CEMINTEL®

FAÇADES & CLADDING

Design Guide

TABLE OF CONTENTS

01 **INTRODUCTION** **3**
Introduction 3
About Cemintel® 3
CSR Gyprock® The Red Book™ 3
Building Product and System Conformance and Compliance 4

02 **CEMINTEL PRODUCTS & CLADDING SYSTEMS** **4**

03 **TECHNICAL INFORMATION** **5**
Facade Design 5
Design Process 5
Structural Design 6
Framing and Substrate Options 6
Stud Set-Out 6
Direct Fixed Installations 6
Cavity Fix Installations 6
Earthquake Loading 7
Wind Loading 7
Cyclonic Zones 7
Structural Bracing 7
Internal Linings 8
Weatherproofing 9
Moisture Management 10
Condensation Risk 10
Wall Wrap/Sarking Selection 10
Air Barriers 11
Energy Efficiency/Thermal Design 13
Thermal Performance 13
Thermal Break – Steel Framing 13
Thermal Bridging 13
Building Envelope Sealing 13
Climate Zones for Thermal Design 14
Fire Resistance Performance 15
Fire Rated External Wall Systems 15
Supplementary Fire Zone Protection 16
Wall Framing Fire Resistance 16
Wall Framing and Lining 16
Bushfire Prone Zones 17
Roof & Eaves Design 17
Spread of Fire 17
Acoustic Performance 18
Extreme Climate Conditions 18
Coastal Areas 18
Corrosive Zones/Categories 18
Temperature Extremes 18
Other Design Considerations 20
Window Selection 20
Termite Management 20
Services 20
Renovations 20
Specialist Profiles 20
Limitations 20

04 **CEMINTEL WALL SYSTEM SOLUTIONS** **21**
Cemintel Wall Systems in The Red Book 01 21

05 **DESIGN TABLES – CAVITY SYSTEM FRAMING** **31**
Cavity System – Cladding Fixed Through Battens to Structural Framing 31
Cavity System – Cladding Fixed to the Batten/Top Hat Framing 31
Batten and Top Hat Arrangements 31
Design Tables – Cemintel Sheet Products 33
Design Tables – Cemintel Weatherboard Products 36

06 **SAFETY, HANDLING + GENERAL CARE** **38**
Health, Safety and Personal Protection Equipment (PPE) 38
Handling & General Care 38

07 **WARRANTY, CLEANING + MAINTENANCE** **39**
Warranty 39
Wash Down Process 39
Inspection, Repair and Maintenance 39

INTRODUCTION 01

Introduction

CSR Cemintel® offers a diverse range of external wall cladding systems with a range of installation options. This guide provides important technical information to be considered by the designer for the correct use and design of Cemintel wall systems.

This guide provides supplementary design information for the CSR external wall systems clad with Cemintel Weatherboard and Sheet products and should be read in conjunction with the appropriate product installation guide.

The design of CSR wall systems clad with the Cemintel ExpressPanel, Barestone, Surround and Territory products is not covered in this guide and we recommend the appropriate design and installation guide of the product.

Cemintel external wall systems use components with one or more layers of Cemintel fibre cement or Gyprock plasterboard linings fixed to one or both sides of steel or timber framed wall construction. These walls can be fire rated or non-fire rated grade applications in non-loadbearing or loadbearing situations and are often used in applications, including commercial, industrial, institutional, residential and high-rise residential construction.

This guide should be read in conjunction with the applicable Cemintel product or installation guide, and the CSR Gyprock® The Red Book™ publications.

About Cemintel®

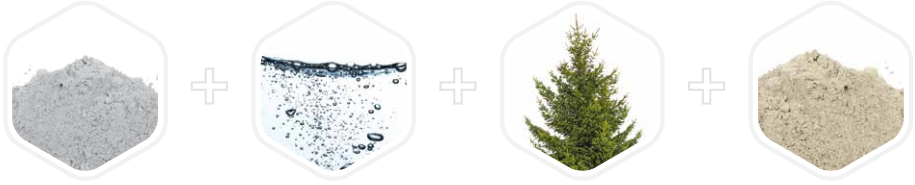
Cemintel is part of the Australian owned icon, CSR Building Products company, manufacturing and supplying cement panels and building systems used for external façades, internal linings, ceilings and flooring which are suitable for use in commercial and residential applications.

Cemintel locally manufactures at Wetherill Park, NSW to AS/NZS 2908.2:2000. The factory utilises a full steel template process to produce a variety of fibre cement products. This method provides a smoother and flatter sheet than non-steels or sheet-on-sheet manufacture process, and sets the Cemintel products apart from others in the market.

The factory at Wetherill Park has a strict testing regime that regularly checks raw materials and finished product to ensure compliance with AS/NZS 2908.2:2000. In addition, products are tested in accordance with asbestos identification to 'AS4964 – Method for the Qualitative Identification of Asbestos in Bulk Samples'.

Fibre cement products are made from natural ingredients. [Ground Sand (Silica), Cement, Air, Water, Radiata Pine, Additives e.g. sealers]. Fibre cement does not contain magnesium chloride (salt).

