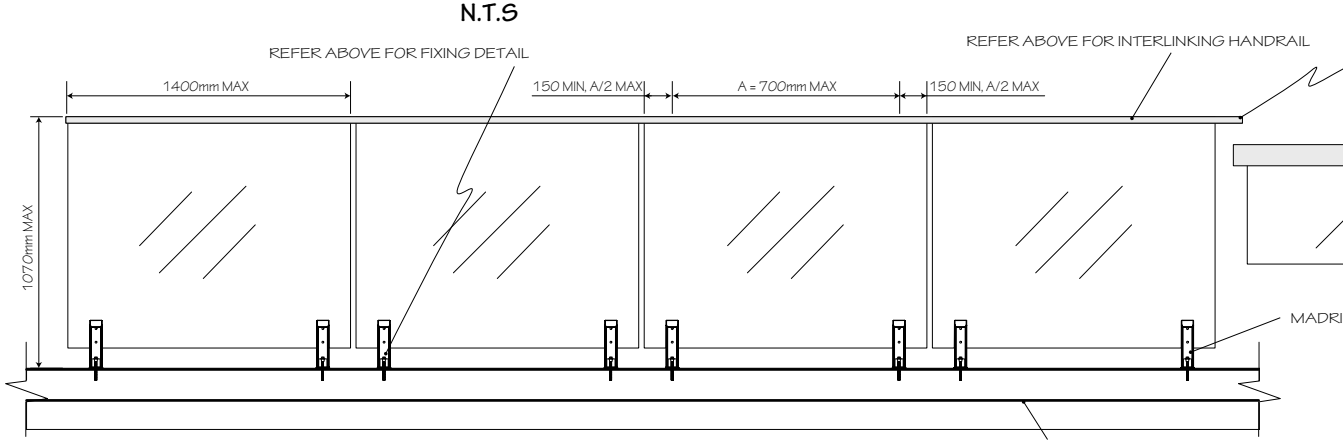
MADRID DELUXE TOP FIX BASE DETAIL
N.T.S



DELUXE NANORAIL HANDRAIL JOINER DETAIL



35 SERIES HANDRAIL JOINER DETAIL



TYPICAL 'MADRID DELUXE TOP FIX' ELEVATION
N.T.S

NOTE: TOP OF HANDRAIL TO BE 1000mm MIN FROM FFL

NOTE: U.N.O. ALL ALUMINIUM TO BE GRADE 6106-T6. U.N.O. ALL FIXINGS TO BE A4/316 STAINLESS STEEL

NOTE: ALL GLAZING TO BE IN ACCORDANCE WITH AS1288 AND AS/NZS2208. GLAZING PANELS TO BE BLOCKED AND SET INTO FRAME IN ACCORDANCE WITH AS1288 TO ENSURE GLASS CANNOT DISLODGE.

NOTE: THE INSTALLER IS RESPONSIBLE TO MAINTAIN THE INTEGRITY OF WATERPROOFING.

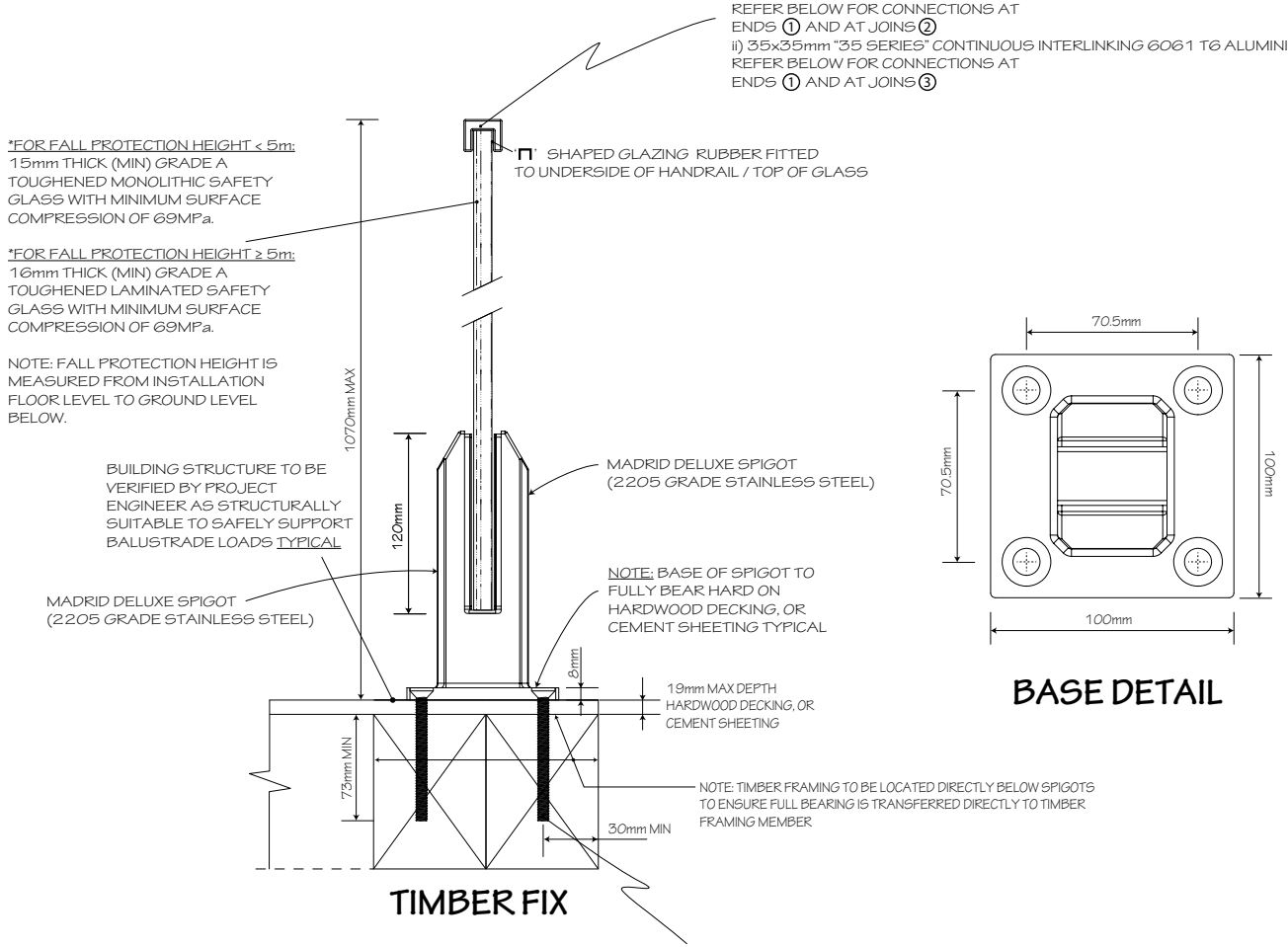
DESIGNED IN ACCORDANCE WITH NCC2022
DESIGNED FOR "C3" and "A" CLASSIFICATION BARRIER IN ACCORDANCE WITH AS1170.1
DESIGNED FOR WIND IN ACCORDANCE WITH AS1170.2 (REFER TABLE).
LOCAL PRESSURE FACTOR K_L = 1.5
TOPOGRAPHICAL MULTIPLIER = 1.0
PROJECT ENGINEER TO CONFIRM FOR JOB SPECIFIC CONDITIONS.

