



CLASSIFICATION REPORT

Classification report in accordance with AS5113:2016

Test sponsors: TBA Textiles Pty Ltd

Address: 12/8 Leighton Place

Hornsby, NSW, 2077

Australia

Job number: RTF180280 Author: Muntaqim Pereira

Test date: 14 December 2018 Revision: R1.0

Amendment schedule

Version	Date	Information relating to report		
R1.0	21/05/2019	Description	Initial Issue.	
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Executive summary

Objective

This report presents the classification of the system detailed in section 2. The classification is carried out in accordance with the procedures given in AS 5113:2016 - "Fire propagation testing and classification of external walls of buildings".

Sponsors

TBA Textiles Pty Ltd, 12/8 Leighton Place, Hornsby NSW 2077, Australia.

Test results

The AS5113:2016 EW classification indices as related to a BS8414-2 test are detailed below.

Classification Criteria	Related classification measure	Result in test	Pass/Fail
5.4.5(a) T_{w5m}	$\leq 600^{\circ}\text{C}$	Maximum 500°C at 22 minutes 29 second after crib ignition	Pass
5.4.5(b) $T_{\text{layer5m, Panel}}$	$\leq 250^{\circ}\text{C}$	Maximum 238°C at 54 minutes 25 seconds after crib ignition	Pass
5.4.5(b) $T_{\text{layer5m, Frame}}$	$\leq 250^{\circ}\text{C}$	Maximum 106°C at 50 minutes 35 seconds after crib ignition	Pass
5.4.5(c) $T_{\text{unexposedside0.9m}}$	$\leq 180^{\circ}\text{C}$ Rise	Maximum 425°C at 54 minutes 20 seconds after crib ignition	Fail
5.4.5(d) flaming	Flaming	Flaming was evident on the unexposed side	Fail
5.4.5(d) openings	No openings	The plasterboard lining on the unexposed side had opened	Fail
5.4.5(e) spread	No spread beyond specimen	Flames spread beyond the specimen confines	Fail
5.4.5(f) debris flaming	≤ 20 s	Several instances of debris flaming for more than 20 seconds was observed	Fail
5.4.5(g) debris mass	≤ 2 kg	20.77kg	Fail
Classification			NIL

Date of test

14 December 2018

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1. Introduction

This report presents the classification of the system detailed in section 2. The classification is carried out in accordance with the procedures given in AS 5113:2016 - "Fire propagation testing and classification of external walls of buildings". This classification should be read in conjunction with this document.

The tests referenced in the classification report are:

- RTF180280, carried out to BS 8414-2:2015 with the additional requirements as per AS 5113:2016 as required to ascertain compliance with EW classification.
- A BB test in accordance with AS 5113-2016 Appendix C test had not been conducted at the time of issuance.

2. Schedule of components

2.1 EW Specimen Schedule

Item		Description
Test Specimen		
1	Name	CFC panel
	Material	9mm thick compressed fibre cement
	Size	Nominal: 2400mm long × 1200mm wide × 9mm thick (cut to size) Mass per unit area: 17 kg/m ² (manufacturer specification)
	Installation	Twenty (20) panels in total were installed on the main and wing wall. The panels were screw fixed using screws (item 17) to the 35mm top hats (300mm centres vertically for intermediate top hat (item 2) and 400mm centres vertically for grooved top hat (item 3)) and 600mm centres horizontally. The screw holes were pre-drilled before being installed. Equal angles (item 13) were fixed at the corner of the main and wing wall, sandwiched between the panel and the intermediate top hats (item 2). Sealants (item 11) were used between the panel to panel joins as well as between the panel and the grooved top hats (item 3) and between the panel and the equal angles (item 11). The panel was also used as capping at the inner wall of the chamber opening. The edge of the panels were capped using a layer of ceramic wool (item 24). At the false slab levels, backing strips (item 10) were installed behind the panels, and basalt rock fibre (item 16) was installed horizontally along the levels to act as cavity barriers. For more details refer to Appendix A.
2	Name	Intermediate 35mm Top Hats
	Material	1.15mm thick Galvanised Steel
	Size	Overall Size: 90mm wide × 35mm high × 3600mm long (cut to length) 50mm wide web
	Installation	The top hats were installed vertically over 15mm horizontal top hats (item 4) and screw fixed at nominal 1200mm horizontal centres, alternating with grooved top hat (item 3). The screws were screw fixed at nominal 300mm centres using hex head screws (item 18). The face of the top hats was applied with a continuous bead of sealant (item 11). For more details refer to Appendix A.
3	Name	Grooved 35mm Top Hats
	Material	1.15mm thick Galvanised Steel
	Size	Overall Size: 171mm wide × 35mm high × 3600mm long (cut to length) There were 29mm, 59mm and 29mm wide web with 5mm gaps in between.
	Installation	The top hats were installed vertically over 15mm horizontal top hats (item 4) and screw fixed at nominal 1200mm horizontal centres, alternating with intermediate top hat (item 2). The top hats were screw fixed at nominal 300mm centres using hex head screws (item 18). A vertical gasket (item 9) was fixed onto the middle web of the top hat. For more details refer to Appendix A.
4	Name	15mm Top Hats
	Material	1.15mm thick Galvanised Steel
	Size	Overall Size: 90mm wide × 15mm high × 3600mm long (cut to length) 50mm wide web

