10. SUMMARY

The testing programme for the cavity units was based on the requirements of the relevant Australian Standards, namely, AS1720.1 – 2010 Timber structures Part 1 – Design Methods - Appendix D Acceptance Testing of Timber Structures and Elements for the timber framed cavity units and AS/NZS 4600:2018 Cold-formed steel structures – Section 8 – Testing for the steel framed cavity units.

When this testing program was being devised, it was intended to test 5 units of each type. During the testing it became apparent that the test units had sufficient capacity to support the intended loads. As such, it was decided to reduce the number of tests, which required a corresponding increase in the test loads.

The testing programme has tested the following cavity wall units:

(i) Two 90mm wide timber framed units with 7.5mm thick wall sheeting, one of which was re-tested with a 6mm thick wall sheet
(ii) One 70mm wide timber framed unit one with 7.5mm wall sheeting, re-tested with a 6mm thick wall sheet
(iii) One 70mm wide steel framed unit with 7.5mm thick wall sheeting
(iv) One 64mm wide steel framed unit with 6mm thick wall sheeting

The re-testing referred to in Items (i) and (ii) above were undertaken to satisfy the acceptance criteria for deflections set out in Clause D4.2 of AS1720.1.

Each of the units was loaded with test loads equivalent to 2.7 (90mm wide timber unit) to 2.9 (70mm wide timber unit, 70mm wide steel unit and 64mm wide steel unit) times the actual tile loads intended to be supported by them.

Loading was in the form of thin steel sheets hung from support points fixed to the fibre cement sheeting. For each layer of steel applied to the test units, the resulting lateral deflections were measured and recorded. The test loads we sustained on the test units for the required timeframes set out in the relevant Australian Standards

The results of the testing are summarised in Table 18 below. The strength and deflection criteria, as applicable, referred to in Table 18 are set out in the following Australian Standards:

- For timber test units: AS1720.1 – 2010 Timber structures Part 1 – Design Methods - Appendix D Acceptance Testing of Timber Structures and Elements
- For steel test units: AS/NZS 4600:2018 Cold-formed steel structures – Section 8 – Testing

Cavity Unit Type	Strength Criteria	Deflection Criteria	Overall Criteria
Test Unit #1 – 90mm Timber Frame – 7.5mm sheeting	Pass	Conditional Pass	Conditional Pass
Test Unit #2 – 90mm Timber Frame – 7.5mm sheeting – Re-tested with 6mm sheeting (Test Unit #2R)	Pass	Pass	Pass
Test Unit #3 – 70mm Steel Frame – 7.5mm sheeting	Pass	Not Applicable	Pass
Test Unit #4 – 70mm Timber Frame – 6mm sheeting – Re-tested with 6mm sheeting (Test Unit #4R)	Pass	Pass	Pass
Test Unit #5 – 64mm Steel Frame – 6mm sheeting	Pass	Not Applicable	Pass

TABLE 18 – SUMMARY OF TEST RESULTS

Based on the test results, it is our opinion that all timber cavity units, namely 70mm wide and 90mm wide, to suit the Hume Doors and Timber range of doors up to 2340mm by 1200mm wide are suitable to support an "all-up" wall load of 40kg/m^2 *, which includes:

(a) 6mm Cemboard Prima Aqua fibre cement sheet
(b) Tile adhesive applied with notched trowel with a 6mm maximum tooth depth (for the purposes of this testing, we have assumed the resulting tile adhesive depth is 3mm maximum)
(c) 8mm max thickness porcelain or ceramic wall tiles
(d) Standard tile grout

While all test units, timber of steel, were loaded to the same Test Load, due to the lesser load testing requirements of AS4600, for steel units, compared to AS1720.1, for timber units, the steel framed units are able to be loaded to a higher load rating than the timber units.

Based on the test results, it is our opinion that all steel cavity units, namely 64mm, 70mm and 90mm wide, to suit the Hume Doors and Timber range of doors up to 2340mm by 1200mm wide are suitable to support a minimum "all-up" wall load of 45kg/m^2 *, which includes:

(a) 6mm Cemboard Prima Aqua fibre cement sheet
(b) Tile adhesive applied with notched trowel with a 6mm maximum tooth depth (for the purposes of this testing, we have assumed the resulting tile adhesive depth is 3mm maximum)
(c) 8mm thickness porcelain or ceramic wall tiles
(d) Standard tile grout

* The loads quoted above are greater than the test loads nominated earlier in the report because the test loads included an allowance for wall sheeting. As actual wall sheeting was used in the test, there is a double up of that load, resulting in the wall being tested to a higher load than the originally quoted Test Loads. This additional load has been taken into consideration in the quoted figures above.

Test results are applicable for both residential and commercial applications.

All cavity units are to be fixed to the surrounding stud framework in accordance with the Hume Doors and Timber Pty Ltd installation instructions. (Refer to Appendix A).