glass outlet

TYPICAL MADRID DELUXE BALUSTRADE SYSTEM

SINGLE ANCHOR TOP FIX

DATE: 18/11/2024 | DRG NO: 24 - 11MADDEL15 - S03 | REV. C



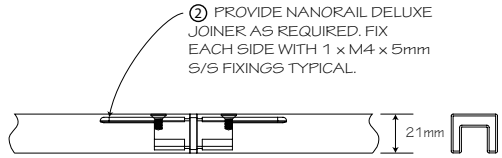
TIMBER FIX

MADRID DELUXE BASEPLATE
N.T.S

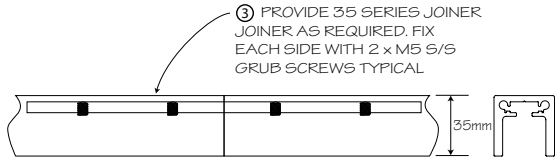
BASE DETAIL

WIND REGION	TERRAIN CATEGORY	INSTALLATION HEIGHT
A	1	< 10m
	2	< 10m
	3	< 10m
B1	1	< 3m
	2	< 5m
	3	< 10m
B2	1	NOT SUITABLE FOR INSTALLATION
	2	< 5m
	3	< 10m
C	NOT SUITABLE FOR INSTALLATION IN WIND REGION C	

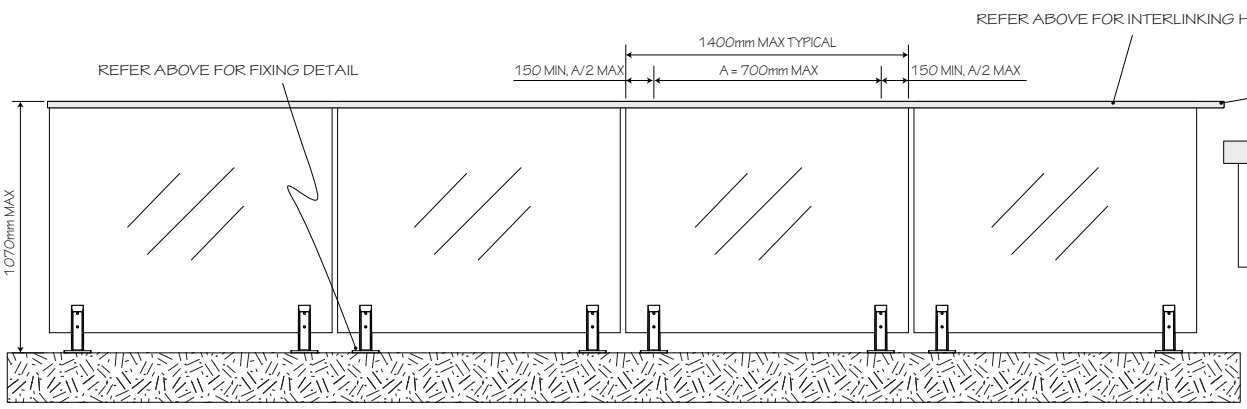
NOTE: INSTALLATION HEIGHT IS MEASURED FROM NATURAL GROUND LEVEL TO TOP OF HANDRAIL HEIGHT WHEN INSTALLED



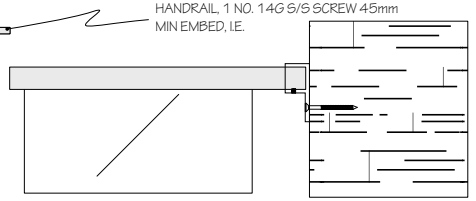
DELUXE NANORAIL HANDRAIL JOINER DETAIL



35 SERIES HANDRAIL JOINER DETAIL



TYPICAL MADRID DELUXE BASEPLATE ELEVATION
N.T.S



NOTE: TOP OF HANDRAIL TO BE 1000mm MIN FROM FFL

NOTE: U.N.O. ALL ALUMINIUM TO BE GRADE 6106-T6. U.N.O. ALL FIXINGS TO BE A4/316 STAINLESS STEEL

NOTE: ALL GLAZING TO BE IN ACCORDANCE WITH AS1288 AND AS/NZS2208. GLAZING PANELS TO BE BLOCKED AND SET INTO FRAME IN ACCORDANCE WITH AS1288 TO ENSURE GLASS CANNOT DISLODGE.

NOTE: THE INSTALLER IS RESPONSIBLE TO MAINTAIN THE INTEGRITY OF WATERPROOFING.

DESIGNED IN ACCORDANCE WITH NCC2022
DESIGNED FOR "C3" and "A" CLASSIFICATION BARRIER IN ACCORDANCE WITH AS1170.1
DESIGNED FOR WIND IN ACCORDANCE WITH AS1170.2 (REFER TABLE).
LOCAL PRESSURE FACTOR K_L = 1.5
TOPOGRAPHICAL MULTIPLIER = 1.0
PROJECT ENGINEER TO CONFIRM FOR JOB SPECIFIC CONDITIONS.

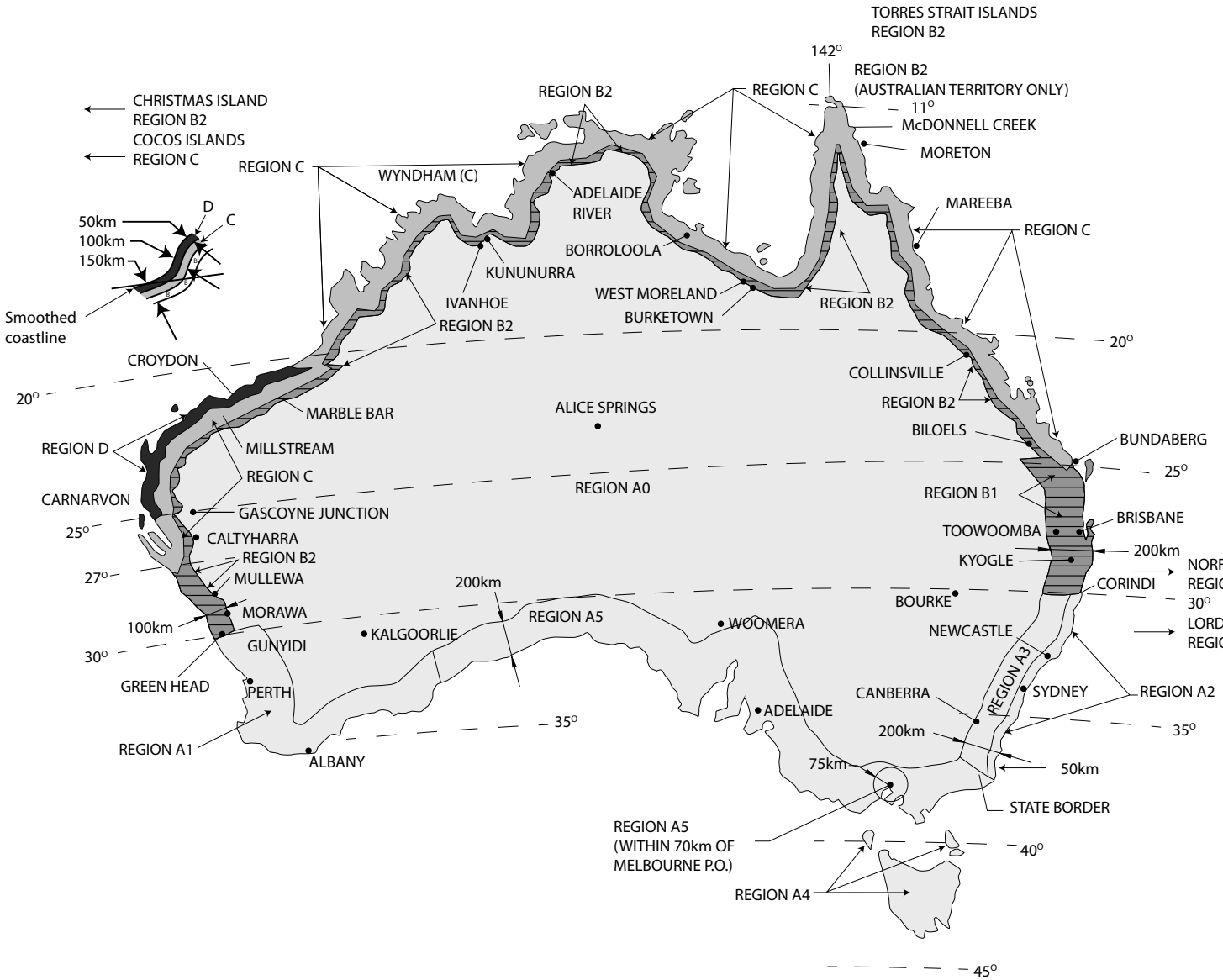
glass outlet

TYPICAL MADRID DELUXE BALUSTRADE SYSTEM

ANCHOR FIX TO TIMBER

DATE: 18/11/2024

DRG NO: 24 - 11MADDEL15 - S04 | REV. C



Regions are marked with the letters A (A0 to A5), B (B1 & B2), C and D. Coastal Region boundaries are smooth lines set in from a smoothed coastline by 50, 100 and 200km. Islands within 50km from the coast are the same Region as the adjacent coast.

