23rd May 2019
Updated 25th June 2019

Richard Crookes
Level 3, 4 Broadcast Way,
Artarmon NSW 2064

Attention: Joel Davie

Dear Joel,

RE: Armidale Secondary College 17352 – SSDA Conditions Building Façade A19.

The Draft SSDA conditions, raised the question of the compliance of the proposed building facades.

The requirements for the external walls and cladding are set out within the National Construction Code and Building Code of Australia (BCA 2016 Amendment 1). Part C sets out the required fire safety aspects of the external wall.

PART C FIRE RESISTANCE AND STABILITY

Clause C1.9 sets out the combustibility requirements of various materials based on there proposed use as follows:

C1.9 Non-combustible building elements

(a) In a building required to be of Type A or B construction, the following building elements and their components must be non-combustible:

(i) External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation.

(ii) The flooring and floor framing of lift pits.

(iii) Non-loadbearing internal walls where they are required to be fire-resisting.

Clause C1.9 subclause (e) also provides clarity on a number of materials that are considered to be an acceptable material where a non-combustible material is required as follows:

(e) The following materials may be used wherever a *non-combustible* material is *required*:

(i) Plasterboard.

(ii) Perforated gypsum lath with a normal paper finish.

(iii) Fibrous-plaster sheet.

(iv) Fibre-reinforced cement sheeting.

(v) 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.

(vi) Bonded laminated materials where—

(A) each lamina, including any core, is *non-combustible*; and

(B) each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2mm; and

(C) the *Spread-of-Flame Index* and the *Smoke-Developed Index* of the bonded laminated material as a whole do not exceed 0 and 3 respectively.

As the proposed buildings are of type A and B construction this clause requires that the external walls of the buildings are to be non-combustible.
The following table includes the details of the various external wall materials and their combustibility compliance status.

Table 1- External Wall Materials

Code	Material	Details	Location	Combustibility
BRK-01	Face brickwork	Dry pressed. Laid in Stretcher Bond Namoi Valley Bricks	External feature walls at ground level.	Considered non-combustible by AS3700 ***
BLK-01	Face concrete blockwork	Split face. Laid in Stack Bond (Boral)	External feature walls at ground level.	Considered non-combustible by AS3700 ***
CC-01	Exposed concrete	Off white cement. Smooth finish. Class 2 finish to AS3610.	External wall elements	Considered non-combustible by AS3700 ***
CFC-01	Compressed fibre cement cladding	Exotel CFC cladding system on light steel framing. joint pattern as shown on the drawings.	External wall cladding	Fibrous Plaster sheet considered acceptable under clause C1.9 (e) (iv) Refer to Codemark CM40221
MR-01	Metal roofing	Metal pan roofing with Colorbond finish. 0.48mm thickness (BMT) Klip-lok 700 Hi-strength by Lysaght roofing	Roofing	Prefinished metal sheeting considered acceptable under clause C1.9 (e) (v)
MR-02	Metal roofing	Metal pan roofing with Colorbond finish. 0.48mm thickness (BMT) Maxline by Revolution Roofing	Roofing	Prefinished metal sheeting considered acceptable under clause C1.9 (e) (v)
MC-01	Metal wall cladding	Metal pan cladding with Colorbond finish. 0.6mm thickness (BMT) Maxline 340 by BlueScope Steel	External Wall cladding	Prefinished metal sheeting considered acceptable under clause C1.9 (e) (v)
LVB-01	Perforated aluminium vertical louvre blades	Folded perforated aluminium blade, fixed to window mullions RO3325 by Locker Group. Dulux Duratec Eternity powdercoat finish.	External Sun louvre blades (an attachment to the external wall)	Prefinished metal sheeting considered acceptable under clause C1.9 (e) (v)
LVB-02	Perforated aluminium vertical louvre blades	Folded perforated aluminium blade, fixed to steel frame. Locker Group. Dulux Duratec powdercoat finish	External Sun louvre blades(an attachment to the external wall)	Prefinished metal sheeting considered acceptable under clause C1.9 (e) (v)
	Insulation	Bradford Gold Glasswool thermal insulation	External Wall Insulation	Tested to AS1530.1 to be non-combustible.
	Sarking	TBA Firefly Breathable Sarking	External Wall Sarking	Tested to AS1530.1 to be non-combustible. Refer to attached.

