EXTERNAL WALL SYSTEM DISCLOSURE CERTIFICATE (INSTALLATION)

EXTERNAL & COMMON WALL COMPONENTS (TYPE A & B CONSTRUCTION)

Note. This certificate must be completed by the Head Contractor's representative or other supervising professional such as the Project Architect or Façade Engineer

Project Name	Concord Hospital Redevelopment
Address	1 H Hospital Road, Concord West NSW 2138
Part of Building to be certified	*Façade external windows and cladding*
External Wall System Disclosure Certificate (Design) Date	*16th August 2021*

I hereby certify that

- I have reviewed and inspected the installation of the external wall systems for the project;
- To our knowledge and from inspections there are no plastic packers installed on site
- The wall systems have been installed as nominated in the approved External Wall System Disclosure Statement for the project which is attached;
- The wall systems have been installed in accordance with any relevant Manufacturer's installation requirements, Code Mark Certificate requirements, relevant Fire-safety Engineering requirements and any other requirements necessary to ensure compliance;
- Only the products identified in the External Wall System Disclosure Certificate (Design) have been installed and substitute products have not been used.
- The wall systems have been installed as nominated in the NCC Section J JV3 Report No. 004 Rev F dated March 8 2021 prepared by Action Sustainability and BCA 2016 Amendment 1 Parts J1, J2.4 & J3
- The wall systems installed are consistent with all Fire Engineering Reports applicable to the building Fire Engineering Report (SHIF0103/R002 Rev N)
- The wall systems installed comply with the Performance Requirements of FP1.4 of the BCA 2016 Amendment 1 for Weatherproofing – Concord Hospital FP1.4 Assessment Letter Dated 20 May 2020.
- The wall systems installed are consistent with the SSD stamp approved plans as referenced in SSD 9036 , Mod 1 dated 11 April 2019, SSD 9036 Mod 3 dated 19 December 2019, SSD 9036 Mod 4 dated 27 April 2020 and SSD 9036 Mod 5 dated 21 September 2020 Applicant: NSW Health Infrastructure Consent Authority: Minister for Planning Date: 28 February 2019
- No Aluminium Composite Panels were used in the external wall system.
- The pre-finished metal sheeting as per schedule below has a combustible surface finish not exceeding 1mm thickness and as a Spread-of-Flame index of not greater than 0.
- I am a properly qualified and experienced person and have a good working knowledge of the relevant requirements referenced above. (My qualifications and accreditations are listed below)

- The information contained in this statement is true and accurate to the best of my knowledge.

Relevant qualifications and accreditations: Façade Project Manager

Name: Travis Coppin

Company: Brighton Ceilings

Address: 65 The Grand Parade Brighton Le Sands NSW 2216

Phone No. 02 9599 6230 *Fax No*. 02 9599 1766

Signature **Date** 17/08/2021

EXTERNAL WALL ELEMENTS TABLE The table below must be completed for all wall types.

LINING / CLADDING / BUILDING ATTACHMENTS MATERIAL *(Note. Nominate every type of external cladding, attachment and/or wall material)*

External/Cladding Material (Eg Fibre cement, Aluminium composite panel, masonry, steel members etc)	**Elevation(s)**	**Structural frame material**	**Manufacturer** (Eg, Alucobond, Vitracore etc)	**Product Name** (Eg, Alucobond Plus, Vitracore G2 etc)	**Test certificate, Codemark certificate or Fire Engineering Report** (List all documents evidencing compliance)	**Nominated or proprietary installation requirements** (relevant installation details or guidelines must be listed below and attached)
GRC Panels	-	Steel Stud	Rieder	Fibre C	EWFA Test Report. 487313-00.1	As per shop drawings previously
Terracotta panel cladding	-	Steel Stud	Mayor	Tempio	Warringtonfire RFT190284	submitted
Solid Aluminium panels	-	Steel Stud	Kingspan	DR Design	SFCRTF190363.1	
Colorbond Metal	-	Steel Stud	Lysaght	Spandek	Flammability of Lysaght Steel product	
CFC soffit material	-	Suspended Steel fram	CSR Cemintel	Cemintel 9mm	Cemintel Tech Data Compressed Sh Refer Appendix 1 for further information	

INSULATION *(list all types incorporated in the external wall systems)*

Material Rockwool etc	**Elevation**	**Manufacture** (Eg, CSR etc)	**Product Name**	**Test certificate reference**
Glasswool	-			

SARKING *(list all types incorporated in the external wall systems)*

Manufacture (Eg, CSR etc)				**Elevation**
Colourbond .55 sheet	- All external walls	Colourbond .55 sheet	Flammability of Lysaght Steel product	-

OTHER SUPPORTING DOCUMENTATION

List below

Manufacturer / Product	Document	Reference Number	Date

ELEVATION DEMARCATION PLAN

Drawing number	Drawing title	Revision	Date	Prepared by
		AS BUILTS		Brighton Ceilings

Certificate of Test

Quote No.: NE7500 **REPORT No.: FNE11604**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope COLORBOND Metallic Steel Polyester

SPONSOR:
Bluescope Steel Limited
Innovations Lab
Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a polyester painted steel sheet with aluminium-zinc-magnesium alloy coating on both sides.

Nominal thickness of steel sheet:	0.70 mm
Nominal thickness of aluminium-zinc-magnesium coating:	30 µm
Nominal thickness of paint layer:	45 µm
Nominal total thickness:	0.8 mm
Nominal total mass:	5.5 kg/m^2
Nominal total density:	7700 kg/m^3
Colour:	metallic grey (Astro)

TEST PROCEDURE: Six samples were tested in accordance with Australian Standard 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m^2)	N/A	N/A
Smoke Release ($\log_{10}$D)	-1.535	0.086

For regulatory purposes these figures correspond to the following indices:

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)
0	0	0	2

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

DATE OF TEST: 10 February 2016

Issued on the 3rd day of March 2016 without alterations or additions.

Heherson Alarde
Testing Officer

Brett Roddy
Team Leader, Fire Testing and Assessments

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Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

QUOTE No.: NC8205 **REPORT No.: FNC12440**

COMBUSTIBILITY TEST FOR MATERIALS IN ACCORDANCE WITH AS 1530.1-1994

TRADE NAME: Low Carbon Steel Manufactured by Bluescope Australia

SPONSOR:
Bluescope Steel Limited
Five Islands Road
Sirius Building (#51)
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF TEST SAMPLE: The sponsor described the tested specimen as low carbon steel.

Nominal thickness:	4.38 mm (loose laid to form 50 mm)
Nominal density:	7850 kg/m^3
Colour:	grey

TEST PROCEDURE: Five (5) samples were tested in accordance with Australian Standard 1530 Methods for fire tests on building materials, components and structures, Part 1- 1994: Combustibility Test for Materials.

An alternative suitable insulating material was used to fill the annular space between the furnace tubes, as specified in Clause 4.2 of ISO 1182:2010.

RESULTS: The following calculated results were obtained, refer also to Summary of measurements:

Arithmetic mean	$= \frac{\Sigma\, results}{5}$
Mean furnace thermocouple temperature rise (°C)	0.10
Mean specimen centre thermocouple temperature rise (°C)	0.06
Mean specimen surface thermocouple temperature rise (°C)	0.32
Mean duration of sustained flaming (s)	0
Mean mass loss (%)	0.06

DESIGNATION: The material is **NOT** deemed combustible according to the test criteria specified in Clause 3.4 of AS 1530.1-1994.

These test results relate only to the behaviour of the test specimens of the material under the particular conditions of the test and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

DATE OF TEST: 27 August 2019

Issued on the 9th day of September 2019 without alterations or additions.

Faustin Molina
Testing Officer

Brett Roddy
Group Leader, Fire Testing and Assessments

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SUMMARY OF MEASUREMENTS AND OBSERVATIONS OF SAMPLES UNDER TEST C12440

Parameters	Symbol or expression	Unit symbol	Sample Number				
			1	2	3	4	5
Initial specimen mass	m_{si}	g	540.98	543.87	544.14	541.96	543.60
Final specimen mass	m_{sf}	g	540.82	543.84	544.00	541.15	543.21
Mass loss	$\Delta m = \frac{Msi - Msf}{Msi} \times 100$	%	0.03	0.01	0.03	0.15	0.07
Total duration of sustained flaming	Cumulative total of duration of flaming*	s	0	0	0	0	0
Initial furnace thermocouple temperature	T_{fi}	°C	747	753	751	751	751
Maximum furnace thermocouple temperature	T_{fm}	°C	782	775	781	779	780
Final furnace thermocouple temperature	T_{ff}	°C	782	775	781	779	780
Furnace thermocouple temperature rise	$\Delta Tf = Tfm - Tff$	°C	0	0	1	0	0
Maximum specimen centre thermocouple temperature	T_{cm}	°C	766	763	763	769	771
Final specimen centre thermocouple temperature	T_{cf}	°C	766	763	763	769	771
Specimen centre thermocouple temperature rise	$\Delta Tc = Tcm - Tcf$	°C	0	0	0	0	0
Maximum specimen surface thermocouple temperature	T_{cm}	°C	770	764	766	771	768
Final specimen surface thermocouple temperature	T_{sf}	°C	769	764	765	771	768
Specimen surface thermocouple temperature rise	$\Delta Ts = Tcm - Tsf$	°C	1	0	1	0	0
Test duration	-	min	105	85	75	85	85

* Any individual duration flaming less than 5 seconds was discarded

End of Test Certificate

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Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

Quote No.: NE7500 **REPORT No.: FNE11605**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope COLORBOND Steel

SPONSOR:
Bluescope Steel Limited
Innovations Lab
Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a polyester painted steel sheet with aluminium-zinc-magnesium alloy coating on both sides.

Nominal thickness of steel sheet:	0.35 mm
Nominal thickness of aluminium-zinc-magnesium coating:	30 µm
Nominal thickness of paint layer:	50 µm
Nominal total thickness:	0.45 mm
Nominal total mass:	5.5 kg/m^2
Nominal total density:	7700 kg/m^3
Colour:	dark grey (Woodland Grey)/brown

TEST PROCEDURE: Six samples were tested in accordance with Australian Standard 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m^2)	N/A	N/A
Smoke Release ($\log_{10}$D)	-1.560	0.072

For regulatory purposes these figures correspond to the following indices:

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)
0	0	0	2

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

DATE OF TEST: 11 February 2016

Issued on the 3rd day of March 2016 without alterations or additions.

Heherson Alarde
Testing Officer

Brett Roddy
Team Leader, Fire Testing and Assessments

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Test Report

VISIONPLUS BUILDING MATERIALS PTY LTD
87 SOUTH TERRACE,ADELAIDE AUSTRALIA 5000

Sample Description	: GRC
Manufacturer	: TONGCHUANG

As above test item and its relevant information regarding to the submission are provided and confirmed by the applicant. SGS is not liable to either the test item or its relevant information, in terms of the accuracy, suitability, reliability or/and integrity accordingly.

****

SGS Ref No.	: SDFS2011007433FF
Sample Receiving Date	: Nov 17, 2020
Test Performing Date	: Nov 17, 2020 to Nov 25, 2020
Test Performed	: Selected test(s) as requested by applicant

Test Result Summary

No.	Test(s) Requested	Result(s)	Comments
1	AS 1530.1-1994 R2016 Methods for fire tests on building materials components and structures Part 1: Combustibility test for materials	NOT DEEMED COMBUSTIBLE	/
For further details, please refer to the following page(s)			

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch

scan to see the report
SDHL2011029790FB-01

Heather Meng
Authorized Signatory

SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch

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Test Conducted:

This test is conducted accordance with AS 1530.1-1994 R2016 Methods for fire tests on building materials, components and structures Part1: Combustibility test for materials.

I. Sample description:

Thickness of single specimen	About 10 mm
Specimen size	Diameter: 46 mm; Height: 50 mm

Remark: Tested specimen consisted of 5 layers of provided sample.

II. Conditioning:

Oven Temperature	(60±5)℃
Duration	24h

Remark: The specimen shall be conditioned in a ventilated oven maintained at (60 ±5)℃ for between 20 h and 24 h, and cooled to ambient temperature in a desiccator prior to testing.

III. Criteria of combustibility:

A material shall be deemed to be combustible under any of the following circumstances:

(a) The mean duration of sustained flaming is other than zero.

(b) The mean furnace thermocouple temperature rise exceeds 50°C.

(c) The mean specimen surface thermocouple temperature rise exceeds 50°C

IV. Test results:

No.	Temperature rise			* Total duration of sustained flaming (s)	Mass loss (%)
	ΔT_f (°C)	ΔT_c (°C)	ΔT_s (°C)		
1	31.6	-3.3	39.8	0	17.4
2	29.7	-0.3	37.7	0	16.6
3	30.7	-1.1	33.7	0	16.6
4	34.4	-10.4	38.7	0	17.7
5	32.9	-6.1	37.3	0	16.1
Average	31.9	-4.2	37.4	0	16.9

Remark:
ΔT_f – Furnace thermocouple temperature rise
ΔT_c – Specimen centre thermocouple temperature rise
ΔT_s – Specimen surface thermocouple temperature rise
* calculate and record the mean duration of sustained flaming which is obtained by summing all the individual durations of flaming for 5s or longer and dividing by five.

V. Combustibility: NOT DEEMED COMBUSTIBLE

SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch Hardness

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STATEMENTS:

These test results relate only to the behavior of the test specimens of the material under the particular conditions of the test, and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

Photo Appendix:

Remark: This test report is to supersede No. SDHL2011029790FB test report which was issued on Nov 25, 2020. And the original test reports (paper and electronic) are invalid.

End of Report

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EWFA Test Report No.	487313-00.1	Page 1 of 2

Report Sponsor	Issue Date
The Tile People 11C Westward Ho Road, Glen Eden Auckland 0602	January 30th, 2018

Test in accordance with AS/NZS 1530.1 - 1994

Objective

To determine the performance of the material samples as described in this report when subjected to the test conditions stated in the test standard referenced below.

Product	Fibre-C

Test Reference	Reference Date
48731300 1	January 30th, 2018

Test Method	Supplementary Standards
AS 1530.1:1994 Part 1: Combustibility test for materials	ISO 1182:2010

Product Description

The sponsor described the material as "extruded fibre reinforced concrete". The material was grey in colour. The material was glass fibre reinforced concrete comprising of 90% sand and cement and 10% glass fibres, pigments and concrete additives, as nominated by the test sponsor.

The material was supplied in nominally 12.5mm thick disks and had a nominal density of 2125kg m^{-3}.

EWFA personnel were not involved with the selection of these test specimens. The sponsor supplied the material cut into disks of 12.5 mm (nom) thickness. These were loose laid to form a sample 50 mm high for the test.

Before conducting these tests the test specimens were conditioned in a ventilated oven maintained at a temperature of 60±5°C for at least 20 and no more than 24 hours. Prior to conducting these tests the samples were cooled to room temperature in a desiccator.

TESTING AUTHORITY	Exova Warringtonfire Aus Pty Ltd
Address	PO Box 4282 DANDENONG SOUTH VIC 3164 Unit 2, 409-411 Hammond Road DANDENONG VIC 3175
Phone / Fax	61 (0)3 9767 1000 / 61 (0)3 9767 1001
ABN	81 050 241 524
Email / Home Page	www.exova.com
Authorisation	Prepared By: J. Richardson Reviewed By: C. M. McLean

Test Results

Mean furnace temperature rise	1.4°C
Mean specimen centre thermocouple temperature rise	0.6°C
Mean specimen surface thermocouple temperature rise	1.2°C
Mean duration of sustained flaming	0 seconds
Mean mass loss	9.61%

Criteria of Combustibility

Clause 3.4 of AS1530.1:1994 defines a combustible material as one for which;
the duration of sustained flaming, as determined by summing the individual durations of flaming of 5 seconds or longer for all of the samples and dividing by five, is greater than zero, or
the arithmetic mean of the temperature rise of the furnace thermocouple exceeds 50°C or
the arithmetic mean of the specimen surface thermocouple temperature rise exceeds 50°C.

Comments

The material is NOT DEEMED COMBUSTIBLE according to the criteria of combustibility specified in Clause 3.4 of AS 1530.1-1994 (R2016).

An alternative suitable insulating material, as specified in Clause 4.2 of ISO 1182:2010, was used to fill the annular space around the furnace tube.

Conditions/Validity

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These tests have been conducted in accordance with the test standard referenced above and this report should be read in conjunction with that standard.

This test report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the performance of the actual products supplied. The tests were performed at CSIRO laboratories at the request of Exova Warringtonfire Aus Pty Ltd. Theses test results relate only to the behaviour of the material under the conditions of the test and are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

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Reaction-to-fire test report

A reaction-to-fire test in accordance with AS 1530.1:1994 (R2016)

Test sponsor: Design Central Australia Pty Ltd

Product: 16 mm Thick FK-16 Tempio® ventilated facade

Job number: RTF190284

Test date: 1 November 2019 Revision: R1.0

Amendment schedule

Version	Date	Information about the report			
R1.0	8 November 2019	Description	Initial issue.		
			Prepared by	Reviewed by	Authorised by
		Name	Atousa Aris	Muntaqim Pereira	Anthony Rosamilia
		Signature			

Contact information

Warringtonfire Australia Pty Ltd – ABN 81 050 241 524

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2. Product description 5
3. Test results 6
4. Criteria of combustibility 7
5. Observations 7
6. Comments 7
7. Application of test results 7

1. Introduction

This report documents the findings of the fire hazard properties of 16 mm Thick FK-16 Tempio® ventilated facade undertaken on 1 November 2019 in accordance with AS 1530.1:1994 (R2016) and the supplementary standard of ISO 1182:2010.

Warringtonfire Australia did the test at the request of Design Central Australia Pty Ltd.

Table 1 Test sponsor details

Test sponsor	Address
Design Central Australia Pty Ltd	15 King William Road Unley SA 5061 Australia

2. Product description

Table 2 describes the sampled product.

Table 2 Product description

Product name	Description
16 mm Thick FK-16 Tempio® ventilated facade	The sponsor described the material as porcelain clay. The material is to be used in ventilated façade systems. The material was beige in colour with a smooth surface finish. The material had a measured density of 2101 kg/m^3. The material had holes through it, which were elongated circles 5 mm apart from each other. The height and width of these were 5 mm and 12.5 mm, respectively. Warringtonfire personnel were not involved with the selection of the material. Before conducting these tests, the test specimens were conditioned in a ventilated oven maintained at a temperature of 60 ± 5 °C for at least 20 and no more than 24 hours. Prior to conducting these tests, the samples were cooled to room temperature in a desiccator.

Figure 1 Photo of product

Figure 2 Photo of product

3. Test results

Table 3 shows the summary of observations and calculations of the material samples.

Table 3 Test calculations

Parameter	Symbol or expression	Unit	Results					Arithmetic mean = ∑results/5
			1	2	3	4	5	
Initial specimen mass	m_{si}	g	131.6	130.7	130.8	131.5	131.5	
Final specimen mass	m_{sf}	g	131.6	130.6	130.8	131.4	131.5	
Mass loss	$\delta m = (m_{si} - m_{sf})/m_{si}$	%	0.0	0.1	0.0	0.1	0.0	0.0
Total duration of sustained flaming	Cumulative total of duration of flaming (>5s)	s	0	0	0	0	0	0
Initial furnace thermocouple temperature	T_{fi}	°C	746.7	746.2	745.4	746.4	751.4	
Maximum furnace thermocouple temperature	T_{fm}	°C	770.1	762.3	771.7	773.5	763.5	
Final furnace thermocouple temperature	T_{ff}	°C	768.1	761.7	770.6	770.8	761.5	
Furnace thermocouple temperature rise	$\delta T_f = T_{fm} - T_{ff}$	°C	2.0	0.6	1.1	2.7	2.0	1.7
Maximum specimen centre thermocouple temperature	T_{cm}	°C	765.1	772.1	770.6	772.2	745.2	
Final specimen centre thermocouple temperature	T_{cf}	°C	765.1	772.0	770.5	772.2	744.6	
Specimen centre thermocouple temperature	$\delta T_c = T_{cm} - T_{cf}$	°C	0.0	0.1	0.1	0.0	0.6	0.2
Maximum specimen surface thermocouple temperature	T_{sm}	°C	784.0	795.3	792.1	789.2	786.9	
Final specimen thermocouple temperature	T_{sf}	°C	783.4	795.0	791.8	788.4	786.2	
Specimen surface thermocouple temperature rise	$\delta T_s = T_{sm} - T_{sf}$	°C	0.6	0.3	0.3	0.8	0.7	0.5
Test duration		s	3600	3600	3600	3600	3600	3600

Table 4 Summary of results

Characteristic	Result
Mean furnace temperature rise:	1.7 °C
Mean specimen centre thermocouple temperature rise:	0.2 °C
Mean specimen surface thermocouple temperature rise:	0.5 °C
Mean duration of sustained flaming:	0 seconds
Mean mass loss:	0.0 %

4. Criteria of combustibility

Clause 3.4 of AS 1530.1:1994 (R2016) defines a combustible material as one for which; the duration of sustained flaming – as determined by summing the individual durations of flaming of 5 seconds or longer for all the samples and dividing by five, is greater than zero, or the arithmetic mean of the temperature rise of the furnace thermocouple exceeds 50 °C or the arithmetic mean of the specimen surface thermocouple temperature rise exceeds 50 °C.

Decision rule

Any measurement resulting in a temperature rise of 50 °C or more is taken to meet the temperature rise criteria for combustibility.

5. Observations

Table 5 Test observation

Observations
There were some cracks in the samples after the test.
The colour of the samples changed to light brown after the test.

6. Combustibility

The material is NOT DEEMED COMBUSTIBLE according to the test criteria for combustibility specified in Clause 3.4 of AS 1530.1:1994 (R2016).

7. Comments

A suitable alternative insulating material was used to fill the annular space between the furnace tubes, as specified in Clause 4.2 of ISO 1182:2010.

Prior to testing, the material was tied together using two fine nickel-chromium thermocouple wires to prevent air gaps between layers.

During three of the tests, the thermocouples did not reach equilibrium. The tests were ended after 3600 seconds as described in Section 7.4.7 in ISO 1182:2010.

8. Application of test results

This test report does not provide an endorsement by Warringtonfire Australia Pty Ltd of the performance of the actual products supplied.

These test results only relate to the behaviour of the tested specimens under the particular conditions of the test and they are not intended to be the sole criterion for the assessing the potential fire hazard of the material in use.

warringtonfire
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Certificate of test

Test sponsor	Certificate issue date	Certificate number
Kingspan Insulated Panels Pty Ltd 38-52 Dunheved Circuit St Marys, NSW, 2760 Australia	27 February 2020	SFCRTF190363.1

Description of the test specimen

The test sponsor described the material as Grade 5005 aluminium alloy, which is a component used by the test sponsor in their products Dri Design, Recessed Fixed Cassette, Interlocking Plank, Hook On Cassette, Shingle and KingZip. The material was silver in colour with a smooth surface finish. The material had a measured density of 2,662 kg/m^3.

Test information

The specimen was tested by this laboratory on behalf of the test sponsor in accordance with AS 1530.1:1994 (R2016). It achieved the results shown below.

Table 1 Test and report details

Referenced report	Product	Test standard	Test date	Referenced report issue date
RTF190363.1	Grade 5005 Aluminium	AS 1530.1:1994 (R2016) using the supplementary standard of ISO 1182:2010	18 February 2020	27 February 2020

The material, as described in the referenced test report in Table 1, is **NOT DEEMED COMBUSTIBLE** according to the test criteria for combustibility specified in Clause 3.4 of AS 1530.1:1994 (R2016).

Conditions/validity

- This certificate is provided for general information only and does not comply with the regulatory requirements for evidence of compliance.
- Please refer to the relevant test report to determine the applicability of the test result to a proposed installation and for a full description of the tested construction.
- The results of these fire tests may be used to assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.
- All work and services carried out by Warringtonfire Australia are subject to, and conducted in accordance with our standard terms and conditions. These are available on request or at https://www.element.com/terms/terms-and-conditions.

Testing authority	Warringtonfire Australia Pty Ltd	
Address	Unit 2, 409-411 Hammond Road, Dandenong South, VIC 3175	
Phone	T: +61 (0)3 9767 1000	
ABN	81 050 241 524	
Email	info.fire.melbourne@warringtonfire.com	
Authorisation	Prepared by:	Reviewed by:
	A. Aris	
	Atousa Aris	Tanmay Bhat

Façade Systems

Australia

Protected by Kingspan WARRANTY

Dri-Design®
Product Data Sheet

Kingspan®

Dri-Design®

Product Data Sheet

Application

Dri-Design offers the ultimate design flexibility for exterior and interior applications. Its unique interlocking system ensures the cassettes perform flawlessly in the long term, without the delaminating, streaking or staining associated with silicone sealants and gaskets.

The façade cassettes can be installed on our Karrier Panel System, Eurobond Rainspan mineral wool wall panels, or onto tophats over a traditional built-up construction method.

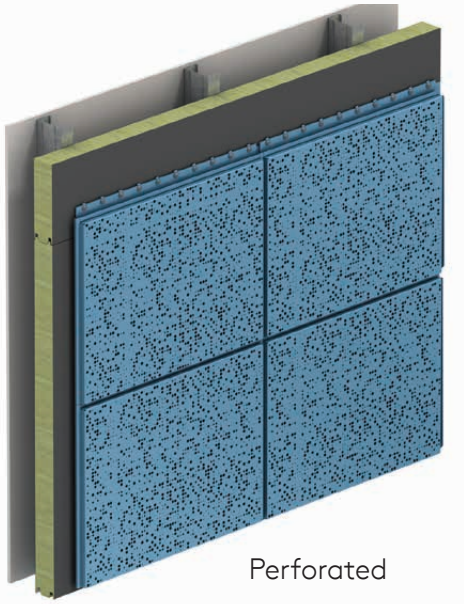
The Dri-Design cassettes are available in highly durable powdercoating finishes. Speak to our team regarding bespoke solutions such as anodised aluminium.

Profiles

Flat

Shadow

Tapered

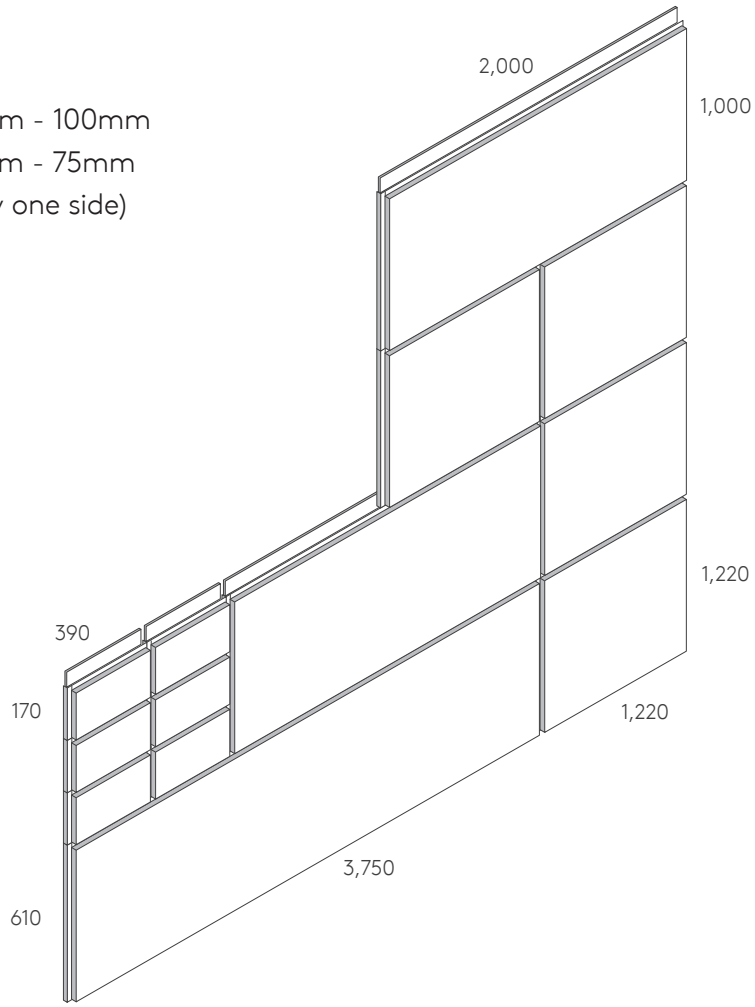


Perforated

Dimensions

The minimum face size for aluminium cassettes is 390mm wide x 170mm high, these can be increased in 1 mm increments up to the below size guide. For other face sizes, or for different metals, please contact your local Kingspan representative to discuss your specific requirements.

Depths:
Flat - 32mm
Shadow - 33mm - 100mm
Tapered - 33mm - 75mm
(only one side)



Note: Dri-Design Shadow & Tapered are limited to shorter widths.

Product Tolerances

Product Tolerances	
Length	±2mm
Width	±2mm
Thickness	±2mm
Squareness	±2mm

Material Properties

Aluminium alloy 5005 H34. Polyester powder coated (PPC) and anodised finishes available.

Thickness is 2.0mm.

Fire

Kingspan Dri-Design cassettes meet the Deemed-to-Satisfy non-combustibility requirements of the National Counstruction Code 2019 under Section C1.9, when tested to AS1530.3.

Test Standard		**Result**
AS1530.1		Non-Combustible
AS15030.3	**Ignitability Index**	0
	Spread of Flame Index	0
	Heat Evolved Index	0
	Smoke Development	4

Environmental

Aluminium can be fully recycled and used for the production of new material.

Packaging & Storage

The Dri-Design cassettes are typically packed in a timber crate with protection placed between each set of cassettes.

Protect Dri-Design crates during storage against rain, penetration of moisture and condensation (e.g. when transporting cold cassettes to warmer rooms). Do not stack crates.

Storage exceeding 6 months should be avoided, as it may become difficult to remove any protective films which may be applied. To prevent the possibility of damage, cassettes should not be stacked on top of each other.

Handling

The crates must be handled carefully during transport and unloading. Do not handle open crates. Upon delivery the crates must be examined for any damage due to moisture (cassettes that have become wet must be dried to avoid any spots or corrosion forming).

Individual cassettes must be lifted out of the crate by two people holding all four corners and not drawn over each other. Carry the cassettes vertically. Wear gloves to avoid staining.

Quality & Durability

Kingspan Façade Systems components are manufactured from the highest quality materials to rigorous quality control standards, complying with ISO 9001:2000 standard, ensuring long-term reliability and service life.

Site Installation Procedure

Site assembly instructions are available from Kingspan Technical Services. Kingspan recommend that the appointed contractor attends the product install training course prior to installation which is provided by Kingspan Field Services.

Guarantees & Warranties

Kingspan will provide external coating and product guarantees on an individual project basis.

Contact Details

Australia

Kingspan Insulated Panels Pty Ltd

38-52 Dunheved Circuit

St Marys, NSW, 2760

T: 1300 KINGSPAN (1300 546 477)

F: +61 (02) 8889 3099

E: info@kingspanpanels.com.au

www.kingspanpanels.com.au

For the product offering in other markets please contact your local sales representative or visit www.kingspanpanels.com

Care has been taken to ensure that the contents of this publication are accurate, but Kingspan Insulated Panels and its subsidiary companies do not accept responsibility for errors or for information that is found to be misleading. Suggestions for, or description of, the end use or application of products or methods of working are for information only and Kingspan Insulated Panels and its subsidiaries accept no liability in respect thereof.

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04/2021

Kingspan®
Insulated Panels

26th September 2019

Your Reference : *Kingspan Dri-Design / Shingle / Hook on Cassette / Interlocking Plank / Recessed Fixed Cassette* / Commercial fin attachments : Non-Combustibility

Kingspan Insulated Panels offer solid all-metal (aluminium) façade systems called *Dri-Design, Shingle, Interlocking Plank, Recessed Fixed Cassette* and *Hook on Cassette*. These products can be used with aluminium fin attachments, which are made from the same material (aluminium).

