TEST REPORT

Lucideon Reference:	155333 (QT38881/1/SL) /Ref. 1
Project Title:	Testing of Balustrade System in Accordance with BS 6180: 2011 Barriers In and About Buildings
Client:	Q-railing UK Unit 707 Centre 500 Lowfield Drive, Wolstanton Newcastle-Under-Lyme Staffordshire ST5 0UU
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1 INTRODUCTION

Lucideon were commissioned by the client, Q-railing UK, to carry out a Uniformly Distributed Load (UDL) test applied to the infill of their EASY GLASS® Glass Clamps model 44 and model 46 systems. The tests were undertaken in accordance with BS 6180:2011 Barriers In and About Buildings, to allow their balustrade system to be classified for use in accordance with the Code of Practice included within the Standard.

The testing was carried out at Lucideon's test facilities Queens Road, Penkhull, Stoke on Trent.

This report summarises the test results obtained during the test programme and does not provide interpretation of those results.

2 TEST SAMPLES

The system tested was designated as EASY GLASS® Glass Clamps model 44 and model 46.

The system incorporated the following components:

- Stainless Steel Posts and Handrail 304 diameter 48.3 mm x 2.0 mm model 0927
- Stainless Steel Handrail brackets 304 model 0711
- Glass Clamps Model 44 and 46
- Rubber Inlays for Glass Clamps Model 44 and 46
- Adapters for Tube diameter 48.3 mm x 2.0 mm
- 10mm Monolithic Glass Panel 1400 mm x 900 mm

The system is shown in the Figures included in the Appendix.

The system and glass was installed by Q-railing personnel.

3 TEST PROGRAMME

A uniformly distributed load was applied to the glass infill of a Q-line post system with handrail brackets model 44 and 46. Sufficient load was applied to the infill to allow classification at 0.74 kN/m^2 and 1.5 kN/m^2.

4 TEST METHOD

The EASY GLASS® Glass Clamps model 44 and model 46 balustrade system was laid horizontally onto two wooden beams which were fixed to the strong floor of the test facility. Deflection was recorded via a linear voltage cable transducer which was fixed to the underside of the glass infill panel at the geometric centre.

A uniformly distributed load was applied to the glass infill panel by means of 25 kg bags of cement. Smaller bags of sand were applied to add additional units of weight of less than 25 kg. The uniformly distributed load was applied and the infill panel allowed to stabilize for 5 minutes and the deflections recorded. The generic test arrangement can be seen in Plate 1.

The UDL was calculated as follows:

Area of infill panel (1.4 m x 0.9 m)	1.26 m^2
Mass required to achieve 0.74 kN/m^2	
kN to kg force (0.74/0.980665) x 100	75.46 kg
Mass required to achieved 0.74 kN/m2 for a 1.26 m^2 panel	
75.46 kg x 1.26 m^2	95.07 kg
Mass required to achieve 1.5 kN/m^2	
kN to kg force (1.50/0.980665) x 100	152.96 kg
Mass required to achieved 0.74 kN/m2 for a 1.26 m^2 panel	
152.96 kg x 1.26 m^2	192.72 kg

5 RESULTS

The tests were carried out in accordance with the guidance given in BS 6180 Barriers In and About Buildings - Code of Practice. The Standard states that the maximum allowable deflection for a free standing glass protective barrier panel is 25 mm.

Table 2 of BS 6180 Barriers In and About Buildings - Code of Practice categorises parapets, barriers and balustrades for areas of use depending on the loads they have achieved under testing.

The loads achieved by the Q-railing Europe GmbH and Co KG EASY GLASS® Glass Clamps model 44 and model 46 balustrade system tested under uniformly distributed load are given in Table 1.

All figures quoted in the Tables contain no safety factors and are direct loads as achieved by the system under test conditions.

Table 2 summarises the suitability of the tested systems in accordance with Table 2 of BS 6180:2011.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

Table 1 - Summary of Performance of Q-railing Europe GmbH and Co. KG EASY GLASS® Glass Clamps Model 44 and Model 46 Balustrade System Tested Under Uniformly Distributed Load

System	Glass Type	Dimensions Glass Panel h x w x d (m)	Area of Glass Panel (m^2)	Uniformly Distributed Load (kN/m^2)	Deflection at Working Line Load for System (mm)
Glass Clamps Model 44 and Model 46	10 mm Tempered Monolithic	0.9 x 1.4 x 10	1.26	0.74	6.40
Glass Clamps Model 44 and Model 46	10 mm Tempered Monolithic	0.9 x 1.4 x 10	1.26	1.5	13.42

Table 2 - Summary of Suitability of Q-railing Europe Systems in Accordance with Table 2 of BS 6180:2011