All sheeting is to be fixed to the cavity units in accordance with the Hume Doors and Timber Pty Ltd installation instructions.

BORNHORST & WARD PTY LTD

A. Ross Kynaston.

ANDREW ROSS KYNASTON
RPEQ No. 5738

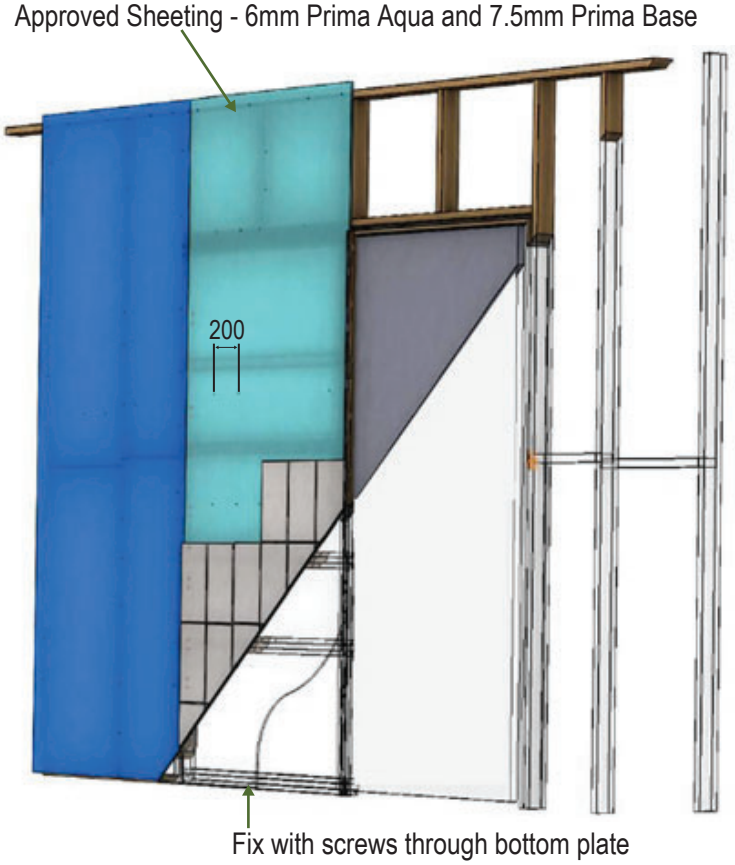
APPENDIX A

HUME DOORS AND TIMBER PTY LTD
TILING DIRECT TO CAVITY UNIT INSTALLATION INSTRUCTIONS

EVOLUTION CAVITY UNIT

TILING DIRECT TO CAVITY UNIT

INSTALLATION INSTRUCTIONS



INSTALLING CAVITY FOR TILED AREA

Follow our Evolution Cavity Unit installation instructions as supplied with your cavity or download them on our website:
www.humedoors.com.au/downloads#installation

IMPORTANT: The below points must be followed when installing into a tiled area:

1. Track must be fixed using every pre-punched hole
2. Fix back post to stud with a minimum of 5 screws/nails, spaced evenly.
3. Ensure Cavity unit is plumb and level
4. Fix with screws through bottom plate

Once cavity unit is installed you are ready to apply sheeting and tile the wall.

Please follow the instructions for your cavity type below to ensure your wall is prepared correctly for tiling.

HUME EVOLUTION **TIMBER**

APPROVED SHEETING MATERIAL

6mm Prima Aqua
7.5mm Prima Base

REQUIRED FIXINGS

8G coarse thread self-tapping screws
For 70/75mm stud use 16mm long screws
For 90/100mm stud use 25mm long screws
Screws must not penetrate inside pocket of cavity unit

FIXING SHEET TO CAVITY UNIT

Fix Approved sheeting to cavity unit (see diagram) with 8G coarse thread screws as detailed above

Screws must be spaced 200mm apart (centred)

SIZE & WEIGHT

Tested for Max load of 40kg/m²
Sizes up to 2340 x 1200 (Door) x 70/75/90/100mm stud thickness

HUME EVOLUTION **STEEL**

APPROVED SHEETING MATERIAL

6mm Prima Aqua
7.5mm Prima Base

REQUIRED FIXINGS

8G self-drilling metal screws
For 64mm stud use 13mm long screws
For 70/75mm stud use 16mm long screws
For 90mm stud use 25mm long screws
Screws must not penetrate inside pocket of cavity unit

FIXING SHEET TO CAVITY UNIT

Fix Approved sheeting to cavity unit (see diagram) with 8G self-drilling screws as detailed above

Screws must be spaced 200mm apart (centred)

SIZE & WEIGHT

Tested for Max load of 45kg/m²
Sizes up to 2340 x 1200 (Door) x 64/70/75/90mm stud thickness

For further information please refer to test data on our website **https://www.humedoors.com.au/downloads#technical-information**