All of these systems meet the *Deemed-to-Satisfy* non-combustibility requirements of the *National Code of Construction 2019* under *Section C1.9(e)(v)*, when tested to *AS1530.3*.

"Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0."

Best regards

M. G. Tatam

Dr M.G.Tatam
Building Technology Director

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ABN: 11 106 797 148

AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing
A.B.N 43 006 014 106
1st Floor, 191 Racecourse Road, Flemington, Victoria 3031
P.O Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2400 Fax (03) 9371 2499

TEST REPORT

Client : Kingspan Insulated Panels Pty Ltd
38-52 Dunheved Circuit
St Marys NSW 2760

Test Number : 18-002396
Issue Date : 15/05/2018
Print Date : 16/05/2018

Sample Description

Clients Ref : "Dri Design - Aluminium/Shingle - Aluminium/Hook on Cassette-Aluminium/Interlocking Plank-Aluminium"
Coated metal panels
End Use : Facades
Nominal Composition : Aluminium cassette with a polyester powder coated finish (60 microns)
Nominal Mass per Unit Area/Density : 2700kg/m3

AS/NZS 1530.3-1999

Methods for Fire Tests on Building Materials, Components and Structures
Part 3: Simultaneous Determination of Ignitability,
Flame Propagation, Heat Release and Smoke Release

Face tested:	Face		
Date tested:	15/05/2018		
	Standard Error	Mean	
Ignition time	Nil	Nil	min
Flame propagation time	Nil	Nil	sec
Heat release integral	Nil	Nil	kJ/m²
Smoke release, log d	0.0345	-1.0359	
Optical density, d		0.0935	/ metre
Number of specimens ignited:		0	
Number of specimens tested:		6	
Regulatory Indices:			
Ignitability Index		0	Range 0-20
Spread of Flame Index		0	Range 0-10
Heat Evolved Index		0	Range 0-10
Smoke Developed Index		4	Range 0-10

129337 27466

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Accredited for compliance with ISO/IEC 17025
- Chemical Testing : Accreditation No. 983
- Mechanical Testing : Accreditation No. 985
- Performance & Approvals Testing : Accreditation No. 1356

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APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc.(Hons)
MANAGING DIRECTOR

0204/11/06

AWTA PRODUCT TESTING

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TEST REPORT

Client : Kingspan Insulated Panels Pty Ltd
38-52 Dunheved Circuit
St Marys NSW 2760

Test Number : 18-002396
Issue Date : 15/05/2018
Print Date : 16/05/2018

These results only apply to the specimen mounted, as described in this report. The result of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

Ignition is initiated by a pilot flame that is held near, but does not touch the specimen. A material that does not ignite during the standard test may ignite if contacted with a pilot flame during the test.

Each test specimen had an unattached backing of 4.5mm thick fibre reinforced cement board.

Each test specimen was clamped in four places.

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- Chemical Testing : Accreditation No. 983
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APPROVED SIGNATORY

MICHAEL A JACKSON B.Sc.(Hons)
MANAGING DIRECTOR

CEMINTEL COMMERCIAL EXPRESSPANEL™ PRODUCT WARRANTY

Product Description

Cemintel Commercial ExpressPanel™ ("**Product**")

Warranty Provider

CSR Building Products Limited (ACN 008 631 365) trading as Cemintel® ("**Cemintel**")

What this Warranty applies to

The Product described above when handled, installed and maintained in accordance with the Cemintel Design & Installation Guide (also known as D&I Guide or Technical Manual) current as at the time of purchase. Please check the Cemintel website for the latest version of the Cemintel Design & Installation Guide.

Risks Covered

Subject to the conditions and exclusions set out in this warranty document, the Cemintel Product will remain free from any defects in manufacture and materials and shall not materially degrade, or break down during the Term of this warranty ("**Cemintel Warranty**")

Term of Warranty

10 years from date of purchase.

Conditions

This Cemintel Warranty will only apply where:

a) the Product is handled, installed and maintained in accordance with the relevant Cemintel Design & Installation Guide current at the time of purchase;

b) no external forces or causes have degraded the workmanship and/or materials of the Cemintel Product other than those forces or causes which the Building Code of Australia and/or the relevant Australian Standards regard the Cemintel Product as having been designed to withstand under normal conditions; and

c) Cemintel is given a reasonable opportunity to inspect any alleged faulty Product in-situ prior to its removal, repair or replacement.

Exclusions

Cemintel Product is subject to natural variation in colour and finish due to the manufacturing process and the raw materials used in its manufacture. The builder/installer must ensure the Cemintel Product meets aesthetic requirements before installation (including variations when compared to sample materials, displays or printed illustrations, scratch marks and other reasonably visible surface imperfections).

The appearance and functionality of the Cemintel Product will also depend on a number of factors which are beyond the control of Cemintel. Design and installation of systems using the Product should always be carried out by experienced designers/builders in accordance with the Building Code of Australia and any other relevant industry standards.

To the extent that the law allows, Cemintel shall not be liable for:

a) damage to Product arising from external causes outside of Cemintel's control including but not limited to claims, defects or damages arising from or in any way attributable to handling of Product in transit and on-site, poor design or detailing, poor workmanship, movement of materials to which the Product is attached and/or, incorrect design of the structure settlement or structural movement, high levels of pollution, acts of God including, but not limited to, floods, cyclones, earthquakes or other severe weather or unusual climatic conditions, performance of third party paint/coatings applied to the Product, or normal wear and tear;

b) Deterioration of any part of a Cemintel Product caused by work carried out on the Cemintel Product after installation, including any re-use of the Product after its initial installation; or

c) Any faults to the extent that they are caused or contributed to by any third party design or under-engineering of the building or structure to which the Cemintel Product is attached (including but not limited to the design of the frame or foundations to which the Cemintel Product is incorporated or affixed).

Remedies

Subject to any rights or remedies of consumers that cannot be limited, Cemintel's liability under this Cemintel Warranty will be limited, at Cemintel's option, to:

a) supply a replacement of the defective Product or supply equivalent goods;

b) repair the defective Product;

c) payment for the supply of a replacement for the defective Product; or

d) payment for the repair of the defective Product.

Other than as expressly set out in this Cemintel Warranty, and any warranties that cannot be excluded under The Australian Consumer Law (Schedule 2 of the Competition and Consumer Act 2010 (Cth)) (and any other law), Cemintel excludes all other warranties and guarantees with regard to the Product, including all implied warranties and guarantees.

Any remedial work carried out or paid for under the provisions of this Cemintel Warranty will not extend the term of the Cemintel Warranty.

Consumer Guarantee Provisions

The following statement is provided where the Product is supplied to a buyer who is a "Consumer" under the Australian Consumer Law: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Making a Claim

If you are the property owner, please contact your Builder at first instance.

If you are the Builder or direct purchaser of the Product, please make a claim under this warranty by contacting Cemintel on 1300 236 468, or write to one of our state offices at www.cemintel.com.au/contact-us.

All expenses of claiming the Cemintel Warranty will be borne by the person making the claim. Cemintel requires reasonable documentation supporting the claim to be provided when making a claim.

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Fire Performance of Cemintel Commercial ExpressPanel®

CSR

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COMPLIANCE FOR NON-COMBUSTIBLE MATERIALS

COMMERCIAL EXPRESSPANEL® – JANUARY 2018

Cemintel® is an Australian owned company and part of the iconic CSR Building Products Pty Ltd, manufacturing and supplying cement panels and building systems used for external facades, internal linings, ceilings and flooring in commercial and residential applications.

The following information is provided in regards to Cemintel Commercial ExpressPanel and its non-combustible attributes:

- Cemintel Commercial ExpressPanel is made from cement, sand, cellulose fibre and water.
- Cemintel Commercial ExpressPanel is autoclaved to cure under heat and pressure.
- Cemintel Commercial ExpressPanel is manufactured and tested in accordance with Australian and New Zealand Standard for cellulose-cement flat sheet product AS/NZS 2908.2
- In accordance with the standard characteristic type tests required by AS/NZS 2908.2:2000, Cemintel Commercial ExpressPanel has a classification of Type A Category 5 (fibre cement) sheet.
- Cemintel Commercial ExpressPanel may be used where non-combustible materials are required by the Building Code of Australia (BCA) and according to the National Construction Code (NCC) Volume 1 Section C1.9 and Volume 2 Section 3.7.1.2.
- Cemintel fibre cement products have been assessed by Exova (WFRA 45759) in accordance with AS/NZS 3837 ('Method test for heat and smoke release for materials and products using an oxygen consumption calorimeter') and have been classified to conform to Group 1 (high and best result possible) with an average specific extinction area far lower than the permissible 250m²/kg, as referenced in specification C1.10 of the BCA.

For further information on Cemintel Commercial ExpressPanel, please refer to Compliance Certificate and Certificate of Physical Properties attached.

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COMPLIANCE CERTIFICATE

COMMERCIAL EXPRESSPANEL® – JANUARY 2018

Commercial ExpressPanel is manufactured in Australia to AS/NZS 2908.2:2000 and is classified as Type A Category 5 (fibre cement) sheet.

Characteristic Type Tests have been conducted for Commercial ExpressPanel in accordance with AS/NZS 2908.2:2000 including:

- Bending Strength
- Water Permeability
- Frost Resistance (Freeze - Thaw test)
- Warm Water
- Heat - Rain
- Soak - Dry
- Dimensional and Geometrical Characteristics
- Apparent Density

These tests have been conducted by Cemintel's Research & Development Technical Team. Detailed Technical Specifications for Commercial ExpressPanel can be downloaded at **www.cemintel.com.au/technical/technical-data-sheets/**

CERTIFICATE OF PHYSICAL PROPERTIES

COMMERCIAL EXPRESSPANEL® – JANUARY 2018

PANEL – STRENGTH & MOISTURE RELATED PROPERTIES		
Physical Property	Result	Relevant Standard
Modulus of Rupture (Wet)	>18MPa	AS2908.2
Modulus of Elasticity (Wet)	9-13GPa	AS2908.2
Density (Oven Dry)	1625 kg/m3	AS2908.2
Water Vapor Diffusion	Not Required	Not Required
Water Tightness (24hrs)	No water droplet	AS2908.2
Water Absorption (Saturated – 48hrs)	18 wt%	ASTM C 1186
Moisture Content (EMC)	7 Wt %	ASTM C 1186
Moisture Movement	0.04%	ASTM C 1186

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CERTIFICATE OF PHYSICAL PROPERTIES

COMMERCIAL EXPRESSPANEL® – JANUARY 2018

PANEL – OTHER DURABILITY/WEATHER RESISTANCE INDICATORS		
Test	Result	Relevant Standard
Heat Rain	PASSED (25 Cycles)	AS2908.2
Freeze Thaw	PASSED (50 Cycles)	AS2908.2
Warm Water Resistance	PASSED (56 days)	AS2908.2
Soak Dry	PASSED (25 Cycles)	AS2908.2

PANEL – FIRE RESISTANCE, THERMAL & ACOUSTIC PROPERTIES		
Characteristic	Result	Relevant Standard
FIRE RESISTANCE		
Combustibility	Assessed as suitable for use in applications where non-combustible materials are specified by the Deemed to Satisfy Provisions.	
Group Number	1	AS/NZ 3837
Average Specific Extinction Area	<250	AS/NZ 3837
E.F.H.I	Ignitability index = 0 Flame spread index = 0 Heat evolved index = 0 Smoke developed = 1	AS/NZS 1530.3
THERMAL CONDUCTIVITY		
Thermal Conductivity (λ-Factor)	≈ 0.4108 W/m.K.	
Thermal Expansion Co-efficient	0.005-0.01mm/mK	N/A

CEMINTEL®

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03/2018

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Fire Performance Guide for Fibre Cement Cladding

White Paper

JUNE 2019

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INTRODUCTION

Cemintel fibre cement is a non-combustible solution for safe and compliant construction under the Deemed-to-Satisfy requirements of the BCA.

The purpose of this document is to provide an understanding of the market situation regarding the fire performance of building products used in facades, and to help define some of the terminology that has emanated in the last few months relating to fire performance. With increased knowledge, more informed discussions can be had on the topic and a better understanding as to why fibre cement is a safe option for non-combustible facades and cladding.

The globally documented Grenfell Tower fire on 14th June 2017 has caused significant focus on the Australian façade/cladding market. It begs the question as to what has happened locally since the Melbourne apartment fire (Lacrosse) in 2014, and the more recent Spencer Street Melbourne apartment fire in February 2019.

The Lacrosse fire was the basis for greater scrutiny of the Australian construction industry, however, in truth, it wasn't until the Grenfell fire that a deeper review of building practices including compliance sign off processes was undertaken with legislative actions an outcome. While often referenced as a comparison, it is important to understand that the tragedy of Grenfell fire was not solely due to the façade material used, but a combination of factors. For your information, Appendix A is an overview of this event to help be better informed of those circumstances.

Grenfell received global focus. In reality however, there have been a number of other fires around the world that reiterates the core issue with the debate – combustible aluminium cladding. Some examples of these are at Appendix B.

This document provides some of the basic language associated with fire performance relative to façades and cladding and more particularly, the AS 5113 Fire Test.

It identifies the National Construction Code (NCC), a performance based code containing all Performance Requirements for the construction of buildings. It is built around a hierarchy of guidance and code compliance levels, with the Performance Requirements being the minimum level that buildings and building elements must meet.

This document is not meant to be exhaustive but rather a basic reference guide.

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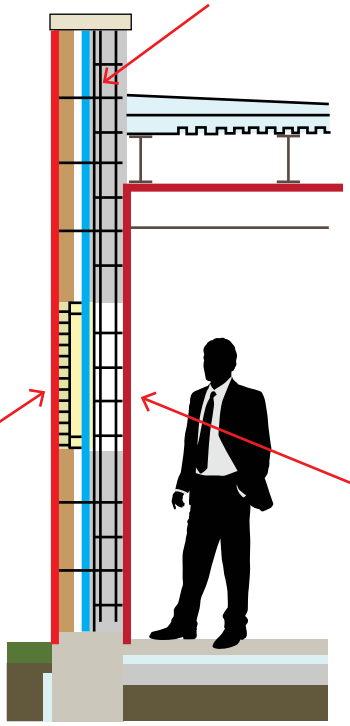
WHAT IS A WALL?

Components of a Basic Wall

Structural building element/non-loadbearing wall building element / timber or steel frame/concrete or masonry



Outside

- Insulation
- Acoustic treatment
- Weatherproofing/sarking
- Termite protection
- Decorative lining (eg. cladding)

External Attachment

Inside

- Insulation
- Acoustic treatment
- Plasterboard
- Decorative lining

Internal Lining

Other Internal/External Interactions

- Condensation
- Energy Efficiency
- Noise amelioration

Some challenges relating to the wall?

- Acoustics, weatherproofing and fire resistance – these are supposed to be identical to the tested prototype
- Energy efficiency of the total wall system
- BCA DtS wall to be non-combustible
- Minimum performance levels must be achieved
- No DtS for weatherproofing
- Full performance options

External Wall or Attachment?

For buildings requiring Type A and B construction, the BCA DtS provisions addresses two common cases relating to fire performance of external walls:

- The cladding is the exterior wall or part of the wall (BCA Specification C1.1, Sections 3.1(b) and 4.1(b) apply).
- The cladding is an attachment to an exterior wall having the required FRL (BCA specification C1.1 Clause 2.4 applies).

The term “external wall” is defined in the BCA as “…an outer wall of a building which is not a common wall”.

The term “attachment” or the difference between an attachment and an external wall is not defined in the BCA.

When a term is not specifically defined in the Code, the common usage governs. The following definitions are from the Macquarie dictionary:

- Wall – an upright work or structure of stone, brick or similar material, serving for enclosure, division, support, protection etc. as one of the upright enclosing sides of a building; or anything which resembles or suggests a wall.
- Attachment – an adjunct or supplementary device.

The CSIRO applies the following reasoning to determine when a building element should be assessed as an external wall (or integral part of external wall) or an attachment:

- If the cladding/lining/other item is removed and the remaining structure no longer functions suitably as an external wall (eg. the remaining structure has no fire resistance level, is unable to prevent the penetration of water, is unable to resist wind loads or in certain applications cannot meet acoustic requirements), then it is considered an integral part of the external wall. BCA Specification C1.1 Sections 3.1(b) and 4.1(b) applied.
- If the cladding/lining/other item is removed and the remaining wall still functions as an external wall then Specification C1.1 Clause 2.4 applied.

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External Wall DtS Provisions

There are three groups of requirements in the BCA Volume One Deemed-to-Satisfy provisions related to reducing the impact of fire on external walls (or elements which are an integral part of an external wall).

1. A tested Fire Resistance Level (FRL)
2. Requirements for the building elements to be non-combustible
3. Requirements to meet certain fire hazard properties for linings, materials and assemblies.

These requirements are independent of each other and must all be considered.

The following BCA DtS provisions apply for combustibility of external walls:

- BCA Specification C1.1 Section 3.1(b) and 4.1(b) state that for buildings required to have Type A or Type B fire resisting construction, external walls must be non-combustible.

All external walls are required to be non-combustible for buildings greater than two or three storeys in height (depending on classification) or deemed non-combustible in accordance with BCA Clause C1.9. The BCA defines combustible as:

- Applied to a material – combustible as determined by AS 1530.1
- Applied to construction or part of a building – constructed wholly or in part of

A GENERAL OVERVIEW OF BUILDING AND COMPLIANCE REQUIREMENTS

Fire Performance Requirements of the NCC

Section C Volume 1 - refers to Fire Resistance and contains the Performance Requirements and Deemed-to-Satisfy provisions for **Classes 2 to 9** constructions.

The Performance Requirements for fire resistance have the following objectives:

- Maintaining structural stability during a fire
- Avoiding the spread of fire
- Protecting the building from the spread of fire and smoke to allow sufficient time for evacuation in an emergency
- Maintain tenable conditions during occupant evacuation
- Protection of service equipment and hazardous substances
- Protection of emergency equipment
- Maintaining fire resistance performance at penetrations, joints and attachments
- Access to the building for emergency vehicles and personnel.

Additionally, Section 2.3 – Volume 2 refers to Fire Safety and contains the Performance Requirements for **Classes 1 and 10**. The DtS provisions for wall cladding are contained in Section 3.5 (not in this document).

Due to the lower complexity of Classes 1 and 10 construction, the fire performance requirements and objectives are more simplistic:

- Protection from the spread of fire
- Fire detection and early warning
- Protection from heating appliances
- Resistance to bushfires.

The Builder/Architect/Designer can choose to follow the DtS provisions provided in the NCC to achieve compliance to the relevant Performance Requirements. Where the design application does not fit with standard DtS solutions, a Performance Solution must be developed in collaboration with the project stakeholders (ie. Architect, Engineer, Surveyor, local authorities for fire etc.)

Combustible or Non-Combustible

The BCA definition:
Combustible means:

(a) applied to a material – combustible as determined by AS 1530.1 and;
(b) applied to a construction or part of a building – constructed wholly or in in part of combustible materials

Where are Non-Combustible Materials Required?

This is specifically defined in BCA Clause 1.9, however, as a general guide:

- Depends on both ‘Building Class’ and ‘Construction Type’
- Bonding walls around a unit (party wall and corridor wall); and
- The exterior of a high rise project.

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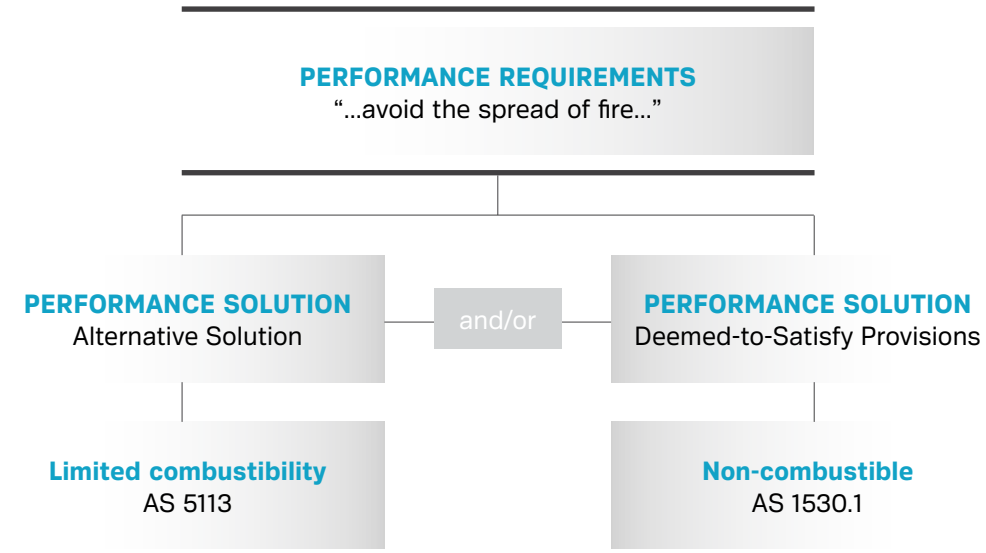
FIRE PERFORMANCE COMPLIANCE

There are 2 pathways for compliance under the BCA:



NOTE: DtS provisions allow building materials to be used in certain ways without the need for further verification. For example, fibre cement or plasterboard may be used where a non-combustible material is required without any further need to demonstrate compliance. All Cemintel panels are fibre cement and there is no need to illustrate suitability. Instead reference can be made to BCA Clause C1.9.
To assist with specifications, Fire Certificates are available for downloading from the website at **cemintel.com.au**

This is the general testing apparatus for compliance testing.

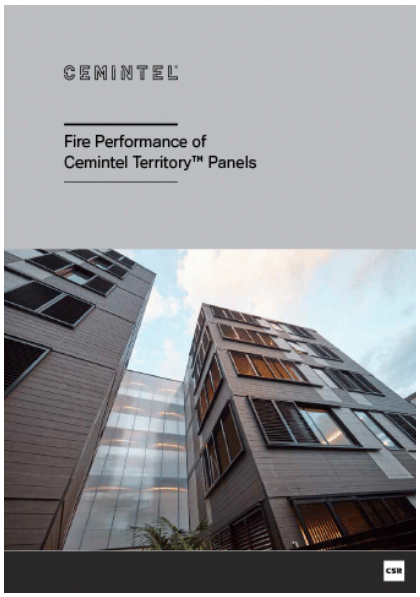
AS 5113

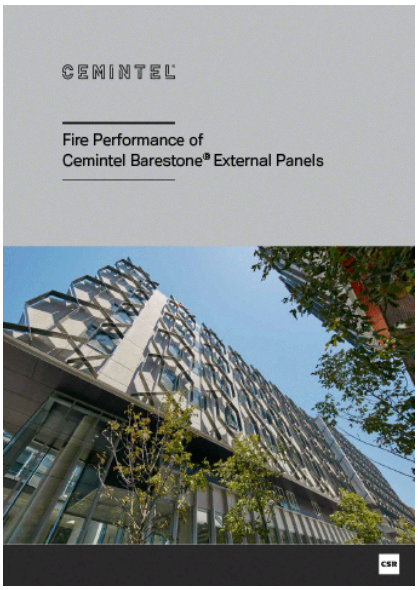
This is the test rig for AS 5113, based on the rig used for BRE testing in Europe. The test time is 30 minutes.

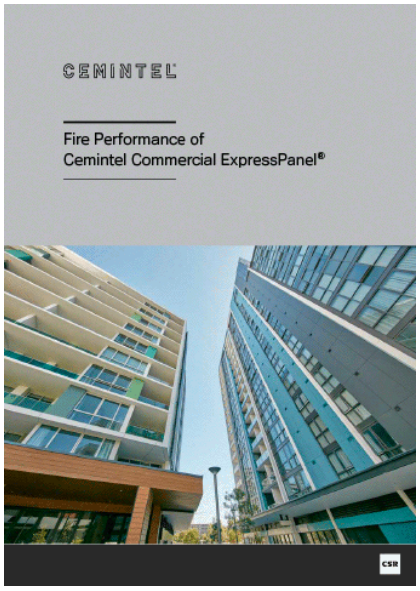
AS1530

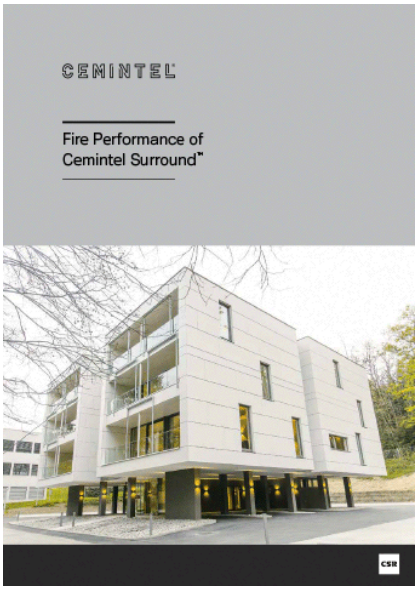
This is a furnace for AS1530.1 testing. A 45mm (d) x 50mm (t) piece of material is dropped into the furnace at a temperature of 750°C for 30 minutes.

Cemintel panels are fibre cement and there is no need to illustrate suitability. Instead reference can be made to BCA Clause C1.9. To assist with specifications,
Fire Certificates are available for downloading from the website: cemintel.com.au.
The testing report will identify each component used withing the tested configuration and nothing can be changed from the tested configuration to achieve an AS 5113 compliance rating.









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Classification Summary of Buildings and Structures

This list provides the definitions of Building Classes as set out in the Building Code of Australia.

Classes of Building – BCA Clause A3.2		
Class 1	**Class 1a**	A single dwelling being a detached house, or one or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit.
	Class 1b	A boarding house, guest house, hostel or the like with a total area of all floors not exceeding 300m^2, and where not more than 12 reside, and is not located above or below another dwelling or another Class of building other than a private garage.
Class 2	A building containing 2 or more sole-occupancy units each being a separate dwelling.	
Class 3	A residential building, other than a Class 1 or 2 building, which is a common place of long term or transient living for a number of unrelated persons. Example: boarding-house, hostel, backpackers accommodation or residential part of a hotel, motel, school or detention centre.	
Class 4	A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.	
Class 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	
Class 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public. Example: café, restaurant, kiosk, hairdressers, showroom or service station.	
Class 7	**Class 7a**	A building which is a car park.
	Class 7b	A building which is for storage or display of goods or produce for sale by wholesale.
Class 8	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.	
Class 9	A building of a public nature.	
	Class 9a	A health care building, including those parts of the building set aside as a laboratory.
	Class 9b	An assembly building, including a trade workshop, laboratory or the like, in a primary or secondary school, but excluding any other parts of the building that are of another class.
	Class 9c	An aged care building.
Class 10	A non-habitable building or structure.	
	Class 10a	A private garage, carport, shed or the like.
	Class 10b	A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool or the like.
	Class 10c	A private bushfire shelter
Mixed use buildings	– mainly relates to multi-residential where they may be a basement carpark (Class 7a) with ground floor retail spaces (Class 6) and residential apartments above (Class 2)	

Construction Type

Type of Construction Required – BCA Clause C1.1		
Rise in storeys	**Class of building 2, 3, 9**	**Class of building 5, 6, 7, 8**
4 or more	A	A
3	A	B
2	B	C
1	C	C

Note: The classification of buildings and the type of construction can vary from the standard model depicted in the tables. Concessions can be provided that change the type of construction. The concessions can relate to the design of the building, its size, and the number of escapes.

Types of Construction Required

The Construction Type is determined by the Class of Building (see above) and the rise in storeys above and including ground level. Type A is the most fire resistant and Type C is the least. Type of Construction is determined using the table below:

Classes 2-9 Construction

NCC Volume 1: Section C – Fire Resistance provides the following DtS:

The DtS provisions of C1 which are relevant to material selection for internal and external wall and ceiling linings are in the table below. C2 and C3 focus on application design and not material selection (refer to the NCC Volume 1).

C1.1 Type of Construction	This section allocates a Fire Construction Type (A, B or C) to the building. Refer to 'C1.1 and C1.5 Type of Construction Required' below. Specification C1.1 defines non-combustibility requirements according to these construction types. Refer to 'Specification C1.1 Non-combustibility Requirements' section below including concessions for combustible products. Specification C1,1 also lists Fire Resistance Levels (FRL) requirements of the components. Refer to 'Specification C1.1 Fire Resistance of Building Elements' below.
C1.5 Two Storey Construction	For buildings of Classes 2, 3 and 9C only – the construction can be classified as Type C Fire Construction Type if it satisfies the conditions listed in the 'C1.1 and C1.5 Type of Construction Required' below
C1.10 Fire Hazard Properties	This section specifies the material property requirements for the floor coverings, ceiling linings, internal wall linings and external wall cladding. Specification C1.10 details the material testing requirements depending on if a sprinkler system is installed or not. Refer to 'C1.10 Fire Hazard Properties' below.
Part G5 Bushfire Areas	References to AS 3959 designate the requirements for each Bushfire Attack Level (BAL) including Flame Zone (FZ). Refer to section below.

Specification C1.1 Fire Resistance of Building Elements

In addition to identifying the applications where combustible cladding may be used, Specification C1.1 lists the minimum Fire Resistance Level (FRL) for several building elements (including internal and external walls).

Fire Resistance refers to the graded ability in minutes of a construction element to resist a fully developed fire, as determined by AS 1530.4 (see page 19).

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Part G5 Bushfire Areas

Bushfire Attack Level (BAL) Rating

A BAL rating is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. It's measured in increments of radiant heat (expressed in kilowatts/m^2).

A BAL is the basis for establishing the requirements for construction (under the Australian Standard AS 3959-2009 Construction of Buildings in Bushfire Prone Areas), to improve protection of building elements from bushfire attack.

Once assessed, your site/property/asset will be defined to one of six BAL ratings:

BAL-FZ

Direct exposure to flames from the fire front in addition to heat flux of greater than **40kW/m^2** and ember attack.

BAL-40

Increasing levels of ember attack and ignition of debris with an increasing heat flux of up to **40kW/m^2** and increased likelihood of exposure to flames

BAL-29

Increasing levels of ember attack and ignition of debris with an increasing heat flux of up to **29kW/m^2**

BAL-19

Increasing levels of ember attack and ignition of debris with an increasing heat flux of up to **19kW/m^2**

BAL-12.5

Ember attack with heat flux of up to **12.5kW/m^2**

BAL-Low

There is insufficient risk to warrant specific construction requirements

The image above shows the various BAL ratings and the radiant heat flux for each rating. The greater the distance from the fire the lower the heat flux and therefore the construction standard is lower.

Where your building is greater than 100m from any classified vegetation the BAL rating will be BAL–LOW and will not require any special construction requirements. Where there is a risk or potential that ember attack could affect your home we recommend that BAL – 12.5 is applied.

BAL ratings for all Cemintel® products are available for download at cemintel.com.au/technical

WHAT IS AS 5113?

AS 5113:2016

Fire propagation testing and classification of external walls of buildings
This is a published Australian Standard that sets procedures for testing and classification of external wall according to their tendency to limit the spread of fire across their surface and between neighbouring buildings. It can be applied to external vertical surfaces and external wall systems. AS 5113 also integrates international standard test methods where practicable^. AS 5113 refers to test methods BS8414 part 1 and 2 2015, ISO 13785-2 and AS1530.4-2005 Appendix B7.

The test assesses the fire safety of an **overall external cladding system** used on an external wall, rather than looking at individual components. The testing report will identify each component used within the tested configuration and nothing can be changed from the tested configuration to achieve an AS 5113 compliant rating.

Note: AS 5113 is NOT compulsory in order for a material or system to be used in a façade. It is a verification method under the Performance Requirements of the BCA.

