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Certificate Holder:

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CSR Building Products Ltd - AFS Systems Ptv Ltd Triniti 3, 39 Delhi Rd, North Rvde. NSW 2113 www.afsformwork.com.au

Type and/or use of product:

AFS LOGICWALL is a permanent formwork system for internal and external load-bearing and non-load bearing reinforced concrete walls with structural, fire, weatherproofing, acoustic and thermal performance characteristics.

AFS LOGICWALL® types are as follows, the numerical values representing the thickness of the wall in millimetres, and "D" indicating double layer of reinforcing steel:

- 1. LW120
- 2. LW150
- LW162
- 4. LW200
- LW200D
- LW262D

Certificate number: CM30062 Rev 5

Description of product:

AFS LOGICWALL comprises:

- Galvanised cold-formed steel studs at 146mm centres, the studs having large lipped penetrations in their web element to facilitate placement of reinforcing steel and flow and subsequent bond of concrete fill.
- CSR Cemintel 6mm AFS Formwork Board bonded each side to the flanges of the studs.
- Reinforcing steel.
- Concrete fill.

COMPLIES WITH THE FOLLOWING BCA PROVISIONS AND STATE OR TERRITORY VARIATION(S) BCA 2019+A1						
	Volume One (Including Amendment No. 1)		Volume Two (Including Amendment No. 1)		t No. 1)	
Performance Requirement(s):	FP1.4	Weatherproofing	P2.2.2	Weatherproofi	ing	

THIS TO CERTIFY THAT

AFS LOGICWALL®

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. The purpose of Global-Mark construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product

certified herein. In issuing this Certificate of Approval Global-Mark has relied on the expertise of external bodies (laboratories, and technical experts).

Herve Michoux **Global-Mark Managing Director**

Certificate number: CM30062

Peter Gardner **Unrestricted Building Certifier** Date of issue: 18/01/2022

Date of expiry: 21/01/2025





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Certificate of Conformity

	FP5.2	Sound Transmission through walls	P2.4.6	Sound insulation
	FP5.5	Sound transmission through walls in residential care buildings		
	JP1	Energy use	P2.6.1	Energy efficiency – Building
Deemed-to-Satisfy Provision(s):	B1.1	Resistance to actions	3.0.2	Resistance to actions
	B1.2	Determination of individual actions	3.0.3	Determination of individual actions
	B1.4 (b)(i) and (i)	Determination of structural resistance of materials and forms of construction	3.0.4 (c) and (d)	Determination of structural resistance of materials and forms of construction
	Schedule 5	Fire resistance of building elements	3.1.4.2 (b)	Requirements for termite management systems
	C1.9 (a), (b), (c), (d) (e)(iv)	Non-combustible building elements	3.7.1.1 (d)	General concession – non-combustible materials
	C1.10 (a)(ii)	Fire hazard properties	3.7.2.4 (b)	Construction of external walls
	C2.6 (a)(i)	Vertical separation of openings in external walls	3.7.3.2 (a)	Separating walls
	C3.15 (a)(iii)	Openings for service installations	3.7.3.3	Services in separating walls
	G5.2	Construction in bushfire prone areas – Protection	3.10.5.0	Construction in bushfire prone areas - Application
State or territory variation(s):	NT Part F5	Sound transmission and insulation	NT P2.4.6	Sound insulation
	NSW G5.2	Construction in bushfire prone areas – Protection	NSW Part 2.6	Replaced with BASIX
	NSW J(A)P1	Class 2 buildings and Class 4 parts replaced with BASIX	NT Part 2.6	Replaced with BCA 2009 Part 2.6
	NT Section J	Class 2 buildings and Class 4 parts replaced with BCA 2009 Section J	Vic P2.6.1	Energy efficiency – Building
	QLD Section J	Class 2 buildings replaced with BCA 2009 Section J	QLD 3.1.4.2 (b)	Requirements for termite management systems
			NSW 3.10.5.0	Construction in bushfire prone areas – Application
			Qld 3.10.5.0	Construction in bushfire prone areas - Application



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. Volume One B1.2 and Volume Two 3.0.3 actions as follows:
 - a. Permanent actions
 - b. imposed actions
 - c. wind action
 - d. earthquake action
 - e. liquid pressure action
 - f. ground water action
 - g. rainwater action
 - h. earth pressure action
 - i. differential movement
 - j. time dependent effects
 - k. thermal effects
 - I. ground movement
 - m. construction activity actions
 - n. termite actions

with e., f., g. and h. requiring additional impervious waterproofing treatment, and n. as per Limitation 3.