	Installation	The top hats were installed horizontally over the steel framing (item 6), sandwiching the sarking (item 5) in between. The top hats were fixed at nominal 1200mm vertical centres, using screws (item 18) at nominal 600mm centres. An additional top hat was installed horizontally above the chamber opening. For more details refer to Appendix A.
5	Name	Sarking
	Density	386.2kg/m ³ (measured)
	Installation	Installed horizontally directly over the steel framing (item 6). The sarking was installed starting from the bottom of the specimen with the next piece overlapping the first piece by 150mm. The sarking was secured to the steel framing (item 6) using screws (item 20). The sarking overlap was not taped over using any type of adhesive. For more details refer to Appendix A.
6	Name	Steel Framing
	Material	92mm deep × 32mm wide 1.15 BMT steel studs and noggings.
	Installation	There were six (6) different sizes of steel framing. The steel frames were secured to the false slab levels of the steel substrate (item 25) at nominal 600mm centres with screws (item 22). The ground level main wall steel frame was an overall 3035mm wide x 2625mm high with studs at nominal 600mm centres with the corner side containing two (2) studs at 110mm centres. An additional stud and track lined the top of the reveal of the test specimen. The first level main wall framing was 3035mm wide x 2625mm high and the second level main wall was 3035mm wide x 2175mm high. The steel studs of both steel frames were at nominal 600mm centres with no noggings with the corner side containing two (2) studs 110mm apart. The ground, first and second level of the wing wall frame were 1500mm wide and 2625mm, 2625mm, and 2175mm high, respectively. The steel studs were installed at nominal 600mm centres. The tracks and studs were fixed together using button head screws (item 21). The cavity of the steel framing was infilled with PIR panels (item 7). For more details refer to Appendix A.
7	Name	PIR Insulation Board (Double Foil Faced)
	Size	Overall size: 1196mm wide × 2407mm long × 70mm thick (cut to size) Foil/paper thickness: 0.1mm (both faces) Mass per unit area: 2.67 kg m⁻² (Foil and Core) Density of core: 33.9 kg m⁻³
	Installation	Installed in the cavities of the steel framing (item 6). The PIR boards were cut to size and filled the stud cavities as well. The joins were taped over on both sides using silver foil tape (item 14). For more details refer to Appendix A.
8	Name	13mm Non-fire rated Plasterboard
	Size	1200mm wide × 3000mm long × 13mm thick (cut to size)
	Mass per unit length	10.0 kg m ⁻¹ (measured)

