

TEST REPORT

Lucideon Reference: 173446 (QT44718/2/RK)/Ref. 6

Project Title: Balustrade Testing of FH Brundle's Infinity Juliet Balcony in Accordance with BS 6180, UNI 10806 (Italy), BS 4592 & BS 8300

Client: FH Brundle
81/82 Middlemore Industrial Estate
Middlemore Road
Smethwick
Birmingham
B66 2EP

For the Attention of: Mr Danny Hull

Author(s): Mr Justin Fryer

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Miss Lisa Cobden
Consultancy Team
Reviewer



Mr Justin Fryer
Consultancy Team
Project Manager



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1 TEST ARRANGEMENT

A concrete block of dimensions 2000 mm x 700 mm x 500 mm was fastened to the laboratory strong-floor.

The Infinity Juliet Balcony was attached to the rear face of said concrete block by way of fixings as highlighted in Figure 1 per manufacturer's instructions.

A rigid steel framework was constructed to allow fixing of the brackets at the top side of the balcony. These brackets were clamped back to the steel framework. This framework can be seen in Figure 1.

2 TEST METHOD

A hardwood spreader beam was placed at a distance of 1100 mm, coinciding with the handrail height, from the finished floor height to simulate a uniformly distributed line-load.

A reaction frame consisting of 2 No. steel stanchions and a steel cross-member was fastened to the laboratory strong-floor such that a ram could be clamped to the steel cross member at the same height as the hardwood spreader.

A calibrated load cell was attached to the hydraulic ram by way of a steel cage, to measure the load during testing.

A calibrated linear voltage displacement transducer (LVDT), to measure the deflection, was attached to the opposite side of the glass panel as the load was applied in the centre width of the panel at 1100 mm from the finished floor height.

For BS 6180 a load was steadily applied up to each loading increment or until a deflection of 25 mm was reached as highlighted within BS 6180. The load at the last increment was then recorded.

For the UNI 10806 (Italy) the line load was increased to a load per metre as denoted by a representative of FH Brundle. This was generally taken as 2 kNm^{-1} unless otherwise stated due to the deflections found during testing.

Photographs can be seen in the Plates.

3 RESULTS

Table 1 - BS 6180 Results

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Infinity Juliet Balcony
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	0.36	✓
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single family dwellings	0.74	✓
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	0.22	✓
	(iv) light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.36	✓
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings except as given above	0.74	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	✓

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Infinity Juliet Balcony
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	0.74	✓
	(ix) external balconies including Juliette balconies and edges of roofs; footways and pavements within building cartilage adjacent to basement/sunken areas	0.74	✓
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.50	✓
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	3.00	X
	(xii) grandstands and stadia	(Note 1)	-
Retail areas	(xiii) all retail areas including public areas of banks/building societies or betting shops	1.50	✓
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	(Note 2)	X
	(xv) horizontal loads imposed by vehicles	(Note 2)	X