***Brickwork, although not directly stated within legislation, brickwork masonry construction is considered to be non-combustible, this principle is evident within AS3700, which sets out the criteria for brickwork and masonry walls that will achieve structural and insulative fire resistance (Section 6.5)

Based on the above information it can be seen that the external wall materials meet the requirements of Clause C1.9 for the non-combustibility of the external walls.

Yours Faithfully
NBRSARCHITECTURE

TREVOR EVELEIGH
Associate Director – Studio Principal - Advisory

Firefly – AS1530.1 test certificate

Certificate of Test

Quote No.: NC7891 **REPORT No.: FNC12071**

COMBUSTIBILITY TEST FOR MATERIALS IN ACCORDANCE WITH AS 1530.1-1994

TRADE NAME: Aluminium Foil used in the following products:
TBA Firefly Non-Combustible Sarking (Breathable)
TBA Firefly Non-Combustible Sarking (Non-Breathable)
TBA Firefly Phoenix EA Sarking (Non-Breathable)
TBA Firefly Class 0 Foil Tape
TBA Firefly Vulcan (6 mm thick) Fire Barrier
TBA Firefly Plus 60 (10 mm thick) Fire Barrier
TBA Firefly Titan (15 mm thick) Fire Barrier

SPONSOR: TBA Textiles Pty Ltd
Unit 12, 6 Leighton Place
HORNSBY NSW 2077
AUSTRALIA

DESCRIPTION OF TEST SAMPLE: The sponsor described the tested specimen as an uncoated solid aluminium cylinder representative of the aluminium foil used in the products listed under the Trade Name section of this report.

Nominal thickness: 50 mm
Nominal total density: 2700 kg/m³
Colour: silver (uncoated aluminium)

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:

Mean furnace thermocouple temperature rise	7.8°C
Mean specimen centre thermocouple temperature rise	7.2°C
Mean specimen surface thermocouple temperature rise	14.2°C
Mean duration of sustained flaming	0 seconds
Mean mass loss	0.19 %

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: 1 December 2017

Issued on the 12th day of December 2017 without alterations or additions.

Faustin Molina
Testing Officer

Brett Roddy
Team Leader, Fire Testing and Assessments

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 - Testing.

CSIRO INFRASTRUCTURE TECHNOLOGIES

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

Certificate of Conformity

Certification Body:

CertMark International
ABN: 80 111 217 568
JAS-ANZ Accreditation No. Z445021OAK
PO Box 7144, Sippy Downs
Qld 4556
+61 (07) 5445 2199
www.CertMark.org

Certificate Holder:

James Hardie Australia Pty Ltd
ABN: 12 084 635 558
10 Colquhoun St, Rosehill
NSW 2142
www.jameshardie.com.au

Certificate number: CM40221

THIS TO CERTIFY THAT

Exotec™ Facade Panel and Fixing System

Type and/or use of product:

External Façade Panel and Fixing System.

Description of product:

The James Hardie Exotec™ facade panel system is an express joint façade system comprising of compressed fibre cement (CFC) panels and the proprietary James Hardie top hat system. Panels are supplied as paintable or pre-finished.

COMPLIES WITH THE FOLLOWING BCA PROVISIONS AND STATE OR TERRITORY VARIATION(S) **BCA 2016 Amdt. 1**

	Volume One		Volume Two	
Performance Requirement(s):	FP1.4	Roof and external walls must prevent the penetration of water	P2.2.2	Weatherproofing
Deemed-to-Satisfy Provision(s):	B1.2	Determination of individual actions	3.5.3.3(a)	Wall cladding boards – Fibre-cement
	B1.4	Determination of structural resistance of materials and forms of construction	3.5.3.4(a)	Sheet wall cladding
	C1.9(a)(i), (d)&(e)(iv)	Non-combustible building elements	3.5.3.5	Eaves and soffit linings
	G5.2	Construction in bushfire prone areas (BAL Low-40)	Part 3.7.4	Bushfire areas (BAL Low-40)
	J1.5	Walls (9mm - R-Value 0.015 - Contributes to the overall performance of the building envelope)	3.11.2	Resistance to actions
			3.11.3	Determination of individual actions
			3.11.6	Determination of structural resistance of materials and forms of construction
			3.12.1.4	Building fabric thermal insulation (9mm - R-Value 0.015 - Contributes to the overall performance of the building envelope)
State or territory variation(s):	NSW & SA G5.2, SA G5.3, QLD J1.5		QLD, NSW, SA & Tas 3.7.4	