	Installation	Installed on the unexposed side of the steel framing (item 6) and screw fixed to the steel framing at nominal 300mm vertical centres with plasterboard screws (item 19). For more details refer to Appendix A.
9	Name	Vertical gasket
	Size	48mm × 3.2mm thick
	Installation	Adhered to the centre of each grooved top hat (item 3), to act as vertical joint closers between panel to panel (item 1) joints.
10	Name	Backing strip – Colorbond steel
	Size	1194mm x 60mm x 1mm thick
	Installation	Installed horizontally between the panel (item 1) and the cavity barriers (item 16), along the length of each false slab levels. A continuous bead of sealant (item 11) was applied along the lower sides of strip that faced the panels, to act as adhesive.
11	Name	Fire-rated sealant
	Installation	Applied between the panel to panel joints to full panel thickness. Also applied on the steel angles (item 13) and on the backing strip (item 10).
12	Name	Horizontal gasket
	Material	Made from PVC Nitrile foam. The gasket has adhesive on one side (with release paper) adhered to the backing strip to prevent moisture entry at horizontal joints.
	Size	18mm × 3mm thick
	Installation	Adhered to the top side of the backing strip (item 10), to act as horizontal joint closer between panel to panel (item 1) joints.
13	Name	Galvanised Steel angle
	Size	50mm × 50mm × 1.15mm thick
	Installation	Used as the back support for the main wall to wing wall corner panel joint. A continuous bead of sealant (item 11) was applied on both sides of the angle, sandwiched between the panel (item 1) and the angle.
14	Name	98mm wide silver foil tape
	Installation	Used to tape over the insulation (item 7) joints.
15	Name	Galvanised steel angle
	Size	50mm × 70mm × 1.15mm thick
	Installation	Installed above the chamber opening. Sandwiched between the 15mm top hat (item 4) and the sarking (item 5).
16	Name	Basalt rock fibre cavity barrier
	Size	50mm × 65mm (cut to size and compressed to 50 x 50mm when installed) Density: 69kg/m ³
	Installation	Installed horizontally along each false slab levels. The cavity barriers were friction fitted behind the backing strips (item 10).
Fixings		
17	Name	10g x 30mm wafer head galvanised Expresswall screws
	Installation	Used with washer (item 23) to screw fix the panels (item 1) to the vertical top hats (item 2 and 3).
18	Name	Hex Head Self Drilling 12g × 20mm metal screw
	Installation	Used to secure the top hats (item 2, 3 and 4) to the steel framing (item 6) on both sides of the top-hat.

19	Name	Bugle Head Drill Point Fine Thread ZY PB 6g × 32mm long screws
	Installation	The screws were used to screw fix the plasterboard (item 8) to the steel framing (item 6) at nominally 300mm centres.
20	Name	10 – 16 x 16mm SDS wafer head screw
	Installation	Used to secure the sarking (item 5) to the steel framing (item 6). Screw fixed at nominal 1000mm centres.
21	Name	14g × 16mm needle point screws
	Installation	Used to screw fix the steel framing (item 6) studs and noggings.
22	Name	Hex Head 12g × 65mm long self-drilling screws
	Installation	Used to secure the steel framing (item 6) to the false level of the steel substrate (item 25) at nominal 600mm centres.
23	Name	Weather seal washer
	Installation	Used with Expresswall screws (item 17) to screw fix the panels (item 1) to the vertical top hats (item 2 and 3).
End capping		
24	Name	Ceramic wool
	Size	25mm thick x 285mm wide (cut to edge size)
	Installation	Installed vertically along the outer edge of the test specimen.
Steel Substrate		
25	Items	Steel substrate
	Size	The steel substrate was overall 9.3m high × 3.245m wide for the main wall and 9.3m high × 2.0m wide for the wing wall
	Installation	The substrate consisted of structural steel sections and SHS. 150mm × 5mm thick SHS beams were used as false slabs; these beams were located 2625mm, 5625mm and 7950mm high from the ground, respectively

2.2 BB Specimen Schedule

Test was not conducted at the time of issuance of this report.

3. Test procedure

3.1 Statement of compliance

The EW test was performed in accordance with the requirements of BS 8414-2:2015 and AS5113:2016 as appropriate for external walls of buildings fixed to and supported by a structural steel frame.

The BB test was not conducted.

3.2 Variations to test method

The ignition source of the test was constructed from Pinus Radiata instead of Pinus Silvestris.

3.3 Pre-test conditioning

The EW specimen was completed on 14 December 2018.

Once the system was completed, the test specimen was protected from adverse environmental conditions.

3.4 Sampling/specimen selection

The laboratory was not involved in sampling or selecting the test specimen for the reaction-to-fire test. All test materials were supplied by the test sponsor and installed by representatives of Warringtonfire Australia..

3.5 Ambient Temperature and Wind Speed

The EW test ambient temperature at the start of the test was 22°C and wind speed at the start of the test was 0.0 – 0.3m/s.

3.6 Specimen Orientation

The specimen was asymmetrical and was exposed in the direction that would be expected in practice.

3.7 Ignition source

Softwood (pinus radiata) was used as the crib material with moisture content of 13% and a density of 0.52kg/dm³.

3.8 Test duration

The test duration was 60 minutes.