Table 2 - UNI 10806 (Italy) Results

System Name	Load (kNm ⁻¹)	Deflection (mm)
Infinity Juliet Balcony	1.5	13.04

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

END OF REPORT

PLATES



Plate 1 - Test Arrangement



Plate 2 - Test Arrangement 2

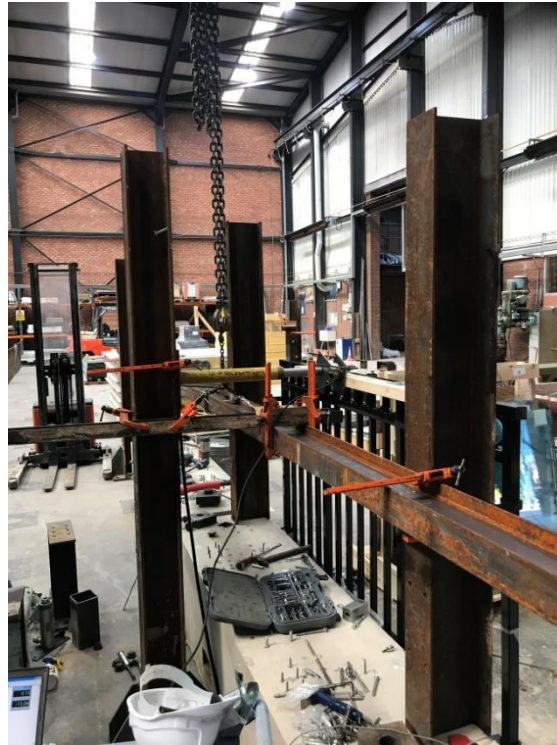
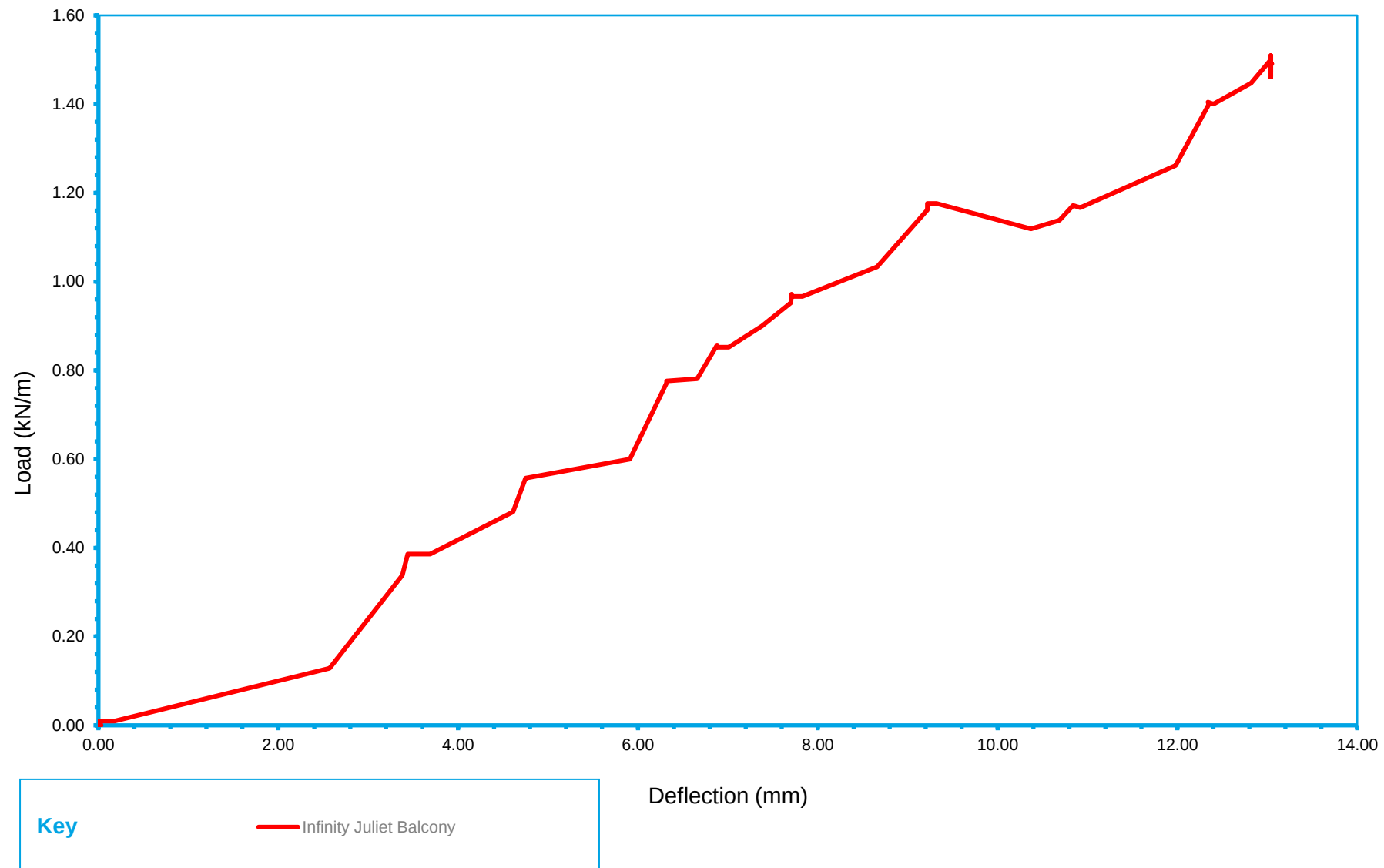


Plate 3 - Reaction Frame Set-Up

Chart 1 - Load Deflection Curve for Balustrade Testing of FH Brundle's 2100 mm Infinity Juliet Balcony