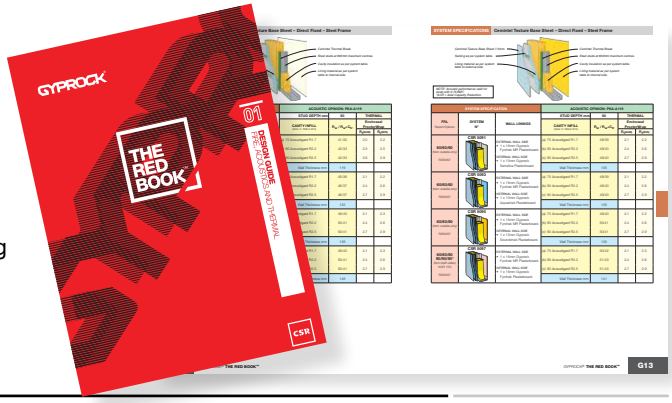
Fibre cement products are deemed suitable for use where a non-combustible material is required according to the National Construction Code (NCC) Volume One, Section C1.9 and Section C1.12 and Volume Two, Part 3.7.1.1. Cemintel fibre cement linings have been assessed with reference to AS3837:1998 as Group 1 materials. Group 1 is the highest rating and allows the material to be used as a wall or ceiling lining in all internal building areas.



Cement + Water & Air + Radiata Pine + Sand

CSR Gyprock® The Red Book™

The Red Book publications showcase the performance of the extensive range of building external wall systems incorporating the Cemintel products and CSR Gyprock® plasterboard. The Cemintel Wall System Solutions are presented in this guide.



01 INTRODUCTION

Building Product and System Conformance and Compliance

There is a high level of regulation within the building industry to help ensure buildings are constructed with compliant and conforming building materials. This has become an extremely important topic in Australia over the past couple of years due to issues with building products with poor fire properties and asbestos contamination in imported products.

Additionally, the building industry has a strict regulatory environment to ensure construction in Australia is safe and meets certain standards. The National Construction Code (NCC) is developed and published by the Australian Building Codes Board (ABCB) and outlines the minimum necessary standards of performance for all buildings in relation to health, safety (including structural and fire safety), amenity and sustainability. The NCC series comprises of three volumes:

- Volume One: Building Code of Australia Class 2 to Class 9 Buildings (BCA Volume One)
- Volume Two: Building Code of Australia Class 1 and Class 10 Buildings (BCA Volume Two)
- Volume Three: Plumbing Code of Australia

Cemintel has undertaken testing and engaged consultants with expertise to provide professional opinion and certification of the performance and/or compliance of Cemintel products and building solution systems. The relevant project designer/ engineer can use these opinions and certifications as evidence to prove that the building product and/or system meets the specified performance requirements nominated in the project documentation.

02 CEMINTEL PRODUCTS AND CLADDING SYSTEMS

The diverse range of Cemintel products can be installed on framed and masonry construction to create a direct fixed cladding system or a cavity fixed cladding wall system to achieve a higher level of weathertightness management. The Cemintel wall systems outlined in this guide are predominantly used in residential and low-rise commercial applications.

Table 1 provides an overview of the wall system qualities of Cemintel Weatherboard and Sheet products.

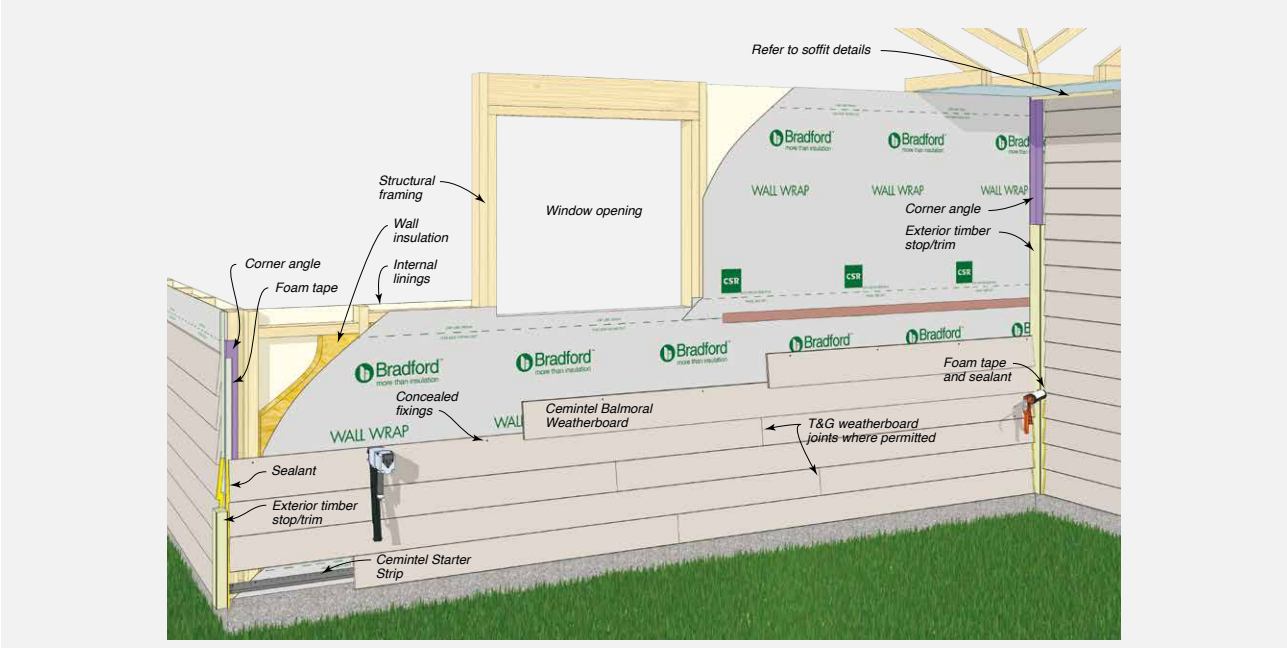
TABLE 1 Cemintel Weatherboard and Sheet Product Application