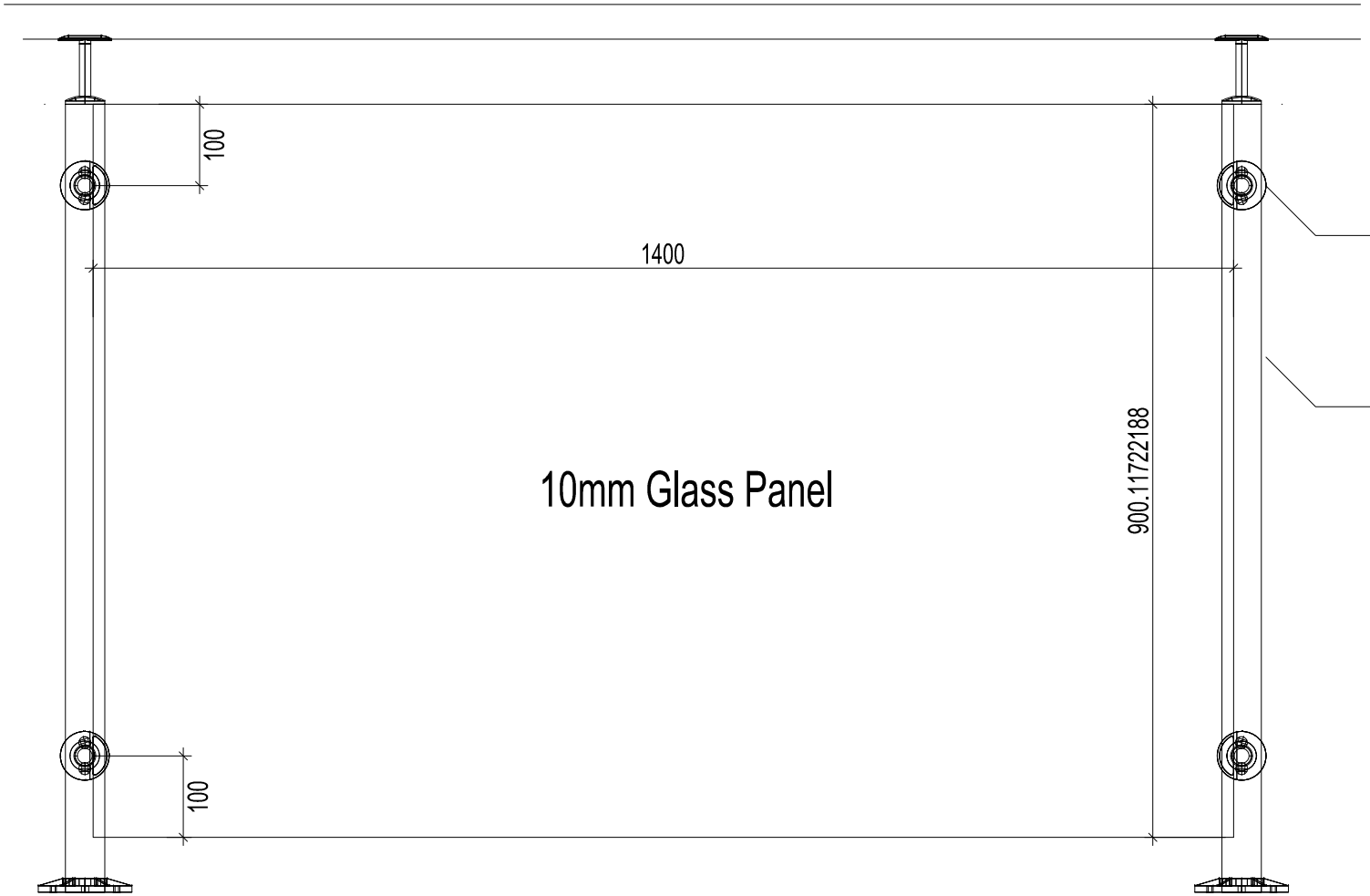
Type of Occupancy for Part of the Building	Examples of Specific Use	Uniformly Distributed Load Applied to Infill (kN/m^2)	EASY GLASS® Glass Clamps Model 44 & Model 46
Domestic and residential activities	(i) all areas within or serving exclusively one single family dwelling including stairs, landings, etc but excluding external balconies and edges of roofs	0.5	✓
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single family dwellings	1.0	✓
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	-	✓
	(iv) light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.5	✓
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings except as given above	1.0	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	✓
Areas with tables or fixed seating	(vii) restaurants and bars	1.50	✓
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	1.0	✓
	(ix) external balconies including Juliette balconies and edges of roofs; footways and pavements within building cartilage adjacent to basement/sunken areas	1.0	✓
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.5	✓
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	1.5	✓
	(xii) grandstands and stadia (See Note A)	Note A	-
Retail areas	(xiii) all retail areas including public areas of banks/building societies or betting shops	1.5	✓
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	1.5	✓
	(xv) horizontal loads imposed by vehicles (See Note B)	Note B	-

Notes: A) See requirements of appropriate certifying authority.
B) See Annex A of BS 6180:2011.

Plate 1 - Generic Test Arrangement

Plate 2 - Fixing Under Uniformly Distributed load

Plate 3 - Individual Bag Weight



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LUCIDEON TEST DRAWING

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United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE

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TESTING LABORATORY
No. 0013

Lucideon Limited

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005
General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009).

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Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
12 February 1982

This certificate issued on
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