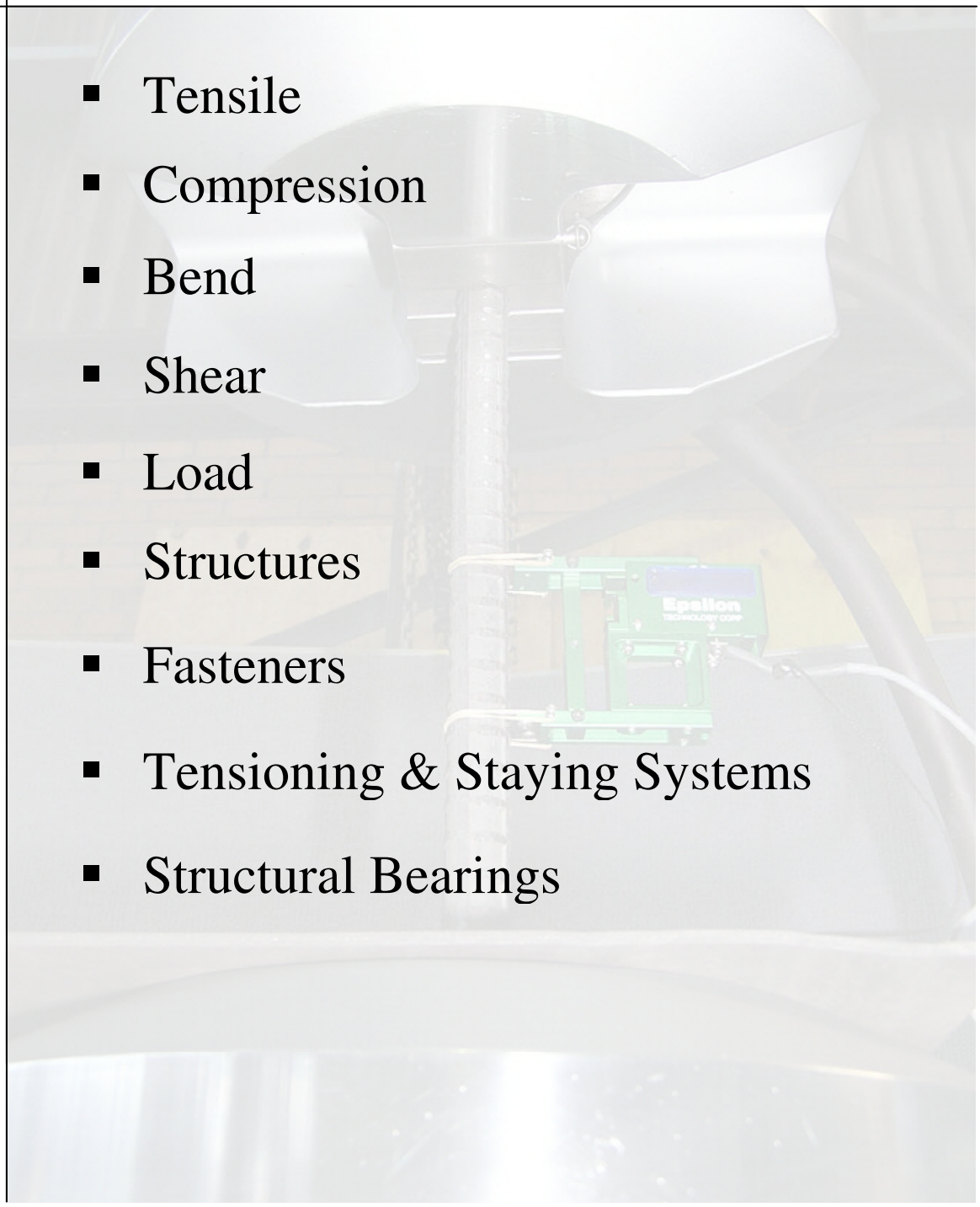
Melbourne Testing Services

Mechanical Testing



- Tensile
- Compression
- Bend
- Shear
- Load
- Structures
- Fasteners
- Tensioning & Staying Systems
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ACCREDITED FOR TECHNICAL COMPETENCE

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IN CONFIDENCE TO THE CLIENT

REPORT NO: MT-08/212

TESTING OF A NEW BRIDGE SERVICES TEMPORARY FENCE SYSTEM

CLIENT: NEW BRIDGE SERVICES
49 KAROONDA WAY
HAMPTON PARK VIC 3976

DATE OF TESTING: MAY 22ND 2008

DATE OF REPORT: MAY 23RD 2008

TEST SYNOPSIS:

Temporary fence panels, a number of concrete blocks, clamping fixtures and bracing members were delivered to the Melbourne Testing Services (MTS) laboratory for testing. Upon arrival at the laboratory the test items, as shown in Fig.1, were inspected and the following fence identification details were recorded:

Fence Panels: *2.3m wide x 2.0m high*

Outer Fence Frame: *Gal Pipe 33mm OD x 27.5mmID.*

Centre Support: *Gal Pipe 25mm OD diameter.*

Back Braces: *Gal Pipe 33mm x 27.5mmID.*

Mesh: *156mm x 38mm pitch rectangular pattern with 3.25mm diameter vertical wires and 4.00mm diameter horizontal wire.*

FIG.1.
TEST FENCE PANEL

Footings: *Plastic covered concrete footing blocks weighing nominally 32kg each with two holes positioned in the centre of the block.*

At the request of the client, tests were to be conducted to determine the performance attributes of individual and assembled fences in accordance with AS 4687-2007 TEMPORARY FENCING AND HOARDINGS.

The following tests were conducted in accordance with Section 4:

- Simulated Climbing Test
- Impact Test
- Infill Aperture Test
- Wind Force Overturning Test

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TEST PREPARATION:

Temporary fence panels were prepared for testing in both single panel and continuous panel configurations. Continuous panel testing was conducted on a three panel assembly with the middle panel being the focus of the testing. The temporary fencing was assembled using the supplied clamping fixtures and in accordance with the manufactures assembly guidelines.

SIMULATED CLIMBING TEST:

Simulated climbing tests were conducted by pulling the top rail of the fence panel vertically downward. A stiffened 400mm lever-arm attached to the centre of the fence panel was used to apply the load (See Fig.2). The downward force was continuously applied until an applied load of 65kg had been achieved. This test load was maintained for a period of 3 minutes.

FIG.2.
CLIMBING TEST

IMPACT TEST:

Impact testing was conducted by swinging a pendulum mass into the mesh infill of a single, unbraced panel (See Fig.3). Four test locations, as described in Fig.2 of AS 4687-2007 were selected and tests were conducted at an impact energy level of 150 joules. A visual inspection for damage to the fence panels, mesh infill, and infill/post connection points was conducted after each impact.

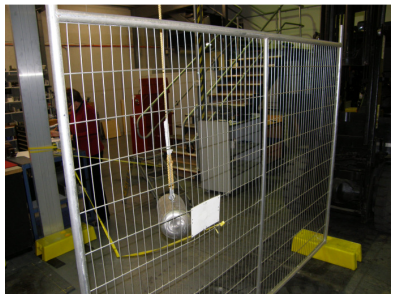

FIG.3.
IMPACT TEST

FOOTHOLD TEST:

(a) Aperture Width

Aperture width testing was conducted by attempting to pass a 76mm x 76mm test block through a mesh aperture (See Fig.4). Measurement of a single mesh aperture was also conducted to determine that the horizontal opening was less than the specified dimensional limit of 75mm.

(b) Infill Downward Load Test

To test that the infill mesh had sufficient stiffness to resist an attempt to climb the fence, a downward load of 100kg was applied at one of the rectangular shaped openings (See Fig.5). This load was maintained for 60 seconds at which point the downward deflection of the infill material was recorded.

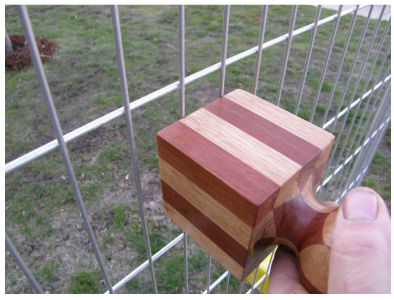

FIG.4.
APERTURE WIDTH TEST

SIMULATED WIND LOAD TEST:

Wind load testing was conducted by applying a lateral overturning load to the centre of the panel (See Fig.6). The test load was steadily increased until the concrete footing blocks were observed to have lifted from the ground, rendering the fence unstable. At this point the applied test load was maintained and the peak test load recorded. Wind load testing was conducted on unbraced panels as well as panels incorporating a back brace with a combination of single and double block support scenarios.

FIG.5.
INFILL TEST

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TEST OBSERVATIONS:

SIMULATED CLIMBING

The fence panels were visually inspected for signs of deformation and failure after completion of the test. No visible sign of permanent deformation or structural failure was observed in the panel or mesh upon completion of testing. The fence panel successfully supported a 65kg test load without overturning.

IMPACT TESTING

Inspection of the panel after an impact collision of 150 joules revealed the following observations:

- No penetration of the mesh.
- No failure between the welded mesh and post/rail connections.
- No visible sign of cracking.
- Did not overturning due to impact.
- Maximum dynamic deflection recorded was **38mm** which is less than the specified maximum allowable of 300mm.

FIG.6.
SIMULATED WIND LOAD TEST

FOOTHOLD APERTURE TESTS

(a) Aperture Width

The infill aperture horizontal width was measured to be **35mm**, less than the specified maximum of 75mm. A test block measuring 76mm x 76mm could not be passed through the rectangular shaped mesh infill.