Cemintel Product	Type		Orientation			Product Surface		Joint Appearance			
	Weatherboard	Sheet	Vertical	Horizontal	Diagonal	Pre-Primed/Sealed	Raw/Un-primed	Expressed Joint	Visible	Concealed (minimal visibility)	Monolithic
Headland® Weatherboards	•			•		•				•	
Scarborough® Weatherboards	•			•		•				•	
Balmoral™ Weatherboards	•			•		•				•	
Plank	•			•			•			•	
Endeavour® Weatherboards	•			•		•				•	
Aspect Cladding®	•			•		•				•	
Edge™ Cladding		•	•			•			•		
SimpleLine®		•	•			•				•	
Mosiac®		•	•	•	•	•		•			
Cladding Sheet		•	•	•			•		•		
Texture Base Sheet		•	•	•		•					•

TECHNICAL INFORMATION

03

FIGURE 3.01 Typical Balmoral Weatherboard Construction Details



Facade Design

This guide represents good practice, though it is not intended as an exhaustive statement of all relevant information. It remains the responsibility of the architect / building designer to ensure the wall system design conforms to NCC requirements and other relevant building standards that may exist for that location, and is appropriate for the intended application. It is recommended that the architect/building designer assigns the responsibility for the façade design to the project engineer.

The design information has been separated into the following topics:

- Structural Design – framing and substrate options, direct fix and cavity fix installation requirements, earthquake loading, wind loading, stud set-out, cyclonic zones, structural bracing, internal linings and curved walls;
- Weatherproofing;
- Moisture Management – condensation risk, wall wrap/sarking selection and air barriers;
- Energy Efficiency/Thermal Design – thermal performance, thermal break requirements, building envelope sealing and thermal bridging;
- Climates Zones for Thermal Design;
- Fire Resistance Performance – fire rated external wall systems, supplementary fire zone protection, wall framing fire resistance, framing and lining, spread of fire, bushfire prone zones and roof & eaves design;
- Acoustic Performance;
- Extreme Climate Conditions – coastal areas, corrosive zones/ categories and temperature extremes; and
- Other Design Considerations – window selection, services, renovations, termite management, specialist profiles and product limitations.

Design Process

The design process to achieve a specification compliant façade system incorporating the Cemintel weatherboard and sheet products is as follows:

STEP 1 Determine the performance requirements, including structure, fire resistance, damp & weatherproofing, sound transmission & insulation durability, and energy efficiency.

STEP 2 Determine the project requirements, including the facade loadings (i.e., wind, earthquake, etc.) and geometry of the structural supports (i.e., stud framing layout, wall height and penetrations, and differential movement requirements), particular to the project.

STEP 3 Select the Cemintel cladding product, façade system (i.e., direct fix or cavity), wall wrap, air barrier, water barrier and insulation that are appropriate for application.

STEP 4 Check the regulatory performance and project requirements are satisfied.

STEP 5 Use design tables to determine façade framing (i.e., vertical and horizontal top hat spacings) and fastener arrangements to suit the cladding, air barrier layer, connection to structural supports and durability of the project.

STEP 6 Prepare design and specification documentation.

03

TECHNICAL INFORMATION

STRUCTURAL DESIGN

Framing and Substrate Options

For timber and steel framing with studs at 600mm centres maximum, the design shall be in accordance with the following standards:

- AS 1684 – Residential Timber-Framed Construction;
- AS 1720 – Timber Structures;
- AS/NZS 4600 – Cold-Formed Steel Structures;
- AS 3623 – Domestic Metal Framing; and
- National Construction Code (NCC).

Studs at vertical joints often require a wider minimum face fixing width to provide adequate edge distances for fixings. In these cases, double studs, trimmers and/or wider battens must be provided behind vertical sheet joints. Refer to appropriate construction details for selected system.

Timber must have an equilibrium moisture content of less than 16% at the time cladding is installed. Unseasoned timber prone to shrinkage must not be used as this can cause sheets and frame to move, causing undue stress on sheet joints.

The design and construction of the steel frames should be considered in conjunction with the advice from the manufacturer. In highly corrosive environments, appropriate measures should be taken to protect the frame from corrosion.

For wall systems with rigid joints, CSR recommends following the AS2870 guidance that support framing be designed for a maximum deflection of span/400 for articulated construction.