AS/NZS 1170.2:2021

Structural Design Actions

Part 2: Wind actions

4.2.1 **Terrain Category Definitions**

Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions:

(a) Terrain Category 1 (TC1) - Very exposed open terrain with very few or no obstructions, and all water surfaces (e.g. flat, treeless, poorly grassed plains; open ocean, rivers, canals, bays and lakes).

(b) Terrain Category 2 (TC2) - Open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5m to 5m, with no more than two obstructions per hectare (e.g. farmland and cleared subdivisions with isolated trees and uncut grass).

(c) Terrain Category 2.5 (TC2.5) - Terrain with some trees or isolated obstructions, terrain in developing outer urban areas with scattered houses, or large acreage developments with more than two and less than 10 buildings per hectare.

(d) Terrain Category 3 (TC3) - Terrain with numerous closely spaced obstructions having heights generally from 3m to 10m. The minimum density of obstructions shall be at least the equivalent of 10 house-size obstructions per hectare (e.g. suburban housing, light industrial estates or dense forests).

(e) Terrain Category 4 (TC4) - Terrain with numerous large, high (10m to 30m tall) and closely-spaced constructions, such as large city centres and well-developed industrial complexes.

Selection of the terrain category shall be made with due regard to the permanence of the obstructions that constitute the surface roughness.

glass outlet	WIND REGION AND TERRAIN CATEGORIES	
DATE: 18/11/2024	DRG NO: 24 - 11MADDEL15 - S05	REV. C

Table 2.2 - Site wind classification from wind region and site conditions

Wind Region	TC	Topographic Classification												
		T0	T0	T0	T1	T1	T1	T2	T2	T2	T3	T3	T4	T5
		FS	PS	NS	FS	PS	NS	FS	PS	NS	PS	NS	NS	NS
A	3	N1	N1	N1	N1	N2	N2	N2	N2	N2	N3	N3	N3	N4
	2.5	N1	N1	N2	N1	N2	N2	N2	N3	N3	N3	N3	N4	N4
	2	N1	N2	N2	N2	N2	N3	N2	N3	N3	N3	N3	N4	N4
	1	N2	N2	N3	N2	N3	N3	N3	N3	N3	N4	N4	N4	N5
B	3	N2	N2	N3	N2	N3	N3	N3	N3	N4	N4	N4	N4	N5
	2.5	N2	N3	N3	N3	N3	N3	N3	N4	N4	N4	N4	N5	N5
	2	N2	N3	N3	N3	N3	N4	N3	N4	N4	N4	N5	N5	N6
	1	N3	N3	N4	N3	N4	N4	N4	N4	N5	N5	N5	N6	N6

Key
FS = Full Shielding
PS = Partial Shielding
NS = No Shielding

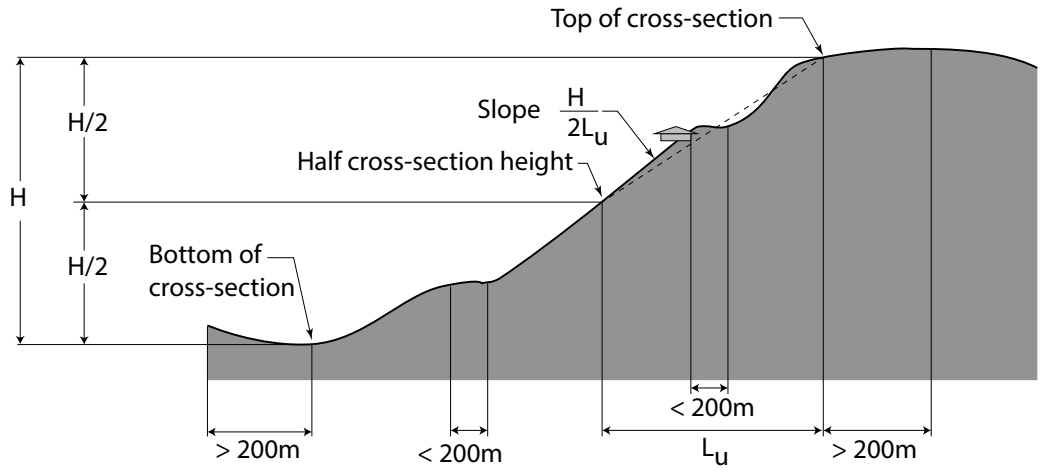


Figure 2.4 (A) - Topographic zones for top and bottom of slope

Table 2.4 - Topographic classification for hills, ridges or escarpments

Maximum slope		Site location, see Figure 2.4 (A)				
		Lower-third zone	Mid-third zone	Top-third zone (T)		
($ø_a$)		(L)	(M)	H ≤10m	10m < H ≤ 30m	H > 30m
< 1:20 (<2.9°)		T0	T0	T0	T0	T0
≥1:20 (≥2.9°)	<1:10 (<5.7°)	T0	T0	T1	T1	T1
≥1:10 (≥5.7°)	<1:7.5 (<7.6°)	T0	T1	T1	T2	T2
≥1:7.5 (≥7.6°)	<1:5 (<11.3°)	T0	T1	T2	T2	T3
≥1:5 (≥11.3°)	<1:3 (<18.4°)	T0	T2	T2	T3	T4
≥1:3 (≥18.4°)		T0	T2	T3	T4	T5

glass outlet	WIND AND TOPOGRAPHIC CLASSIFICATION	
DATE: 18/11/2024	DRG NO: 24 - 11MADDEL15 - S06	REV. C

STRUCTURAL GLASS BARRIER LOAD TEST REPORT

Customer[1]	**Glass Outlet BNE Pty Ltd**
Customer Address[1]	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Requested By[1]	Luke Keong
Purchase Order[1]	–
Issuing Laboratory	MechTest - Brisbane Laboratory
Report Number	RB23-10558-01
Job Description[1]	Load testing of structural glass barrier system with Madrid DELUXE Core drilled spigots and DELUXE NanoRail, record load and deflection up to failure
Identification	SB23-10558-01 & 02
Test Specification[1]	Client Requirements – Apply a horizontal point load laterally against the mid-span of the handrail till failure
Test Results	Information only

Note 1: Information supplied by Client. This information may affect the validity of the result.

Accredited for compliance with ISO/IEC 17025 - Testing.