Fibre cement is an acceptable material for use under Deemed-to-Satisfy requirements.

Remember, AS 5113 is nominated as a 'Verification Method within the BCA, Clause CV3, but AS 5113 compliance is not necessarily required. Compliance can be illustrated simply by using a non-combustible façade system.

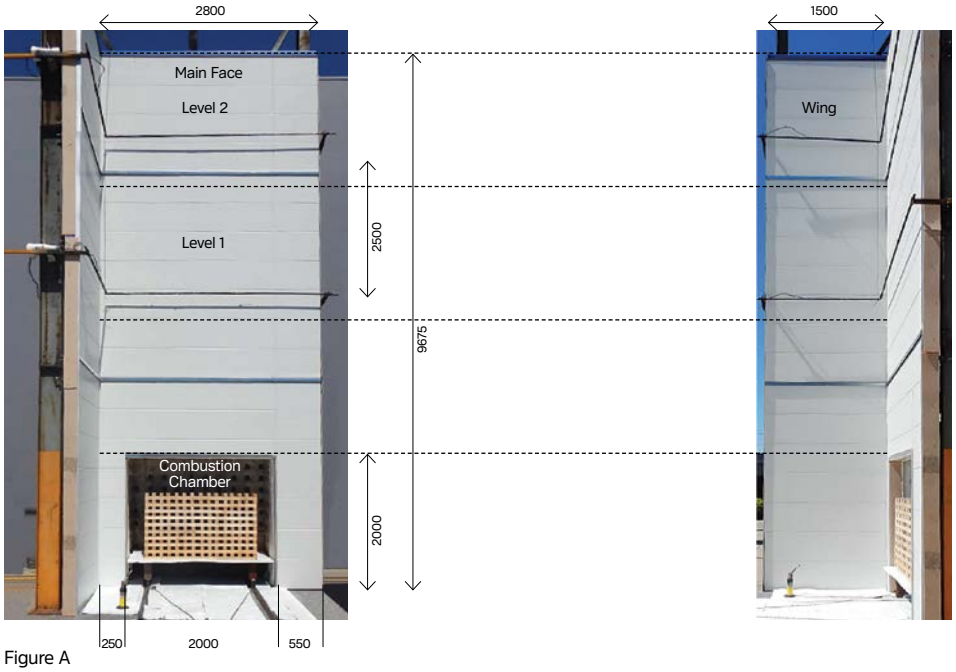


Figure A

Figure A shows the test structure required for AS 5113 testing.

The structure must be building in accordance with the recommended installation instructions of the system being tested.

The testing effectively lasts for 1 hour - a 30 minute burn period and a further 30 minutes where the rig is monitored after the fire is extinguished.The test requires the pass/fail of a number of criteria as in Table 1.

^ Standards Australia

How AS 5113 has evolved

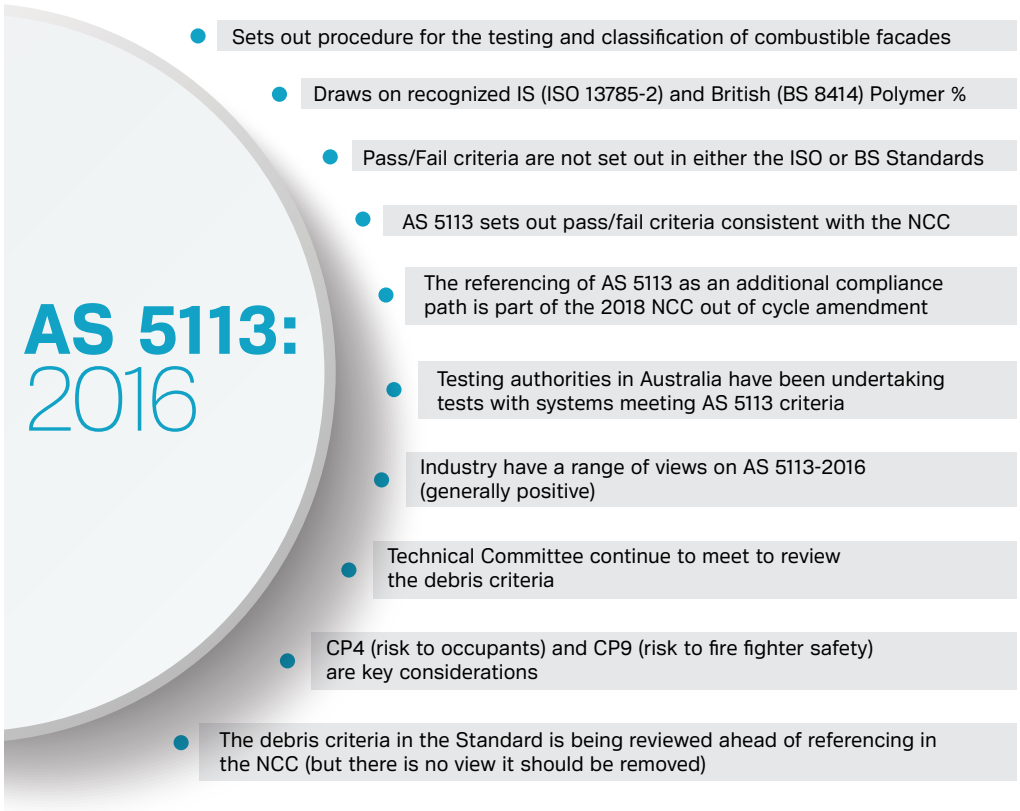


Table 1: Criteria for AS 5113

Classification Criteria	Related Classification Measurement
T w5m	≤ 600°C
T cavity5m, Panels	≤ 250°C
T cavity5m, Glasswool/Steel Framing	≤ 250°C
T unexposedside0.9m	≤ 180°C Rise
Flaming	No flaming
Openings	No openings
Spread	No spread
Debris flaming	≤ 20 seconds
Debris mass	≤ 2kg

The cost of the testing for a supplier is significant when all elements are factored in, for example material cost, testing authority fee, engineering fee for the test wall design and build costs.

Companies and materials have failed the test for various reasons, but commonly because of the debris criteria. The criteria requires that no more than 2kg of debris is allowed (all debris is swept up and weighed), otherwise it is a fail.

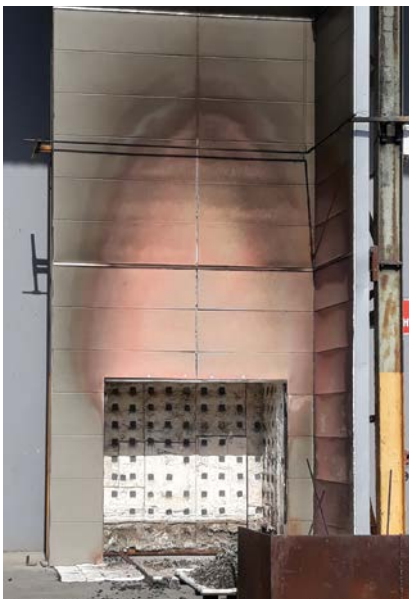
TERRITORY AS 5113 FIRE TEST

The images below illustrate the AS 5113 test for Territory. Territory is a unique product in that it satisfies the DtS requirements of the BCA, and additionally has passed the AS 5113 test with an EW rating.

9min

22mins

30mins - crib removed



60mins

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ALUMINIUM COMPOSITE PANELS (ACP)

What are Aluminium Composite Panels?

ACP is made of 3 layers – a core material which is bonded to a thin skin-layer on each side. They are also referred to as sandwich panels.

Their usage is not restricted to facades, other industries such as signage printing use ACP.

Figure 2: ACP

It has been a popular facade material because:

- it is lightweight
- there is a large choice of colours and finishes
- it is straight
- it has good bending strength
- it is durable
- it is relatively easy to install

There are different kinds of ACP.

Figure 3 shows the 3 Classes that are used in construction.

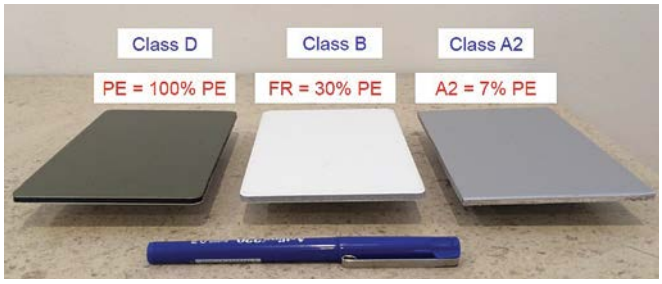


Figure 3: Classification of ACP products (Source: Tony Enright, December 2017)

The following table is a classification guide for ACP:

	Polymer %		
Classification	50-100	~30	Up to 7
AKA (Australia)	PE	FR	A2
Euroclass	D	B	A2
BRE Cat	3	2	1

Some states are calling for a ban on some classes of ACP product. QLD has a call for banning ALL PE products, VIC have instituted a ban on ACP's with a PE core of >30% on all multi-storey buildings, and NSW has issued a ban on ACP panels with a PE core of >30%. VIC have also banned EPS (polystyrene).

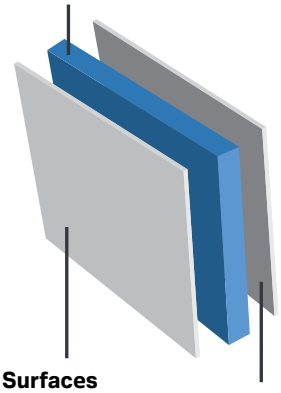
ACP has a number of fire hazards including:

- upward flame spread
- lateral flame spread
- burning drips falling
- burning sheets falling

These hazards can lead to the following issues:

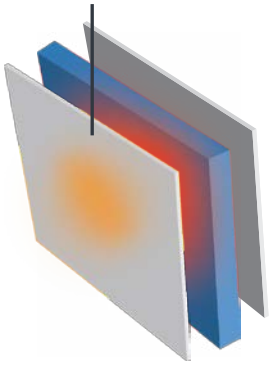
- fire spread circumvents safety systems
- can overwhelm the system
- block exits and fire rescue teams which can lead to loss of life.
- fire can spread up and down

Insulating core 2-5mm thick, 100% polyethylene



Surfaces
0.5mm thick100% aluminium skin

Heat from a fire will conduct quickly to the core through thin aluminium



Core loses ability to bind, causing outer skins to deform and delaminate.

Core melts and can ignite

Notes:

- Aluminium melts at 660 degrees celsius and is a good conductor. At 380 degrees celsius H^20 and Co^2 start to be produced – give off energy/heat
- $1m^2$ of PE cladding = approx. 4 hours petrol

Reference:

https://www.api.org.au/sites/default/files/uploaded-content/website-content/curll_matt_aluminium_composite_cladding_brochure_v5.pdf

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OTHER TEST STANDARDS

While AS 5113 is gaining a lot of focus, there are a number of other testing standards that can be referred in relation to Fire Performance.

AS 1530

Methods for fire tests on building materials, components and structures

As more talk and conjecture occurs in the industry, things that existed quietly previously come to the fore. This is the case of AS1530 as more requests are being made for proof of AS1530.1

This Standard provides methods for determining the performance of external construction elements when exposed to radiant heat, burning embers and burning debris.

- The methods do not simulate engulfment by flames from the fire front or large burning items such as other burning buildings or adjacent isolated trees and shrubs (see AS 1530.8.2).
- The peak level of radiant heat exposure is dependent upon the distance of the building from the potential fire front, the fire severity and the extent of shielding. The peak level can be based on an analysis of the specific site from first principles or from the classification of the site in accordance with the simple methods specified in AS 3959.
- The results of the fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method would not provide a full assessment of fire hazard under all fire conditions.
- These fire tests provide data relating to the performance of the particular element and building system and do not provide a general assessment of the performance of a specific type of material.

AS 1530.1

Combustibility test for materials

There are 3 main materials that pass this Standard: stone, glass and metal/steel.

Fibre cement along with a number of other materials (eg. timber) does not pass this criteria.

If the materials flames or if it loses a prescribed mass, it fails.

AS 1530.2

Test for flammability of materials

Does not relate to fibre cement, mainly for sarking/wall wraps.

AS 1530.3

Simultaneous determination of ignitability, flame propagation, heat release and smoke release

These are the early fire hazard indices and fibre cement generally rates 0/0/0/1 (which is very good).

AS1530.4

Fire-resistance test of elements of construction (FRL)

The fire rating of systems is laboratory tested to determine the time to failure of 3 performance measurements which combine to give a Fire Resistance Level (FRL). They are:

Structure Adequacy: failure occurs when the specimen collapses under load.

Integrity: failure occurs when the specimen develops cracks or openings through which flames or hot gases can pass.

Insulation: failure occurs when the average temperature of the unexposed surface of the specimen increases by more than 140°C above the initial temperature, or the temperature at any point of the unexposed surface increases by more than 180°C above the reference temperature.

The test performance of the specimen is expressed as an FRL which indicates the number of minutes for which the specimen fulfils the requirements of the three criteria. These numbers are then rounded down to the nearest regulatory requirement.

The common regulatory FRL requirements are:

Non-Loadbearing	Loadbearing
-/30/30	30/30/30
-/60/60	60/60/60
-/90/90	90/90/90
-/120/120	120/120/120
-/180/180	180/180/180

As an example: FRL -/120/120

The dash indicates no requirement for Structural Adequacy, which applies to all non-loadbearing systems.

The first 120 indicates integrity for 120 minutes.

The second 120 indicates Insulation for 120 minutes.

CV3

CV3 is a reference point for suitable cladding material.

CV3 is a verification method that calls up AS 5113. Like AS 5113, this is a verification method to measure vertical spread. A DtS requirement must be used to measure horizontal spread.

Codemark

CODEMARK™
30041

A Certificate of Conformity can be issued under the ABCB's voluntary Codemark of Australia or Codemark scheme as evidence that a building material, method of construction or design fulfils specific requirements of the BCA.

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INDUSTRY DISCUSSION POINTS

Flame Spread

Much of the discussion regarding what is a suitable facade material is centreing on those that do not spread flame. This is good news for fibre cement.

Flame spread varies due to the following:

- size of ignition
- heat release rate
- density, heat capacity, thickness
- orientation
- geometry - reentry at corners and cavities
- fixing detail
- melting - thermoplastic or thermoset
- charring and fire retardants
- wind

Heat Release Rate of Fire

According to Fire Engineer, Tony Enright† of Enright Consulting, evaluation of the heat release rate of fire is a key consideration. The lower the power rating, the less likely the material will add energy to keep the fire going/fire spreading.

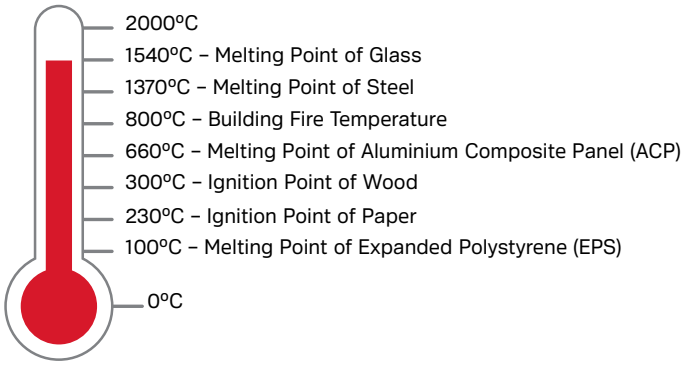
The below table shows the heat consumption scale for some materials as identified by Enright Consulting:

Table 1: Power (kW) = Burning Rate (kg/sec) x Energy (mj/kg)	
Product/Material	Heat of Consumption (mj/kg)
Stone, glass, metal	~ 0.0
Fibre cement	~ 1
A2	2.5
FR ACP	4
Wood	16
PVC (poly vinyl chloride)	16.4
Wood composites – HPL (high pressure laminate)	18.4
Fibreglass	21.0
EPS (expanded polystyrene)	38.1
PE (polyethylene)	43.3
Petrol	43.7

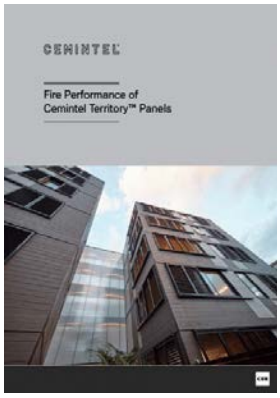
† Tony Enright appeared in the ABC Four Corners documentary 'Combustible', www.abc.net.au/4corners/combustible, 31 August 2017

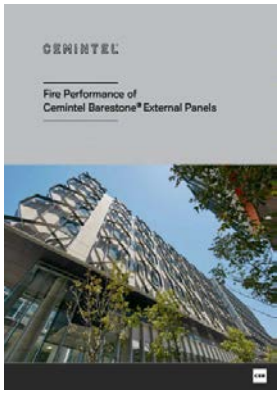
The Melbourne Fire Brigade have the following guide on material behaviour in fires. The Melbourne Fire Brigade (MFB) have had significant input into the discussion given the risk to its employees when attending combustible cladding fires.

The categories are (top to bottom):



What is Cemintel's Position for Fire Performance?





All products in the Cemintel portfolio are deemed as a non-combustible material in accordance with C1.9 and part 3.7.1.2 of the BCA. They are suitable for use where non-combustible building materials are required.

For residential buildings covered by Volume 2 of the NCC, clause 3.7.1.2 specifically indicates that fibre cement is suitable for use where non-combustible materials are required.

For residential and commercial buildings covered by Volume 1 of the NCC, Clause C1.9 similarly indicates that fibre cement is suitable for use where non-combustible materials are required.

Fire Certificates have been produced to cover off specification requirements for fire performance. They are currently available for Territory, Surround, Barestone and Commercial Express Panel and are on our website under "Technical".

Cemintel's Territory range has achieved an EW rating after passing all criteria of the AS 5113 test. It also qualifies as a non-combustible material under the DtS requirements of the BCA.

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Why is glass considered a suitable façade material?

Glass (curtain walling/façade) is an interesting material in the debate given its extensive use in facades. Light is a key factor in designing buildings and architects love using it for this reason, as well as it having a concealed fixing option.

Glass passes AS1530.1 and therefore it is not required to perform the AS 5113 test to be classified as a suitable non-combustible material.

However, consider this – a 3500mm x 1500mm x 16mm glass panel can weigh around 210kg*. When used in a façade, it generally sits within an aluminium box frame (approximately 100-150mm) held in place by a rubber seal. In the case of a fire in a glass façade building, as the temperature increased the seal would fail, the aluminium frame would start to fail at about between 600-700°C and the glass would start to change composition between 700-900ºC. Whether the glass shattered or stayed in one piece – think about the impact of 210kg falling from height. Given one of the key criteria of AS 5113 that most materials are failing is the debris (ie. no more than a total of 2kg) there is seemingly a contradiction within the BCA. Noteworthy is that even without fire, glass panes fall out of high rise buildings.

European Classification

With more products being imported for use in facades, it is important to understand that there will be different classifications.

European Classification A1 – non combustible (ie. Cemintel Surround)

European Classification A2 – limited combustibility

* Capral Aluminium, CW150 Curtain Wall, www.capral.com.au

Ongoing Discussion

The following is a list of themes and issues that keep recurring regarding the non-combustible facade discussions:

- Average time for flame to spread has been reduced as a result of changes to Building Standards and materials used – from 25 mins down to 7 mins (ref: Fire Brigade). The Fire Brigade has been very active in lobbying for change.
- Adhesive/tape fixing is not a safe option. Example: Lacrosse panels fell off. The amount of pressure required to fix it with just tape is not physically possible on site (vs IBM mechanical fix) and it will fail in a fire.
- Testing product vs system can give different results. Testing of systems to get an indication of fire behaviour is better than no testing.
- The Qld Government has called for a national ban on PE. There have also been changes to state legislation to improve compliance, and in October 2017 they released the 'Non-Conforming Building Products Code of Practice', followed by Building and Construction Legislation (Non-Conforming Building Products – Chain of Responsibility and Other Matters) Amendment Act 2017 in November 2017.
- The NSW Dept of Fair Trading issued a ban on ACP panels with a PE core of greater than 30%, commencing 15/8/18.
- Victoria's State Government has introduced a ban on PE products (>30%) in March 2018. See Guideline in Appendix C.
- Laminated core honeycombs ignite due to glue however, the product is still being used in facades.
- Debris Debate – 250kg double glazed window vs 2kg debris. Note: Poland & Eastern Europe have a 5kg maximum, however, the concept of debris being considered is a good one (Grenfell firefighters had to use riot shields).
- AS 5113 testing must be as per supplier installation manual. There have been reports through a number of industry bodies that some AS 5113 tests have been conducted with a different system from their recommended system in order to pass the test. As an example, fire retardant sealants have been used in lieu of standard sealants that have been specified in installation instructions.
  The system tested must be that reflected in installation information, otherwise this is misleading.

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CONCLUSION

The information in this bulletin is designed to increase the knowledge that helps us have more informed discussions around the issue of fire performance and the suitability of fibre cement.

With so much hype in the industry regarding fire performance, people from all areas of industry are asking for more information to meet compliance requirements. It is possible that on occasions they do not fully understand the situation and why they are asking for information. With the information provided here, you can be more confident to engage in discussions regarding fire performance.

So what is the solution? Unfortunately, there is no silver bullet with such a complex issue. It is complex because of the number of stakeholders that are involved in reaching a resolution and the huge costs of admission of liability to existing buildings alone. It is unlikely that there will be a national resolution to the situation. State Governments and industry bodies are taking a local approach as to how they deal with the situation and change is slow. Insurance companies are also weighing in on the debate.

What is the best façade product? Ultimately, there is still no clear recommendation being provided by any authority or Government body on what is the preferred façade material, rather it is by exclusion ie. banning ACP that has >30% PE content.
The introduction of testing such as the AS 5113 will assist, and it will also make way for more material options. Importantly, fibre cement continues to be a suitable material for facades/cladding. Cemintel has a range of fibre cement products that comply with the BCA requirements for non-combustible materials, and one range has also passed AS 5113.

Will ACP products be totally banned? This is a common question in the market.
It would be reasonable to suggest that should there be another apartment tower fire involving combustible cladding, there would be increased pressure from the many key stakeholders to consider this as an option, as it was after Grenfell.

This document is not meant to be exhaustive but a snapshot in time of the overall situation.

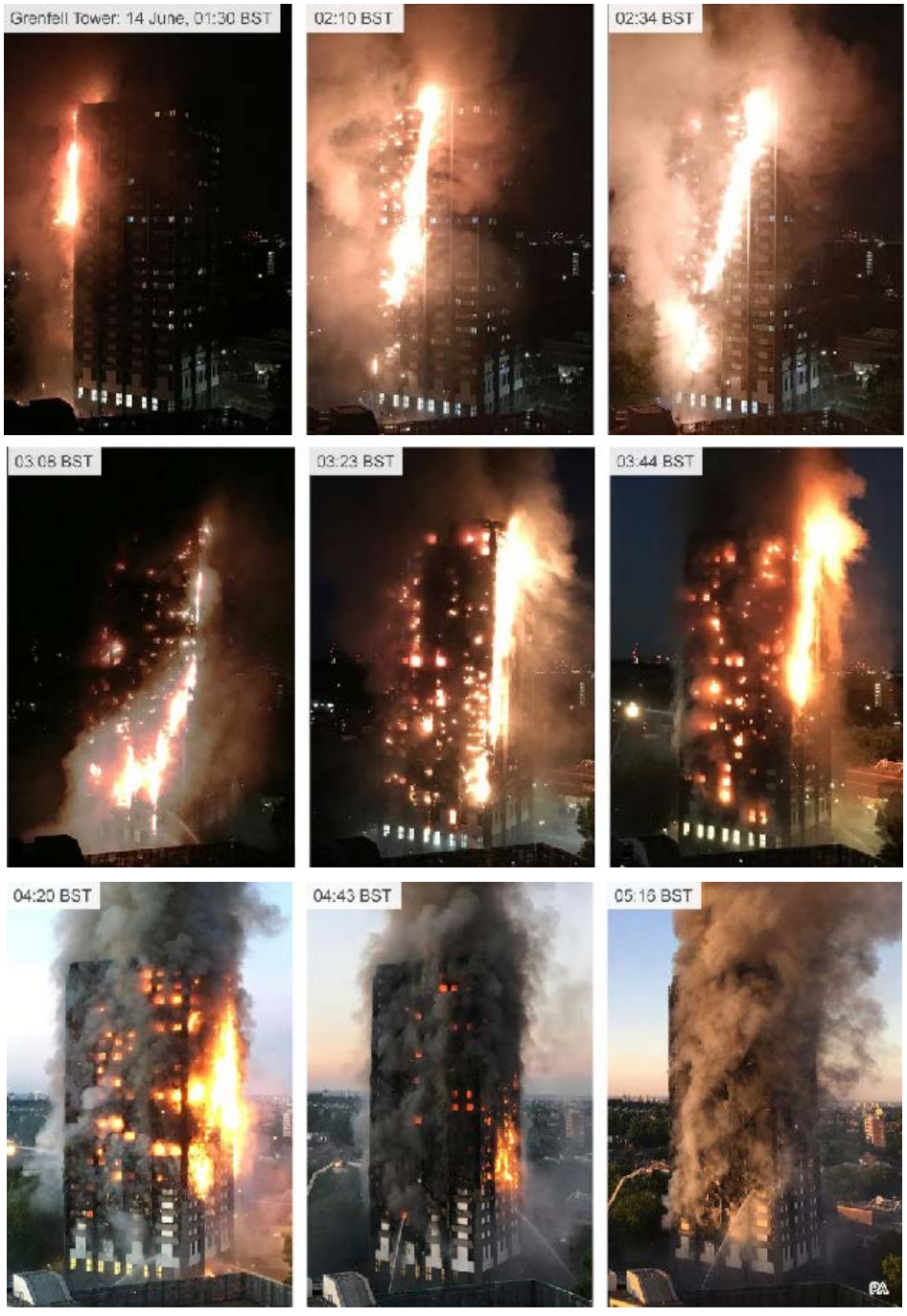
Article obtained from
bbc.com.au dated 18 June 2018 https://www.bbc.com/news/uk-40301289

The fire which destroyed Grenfell Tower in June 2017 was one of the UK's worst modern disasters.

Just before 01:00 on 14 June, fire broke out in the kitchen of a fourth floor flat at the 23 storey tower block in North Kensington, West London.

Within minutes, the fire had raced up the exterior of the building and then spread to all four sides. By 03:00, most of the upper floors were well alight.

Seventy-two people died. Here is how events unfolded that night.



Article obtained from
bbc.com.au dated 18 June 2018 https://www.bbc.com/news/uk-40301289

How the fire started

The fire began "in or around" a Hotpoint fridge-freezer in flat 16 on the fourth floor, according to a provisional report by Dr Niamh Nic Daéid, director of the Leverhulme Research Centre for Forensic Science at Dundee University.

Her report contains extracts from a witness statement by flat occupant Behailu Kebede, who described being woken by the sound of a smoke alarm.

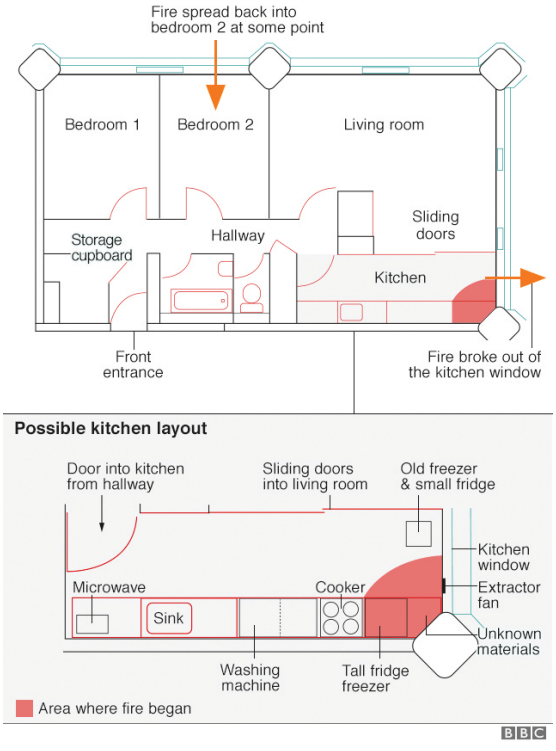
He went into the kitchen and saw smoke in the area of the fridge-freezer and near the kitchen window.

Mr Kebede immediately called the fire brigade, which logged the call at 00:54. Four fire engines were sent to the scene, the first arriving at 00:59.

The first fire crew entered the flat at 01:07 - an approximate timing taken from a thermal imaging camera. They initially searched the bedrooms and did not enter the kitchen until 01:14.

In the kitchen, firefighter Daniel Brown described seeing an "isolated curtain of flame from about 2-3 feet in the air to the ceiling".

Thermal images captured by the fire crew appear to show that "hot fire gases and flames had spread across the window space".



As the fire crew dealt with the fire in the fridge-freezer, their thermal images also appear to show falling embers outside the kitchen window.

Mobile phone images taken by Mr Kebede from outside Grenfell Tower approximately 11 minutes after his first 999 call show an orange glow of flames around the kitchen window, and later a fire burning more intensely in the area of the window filler panel and extractor fan.

Subsequent photos by Mr Kebede suggest that the "fire was continuing to develop and grow", Dr Nic Daéid reports, by 01:09 becoming "external to the building".

Although the timings provided are approximate, it appears that the fire had spread to the cladding before the firefighters had entered the kitchen.

Dr Nic Daéid's provisional report also identifies "unknown materials" stored between the freezer and wall which "may have become involved in the fire in the early stages of its development".

Among these materials was an item described as an "electric cooking device" or "large hot plate".

In another report, fire expert Professor Luke Bisby expressed his view that the likely reason for the fire spreading beyond the kitchen was that flame and hot gases penetrated the internal window frame.

Images from the kitchen of flat 16 show the positioning of the kitchen appliances and the window.

How the fire spread

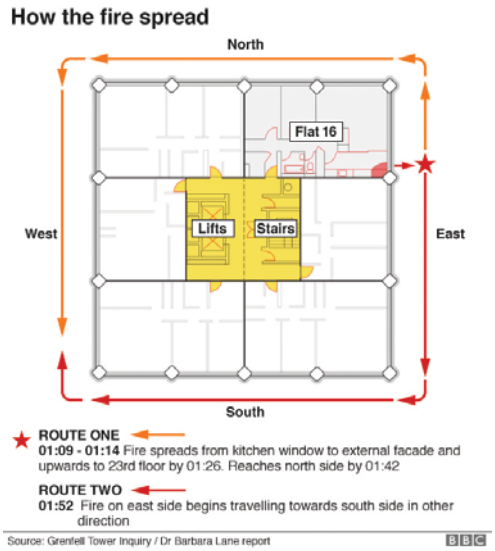
From the fourth floor, the fire spread rapidly upwards and across the eastern side of the building. From there, it spread across the north face of the tower.

Mobile phone videos show the blaze reaching the top floor on the east side of Grenfell Tower by about 01:26, less than 30 minutes after firefighters had arrived.

In a report to the Grenfell Public Inquiry, fire safety engineer Dr Barbara Lane identified the fire spreading vertically up the tower columns, and "laterally along the cladding above and below the window lines (and) the panels between windows."

The fire had spread to the north side of the tower by 01:42, Dr Lane recorded.

At 01:52, the fire also began travelling across the eastern side towards the south in the other direction.



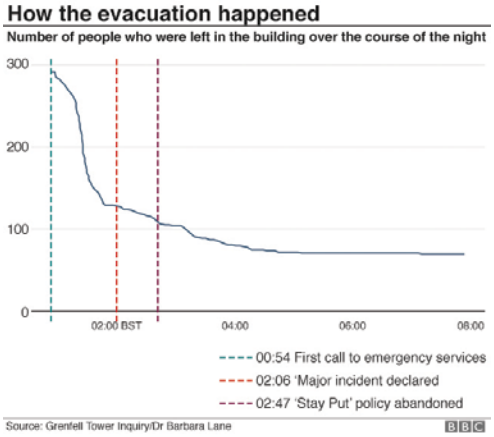
At 02:06, London Fire Brigade declared the fire a "major incident". At this point, some 40 fire engines were either at or en route to the scene.