4. Test results

4.1 Peak temperatures

EW Test Temperatures

Parameter	Results
t _s , start time	5 minutes 20 seconds after ignition of crib
Peak temperature/time at Level 2, 50mm external	500°C at 17 minutes 09 seconds after t _s
Peak temperature/time at Level 2, Panel layer	238°C at 49 minutes 05 seconds after t _s
Peak temperature/time at Level 2, Frame layer	106°C at 45 minutes 15 seconds after t _s
Peak temperature/time at Level 1, 50mm external	909°C at 17 minutes 05 seconds after t _s
Peak temperature/time at 900mm above lintel	425°C at 49 minutes 00 seconds after t _s

BB Test Temperatures

Parameter	Result
Peak temperature/time, cavity (panels)	Not conducted.
Peak temperature/time, unexposed	

4.2 Test results

The AS5113:2016 EW classification indices as related to a BS8414-2 test are detailed below.

Classification Criteria	Related classification measure	Result in test	Pass/Fail
5.4.5(a) T _{w5m}	≤600°C	Maximum 500°C at 22 minutes 29 second after crib ignition	Pass
5.4.5(b) T _{layer5m, Panel}	≤250°C	Maximum 238°C at 54 minutes 25 seconds after crib ignition	Pass
5.4.5(b) T _{layer5m, Frame}	≤250°C	Maximum 106°C at 50 minutes 35 seconds after crib ignition	Pass
5.4.5(c) T _{unexposedside0.9m}	≤180°C Rise	Maximum 425°C at 54 minutes 20 seconds after crib ignition	Fail
5.4.5(d) flaming	Flaming	Flaming was evident on the unexposed side	Fail
5.4.5(d) openings	No openings	The plasterboard lining on the unexposed side had opened	Fail
5.4.5(e) spread	No spread beyond specimen	Flames spread beyond the specimen confines	Fail
5.4.5(f) debris flaming	≤20 s	Several instances of debris flaming for more than 20 seconds was observed	Fail
5.4.5(g) debris mass	≤2 kg	20.77kg	Fail
Classification			NIL

The AS5113:2016 BB classification indices as related to Clause 5.2(b) (iii) when tested to Appendix C are detailed below.

Classification Criteria	Related classification measure	Result in test	Pass/Fail
5.4.6(b) T _{cavity5m, Panels}	≤250°C	Not Conducted	
5.4.6(b) T _{unexposed side}	≤180°C		
5.4.6(c) Flaming Unexposed	No flaming		
5.4.6(d) Flaming Exposed	≤30 s		
5.4.6(e) Debris Flaming	≤20 s		
5.4.6(f) Debris Mass	≤2 kg		
Classification			-

4.3 Classification

FFP: NIL / -

5. Application of test results

The result of fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions.

This report details methods of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in AS 5113.

Any significant variation with respect to size, constructional details, edge or end conditions, other than those allowed under the field of direct application in the relevant test method, is not covered by this report.

Because of the difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy of the result.