- 2. Volume One B1.4 and Volume Two 3.0.4 is satisfied by complying with AS 3600:2018 (including Amendment No.1) as specified in Deemed-to-Satisfy Provisions Volume One B1.4 (b)(i) and Volume Two 3.0.4 (d) respectively.
- 3. AFS LOGICWALL satisfies the requirement of Volume One B1.4(i)(i) and Volume Two 3.0.4(c) and 3.1.4.2 (b) being a primary building element that consists of a combination of materials considered not subject to termite attack: steel, concrete, and fibre-reinforced cement sheet.
- 4. As per NCC Volume One A5.4, the FRL of AFS LOGICWALL building elements has been determined in accordance with Schedule 5 for compliance with the Deemed-to-Satisfy Provisions including C1.1 and Specification C1.1.
- 5. Volume One Schedule 5 and C2.6(a)(i), and Volume Two 3.7.2.4(b) and 3.7.3.2(a) are satisfied in respect of the walls having fire resistance levels as follows:
 - a. For LW120 and LW150 wall types constructed with the properties listed below, FRL 240/240/180:
 - i. Maximum 3.0 m height
 - ii. N12 reinforcing steel as follows:
 - 1. Vertical at 400 mm centres and horizontal at 600 mm centres for LW120
 - 2. Vertical and horizontal at 450 mm centres for LW150
 - iii. 32 MPa, 120 mm slump, 10 mm max. aggregate size concrete
 - iv. Applied compressive load not exceeding:
 - 1. 233 kN/m for LW120
 - 2. 200 kN/m for LW150
 - b. For wall LW162 and LW200 wall types constructed with the properties listed below, FRL 240/240/240:
 - i. Maximum 3.0 m height
 - ii. N12 reinforcing steel, vertical at 450 mm centres and horizontal at 450 mm centres

Building classification/s: Unrestricted



- iii. 32 MPa, 120mm slump, 10 mm max. aggregate size concrete
- iv. Applied compressive load not exceeding 200 kN/m
- c. For LW120, LW150, LW162, LW200, LW200D and LW262D walls outside the scope of (a) and (b) above, the FRL shall be determined in accordance AS 3600:2018 (including Amendment No.1).
- 6. In respect of the AFS Formwork Board fibre-cement boards, the Deemed-to-Satisfy Provisions Volume One C1.9(e)(iv) and Volume Two 3.7.1.1(d) permit use where a non-combustible material is required. With reference to C1.9(d), the adhesive used to fix the AFS Formwork Board to the steel studs is deemed to be exempt from the non-combustibility requirements of C1.9(a) and (b) because it is also a sealant.
- 7. The fire hazard properties of AFS Formwork Board are as follows:
 - a. Fire hazard indices:

Ignitability Index – 0
Spread of Flame Index – 0
Heat Evolved Index – 0
Smoke Developed Index – 1

b. Group Number –

c. $SMOGRA_{RC}$ 0.2 m^2/s^2 (x1000)

- 8. Volume One FP1.4 and Volume Two P2.2.2 in respect of weatherproofing is satisfied for serviceability wind pressures up to +0.68 kPa / -1.27 kPa.
- 9. Deemed-to-Satisfy Provisions Volume One G5.2 and Volume Two 3.10.5 in respect of construction in bushfire prone areas is satisfied for all bushfire attack levels up to and including BAL-FZ, provided the external walls are designed for a fire resistance level (FRL) of at least –/30/30 or 30/30/30 as required in AS 3959:2018 Section 9.
- 10. In respect of Volume One J1 and Volume Two P2.6.1, wall configurations shown in AFS Logicwall Manual, November 2019 Edition, Section G and Section L contribute to the thermal resistance of the building fabric, thereby contributing to those requirements as follows:
 - a. R-Value for basic AFS Logicwall element, determined in accordance with AS/NZS 4859.1:2018 (including Amendment No.1) not including air-films, air-spaces and additional insulation and linings as follows:

i. LW120 - R 0.123 m².K/W

ii. LW150 – R 0.144 m².K/W

iii. LW162 - R 0.152 m².K/W

iv. LW200 - R 0.179 m².K/W

v. LW262 - R 0.213 m².K/W

b. all wall types having a surface density in excess of 220kg/m³.



APPENDIX A - PRODUCT TECHNICAL DATA

A1 Type and intended use of product

Refer to page 1 of this Certificate.

A2 Description of product

Refer to page 1 of this Certificate.

A3 Product specification

Full product specification is contained in AFS Logicwall Manual, November 2019 Edition.