John Thorpe - CMI

Don Grehan – Unrestricted Building Certifier

Date of issue: 13/04/2018

Date of expiry: 13/04/2021

Certificate of Conformity

SUBJECT TO THE FOLLOWING LIMITATIONS AND CONDITIONS AND THE PRODUCT TECHNICAL DATA IN APPENDIX A AND EVALUATION STATEMENTS IN APPENDIX B

Limitations and conditions:

1. A qualified Structural Engineer must design the substructure and the connection between the substructure and the top hats.
2. It is the responsibility of the Project Engineer to determine the appropriate wind pressure for the project and specify the fixing of the top hats to the structure. The Engineer must limit deflection of the supporting structure to span/250 for Serviceability Wind Load in accordance with AS 1170.2:2011 'Structural design actions Wind actions'.
3. The Exotec™ Façade Panel, as certified, will contribute to the overall thermal performance of the building; however, the performance values are for guidance only and must be verified by a suitably qualified person(s). It is the responsibility of the building designer to ensure the minimum thermal requirements for the building envelope is achieved.
4. A suitable weather barrier must be installed behind Exotec™ Façade Panel and Fixing System in accordance with the relevant requirements of the BCA and AS/NZS 4200.2:2017 'Pliable building membranes and underlays Installation. Where a combustible weather barrier is proposed, it must be assessed independent of this certificate. Refer A6 – Other relevant technical data.
5. This Certificate is issued based on the evidence of compliance as detailed herein. Any deviation from the specifications contained in this Certificate is outside of this document's scope and the installation of the certified product/system will not be covered by this CodeMark certification. This may result in the product being classified as a non-conforming building product/system.

Building classification/s:

1,2,3,4,5,6,7,8,9 & 10

Scope of certification: The CodeMark Scheme is a building product certification scheme. The rules of the Scheme are available at the ABCB website www.abcb.gov.au. This Certificate of Conformity is to confirm that the relevant requirements of the Building Code of Australia (BCA) as claimed against have been met. The responsibility for the product performance and its fitness for the intended use remain with the certificate holder. The certification is not transferrable to a manufacturer not listed on Appendix A of this certificate.

Disclaimer: The Scheme Owner, Scheme Administrator and Scheme Accreditation Body do not make any representations, warranties or guarantees, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained within this certificate; and the Scheme Owner, Scheme Administrator and Scheme Accreditation Body disclaim to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages and costs arising as a result of the use of the product(s) referred to in this certificate.

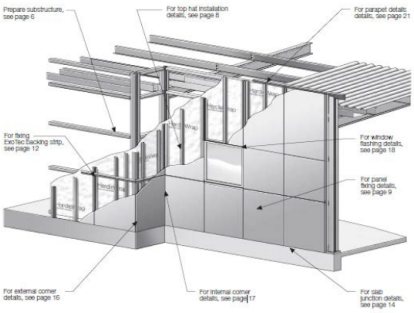
Certificate of Conformity

APPENDIX A – PRODUCT TECHNICAL DATA

A1 Type and intended use of product

As per page 1.

A2 Description of product



Source: *Certificate Holder*

Product	Description	Quantity / Size (Nominal)		
		Thickness (mm)	Width (mm)	Lengths (mm)
Exotec™ facade panel	Dense compressed panel. Square edge. Factory sealed on all six sides. The Nominal density of the 9mm board is 1550kg/m³ The Paintable panel has a distinctive white face, which accepts a wide range of paint finishes. The panel must be installed with the white side facing the exterior of the structure. The Pre-Finished Panel is pre-sealed by James Hardie to create a natural "raw" fibre-cement aesthetic with an optional pre-finish using factory applied coating via a third-party supplier.	9	900 200	1800, 2100, 2400, 2700 and 3000
		12	1200	2400 and 3000