Grenfell Tower had a 'stay put' fire policy - essentially, the building design would contain a fire in a single flat for as long as it took fire crews to bring it under control.

So on the night, many residents were told to remain in their flats by the emergency services, only to become trapped as the fire blazed out of control and thick poisonous smoke spread up the single narrow stairwell.

Dr Lane said that the stay put policy had "substantially failed" by 01:26 - less than 30 minutes after the first firefighters were at the scene.

Some people people ignored the stay put advice and made it down the stairs to safety.



A total of 65 people were rescued from the building by firefighters.

But in desperation, other residents went upwards and sought refuge in flats of friends and neighbours on the upper floors. Twenty-four people died on the top floor of the tower block.

By 02:10, multiple internal fires could be seen burning inside the building.

At 02:22 fire had spread to the south side of the tower and by 02:30 it was reported that the eastern side of the building was "fully involved in fire".

The stay put advice was finally abandoned at 02:47, when the incident commander gave the order to "advise people to make efforts to leave the building."

Counsel to the Grenfell inquiry Richard Millet QC told the 4 June hearing that 144 people managed to evacuate before 01:38, but only 36 after the stay put guidance was abandoned.

By 02:51, the fire had reached the western side. At this point, some 63 flats were on fire and more than 100 people remained in the building.

At 04:30 the whole building was engulfed, with more than 100 flats on fire.

The blaze did not burn itself out until 01:14 BST on Thursday - 24 hours later.

Article obtained from
bbc.com.au dated 18 June 2018 https://www.bbc.com/news/uk-40301289

What caused the fire to spread so quickly?

The most significant part of the renovation of Grenfell Tower was the addition of external cladding. This consisted of aluminium sheets bonded to a central plastic (polyethylene) core.

In his report to the public inquiry, Professor Luke Bisby said evidence "strongly supports" the theory that the polyethylene material in the cladding was the primary cause of the fire's spread.

"The ACM (aluminium composite material) product on Grenfell Tower incorporates a highly combustible polyethylene polymer filler which melts, drips, and flows at elevated temperature. The polyethylene filler material is expected to release large amounts of energy during combustion".

Images after the fire show evidence of melted cladding on the tower's columns

His report also suggests that vertical cavities within the cladding structure played a role in the spread of the fire, as did the insulation, although evidence was inconclusive.

A number of other flammable materials, including a polyurethane polymer foam insulation board which pre-dated the refurbishment were also present and may have contributed, Prof. Bisby found.

In her report, fire expert Dr Barbara Lane identifies combustible materials used in the refurbishment of the tower's windows as another factor in allowing the fire to spread.

The Grenfell Inquiry has also heard that the building's smoke extraction system was not working, and that firefighters experienced problems with the water supply because there was no 'wet riser' - a water-filled pipe running up the building to be used in the event of fire.

Giving evidence to the inquiry, Dr Lane said exposed gas pipes installed in 2016 were another contributory factor, while none of the flat doors met current fire resistance standards.

Work done on the lifts in 2005 and 2012-16 left them unfit for evacuating vulnerable residents and aiding the emergency response, Dr Lane said.

Who were the victims?

The final death toll from the blaze is now recorded as 72 people.

They include six members of the Choucair Family and five members of the Hashim Family, who lived on the 22nd floor.

Five members of the El-Wahabi family died on the 21st floor.

The youngest victim was six-month old baby Leena Belkadi, who died in her mother's arms as she tried to escape.

Other young victims included Jeremiah Deen, 2, Isaac Paulos, 5, Hania Hassan, 5, and her sister Fethia, 3, and twelve-year olds Biruk Haftom and Jessica Urbano-Ramirez.

The oldest victim is believed to be 84-year-old Sheila from the 16th floor, who had lived in Grenfell Tower for 34 years.

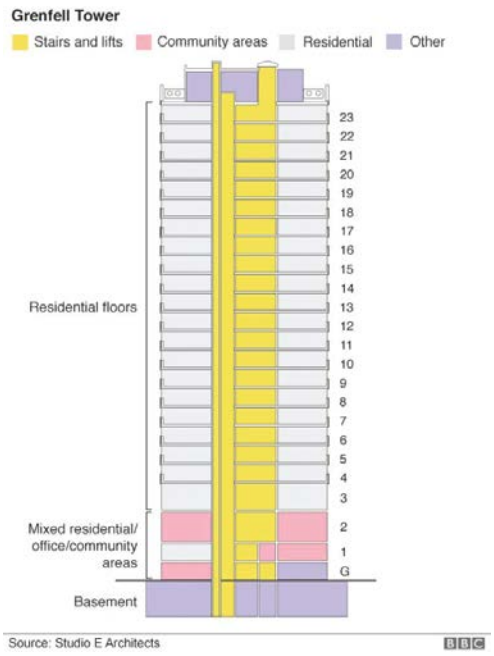
Baby Logan Gomes, who was stillborn in hospital on 14 June the morning after the fire, is also included in the toll.

The final victim was Maria Del Pilar Burton, who suffered from serious long-term health issues, and died in hospital in January 2018.

What kind of building was Grenfell Tower?

Grenfell Tower was part of the Lancaster West Estate, a social housing complex of almost 1,000 homes.

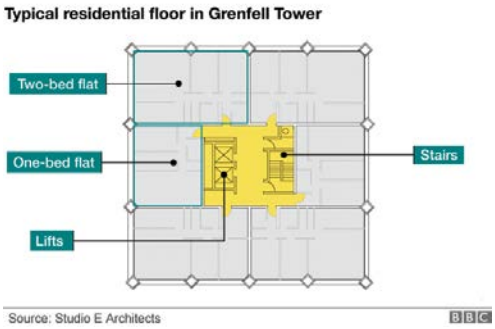
The tower was built in the 1970s, but recently renovated.



An £8.6m refurbishment - part of a wider transformation of the estate - was completed by Rydon Construction in May 2016.

Work included new exterior cladding, replacement windows and a communal heating system.

The bottom four floors were also remodelled, creating seven additional homes and



There were 129 flats across 21 residential floors and three levels of mixed use.

The tower was managed by the Kensington and Chelsea Tenant Management Organisation (KCTMO) on behalf of the council.

Article obtained from
bbc.com.au dated 18 June 2018 https://www.bbc.com/news/uk-40301289

How is the fire and its causes being investigated?

Specially trained officers from the Met, City of London Police and British Transport Police have been involved in the search and recovery operation, thoroughly searching every single flat on every single floor.

Officers have examined 15.5 tonnes of debris on each floor, helped by forensic anthropologists, archaeologists and forensic dentists or odontologists.

A public inquiry, ordered by Prime Minister Theresa May, is under way.

Lawyers representing survivors and relatives of the victims began giving evidence to the public inquiry into the tragedy on Monday 11 December 2017.

The Metropolitan Police are looking into offences including manslaughter, corporate manslaughter, misconduct in public office and breaches of fire safety regulations in relation to the fire, the inquiry has been told.

The force has already gathered 31 million documents and 2,500 physical exhibits. Some 1,144 witnesses have given statements and 383 companies are part of the investigation.

The public inquiry plans to deliver an interim report into the fire's causes and the emergency response by next autumn.

Article obtained from
Electronic Journal of Structural Engineering 16(1) 2016

eJSE International

Electronic Journal of Structural Engineering 16(1) 2016

2 MAJOR FAÇADE FIRES

Table 2.1 gives a summary of the recent major façade fire incidents that took place around the world. In all cases, it was evident that there has been a rapid fire spread along the exterior cladding due to the combustibility of the materials used. Although sprinklers were installed, external fire spread was not prevented that considerably reduced the evacuation time for occupants. The cases of apartment buildings where the occupancy is relatively high throughout the day turned out to be catastrophic events, which ultimately resulted to loss of human lives.

There are examples where authorities have stepped up to strengthen their guidelines in order to prevent such incidents from happening again in the future.

Table 2.1 A summary of recent major facade fire incident

Building	Location	Year	Description	Damage
Grenfell Tower (Kirkpatrick et al. 2017) (24 stories)	London, UK	2017	Fire started at 4th floor and spread rapidly through the external cladding which consisted of ACM panels with PE core	79 dead 70 injured
The Address Downtown Dubai (302m tall) (Associated Press 2017; Schreck and Gambrell 2016)	Dubai, UAE	2016	Fire started at the parking level while the construction works were ongoing	16 minor injuries
Marina torch (352m) (Austin and Williams 2015)	Dubai, UAE	2015 & 2017	Fire initiated in the 52nd floor and spread quickly due to high winds	No injuries
Tamweel Tower (160m tall) (Miers 2016)	Dubai, UAE	2012	A fire ignited which burned two separate broad vertical bands of exterior cladding from ground to roof level. ACM panels with PE core	Repair works have begun after 3 years
Saif Belhasa Building (13 stories) (Miers 2016)	Dubai, UAE	2012	Fire started at the 4th floor and spread rapidly to the roof level. Cladding consisted of ACM panels with PE core	9 flats destroyed 2 injured Debris damaged 5 vehicles
16 Storey apartment building(Reuters 2015)	Baku, Azerbaijan	2015	Rapid fire spread along the cladding which were fitted after a renovation. 'Polyurethane panels' according to reports.	17 dead 60 injured
Lacrosse Building (Toscano and Spooner 2015)	Melbourne, Australia	2014	Fire started on the 6th floor and Fast-running flames soon ignited external wall cladding and aided by combustible material located within the wall structure quickly spread to the top of the building	No injuries
18 storey building(FPA 2012)	Roubaix, France	2012	Dramatic upwards spread of the fire from its origin to the top of the 18-floor building, apparently fuelled by its highly flammable outer cladding	1 dead 1 injured
28 storey building (Barboza 2010)	Shanghai, China	2010	Building was undergoing renovations which involved installing energy saving insulation. Fire was believed to have spread on polyurethane insulation to external walls	53 dead 90 injured
Monte Carlo Hotel (32 stories) (Duval 2008)	Las Vegas, US	2008	Fire was burning along the combustible components of the building's architectural trim and the exterior insulation and finish system which consists of a layer of expanded polystyrene foam adhered to gypsum sheathing	13 minor injuries
Marco Polo Apartments (36 stories) (Farrer and Barney 2017)	Honolulu, US	2017	Fire started on the 26th floor and blaze rapidly spread higher. The building did not have a sprinkler system	3 dead 12 injured

Lacrosse Apartment Fire, Melbourne.
November 2014. No casualties
16 floors engulfed in about 15 mins

The Address Hotel, Dubai.
January 2016. 14 people injured Minutes to leap 40 storeys – the cause of the fire was a short circuit

Baku Residence, Azerbaijan.
May 2015. 15 people died – 5 children, 63 injured. 16 storeys went up in seconds according to witnesses

Lacrosse Apartment Fire, Melbourne.
November 2014. No casualties
16 floors engulfed in about 15 mins

The Saif Belhasa, Dubai.
October 2012. 2 injuries.
9 of the 13 storeys burnt out

Haeundae Busan, South Korea.
October 2010. No casualties
33 floors engulfed in less than
30 minutes

Jing An District, Shanghai.
November 2010. 58 people killed, more than 70 injured. 28 storeys

Television Cultural Centre, Beijing.
February 2009. 1 person killed, 7 injured. Although illegal pyrotechnics were the cause of the fire, the 44-floor building was engulfed in about 13 mins

5-star Hotel Shenyang, China.
February 2011. No casualties. Fireworks were said to cause the fire. The fire travelled across 37 floors in 20 mins.

Spencer St, Melbourne.
February 2019. No casualties. 150 evacuated.

Macquarie St, Sydney. May 2018.
No casualties. 20 people evacuated. Scaffolding set up to remove cladding, catches fire.

Marina Torch, Dubai.
February 2015 & August 2017. 79 storeys.

Hon Richard Wynne MP

Minister for Planning

Minister's Guideline MG-14: Issue of building permits where building work involves the use of certain cladding products

This is a guideline issued by the Minister pursuant to section 188(1)(c) of the Building Act 1993 (Act). Municipal building surveyors and private building surveyors must have regard to this guideline pursuant to section 188(7) of the Act.

Purpose

This Guideline has been issued to reduce the risks to life and property which can arise from the inappropriate use of products containing combustible materials in external wall cladding systems in some multi-storey buildings in Victoria.

This is a guideline relating to the functions of municipal building surveyors and private building surveyors when considering an application for a building permit which proposes the use of combustible materials in external wall systems.

This Guideline takes effect from 22 March 2018.

Issue of building permits for the use of certain cladding products on Type A and B Construction

When considering whether to issue a building permit in relation to a building of Type A or Type B Construction, the relevant building surveyor should not be satisfied that proposed building work which includes the installation of a Prescribed Combustible Product as part of an External Wall (including as an attachment) would comply with the Act and Regulations **unless** the application for the building permit includes a determination of the Building Appeals Board that the installation of the Prescribed Combustible Product in relation to that application complies with the Act and Regulations.

Definitions

For the purposes of this Guideline:

BCA Volume One means Volume One of the National Construction Code Series including any variations or additions in the Appendix Victoria set out in the Appendices to that Volume.

External Wall has the meaning given to it in Part A1 of the BCA Volume One.

Prescribed Combustible Products means:

- a panel that comprises a polyethylene core or lamina bonded to one or more sheets of metal panels including an aluminium composite panel (also sometimes referred to as aluminium composite material); or
- an expanded polystyrene product used in an external insulation and finish (rendered) system.

Polyethylene core means a core or lamina that is comprised of 30% or more polyethylene by mass.

Type A Construction has the meaning given to it in Part C1 of the BCA Volume One.

Type B Construction has the meaning given to it in Part C1 of the BCA Volume One.

I have issued this guideline pursuant to section 188(1)(c) of the Building Act 1993 (Vic).

The Hon Richard Wynne MP

Minister for Planning

Issued: 13 March 2018

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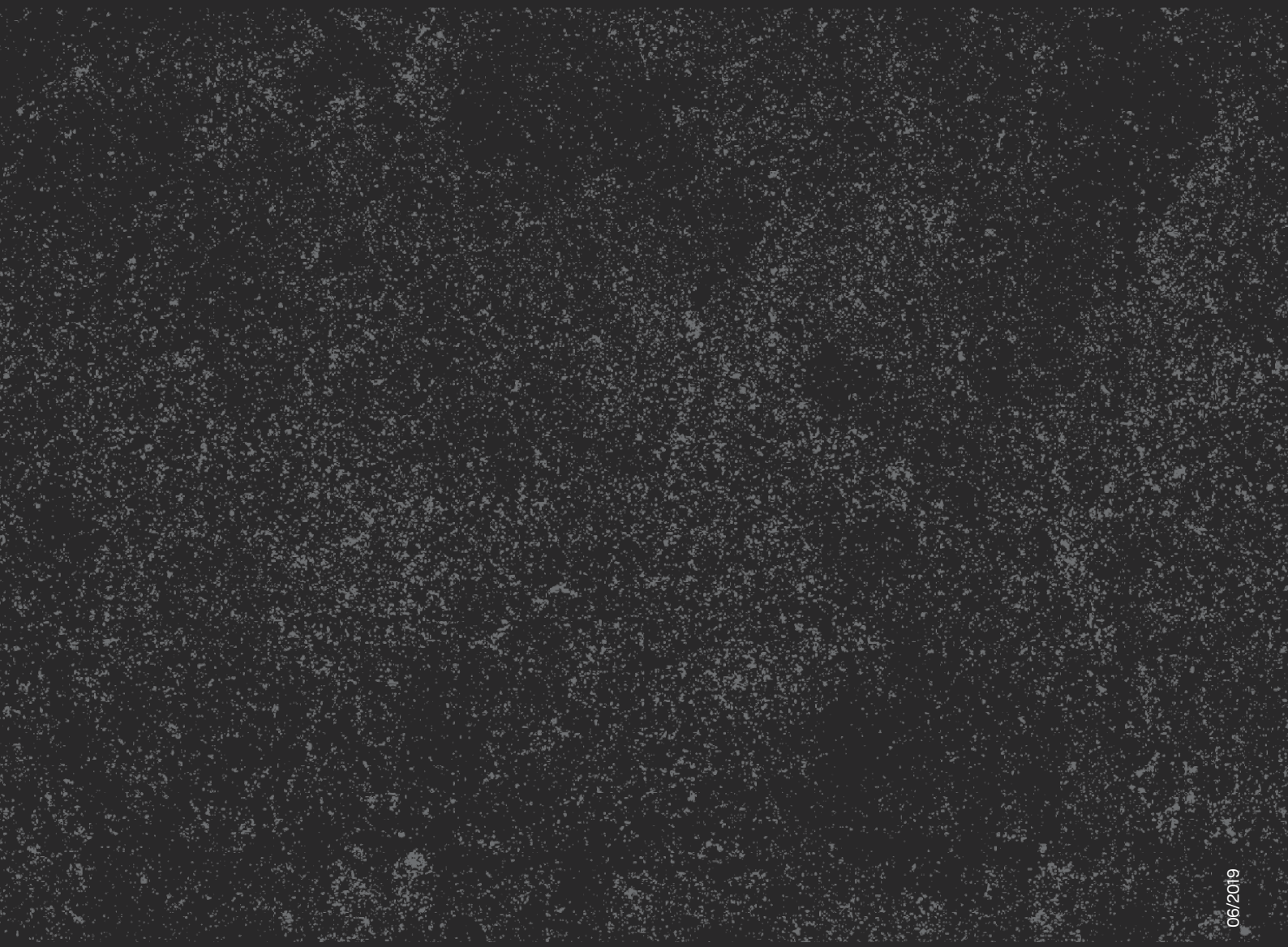

06/2019

CSR

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SECTION 1: IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name	**CEMINTEL® Fibre Cement**
Other Names	CEMINTEL Texture Base Sheet, Wallboard, CeminSeal Wallboard, Cladding Sheet, Eaves Lining, CeminSeal Soffits, Compressed Sheet, ExpressPanel (Residential and Commercial), Ceramic Tile Underlay, Stucco Panel, Woodgrain Panel, Lattice, Cladding Plank, Headland Weatherboard, Endeavour Weatherboard, Scarborough Weatherboard, Rendaline Sheet, Capitals (Lincoln, Ovolo, Pencil Round and Ornate), CeminSeal BareStone, Edge Cladding, Constructafloor, Aspect Cladding, Mosaic Panels, SimpleLine, Cavity Battens, BareStone, Rigid Air Barrier.
Product Codes/Trade Names	n/a
Recommended Use	Used as external cladding (sheets, planks and weatherboards), cavity battens, internal lining including wet areas, bracing sheets, lining eaves and as compressed sheeting for flooring, decks and underlay for tiles. Compressed sheets may be also used as building facades.
Applicable In	Australia
Supplier	CSR Building Products Limited ABN 55 008 631 356
Address	Triniti 3, 39 Delhi Road, North Ryde, NSW 2113, Australia
Telephone	+61 2 9235 8000 (or 1800 807 668 (available in Australia only)
Email Address	www.cemintel.com.au/contact
Website	www.cemintel.com.au/
Facsimile	+61 2 9372 5819
Emergency Phone Number	000 Fire Brigade and Police (available in Australia only)
Poisons Information Centre	13 11 26 (available in Australia only)

This Safety Data Sheet (SDS) is issued by the Supplier in accordance with National standards and guidelines from Safe Work Australia (SWA – formerly ASCC/NOHSC). The information in it must not be altered, deleted or added to. The Supplier will not accept any responsibility for any changes made to its SDS by any other person or organization. The Supplier will issue a new SDS when there is a change in product specifications and/or Standards, Codes, Guidelines, or Regulations.

SECTION 2: HAZARD IDENTIFICATION

Statement Of Hazardous Nature

Classified as **Non-Hazardous** as delivered, according to the criteria of Safe Work Australia (SWA – formerly ASCC/NOHSC) Approved Criteria For Classifying Hazardous Substances [NOHSC:1008] 3rd Edition.

The fine dust in/on the supplied product may include respirable crystalline silica. Cutting, breaking, drilling, sawing, grinding and finishing may generate dust which is **Hazardous**. Recommendations on Exposure Controls / Personal Protection (see Section 8 below) should be followed.

CEMINTEL Fibre Cement is classified as Non-Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

GHS CLASSIFICATION

Not classified as Hazardous. Because this product is classified as Non-Hazardous, a Safety Data Sheet (SDS) is not required under the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) or Australian Regulations. CSR has elected to issue this SDS for the information of users, installers and the community. It has been formatted according to the GHS, as adopted by Safe Work Australia.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	SYNONYMS	PROPORTION	CAS NUMBER
Calcium silicate hydrate		<60%	1344-95-2
Crystalline silica	Sand, Quartz	20-55%	14808-60-7
Cellulose (from wood pulp)		<15%	9004-34-6
Water		<15%	7732-18-5
Other non hazardous ingredients (fillers, pigments, acrylic sealers and surface coatings)		<10%	---

Note: This product does not contain any hazardous fibre.

SECTION 4: FIRST AID MEASURES

The following applies to **dust** from this product:	
Swallowed	Rinse mouth and lips with water. Do not induce vomiting. If symptoms persist, seek medical attention.
Eyes	Flush thoroughly with flowing water, while holding eyelids open, for 15 minutes to remove all traces. If symptoms such as irritation or redness persist, seek medical attention.
Skin	Remove heavily contaminated clothing. Wash off skin thoroughly with water. Use a mild soap if available. Shower if necessary. Seek medical attention for persistent redness, irritation or burning of the skin.
Inhaled	Remove to fresh air, away from dusty area. If symptoms persist, seek medical attention.
Advice to Doctor	Treat symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

Suitable extinguishing media	Use carbon dioxide, foam, dry chemical or water spray to extinguish, as required for fire in surrounding materials.
Specific hazards	None
Special protective precautions and equipment for fire fighters	As required for fire in surrounding materials.
HAZCHEM Code	None

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Recommendations on Exposure Controls / Personal Protection (see Section 8 below) should be followed during spill clean-up if conditions are dusty.
Environmental precautions	No specific precautions required.
Methods and materials for containment and cleaning up	Dust is best cleaned up by wet sweeping and/or vacuuming to avoid making dust airborne. Wetting down before sweeping up dust may be a useful control measure. Bag waste materials.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Respirable dusts can be generated during processing and handling. Wear protective equipment to prevent skin and eye contamination. Manual handling should be in accordance with Manual Handling Regulations and Codes.
Conditions for safe storage	Store in a dry area.
Incompatibilities	None

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Workplace Exposure Standards	**Workplace Exposure Standards for Airborne Contaminants, Safe Work Australia** Crystalline silica (quartz): TWA - 0.1 mg/m3 as respirable dust (≤ 7 microns particle equivalent aerodynamic diameter) Calcium silicate dust: TWA - 10 mg/m3 as inspirable dust Cellulose (paper fibre): TWA - 10 mg/m3 as inspirable dust Total dust (of any type, or particle size): TWA -10 mg/m3
Notes on Exposure Standards	All occupational exposures to atmospheric contaminants should be kept to as low a level as is workable (practicable) and in all cases to below the Workplace Exposure Standard (WES). TWA (Time Weighted Average): the time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.
Biological Limit Values	No biological limit allocated.
ENGINEERING CONTROLS	
☐ **Ventilation**	Keep exposures to dust as low as practicable. Work in the open air and within external openings (such as doors and windows in buildings) generally provides adequate ventilation. Local mechanical ventilation or extraction may be required in areas where dust could escape into the working environment. Local dust extraction and collection may be used, if necessary, to control airborne dust levels. Hand tools generate less dust when cutting, drilling or sanding. If power tools are used they should be fitted with efficient and well maintained dust extraction devices. If generated dust cannot be avoided follow personal protection recommendations.
☐ **Special Consideration for Repair and/or Maintenance of Contaminated Equipment**	Where possible vacuum or wash down all gear, equipment or mobile plant prior to maintenance and repair work. If compressed air cleaning cannot be avoided, recommendations on Exposure Control and Personal Protection should be followed.
PERSONAL PROTECTION	
☐ **Personal Hygiene**	Wash hands before eating, drinking, using the toilet, or smoking. Wash work clothes regularly.
☐ **Skin Protection**	Wear loose comfortable clothing. Direct skin contact should be avoided by wearing long sleeved shirts and long trousers, a cap or hat, and gloves (standard duty leather or equivalent AS 2161).
☐ **Eye Protection**	Ventilated non-fogging goggles (dust resistant AS/NZS 1336) should be worn when working in a dusty environment.
☐ **Respiratory Protection**	None required if engineering and handling controls are adequate. Where engineering and handling controls are not enough to minimise exposure to total dust and to respirable crystalline silica, personal respiratory protection may be required. The type of respiratory protection required depends primarily on the concentration of the respirable crystalline silica dust in the air, and the frequency and length of exposure time. Amount of exertion required during the work, and personal comfort are other considerations in choice of respirator. A suitable P1 or P2 particulate respirator chosen and used in accordance with AS/NZS 1715 and AS/NZS 1716 may be sufficient for many situations, but where high levels of dust are encountered, more efficient cartridge-type or powered respirators or supplied-air helmets or suits may be necessary. Use only respirators that bear the Australian Standards mark and are fitted and maintained correctly, and kept in clean storage when not in use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Grey flat sheets or mouldings, which may have a tinted or primed finish
Odour	None
Odour threshold	Not applicable
pH	Approximately 7.4
Melting point	Not determined
Initial boiling point and range	Not determined
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability	Non-flammable
Upper/lower flammability or explosive limits	Not applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES CONT.

Vapour pressure	Not applicable
Vapour density	1.3 to 1.7
Specific gravity (Relative density)	Insoluble
Solubility	Not determined
Partition coefficient (n-octanol/water)	Not applicable
Viscosity	Not applicable
Auto-ignition temperature	Not determined
Decomposition temperature	0%
% Volatiles	0%
Volatile Organic Compounds (VOC) Content (as specified by the Green Building Council of Australia)	0%

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	Stable
Hazardous Reactions	None
Conditions to avoid	Dust generation
Incompatible Materials	None
Hazardous Decomposition Products	None

SECTION 11: TOXICOLOGICAL INFORMATION

HEALTH EFFECTS: ACUTE (SHORT TERM)	
Swallowed	Unlikely under normal industrial use, but swallowing the dust from this product may result in abdominal discomfort.
Eyes	Dust is irritating to the eyes causing watering and redness. Exposure to dust may aggravate pre-existing eye conditions.
Skin	The dust from this product, particularly in association with heat and sweat, may cause irritation, but it is not absorbed through the skin. It may be mildly irritating and drying to the skin due to its physical characteristics.
Inhaled	Dust is mildly irritating to the nose, throat and respiratory tract and may cause coughing and sneezing. Pre-existing upper respiratory and lung diseases including asthma and bronchitis may be aggravated.
HEALTH EFFECTS: CHRONIC (LONG TERM)	
Skin	Repeated heavy contact with the dust may cause drying of the skin and can result in skin rash (dermatitis) typically affecting the hands. Over time this may become chronic and can also become infected.
Inhaled	Repeated exposure to the dust may result in increased nasal and respiratory secretions and coughing. Inflammation of lining tissue of the respiratory system may follow repeated exposure to high levels of dust with increased risk of bronchitis and pneumonia.
ADDITIONAL NOTES	
Long Term Effects	Long term occupational over-exposure or prolonged breathing-in (or inhalation) of crystalline silica dust at levels above the WES carries the risk of causing serious and irreversible lung disease, including bronchitis, and silicosis (scarring of the lung), including acute and/or accelerated silicosis. It may also increase the risk of other irreversible and serious disorders including scleroderma (a disease affecting the skin, joints, blood vessels and internal organs) and other auto-immune disorders. Any respirable fraction present in dust generated from this product has not been shown to be a carcinogenic risk. Based on limited animal research, it is possible that repeated inhalation of cellulose fibre dust over time may lead to inflammation and scarring of the lung in humans. Measures taken to protect against crystalline silica dust will also be adequate for preventing health effects from cellulose.
Special Toxic Effects	Inhalation of dust, including crystalline silica dust, is considered by medical authorities to increase the risk of lung disease due to tobacco smoking.

SECTION 12: ECOLOGICAL INFORMATION

Eco-toxicity	Product is non-toxic to aquatic and terrestrial organisms.
Persistence and Degradability	Product is persistent and would have a low degradability.
Bioaccumulative potential	There is no evidence to suggest bioaccumulation will occur.
Mobility in soil	A low mobility would be expected in a landfill situation.

SECTION 13: DISPOSAL CONSIDERATIONS

This product can be treated as a common waste for disposal, or dumped into a landfill site in accordance with local authority guidelines. Measures should be taken to prevent dust generation during disposal, and exposure and personal precautions should be observed (see above).

SECTION 14: TRANSPORT INFORMATION

UN number	None allocated
UN Proper Shipping Name	None allocated
Class and Subsidiary Risk	None allocated
Packaging Group	None allocated
Marine Pollutant	No
Special Precautions for User	None
HAZCHEM code	None allocated

SECTION 15: REGULATORY INFORMATION

Poisons Schedule	Not scheduled

SECTION 16: OTHER INFORMATION

For further information on this product, please contact:
CSR Building Products Limited (ABN 55 008 631356), Triniti 3, 39 Delhi Road, North Ryde, NSW 2113, Australia.

Phone	+61 2 9372 5888 or 1800 807 668 (available in Australia only)
Fax	+61 2 9372 5877
ADDITIONAL INFORMATION AUSTRALIAN STANDARDS REFERENCES	
AS/NZS 1336	Recommended Practices for Occupational Eye Protection
AS/NZS 1715	Selection, Use and Maintenance of Respiratory Protective Devices
AS/NZS 1716	Respiratory Protective Devices
AS 2161	Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)
OTHER REFERENCES	
NOHSC:1008 (2004)	Approved Criteria for Classifying Hazardous Substances
Model Code of Practice	Preparation of Safety Data Sheets for Hazardous Chemicals, December 2011, Safe Work Australia.
Model Code of Practice	Labelling of Workplace Hazardous Chemicals, December 2011, Safe Work Australia.
Model Code of Practice	Managing Risks Of Hazardous Chemicals In The Workplace, July 2012, Safe Work Australia.
WHS	Guidance on the Classification of Hazardous Chemicals under the WHS Regulations, April 2012, Safe Work Australia.
ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th edition, National Transport Commission.

SECTION 16: OTHER INFORMATION

WES	Workplace Exposure Standards For Airborne Contaminants, April 2013, Safe Work Australia.
WES	Guidance On The Interpretation Of Workplace Exposure Standards For Airborne Contaminants, April 2013, Safe Work Australia.
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 3rd revised edition, United Nations, New York and Geneva, 2009.
GHS	Understanding the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations, New York and Geneva, 2010.
HSIS	Hazardous Substances Information System (HSIS), internet advisory service, Safe Work Australia.
HCIL	GHS Hazardous Chemical Information List (HCIL), internet advisory service, Safe Work Australia.

AUTHORISATION

Reason for Issue	Update to GHS format
Authorised by	Kate Lane
Date of Issue	16/03/2018

Whilst the information contained in this document is based on data which, to the best of our knowledge, was accurate and reliable at the time of preparation, no responsibility can be accepted by us for errors and omissions. The provision of this information should not be construed as a recommendation to use any of our products in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Since the information contained in this document may be applied under conditions beyond our control, no responsibility can be accepted by us for any loss or damage caused by any person acting or refraining from action as a result of this information.