Stud Set-Out

For direct fixed cladding in high wind speed locations, the spacing of the studs supporting the Cemintel cladding will need to be reduced. Span tables for cladding and cavity system framing are provided in the Cemintel product installation guide.

It is recommended that the stud set-out be adopted to align the cladding joints and battens / top hats with the studs of the structural framing. Note: where the expressed joints and supporting battens/top hats mis-align additional structural framing (studs and nogging) will be required. This additional framing will require connection capable of transferring imposed loads to the structural framing with the design provided by others.

Direct Fixed Installations

Cemintel cladding must not be fixed directly to hot rolled steel sections or to cold formed sections with base metal thickness (BMT) less than 0.50mm BMT and greater than 1.6mm BMT, in these cases, timber battens or metal top hats should be fixed with appropriate screws.

The appropriate fastener requirements for fixing the cladding of a Cemintel system will be nominated in the relevant Cemintel product installation guide.

Cavity Fix Installations

The cavity systems provide an effective method to manage the migration of water vapour through a stud framed wall system. The cavity is created by fixing vertical battens and/or top hats to the structural framing. The design tables for the cavity system framing are presented in this guide and the product installation guides. The table considers two cavity depths formed by battens or top hats fixed to the structural framing, over an air barrier with the cladding fixed to the face of the battens/top hats. The cavity can be formed with the following batten/top hat components:

- Non-structural – 18mm to 20mm deep/thick Cemintel FC Batten or timber battens with a minimum 70mm face width; and
- Structural – 18mm to 50mm deep steel top hats with a 38mm minimum face width, 19mm deep Cemintel FC Batten, or 35mm to 50mm deep timber battens with a minimum 42mm face width.

The non-structural battens and top hats are fixed 'On-stud' to the structural framing and acts as a spacer between the Cemintel cladding and framing. For structural battens and top hats, the Cemintel cladding can be direct fixed to batten or top hats. Note, for steel framed buildings the designer will advise on the thermal break requirements.

Typical batten and top hat fixing arrangements are shown in Figure 3.02 for 'On-stud' and Figure 3.03 for 'Off-stud' arrangements.

FIGURE 3.02 Typical 'On-stud' Arrangement of Cemintel FC Battens

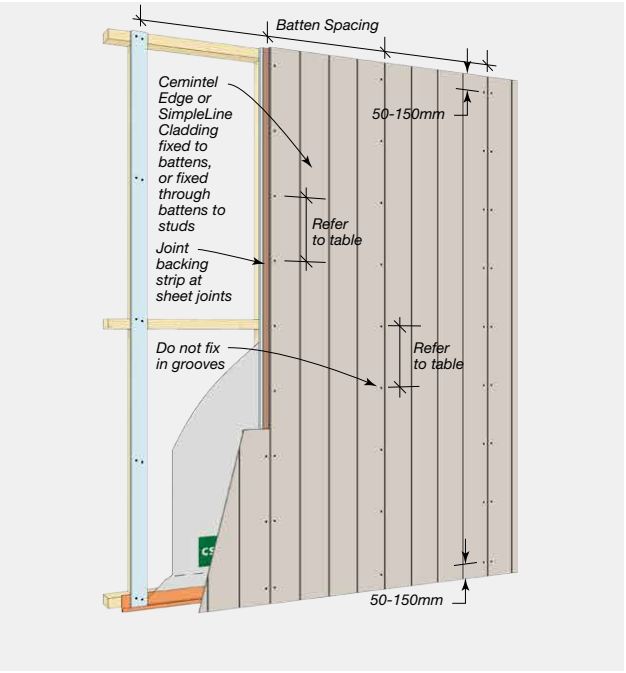
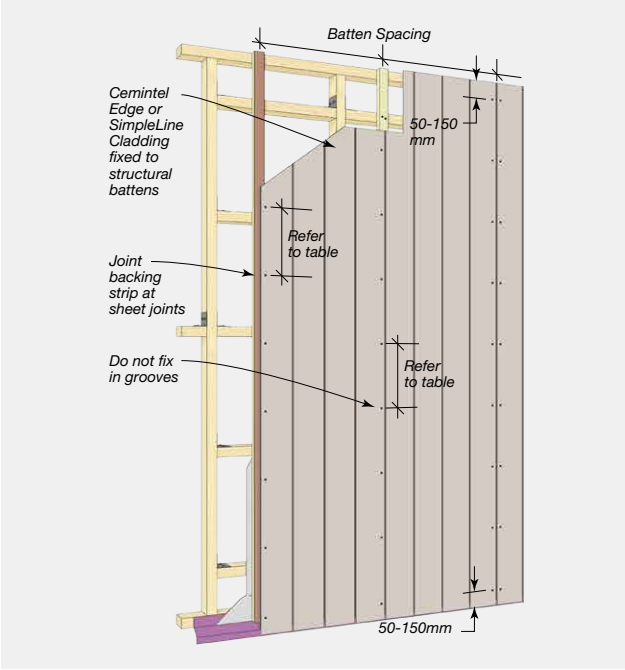
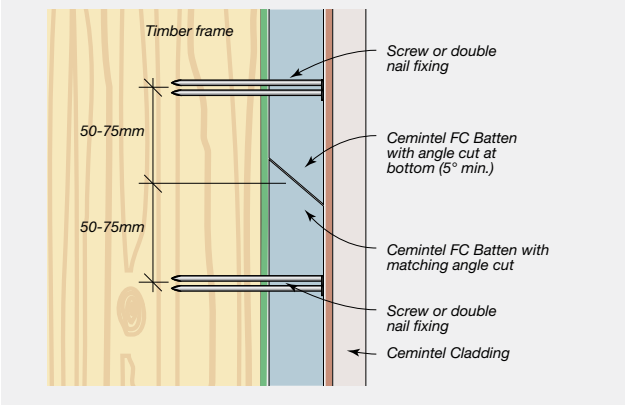