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Exotec™ Top Hat	A rolled metal section, for use with Exotec™ façade panel and fixing system, designed to span vertically across the building structure to support façade panels and isolate different movement of the panels from those of the structure.	1.15 gauge	124 wide x 35 deep	6000 and 7200
James Hardie Intermediate Top Hat	A metal top hat installed vertically for use with Exotec™ and ComTex façade panel and fixing system, for intermediate sheet support.	1.15 gauge	50 wide x 35 deep	6000 and 7200
Exotec™ Gasket Snap Strip	For use with the Exotec™ façade panel fixing system, this gasket snap strip is specially designed to clip into the Exotec™ Top Hat at vertical façade panel joins to cover fixings to the structure and to provide an initial weather seal and drainage using a neoprene gasket.	-	-	3620
James Hardie Backing Strip	A weather seal at horizontal panel joints for use with Exotec™ façade panel and fixing system.	-	-	1190, 2390 and 2990
James Hardie Façade Washers	Façade washers used for exposed fastener fixing with Exotec™ façade panel and fixing system.	-	-	-
James Hardie Base Coat	A water-resistant base coat compound used to finish over countersunk fasteners with epoxy.	-	-	-
James Hardie Joint Sealant	A general purpose, paintable, exterior grade polyurethane joint sealant.	-	-	-
HardieEdge™ Trim	An architectural slab edge solution fabricated from high-quality powder coated aluminium.	-	-	3950

A3 Product Specification

Strength and Moisture Related			
Physical Property	**Saturated Condition**	**Equilibrium Condition 23ºC – 50% RH**	**Standard**
Average Bending Strength Category Type	> 7.0MPa 3 A	-	AS/NZS 2908.2
Density in kg/m³ (Oven Dry)	1490	-	AS/NZS 2908.2
Watertightness	-	Passes	AS/NZS 2908.2
Water Absorption	24.7%		ASTM C1186
EQ Moisture Content	-	3.2%	ASTM C1186
Dimensional Conformance	-	Passes	AS/NZS 2908.2

Weatherproofing

Testing of James Hardie Exotec™ Façade Panel in accordance with AS/NZS 4284:2008.

The AS/NZS 4284:2008 test arrangement consisted of a single storey test sample comprising the Exotec™ façade panel system using 9mm sheet. The sample was approximately 3500mm high and 4400mm wide. The system was built on a 140 x 45mm SG8 timber stud frame at 400mm centres with nogs at 800mm centres. A window of 765 x 1200mm, and a 600 x 400mm return detail was included, clad in 6mm James Hardie RAB board, with 'Top Hat metal rails fixed vertically down the system between nog lines – not on the studs. A horizontal expansion joint was included at 2700mm above the footer, including an Aluminium 'T' socket.

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Test	Result
Static Water Penetration Test	No water leaks
Cyclic Water Penetration Test	No water leaks

Seismic test at serviceability limit displacement

Seismic deflection parameters (SLS)

Distance (d ± x mm)	Cycles (n)	Period (T, seconds)	Pause at mid-point and ends (sec)
18 ± 1 mm	10	10mm/sec	10
20 ± 2 mm	10	10mm/sec	10

Note: The seismic deflection testing at ±20mm was undertaken straight after the SLS seismic deflection of ±18mm and resulted in a fine crack occurring at the head of the window. The cyclic water penetration test was performed following the seismic test with the results as follows.

Cyclic water test

Phase	Air Pressure (Pa)	Duration	Result
	0	5 Mins	No water leaks
1	525-1050	5 Mins	No water leaks
2	700-1040	5 Mins	No water leaks
3	1050-2100	5 Mins	Dampness on back of RAB board around crack in RAB board. No water leakage.

Structural test at ultimate limit state air pressure

Air Pressure (Pa)	Result
+5000	Ok
-5000	Ok

Ultimate limit state seismic test

ULS seismic deflections

Distance (± x mm)	Cycles (n)	Period (T, seconds)	Pause at ends (sec)
30mm	10	Approx. 10 sec, with 3-4 sec between end points	10

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Durability

Description	Result	Standard
Heat-Rain Durability	Passes	AS/NZS 2908.2
Warm Water Resistance	Passes	AS/NZS 2908.2
Freeze-Thaw Resistance	Passes	AS/NZS 2908.2
Soak-Dry	Passes	AS/NZS 2908.2

Thermal Properties

When tested in accordance with ASTM C518, the 9mm panel achieves an R-Value of 0.015. It is the responsibility of the building designer to ensure the minimum R-Value for the building envelope is achieved.

Fire

Description	Result	Standard
Non-Combustibility	Non-Combustible	Suitable where non-combustible materials are required in accordance with C1.9(e)(iv) of the BCA
Sample Classification Average Specific Extinction Area	Group 1 55.1m2/Kg	AS/NZS 3837
Fire Propagation Index	0	BS 476.6
Spread of Flame Index	Class 1	BS 476.7

Bushfire

Provided any joints are no greater than 3mm or appropriately sealed, compliance with AS 3959-2009 as well as the National Construction Code of Australia Volumes 1 and 2 2016 and 2016 Amendment 1 for BAL-Low to BAL-40.