Accreditation Number 20414

Accreditation No. 20414

Form ID: AMTS-06-06-01 (R1)

Authorised Signatory

Nikita Eshchenko

18 December 2023

Advanced Materials Testing Services Pty Ltd
Building 3 / 627 Boundary Road, Archerfield, QLD 4108
Trading as MechTest
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💻 www.mechtest.com.au

TEST RESULTS

Test Method	AMTS-04-06-01 & Client Requirements: – Label each sample with a unique sample number. – Position the load cell at the mid-span of the handrail, so that the load is applied horizontally and perpendicular to the length of the handrail. – Position the gauge length so that it is axially inline with the load direction. – Gradually apply a load to the sample till failure occurs. – Record peak load, deflection and failure mode. – Inspect the Madrid DELUXE Core drilled spigots for deformation after the load is released.
Test Technician	Nikita Eshchenko
Job Location	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Test Date	15 December 2023
Loading Device	T00104 – Screw actuated load applicator
Measuring Device	T00098 – 100 mm Length gauge T00097 – Dewesoft DAQ system T00077 – Tape measure T00094 – 20kN load cell, load cell platen – 100 mm Ø
Specimen Details	Refer to Table 1.

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Table 1: Specimen details for SB23-10558-01 & 02.

Type of Component	Structural glass barrier – MADRID DELUXE spigots
Manufacturer ID	MADDEL-S / 15mm Clear TGH / STG-R5800-DELUXE
Dimensions	Spigots: 45 mm x 60 mm x 245 mm (H) Glass panel: 1000 mm (H) x 1300 mm (W) Handrail: 21 mm (H) x 30 mm (W) x 1.4 mm
Item Material (if known)	Spigots: Stainless Steel 2205 Glass panel: 15mm Grade A Toughened and Heat-soaked safety glass Handrail: Stainless Steel 316L
Other Details	Spigot fixing (Code: GROUT-SIKA): Cast into concrete using non-shrink grout

Table 2: Test results – Load and deflection result for samples SB23-10558-01 & 02.

Item	Peak Load (F_{max}) [kN]	Deflection at F_{max} [mm]	Deflection at 1 kN [mm]	Comments
01	3.41	98.92 *	24.19	Glass panel failed and shattered.
02	3.39	99.45 *	25.00	Glass panel failed and shattered.
Average	3.40	99.19 *	24.60	–

Notes: Information only.
(*) The travel range of the length gauge was exceeded during the ultimate test for sample items SB23-10558-01 and 02.

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FIGURES

Figure 1: View of typical test items 01 and 02.

Figure 2: View of typical test arrangement for sample items 01 & 02.

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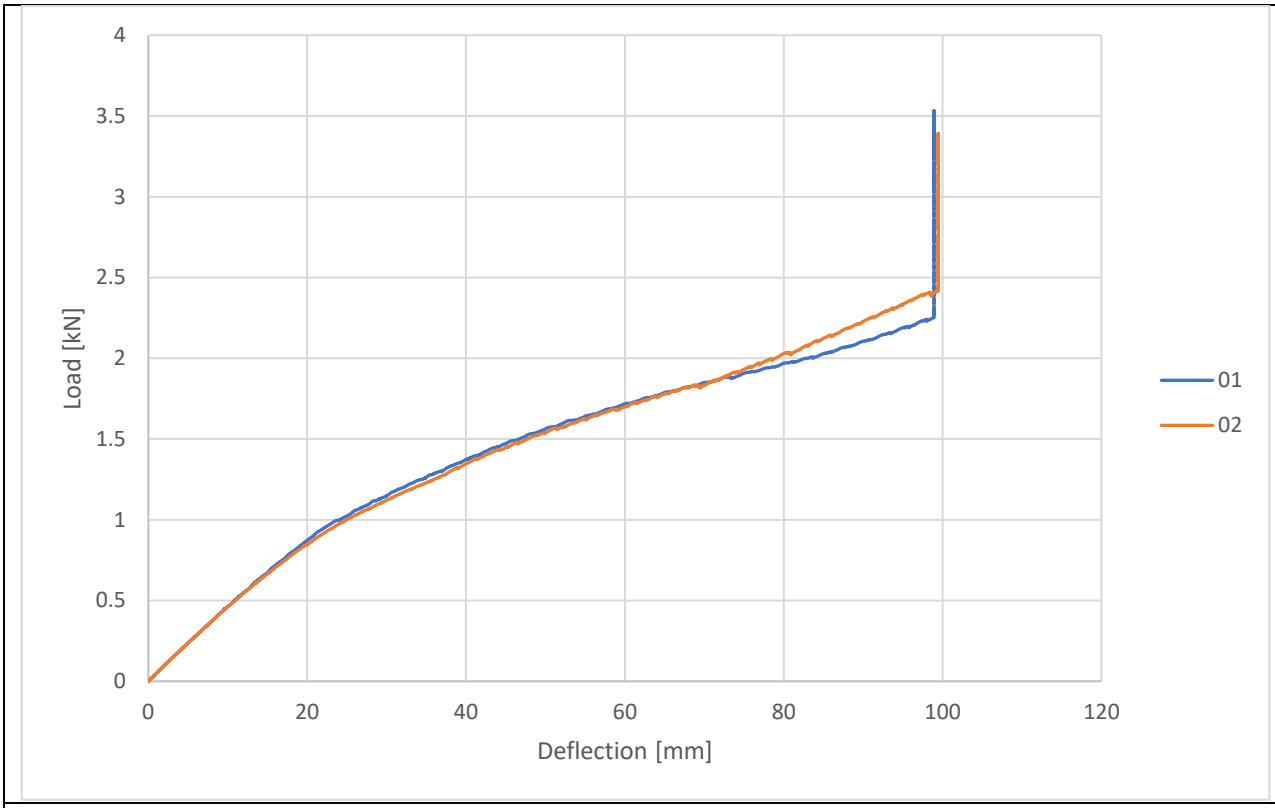

Figure 3: View of load vs deflection curve for test items 01 and 02, note: the travel range of the deflection gauge was exceeded during the test for sample items 01 and 02.

Figure 4: View of typical failure mode for test items 01 and 02.

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Figure 5: View of permanent deformation of the spigot after the load was released for sample item 01.

Figure 6: View of permanent deformation of the spigot after the load was released for sample item 02.

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STRUCTURAL GLASS BARRIER LOAD TEST REPORT

Customer[1]	**Glass Outlet BNE Pty Ltd**
Customer Address[1]	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Requested By[1]	Luke Keong & Richard Van Lieshout
Purchase Order[1]	–
Issuing Laboratory	MechTest - Brisbane Laboratory
Report Number	RB24-10821-01 Rev 1.
Job Description[1]	Load testing of structural glass barrier system with MADRID DELUXE spigots and NanoRail DELUXE
Identification	SB24-10821-01-01 through 03
Test Specification[1]	Client Requirements – Apply a horizontal point load laterally against the mid-span of the handrail till failure
Test Results	Information only
Revision Notes	Amendments made to the specimen details to include correct fixing details, this report replaces RB24-1821-01

Note 1: Information supplied by Client. This information may affect the validity of the result.

Accredited for compliance with ISO/IEC 17025 - Testing.

Accreditation Number 20414

Accreditation No. 20414

Form ID: AMTS-06-06-01 (R1)

Authorised Signatory

Nikita Eshchenko

26 February 2024

Advanced Materials Testing Services Pty Ltd
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Trading as MechTest
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TEST RESULTS

Test Method	AMTS-04-06-01 & Client Requirements: – Label each sample with a unique sample number. – Position the load cell at the mid-span of the handrail, so that the load is applied horizontally and perpendicular to the length of the handrail. – Position the gauge length so that it is axially inline with the load direction. – Gradually apply a load to the sample till failure occurs. – Record peak load, deflection and failure mode. – Inspect the MADRID DELUXE spigots for deformation and inspect the fasteners used to secure the MADRID DELUXE spigots after the load is released.
Test Technician	Nikita Eshchenko & Liam Wong
Job Location	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Test Date	19 February 2024
Loading Device	T00104 – Screw actuated load applicator
Measuring Device	T00096 – 100 mm Length gauge T00093 – Dewesoft DAQ system T00077 – Tape measure T00094 – 20kN load cell, load cell platen – 100 mm Ø
Specimen Details	Refer to Table 1.

