Certificate of Conformity

Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia

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Certificate Holder:

CSR Building Products Ltd – AFS Systems Pty Ltd
Triniti 3, 39 Delhi Rd,
North Ryde, NSW 2113
www.afsformwork.com.au
Tel: 1300 727 237

Certificate number: CM30062 Rev 4

THIS TO CERTIFY THAT

AFS LOGICWALL®

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 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
3. LW162
4. LW200
5. LW200D
6. LW262D

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 with an adhesive compound.
- 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)	
Performance Requirement(s):	BP1.1	Structural reliability	P2.1.1	Structural stability and resistance

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

Peter Gardner
Unrestricted Building Certifier

Date of issue: 12/10/2020

Date of expiry: 21/01/2022

	BP1.2	Structural resistance		
	CP1	Fire Resistance - Structural stability		
	CP2	Spread of fire	P2.3.1	Spread of fire
	CP3	Spread of fire and smoke in patient care and aged care buildings		
	CP4	Safe conditions for evacuation		
	CP8	Fire protection of openings and penetrations		
	FP1.4	Weatherproofing	P2.2.2	Weatherproofing
	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):	C1.9 (a), (b), (d) (e)(iv)	Non-combustible building elements	3.7.1.1(d)	Non-combustible materials
	C1.10	Fire hazard properties		
	G5.2	Construction in bushfire prone areas – Protection	3.10.5.0	Construction in bushfire prone areas - Application
State or territory variation(s):	NSW C1.10(a)(v)	Fire hazard properties		
	NT Part F5	Sound transmission and insulation	SA P2.3.1 (a) (ii) and (iii)	Spread of fire
	NSW G5.2	Construction in bushfire prone areas – Protection	NT P2.4.6	Sound insulation
	NSW J(A)P1	Class 2 buildings and Class 4 parts replaced with BASIX	NSW Part 2.6	Replaced with BASIX
	NT Section J	Class 2 buildings and Class 4 parts replaced with BCA 2009 Section J	NT Part 2.6	Replaced with BCA 2009 Part 2.6
	QLD Section J	Class 2 buildings replaced with BCA 2009 Section J	Vic P2.6.1	Energy efficiency – Building

			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 BP1.1 (b) and Volume Two P2.1.1 (b) 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
    l. ground movement
    m. construction activity actions

    with e., f., g. and h. requiring additional impervious waterproofing treatment.
2. Volume One BP1.2 and Volume Two P2.1.1 (c) 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. Volume One CP1, CP2 and CP3, and Volume Two P2.3.1 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
        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

Building classification/s: Unlimited

shall be determined in accordance AS 3600:2018 (including Amendment No.1).

4. 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.
5. 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 – 1
    c. $SMOGRA_{RC}$ $0.2m^2/s^2$ (x1000)
6. 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.
7. 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.
8. 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 $m^2.K/W$
        ii. LW150 – R 0.144 $m^2.K/W$
        iii. LW162 – R 0.152 $m^2.K/W$
        iv. LW200 – R 0.179 $m^2.K/W$
        v. LW262 – R 0.213 $m^2.K/W$
    b. all wall types having a surface density in excess of $220kg/m^3$.
9. The Certificate excludes compliance with the National Construction Code 2019:
    a. Volume One BP1.1(b) and Volume Two P2.1.1 (b) – (v) snow action and (xv) termite actions.
    b. Volume One BP1.4 and Volume Two P2.1.2 Buildings in flood areas.
    c. Volume One FP6.1 and Volume Two P2.4.7 Condensation and water vapour management.

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.
3. Protection of service penetrations in walls as follows:
    a. Removal of the fibre cement lining from within the face area covered by a fire collar.
    b. Installation of a fire collar to the concrete as per the manufacturer's specifications for concrete walls.

A6 Other relevant technical data

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			
BP1.1	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 1 to 4
BP1.2	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 1 to 4
CP1	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 18 and 19
	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 7 and 8
CP2	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 18 and 19
	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 7 and 8
CP3	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5, 6, 18 and 19
	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 7 and 8
CP4	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 18 and 19
CP8	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 20
C1.9	Volume One A2.3(2)(a)	Volume One A5.2(1)(f) – Another form of documentary evidence	Item 21
C1.10	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 19
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
FP5.2	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 10
	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
FP5.5	Volume One A2.2(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Item 10
	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
G5.2	Volume One A2.3(2)(a)	Volume One A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5 and 6
	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 7 and 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			

P2.1.1	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 1 to 4
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
P2.3.1	Volume Two A2.2(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5 and 6
	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 7 and 8
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
3.7.1.1(d)	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(f) – Another form of documentary evidence	Item 21
3.10.5.0	Volume Two A2.3(2)(a)	Volume Two A5.2(1)(d) – Report issued by an Accredited Testing Laboratory	Items 5 and 6
	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 7 and 8

B2 Reports

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

Ref	Author	Reference	Date	Description	NATA Registration
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	N/A
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
14	PKA Acoustic Consulting, Peter Knowland	215 012 PKA-EOS 001 Part B v1	17/04/2015	BCA / NCC Evidence of Suitability – Acoustic Performance: AFS Logic Wall AFS162	N/A
15	James M. Fricker Pty Ltd	107LW150.03 107LW150.04 107LW150.05 107LW200.04 107LW200.05 107LW120.02 107LW120.021 107LW120.05 107LW150.06 107LW150.061 107LW150.07	5/07/2019	“Total R” Thermal Performance Calculations to AS/NZS 4859 Parts 1 & 2:2018 – Insulated Logicwall Systems	N/A

Ref	Author	Reference	Date	Description	NATA Registration
16	James M. Fricker Pty Ltd	107LW 120.06 107LW 150.06 107LW 120.062 107LW 150.062 107LW 120.063 107LW 150.063	5/08/2019	"Total R" Thermal Performance Calculations to AS/NZS 4859 Parts 1 & 2:2018 – Insulated Logicwall Systems	N/A
17	Acoustic Logic Justin Leong	20181292.1/1032A/R0/JL	13/02/2019	AFS Logicwall 120mm Base Wall – Acoustic Performance Opinion AFS1001	N/A
18	AWTA Product Testing	18-000662	16/02/2018	Testing of 6.0mm thick Ceminseal Wallboard of density 9.0kg/m^2 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.	Accreditation No. 1356
19	Warringtonfire Muntaqim Pereira and Anthony Rosamilia	ASCRRTF190235	14/10/2019	Classification of wall and ceiling lining in accordance with AS 5637.1:2015 – 6mm Cemintel AFS Formwork	Accreditation No. 3277
20	Stephen Grubits & Associates Carlos Quaglia	2013/277.33	23/06/2016	Penetrations in Logicwall / Rediwall – removed lining	N/A
21	CSR Cemintel	-	6/11/2019	Cemintel Technical Data Sheet – AFS Formwork	N/A