Appendix A Drawings of test assembly

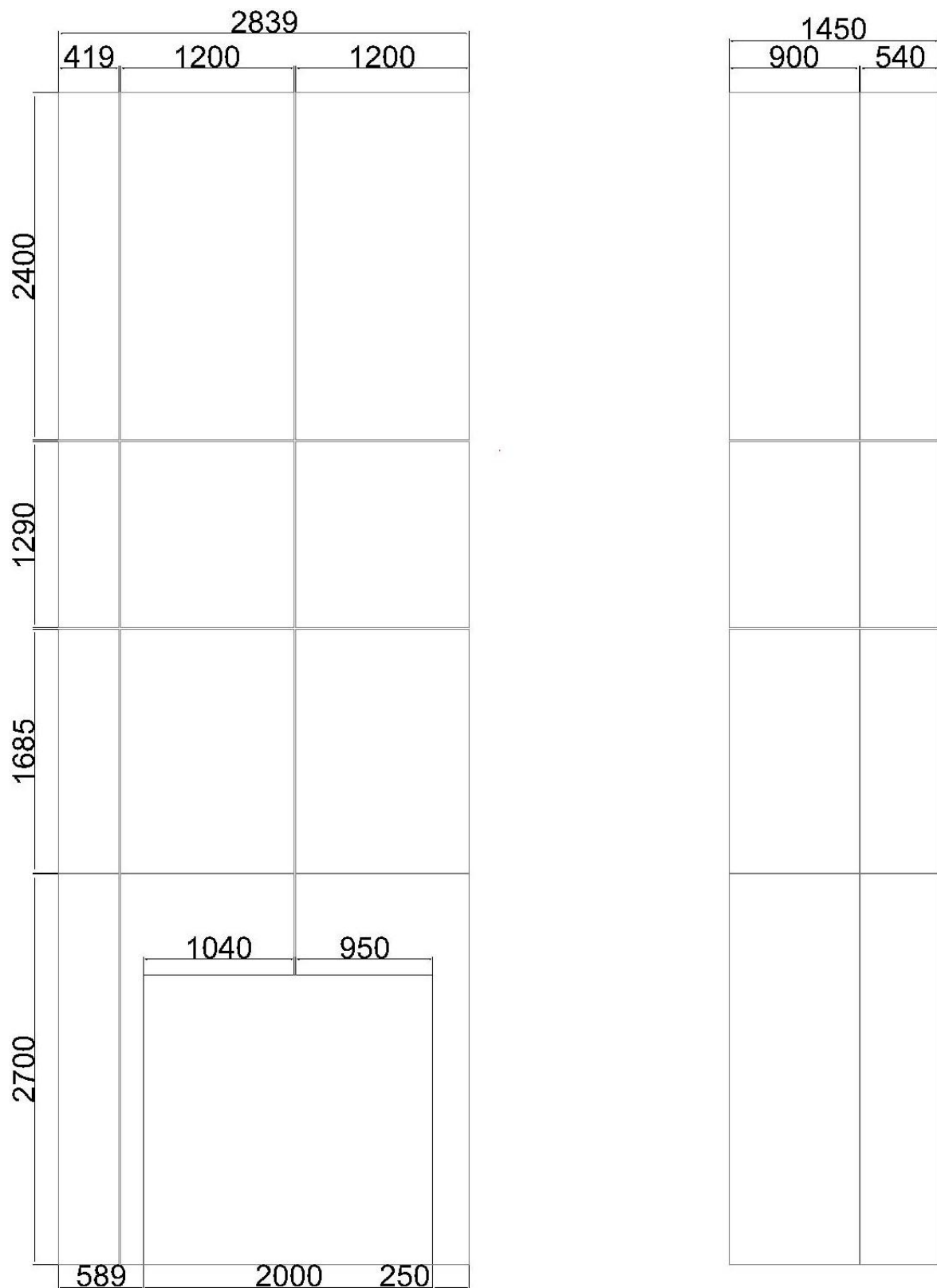


Figure 1 Panel layout

