

TECHNICAL REPORT



Maxwell Road, Stevenage,
Hertfordshire SG1 2EW, England
Telephone +44 (0) 1438 777700
Facsimilie +44 (0) 1438 777800
e-mail: info@fira.co.uk
website: www.fira.co.uk

RICHARD BURBIDGE LTD

Whittington Road
Oswestry
Shropshire
SY11 1HZ

Our Ref.: TCMSF20189

Date: 2 January 2008

Date delivered: 17 January 2007

Date of tests: 18 January 2007

For the attention of Mr Tony Jones

SAMPLE(S) FOR TEST :

Crosshatch Infill

TEST REQUIREMENTS :

BS 6180: 1999: Barriers in and about buildings – Code of practice
- Communal Domestic use – Clauses 6.4.1

RESULT :

PASS

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Registered Office:
Chiltern House, Stocking Lane,
Hughenden Valley, High Wycombe,
Buckinghamshire HP14 4ND, UK.

Registered No 3181481 England

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INTRODUCTION

As part of the BM TRADA Certification Ltd Balustrade Product Conformity Scheme, FIRA was commissioned to undertake structural testing of Richard Burbidge Decking Crosshatch Infill in accordance with the requirements of the following documents:

BS 6180: 1999: Barriers in and about buildings – Code of practice

BS 6399: Part 1: 1996: Loading for buildings - Code of practice for dead and imposed loads

BS 5268: Part 2: 2002: Structural use of timber – Code of practice for permissible stress design, materials and workmanship

The intention of the testing was to assess whether the products were structurally suitable for use commercial arenas. Their failure mode and critical failure load were to be established in order to assess and improve upon future designs with the outcome that the developed design could be included in the BM TRADA Certification Ltd Balustrade Product Conformity Scheme.



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TEST SPECIMEN(S)

Description of Specimen Richard Burbidge decking crosshatch panel system using metal balustrade and stainless steel A4 fixings.

Material type	Pine (<i>Pinus sylvestris</i>) Mild steel balusters
System	Richard Burbidge timber panel system with metal balusters
Description of Test Unit <i>See Attached Diagram</i>	
Handrail 06-0000-496-B0203 LD201	Pine (<i>Pinus sylvestris</i>) Traditional handrail
Handrail - Length	1800mm
Spindle / in-fill 06-0000-926-B0406 – LD212 06-0000-948-A0203 – LD237 06-0000-055-A0502 – LD238 06-0155-001- 0804 – LD239	Cross hatch decking panel - Pine (<i>Pinus sylvestris</i>) Straight metal baluster Twist metal baluster Contemporary leaf metal baluster
Newel Dimensions 06-0000-717-C0306 LD202	Pine (<i>Pinus sylvestris</i>) 1195mm x 82mm x 82mm
Base rail 06-0000-497-0499	Pine (<i>Pinus sylvestris</i>) Large traditional base rail
Base rail - Length	1800mm
String/Joist Dimensions 06-0193-001-0907 – LD104	Pine (<i>Pinus sylvestris</i>) 1800mm x 150mm x 47mm
Deck board dimensions 06-0000-539-A0501 – LD152	1800m x 117mm x 27mm
Fixings Used 06-0182-001-A0806 – LD333 06-0182-002- 0905 – LD333 06-0182-003-A1106 – LD333	Galvanized No 6 x 19mm pan head screws Stainless steel (A4) 4.2mm x 19mm flat head csk Stainless steel (A4) twist bracket Stainless steel (A4) tapered screw ½" x 2" whitworth Pine (<i>Pinus sylvestris</i>) cover cap

Product descriptions produced by FIRA International Ltd give basic Construction, Material and Dimensional information and are not intended to represent a complete product specification. Overall product dimensions will be recorded accurately. Where variations in material thickness occur, dimensions will be taken as standard thickness.



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TEST PROCEDURE

The decking balustrade is laid horizontally and mounted in a universal test rig with both end newels fully supported by and clamped to steel channel sections. Both the end and the central newels are lodged between supporting wall bars.

In- fill strength

A uniformly distributed load is applied to the handrail using calibrated weights and load bags laid on top of a foam sheet, which rests on the in-fill. The load is maintained for a period of 15 minutes, at the end of which the balustrade is inspected for structural damage. Experience has shown that if the in- fill can sustain the load when it is initially applied, then unless there is visual movement or lots of cracking noises at the fixings it not necessary to hold the load for 15 minutes.



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TEST RESULTS

BS 6180: 1999, Clause 6.4.1 Balustrade horizontal deflection test

Item: Crosshatch Infill
Test Level: Communal Domestic Applications
Initial Inspection: No apparent faults.

Load Table

	Communal Domestic Level
UDL to In-fill	1.0kN/m ²
UDL² Required	1.35kN
UDL² Achieved	137kg

Results Table

TEST	TEST REQUIREMENT		RESULT- Commercial Level
In-fill Strength	Design Load	Initial Loading	PASS



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CONCLUSION

When tested Crosshatch Infill supplied by Richard Burbidge Ltd satisfied the selected combined rules of BS 6180: 1999: Barriers in and about buildings and BS 5268: Part 2: 2002: Structural use of timber – Code of practice for permissible stress design, materials and workmanship.