PANEL DESCRIPTION / COMPOSITION

CeminSeal® Wallboard - Recessed Edge

APPLICATIONS

	Result
Applications	Internal Linings, Eaves & Soffits (Express jointed only)
Type of Building Structure	Residential Housing Buildings within the scope of AS4055, Commercial & Other
Wet Areas	Yes

PANEL - DIMENSIONAL & GEOMETRICAL CHARACTERISTICS

Dimensional/Geometrical Characteristic	Specification	Manufacturing Tolerance	Relevant Standard
Panel Dimensions	900mmW x 3000mmL x 6mmD 1200mmW x 1800mmL x 6mmD 1200mmW x 2400mmL x 6mmD 1200mmW x 2700mmL x 6mmD 1200mmW x 3000mmL x 6mmD 1200mmW x 3600mmL x 6mmD 1200mmW x 4200mmL x 6mmD 1350mmW x 2400mmL x 6mmD 1350mmW x 3000mmL x 6mmD 1350mmW x 3600mmL x 6mmD 1350mmW x 4200mmL x 6mmD 1200mmW x 2400mmL x 9mmD 1200mmW x 2700mmL x 9mmD 1200mmW x 3000mmL x 9mmD 1200mmW x 3000mmL x 12mmD	Width +0 -3mm Length +0 - 4mm Thickness +0.5 -0mm	
Profile	Recessed Edge		
Perpendicularity/squareness of edges	2mm/linear meter		
Weight (typical)	6mm = 9.4kg/m2, 9mm = 14kg/m2		
Layout Options	Horizontal		
Jointing	Butt Jointed, Concealed, Expressed (ceilings only)		

PANEL - STRENGTH & MOISTURE RELATED PROPERTIES

Physical Property	Result	Relevant Standard
Modulus of Rupture (Wet)	> 8 MPa	AS2908.2
Modulus of Elasticity (Wet)	3-5 GPa	AS2908.2

Physical Property	Result	Relevant Standard
Density (Oven Dry)	1350 kg/m3	AS2908.2
Water Vapor Diffusion	Not Required	Not Required
Water Tightness (24hrs)	No water droplet	AS2908.2
Water Absorption (Saturated – 48hrs)	30 wt%	ASTM C 1186
Moisture Content (EMC)	7 Wt %	ASTM C 1186
Moisture Movement	0.0006	ASTM C 1186

PANEL - OTHER DURABILITY/WEATHER RESISTANCE INDICATORS

Test	Result	Relevant Standard
Heat Rain	PASSED (25 Cycles)	AS2908.2
Freeze Thaw	PASSED (50 Cycles)	AS2908.2
Warm Water Resistance	PASSED (56 days)	AS2908.2
Soak Dry	PASSED (25 Cycles)	AS2908.2

PANEL - FINISH CHARACTERISTICS

Characteristic	Result	Relevant Standard
Finish	Preprimed	
Coating Type	CeminSeal®	
Colour Bodied	No	
Paint Type		
UV Resistance	N/A	N/A
Formaldehyde Emission Rate	Meets Green Building Council Office Design IEQ-14 Requirements for <0.1mg/m2/hr* *Refers to results obtained for Woodlands Teak	ASTM D5116
VOC Emission Rate	Meets Green Building Council Office Design IEQ-14 Requirements for <0.5mg/m2/hr* *Refers to results obtained for Woodlands Teak	ASTM D5116

Spectral Reflectivity Values	Solar Reflectance %	Solar Absorption %	Basix Colour	Relevant Standard
CeminSeal® Wallboard - Recessed Edge				N/A

PANEL - FIRE RESISTANCE, THERMAL & ACOUSTIC PROPERTIES

Characteristic	Result	Relevant Standard
FIRE RESISTANCE		
Combustibility	Suitable for use in applications where non-combustible materials are specified by the Deemed to Satisfy Provisions of the 2016 BCA Vol 1 Amendment 1 Clause C1.9 (2015 BCA Vol Clause C1.12)	

Characteristic	Result	Relevant Standard
Fire Hazard Properties	Group 1 Av Specific Extinction Area <250	AS/NZ 3837
Classification	1	AS/NZ 3837
Surface Burning Characteristics	Ignitability =0, Flame Propagation =0, Heat Release =0, Smoke Release=1	AS1530.3
THERMAL CONDUCTIVITY		
Thermal Conductivity (λ-Factor)	≈ 0.2776 W/m.K.	
Thermal Expansion Co-efficient	0.005-0.01mm/mK	N/A
ACOUSTIC VALUE		
Sound reduction (depends on construction)	N/A	N/A

SYSTEM SOLUTIONS

Characteristic	Result	Relevant Standard
Within Scope of AS4055?	Yes	
Wind Loading - Residential housing buildings within the scope of AS4055	N1, N2, N3, N4, N5, C1, C2, C3	
Weatherproofing	N/A	N/A
Cyclonic Conditions	N/A	N/A
Fire Resistance Limits (FRLs)	N/A	N/A
Bushfire Construction	BAL 40 (Construction for Bushfire Attack Level 40 for an external wall)	AS 3959-8
Acoustic	N/A	N/A
Thermal	N/A	N/A

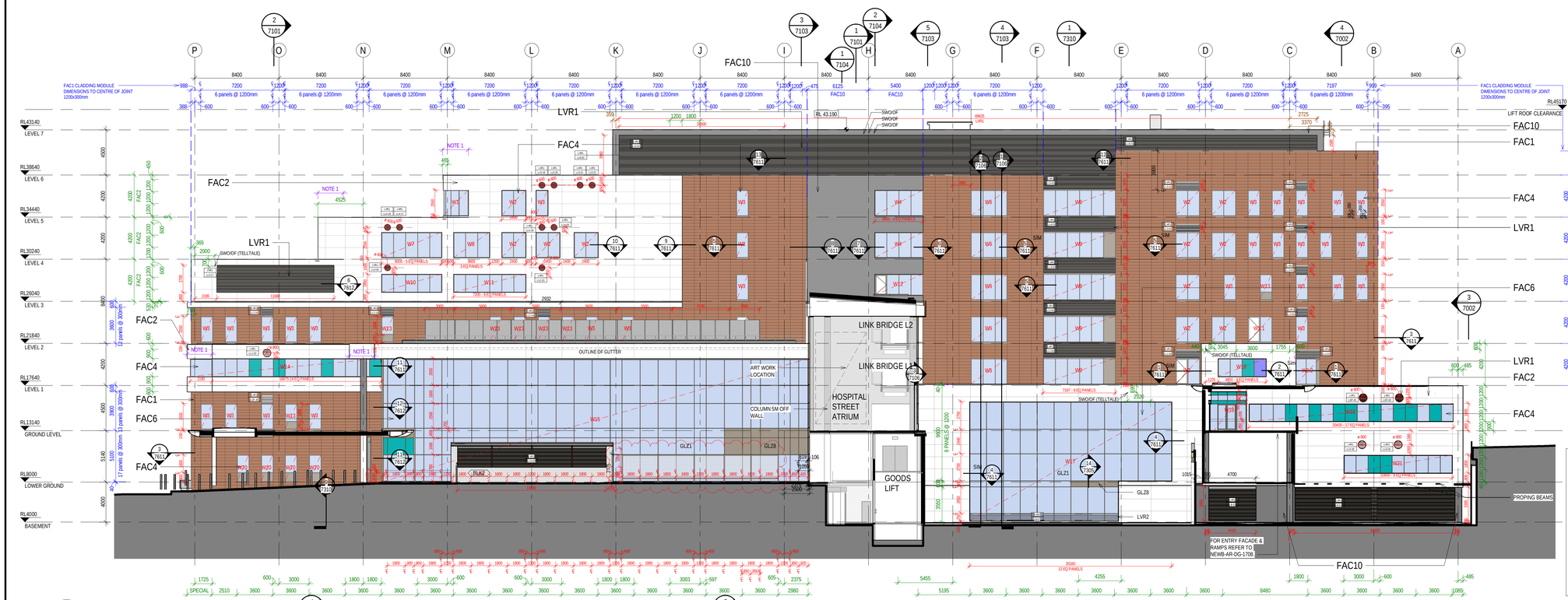
FIXING

Characteristic	
Maximum Span (Stud Spacing)	Up to 1200mm (internal); Up to 1610mm (external)
DIRECT FIX	
Nail to Timber Frame	Yes (walls)
Screw to Timber Frame	No
Screw to Steel Frame	Yes (walls)

Characteristic	
INDIRECT FIX	
Timber Frame	Yes (ceilings)
Steel Frame	Yes (ceilings)
Masonry Frame	No
EXPOSED FASTENERS	
Screw	No
Rivet	No
Nail	No
CONCEALED FASTENERS	
Clip	No
Countersunk Screw/Nail	Yes
Adhesive, Split Batten, etc.	Yes
Hidden by Overlapping Panel	No
Flush Jointed (Taped)	Yes

WARRANTY 25 YEARS

November 11, 2019



1 NORTH ELEVATION / SECTION
15B2
1 : 200

2 SOUTH ELEVATION
15B2
1 : 200

NOTES:

TO BE READ IN CONJUNCTION WITH SERVICES, STRUCTURAL & CIVIL DOCUMENTATION. ANY DISCREPANCY TO BE BROUGHT TO THE ATTENTION OF JACOBS.

ELEVATION LEGEND:

FAC1	TERRACOTTA CLADDING
FAC2	REINFORCED CONCRETE CLADDING (FIBRE C)
FAC3	ALUMINIUM SOLID CLADDING
FAC4	FRAMED GLAZING (WHITE / GREEN DENOTES COLOURBACK PANEL)
FAC5	CURTAIN WALL GLAZING (PROPRIETARY SYSTEM)
FAC6	CURTAIN WALL WITH GLAZING ALUMINIUM CLIPS & RHS STEEL MULLIONS AS PER STRUCTURAL ENGINEER (WHITE DENOTES COLOURBACK PANEL)
FAC7	CURTAIN WALL (CURVED TRANSOMS + GLAZING) VERTICALS - SILICONE/ UNCAPPED HORIZONTALS - CAPPED
FAC8	FIXED GLASS BALUSTRADE SCREEN
FAC9	FRAMELESS FIXED GLAZING
FAC10	METAL SHEET CLADDING (COLORBOND)
FAC11	EXPOSED FLAT FACE MASONRY BLOCKWORK (PORCELAIN COLOURED)
FAC12	CEMENTITIOUS RENDER FACADE SYSTEM
FAC13	OFF-FORM CONCRETE SEALER
FAC14	CEMENT RENDER (WHITE)
FR1	FLAT ROOF, MEMBRANE WITH SELECT PAVERS/BALLAST
MR1	METAL ROOF SHEETING WITH 100mm INSULATION ROOF RAISERS
LVR1	HORIZONTAL LOUVRES
LVR2	ACTUATED POWER GLASS LOUVRES
LVR3	VERTICAL LOUVRES
LVR4	600mm DEEP ACOUSTIC LOUVRES, HORIZONTAL

GLAZING LEGEND:

GLZ1	STANDARD CLEAR SINGLE GLAZED IGUs
GLZ2	CLEAR SINGLE GLAZED IGUs, WITH JOCKEY SASH & INTEGRAL BLINDS
GLZ3	TRANSLUCENT SINGLE-GLAZED IGUs
GLZ4	WHITE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ5	GREEN OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ6	CLEAR SINGLE GLAZING
GLZ7	STANDARD CLEAR DOUBLE GLAZED IGUs
GLZ8	BRONZE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ9	ASSAULT GUARD CLEAR GLAZING

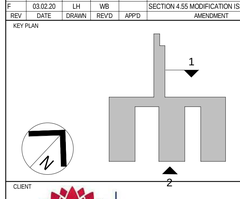
DIMENSION LEGEND:

- DIMENSION SET OUT FOR METAL SHEET CLADDING (COLORBOND) - FAC10
- DIMENSION SET OUT FOR WINDOW AND LOUVERS
- DIMENSION SET OUT FOR TERRACOTTA CLADDING - FAC1
- DIMENSION SET OUT FOR ALUMINIUM NON-COMPOSITE CLADDING - FAC3
- REINFORCED CONCRETE CLADDING (FIBRE C) - FAC2
- NOTE 1 - REFER TO CURVED FACADE SETOUT PLAN DETAILS FOR FACADE AND WINDOWS SERIES 7600

- ALL DRAWINGS TO BE PRINTED AND READ IN COLOUR
- ALL DIMENSION TO BE VERIFICATION ON SITE PRIOR OF CONSTRUCTION.
- CO-ORDINATION AND ADJUSTMENT OF FINAL WINDOW AND DOOR MULLION LOCATIONS TO BE CO-ORDINATED WITH FINAL INTERNAL FITOUT.
- DOOR SIZES TO BE READ WITH CONSTRUCTION PLANS AND DOOR SCHEDULE

REV	DATE	DRAWN	REVD	APPD	AMENDMENT
P	26.02.20	SC	WB		FACADE UPDATE
O	10.12.20	SC	WB		ROUND LOUVRES UPDATE
N	07.08.20	LH	WB		SOUTH ELEVATION UPDATE
M	27.07.20	MW	WB		SECTION 4.55 MODIFICATION 5 ISSUE
L	25.05.20	LH	WB		ELEVATION UPDATE
K	20.05.20	LH	WB		SECURE COURTYARD UPDATE
J	23.04.20	LH	WB		GENERAL ELEVATION UPDATE
I	24.03.20	LH	WB		EAST ATRIUM SMOKE FAN & GENERAL UPDATE
H	20.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE
G	14.02.20	LH	WB		ISSUED FOR CC4A
F	03.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE

KEY PLAN



CLIENT

NSW GOVERNMENT Health Infrastructure

JOHNSTAFF

roberts pizzarotti

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AUSTRALIA
TEL: +61 2 9928 2100
FAX: +61 2 9928 2510
WEB: jacobs.com

PROJECT
CONCORD HOSPITAL
REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE
ELEVATION - NORTH & SOUTH

DRAWING STATUS
FOR CONSTRUCTION

DRAWN	DRAWING CHECK
MW/BY	PC/WB
DESIGNED	DESIGN REVIEW
AC/DG	CY
REVIEWED	DATE
APPROVED	DATE

SCALE
1 : 200 @ B1

PROJECT No.	DRAWING No.	REV
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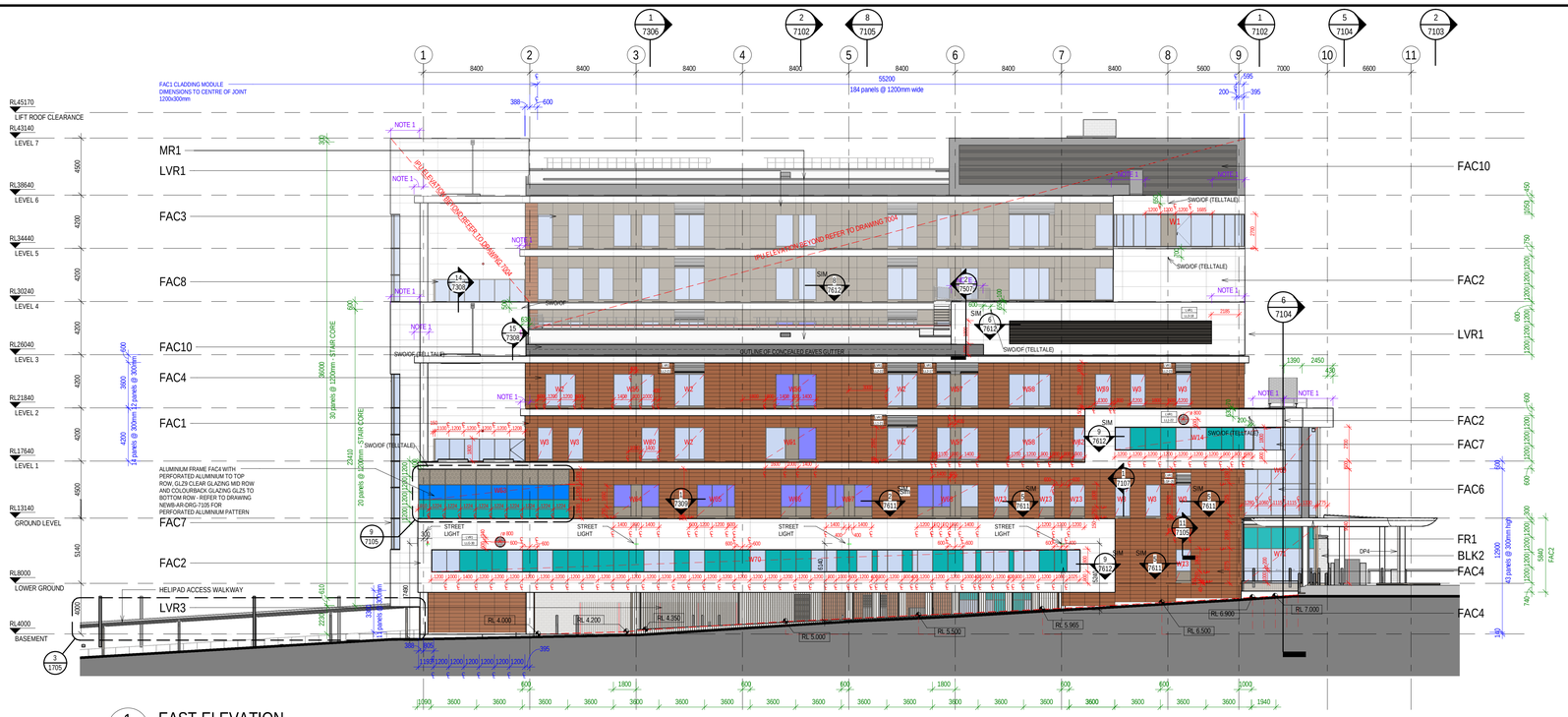

1 15B2 **EAST ELEVATION**

1 : 200

2 15B2 **WEST ELEVATION**

1 : 200

3 15B2 **PART WEST ELEVATION SECTION**

1 : 200

4 1562 **PART WEST PLANT ROOM ELEVATION SECTION**

1 : 200

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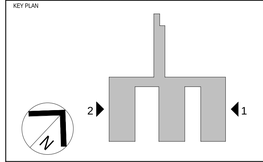
- ALL DRAWINGS TO BE PRINTED AND READ IN COLOUR
- ALL DIMENSION TO BE VERIFICATION ON SITE PRIOR OF CONSTRUCTION.
- CO-ORDINATION AND ADJUSTMENT OF FINAL WINDOW AND DOOR MULLION LOCATIONS TO BE CO-ORDINATED WITH FINAL INTERNAL FITOUT.
- DOOR SIZES TO BE READ WITH CONSTRUCTION PLANS AND DOOR SCHEDULE

REV	DATE	DRAWN	REVD	APPD	AMENDMENT
N	26.02.20	SC	WB		FACADE UPDATE
M	11.09.20	LH	WB		GENERAL UPDATE
L	31.07.20	MW	WB		GENERAL UPDATE
K	27.07.20	MW	WB		SECTION 4 55 MODIFICATION 5 ISSUE
J	01.06.20	LH	WB		ELEVATION UPDATE
I	25.05.20	LH	WB		ELEVATION UPDATE
H	20.05.20	LH	WB		SECURE COURTYARD UPDATE
G	23.04.20	LH	WB		GENERAL ELEVATION UPDATE
F	13.03.20	LH	WB		SECTION 4 55 MODIFICATION ISSUE
E	14.02.20	LH	WB		ISSUED FOR CCAA
D	03.02.20	LH	WB		SECTION 4 55 MODIFICATION ISSUE
C	04.12.19	BA	WB		UPDATES TO FACADE - EAST ELEVATION BANDING DETAIL UPDATE & COLORBACK GLASS REVISED
B	08.11.19	BA	WB		GENERAL UPDATES

KEY PLAN



CLIENT

NSW GOVERNMENT Health Infrastructure

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FAX: +61 2 9928 2510
WEB: jacobs.com

PROJECT

CONCORD HOSPITAL REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE

ELEVATION - EAST & WEST

DRAWING STATUS

FOR CONSTRUCTION

DRAWN	DRAWING CHECK
MW/BY	PC/WB
DESIGNED	DESIGN REVIEW
AC/DG	CY
REVIEWED	DATE
APPROVED	DATE

SCALE: 1 : 200 @ B1

PROJECT No.	DRAWING No.	REV
IA064700	NEWB-AR-DRG-7002	N

2/26/2021 11:23:35 AM

1 IPU 1 - EAST ELEVATION

15B2 1 : 200

2 IPU 2 - WEST ELEVATION

15B2 1 : 200

NOTES:

TO BE READ IN CONJUNCTION WITH SERVICES, STRUCTURAL & CIVIL DOCUMENTATION. ANY DISCREPANCY TO BE BROUGHT TO THE ATTENTION OF JACOBS.

ELEVATION LEGEND:

FAC1	TERRACOTTA CLADDING
FAC2	REINFORCED CONCRETE CLADDING (FIBRE C)
FAC3	ALUMINIUM SOLID CLADDING
FAC4	FRAMED GLAZING (WHITE / GREEN DENOTES COLOURBACK PANEL)
FAC5	CURTAIN WALL GLAZING (PROPRIETARY SYSTEM)
FAC6	CURTAIN WALL WITH GLAZING ALUMINIUM CLIPS & RHS STEEL MULLIONS AS PER STRUCTURAL ENGINEER (WHITE DENOTES COLOURBACK PANEL)
FAC7	CURTAIN WALL (CURVED TRANSOMS + GLAZING) VERTICALS - SILICONE/ UNCAPPED HORIZONTALS - CAPPED
FAC8	FIXED GLASS BALLISTRADE SCREEN
FAC9	FRAMELESS FIXED GLAZING
FAC10	METAL SHEET CLADDING (COLORBOND)
FAC11	EXPOSED FLAT FACE MASONRY BLOCKWORK (PORCELAIN COLOURED)
FAC12	CEMENTITIOUS RENDER FACADE SYSTEM
FAC13	OFF-FORM CONCRETE SEALER
FR1	FLAT ROOF, MEMBRANE WITH SELECT PAVERS/BALLAST
MR1	METAL ROOF SHEETING WITH 100mm INSULATION ROOF RAISERS
LVR1	HORIZONTAL LOUVRES
LVR2	ACTUATED POWER GLASS LOUVRES
LVR3	VERTICAL LOUVRES
LVR4	600mm DEEP ACOUSTIC LOUVRES, HORIZONTAL

GLAZING LEGEND:

GLZ1	STANDARD CLEAR SINGLE GLAZED IGUs
GLZ2	CLEAR SINGLE GLAZED IGUs, WITH JOCKEY SASH & INTEGRAL BLINDS
GLZ3	TRANSLUCENT SINGLE-GLAZED IGUs
GLZ4	WHITE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ5	GREEN OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ6	CLEAR SINGLE GLAZING
GLZ7	STANDARD CLEAR DOUBLE GLAZED IGUs
GLZ8	BRONZE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GLZ9	ASSAULT GUARD CLEAR GLAZING

DIMENSION LEGEND:

- DIMENSION SET OUT FOR METAL SHEET CLADDING (COLORBOND) - FAC10
- DIMENSION SET OUT FOR WINDOW AND LOUVERS
- DIMENSION SET OUT FOR TERRACOTTA CLADDING - FAC1
- DIMENSION SET OUT FOR ALUMINIUM NON-COMPOSITE CLADDING - FAC3
- REINFORCED CONCRETE CLADDING (FIBRE C) - FAC2
- NOTE 1 - REFER TO CURVED FACADE SETOUT PLAN DETAILS FOR FACADE AND WINDOWS SERIES 7600

- ALL DRAWINGS TO BE PRINTED AND READ IN COLOUR
- ALL DIMENSION TO BE VERIFICATION ON SITE PRIOR OF CONSTRUCTION.
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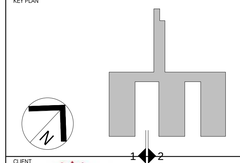
REV	DATE	DRAWN	REVD	APPD	AMENDMENT
J	13.07.20	MW	WB		GENERAL UPDATE
I	30.06.20	MW	SC		GENERAL UPDATE
H	05.05.20	LH	WB		ELEVATION UPDATE
G	23.04.20	LH	WB		GENERAL ELEVATION UPDATE
F	20.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE
E	14.02.20	LH	WB		ISSUED FOR CC4A
D	03.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE
C	04.12.19	BA	WB		UPDATES TO FACADE - EAST ELEVATION BANDING DETAIL UPDATE & COLORBACK GLASS REVISED
B	08.11.19	BA	WB		GENERAL UPDATES
A	27.09.19	BA	WB		ISSUE FOR CONSTRUCTION
21	03.09.19	BA	WB		ELEVATIONS & DETAILS UPDATE - LOUVRES, WINDOW TAGS ADDED & GENERAL UPDATES

KEY PLAN



CLIENT

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PROJECT

CONCORD HOSPITAL REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE

ELEVATION - IPU 1 EAST & IPU 2 WEST

DRAWING STATUS

FOR CERTIFICATION

DRAWN: MW/BY	DRAWING CHECK: PC/WB
DESIGNED: AC/DG	DESIGN REVIEW: CY
REVIEWED	DATE
APPROVED	DATE

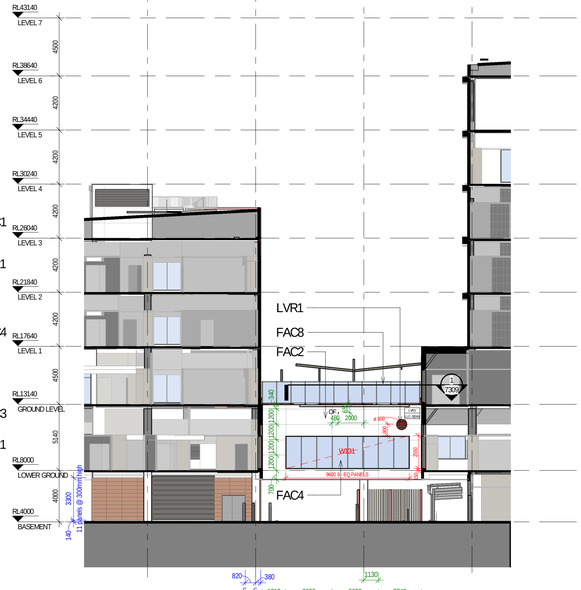
SCALE: 1 : 200 @ B1

PROJECT No.: IA064700 | DRAWING No.: NEWB-AR-DRG-7003 | REV: J

13/07/2020 4:58:28 PM

1 15B2 **IPU2 - EAST ELEVATION**
1 : 200

2 15B2 **IPU 3 - WEST ELEVATION**
1 : 200



3 15B2 **IPU 3 - NORTH ELEVATION**
1 : 200

NOTES:

TO BE READ IN CONJUNCTION WITH SERVICES, STRUCTURAL & CIVIL DOCUMENTATION. ANY DISCREPANCY TO BE BROUGHT TO THE ATTENTION OF JACOBS.

ELEVATION LEGEND:

FAC1	TERRACOTTA CLADDING
FAC2	REINFORCED CONCRETE CLADDING (FIBRE C)
FAC3	ALUMINIUM SOLID CLADDING
FAC4	FRAMED GLAZING (WHITE / GREEN DENOTES COLOURBACK PANEL)
FAC5	CURTAIN WALL GLAZING (PROPRIETARY SYSTEM)
FAC6	CURTAIN WALL WITH GLAZING ALUMINIUM CLIPS & RHS STEEL MULLIONS AS PER STRUCTURAL ENGINEER (WHITE DENOTES COLOURBACK PANEL)
FAC7	CURTAIN WALL (CURVED TRANSOMS + GLAZING) VERTICALS - SILICONE/ UNCAPPED HORIZONTALS - CAPPED
FAC8	FIXED GLASS BALUSTRADE SCREEN
FAC9	FRAMELESS FIXED GLAZING
FAC10	METAL SHEET CLADDING (COLORBOND)
FAC11	EXPOSED FLAT FACE MASONRY BLOCKWORK (PORCELAIN COLOURED)
FAC12	CEMENTITIOUS RENDER FACADE SYSTEM
FAC13	OFF-FORM CONCRETE SEALER
FR1	FLAT ROOF, MEMBRANE WITH SELECT PAVERS/BALLAST
MR1	METAL ROOF SHEETING WITH 100mm INSULATION ROOF RAISERS
LVR1	HORIZONTAL LOUVRES
LVR2	ACTUATED POWER GLASS LOUVRES
LVR3	VERTICAL LOUVRES
LVR4	600mm DEEP ACOUSTIC LOUVRES, HORIZONTAL

GLAZING LEGEND:

GL21	STANDARD CLEAR SINGLE GLAZED IGUs
GL22	CLEAR SINGLE GLAZED IGUs, WITH JOCKEY SASH & INTEGRAL BLINDS
GL23	TRANSLUCENT SINGLE-GLAZED IGUs
GL24	WHITE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL25	GREEN OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL26	CLEAR SINGLE GLAZING
GL27	STANDARD CLEAR DOUBLE GLAZED IGUs
GL28	BRONZE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL29	ASSAULT GUARD CLEAR GLAZING

DIMENSION LEGEND:

- DIMENSION SET OUT FOR METAL SHEET CLADDING (COLORBOND) - FAC10
- DIMENSION SET OUT FOR WINDOW AND LOUVERS
- DIMENSION SET OUT FOR TERRACOTTA CLADDING - FAC1
- DIMENSION SET OUT FOR ALUMINUM NON-COMPOSITE CLADDING - FAC3
- REINFORCED CONCRETE CLADDING (FIBRE C) - FAC2
- NOTE 1 - REFER TO CURVED FACADE SETOUT PLAN DETAILS FOR FACADE AND WINDOWS SERIES 7600

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REV	DATE	DRAWN	REVD	APPD	AMENDMENT
G	21.08.20	MW	WB		GENERAL UPDATE
F	23.04.20	LH	WB		GENERAL ELEVATION UPDATE
E	14.02.20	LH	WB		ISSUED FOR CC4A
D	20.12.19	BA	WB		FACADE UPDATES - COLORBACK TO AIR LOBBY, UPDATES TO NCVH AND FACADE PLAN DETAIL UPDATES (WINDOW REPOSITIONED)
C	04.12.19	BA	WB		UPDATES TO FACADE - EAST ELEVATION BANDING DETAIL UPDATE & COLORBACK GLASS REVISED
B	08.11.19	BA	WB		GENERAL UPDATES
A	27.09.19	BA	WB		ISSUE FOR CONSTRUCTION
20	03.09.19	BA	WB		ELEVATIONS & DETAILS UPDATE - LOUVRES, WINDOW TAGS ADDED & GENERAL UPDATES

KEY PLAN

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JOHNSTAFF

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PROJECT
CONCORD HOSPITAL
REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE
ELEVATION - IPU 2 EAST & IPU 3 WEST