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Table 1: Specimen details for SB24-10821-01-01 through 03.

Type of Component	Structural glass barrier – MADRID DELUXE spigots
Manufacturer ID	MADDEL-SBP / 15mm Clear TGH / STG-R5800-DELUXE
Dimensions	Spigots: 45 mm x 60 mm x 177 mm (H) Glass panel: 1000 mm (H) x 1400 mm (W) Handrail: 21 mm (H) x 30 mm (W) x 1.4 mm
Item Material (if known)	Spigots: Stainless Steel 2205 Glass panel: 15mm Grade A Toughened and Heat-soaked safety glass Handrail: Stainless Steel 316L
Other Details	Spigot fixing (Code: CSK-100-4PK): 4x 100 mm SS316 M10 self-tapping, countersunk screws into LVL topped with 19mm Merbau decking boards.

Table 2: Test results – Load and deflection result for samples SB24-10821-01-01 through 03.

Item	Peak Load (F_{max}) [kN]	Deflection at F_{max} [mm]	Deflection at 1 kN [mm]	Comments
01	3.89	99.49 *	29.62	Handrail separated from the glass panel at peak load. Deformation of the spigots observed after the load was released.
02	3.50	99.04 *	30.48	Handrail separated from the glass panel at peak load. Deformation of the spigots observed after the load was released.
03	3.35	98.29 *	33.82	Handrail separated from the glass panel at peak load. Deformation of the spigots observed after the load was released.
Average	3.58	98.94 *	31.31	–

Notes: Information only.
(*) The travel range of the length gauge was exceeded during the test for sample items SB24-10821-01-01 through 03.

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FIGURES

Figure 1: View of typical test items 01 through 03.

Figure 2: View of typical test arrangement for sample items 01 through 03.

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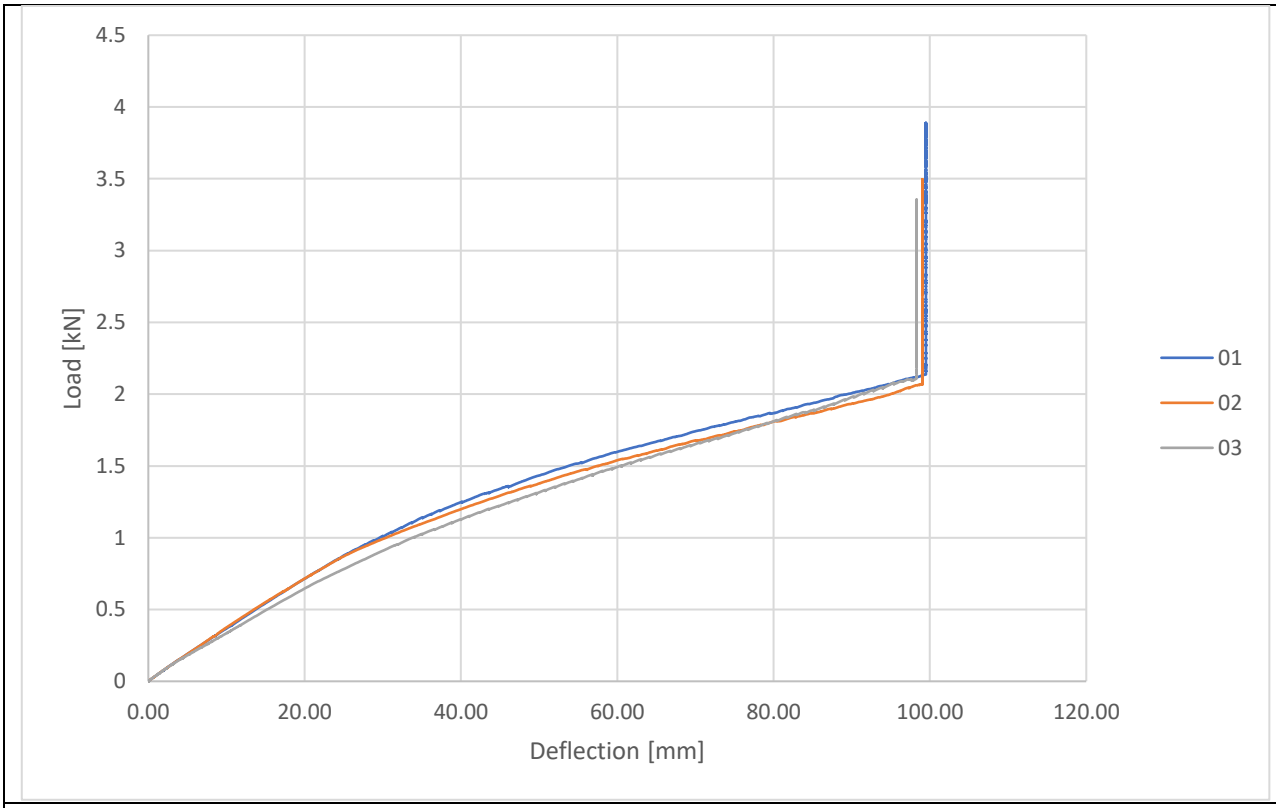

Figure 3: View of load vs deflection curve for test items 01 through 03, note: the travel range of the deflection gauge was exceeded during the test for sample items 01 through 03.

Figure 4: View of typical failure mode for test items 01 through 03, the NANORAIL separated from the glass panel.

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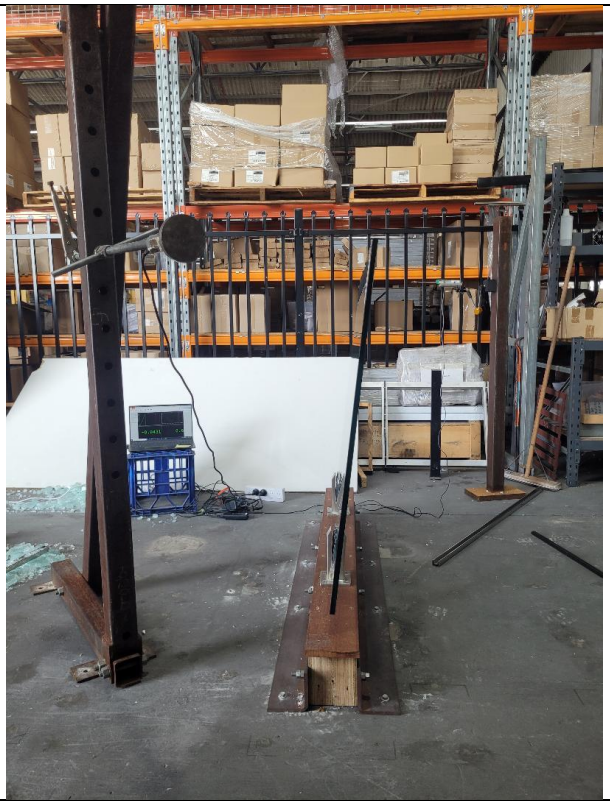

Figure 5: View of typical permanent deflection after the load was released for sample items 01 through 03.

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STRUCTURAL GLASS BARRIER LOAD TEST REPORT

Customer[1]	**Glass Outlet BNE Pty Ltd**
Customer Address[1]	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Requested By[1]	Luke Keong
Purchase Order[1]	–
Issuing Laboratory	MechTest - Brisbane Laboratory
Report Number	RB24-10959-01
Job Description[1]	Load testing of structural glass barrier system with MADRID DELUXE Top Fix spigots and DELUXE NanoRail, record load and deflection up to failure
Identification	SB24-10959-01-01 through 03
Test Specification[1]	Client Requirements – Apply a horizontal point load laterally against the mid-span of the handrail till failure
Test Results	Information only

Note 1: Information supplied by Client. This information may affect the validity of the result.