(b) Infill Downward Load Test

Infill downward load test resulted in a deflection of **2mm**, less than the specified permissible maximum of 35mm.

SIMULATED WIND LOAD TESTING

Simulated wind load testing was conducted on various temporary fence panel erection scenarios including:

1. A stand alone, unbraced panel with two (2) concrete footings
2. Back braced panels with single and multiple back brace footings

In each case the tested panels resisted the simulated wind loads without failure of the fence's structural frame work or infill material.

Testing was conducted to the point where the fence panels were on the verge of tipping. The peak tipping force was recorded and is presented along with the calculated equivalent wind speed for each test in Appendix A.

SUMMARY

Unbraced Panels

The test results confirm that an unbraced, New Bridge Temporary Fence panel, as described and reported herein, meets the minimum requirements as specified in Section 4 of AS 4687-2007 TEMPORARY FENCING AND HOARDINGS for:

Simulated Climbing Test
Impact Test
Infill Aperture Width Test
Infill Downward Load Test

The minimum recorded test force of 0.21kN was greater than 0.19kN as required for a Region A Design Wind Speed of 15 metres per second.

Braced Panels

The test results confirm that a single New Bridge Temporary Fence panel without shade cloth and fitted with one back brace and one or two footing blocks as described and reported herein, meets the minimum requirements as specified by Section 4.5 of AS 4687-2007 TEMPORARY FENCING AND HOARDINGS for wind load tests per Table A1 and A2.

Notes:

1) Melbourne Testing Services Pty Ltd shall not be liable for loss, cost, damages or expenses incurred by the client or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Melbourne Testing Services Pty Ltd be liable for consequential damages including, but not limited to, lost profit, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested.
2) This report is specific to the temporary fence panels described herein, in their state at the time of testing. It should not be taken as a statement that all similar temporary fence panel assemblies or components of temporary fence panel assemblies in all states of repair, would also perform in a similar manner to items described herein.
3) Melbourne Testing Services shall take no responsibility for the procurement and authenticity of the temporary fencing as described herein.
4) Melbourne Testing Services shall take no responsibility for the onsite installation procedures used for the temporary fencing described herein.
5) It remains the responsibility of the client to ensure that the temporary fence panels tested are representative of the entire product batch.
6) Wind speed calculations based on AS/NZS 1170.2 2002 with an importance level of 1, terrain category of 2 and topographic multiplier of 1.

RODNEY WILKIE
AUTHORISED SIGNATORY

APPENDIX A

Fence Assembly Scenario	Infill Type (mm)	Bracing Condition (per panel)	Number of Blocks (per brace)	Test Load (kN)	Calculated Wind Speed Capacity (m/s)	Conformance with AS 4687	Australian Wind Region
New Bridge Single Panel	Rectangular Mesh	None	N/A	0.21	**15.7**	Pass	A
		1 back brace	1	0.67	**28.1**	Pass	A to D
	With Shade Cloth	1 back brace	2	1.11	**19.2**	Pass	A & B

TABLE A1.
WIND LOAD TEST DATA FOR
SINGLE PANELS

Fence Assembly Scenario	Infill Type (mm)	Bracing Condition (per panel)	Number of Blocks (per brace)	Test Load (kN)	Calculated Wind Speed Capacity (m/s)	Conformance with AS 4687	Australian Wind Region
New Bridge Double Panel	Rectangular Mesh	1 back brace	1	0.67	**22.5**	Pass	A to C
		1 back brace	2	1.11	**29.0**	Pass	A to D

TABLE A2.
WIND LOAD ANALYSIS FOR
DOUBLE (2) UNCOVERED FENCE PANELS

Fence Assembly Scenario	Infill Type (mm)	Bracing Condition (per panel)	Number of Blocks (per brace)	Test Load (kN)	Calculated Wind Speed Capacity (m/s)	Conformance with AS 4687	Australian Wind Region
New Bridge Triple Panel	Rectangular Mesh	1 back brace	1	0.67	**19.4**	Pass	A & B
		1 back brace	2	1.11	**24.9**	Pass	A to D

TABLE A3.
WIND LOAD ANALYSIS FOR
TRIPLE (3) UNCOVERED FENCE PANELS

Fence Assembly Scenario	Infill Type (mm)	Bracing Condition (per panel)	Number of Blocks (per brace)	Test Load (kN)	Calculated Wind Speed Capacity (m/s)	Conformance with AS 4687	Australian Wind Region
New Bridge Four Panel	Rectangular Mesh	1 back brace	1	0.67	**17.2**	Pass	A
		1 back brace	2	1.11	**22.2**	Pass	A to C

TABLE A4.
WIND LOAD ANALYSIS FOR
FOUR (4) UNCOVERED FENCE PANELS

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