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AAMA 506-06 / ASTM E1996 / ASTM E1886 HURRICANE IMPACT AND PRESSURE CYCLE TEST REPORT

310-1788

REPORT TO:
PROWLER PROOF
122 BUCHANAN ROAD
BANYO, QLD. AUSTRALIA 4014

ORIGINAL REPORT NUMBER: 310-1788
ORIGINAL REPORT DATE: 06/23/2011

PRODUCT:
FORCEFIELD FACE FIXED
867 mm x 2445 mm (34 1/8” x 96 1/4”)
EXTERIOR SCREEN

REPORT TO:	Prowler Proof 122 Buchanan Road Banyo, QLD. Australia 4014
STARTING TEST DATE: ENDING TEST DATE:	06/08/2011 06/09/2011
STANDARDS/SPECIFICATIONS:	AAMA 506-06 Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products. ASTM E1996-05 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes. ASTM E1886-05 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.

DESCRIPTION OF SAMPLE TESTED

MODEL/TYPE:	Forcefield Face Fixed Screen.
CONFIGURATION:	O
FRAME SIZE:	867 mm (34 1/8”) x 2445 mm (96 1/4”)
FRAME TYPE:	Extruded aluminum of alloy 6060 perimeter frame with a temper of T5.
JOINT CONSTRUCTION:	All corners were mitered and welded.
SCREEN SYSTEM:	The mesh infill is made from 0.8 mm diameter wire of 316 marine grade stainless steel with 11/10.5 strands per 25 mm (1”). The mesh infill was fixed to the extruded aluminum frame using a synthetic compound with an edge cover of 10 mm (3/8”) along all four edges and retained with a black FF retainer. See drawings for details.
INSTALLATION METHOD:	The screen frame was attached to the face of a 51 mm x 152 mm (2 x 6) wood test buck and screw-connected through the face of the screen frame at 51 mm (2”) from each corner and 305 mm (12”) on center around the perimeter. 9 screws total per long dimension and 4 screws total per short dimension. 26 screws total.

LARGE MISSLE IMPACT AND CYCLING TEST
AAMA 506-06/ASTM E 1996-05/ASTM E 1886-05

The appropriate missile to be used for impact tests was selected in accordance with section 6 of ASTM E1996 based on the following criteria:

Level of Protection:	Basic Protection
Wind Zone:	Wind Zone 3 – 58 m/s (130 mph) ≤ basic wind speed ≤ 63 m/s (140 mph), or 54 m/s (120 mph) ≤ basic wind speed ≤ 63 m/s (140 mph) and within 1.6 km (one mile) of the coastline. The coastline shall be measured from the mean high water mark.
Assembly Height Above Ground:	Less than or equal to 9.1 m (30 ft). Missile Level D

IMPACT AND CYCLING TEST RESULTS

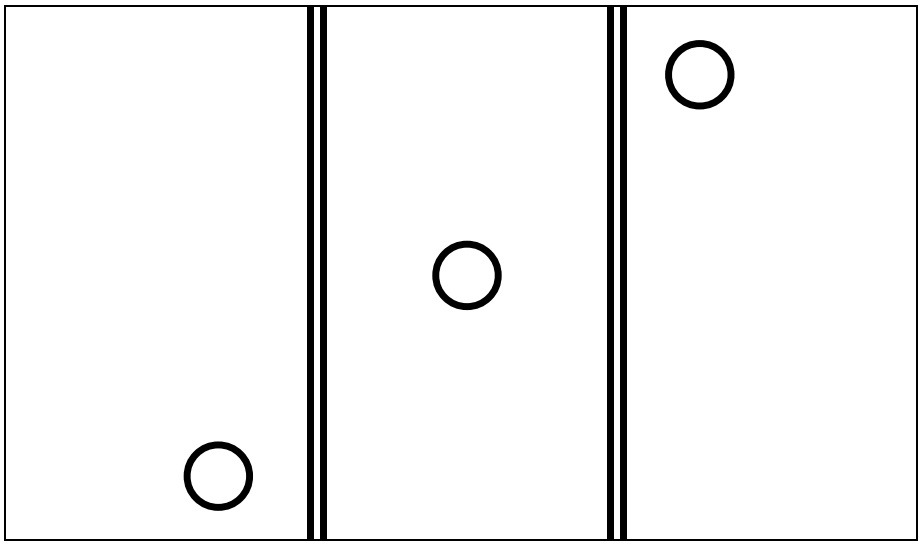
4.1 Test Specimens:
Three (3) test specimens were submitted for impact testing. All specimens used identical materials, details, and methods of construction.