FIGURE 3.03 Typical 'Off-stud' Arrangement of Structural Battens



The timber battens will require a minimum H3 protective treatment. In highly corrosive environments, appropriate measures should be taken to protect the frame and metal components from corrosion. Refer to Corrosive Zones/ Categories section. Horizontal surfaces of battens must have a minimum fall of 5° to the horizontal to allow drainage of any moisture, see Figure 3.04.

FIGURE 3.04 Cemintel FC Batten and Timber Batten Joining



The structural battens and top hats can be fixed off-stud to the structural horizontal framing elements. Refer to the project engineer or framing manufacturer for guidance on the horizontal structural framing arrangement and connection details. Refer to the relevant Cemintel product installation guide for advice on the allowable orientations of the cladding. The fastener requirements for fixing the battens/top hats to the structural framing are nominated in the relevant Cemintel product installation guide.

Earthquake Loading

Due to the lightweight nature of Cemintel cladding, the cladding is suitable for buildings in earthquake regions where the imposed lateral earthquake loading due to the cladding, fire rated linings and support framing is less than design ultimate limit state wind pressure of the system.

It is the responsibility of the designer to determine the earthquake loads and effects on the building, and the suitability of the system solutions.

The effects of both building movement and the inertial forces require specific design of the connection of wall and ceiling framing to the structure. This should be considered as part of the building structural design and information may be available from the frame supplier.

Wind Loading

The Cemintel product installation guides provide design tables for the maximum spacing and spans of the Cemintel cladding and the supporting structure (i.e., battens/top hats/framing studs).

For buildings within the geometric limits of AS 4055 "Wind loading for housing", which include a roof height less than 8.5m, eaves height less than 6m, and a building width less than 16m., design tables have been developed for design wind pressures determined in accordance with AS 4055 wind classifications with local pressure factored external pressure coefficient, $k_l.C_{p,e}$ of -1.3 & +0.7.

For other building geometries, design tables have been developed for a range of design ultimate limit state wind pressures.

It is the responsibility of the designer to determine the wind classification and/or design wind pressures of the building, and the suitability of the system solutions.

Cyclonic Zones

Cemintel claddings are suitable for use in cyclonic zones in buildings that comply with the geometrical limits of the simplified wind code AS 4055. The cladding has not been tested to the cyclic loading regime of AS/NZS 1170.2.

Structural Bracing

Typically, the Cemintel cladding is not intended to provide wall bracing. Refer to the product installation guide for information on the bracing capability of the cladding.

The bracing must be provided in the structural framing in the normal manner by using methods such as strap bracing or sheet bracing. Where sheet bracing is used, the entire wall framing must be sheeted to maintain a uniform fixing plane. Continuous packing strips may be used on studs to match the thickness of other sheet bracing material if required. Note that window set-out will be affected.

Internal Linings

All linings and framing are to be designed for the appropriate design loads due to imposed actions. Contact CSR Gyprock for loads higher than those stated in this guide.

Imposed actions from wind pressure can occur on the internal lining of walls and ceilings that form part of the building perimeter enclosure due to air flow through the facade and/or internal pressures created by openings in the building facade, such as doors and windows, that are left open or are damaged in a wind event. Earthquake loads can be imposed by seismic actions must be considered in accordance with the BCA and determined in accordance with AS/NZS 1170.4.

For CSR Gyprock and Cemintel products, the maximum permitted support framing centres for design loads acting perpendicular to the cladding are shown in Table 2. The minimum plasterboard fixing requirements shall be in accordance with CSR Gyprock® The Red Book publications.

TABLE 2 Maximum framing centres for plasterboard and wallboard linings on internal walls

Linings (horizontal or vertical sheet orientation)	**Maximum Stud Spacing (mm)**			
	Design Ultimate Limit State Load (kPa)			
	0.25	**0.50**	**0.75**	**1.00**
10mm Gyprock Plus	600	600	450	450
Other 10mm Gyprock plasterboards	600	600	600	450
13mm and 16mm Gyprock plasterboards	600	600	600	600
6mm and 9mm CeminSeal Wallboard	600	600	600	600

Note: Contact CSR DesignLINK stud spacing requirements for design wind pressures in excess of 1.0kPa.

WEATHERPROOFING

The control of water ingress to a building is the responsibility of the building designer. All framing, wall wrap/sarking, flashings, damp proof courses and sealants must be installed in accordance with this design guide, the relevant product manufacturer's instructions, applicable standards and building codes.