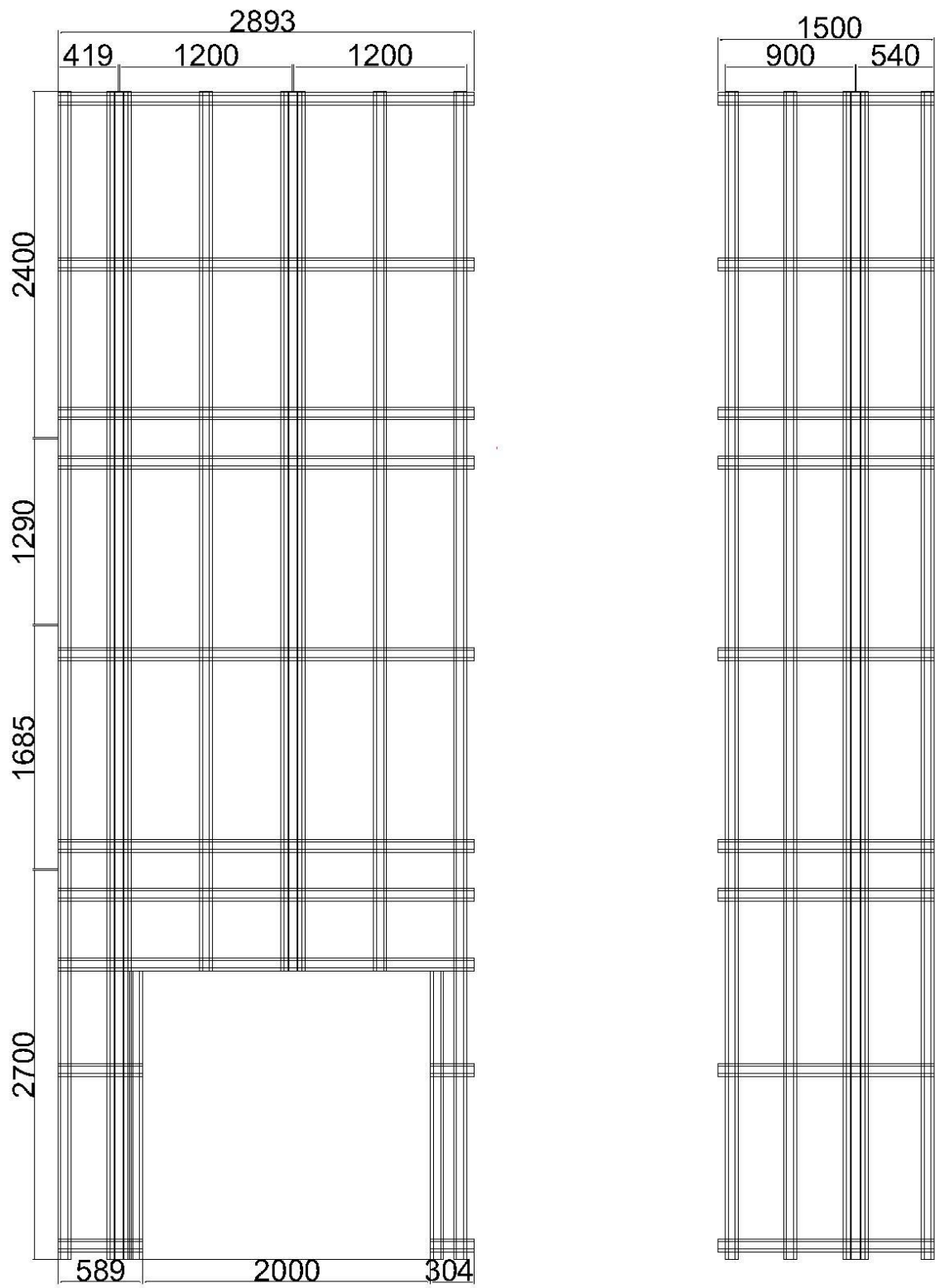


Figure 2 Top hat layout

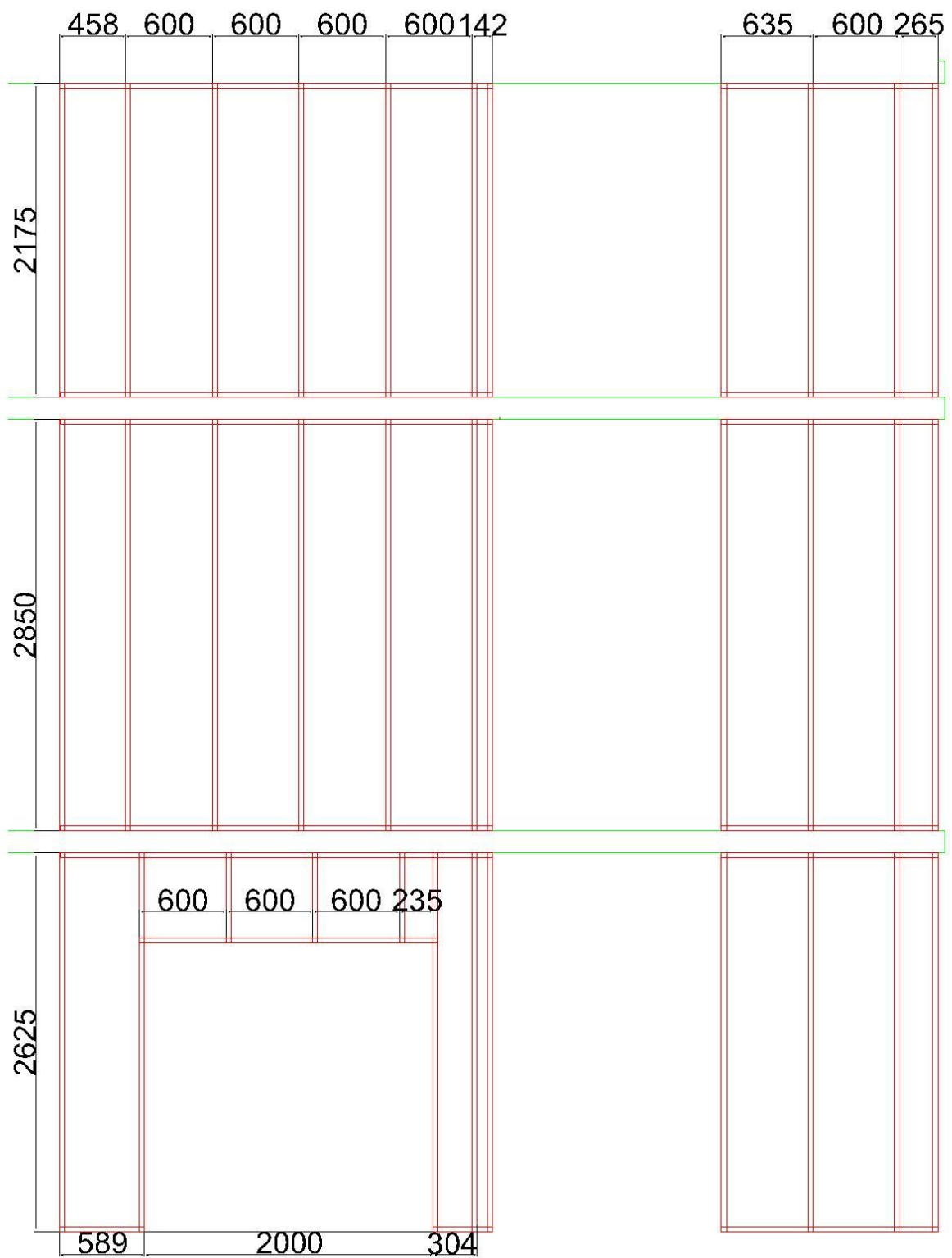