Accredited for compliance with ISO/IEC 17025 - Testing.

Accreditation Number 20414

Accreditation No. 20414

Form ID: AMTS-06-06-01 (R1)

Authorised Signatory

Nikita Eshchenko

12 March 2024

Advanced Materials Testing Services Pty Ltd
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Trading as MechTest
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TEST RESULTS

Test Method	AMTS-04-06-01 & Client Requirements: – Label each sample with a unique sample number. – Position the load cell at the mid-span of the handrail, so that the load is applied horizontally and perpendicular to the length of the handrail. – Position the gauge length so that it is axially inline with the load direction. – Gradually apply a load to the sample till failure occurs. – Record peak load, deflection and failure mode. – Inspect the MADRID DELUXE Top Fix spigots for deformation after the load is released.
Test Technician	Nikita Eshchenko & Liam Wong
Job Location	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Test Date	6 March 2024
Loading Device	T00104 – Screw actuated load applicator
Measuring Device	T00099 – 100 mm Length gauge T00097 – Dewesoft DAQ system T00077 – Tape measure T00094 – 20kN load cell, load cell platen – 100 mm Ø
Specimen Details	Refer to Table 1.

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Table 1: Specimen details for SB24-10959-01-01 through 03.

Type of Component	Structural glass barrier – MADRID DELUXE Top Fix spigots
Manufacturer ID	MADDEL-TF / 15mm Clear TGH / STG-R5800-DELUXE
Dimensions	Spigots: 50 mm x 65 mm x 177 mm (H) Glass panel: 1000 mm (H) x 1400 mm (W) Handrail: 21 mm (H) x 30 mm (W) x 1.4 mm
Item Material (if known)	Spigots: Stainless Steel 2205 Glass panel: 15mm Grade A Toughened and Heat-soaked safety glass Handrail: Stainless Steel 316L
Other Details	Spigot fixing: 1x M12 threaded stainless steel rod per spigot mechanically fixed to a parallel flanged steel channel.

Table 2: Test results – Load and deflection result for samples SB24-10959-01-01 through 03.

Item	Peak Load (F_{max}) [kN]	Deflection at F_{max} [mm]	Deflection at 1 kN [mm]	Comments
01	3.60	98.70 *	37.23	Glass panel failed and shattered.
02	3.81	98.35 *	32.89	Glass panel failed and shattered.
03	3.70	99.41 *	33.03	Handrail separated from the glass panel.
Average	3.70	98.82 *	34.38	–

Notes: Information only.
(*) The travel range of the length gauge was exceeded during the ultimate test for sample items SB24-10959-01-01 through 03.

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FIGURES

Figure 1: View of typical test items 01 through 03.

Figure 2: View of typical test arrangement for sample items 01 through 03.

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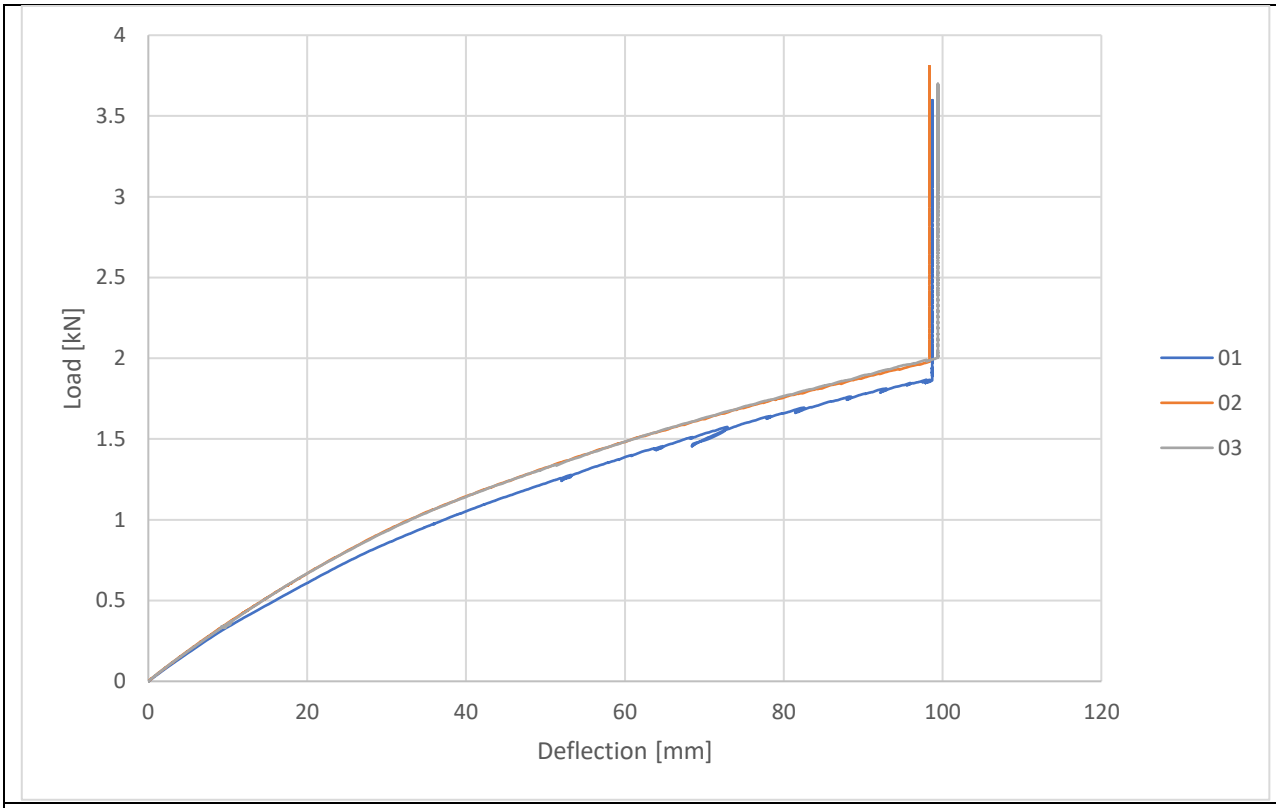

Figure 3: View of load vs deflection curve for test items 01 through 03, note: the travel range of the deflection gauge was exceeded during the test for sample items 01 though 03.

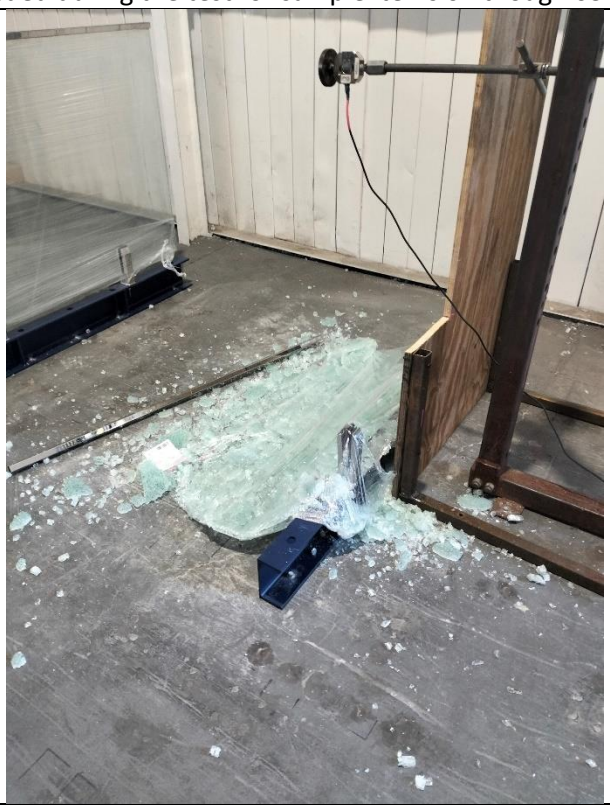

Figure 4: View of typical failure mode for test items 01 and 02, failure of the glass panel.