The selection of the appropriate installation system is based on many factors, but particular attention must be paid to weatherproofing to ensure adequate long-term performance. Therefore, an assessment based on NCC Weatherproofing Risk Factors should be undertaken prior to selection of the installation system. Refer to Table 3.

The weatherproofing performance of the Cemintel wall systems detailed in the Cemintel product installation guides, the direct fixed systems, and ventilated and drained cavity systems, have been assessed and independently certified that these systems satisfy the Verification Method FV1.1 Weatherproofing in BCA Volume One and the Verification Method V2.2.1 Weatherproofing in BCA Volume Two for a maximum serviceability limit state wind pressure of +1.19kPa, maximum stud spacing of 600mm and cavity depth (thickness) of between 18mm to 50mm.

Cavity systems are ideal solutions for weatherproofing walls and should be considered for high risk designs. Table 3 is part of a method outlined in the BCA to determine a buildings risk. A score of 13 – 20 is considered to be a high-risk design.

Important: Windows must be a front draining style and have appropriate flashing to prevent moisture ingress and penetrations should be effectively sealed at the air barrier and at the cladding.

TABLE 3 Waterproofing Risk Factors

Risk Factor	Category	Risk Severity	Risk Score	My Score
Wind Region	Region A (AS/NZS 1170.2)	Low to Medium	0	
	Region B (AS/NZS 1170.2)			
	Region C (AS/NZS 1170.2)	High	1	
	Region D (AS/NZS 1170.2)	Very High	2	
Number of Storeys	One storey	Low	0	
	Two storeys in part	Medium	1	
	Two storeys	High	2	
	More than two storeys	Very High	4	
Roof/Wall Junctions	Roof-to-wall junctions fully protected	Low	0	
	Roof-to-wall junctions partially exposed	Medium	1	
	Roof-to-wall junctions fully exposed	High	3	
	Roof elements finishing within the boundaries formed by the external walls	Very High	5	
Eaves Width	Greater than 600mm for single storey	Low	0	
	451-600mm for single storey; or	Medium	1	
	greater than 600 mm for two storeys			
	101 - 450 mm for single storey; or	High	2	
	451 mm – 600mm for two storeys; or			
	greater than 600 mm for above two storeys			
	0 - 100 mm for single storey; or	Very High	5	
	0 - 450 mm for two storeys; or			
	less than 600mm for above two storeys			
Envelope Complexity	Simple shape with single cladding type	Low	0	
	Complex shape with no more than two cladding types	Medium	1	
	Complex shape with more than two cladding types	High	3	
	As for high risk but with fully exposed roof-to-wall junctions	Very High	6	
Decks, Porches and Balconies	None; or	Low	0	
	Timber slat deck or porch at ground level			
	Fully covered in plan view by roof; or	Medium	2	
	Timber slat deck attached at first or second floor level			
	Balcony exposed in plan view at first floor level; or	High	4	
	Balcony cantilevered at first floor level			
	Balcony exposed in plan view at second floor level or above; or	Very High	6	
	Balcony cantilevered at second floor level or above			
		Building Total Risk Score:		

Notes:
1. Eaves width is measured horizontally from the external face of any wall cladding to the outer edge of any overhang, including fascia and external gutters.
2. Barriers to prevent falling and parapets are considered as 0mm eaves.

MOISTURE MANAGEMENT

To ensure occupant health, safety and comfort and to protect the building frame from damage due to dampness and deterioration, a moisture strategy with the following objectives is required:

- Prevent external moisture entering the building;
- Prevent the accumulation of internal moisture in a building; and
- Allow airflow for cavity ventilation and drying of wet assemblies and surfaces.

The Building Code of Australia (BCA) volumes cover requirements for weatherproofing, condensation, water vapour, ventilation, air tightness and thermal performance which help manage associated risks and resist ingress of weather and groundwater into a building to minimise the impact on the health of occupants.

The Cemintel drained cavity systems are similar-to brick veneer construction and are highly effective at removing condensation and any incidental moisture from the cavity, thereby ensuring that the framing within the cavity can dry out.

Condensation Risk

Condensation occurs as air cools and contacts cold surfaces that are below the air's dew point. Absorptive materials such as brick, cement sheet and timber are permeable and act as a buffering material until they become saturated, whilst non-absorptive materials such as steel and glass reach saturation quickly. Water can then accumulate and must be allowed to dry or drain away. Moist surfaces can result in health issues for occupants and lead to degradation of building materials and loss of structural integrity.

The likelihood and severity of condensation is largely a function of:

- Climate (primarily temperature and humidity including seasonal and diurnal variations);
- Occupancy and building use;
- Material properties of the building envelope (including insulation material type & R-Value);
- Passive and mechanical ventilation;
- Air tightness;
- The building envelope's ability to allow or prevent the movement of vapour; and
- The building envelope's ability to act as a water barrier behind the primary cladding element.

CSR recommends that designers undertake a condensation risk analysis prior to selecting vapour control membranes. An air barrier may be required where buildings are subject to higher wind loads and may require the incorporation of a vapour/water barrier membrane in addition to the air barrier.

Greater use of insulation, better sealing to restrict air movement, and increased use of air conditioning leads to larger differences between the temperature and water vapour content of indoor environments and adjacent outdoor areas and greatly increases the risk of condensation at surfaces and interstitial spaces.