Figure 3 Steel framing arrangement

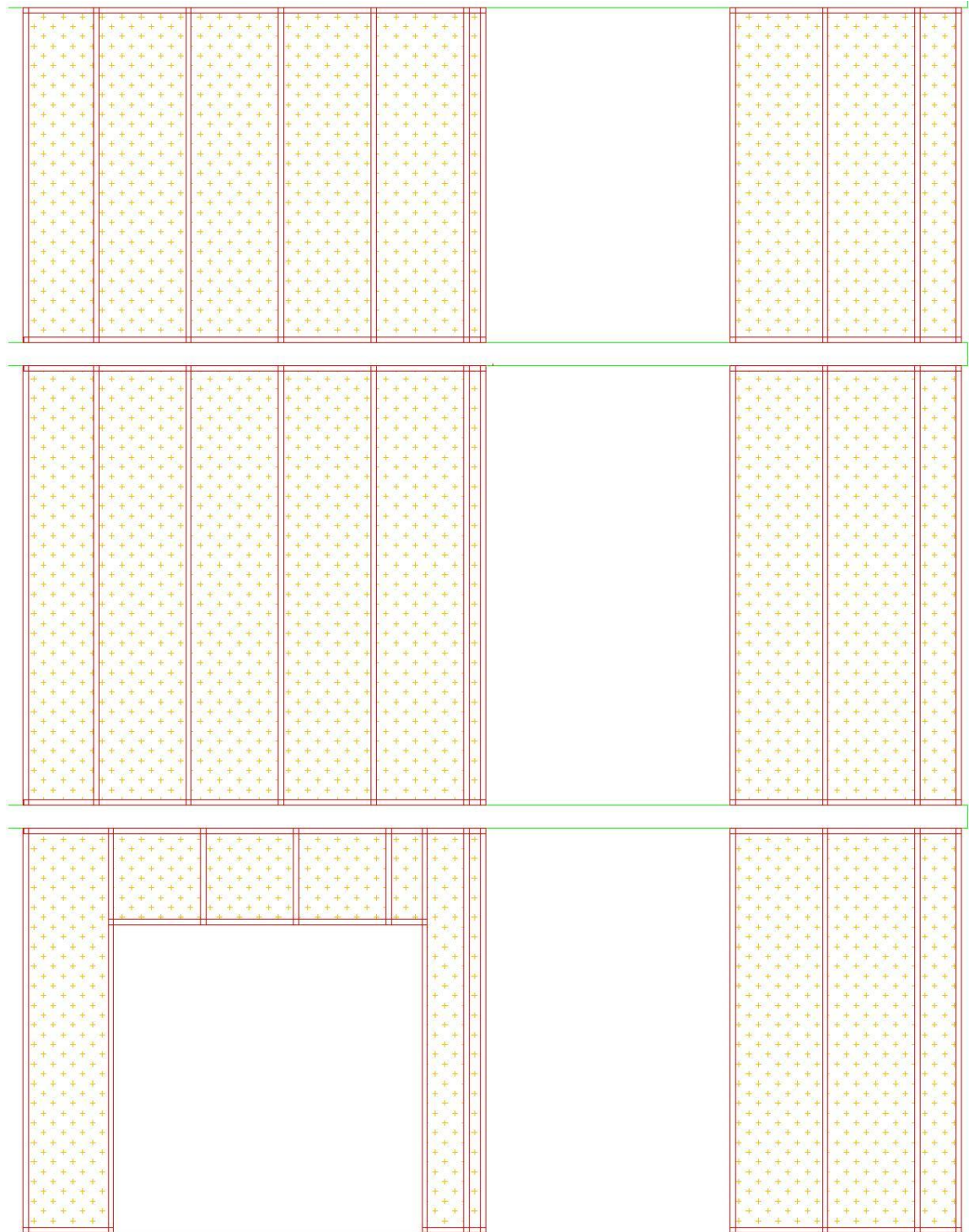


Figure 4 PIR insulation