A4 Manufacturer and manufacturing plant(s)

James Hardie
1-35 Cobalt Street,
Carole Park QLD 4300
Australia.

A5 Installation requirements

The ExoTec™ Façade Panel and Fixing system must be installed in accordance with the relevant James Hardie technical literature. Where ExoTec™ Façade Panel is to be painted on-site or finished with a factory applied coating, the panels must be specified and installed in accordance with the ExoTec™ Façade Panel and Fixing System Installation Guide (April 2018) and ExoTec™ Façade Panel and Fixing System Technical Specification (April 2018). Where the ExoTec™ RAW Façade Panel is to be used, refer to the ExoTec™ RAW Façade Panel and Fixing System (April 2018).

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The Exotec™ façade panel can be installed upright horizontally or vertically. The panel layout will determine the location of the Exotec™ and James Hardie Intermediate top hats. The vertical expressed joints may be aligned or offset in a brick pattern layout.

1. The Exotec™ façade panels must be fixed to:
   a) Exotec™ top hat for vertical sheet joints.
   b) James Hardie Intermediate top hat for supporting the panels between vertical sheet joints.
2. Exotec™ façade panels are installed with a 10mm nominal expressed joint between adjacent panels, vertically and horizontally. Vertical joints up to 20mm width can be formed, with additional care required at installation to ensure the panel edges cover the Exotec™ gasket snap strip on both sides of the joint. A minimum vertical expressed joint of 6mm is allowed with care. Horizontal joints are a nominal 10mm.
3. Exotec™ façade panels may be fixed to Exotec™ top hats and James Hardie Intermediate top hats by either:
   a) Countersunk fasteners: Flush finished over screw heads with a suitable epoxy, and then with James Hardie base coat.
   b) Exposed head screws: Using pan, wafer or hex head screws. Used where pre-finished panels are installed. Exposed head fasteners may be colour coated to match panel finish. Note: This option is for site painted panels. Where ExoTec™ panels are pre-finished with a factory applied finish, or for ExoTec™ RAW panels are used, refer to Option B. Fasteners must have the appropriate level of durability required for the intended project. This is of particular importance in coastal areas, subject to salt spray and other corrosive environments. Fasteners must be fully compatible with all other materials that the fasteners will come in contact with, to ensure the durability and integrity of assembly. For exposed head fasteners, James Hardie Façade Washers are recommended to be inserted between the panel and the fastener.
6. A suitable weather barrier must be installed behind Exotec™ Façade Panel and Fixing system in accordance with the relevant requirements of the BCA and the AS/NZS 4200.2:2017 'Pliable building membranes and underlays – Installation. James Hardie recommends HardieWrap™ Weather Barrier – refer to the building designer, certifier, or other relevant expert, for suitability.

Design Considerations

Slab and Footings	The slab and footings on which the building is situated must be designed and certified by a qualified Structural Engineer according to all relevant codes, regulations and standards.
Ground Clearances	Install James Hardie external cladding with a minimum 150mm clearance to the earth on the exterior of the building or in accordance with local building codes if greater than 150mm is required. Also, maintain a minimum 50mm clearance between James Hardie external cladding and roofs, decks, paths, steps and driveways. Adjacent finished grade must slope away from the building in accordance with local building codes, typically a minimum slope of 50mm minimum over the first metre. Do not install external cladding in areas where it may remain in contact with standing water or debris.
Coastal Areas	In coastal areas located within 1km of the shoreline or large expanses of salt water (e.g. Port Phillip Bay, Sydney Harbour east of the Spit and Harbour Bridges, Swan River wet of the Narrows Bridge), one of the following is required: • All horizontal and vertical expressed joints must be filled with a suitable sealant. • Where both the horizontal and vertical expressed joints are not filled, the joints and panels must be washed down twice a year. • On unprotected walls, rain will perform this washdown, but where walls are protected by soffits above, the washdown twice per year is a maintenance requirement.