The ABCB publication "Condensation in Buildings Handbook 2014" provides guidance on managing condensation. This guidance includes review of Bureau of Meteorology climate statistics (maximum and minimum average monthly temperatures together with average monthly dew point temperatures). This highlights the likelihood of condensation, which occurs when minimum temperature falls below the dew point, and identifies the daytime drying potential.

Wall Wrap/Sarking Selection

The fabric of the building separates the interior and exterior environments and is subject to the movement of heat, air, water, and water vapour. Multiple materials are usually required to form effective control layers in the interstitial spaces between the exterior cladding and interior lining of a building.

The appropriate membrane (i.e., wall wrap/sarking, rigid air barrier) for an application will depend on the local climate, building type, service wind pressure, use and orientation, material R-Value of the insulation, as well as the degree and location of ventilation.

Vapour barriers restrict the transmission of water vapour, while vapour permeable membranes allow the transmission of water vapour. Table 4 and Table 5 provide guidance on recommended wall wrap/sarking selection.

The wall wrap must have a water barrier classification to AS/NZS 4201.4 – Pliable building membranes and underlays – Methods of test – Resistance to water penetration. A non-water barrier classification is not suitable. Wraps included in this guide, and the Cemintel Rigid Air Barrier, have achieved the water barrier classification. Wall wraps must meet the requirements of AS/NZS 4200.1 – Pliable building membranes and underlays – Materials and be installed in accordance with AS 4200.2 – Pliable building membranes and underlays – Installation requirements.

The designer, architect or engineer is responsible for determining what is appropriate for the application.

CSR provides several product options for use as air barriers and moisture barriers as set out in Table 6 and Table 7, and the designer is responsible for determining what is appropriate for the application.

Whilst the requirement to seal joins and penetrations may vary depending upon BCA and/or state requirements, CSR recommends sealing the external wall wrap/sarking

to maintain vapour performance and draught proofing effectiveness, as well as to ensure water barrier integrity. As there are a number of factors that need to be considered in assessing and managing condensation risk. Additional literature on this subject is available from CSIRO/BRANZ/ ASHRAE/ABCB and CSR DesignLINK can help with this assessment.

Air Barriers

The air barrier is required to reduce air leakage between the external and internal areas of the building. It is important to note that air barriers must be installed correctly as they are an integral element of a pressure equalised self-draining cavity system. This guide considers the internal plasterboard lining as the predominant air barrier in the presented wall systems. Alternatively, the internal cavity lining (i.e., wall wrap, rigid air barrier, waterproofing layer, backpan) of the ventilated and drained cavity can be the air barrier. Further information on the air barrier requirements and installation detailing to achieve a pressure equalisation system are presented in Tables 6, 7 & 8.

Select wall wraps can provide a water resistant and air tight barrier when installed appropriately. It is recommended that wall wraps used as an air barrier have an air resistance greater than 0.1 MNs/m^3 when tested to ISO 5636-5. Refer to the Installation section in this manual and "Cemintel Air Barriers – Design and Installation Guide" for details on wall wraps and Cemintel Rigid Air Barrier.

TABLE 4 Recommended Products for Moisture Management of Walls

Climate (BCA Zone)	Guidance on Vapour Control	Performance and Category	Recommended CSR Products (Refer to Table 4.05)
Warm-Humid, or Tropical climates (Zone 1)	Where vapour flow is typically inward, such as where the building is air-conditioned for cooling, the membrane should function as a vapour barrier.	Vapour Barrier - Class 1 or 2	• Bradford Thermoseal membranes • Bradford Thermoseal Firespec • Cemintel Rigid Air Barrier with a Vapour Barrier Membrane
Temperate or Hot-Dry (inland) climates (Zones 2, 3, 4, 5)	These climates have varying diurnal and seasonal temperature changes that can affect the direction of the water vapour flow. In most cases a vapour permeable membrane outside the insulation is recommended to avoid creating a moisture trap, allowing drying in either direction. Where a high level of thermal insulation is used, a high degree of permeability may be required, and in some locations a vapour barrier is required. Expert guidance based on local experience should be sought.	Vapour Permeable or Vapour Barrier Class 2, 3 or 4 as required	• Bradford Enviroseal membranes • Bradford Thermoseal membranes • Bradford Thermoseal Firespec • Cemintel Rigid Air Barrier • Cemintel Rigid Air Barrier with a Vapour Barrier Membrane
Cold climates (Zones 6, 7, 8)	Where there is a strong tendency for outward migration of vapour and a high risk of condensation, vapour permeable membranes should be installed on the cold, external side of the insulation. (1)	Vapour Permeable Class 3 or 4	• Bradford Enviroseal membranes. • Cemintel Rigid Air Barrier

(1) The use of a Class 3 membrane such as Cemintel Rigid Air Barrier may not be sufficient in some cold climates. If a Class 4 membrane cannot be used, a solution may include the use of a material to the interior side of the insulation that acts as a vapour barrier, e.g. a Class 1 or 2 membrane or a vapour sealed plasterboard lining coupled with a mechanical ventilation solution. Seek expert advice prior specifying systems for these regions.