Appendix B Instrumentation positions

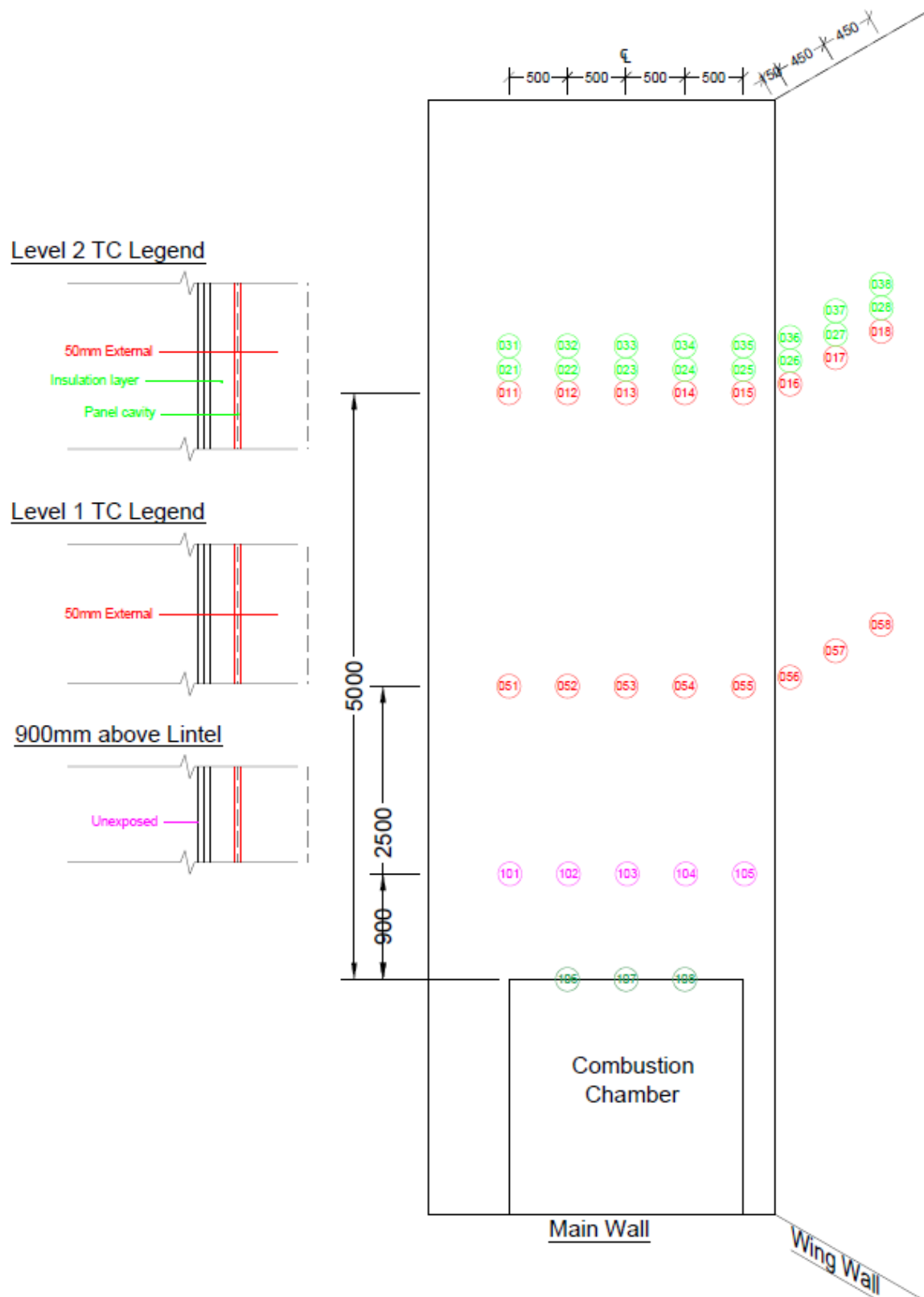


Figure 5 Thermocouple locations