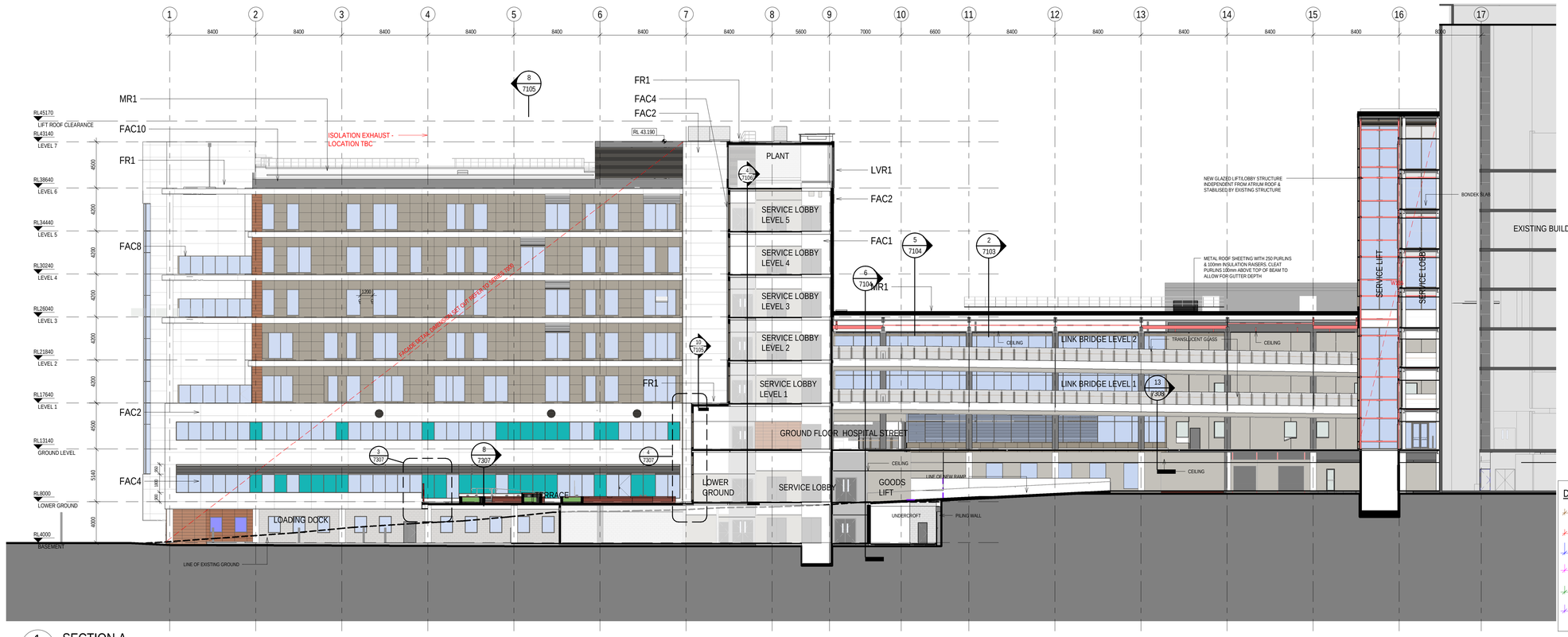
DRAWING STATUS
FOR CONSTRUCTION

DRAWN	DRAWING CHECK
MW/BY	PC/WB
DESIGNED	DESIGN REVIEW
AC/DG	CY
REVIEWED	DATE
APPROVED	DATE

SCALE
1 : 200 @ B1

PROJECT No.	DRAWING No.	REV
IA064700	NEWB-AR-DRG-7004	G

21/08/2020 11:07:21 AM



1 SECTION A
15G1
1 : 200

2 SECTION B
15B2
1 : 200

NOTES:

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ELEVATION LEGEND:

FAC1	TERRACOTTA CLADDING
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FAC5	CURTAIN WALL GLAZING (PROPRIETARY SYSTEM)
FAC6	CURTAIN WALL WITH GLAZING ALUMINIUM CLIPS & RHS STEEL MULLIONS AS PER STRUCTURAL ENGINEER (WHITE DENOTES COLOURBACK PANEL)
FAC7	CURTAIN WALL (CURVED TRANSOMS + GLAZING) VERTICALS - SILICONE/ UNCAPPED HORIZONTALS - CAPPED
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FAC9	FRAMELESS FIXED GLAZING
FAC10	METAL SHEET CLADDING (COLORBOND)
FAC11	EXPOSED FLAT FACE MASONRY BLOCKWORK (PORCELAIN COLOURED)
FAC12	CEMENTITIOUS RENDER FACADE SYSTEM
FAC13	OFF-FORM CONCRETE SEALER
FR1	FLAT ROOF. MEMBRANE WITH SELECT PAVERS/BALLAST
MR1	METAL ROOF SHEETING WITH 100mm INSULATION ROOF RAISERS
LVR1	HORIZONTAL LOUVRES
LVR2	ACTUATED POWER GLASS LOUVRES
LVR3	VERTICAL LOUVRES
LVR4	600mm DEEP ACOUSTIC LOUVRES, HORIZONTAL

GLAZING LEGEND:

GL21	STANDARD CLEAR SINGLE GLAZED IGUs
GL22	CLEAR SINGLE GLAZED IGUs, WITH JOCKEY SASH & INTEGRAL BLINDS
GL23	TRANSLUCENT SINGLE-GLAZED IGUs
GL24	WHITE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL25	GREEN OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL26	CLEAR SINGLE GLAZING
GL27	STANDARD CLEAR DOUBLE GLAZED IGUs
GL28	BRONZE OPAQUE COLOURBACK SINGLE GLAZING BACKED WITH INSULATION
GL29	ASSAULT GUARD CLEAR GLAZING

DIMENSION LEGEND:

- DIMENSION SET OUT FOR METAL SHEET CLADDING (COLORBOND) - FAC10
- DIMENSION SET OUT FOR WINDOW AND LOUVERS
- DIMENSION SET OUT FOR TERRACOTTA CLADDING - FAC1
- DIMENSION SET OUT FOR ALUMINIUM NON-COMPOSITE CLADDING - FAC3
- REINFORCED CONCRETE CLADDING (FIBRE C) - FAC2
- NOTE 1 - REFER TO CURVED FACADE SETOUT PLAN DETAILS FOR FACADE AND WINDOWS SERIES 7600

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REV	DATE	DRAWN	REVD	APPD	AMENDMENT
H	03.09.20	LH	WB		GENERAL UPDATE
G	20.05.20	LH	WB		SECURE COURTYARD UPDATE
F	20.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE
E	14.02.20	LH	WB		ISSUED FOR CC4A
D	03.02.20	LH	WB		SECTION 4.55 MODIFICATION ISSUE
C	04.12.19	BA	WB		UPDATES TO FACADE - EAST ELEVATION BANDING DETAIL UPDATE & COLORBACK GLASS REVISED
B	27.09.19	BA	WB		ISSUE FOR CONSTRUCTION
A	24.07.19	LH	WB		IFC ATRIUM PACKAGE
15	26.06.19	LH	WB		ISSUE FOR CROWN CERTIFICATE 3
14	03.04.19	LH	WB		DRAFT FACADE PACKAGE
13	13.09.18	JACOBS	WB		TENDER ISSUE
12	31.08.18	JACOBS	WB		DESIGN DEVELOPMENT
11	13.07.18	BY	WB		ISSUED FOR COORDINATION

KEY PLAN

CLIENT
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PROJECT
CONCORD HOSPITAL REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE
SECTION SHEET 1

DRAWING STATUS
FOR CONSTRUCTION

DRAWN: MW/BY	DRAWING CHECK: PC/WB
DESIGNED: AC/DG	DESIGN REVIEW: CY
REVIEWED	DATE
APPROVED	DATE

SCALE
1 : 200 @ B1

PROJECT No. IA064700 | DRAWING No. NEWB-AR-DRG-7101 | REV H

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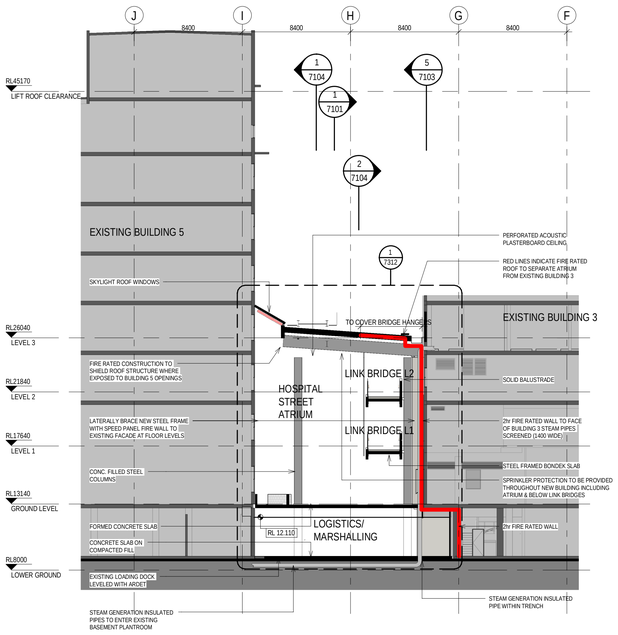
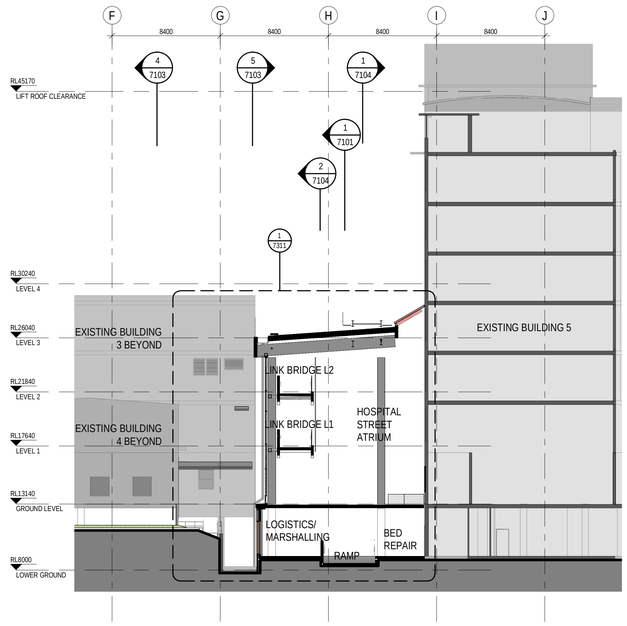


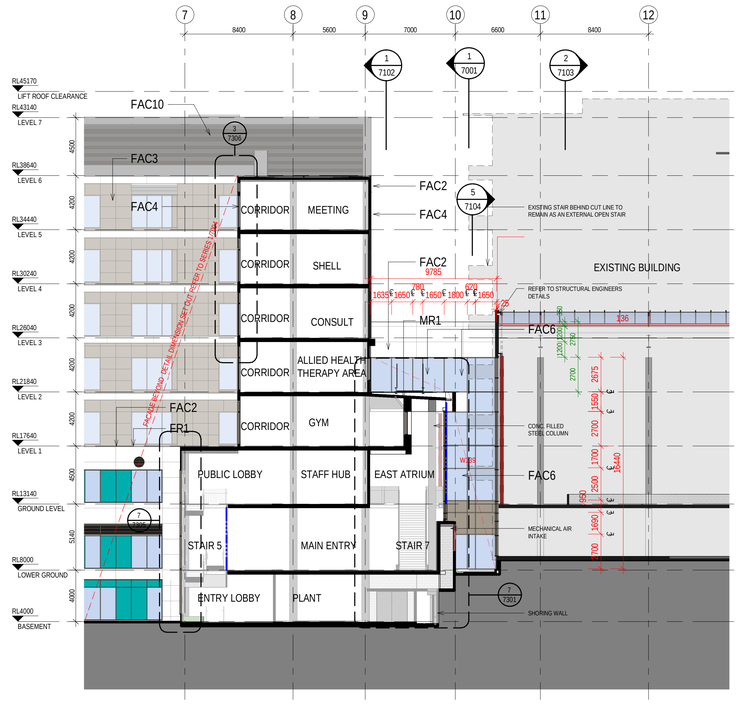
1 15G1 HOSPITAL STREET ATRIUM - SECTION A

1 : 200



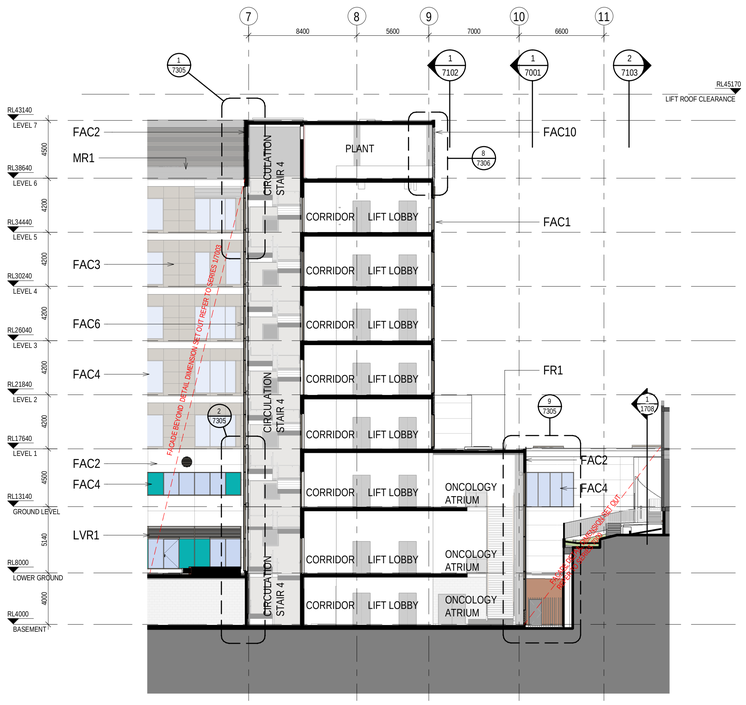
2 15G1 HOSPITAL STREET ATRIUM - SECTION B

1 : 200



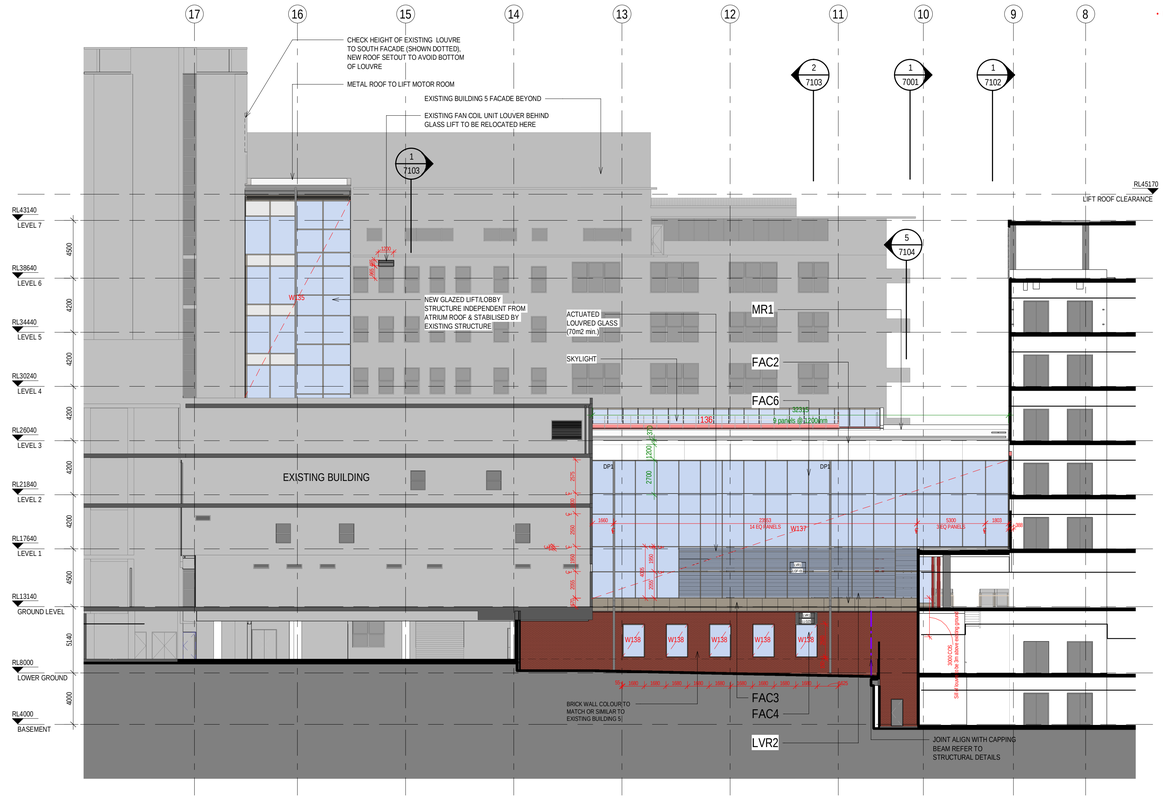
3 15B2 ONCOLOGY ATRIUM - SECTION A

1 : 200



4 15B2 ONCOLOGY ATRIUM - SECTION B

1 : 200



5 15B2 SECTIONAL ELEVATION FROM EXISTING BUILDING NO. 3 TO HOSPITAL STREET ATRIUM

1 : 200

NOTES:

TO BE READ IN CONJUNCTION WITH SERVICES, STRUCTURAL & CIVIL DOCUMENTATION. ANY DISCREPANCY TO BE BROUGHT TO THE ATTENTION OF JACOBS.

ELEVATION LEGEND:

FAC1	TERRACOTTA CLADDING
FAC2	REINFORCED CONCRETE CLADDING (FIBRE C)
FAC3	ALUMINIUM SOLID CLADDING
FAC4	FRAMED GLAZING (WHITE / GREEN DENOTES COLOURBACK PANEL)
FAC5	CURTAIN WALL GLAZING (PROPRIETARY SYSTEM)
FAC6	CURTAIN WALL WITH GLAZING ALUMINIUM CLIPS & RHS STEEL MULLIONS AS PER STRUCTURAL ENGINEER (WHITE DENOTES COLOURBACK PANEL)
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GLZ7	STANDARD CLEAR DOUBLE GLAZED IGUs
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DIMENSION LEGEND:

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- DIMENSION SET OUT FOR WINDOW AND LOUVERS
- DIMENSION SET OUT FOR TERRACOTTA CLADDING - FAC1
- DIMENSION SET OUT FOR ALUMINIUM NON-COMPOSITE CLADDING - FAC3
- REINFORCED CONCRETE CLADDING (FIBRE C) - FAC2
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REV	DATE	DRAWN	REVD	APPD	AMENDMENT
D	14.02.20	LH	WB		ISSUED FOR CC4A
C	04.12.19	BA	WB		UPDATES TO FACADE - EAST ELEVATION BANDING DETAIL UPDATE & COLORBACK GLASS REVISED
B	27.09.19	BA	WB		ISSUE FOR CONSTRUCTION
A	24.07.19	LH	WB		IFC ATRIUM PACKAGE
11	26.06.19	LH	WB		ISSUE FOR CROWN CERTIFICATE 3
10	03.04.19	LH	WB		DRAFT FACADE PACKAGE
9	13.09.18	JACOBS	WB		TENDER ISSUE
8	31.08.18	JACOBS	WB		DESIGN DEVELOPMENT
7	02.08.18	MW	WB		ISSUED FOR COORDINATION
6	13.07.18	BY	WB		ISSUED FOR COORDINATION
5	22.06.18	BY	WB		MAIN WORKS 70% DD ISSUE
4	12.04.18	BY	WB		ISSUED FOR SSDA

KEY PLAN

CLIENT

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WEB: jacobs.com

PROJECT

CONCORD HOSPITAL REDEVELOPMENT STAGE 1

HOSPITAL ROAD
CONCORD NSW 2139

TITLE

SECTION SHEET 3

DRAWING STATUS

ISSUE FOR CC4A

DRAWN	DRAWING CHECK
MW/BY	PC/WB
DESIGNED	DESIGN REVIEW
AC/DG	CY
REVIEWED	DATE
APPROVED	DATE

SCALE 1 : 200

PROJECT No.	DRAWING No.	REV
IA064700	NEWB-AR-DRG-7103	D

14/02/2020 2:44:28 PM

Certificate of Test

QUOTE No.: NC6118

REPORT No.: FNC9749

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COMBUSTIBILITY TEST FOR MATERIALS

TRADE NAME: Bradford Glasswool Partition Batts (14 kg/m³)

SPONSOR:
CSR Building Products Limited
CSR Performance System
376 Victoria Street
WETHERILL PARK NSW
AUSTRALIA

DESCRIPTION OF TEST SAMPLE: The sponsor described the tested specimen as glass-fibre insulation batt bonded with thermosetting resin.

Nominal density: 14 kg/m³
Nominal thickness: 50 mm
Colour: light golden yellow

TEST PROCEDURE: Five (5) samples were tested in accordance with Australian Standard 1530 Methods for fire tests on building materials, components and structures, Part 1- 1994: Combustibility Test for Materials.

RESULTS:

Mean furnace thermocouple temperature rise	47.3°C
Mean specimen centre thermocouple temperature rise	-29.8°C
Mean specimen surface thermocouple temperature rise	-19.5°C
Mean duration of sustained flaming	0 seconds
Mean mass loss	10.17 %

DESIGNATION: The material is NOT deemed COMBUSTIBLE according to the test criteria specified in Clause 3.4 of AS 1530.1-1994.

These test results relate only to the behaviour of the test specimens of the material under the particular conditions of the test and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

DATE OF TEST: 26 April 2010

Issued on the 11th day of June 2010 without alterations or additions.

Russell Collins
Testing Officer

Garry E Collins
Manager, Fire Testing and Assessments

Issued to: Paul McGuire
Company: Regulus Australia
Concord Repatriation General Hospital
Hospital Or: Concord NSW
Issued On: 2nd August 2021

NATA

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625

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14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile:61 2 9490 5555

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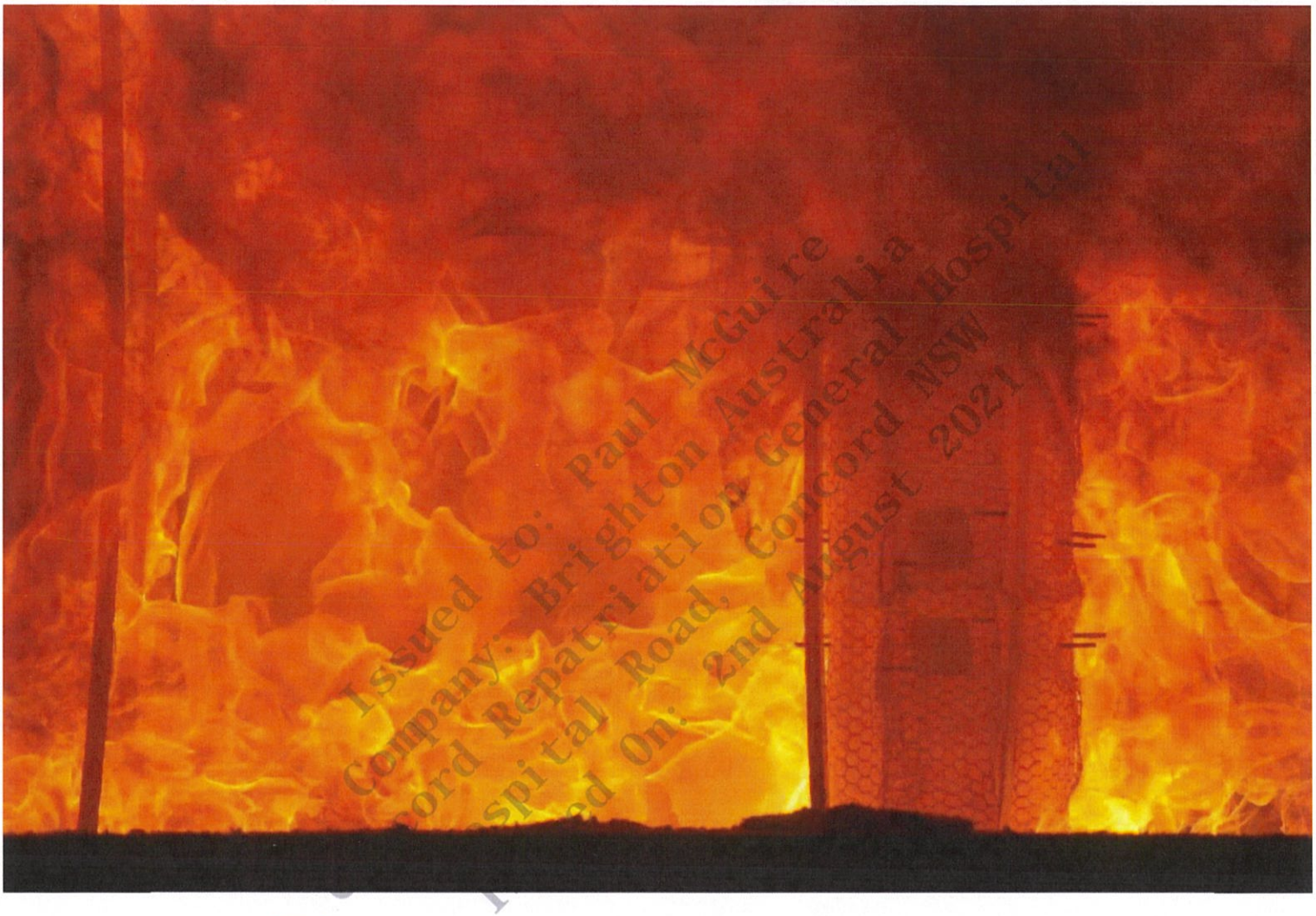

Issued to: Paul McGuire
Company: Brighton Australia
Repatriation General Hospital
Road, Concord NSW
On: 2nd August 2021

Fire assessment report

Faced glass-fibre and mineral-fibre insulation products to AS/NZS 1530.3:1999

Sponsor: CSR Bradford

Report number: FAS200045 Revision: R1.2

Issued date: 28 April 2021 Expiry date: 31 March 2026

Quality management

Version	Date	Information about the report			
R1.0	Issue: 26/03/2021	Reason for issue	Report issued to CSR Bradford for review and comment.		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Tanmay Bhat	Mahmoud Akl
R1.1	Issue: 19/04/2021	Reason for issue	Minor variations across the report based on comments from the report sponsor.		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Omar Saad	Omar Saad
R1.2	Issue: 28/04/2021	Reason for issue	Minor typographical amendment.		
	Expiry: 31/03/2026		**Prepared by**	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Omar Saad	Omar Saad
		Signature			

Issued to: Paul McGuire
Company: Brighton Australia Hospital
Re: Concord Repatriation General Hospital
Concord Road, Concord NSW
Issued On: 2nd August 2021

Executive summary

This report documents the findings of the assessment undertaken to determine the likely fire hazard properties of various CSR Bradford glass-fibre and mineral-fibre products when used individually or lined with a variety of facings – if tested in accordance with AS/NZS 1530.3:1999.

The analysis in sections 5, 6 and 7 of this report found that the proposed systems together with the described variations are likely to achieve the fire hazard properties shown in Table 1. More specifically, the facing options described in Table 1 may be used in conjunction with any of the insulation products specified in Table 2 or Table 3 to achieve the fire hazard indices specified in Table 1 – if the combined systems were tested in accordance with AS/NZS 1530.3:1999.

Table 1 Variations to facings and assessment outcome

Facing	Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)	Adhesive options
None	0	0	0	1	None
Ultraphon	0	0	0	3	The following types of adhesives may be used to glue fix the facing on to the underlying batt/blanket. • Bostik Rapidset 4725 when applied at a rate of 25 g/m^2 (dry weight) • Bostik HT adhesive when applied at a rate of 25 g/m^2 (dry weight) • Seigel Perma-Lok 800 glue when applied at a rate of 16 g/m^2. Alternatively, the insulation product may be lined with the facing without the use of any adhesive.
Medium duty foil	0	0	0	0-1	
Heavy duty foil	0	0	0	0-1	
Black Matt Facing (BMF)	18	0	0	3	
Heavy Duty Perforated foil	0	0	0	3	
Acoustituff	0	0	0	1	
Thermoseal Roof Tile Plus foil	0	0	0	1	
Thermoplast 993	0	0	0	0-1	
Thermoplast 990	0	0	0	0-1	
Light Duty foil	0	0	0	1	
Medium Duty foil with one Antiglare surface	0	0	0	1	
Heavy Duty foil with one Antiglare surface	0	0	0	1	
Light Duty 'FC' Foil	0	0	0	1	
Medium Duty Perforated foil	0	0	0	2	
Thermoplast 993F White	0	0	0	0-1	
Perforated Thermoplast 993F – White	0	0	0	2	

Re: Concord Repatriation General Hospital
Issued on: 2nd August 2021
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Company: Brighton Australia
Road, Concord NSW

Facing	Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)	Adhesive options
Thermoplast 993 Black	0	0	0	3	
Perforated Thermoplast 993 – Black	0	0	0	5	
Thermoplast 990F White	0	0	0	0-1	
Perforated Thermoplast 990F – White	0	0	0	2	
Heavy Duty Perforated foil with PET facing	17	0	2	5	
PET Facing	17	0	2	5	

Table 2 CSR Bradford glass-fibre insulation products used in proposed systems

Product	Density	Thermosetting resin binder content
Various glass-fibre insulation products as identified in Appendix B under Table 73.	Up to 130 kg/m^3	Up to 13% by mass

Table 3 CSR Bradford mineral- fibre insulation products used in proposed systems

Product	Density (kg/m^3)	Thermosetting resin binder content
Various mineral-fibre insulation products as identified in Appendix B under Table 74.	Up to 110 kg/m^3	Up to 3.4% by mass

The variations and outcome of this assessment are subject to the limitations and requirements described in sections 2, 3 and 8 of this report. The results of this report are valid till 31/03/2026.

Re: Concord Repatriation General Hospital
Issued to: Paul McGuire
Company: Brighton Australia
Issued on: 2nd August 2021

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Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

1. Introduction

This report documents the findings of the assessment undertaken to determine the likely fire hazard properties of CSR Bradford glass-fibre and mineral-fibre insulation products when used individually or lined with a variety of facings – if tested in accordance with AS/NZS 1530.3:1999[1].

This assessment was carried out at the request of CSR Bradford. The sponsor details are included in Table 4.

Table 4 Sponsor details

Sponsor	Address
CSR Building Products Limited trading as CSR Bradford	Triniti 3, 39 Delhi Road North Ryde 2113 NSW Australia

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion about the likely performance of a component or element of structure if it was subject to a fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for doing these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2019[2].

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

Assessments will vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

This assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire hazard properties if the elements were to be tested in accordance with AS/NZS 1530.3:1999.

This assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

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Company: Brighton Australia
Concord Reparation General Hospital
Hospital: Concord NSW
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[1] Standards Australia and Standards New Zealand, 1999, Methods for fire tests on building materials, components and structures – Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release (Reconfirmed in 2016), AS/NZS 1530.3:1999 (R2016), Standards Australia, NSW.

[2] Passive Fire Protection Forum (PFPF), 2019, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

2.2 Compliance with the National Construction Code

This assessment report has been prepared to meet the evidence of suitability requirements of the National Construction Code Volumes One and Two – Building Code of Australia (NCC) 2019 including Amendment 1[3] under A5.2 (1) (d).

This assessment has been written in accordance with the general principles outlined in EN 15725:2010[4] for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement or deemed to satisfy (DTS) provisions of the NCC under A5.5 for reaction to fire as applicable to the assessed systems.

This assessment report may also be used to demonstrate compliance with the requirements for evidence of suitability under NCC 2016 including Amendment 1[5].

2.3 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our variation proposal on 2 November 2020, CSR Bradford confirmed that:

- To their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the standard against which this assessment is being made.
- They agree to withdraw this assessment from circulation if the component or element of structure is the subject of a fire test by a test authority in accordance with the standard against which this assessment is being made and the results are not in agreement with this assessment.
- They are not aware of any information that could adversely affect the conclusions of this assessment and – if they subsequently become aware of any such information – they agree to ask the assessing authority to withdraw the assessment.

3. Limitations of this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 4.3.
- This report details the methods of construction, test conditions and assessed results that are expected if the systems were tested in accordance with AS/NZS 1530.3:1999.
- This report is only valid for the assessed products and must not be used for any other purpose. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL).
- The documentation that forms the basis for this report is listed in Appendix A.
- This report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.
- This assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and the expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.