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Moisture Management	The Exotec™ Facade Panel and Fixing System acts as a weather shield. To achieve a particular level of weathertightness, the designer must determine the appropriate moisture management detailing for the project. The designer should consider the following matters when making that determination: • It is the responsibility of the builders and designers to identify moisture related risks associated with any particular building design. • It is the responsibility of the builder to ensure appropriate moisture management is provided during framed wall construction through effective use of flashings, sealants and vapour permeable membranes such as HardieWrap™ weather barrier, building wraps, vapour retarders and damp-proof course. Before installing panels, all wall openings, penetrations, intersections, connections, window sills, heads and jambs must incorporate appropriate flashing and waterproofing. Materials, components and the installation practices that are used to manage moisture in framed wall construction must, at a minimum, comply with the requirements of relevant standards, building codes and the manufacturer's specifications. Sealant at sheet joints must be installed where detailed in this literature. For wind pressures up to 4.0kPa, please refer to the Exotec™ Façade Panel and Fixing System – Technical Specification (April 2018) for installation requirements. For high walls it may be necessary to provide flashing to drain the facade at one or more intermediate levels. The installation of smoke, vermin and other barriers must not restrict moisture from reaching flashings.
Top Hat Framing	Exotec™ facade panels must be fixed to Exotec™ top hat and James Hardie Intermediate top hat sections which are installed vertically over steel, masonry or timber structures. Exotec™ top hat and James Hardie Intermediate top hat sections must not be installed horizontally. Ensure a planar fixing surface for Exotec™ facade panels. The structure can either be straightened or packed out between the substructure and top hats. Packing out of top hats must be limited to 20mm maximum. It is the responsibility of the project engineer to determine the appropriate wind pressures for the project and specify the fixing of the top hats to the structure. The engineer must limit the deflection of the supporting structure to span/250 for Serviceability Wind Load. The nominal spacing between top hats is 605mm for a 1200mm wide panel and 455mm for a 900mm wide panel, i.e. top hats are required at panel edges and at intermediate spacings within the panels. The Exotec™ top hats at panel edges have the legs facing out from the structure and at intermediate locations the James Hardie Intermediate top hat is used, with the legs fixed to the structure. The maximum spans and nominal spacings of Exotec™ top hats and James Hardie Intermediate top hats for wall and soffit applications are provided below. For wall applications, the maximum cantilever distance of the top hats is one quarter of the single span.

Walls – Maximum Exotec™ Top Hat and James Hardie Intermediate Top Hat Spans (mm) For Ultimate Design Wind Pressures (9mm and 12mm Panels).

Span Type	Nominal Top Hat Spacing (mm)	Design Wind Pressure (kPa)									
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0
Single Span	450	1680	1470	1330	1240	1160	1110	1060	980	890	800
	600	1530	1330	1210	1120	1060	1010	N/A	N/A	N/A	N/A
2 Span	450	2250	1970	1790	1660	1500	1380	1250	1080	950	830
	600	2050	1790	1620	1400	1250	1140	N/A	N/A	N/A	N/A
3 Span Continuous	450	2080	1810	1650	1530	1440	1350	1250	1080	950	830
	600	1890	1650	1500	1390	1250	1140	N/A	N/A	N/A	N/A

Soffits – Maximum Exotec™ Top Hat and James Hardie Intermediate Top Hat Spans (mm) For Ultimate Design Wind Pressures (9mm and 12mm Panels).

Span Type	Nominal Top Hat Spacing (mm)	Design Wind Pressure (kPa)									
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0
Single Span	450	1560	1390	1270	1190	1120	1070	1030	960	900	860
	600	1420	1260	1160	1080	1020	N/A	N/A	N/A	N/A	N/A

2 Span	450	2090	1860	1710	1600	1440	1310	1210	1050	930	840
	600	1900	1690	1520	1340	1200	N/A	N/A	N/A	N/A	N/A
3 Span	450	1930	1720	1580	1470	1390	1310	1210	1050	930	840
Continuous	600	1750	1560	1430	1340	1200	N/A	N/A	N/A	N/A	N/A

Fastener Spacings - Walls and Soffit

Fasteners Spacing (9mm and 12mm Thick Panels) For Wall and Soffit Application

Design Wind Pressure (ultimate) (kPa)	Nominal Top Hat Spacing (mm)	Max. Fasteners Spacing	Max. Fasteners Spacing at Intermediate Top Hats (mm)
1.0	600	600	600
1.5	600	600	600
2.0	600	400	400
2.5	600	400	400
3.0	*600	400	300
3.0	450	400	400
3.5	450	350	350
4.0	450	300	300
4.5	450	300	300
5.0	450	300	250
5.5	450	300	250
6.0	450	300	200
6.5	400	250	200
7.0	400	250	200

