

**IAN BENNIE AND ASSOCIATES**

**TEST REPORT NO. 8052S4-5-6**

**TERRACADE TN CLADDING  
WIND LOAD TESTS to AS4040**

**for**

**Austral Bricks P/L**

**November 2008**



Registered Laboratory No. 2371



# IAN BENNIE & ASSOCIATES PTY. LTD.

## Building Performance Testing

ACN : 007 133 253



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Laboratory  
No. 2371

### TEST REPORT NUMBER 8052S4-5-6

**Test Client**      **Austral Bricks P/L**

#### **Sample**

**Identification**      Three samples of Terracade TN Cladding were supplied for testing. The samples measured 1800 mm by 1800 mm and consisted of 3 tiles in width and 6 tiles in height. The tiles were mounted on vertical suspension rails that were fixed to a timber sub-frame. For these samples, a timber frame was fitted along the top edge of the top tiles to prevent them from lifting during the tests. General details of the samples are given in Figure 1. All components of the samples were as detailed in Austral Bricks P/L, Terracade TL Technical Manual – Issue A-0106.

Rail Identification (all samples): AUSTRAL-VTNRA27BLK

Tiles:      Sample S4 – Tile Batch Number TA 0108  
              Sample S5 – Tile Batch Number ST 0108  
              Sample S6 – Tile Batch Number GI 0108

The overall height and Critical Internal Dimension (CID) between the mounting nibs of each tile was measured by Austral prior to delivery to the Laboratory. These measurements are included with the test results for each sample.

**Test Method**      Negative wind load strength limit state testing was conducted in accordance with AS4040 Methods of testing sheet roof and wall cladding, Method 3: Resistance to wind pressures for cyclone regions. As the final static pressure stage of Method 3 is the same duration as required in Method 2: Resistance to wind pressures for non-cyclone regions, the result of the final stage is also evaluated for non-cyclone regions.

For the purpose of the tests, a thin plastic film was installed over the front of the suspension rails immediately behind the tiles. This film provided the air

seal for uniformly distributed air pressure loads applied from behind the sample.

Subsequent to the negative wind load testing, one of the samples, S5, was subjected to positive wind loading. For the purpose of this test, a thin plastic film was installed over the front of the tiles. This film provided the air seal for uniformly distributed air suction loads applied from behind the sample.

**Procedure:** AS4040.3 nominates a sequence of fatigue cycling based on the Ultimate Strength Limit State Pressure ( $P_t$ ) as follows:

8000 cycles ..... 0 to 0.40  $P_t$

2000 cycles ..... 0 to 0.50  $P_t$

200 cycles ..... 0 to 0.65  $P_t$

This fatigue test is then followed by a static test at 1.3 times the Ultimate Limit State Pressure for a period of 1 minute. Where two identical samples are tested AS4040.3 nominates the static pressure is reduced to 1.2  $P_t$  and to 1.0  $P_t$  when 3 samples are tested. Once this pressure had been the pressure was increased until either failure occurred or the maximum capacity of the test equipment was reached.

**Nominated Strength Limit State Pressure:** -4.4 kPa

## TEST RESULTS

### **Sample S4 – Tile Batch TA 0108**

**Test Location:** IBA Test Centre  
Dandenong, Melbourne.

**Test Date(s):** 7 October 2008.

#### **Tile Dimensions:**

The following table indicates the overall height and CID measurements for each tile as installed in the test sample (outdoor view).

309.2	309.4	309.3
255.1	254.8	254.4
309.3	309.3	309.1
255.9	256.1	255.8
309.7	309.3	309.4
255.7	255.7	255.6
309.3	309.0	309.1
255.7	255.2	255.4
309.3	309.2	309.5
255.2	254.2	255.7
309.6	309.0	308.8
254.2	254.6	254.7

#### **Observations:**

8000 cycles at	-1.76 kPa	No sign of failure was observed.
2000 cycles at	-2.20 kPa	No sign of failure was observed.
200 cycles at	-2.86 kPa	No sign of failure was observed.
Static load(s)	-5.5 kPa.	Pressures were applied incrementally up to -5.5 kPa (being the limit of the test equipment) and no sign of failure was observed.

## **Sample S5 – Tile Batch ST 0108**

**Test Location:** IBA Test Centre  
Dandenong, Melbourne.

**Test Date(s):** 7 October 2008.

### **Tile Dimensions:**

The following table indicates the overall height and CID measurements for each tile as installed in the test sample (outdoor view).

310.7	310.2	310.3
255.5	255.5	255.1
309.3	310.3	310.9
254.7	255.3	255.5
308.8	309.3	308.9
254.6	255.4	254.7
309.3	309.8	308.6
254.7	255.1	255.0
309.9	309.4	309.6
255.1	254.5	255.1
309.8	309.9	310.1
254.9	255.3	254.5

### **Observations:**

8000 cycles at	-1.76 kPa	No sign of failure was observed.
2000 cycles at	-2.20 kPa	No sign of failure was observed.
200 cycles at	-2.86 kPa	No sign of failure was observed.
Static load(s)	-5.2 kPa.	Pressures were applied incrementally up to -5.2 kPa (being the limit of the test equipment) and no sign of failure was observed.
	+5.0 kPa	No sign of failure was observed.
	+5.2 kPa	The load was sustain for 20 seconds and then the bottom and second bottom tiles on the left side of the sample broke vertically down their centres.

## **Sample S6 – Tile Batch GI 0108**

**Test Location:** IBA Test Centre  
Dandenong, Melbourne.

**Test Date(s):** 8 October 2008.

### **Tile Dimensions:**

The following table indicates the overall height and CID measurements for each tile as installed in the test sample (outdoor view).