Issued to: Paul McGuire
Company: Brisbon Australia
Report Repatriation: General Hospital
Issued on: 2nd August 2021
Re: Concord Hospital Concord NSW

[3] National Construction Code Volume One and Two – Building Code of Australia 2019 including Amendment 1, Australian Building Codes Board, Australia.
[4] European Committee for Standardization, 2010, Extended application reports on the fire performance of construction products and building elements, EN 15725:2010, European Committee for Standardization, Brussels, Belgium.
[5] National Construction Code Volume One and Two – Building Code of Australia 2016 Amendment 1, Australian Building Codes Board, Australia.

4. Description of the specimen and variations

4.1 System description

The proposed systems mainly consist of two components, namely the substrate and the facing. The substrate can be either a glass-fibre or mineral-fibre insulation product as specified earlier in Table 2 and Table 3. These insulation products may be lined with any of the facing options specified in Table 1. Optionally, the thermal and acoustic insulation products may be left without any additional facing. The specified types of adhesives described in Table 1 may be used to glue fix the facing to the underlying insulation product. Alternatively, the no adhesive option may be adopted. The no adhesive option is typically used in ceilings where a steel wire mesh is used to retain the facing and the blanket in place.

4.2 Referenced test data

The assessment of the variations to the tested systems and the determination of the likely performance is based on the results of the fire tests documented in the reports summarised in Table 5. Further details of the tested system are included in Appendix A.

Table 5 Referenced test data

Report number	Test date	Testing authority	Test standard	Test sponsor
FNE9589	13 November 2009	CSIRO	AS/NZS 1530.3:1999	CSR Building Products Limited
FNE9690	1 March 2010			
FNE9785	26 May 2010			
FNE9787	9 June 2010			
FNE9788	9 June 2010			
FNE9790	10 June 2010			
FNE10360	9 December 2011			
FNE10361	9 December 2011			
FNE10364	20 December 2011			
FNE11429	6 July 2015			
FNE11527	18 March 2016			
FNE11655	8 March 2016			
FNE12136	26 March 2018			
FNE12137	26 March 2018			
FNE12465A	10 December 2019			
FNE12504	3 December 2019			
FNE12565	4 March 2020			
18-000736	20 February 2018	AWTA		
20-006531	8 January 2021			
21-000496	12 February 2021			
7-574195-CN	10 August 2010			
7-574196-CN	11 August 2010			
FNC0354	23 September 2005	CSIRO	AS 1530.1:1994[6]	
FNC9594	10 December 2009			

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Company: Brighton Australia
Re: Concord Repatriation General Hospital
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Issued On: 2nd August 2021

[6] Standards Australia, 1994, Methods for fire tests on building materials, components and structures – Part 1: Combustibility test for materials (Reconfirmed in 2016), AS 1530.1:1994 (R2016), Standards Australia, NSW.

Report number	Test date	Testing authority	Test standard	Test sponsor
FNC9595	10 December 2009			
FNC9596	11 December 2009			
FNC9693	5 March 2010			
FNC9694	6 March 2010			
FNC9695A	6 March 2010			
FNC9749	26 April 2010			
FNC9770	4 May 2010			
FNC9771	4 May 2010			
FNC10324B	9 November 2011			
NR-15003	13-14 May 2015	CSR Building Products Limited		
NR-15004	14-15 May 2015			
NR-15005	3-9 July 2015			
NR-15006	7-9 July 2015			
NR-15007	8-10 September 2015			

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4.3 Variations to the tested systems

Identical systems have not been subject to the reaction to fire test specified in AS/NZS 1530.3:1999. We have therefore assessed the systems using baseline test information for similar products and systems. The variations to the tested products – together with the referenced reaction to fire tests – are described in Table 6.

Table 6 Variations to tested systems

Item	Reference test	Description	Variations
CSR Bradford glass-fibre insulation products	AS 1530.1:1994 tests: • FNC9594 • FNC9695A • FNC9749 • FNC0354 • FNC10324B • NR-15006 • FNC9694 AS/NZS 1530.3:1999 tests: • FNE9589	The range of tested insulation products are as described in Table 2.	The density of the glass-fibre insulation products may vary up to a maximum limit of 130 kg/m^3.
CSR Bradford mineral-fibre insulation products	AS 1530.1:1994 tests: • FNC9595 • FNC9596 • FNC9693 • FNC9770 • FNC9771 • NR-15003 • NR-15004 • NR-15005 • NR-15007 AS/NZS 1530.3:1999 tests: • FNE9690 • FNE11527 • FNE11655	The range of tested insulation products are as described in Table 3.	The density of the mineral-fibre insulation products may vary up to a maximum limit of 110 kg/m^3.

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Item	Reference test	Description	Variations
Facings	• FNE9785 • FNE9787 • FNE9788 • FNE9790 • FNE12136 • FNE10360 • FNE12137 • FNE10361 • FNE10364 • FNE11429 • 7-574195-CN • 7-574196-CN • FNE12465A • FNE12504 • FNE12565 • 20-006531 • 21-000496	The systems consisted of various glass-fibre or mineral-fibre based substrates faced with various facing options – tested to AS/NZS 1530.3:1999. A summary of the facings tested, and the results obtained is presented in Table 7.	Facing on the insulation product may vary from those of the tested specimens to any one of the following. • Ultraphon • Medium Duty (MD) foil • Heavy Duty (HD) foil • Black Matt Face (BMF) • Heavy Duty Perforated (HDP) foil • Acoustituff • Thermoseal Roof Tile Plus foil • Thermoplast Decorative facing 993 • Thermoplast Decorative facing 990 • Light Duty (LD) foil • MD foil with one Antiglare surface • HD foil with one Antiglare surface • LD 'FC' foil • Medium Duty Perforated (MDP) foil • Thermoplast 993F – White • Perforated Thermoplast 993F – White • Thermoplast 993 – Black • Perforated Thermoplast 993 – Black • Thermoplast 990F – White • Perforated Thermoplast 990F – White • HDP foil with PET facing • PET facing. Alternatively, the facing may be omitted.
Adhesion of facings to insulation product	• FNE12136 • FNE12137	Bostik HT adhesive applied at a rate of 25 g/m^2	The adhesive options may be varied as given below. • Bostik Rapidset 4725 at a rate of 25 g/m^2 • Bostic HT applied at a rate of 25 g/m^2 • Siegel Perma-Lok 800 applied at a rate of 16 g/m^2.
	• FNE10360 • FNE10361	Bostik Rapidset 4725 applied at a rate of 20 g/m^2 to 30 g/m^2	

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Item	Reference test	Description	Variations
	• FNE10364		Alternatively, the facings may be laid over the insulation products without any adhesive.
	FNE11429	Bostik Rapidset 4725 adhesive applied at a rate of 35 g/m^2	
	FNE12465A	Bostik HT applied at a rate of 16 g/m^2	
	FNE12504	Bostik Rapidset 4725 applied at a rate of 18 g/m^2	
	FNE12565	Siegel Perma-Lok 800 applied at a rate of 16 g/m^2	
	21-000496	Siegel Perma-Lok 800	

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Table 7 Summary of AS/NZS 1530.3:1999 test results

Facing	Adhesive	Referenced test	Insulation product	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
Ultraphon	Bostik Rapidset 4725	FNE9785	50 mm Bradford Glasswool Ultratel	0	0	0	3
MD foil	Bostik Rapidset 4725	FNE9787	50 mm Bradford Glasswool Ultratel	0	0	0	0-1
HD foil	Bostik Rapidset 4725	FNE9788	50 mm Bradford Glasswool Ultratel	0	0	0	0-1
BMF	Bostik Rapidset 4725	FNE9790	50 mm Bradford Glasswool Ultratel	18	0	0	3
BMF	Bostik HT adhesive	FNE12136	50 mm Bradford Glasswool Ultratel	0	0	0	2
HDP foil	Bostik Rapidset 4725	FNE10360	50 mm Bradford Supertel	0	0	0	3
HDP foil	Bostik HT adhesive	FNE12137	50 mm Bradford Supertel	0	0	0	2
Acoustituff foil	Bostik Rapidset 4725	FNE10361	50 mm Bradford Supertel	0	0	0	1
Acoustituff foil	Bostik Rapidset 4725	FNE10364	50 mm Bradford Glasswool Ultratel	0	0	0	1
Thermoseal Roof Tile Plus foil	Bostik Rapidset 4725	FNE11429	50 mm Bradford Glasswool Ultratel	0	0	0	1

Facing	Adhesive	Referenced test	Insulation product	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
Thermoplast 993 – white (antiglare)	Bostik Rapidset 4725	7-574195-CN	60 mm glass-fibre batt	0	0	0	0-1
Thermoplast 990 – white	Bostik Rapidset 4725	7-574196-CN	60 mm glass-fibre batt	0	0	0	0-1
HDP foil	Bostik HT	FNE12465A	50 mm Bradford Supertel	0	0	0	3
LD foil	Bostik Rapidset 4725	FNE12504	60 mm glass-fibre blanket	0	0	0	1
HDP foil	Seigel Perma-Lok 800	FNE12565	50 mm Bradford Supertel	0	0	0	2
HDP foil and PET	Seigel Perma-Lok 800	20-006531	50 mm Bradford Supertel	17	0	2	5
Thermoplast 993 – black	No adhesive was used	21-000496	110 mm glass-fibre blanket	0	0	0	3

Re: Concord Repatriation General Hospital
Issued to: Paul McGuire
Company: Brighton Australia
Location: Concord Hospital Road, Concord NSW
Issued On: 2nd August 2021

4.4 Purpose of the test

AS/NZS 1530.3:1999 sets out the test method for the assessment of building materials and components according to their tendency to ignite, propagate flame and heat and smoke release.

AS 1530.1:1994 specifies a test method for the determination of the combustibility of a building material.

5. Assessment 1 – Glass-fibre and mineral-fibre insulation products to AS/NZS 1530.3:1999

5.1 Description of variation

The proposed systems consist of either glass-fibre or mineral-fibre insulation products that act as substrates. A range of such substrates have been tested to AS 1530.1:1994 and AS/NZS 1530.3:1999. The proposed substrates are described in Table 8 and Table 9.

Table 8 CSR Bradford glass-fibre based batts and blankets used in proposed systems

Product	Density	Thermosetting resin binder content
Various glass-fibre insulation products as identified in Appendix B under Table 73.	Up to 130 kg/m^3	Up to 13% by mass

Table 9 CSR Bradford mineral-fibre based batts and blankets used in proposed systems

Product	Density (kg/m^3)	Thermosetting resin binder content
Various mineral-fibre insulation products as identified in Appendix B under Table 74.	Up to 110 kg/m^3	Up to 3.4% by mass

5.2 Methodology

The method of assessment used is summarised in Table 10.

Table 10 Method of assessment

Assessment method	
Level of complexity	Intermediate assessment
Type of assessment	Qualitative– interpolation / Comparative

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Company: Brighton Australia
Re: Concord Repatriation General Hospital
Issued on: 2nd August 2021

5.3 Assessment

5.3.1 Assessment rationale

The tendency to ignite, tendency to propagate flame, heat release at elevated temperatures and the tendency to release smoke of the proposed range of glass-fibre and mineral-fibre insulation products are to be determined in accordance with the test method described in AS/NZS 1530.3:1999.

AS 1530.1:1994 presents a test method to determine the combustibility of a building material. The test apparatus consists of a tube furnace within which the specimen is placed using a specimen holder. The test specimen is made to the size of a 45 mm diameter, 50 mm deep cylinder. Five specimens of the material are tested. Thermocouples are provided for measuring the furnace temperature, the temperature at the centre of the specimen and the temperature on the surface of the specimen. The specimen is exposed to a stable temperature of 750°C and the criteria for combustibility are specified as follows.

- The mean duration of sustained flaming exceeding 5 seconds must not exceed zero.
- The mean furnace thermocouple temperature rise must not exceed 50°C.
- The specimen surface thermocouple temperature rise must not exceed 50°C.

A material for which the set of test specimens collectively achieve the above criteria is NOT deemed COMBUSTIBLE.

AS 1530.1:1994 test method provides an indication on the potential for thermal decomposition of the tested material. Thermal decomposition of the material and the resultant formation of volatile gasses lead to flaming, temperature rise, and mass loss in the test specimen.

Conversely, a material which yields superior outcomes with respect to above parameters, and conforms to the performance criteria specified in this standard, has much less potential to ignite.

Naturally, such materials also inherit superior fire hazard properties such as flame propagation, heat release upon ignition and smoke release – as specified in AS/NZS 1530.3:1999. Thus, AS 1530.1:1994 test data can be used to assess such fire hazard properties of materials that vary to a minor degree from those tested to AS/NZS 1530.3:1999. It is noteworthy that AS 1530.1:1994 test method is more onerous than AS/NZS 1530.3:1999.

The performance of a material tested to AS 1530.1:1994 is influenced by its density and the binder content. The test specimen size is fixed irrespective of the size of the insulation product used on-site. Thus, the thickness of the product does not influence of the combustibility of the material when tested to AS 1530.1:1994.

5.3.2 Glass-fibre insulation products

Combustibility of glass-fibre insulation products

A summary of the range of glass-fibre insulation products tested to AS 1530.1:1994 is presented in Table 11. Each of these products were classified as NOT deemed COMBUSTIBLE in the test reports. A detailed summary of each test report is presented in Appendix A.

Table 11 CSR Bradford glass-fibre insulation products tested to AS 1530.1:1994

Test report	Product	Nominal product density	Nominal product thickness (mm)	Mean mass loss (%)
FNC9594	Bradford Gold Insulation R2.0 Ceiling Batts	0.728 kg/m^2 (6.33 kg/m^3)	115	9.4
FNC9694	Bradford Gold Insulation R1.5 Water-repellent Wall and Floor Batts	0.657 kg/m^2 (8.76 kg/m^3)	75	19.5
FNC9695A	Bradford Gold Insulation R5.0 High Performance Ceiling Batts	2.8 kg/m^2 (13.33 kg/m^3)	210	9.4
FNC9749	Bradford Glasswool Partition Batts	14 kg/m^3	50	10.17
FNC0354	Bradford Glasswool Partition Batts	11 kg/m^3	50	9.2
FNC10324B	CSR Bradford R3.6 Building Blanket	16.85 kg/m^3	145	8.06
NR-15006	CSR Bradford New Generation SoundScreen R2.0 Wall Floor Batts	26.8 kg/m^3	70	5.24

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The density of the tested specimens ranged from 6.33 kg/m^3 to 26.8 kg/m^3 with each specimen classified as NOT deemed COMBUSTIBLE. This proves that CSR Bradford glass-fibre based batts and blankets with densities up to 26.8 kg/m^3 possess very low amounts of combustibles.

CSR Bradford has confirmed that the thermosetting resin binder contents of all other glass-fibre based batts and blankets do not exceed 13%. This is confirmed by most of the test results summarised in Table 11 – where the mean mass loss is below this value. FNC9694 recorded a higher mean mass loss but still was NOT deemed COMBUSTIBLE.

Glass-fibre insulation products to AS/NZS 1530.3:1999

FNE9589 describes an AS/NZS 1530.3:1999 test conducted on Bradford Glasswool Quietel which is described as a glass-fibre insulation batt bonded with thermosetting resin. It had a nominal density of 130 kg/m^3 and came in nominally 25 mm thick batts. It consisted of 13% thermosetting resin binder content by mass – as confirmed by CSR Bradford. When tested, it achieved the fire hazard indices 0, 0, 0, 0-1 for the fire hazard properties introduced in section 5.3.1 – in the same order – as classified by AS/NZS 1530.3:1999.

As described earlier, CSR Bradford has confirmed that the thermosetting resin binder contents of all other glass-fibre based batts and blankets do not exceed 13%. The binder is the primary combustible component within these insulation products. The significance of this is that all other batts and blankets contain either similar or lower amounts of combustibles within them.

In an AS/NZS 1530.3:1999 test, the surface of the test sample is exposed primarily to radiation. A pilot flame is held at a short distance of 15 mm from the surface of the specimen. Thus, the outcome of the test is primarily dependent on the behaviour of the material on the exposed face of the test sample. The thickness of the test specimen does not have an appreciable effect on the test results.

Outcome

When evaluated in conjunction with the AS 1530.1:1994 results discussed earlier, the above discussion shows that the glass-fibre insulation products with densities not exceeding 130 kg/m^3 are likely to achieve the fire hazard indices 0, 0, 0, 0-1 if tested to AS/NZS 1530.3:1999.

5.3.3 Mineral-fibre insulation products

Combustibility of mineral-fibre insulation products

A summary of the range of mineral-fibre insulation products tested to AS 1530.1:1994 is presented in Table 12. Each of these products were classified as NOT deemed COMBUSTIBLE in the test reports. A detailed summary of each test report is presented in Appendix A.

Table 12 CSR Bradford mineral-fibre insulation products tested to AS 1530.1:1994

Test report	Product	Nominal product density (kg/m^3)	Nominal product thickness (mm)
FNC9595	Bradford Rockwool Fibertex 450	80	50
FNC9596	Bradford Rockwool Fibertex HD	197	50
FNC9693	Bradford Soundscreen Plus 3.0	30	120
FNC9770	Rockwool Granulated Cavity Wall	20	50
FNC9771	Rockwool Building Grade Insulation	100	50
NR-15003	CSR Fireseal Party Wall Roof Sealer	50	50
NR-15004	CSR Fireseal Party Wall Batts	70	100
NR-15005	CSR Rockwool Fibertex 820 Board	110	25
NR-15007	Bradford Rockwool Granulated Industrial (502)	200	Not applicable

The density of the tested insulation products ranged from 20 kg/m^3 to 200 kg/m^3. NR-15007 incorporated Bradford mineral-fibre granular material packed to achieve a density of 200 kg/m^3. Each of the tested specimens were classified as NOT deemed COMBUSTIBLE. This proves that CSR Bradford mineral-fibre based batts and blankets with densities up to 200 kg/m^3 possess very low amounts of combustibles.

Mineral-fibre based batts and blankets to AS/NZS 1530.3:1999

FNE9690, FNE11527 and FNE11655 describe three AS/NZS 1530.3:1999 tests conducted on various mineral-fibre based batts or blankets. Details of the tested materials are given in Table 13. Each of these materials achieved the fire hazard indices 0, 0, 0, 0-1 or 0, 0, 0, 1 – as classified by AS/NZS 1530.3:1999.

Table 13 AS/NZS 1530.3:1999 test results for mineral-fibre insulation products

Referenced test	Insulation product	Nominal product density (kg/m^3)	Nominal product thickness (mm)
FNE9690	Rockwool Building Grade Granulated (loose fill)	20 and 100	100
FNE11527	CSR Bradford Rockwool Granulated (loose fill)	100	100

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Referenced test	Insulation product	Nominal product density (kg/m^3)	Nominal product thickness (mm)
FNE11655	CSR Bradford Rockwool Fibertex – 820	110	100

CSR Bradford has confirmed that the thermosetting resin binder contents of all mineral-fibre insulation products with densities up to 110 kg/m^3 do not exceed 3.4% by mass. The binder within the batt/blanket is the primary combustible component within these insulation products. The significance of this is that all other batts and blankets contain either similar or lower amounts of combustibles within them. As discussed earlier, the thickness of the product in use does not have an appreciable effect on the test results.

Outcome

When evaluated in conjunction with the AS 1530.1:1994 results discussed earlier, the above discussion shows that the glass-fibre based insulation products with a density not exceeding 130 kg/m^3 are likely to achieve the fire hazard indices 0, 0, 0, 0-1 or 0, 0, 0, 1 – if tested to AS/NZS 1530.3:1999.

5.4 Conclusion

Based on the discussions presented in sections 5.3.1 to 5.3.3, this assessment demonstrates that the following insulation products are likely to achieve the fire hazard indices 0, 0, 0, 0-1 or 0, 0, 0, 1 – if tested in accordance with AS/NZS 1530.3:1999.

- CSR Bradford glass-fibre based batts and blankets with densities up to 130 kg/m^3
- CSR Bradford mineral-fibre based batts and blankets with densities up to 110 kg/m^3.

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6. Assessment 2 – Various facing options to AS/NZS 1530.3:1999

6.1 Description of variation

A series of AS/NZS 1530.3:1999 tests were conducted on various facings with and without glass-fibre substrates. A summary of the tested systems in shown in Table 7. Based on the test results, a range of facing options – coupled with the glass-fibre and mineral-fibre insulation products previously assessed under section 5 – are proposed to be assessed to AS/NZS 1530.3:1999. Alternatively, no facing may be used.

6.2 Methodology

The method of assessment used is summarised in Table 14.

Table 14 Method of assessment

Assessment method	
Level of complexity	Intermediate assessment
Type of assessment	Qualitative– interpolation / Comparative

6.3 Assessment

6.3.1 Rationale for the assessment

The combustibility and fire hazard properties of the proposed glass-fibre and mineral-fibre insulation products were previously assessed under section 5. All of these substrates are classified as NOT deemed COMBUSTIBLE in accordance with AS 1530.1:1994. Each of the substrates also achieved the fire hazard indices 0, 0, 0, 0-1 or 0, 0, 0, 0-1 in accordance with AS/NZS 1530.3:1999. Hence, the proposed substrates achieve the lowest fire hazard properties achievable i.e. they have very low reaction to fire response.

Collectively, these outcomes prove that the contribution of such substrates to the fire hazard properties of the proposed systems – which also consist of facings – is likely to be very small. The overall fire hazard properties of the proposed glass-fibre and mineral-fibre insulation products lined with various facings are likely to be primarily dependent of the same properties of the facings themselves. Hence, the fire hazard properties of the proposed systems can be determined based on the same results of the facings tested to AS/NZS 1530.3:1999.

Additionally, variations among different facings can be assessed based on the amount of combustibles within such facings. The results obtained via testing of facings with higher amounts of combustibles are used to assess the fire hazard properties of facings with similar composition, but with lower amounts of combustible content.

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6.3.2 No facing option

If no facing is used in conjunction with the glass-fibre or mineral-fibre substrate, then the fire hazard indices of the bare insulation products are applicable. As discussed in section 5, the fire hazard indices of the range of substrates are assessed to be 0, 0, 0, 0-1 or 0, 0, 0, 1 – depending on the product. Conservatively 0, 0, 0, 1 classification is assigned as a general solution.

6.3.3 Assessment of facings directly tested to AS/NZS 1530.3:1999

The various facings specified in Table 7 were all subjected to direct AS/NZS 1530.3:1999 testing. These tested facings with proposed substrates are directly assessed to achieve the same fire hazard properties achieved from the tests based on the rationale discussed earlier in section 6.3.1. The implications of the adhesive have been discussed separately under section 7.

Table 15 Facings directly tested to AS/NZS 1530.3:1999

Facing	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
Unfaced	0	0	0	1
Ultraphon	0	0	0	3
MD aluminium foil	0	0	0	0-1
HD aluminium foil	0	0	0	0-1
BMF	18	0	0	3
BMF	0	0	0	2
HDP foil	0	0	0	3
Acoustituff aluminium foil	0	0	0	1
Thermoseal Roof Tile Plus foil	0	0	0	1
Thermoplast 993 – White (antiglare)	0	0	0	0-1
Thermoplast 990 – White	0	0	0	0-1
LD foil	0	0	0	1
Thermoplast 993 Black	0	0	0	3
HDP foil with PET facing	17	0	2	5

6.3.4 Assessment of facings with minor variations to those directly tested to AS/NZS 1530.3:1999

The additional facings that were not directed tested to AS/NZS 1530.3:1999 – but only vary to a minor degree from the tested facings such that an assessment can be conducted – are limited to those specified in Table 16. The reference tests and the assessment rationale are also provided in the same table.

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Table 16 Additional facings assessed based on other facings directly tested to AS/NZS 1530.3:1999

Proposed Facing Material	Similar tested product	Differences between tested and proposed facings	Test report	Fire hazard indices from tests	Rationale
MD foil with one Antiglare surface	MD foil-faced Bradford Glasswool Ultratel	One outer foil layer on MD foil is replaced with an Antiglare foil layer to make MD foil with one Antiglare surface.	FNE9787	0, 0, 0, 0-1	MD foil faced glasswool board has been tested and achieved the fire hazard indices 0, 0, 0, 0-1. HD sarking with anti-glare surface (no glasswool board backing) has been tested and achieved the fire hazard indices 0,0,0,1. MD foil has less combustibles than HD foil. Therefore, MD foil with one Antiglare surface is also likely to achieve the fire hazard indices 0,0,0,1.
	HD Sarking 753 – Reflective sarking wrapped with anti-glare	The Antiglare layer on HD foil laminate has been tested.	18-000736	0, 0, 0, 1	
HD foil with one Antiglare surface	HD foil-faced Bradford Glasswool Ultratel.	One outer foil layer on HD foil is replaced with an Antiglare foil layer to make heavy duty aluminium foil with one Antiglare surface.	FNE9788	0, 0, 0, 0-1	The two individual facing components have been tested and collectively achieved the lowest possible results. The use of the two items together is also likely to achieve the fire hazard indices 0, 0, 0, 1.
	HD Sarking 753 – Reflective sarking wrapped with anti-glare	The Antiglare layer on heavy duty aluminium foil laminate has been tested separately.	18-000736	0, 0, 0, 1	
LD 'FC' Foil	MD aluminium foil-faced Bradford Glasswool Ultratel.	LD 'FC' foil is similar to LD foil. LD foil contains the same materials, but less layers of Kraft paper and adhesive than the MD aluminium foil. LD 'FC' has 'FC' printed on the foil.	FNE9787	0, 0, 0, 1	LD 'FC' has some imprint on it. Its composition is the same as LD foil. Therefore, it is likely to give similar results to LD foil – if tested. Ie it is likely to achieve the fire hazard indices 0, 0, 0, 1.
Medium Duty Perforated (MDP) foil	MD foil-faced Bradford Glasswool Ultratel	This is a perforated version of the MD foil. The perforation pattern is the same as that used on Heavy Duty Perforated (HDP) foil.	FNE9787	0, 0, 0, 0-1	Supertel glasswool board with 750P HDP foil achieved the fire hazard indices 0, 0, 0, 2. The Smoke Developed Index shows a slight increase from the unperforated HD foil tested in FNE9788 and 18-000736 likely due to the presence of perforations. Considering that MD foil has less combustibles than HD foil, the MDP foil likely not to exceed the results obtained by the HDP foil. Accordingly, the MDP foil is also likely to achieve the fire hazard indices 0, 0, 0, 2.
	Thermoseal 750P HDP double sided reflective perforated foil with 2.4 mm holes giving 10% open area as facing on a Supertel.	The HDP foil has been tested on a glasswool blanket.	FNE12137	0, 0, 0, 2	
Thermoplast 993F – White	Thermoplast 993 White Antiglare faced glass-fibre batt.	The new outer layer is white in colour. The Antiglare outer layer,	7-574195-CN	0, 0, 0, 0-1	The white layer – when taken in isolation – is very thin an presents very minimal combustible load. The new

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Proposed Facing Material	Similar tested product	Differences between tested and proposed facings	Test report	Fire hazard indices from tests	Rationale
		and other layers are the same as Thermoplast 993.			white layer is not expected to cause any variations in the results.
Perforated Thermoplast 993F – White	Thermoplast 993 White Antiglare faced glass-fibre batt.	The new outer layer is white in colour. The Antiglare outer layer, and other layers are the same as Thermoplast 993. The perforation pattern is the same as that in HDP foil.	7-574195-CN	0, 0, 0, 0-1	The basic Thermoplast 993F was assessed to the fire hazard indices 0, 0, 0, 0-1. The presence of perforations is likely to cause an increase in the Smoke Developed Index. HDP foil with perforations was tested and achieved the fire hazard indices 0, 0, 0, 2. As the same perforation pattern is used in the proposed Thermoplast 993F perforated version, it is also likely to achieve the fire hazard indices 0, 0, 0, 2.
	Thermoseal 750P HDP double sided reflective perforated foil with 2.4 mm holes giving 10% open area as facing on a Supertel.	The HDP foil has been tested on a glasswool blanket.	FNE12137	0, 0, 0, 2	
Perforated Thermoplast 993 – Black	Thermoplast 993 Black faced glass-fibre batt	The outer layer is black in colour. The other layers are the same as Thermoplast 993. The perforation pattern is the same as that in HDP foil.	21-000496	0, 0, 0, 3	It is noteworthy that compared to the Thermoplast 993 – White tested in 7-574195-CN which achieved a Smoke Developed Index of 0-1, the tested Thermoplast 993 – Black achieved a higher Smoke Developed Index of 3. It was previously established that the presence of perforations led to a minor increase in the Smoke Developed Index. Considering this, the Smoke Developed Index of the perforated Thermoplast 993 Black is conservatively assessed to 5. Thus, the Thermoplast 993 Black with perforations is likely to achieve the fire hazard indices 0, 0, 0, 5.
	Thermoseal 750P HDP double sided reflective perforated foil with 2.4 mm holes giving 10% open area as facing on a Supertel.	The HDP foil has been tested on a glasswool blanket.	FNE12137	0, 0, 0, 2	
Thermoplast 990F – White	Thermoplast 990 White faced glass-fibre batt.	The new outer layer is white in colour. It is the same as that used in Thermoplast 993F. Other layers are the same as Thermoplast 990.	7-574196-CN	0, 0, 0, 0-1	The white layer – when taken in isolation – is very thin an presents very minimal combustible load. The new white layer is not expected to cause any variations in the results.
Perforated Thermoplast 990F – White	Thermoplast 990 White faced glass-fibre batt.	The new outer layer is white in colour. It is the same as that used in Thermoplast 990. Other layers are the same as Thermoplast 990. The perforation pattern is the same as that in HDP foil.	7-574196-CN	0, 0, 0, 0-1	Thermoplast 990 White was tested and achieved the lowest possible fire hazard indices. HDP foil with perforations was tested and achieved the fire hazard indices 0, 0, 0, 2. Conservatively, the worse results are deemed applicable for the Thermoplast 990F – White

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Proposed Facing Material	Similar tested product	Differences between tested and proposed facings	Test report	Fire hazard indices from tests	Rationale
	Thermoseal 750P HDP double sided reflective perforated foil with 2.4 mm holes giving 10% open area as facing on a Supertel.	The HDP foil has been tested on a glasswool blanket.	FNE12137	0, 0, 0, 2	perforated facing. Hence, it is assessed to achieve the fire hazard indices 0, 0, 0, 2.
PET Facing	Supertel with HDP and PET facing	The PET polymer facing is used in isolation without any additional facing	20-006531	17, 0, 2, 5	The tested system consisted of additional HDP foil which constitutes to additional combustibles. Hence, the proposed PET facing consists of lower combustibles compared to the tested specimen. Therefore, the proposed facing is likely to achieve the same or better fire hazard indices as 17, 0, 2, 5.

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6.4 Conclusion

Based on the discussions presented in sections 6.3.1 to 6.3.4, this assessment demonstrates that the facing options described in Table 7 are likely to achieve the fire hazard indices specified in the same table – if tested in accordance with AS/NZS 1530.3:1999.

Table 17 Assessed fire hazard indices of various facing options to AS/NZS 1530.3:1999

Facing	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
Unfaced	0	0	0	1
Ultraphon	0	0	0	3
MD foil	0	0	0	0-1
HD foil	0	0	0	0-1
BMF	18	0	0	3
HDP foil	0	0	0	3
Acoustituff	0	0	0	1
Thermoseal Roof Tile Plus foil	0	0	0	1
Thermoplast 993 – White (antiglare)	0	0	0	0-1
Thermoplast 990 – White	0	0	0	0-1
LD foil	0	0	0	1
MD foil with one Antiglare surface	0	0	0	1
HD foil with one Antiglare surface	0	0	0	1
LD 'FC' Foil	0	0	0	1
MDP foil	0	0	0	2
Thermoplast 993F – White	0	0	0	0-1
Perforated Thermoplast 993F – White	0	0	0	2
Thermoplast 993 – Black	0	0	0	3
Perorated Thermoplast 993 – Black	0	0	0	5
Thermoplast 990F – White	0	0	0	0-1
Perforated Thermoplast 990F – White	0	0	0	2
HDP and PET	17	0	2	5
PET	17	0	2	5

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7. Assessment 3 – Various adhesive options to AS/NZS 1530.3:1999

7.1 Description of variation

A range of adhesive options were used to glue fix the various facings to glass-fibre or mineral-fibre insulation products tested to AS/NZS 1530.3:1999. It is proposed that the following adhesive options can be used in conjunction with all proposed insulation batts/blankets and facing options included in this assessment.