Product selection, and incorporation into the building design, shall be made by a professional Architect or Engineer or other appropriately qualified person who:

- 1. Has qualifications and experience acceptable to the relevant approval authorities; and,
- 2. Has ready access to AFS Logicwall Manual, November 2019 Edition and AS 3600:2018 (including Amendment No.1).

A4 Manufacturer and manufacturing plant(s)

Lot 7 Lockyer Street, Goulburn, NSW, 2580

A5 Installation requirements

Refer to AFS Logicwall Manual, November 2019 Edition.

Product installation shall be carried out:

- 1. By an installer who is trained in the construction methodology of the AFS LOGICWALL® product.
- 2. In accordance with:
 - a. AFS Logicwall Manual, November 2019 Edition.
 - b. The project engineering plans and specifications.
 - c. The project detailing documentation.
 - d. The Inspection and Test Plan (ITP) developed for the project.

The installer shall issue a Certificate of Installation to the Certificate Holder.

The construction shall include the following:

- 1. Temporary bracing of the formwork systems as specified by the project structural engineer.
- 2. Coating in accordance with the specifications in Section F of AFS Logicwall Manual, November 2019 Edition, including adherence with the specified inspection and maintenance program for the site location.

A6 Other relevant technical data

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Any referenced documents within the technical literature identified in Appendix A, A3 and Appendix A, A5.



APPENDIX B – EVALUATION STATEMENTS

B1 Evaluation methods

The following assessment methods have been used to determine compliance with BCA 2019 A1:

Code Clause Assessment Method(s)		Evidence of suitability	Evidence reference in B2				
Volume One							
B1.1	Volume One A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4				
B1.2	Volume One A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4				
B1.4 (b)(i) and (i)	Volume One A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4				
		Volume One A5.2(1)(f) – Another form of documentary evidence	Item 21				
	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 7, 18 and 19				
Schedule 5	Volume One A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8				
	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 7, 18 and 19				
C1.9 (a), (b), (c), (d), (e)(iv)		Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8				
		Volume One A5.2(1)(f) – Another form of documentary evidence	Item 21				
C1.10 (a)(ii)	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 18 and 19				
	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 7, 18 and 19				
C2.6 (a)(i)		Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8				
C3.15 (a)(iii)	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 20				
FP1.4	Volume One A2.2(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 9				
	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 10				
FP5.2	Volume One A2.2(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 11 to 14 and 17				
	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 10				
FP5.5	Volume One A2.2(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 11 to 14 and 17				
	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6 and 7				
G5.2	Volume One A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8				
JP1	Volume One A2.2(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 15 and 16				



Volume Two			
P2.2.2	Volume Two A2.2(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 9
P2.4.6	Volume Two A2.2(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 10
	Volume Two A2.2(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 11 to 14 and 17
P2.6.1	Volume Two A2.2(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 15 and 16
3.0.2	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4
3.0.3	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4
3.0.4 (c) and (d)	Volume Two A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4
		Volume One A5.2(1)(f) – Another form of documentary evidence	Item 21
3.1.4.2 (b)	Volume Two A2.3(2)(a)	Volume One A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Items 1 to 4
		Volume One A5.2(1)(f) – Another form of documentary evidence	Item 21
3.7.1.1 (d)	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(f) – Another form of documentary evidence	Item 21
	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6 and 7
3.7.2.4 (b)		Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8
	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6 and 7
3.7.3.2 (a)		Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8
3.7.3.3	Volume Two A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 20
	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6 and 7
3.10.5.0	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(e) – Certificate or report from a professional engineer or other appropriately qualified person	Item 8



B2 Reports

Certificate number: CM30062

The following reports have been used as evidence to determine compliance with BCA 2019 A1:

Ref	Author	Reference	Date	Description	NATA Registration
1	University of Canterbury, Chris Allington and Nigel Maxey	Report: C2004-02	2004	Civil Engineering Research Paper Lateral load resistance of AFS wall panels	N/A
2	Van Der Meer Consulting Pty Ltd, Neil Bonser	SY030230	21/09/2005	Lateral load resistance of AFS wall panels – Results of structural testing	N/A
3	UNSW Global – Unisearch Expert Opinion Services, Mark Bradford	J085172	5/05/2014	AFS LOGICWALL® System – Corrosion Durability Review	N/A
4	Mahaffey Associates, David Mahaffey	10655/01	23/10/2014	Report on Compliance of LOGICWALL with the Durability Requirements of AS3600	N/A
5	CSIRO – Manufacturing and Infrastructure Technology, Chris Wojcik and Garry E Collins	FSV 1038	12/03/2004	Fire-resistance test on a load-bearing concrete core, framed wall system	Accreditation No. 3632
6	CSIRO – Materials Science and Engineering, Chris Wojcik and Garry E Collins	FSV 1513A	16/12/2011	Fire-resistance test on a load-bearing vertical separating element	Accreditation No. 165 Corporate Site No. 3625
7	CSIRO – Infrastructure Technologies, Keith Nicholls	FCO-3084B	29/10/2019	Fire resistance of AFS Logicwall systems in accordance with AS 1530.4-2014	Accreditation No. 165 Corporate Site No. 3625
8	Stephen Grubits & Associates, Carlos Quaglia	2013/277.81 R1.0	16/07/2019	Logicwall® Fire-Resistance-Level Assessment	N/A
9	AECOM Australia Pty Ltd, Keiran Rice	60602764	13/05/2019	AFS Logicwall System – National Construction Code (NCC 2019) – weatherproofing compliance	N/A
10	CSIRO – Manufacturing and Infrastructure Technology	TL463	16/08/2006	Laboratory Measurement of Airborne Sound Insulation	N/A
11	PKA Acoustic Consulting, Peter Knowland	209 029 PKA-A069 v3	2/11/2010	Acoustic Performance Assessment of a Product or System: AFS Logic Wall – AFS 120, AFS 150, AFS 162, AFS 200 and AFS 262 Concrete Wall Panels	N/A
12	PKA Acoustic Consulting, Peter Knowland	215 020 PKA-A144 v2	16/03/2010	Acoustic Performance Assessment of a Product or System: AFS Logic Wall covering range of AFS120 to AFS262D providing ISO or ASTM Evaluation of various configurations from the base walls or using plasterboard on one or both sides	N/A
13	PKA Acoustic Consulting, Peter Knowland	215 012 PKA-EOS 001 Part A v2	23/04/2015	BCA / NCC Evidence of Suitability – Acoustic Performance: AFS Logic Wall AFS162	N/A



Ref	Author	Reference	Date	Description	NATA Registration
14	PKA Acoustic Consulting,	215 012 PKA-EOS 001 Part B v1	17/04/2015	BCA / NCC Evidence of Suitability – Acoustic Performance:	N/A
	Peter Knowland			AFS Logic Wall AFS162	
15	James M. Fricker Pty Ltd	107LW150.03	5/07/2019	"Total R" Thermal Performance Calculations to AS/NZS 4859 Parts	N/A
		107LW150.04		1 & 2:2018 – Insulated Logicwall Systems	
		107LW150.05			
		107LW200.04			
		107LW200.05			
		107LW120.02			
		107LW120.021			
		107LW120.05			
		107LW150.06			
		107LW150.061			
		107LW150.07			
16	James M. Fricker Pty Ltd	107LW 120.06	5/08/2019	"Total R" Thermal Performance Calculations to AS/NZS 4859 Parts	N/A
		107LW 150.06		1 & 2:2018 – Insulated Logicwall Systems	
		107LW 120.062			
		107LW 150.062			
		107LW 120.063			
		107LW 150.063			
17	Acoustic Logic	20181292.1/1032A/R0/JL	13/02/2019	AFS Logicwall 120mm Base Wall – Acoustic Performance Opinion	N/A
	Justin Leong			AFS1001	
18	AWTA Product Testing	18-000662	16/02/2018	Testing of 6.0mm thick Ceminseal Wallboard of density 9.0kg/m ²	Accreditation No. 1356
				in accordance with AS/NZS 1530.3 Methods for fire tests on	
				building materials, components and structures – Part 3:	
				Simultaneous determination of ignitability, flame propagation,	
				heat release and smoke release.	
19	Warringtonfire	ASCRRTF190235	14/10/2019	Classification of wall and ceiling lining in accordance with AS	Accreditation No. 3277
	Muntaqim Pereira and			5637.1:2015 – 6mm Cemintel AFS Formwork	
	Anthony Rosamilia				
20	CSIRO – Infrastructure	FCO-3380 Rev D	18/08/2020	The fire resistance of AFS Rediwall and AFS Logicwall including	Accreditation No. 165
	Technologies,			various service penetrations in accordance with AS 1530.4-2014	Corporate Site No. 3625
	Keith Nicholls			and AS 4072.1-2005 Amdt 1.	
21	CSR Cemintel	-	6/11/2019	Cemintel Technical Data Sheet – AFS Formwork	N/A