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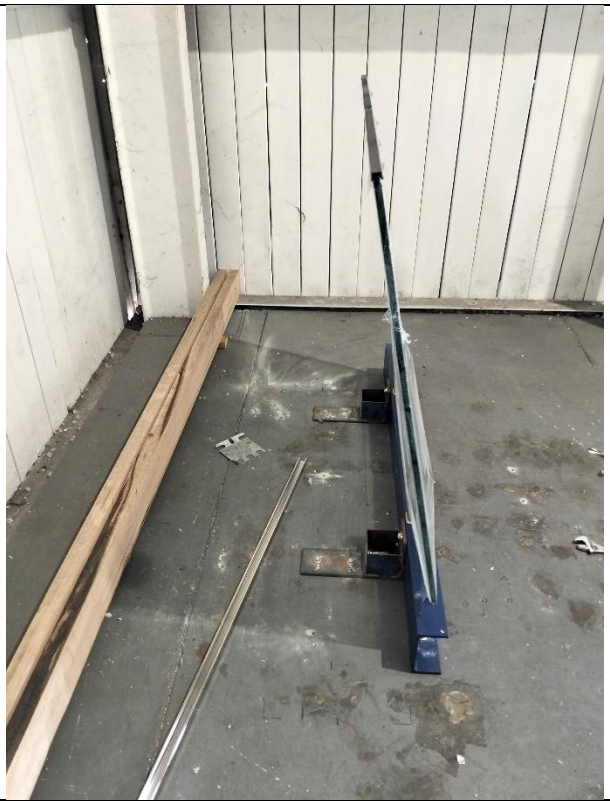

Figure 5: View of the failure mode for test item 03, handrail separated from the glass panel.

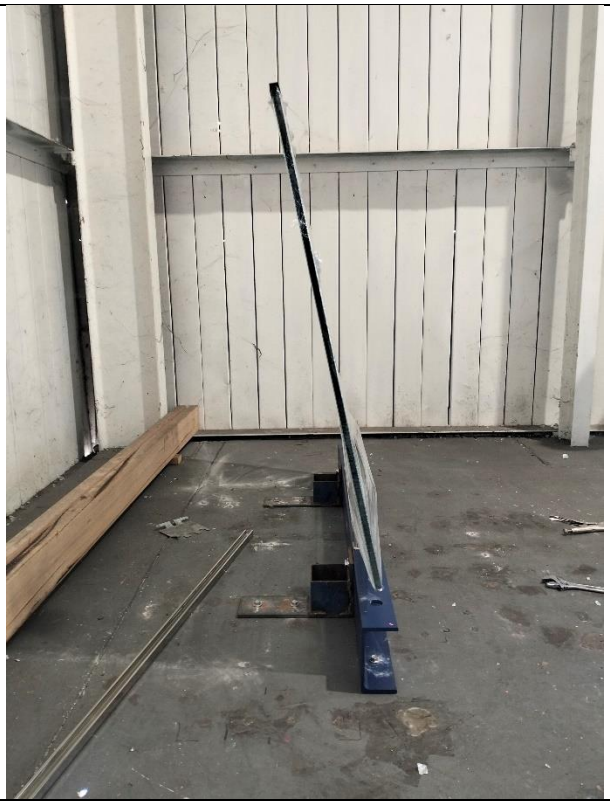

Figure 6: View of permanent deformation of sample item 03 after the load was released.

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STRUCTURAL GLASS BARRIER LOAD TEST REPORT

Customer[1]	**Glass Outlet BNE Pty Ltd**
Customer Address[1]	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Requested By[1]	Luke Keong
Purchase Order[1]	–
Issuing Laboratory	MechTest - Brisbane Laboratory
Report Number	RB24-10959-02
Job Description[1]	Load testing of structural glass barrier system with MADRID DELUXE spigots and DELUXE NanoRail, record load and deflection up to failure
Identification	SB24-10959-02-01 & 02
Test Specification[1]	Client Requirements – Apply a horizontal point load laterally against the mid-span of the handrail till failure
Test Results	Information only

Note 1: Information supplied by Client. This information may affect the validity of the result.

Accreditation No. 20414

Accredited for compliance with ISO/IEC 17025 - Testing.

Accreditation Number 20414

Form ID: AMTS-06-06-01 (R1)

Authorised Signatory

Nikita Eshchenko

12 March 2024

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TEST RESULTS

Test Method	AMTS-04-06-01 & Client Requirements: – Label each sample with a unique sample number. – Position the load cell at the mid-span of the handrail, so that the load is applied horizontally and perpendicular to the length of the handrail. – Position the gauge length so that it is axially inline with the load direction. – Gradually apply a load to the sample till failure occurs. – Record peak load, deflection and failure mode. – Inspect the MADRID DELUXE spigots for deformation after the load is released.
Test Technician	Nikita Eshchenko & Liam Wong
Job Location	Building 9, 153 Vincents St, Virginia, Brisbane, QLD, Australia, 4014
Test Date	6 March 2024
Loading Device	T00104 – Screw actuated load applicator
Measuring Device	T00099 – 100 mm Length gauge T00097 – Dewesoft DAQ system T00077 – Tape measure T00094 – 20kN load cell, load cell platen – 100 mm Ø
Specimen Details	Refer to Table 1.

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Table 1: Specimen details for SB24-10959-02-01 & 02.

Type of Component	Structural glass barrier – MADRID DELUXE spigots
Manufacturer ID	MADDEL-SBP / 15mm Clear TGH / STG-R5800-DELUXE
Dimensions	Spigots: 45 mm x 60 mm x 177 mm (H) Glass panel: 1000 mm (H) x 1400 mm (W) Handrail: 21 mm (H) x 30 mm (W) x 1.4 mm
Item Material (if known)	Spigots: Stainless Steel 2205 Glass panel: 15mm Grade A Toughened and Heat-soaked safety glass Handrail: Stainless Steel 316L
Other Details	Spigot fixing: 4x M10 threaded stainless steel rods per spigot chemically anchored using Soudal VE400-SF into 32MPa concrete.

Table 2: Test results – Load and deflection result for samples SB24-10959-02-01 & 02.

Item	Peak Load (F_{max}) [kN]	Deflection at F_{max} [mm]	Deflection at 1 kN [mm]	Comments
01	3.67	99.93 *	24.24	The handrail separated from the glass panel at peak load.
02	3.87	99.93 *	25.91	The handrail separated from the glass panel at peak load.
Average	3.77	99.93 *	25.08	–

Notes: Information only.
(*) The travel range of the length gauge was exceeded during the ultimate test for sample items SB24-10959-02-01 & 02.

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FIGURES

Figure 1: View of typical test items 01 & 02.