Alternatively, the same facing options may be used with the same substrates without any adhesive. This is called the no adhesive option.

7.2 Methodology

The method of assessment used is summarised in Table 18.

Table 18 Method of assessment

Assessment method	
Level of complexity	Simple assessment
Type of assessment	Qualitative – interpolation / Comparative

7.3 Assessment

7.3.1 Adhesive

Bostik Rapidset 4725 adhesive

The majority of AS/NZS 1530.3:1999 tests conducted on various facings referenced in this assessment report incorporated Bostik Rapidset 4725 adhesive. Considering that some of the facings achieved the lowest possible fire hazard indices of 0, 0, 0, 0-1, it is likely that the Bostik Rapidset 4725 did not cause any appreciable adverse effect on the fire hazard properties of the tested facings.

Bostik HT adhesive

Test reports FNE9790, FNE12136, FNE10360 and FNE12137 provide the grounds for positive assessment of the Bostik adhesives. The identified reports tested Bradford Glasswool Ultratel with BMF facing and Bradford Glasswool Supertel with HDP facing. The two systems were adhered using Bostik Rapidset 4725 and Bostik HT adhesive, respectively. The results demonstrate that the Bostik HT adhesive performs better than the more widely tested Bostik Rapidset 4725 adhesive as detailed in Table 19 below. The Bostik HT adhesive can therefore be positively assessed to be unlikely to cause adverse increases in fire hazard indices – if used in conjunction with all other proposed systems (facings and substrates) outlined in this report.

Table 19 Influence of Bostik adhesives on AS/NZS 1530.3:1999 test results

Facing	Adhesive	Test	Insulation substrate	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
BMF	Bostik Rapidset 4725	FNE9790	Glass fibre	18	0	0	3
BMF	Bostik HT adhesive	FNE12136	Glass fibre	0	0	0	2
HDP foil	Bostik Rapidset 4725	FNE10360	Glass fibre	0	0	0	3

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Facing	Adhesive	Test	Insulation substrate	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
HDP foil	Bostik HT adhesive	FNE12137	Glass fibre	0	0	0	2

Siegel Perma-Lok 800 adhesive

Additionally, Siegel Perma-Lok 800 can be assessed on the basis of test reports FNE12465A and 20-006531. Both these tests incorporated Seigel adhesive as shown in Table 20.

Table 20 Influence of Siegel adhesive on AS/NZS 1530.3:1999 test results

Facing	Adhesive	Referenced test	Insulation substrate	Ignitability index (0-20)	Spread of flame index (0-10)	Heat evolved index (0-10)	Smoke developed index (0-10)
HDP foil	Seigel Perma-Lok 800	FNE12565	Glass fibre	0	0	0	2
HDP foil and PET facing	Seigel Perma-Lok 800	20-006531	Glass fibre	17	0	2	5

The fire hazard indices obtained for HDP foil when tested with Bostik Rapidset 4725 (FNE10360) and Bostik HT (FNE12137) are either similar or worse than those obtained with Seigel Perma-Lok 800 in FNE12565. Thus, using Seigel Perma-Lok 800 with any of the facing options included in this report is unlikely to change the assessed results. The higher fire hazard indices obtained in 20-006531 are likely to be due to the PET facing and not the use of Siegel adhesive.

7.3.2 No adhesive option

All the adhesives discussed earlier add some finite amount of combustibles into the system. The no adhesive option reduces the amount of combustibles in the overall assembly. Test report 20-000496 consisted of Thermoplast 993 – Black facing on glasswool blanket that was not glued using any adhesive and achieved the fire hazard indices of 0, 0, 0, 3. Based on this, the use of any facing included in this assessment in conjunction with any substrate – without the use of any adhesive – is unlikely to cause an adverse impact on the assessed fire hazard performance.

7.4 Conclusion

Based on the above discussion, this assessment demonstrates that that all the facing options included in this assessment, when used in conjunction with the glass-fibre and mineral-fibre insulation products included in this report, are unlikely to cause any adverse effect on their fire hazard properties already assessed in accordance with AS/NZS 1530.3:1999. Alternatively, the same facings may be used with the same range of substrates without any adhesive binding them together. The no adhesive option is unlikely to cause any adverse impact on the assessed performance of the facing and substrate assembly.

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8. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of this assessment may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.

Due to the nature of fire testing and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that this report be reviewed on, or before, the stated expiry date.

This assessment represents our opinion about the performance likely to be demonstrated on a test in accordance with AS/NZS 1530.3:1999, based on the evidence referred to in this report.

This assessment is provided to CSR Bradford for their own specific purposes. Building certifiers and other third parties are responsible for deciding if they accept this assessment in a particular context.

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Appendix A Summary of supporting test data

A.1 Test report – FNE9785

Table 21 Information about test report FNE9785

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 26 May 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Ultraphon facing adhered to Bradford Glasswool Ultratel glass-fibre insulation batt backing.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal thickness of facing	1.0 mm
Nominal total thickness	50 mm
Nominal total density	48 kg/m^3
Colours	Black (exposed face), yellow (batt)

A.2 Test report – FNE10360

Table 22 Information about test report FNE10360

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 9 December 2011.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Heavy duty perforated (HDP) aluminium foil facing adhered to a Bradford 50 mm Supertel Board glass-fibre insulation backing bonded by thermosetting resin. Foil bonded to backing by Bostik Rapidset 4725 / EVA adhesive at an application rate of 20 – 30 g/m^2.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal thickness of foil	0.13 mm
Nominal total thickness	50 mm
Nominal total density	32 kg/m^3
Colours	Silver (exposed face), golden yellow (backing)

The test specimens described in sections A.1 and A.2 achieved the same results – see Table 23.

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Table 23 Identical results summary obtained for test reports FNE9785 and FNE10360

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)
0	0	0	3

A.3 Test report – FNE9787

Table 24 Information about test report FNE9787

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 9 June 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Medium density aluminium foil facing adhered to Bradford Glasswool Ultratel glass-fibre insulation batt-backing.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal total thickness	50 mm
Nominal total density	48 kg/m^3
Colours	Silver (exposed face), yellow (batt)

A.4 Test report – FNE9788

Table 25 Information about test report FNE9788

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 9 June 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Heavy duty aluminium foil facing adhered to Bradford Glasswool Ultratel glass-fibre insulation batt backing.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal total thickness	50 mm
Nominal total density	48 kg/m^3
Colours	Silver (exposed face), yellow (batt)

The test specimens described in sections A.3 and A.4 achieved the same results – see Table 26.

Issued to: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Issued on: 2nd August 2021

Table 26 Identical results summary for test reports FNE9787 and FNE 9788

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	0-1

A.5 Test report – FNE9790

Table 27 Information about test report FNE9790

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 10 June 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	BMF facing adhered to Bradford Glasswool glass-fibre insulation batt backing.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal total thickness	50 mm
Nominal total density	48 kg/m^3
Colours	Black (exposed face), yellow (batt)

The test specimen achieved the following results – see Table 28.

Table 28 Results summary for test report FNE9790

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
18	0	0	3

A.6 Test report – FNE10361

Table 29 Information about test report FNE10361

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 9 December 2011.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Acoustituff aluminium foil facing adhered to Bradford 50 mm Supertel Board glass-fibre insulation backing bonded by thermosetting resin. Foil bonded to backing by Bostik Rapidset 4725 / EVA adhesive at an application rate of 20 – 30 g/m^2.

Issued to Paul McGuire
Company: Brigidon Australia
Re: Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

Item	Information about test report	
	Description	**Details**
	Nominal thickness of foil	0.12 mm
	Nominal total thickness	50 mm
	Nominal total density	32 kg/m^3
	Colours	Silver (exposed face), golden yellow (backing)
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

A.7 Test report – FNE10364

Table 30 Information about test report FNE10364

Item	Information about test report	
Report sponsor	CSR Building Products Limited.	
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.	
Test date	The reaction to fire test was completed on 20 December 2011.	
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.	
Variation to test standards	None	
General description of tested specimen	Acoustituff aluminium foil facing adhered to Bradford 50 mm Ultratel Board glass-fibre insulation backing bonded by thermosetting resin. Foil bonded to backing by Bostik Rapidset 4725 / EVA adhesive at an application rate of 20 – 30 g/m^2.	
	Description	**Details**
	Nominal thickness of foil	0.12 mm
	Nominal total thickness	50 mm
	Nominal total density	32 kg/m^3
	Colours	Silver (exposed face), golden yellow (backing)
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

Issued To: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

A.8 Test report – FNE11429

Table 31 Information about test report FNE11429

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 6 July 2015.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None

Item	Information about test report
General description of tested specimen	Enviroseal Roof Tile Plus-faced Bradford Ultratel glasswool board. Foil facing bonded to board by Bostik Rapidset 4725 adhesive at an application rate of 35 g/m^2. It has been confirmed by CSR Building Products Limited that this product is now identified as Thermoseal Roof Tile Plus-faced and that this is purely a name change without any change to the product.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal thickness of foil facing	0.33 mm
Nominal total thickness	50 mm
Nominal total density	48 kg/m^3
Colours	Silver (foil), golden yellow (glasswool)

All the test specimens described in sections A.6 to A.8 achieved the same results – see Table 32.

Table 32 Identical results summary obtained for test reports FNE10361, FNE10364 and FNE11429

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	1

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Issued On: 2nd August 2021

A.9 Test report – 7-574195-CN

Table 33 Information about test report 7-574195-CN

Item	Information about test report
Report sponsor	CSR Performance Systems.
Test laboratory	AWTA Product Testing, 1st Floor, 191 Racecourse Road, Flemington, Victoria 3051, Australia.
Test date	The reaction to fire test was completed on 10 August 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford Thermoplast 993 white (antiglare). Nominal layered composition of foil/paper/foil/sarking fabric/glass fibre insulation batt.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal total thickness	60 mm
Approximate total mass	1030 g/m^3
Colour	White

A.10 Test report – 7-574196-CN

Table 34 Information about test report 7-574196-CN

Item	Information about test report
Report sponsor	CSR Performance Systems.
Test laboratory	AWTA Product Testing, 1st Floor, 191 Racecourse Road, Flemington, Victoria 3051, Australia.
Test date	The reaction to fire test was completed on 11 August 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford Thermoplast 990 white. Sarking material over insulation batt.

Description	Details
Nominal total thickness	60 mm
Approximate total mass	960 g/m^3
Colour	Silver (facing), yellow (back)

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

The test specimens described in sections A.9 and A.10 achieved the same results – see Table 35.

Table 35 Identical results summary obtained for test reports 7-574195-CN and 7-574196-CN

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	0-1

Issued to: Paul McGuire
Company: Brigton Australia
Concord Repatriation General Hospital
Issued On: 2nd August 2021
Re:

A.11 Test report – FNE12136

Table 36 Information about test report FNE12136

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 26 March 2018.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	50 mm Ultratel Board – faced on one side with Black Matt Facing (BMF). Glasswool insulation board bonded with 13% by mass phenolic resin binder. The board consisted of two layers, a 0.6 mm random felted glass fibre tissue (Regina P500 PVB) dyed black (BMF) layer and a 50 mm glasswool layer. The BMF bonded onto the glasswool board with Bostik HT adhesive applied at an application rate of 25 g/m^2.

Description	Details
Nominal total thickness	50.6 mm
Nominal glasswool density	48 kg/m^3

Item	Information about test report	
	Nominal BMF mass	60 g/m^2
	Colour	Yellow (glasswool), black (exposed face)
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

A.12 Test report – FNE12137

Table 37 Information about test report FNE12137

Item	Information about test report	
Report sponsor	CSR Building Products Limited.	
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.	
Test date	The reaction to fire test was completed on 26 March 2018.	
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.	
Variation to test standards	None	
General description of tested specimen	50 mm Supertel Board – faced on one side with 750P Heavy Duty Perforated Foil (HDP). Glasswool insulation board bonded with 13% by mass phenolic resin binder. The board consisted of two layers, a layer consisting of 0.3 mm Thermoseal 750P heavy duty (HDP) double sided reflective perforated foil with 2.4 mm holes giving 10% open area and a 50 mm glasswool layer. The HDP foil bonded onto the glasswool board with Bostik HT adhesive applied at an application rate of 25 g/m^2.	
	Description	**Details**
	Nominal total thickness	50.3 mm
	Nominal glasswool density	32 kg/m^3
	Nominal HDP foil mass	350 g/m^2
	Colour	Yellow (glasswool), silver (exposed face)
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

Issued to: Paul McGuire
Company: Bright Australia
Re: Concord Repatriation General Hospital
Issued On: 2nd August 2021

The test specimens described in sections A.11 and A.12 achieved the same results – see Table 38.

Table 38 Identical results summary obtained for test reports FNE12136 and FNE12137

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	2

A.13 Test report – FNE9690

Table 39 Information about test report FNE9690

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 1 March 2010.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Rockwool building grade loose fill granulated insulation.

Description	Details
Nominal density	20 kg/m^3 and 100 kg/m^3
Nominal thickness	100 mm
Colour	Brown

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

The test specimen achieved the following results – see Table 40.

Table 40 Results summary for this test report

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	0-1

A.14 Test report – FNE11527

Table 41 Information about test report FNE11527

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 18 March 2016.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford Rockwool Granulated (loose-fill).

Description	Details
Nominal density	100 kg/m^3
Nominal thickness	100 mm
Colour	White

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Issued to: Paul McGuire
Company: Brighton General Hospital
Concord Repatriation General Hospital, Australia
Issued on: 2nd August 2021
Ref: NSW

A.15 Test report – FNE11655

Table 42 Information about test report FNE11655

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 8 March 2016.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford Rockwool Fibretex – 820 insulation board.

Description	Details
Nominal thickness	100 mm
Nominal mass	2.7 kg/m^2
Nominal density	110 kg/m^3
Colour	Yellow

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

A.16 Test report – FNE9589

Table 43 Information about test report FNE9589

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 13 November 2009.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Bradford Glasswool Quietel - glass-fibre insulation batt bonded with thermosetting resin.

Description	Details
Nominal density	130 kg/m^3
Nominal thickness	25 mm
Colour	Yellow

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

All the test specimens described in sections A.14 to A.16 achieved the same results – see Table 44.

Table 44 Identical results summary obtained for test reports FNE11527, FNE11655 and FNE9589

Performance criteria	Integrity	Time to failure	Position of failure
0	0	0	1

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Issued On: 2nd August 2021

A.17 Test report – FNC9595

Table 45 Information about test report FNC9595

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 10 December 2009.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Rockwool Fibertex 450 - mineral fibre insulation batt.

Description	Details
Nominal density	80 kg/m^3
Nominal thickness	50 mm
Colour	Brown

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.18 Test report – FNC9596

Table 46 Information about test report FNC9596

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 11 December 2009.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Rockwool Fibertex HD - mineral fibre insulation batt.

Description	Details
Nominal density	197 kg/m^3
Nominal thickness	50 mm
Colour	Brown

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

Issued to: Paul McGuire
Company: Construction Australia
Concord Repatriation General Hospital
Issued on: 2nd August 2021
Re:

A.19 Test report – FNC9693

Table 47 Information about test report FNC9693

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 5 March 2010.

Item	Information about test report
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Soundscreen Plus 3.0 - rockwool mineral fibre insulation batt.

Description	Details
Nominal density	30 kg/m^3
Nominal thickness	120 mm
Colour	Brown

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.20 Test report – FNC9770

Table 48 Information about test report FNC9770

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 4 May 2010.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Rockwool Granulated Cavity Wall - granulated mineral fibre insulation.

Description	Details
Nominal density	20 kg/m^3
Nominal thickness	50 mm
Colour	Brown

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.21 Test report – FNC9771

Table 49 Information about test report FNC9771

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 4 May 2010.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Rockwool Building Grade Insulation - granulated mineral fibre insulation.

Description	Details
Nominal density	100 kg/m^3

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

Item	Information about test report	
	Nominal thickness	50 mm
	Colour	Brown
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.	

A.22 Test report – FNC10324B

Table 50 Information about test report FNC10324B

Item	Information about test report	
Report sponsor	CSR Building Products Limited.	
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.	
Test date	The combustibility test was completed on 9 November 2011.	
Test standards	The test was done in accordance with AS 1530.1:1994.	
Variation to test standards	None	
General description of tested specimen	CSR Bradford R3.6 Building Blanket - glass-fibre insulation batt.	
	Description	**Details**
	Nominal density	16.85 kg/m^3
	Nominal thickness	145 mm
	Colour	Yellow
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.	

A.23 Test report – FNC0354

Table 51 Information about test report FNC0354

Item	Information about test report	
Report sponsor	CSR Building Products Limited.	
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.	
Test date	The combustibility test was completed on 23 September 2005.	
Test standards	The test was done in accordance with AS 1530.1:1994.	
Variation to test standards	None	
General description of tested specimen	Glasswool Partition Batts - acoustic/thermal insulation batt for walls.	
	Description	**Details**
	Nominal density	11 kg/m^3
	Nominal thickness	50 mm
	Colour	Gold
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.	

Re: Issued to: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Issued on: 2nd August 2021

A.24 Test report – FNC9594

Table 52 Information about test report FNC9594

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 10 December 2009.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Gold Insulation R2.0 Ceiling batts - glass-fibre insulation batt bonded with thermosetting resin.

Description	Details
Nominal mass	728 g/m^2
Nominal thickness	115 mm
Colour	Light golden yellow.

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.25 Test report – FNC9694

Table 53 Information about test report FNC9694

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 6 March 2010.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Gold Insulation R1.5 Water-repellent Wall and Floor batts - glass-fibre insulation batt bonded with thermosetting resin.

Description	Details
Nominal mass	657 g/m^2
Nominal thickness	75 mm
Colour	Light golden yellow.

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Issued On: 2nd August 2021

A.26 Test report – FNC9695A

Table 54 Information about test report FNC9695A

Item	Information about test report
Report sponsor	CSR Building Products Limited.

Item	Information about test report
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 6 March 2010.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Gold Insulation R5.0 High Performance Ceiling batts - glass-fibre insulation batt bonded with thermosetting resin.

Description	Details
Nominal mass	2800 g/m^2
Nominal thickness	210 mm
Colour	Light golden yellow.

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.27 Test report – FNC9749

Table 55 Information about test report FNC9749

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Materials Science and Engineering, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The combustibility test was completed on 26 April 2010.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Glasswool Partition Batts - glass-fibre insulation batt bonded with thermosetting resin.

Description	Details
Nominal density	14 kg/m^3
Nominal thickness	50 mm
Colour	Light golden yellow.

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

Issued to: Paul McGuire
Company: Brighton General Hospital
Concord Repatriation General Hospital Concord NSW
Issued On: 2nd August 2021
Re:

A.28 Test report – NR-15003

Table 56 Information about test report NR-15003

Item	Information about test report
Report sponsor	Marketing Group, CSR Bradford Insulation
Test laboratory	CSR Building Products, Insulation Research Laboratory, 376 Victoria Street, Wetherill Park, NSW 2164, Australia
Test date	The combustibility test was completed on 13-14 May 2015.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None

Item	Information about test report
General description of tested specimen	CSR Fireseal Party Wall Roof Sealer - in the form of tile roof material. Description: Details Nominal density: 50 kg/m^3 Nominal thickness: 50 mm
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.29 Test report – NR-15004

Table 57 Information about test report NR-15004

Item	Information about test report
Report sponsor	Marketing Group, CSR Bradford Insulation
Test laboratory	CSR Building Products, Insulation Research Laboratory, 376 Victoria Street, Wetherill Park, NSW 2164, Australia
Test date	The combustibility test was completed on 14-15 May 2015.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	CSR Fireseal Party Wall Batts. Description: Details Nominal density: 70 kg/m^3 Nominal thickness: 100 mm
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.30 Test report – NR-15005

Table 58 Information about test report NR-15005

Item	Information about test report
Report sponsor	Marketing Group, CSR Bradford Insulation
Test laboratory	CSR Building Products, Insulation Research Laboratory, 376 Victoria Street, Wetherill Park, NSW 2164, Australia
Test date	The combustibility test was completed on 3-9 July 2015.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	CSR Rockwool Fibertex 820 board. Two layers of insulation sandwiched to make 50 mm thickness. Description: Details Nominal density: 110 kg/m^3 Nominal thickness: 25 mm
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

Issued to: Paul McGuire
Company: Concord Repatriation General Hospital
Issued on: 2nd August 2021
Re: Copyright Australia

A.31 Test report – NR-15006

Table 59 Information about test report NR-15006

Item	Information about test report
Report sponsor	Marketing Group, CSR Bradford Insulation
Test laboratory	CSR Building Products, Insulation Research Laboratory, 376 Victoria Street, Wetherill Park, NSW 2164, Australia
Test date	The combustibility test was completed on 7-9 July 2015.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	CSR Bradford New Generation SoundScreen R2.0 Floor Batts.
	Description / **Details**: Nominal density / 25.7 kg/m^3 (measured) / 26.8 kg/m^3 (nominal); Nominal thickness / 70 mm
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

A.32 Test report – NR-15007

Table 60 Information about test report NR-15007

Item	Information about test report
Report sponsor	Marketing Group, CSR Bradford Insulation
Test laboratory	CSR Building Products, Insulation Research Laboratory, 376 Victoria Street, Wetherill Park, NSW 2164, Australia
Test date	The combustibility test was completed on 8-10 September 2015.
Test standards	The test was done in accordance with AS 1530.1:1994.
Variation to test standards	None
General description of tested specimen	Bradford Rockwool Granulated Industrial (502).
	Description / **Details**: Nominal density / 200 kg/m^3
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.1:1994.

All the test specimens described in sections A.17 to A.32 achieved the same results – see Table 61.

Table 61 Identical results summary obtained for test reports B.17 to B.32

Mean duration of sustained flaming (seconds)	Designation
0	Not deemed combustible

Issued to: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Issued On: 2nd August 2021

A.33 Test report – 18-000736

Table 62 Information about test report 18-00736

Item	Information about test report
Report sponsor	CSR Bradford Pty Ltd
Test laboratory	AWTA Product Testing, 1st Floor, 191 Racecourse Road, Flemington, Victoria 3051, Australia.
Test date	The reaction to fire test was completed on 20 February 2018.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Heavy Duty Sarking 753 - reflective sarking wrap with anti-glare.

Description	Details
Colours	Foil/Anti-glare

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

A.34 Test report – FNE12504

Table 63 Information about test report FNE12504

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The reaction to fire test was completed on 3 December 2019.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR 60 mm Bradford Black Roofing Blanket (glasswool) faced with Thermoseal 729 LD foil on exposed side. Foil facing adhered to insulation using water based Bostik adhesive (clarified to be Rapidset 4725 by CSR) at an application rate of 18 g/m^2.

Description	Details
Nominal thickness of foil	< 1 mm
Nominal thickness of glasswool	60 mm
Nominal total thickness	61 mm
Nominal mass	773 g/m^2
Colour	Silver (face), white (back)

Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Issued 02: Road, Concord NSW
2nd August 2021

The test specimens described in sections A.33 and A.34 achieved the same results – see Table 64.

Table 64 Identical results summary obtained for test reports 18-000736 and FNE12504

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	1

A.35 Test report – FNE12465A

Table 65 Information about test report FNE12465A

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The fire hazard property test was completed on 10 December 2019.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford 50 mm Supertel Board Faced with Thermoseal 750 HD Perf foil on one side. Glasswool insulation board consisted of a double sided reflective perforated foil with 2.4 mm apertures adhered to glass wool insulation using Bostik ADH (clarified to be HT by CSR) at an application rate of 16 g/m^2.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal thickness of foil	< 1 mm
Nominal thickness of glasswool	50 mm
Nominal total thickness	51 mm
Nominal mass	1983 g/m^2
Colour	Silver (face), yellow (back)

The test specimen achieved the following results – see Table 66.

Table 66 Results summary for this test report

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	3

A.36 Test report – FNE12565

Table 67 Information about test report FNE12565

Item	Information about test report
Report sponsor	CSR Building Products Limited.
Test laboratory	CSIRO Infrastructure Technologies, 14 Julius Avenue, Riverside Corporate Park, North Ryde, NSW 2113, Australia.
Test date	The fire hazard property test was completed on 4 March 2020.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	CSR Bradford 50 mm Supertel Board Faced with Thermoseal 750 HD Perf foil on one side. Double sided perforated foil with 2.4 mm apertures with a 9% open area bonded to glasswool made of glass fibres and a phenolic resin binder. Adhesion of the layers using Siegel Perma-Lok 800 glue applied at an application rate of 16 g/m^2.

Issued to: Dr. Paul McGuirk
Company: Brighton Australia Hospital
Concord Repatriation General NSW
Road, Concord
Issued On: 2nd August 2021

Item	Information about test report	
	Description	Details
	Nominal thickness of foil	< 1 mm
	Nominal thickness of glasswool	50 mm
	Nominal thickness	50 mm
	Nominal mass	1.983 kg/m^2
	Colour	Silver (foil), golden yellow (glasswool)
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

The test specimen achieved the following results – see Table 68.

Table 68 Results summary for this test report

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	2

Issued to: Paul McGuire
Company: Brighton Australia Hospital
Concord Repatriation General
Hospital, Concord NSW
Issued on: 21st August 2021
Re:

A.37 Test report – 20-006531

Table 69 Information about test report 20-006531

Item	Information about test report	
Report sponsor	CSR Building Products Ltd.	
Test laboratory	AWTA Product Testing, 1st Floor, 191 Racecourse Road, Flemington, Victoria 3051, Australia.	
Test date	The fire hazard property test was completed on 8 January 2021.	
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.	
Variation to test standards	None.	
General description of tested specimen	Supertel with Heavy Duty Foil Perforated and PET facing. Foil faced insulation batts consisted of glasswool insulation, laminated foil and paper facing with polymer overlay. Siegel solvent based adhesive (Clarified to be Perma-lok 800 by CSR) was used to glue fix the facing to the substrate.	
	Description	Details
	Nominal thickness	50 mm
	Nominal mass per unit area/density	38 g/m^2
	Colour	Silver face, yellow batt
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.	

The test specimen achieved the following results – see Table 70.

Table 70 Results summary for this test report

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
17	0	2	5

A.38 Test report – 21-000496

Table 71 Information about test report 21-000496

Item	Information about test report
Report sponsor	CSR Building Products Ltd.
Test laboratory	AWTA Product Testing, 1st Floor, 191 Racecourse Road, Flemington, Victoria 3051, Australia.
Test date	The fire hazard property test was completed on 12 February 2021.
Test standards	The test was done in accordance with AS/NZS 1530.3:1999.
Variation to test standards	None
General description of tested specimen	Building blanket with Thermoplast 993 Black Facing. Glasswool insulation batt with separate laminated paper and decorative black facing laid separately on top.
Instrumentation	The test report states that the instrumentation was in accordance with AS/NZS 1530.3:1999.

Description	Details
Nominal thickness	110 mm
Colour	Black facing, yellow glasswool

The test specimen achieved the following results – see Table 72.

Table 72 Results summary for this test report

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Development Index (0-10)
0	0	0	3

Issued to: Paul McGuire
Company: Brighton Australia
Re: Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

Appendix B Trade names of various insulation products

Each of the insulation products listed in Table 73 and Table 74 must conform to the density and binder content limits prescribed in the same tables. Their facing options and facing adhesive options must be as identified in this assessment under Table 1.

Table 73 CSR Bradford glass-fibre insulation products used in proposed systems

Product	Density	Thermosetting resin binder content
Bradford Gold and Gold HP	Up to 130 kg/m^3	Up to 13% by mass
Bradford Optimo		
Bradford Soundscreen		
Bradford Acoustigard		
Bradford Anticon, Anticon Antiglare, Anticon HP, Anticon Tuff		
Bradford Glasswool Building Blanket		
Bradford Ceiling Panel Overlays		
Bradford Multitel BAL		
Bradford Multitel		
Bradford Flexitel		
Bradford Supertel		
Bradford HT Thermatel		
Bradford Ultratel		
Bradford Quietel		
Bradford Specitel		

Table 74 CSR Bradford mineral- fibre insulation products used in proposed systems

Product	Density (kg/m^3)	Thermosetting resin binder content
Bradford Fireseal Party Wall Batts	Up to 110 kg/m^3	Up to 3.4% by mass
Bradford Fireseal Party Wall Sealer		
Bradford Fibertex 350, 450, 650, 820		

Re: Issued to: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

warringtonfire

Proud to be part of element

Issued to: Paul McGuire
Company: Brighton Australia
Concord Repatriation General Hospital
Hospital Road, Concord NSW
Issued On: 2nd August 2021

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Paul Mcguire

From: Bosnjak, Matthew <MBOSNJAK@csr.com.au>
Sent: Monday, 9 August 2021 12:17 PM
To: Paul Mcguire
Cc: Michael Dews; Eddie Alves
Subject: RE: Concord Hospital - AS1530.1 Test Report for the Cemintel CeminSeal Wallboard Sheet

Hi Paul,

Thanks for your email.

DTS provisions allow building materials to be used in certain ways without the need for further verification. For example, fibre cement or plasterboard may be used where a non-combustible material is required without any further need to demonstrate compliance. All Cemintel panels are fibre cement and there is no need to illustrate suitability. Instead reference can be made to BCA Clause C1.9.

Please let me know if we can assist further.

PANEL - FIRE RESISTANCE, THERMAL & ACCOUSTIC PROPERTIES

Characteristic	Result	Relevant Standard
FIRE RESISTANCE		
Combustibility	Suitable for use in applications where non-combustible materials are specified by the Deemed to Satisfy Provisions of the 2016 BCA Vol 1 Amendment 1 Clause C1.9 (2015 BCA Vol Clause C1.12)	

Characteristic	Result	Relevant Standard
Fire Hazard Properties	Group 1 Av Specific Extinction Area <250	AS 5637.1
Classification	1	AS/NZ 3837

Kind Regards,

Matthew Bosnjak | Commercial | CSR Interior Systems
Gyprock™ Plasterboard | Cemintel™ Fibre Cement | Himmel™ Interior Systems
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From: Paul Mcguire <paul@brightonaustralia.com.au>
Sent: Monday, 9 August 2021 11:35 AM
To: Bosnjak, Matthew <MBOSNJAK@csr.com.au>
Cc: Michael Dews <michaeld@brightonaustralia.com.au>; Eddie Alves <eddie@brightonaustralia.com.au>
Subject: FW: Concord Hospital - AS1530.1 Test Report for the Cemintel CeminSeal Wallboard Sheet

Hi Matthew

I have requested the above report from Antoine but have received an email reply advising he is on leave.

Are you able to or could you direct me to the CSR representative that can provide me with this report? We need the report urgently as it is part of our certification for Concord Hospital.

Regards

Paul McGuire
Brighton Ceilings

From: Paul Mcguire
Sent: Monday, 9 August 2021 10:18 AM
To: Veling, Antoine <aveling@csr.com.au>
Cc: Michael Dews <michaeld@brightonaustralia.com.au>; Eddie Alves <eddie@brightonaustralia.com.au>
Subject: Concord Hospital -

Hi Antoine

We need to provide an AS1530.1 Test Report for the Cemintel CeminSeal Wallboard Sheet supplied for Concord Hospital. Could you send this through to me?

Regards

Paul