4.3 Location of Impact:
Missile impact locations were in accordance with section 5.3 of ASTM E 1996.

Specimen #1: Impact Location – Bottom right corner of Screen System.

Specimen #2: Impact Location – Center Point of Screen System.

Specimen #3: Impact Location – Upper left corner of Screen System.



SPECIMEN # 1 SPECIMEN # 2 SPECIMEN # 3

5.4 Air Pressure Cycling.

After completion of the impact tests, the specimens were pressure cycled in accordance with Table 1 of ASTM E1996-05.

All Specimens

Design Load: ± 2880 Pa (60.0 psf)

Loading Sequence	Loading Direction	Actual Load Cycle Pa (psf)		Number of Air Pressure Cycles	Cycle Time (Seconds)
1	Positive .2 - .5	580 pa (12.0 psf)	1440 pa (30.0 psf)	3500	< 5
2	Positive .0 - .6	0 pa (0 psf)	1720 pa (36.0 psf)	300	< 5
3	Positive .5 - .8	1440 pa (30.0 psf)	2300 pa (48.0 psf)	600	< 5
4	Positive .3 - 1.0	860 pa (18.0 psf)	2880 pa (60.0 psf)	100	< 5
5	Negative .3 - 1.0	860 pa (18.0 psf)	2880 pa (60.0 psf)	50	< 5
6	Negative .5 - .8	1440 pa (30.0 psf)	2300 pa (48.0 psf)	1050	< 5
7	Negative .0 - .6	0 pa (0 psf)	1720 pa (36.0 psf)	50	< 5
8	Negative .2 - .5	580 pa (12.0 psf)	1440 pa (30.0 psf)	3350	< 5

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6.2.1 Missile Description.

Large missile impacts were conducted using a #2 common 51 mm x 102 mm (2" x 4") timber with a circular sabot attached to the trailing end. The large missile measured 2375 mm (96") and weighed 4100 g (9.0 lbs).
Missile Level D

6.2 Pass/Fail Criteria.

For pass/fail criteria, no penetration is defined as no tear longer than 127 mm (5") in length and 1.59 mm (.063") wide through which air can pass, or no opening through which a 76 mm (3") diameter solid sphere can freely pass when evaluated upon completion of the missile impacts and cycling test.

TEST RESULTS

LARGE MISSILE TEST	
Specimen	**Results after Impact Test**
1	Impact rejected missile without penetration.
2	Impact rejected missile without penetration.
3	Impact rejected missile without penetration.

AIR PRESSURE CYCLING TEST	
Specimen	**Results after Impact and Cycle Testing**
1	Specimen showed no resultant failure or duress after cycle testing. No failure of fasteners or separation of screen from the frame.
2	Specimen showed no resultant failure or duress after cycle testing. No failure of fasteners or separation of screen from the frame.
3	Specimen showed no resultant failure or duress after cycle testing. No failure of fasteners or separation of screen from the frame.

Notes: 1) Missile speed at impact complied with section 11.2.1 of ASTM E 1886-05 and Table 2 of ASTM E 1996-05, missile level D.
2) Missile orientation at impact complied with section 11.2.2 of ASTM E 1886-05.
3) The specimens were conditioned to 21.2°C (70°F) prior to testing.
4) A 2 mil Polyethylene film was used during the cycle test and it is the opinion of the undersigned that it had no influence on the results of these tests.

The listed results were obtained using the ASTM E 1886-05 test method and indicate compliance with the performance requirements of ASTM E 1996-05 for the listed test parameters at ± 2880 Pa, (60.0 psf).

The results were secured by using the designated test methods and they indicate compliance with the performance requirements of the referenced specification. A copy of this report has been forwarded to the Administrator of the Certification Program. This report does not constitute certification of this product, which may only be granted by the Administrator.

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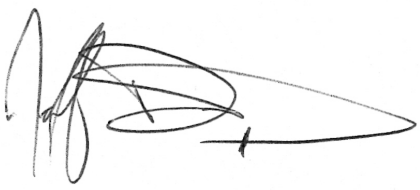
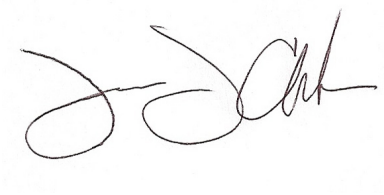


Jeffrey M. Douglas
Laboratory Manager



Jim Clarke
Test Technician

ERRATA/ADDENDUM SUMMARY

Revision No.	Date	Page No.	Description/Example
Released Original Report	06/23/2011		