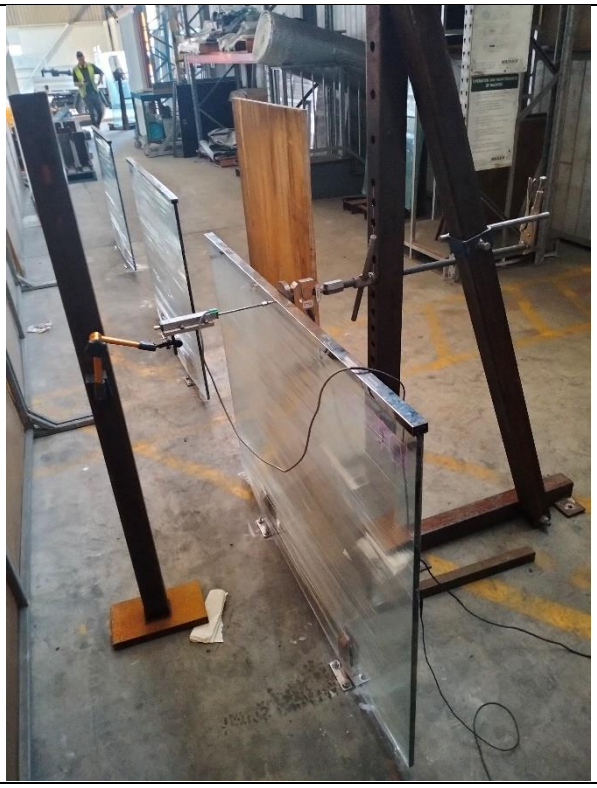

Figure 2: View of typical test arrangement for sample items 01 & 02.

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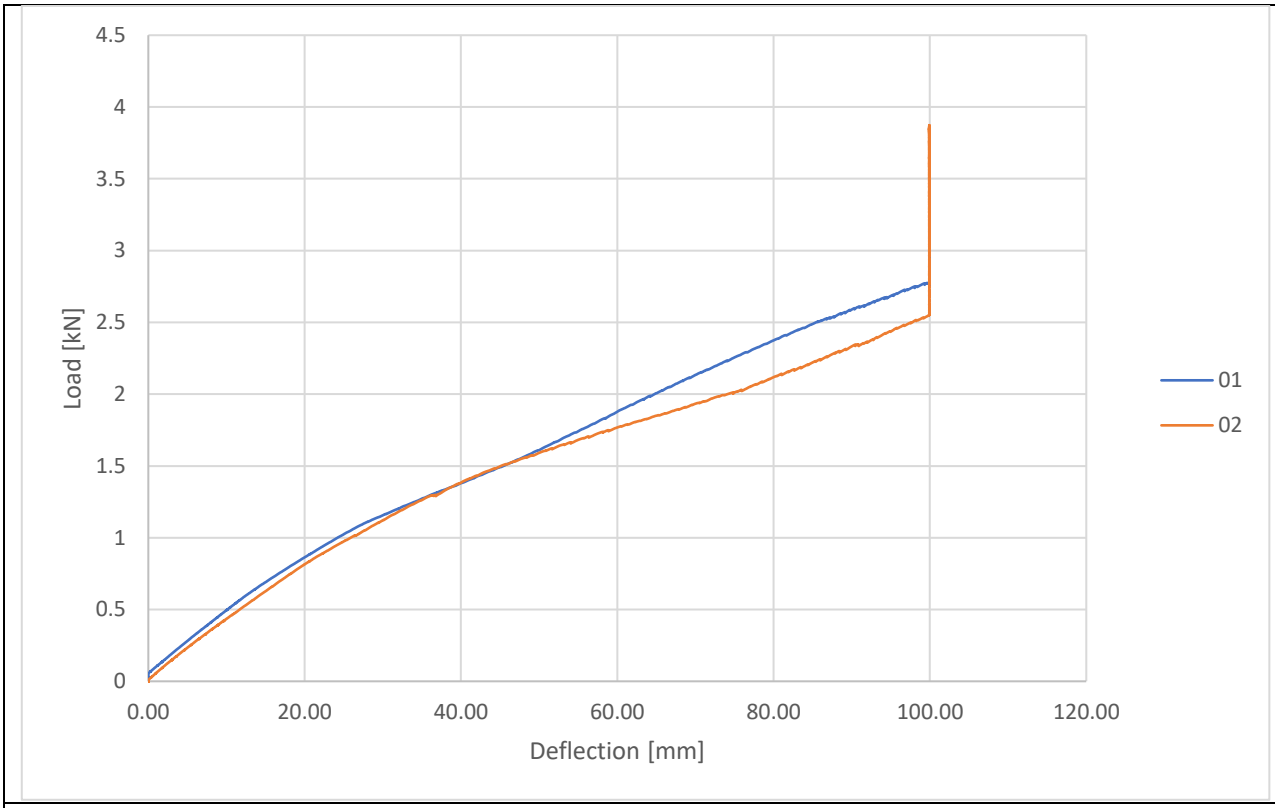

Figure 3: View of load vs deflection curve for test items 01 & 02, note: the travel range of the deflection gauge was exceeded during the test for sample items 01 & 02.

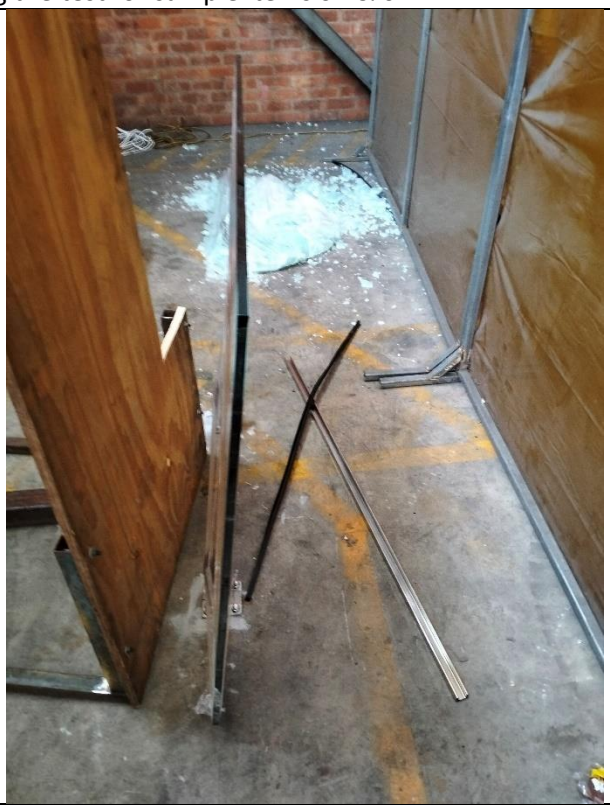

Figure 4: View of typical failure mode for test items 01 and 02, the handrail separated from the glass panel.

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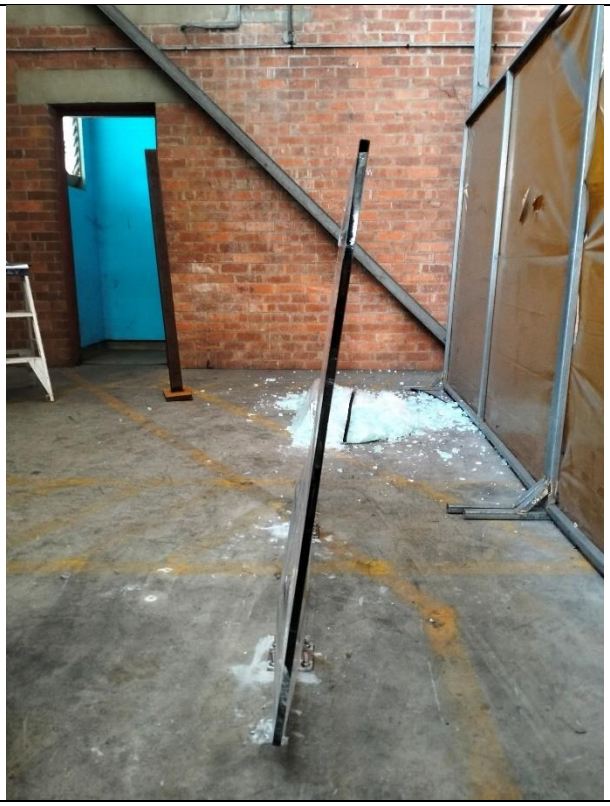

Figure 5: View of typical permanent deformation for sample items 01 & 02 after the load was released.

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