The Crosshatch Infill is therefore considered to be suitable for communal domestic applications when used within decking spans of 1800mm between the centre of newel posts.

NOTE(S)

A, B and C3 are the full range of applications for which the products are suitable as specified by BS 6399: Part 1: 1996. For more information see ANNEX B.

Tested by: D Gardner/ R Odhavji

Reported by: Rishi Odhavji

Approved by: Phil Reynolds
Testing Manager



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Plate 1: Crosshatch Infill Panel

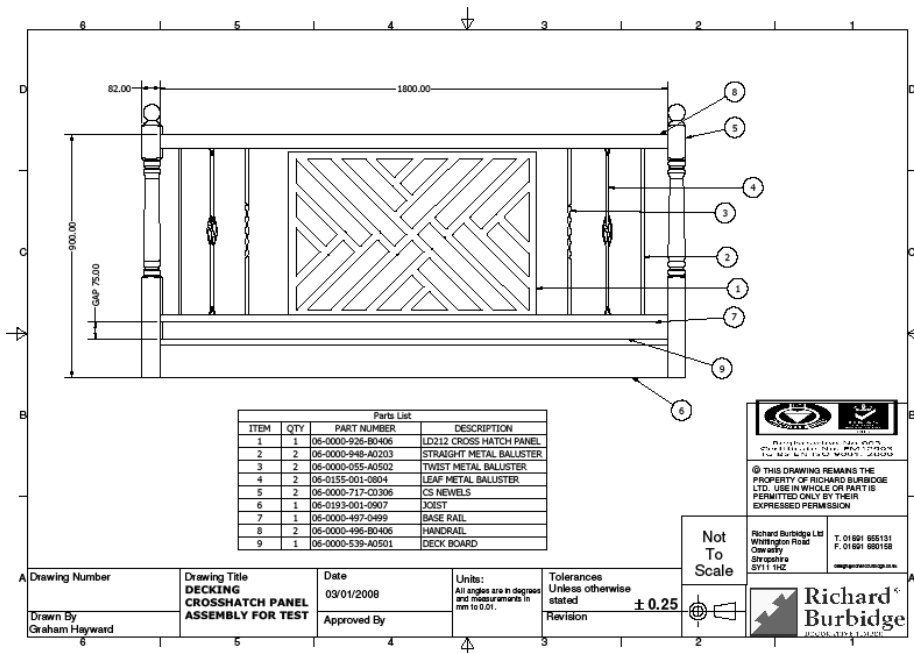


Plate 2: Technical Drawing



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ANNEX A

Test Requirements

Spindle / infill tests

Individual spindles

BS 6180 does not give a deflection limit for spindles, which means that a strength test is required unless calculations can prove that the spindles can withstand the design load given in BS 6399-1, Table 4. Clause 6.3.1 in BS 6180 allows the design load to be halved when the infill “consist of successive balusters”.

As these tests are relatively “quick and easy” to do, it is suggested that a minimum of 5 balusters are tested, giving a safety factor of 1.79 for “5268” loads and 2.00 for Q-mark loads. The test loads to be applied are given in table 6.2 in Annex B. It should however be noted that the Q-mark scheme requires all spindles to be tested.



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ANNEX B

Table 6.2 Use of buildings or part buildings

Taken from BS 6399: Part 1: 1996: Loading for buildings - Code of practice for dead and imposed loads.

Building-Use category	Type of occupancy for part of the building or structure	Descriptive title
A	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 (see C3 ix)
		(ii) Other residential, (but also see C)
B and E	Offices and work areas not included elsewhere including storage areas	(iii) Light access stairs and gangways not more than 600 mm wide (not applicable to stair rails)
		(iv) Light pedestrian traffic routes in industrial and storage buildings except designated escape routes
		(v) Areas not susceptible to overcrowding in office and industrial buildings also industrial and storage buildings except as given above
C	Areas where people may congregate	
C1/C2	Areas with tables or fixed seating	(vi) Areas having fixed seating within 530 mm of the barrier, balustrade or parapet
		(vii) Restaurants and bars
C3	Areas without obstacles for moving people and not susceptible to overcrowding	(viii) Stairs, landings, corridors, ramps
		(ix) External balconies and edges of roofs. Footways and pavements within building curtilage adjacent to basement/sunken areas
C5	Areas susceptible to overcrowding	(x) Footways or pavements less than 3 m wide adjacent to sunken areas
		(xi) Theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studio. Footways or pavements greater than 3 m wide adjacent to sunken areas
		(xii) Grandstands and stadia
D	Retail areas	(xiii) All retail areas including public areas of banks/building societies or betting shops. For areas where overcrowding may occur, see C5
F/G	Vehicular	(xiv) Pedestrian areas in car parks including stairs, landings, ramps, edges or internal floors, footways, edges of roofs
		(xv) Horizontal loads imposed by vehicles