310.5	310.3	309.7
255.5	255.1	254.4
310.2	310.3	310.0
255.2	255.5	255.0
310.5	310.3	309.6
255.4	255.2	255.2
310.3	310.2	310.2
255.1	255.3	255.1
309.9	309.8	309.7
254.8	255.1	253.4
310.2	310.3	310.3
255.0	254.5	254.1

### **Observations:**

8000 cycles at	-1.76 kPa	No sign of failure was observed.
2000 cycles at	-2.20 kPa	No sign of failure was observed.
200 cycles at	-2.86 kPa	No sign of failure was observed.
Static load(s)	-4.6 kPa	Pressures were applied incrementally up to -4.6 kPa and no sign of failure was observed.
	-4.9 kPa	The top right tile broke off from the clips. It appeared the tile broke at the bottom clips first. There was no damage or deformation apparent on the clips.

**Requirement:**

AS1562.1 Design and installation of sheet roof and wall cladding, specifies that the cladding system remain substantially in position, notwithstanding any permanent distortion, fracture or damage that might occur in the sheeting or fastenings.

**Conclusion:**

The test samples passed the test requirements of Australian Standard AS4040 Methods of testing sheet roof and wall cladding at the following strength limit state pressures:

<b>Cyclone Regions:</b>	<b>-4.4 kPa</b>	
<b>Non-cyclone Regions:</b>	<b>-4.6 kPa</b>	(based on Sample S6)
	<b>+5.0 kPa</b>	(based on Sample S5)

**DISTRIBUTION:**  
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Derek Dubout 14 November 2008  
Authorised NATA Signatory

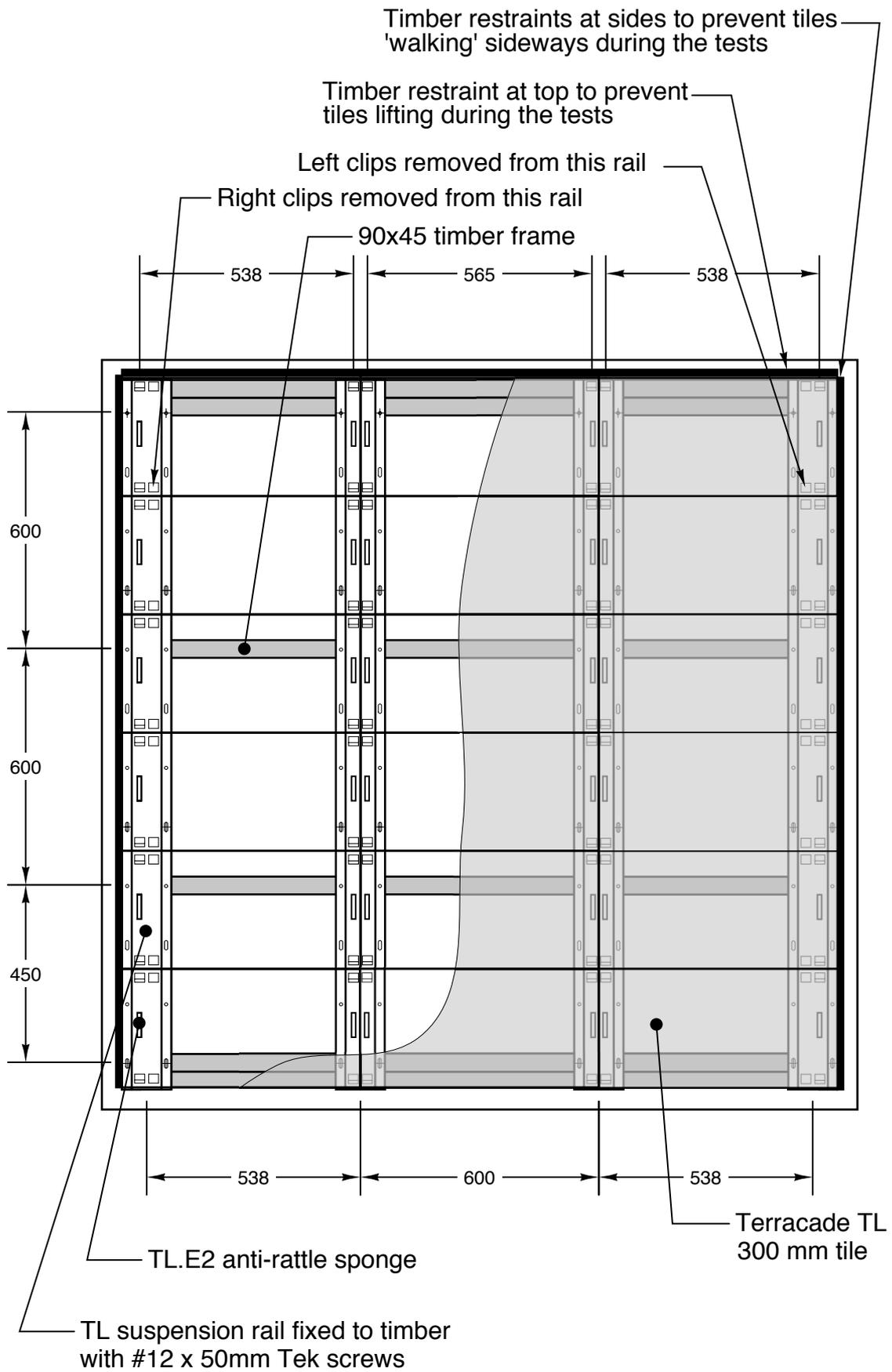


Figure 1. Front elevation of the test samples.