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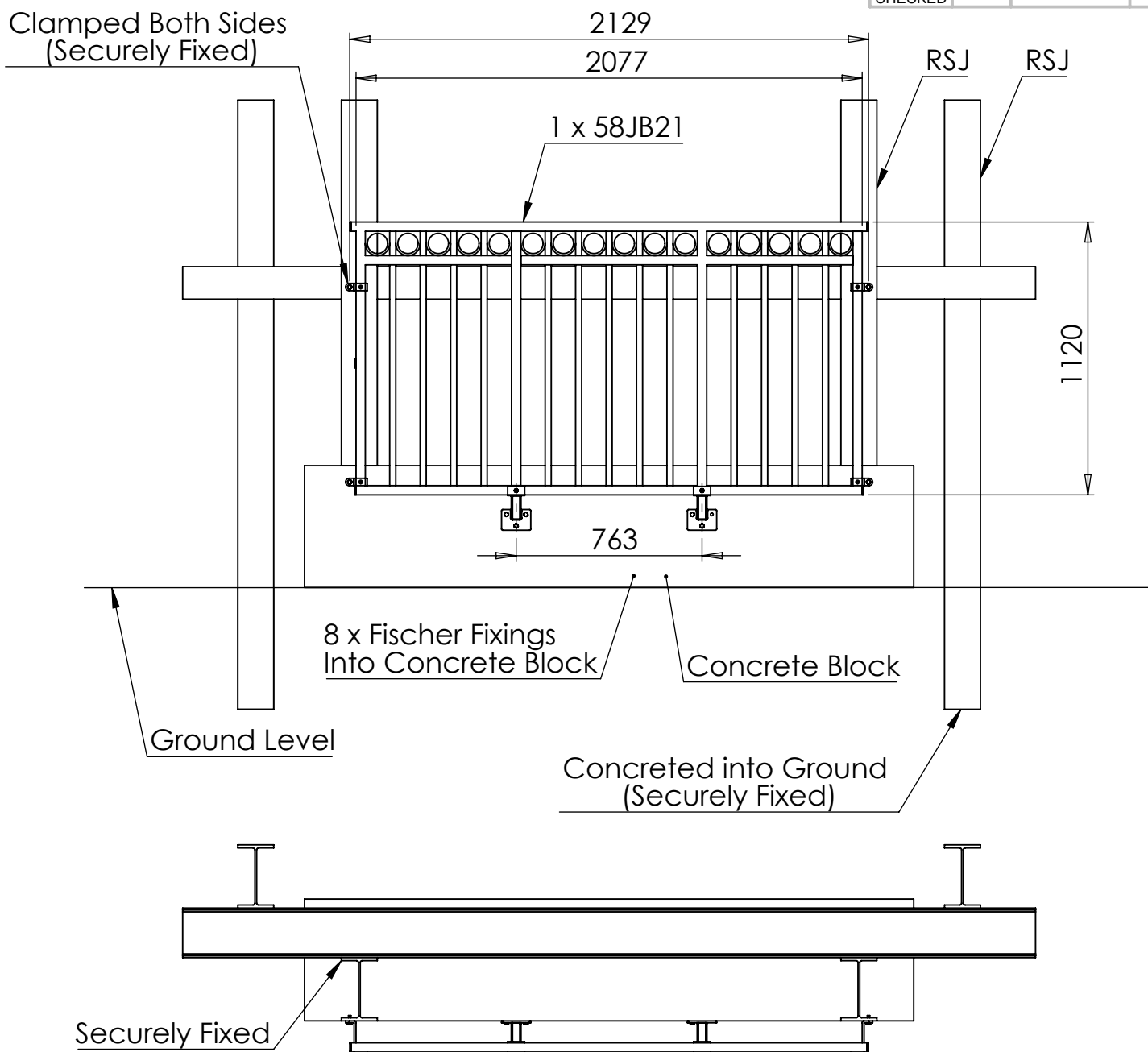
TEST REPORT NUMBER - TR15-001

PRO RAILING - Infinity Juliet Balcony

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN MILLIMETERS

	NAME	DATE	REVISION
DRAWN	LT	10/08/2017	
CHECKED			



Load Testing of Infinity Juliet Balcony Kit to BS EN 6180:2011 & UNI 10806:1999

Carry out load testing in accordance with BS 6180:2011 Barriers in and about buildings, and EC1-1991-1-1:2002 UK National Annex to Eurocode 1: Actions on structures – Part 1-1: General actions - Densities, self-weight, imposed loads for buildings.

Carry out load testing in accordance with UNI 10806:1999
Prefabricated Railing Systems - Determination of the mechanical strength under static load.

These tests will allow FH Brundle Infinity Juliet Balcony kits to be classified
for use in accordance with the Code of Practice included within the standards.

Test In Accordance	Parts Required	Foundation Material	Fischer Innovative Solutions Fixings www.fischer.co.uk	Notes
BS EN 6180:2011 UNI 10806:1999	1 x 58JB21	C35 with glass fibres, aggregate size 20mm slump 100	50566 - RG 16 x 90 M10 I A4 + FIS V - Injection Mortar	Width between bottom brackets 763mm, Width between side brackets 2129mm