Notes:

1. For high walls it may be necessary to provide flashing to drain the façade at one or more intermediate levels. The installation of the barrier must not restrict moisture from reaching flashings and draining out.
2. The Engineer must limit the deflection of the supporting structure to span/250 for Serviceability Wind Load. Except Where * is shown it is span/180

A6 Other relevant technical data

Weather Barrier

HardieWrap™ Weather Barrier is recommended to be installed behind Exotec™ Façade Panels and Fixing System in accordance with AS/NZS 4200.2:2017 'Pliable building membranes and underlays – Installation' and HardieWrap™ Technical Data Sheet; however, for Type A or B Construction, must be assessed by a suitably qualified Fire Safety Engineer to ensure the barrier will not affect the compliance of the wall system.

If using an alternate product in lieu of HardieWrap™ Weather Barrier; in addition to the above, the designer must ensure that the product is fit for purpose and it has the following properties in accordance with AS/NZS 4200.1:2017 'Pliable building membranes and underlays Materials':

a. Vapour barrier - low or medium;
b. Water barrier – high.

Refer to the building designer for the suitability of HardieWrap™ Weather Barrier or other specified membrane or contact James Hardie for more information.

Bushfire

BAL-FZ construction requires the ExoTec™ Façade Panel and Fixing System to be installed in conjunction with a suitable fire rated wall system with minimum 30 minute FRL – refer to the James Hardie Bush Fire Prone Areas Technical Supplement for more information, and James Hardie™ Fire and Acoustically Rated Walls Application Guide.

Fire Rated Wall Systems

Both one and two-way fire rated wall systems are available with the ExoTec™ Facade Panel and Fixing System. This will depend on the wall configuration and internal materials used. For more information refer to the ExoTec™ Facade Panel and Fixing System FRL External Walls section of the James Hardie™ Fire and Acoustically Rated Walls Application Guide.

APPENDIX B – EVALUATION STATEMENTS

B1 Evaluation methods

1. Structural Provision – A2.2(a)(v) and 1.2.2(a)(iii). Reports from Qualified Professional Engineer.
2. Characteristic Type Testing – A2.2(a)(iv) and 1.2.2(a)(i). Reports from accredited test laboratories.
3. Bushfire Assessment – A2.2(a)(v) and 1.2.2(a)(iii). Reports from a Qualified Professional Engineer.
4. Fire Assessment – A2.2(a)(iv) and 1.2.2(a)(i). Reports from accredited test laboratories.
5. Thermal Properties – A2.2(a)(v) and 1.2.2(a)(iii). Reports from an appropriately qualified person.

B2 Reports

1. Cardno; Engineering Report S11713-LO-44A; Certification of James Hardie ExoTec™ Façade Panel and Fixing System - compliance to AS/NZS 1170.2-2002 Clause 2.5.5 & AS 4040.3-1992; Dated 18/08/2009.
2. David Beneke Consulting Pty Ltd; Report No.: 2011-45-LO-05; Certification of James Hardie ExoTec™ Façade Systems in High Wind Applications; Dated 19/04/2011.
3. James Hardie Australia Pty Ltd; NATA Accreditation No. 14220; Compliance Certificate ExoTec™ Façade Panel - Characteristic Type Tests required by AS/NZS 2908.2:2000; Dated July 2010.
4. CSIRO; NATA Accreditation No. 165; Certificate No.: 1126; Certificate of Assessment in accordance with AS/NZS 3837 Group Number 1 and Average specific extinction area: 55.1m^2/kg; Dated 28/08/2008.
5. Acronem Consulting Australia Pty Ltd; Thermal break requirements for Exotec™ on Metal Frames Single Stud; Dated 28/11/2017.
6. Facade Testing NZ Limited; IANZ Accreditation No. 1259; Report No. FT-R1005a; Testing in accordance with AS/NZS 4284:2008; Dated 08-09/05/2017.
7. BRANZ, Project Number: EC0712; Thermal Conductivity Measurement of Six Samples of Fibre Cement Board Products; Dated 17/10/2003.
8. Ignis Solutions Pty Ltd; Evaluation No. IGNS-6690-01 Issue 01 Revision 00[2018]; Compliance with AS 3959-2009 BAL Low-40; Dated 31/03/2018.

The Certificate holder has chosen not to make the above evidence of compliance publicly available, due to the documents being considered commercial in confidence.