03 TECHNICAL INFORMATION

TABLE 5 Recommended CSR Products for Moisture Management of Walls

Product	Vapour Permeance Class AS/NZS 4200.1	Vapour Permeance ASTM E96 µg/N.s	Weather exposure limit prior to cladding
Thermoseal 733	Class 1	<=0.0022	1 month
Thermoseal Resiwrap	Class 1	<=0.0022	1 month
Thermoseal Wall Wrap/XP	Class 1	<=0.0022	1 month
Thermoseal Firespec	Class 2	0.0022 to 0.1429	1 month
Thermoseal Wall Wrap Prime	Class 2	0.0022 to 0.1429	1 month
Cemintel Rigid Air Barrier	Class 3	0.25	6 months (panel) 2 months (tape)
Enviroseal ProctorWrap CW, Enviroseal ProctorWrap CW-IT	Class 4	4.2	2 months
Enviroseal ProctorWrap HTS	Class 4	4.0	2 months
Enviroseal ProctorWrap RW	Class 4	4.5	1 month

Wall Wrap/Sarking Air Barrier or Rigid Air Barrier

Note: For specific installation information on Wall Wrap and Rigid Air Barrier, refer to the 'Cemintel Air Barrier Design and Installation Guide'.

Air Barriers are suitable for the following wind load situations:

TABLE 6 Wall Wrap/Sarking Air Barrier

Description	Maximum Wind Loading (Ultimate) (kPa)
Bradford Enviroseal ProctorWrap CW-IT	2.5
Cemintel Rigid Air Barrier	7.0

TABLE 7 Cemintel Rigid Air Barrier - sheet installed in the vertical direction

Stud Centres (mm)	Maximum Wind Loading (Ultimate) (kPa)
600	1.61
450	2.86
400	3.62
300	6.00

TABLE 8 Cemintel Rigid Air Barrier - sheet installed in the horizontal direction

Stud Centres (mm)	Maximum Wind Loading (Ultimate) (kPa)
600	1.97
450	3.51
400	4.94
300	7.00

ENERGY EFFICIENCY/THERMAL DESIGN

Energy efficiency requirements for buildings are set out in the BCA as performance requirements and acceptable construction practices and are dependent on geographical climate zones. To meet the requirements, it is recommended that insulation be installed in the wall framing and appropriate sealing of the building envelope be provided. Refer to the 'Climate Zones for Thermal Design' section for the required thermal performance levels and check with local building authorities for minimum insulation requirements. Refer to the 'Building Envelope Sealing' section for requirements.

It is recommended that insulation values above the minimum be chosen for energy conservation and occupant comfort. Insulation also improves the acoustic performance of the wall against outside noise.

The level of insulation provided in a wall is described by its R-value. The higher the R-value the greater the insulation provided. R-values for systems are provided in the "System Engineering" section. For further information of R-Value of wall systems with cavity depths less than 35mm, contact CSR DesignLINK. Cemintel recommends CSR Bradford insulation products to achieve the required performance. Refer to Cemintel product installation guide for further information.

Thermal Performance

The CSR Gyprock The Red Book presents Cemintel external wall systems that include thermal ratings expressed as $R_{t(WINTER)}$ and $R_{t(SUMMER)}$ to represent Total R-values for the winter and summer design conditions as required by AS/NZS 4859.1, which is called upon in the BCA.

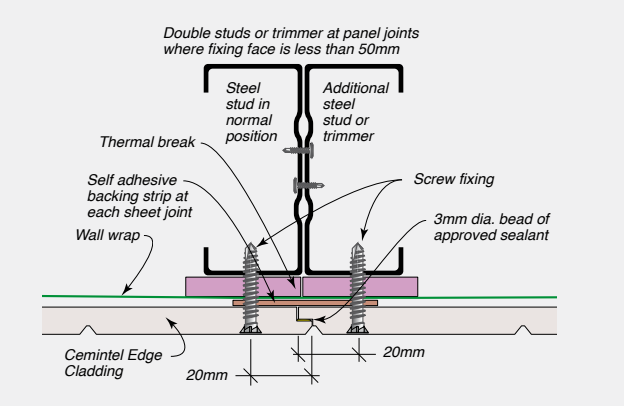
The Total R-values presented in The Red Book are based on assumptions in accordance with the methods of AS/NZS 4859.1 – Materials for thermal insulation of buildings – General criteria and technical provisions. Any included bulk insulation is a CSR Bradford product that has a material R-value compliant with the standard, and building elements have thermal values sourced from the AIRAH handbook. No allowance has been made for thermal bridging. Thermal performances quoted are based on an assessment through the insulation path. The contribution to Total R-values depends on installation, workmanship and environmental conditions and it is assumed that cavities are ventilated.

Thermal Break – Steel Framing

When fixing to steel framing, a thermal break is required where Cemintel cladding is fixed directly or via a non-structural batten, less than 20mm thick, to the steel support framing of walls enclosing habitable or usable spaces. Refer to the BCA for detailed information on thermal break requirements. The thermal break is applied to the face of the frame to meet the deemed to satisfy requirements of the BCA to ensure that the thermal performance of the wall is comparable to that of a timber framed wall. A thermal break requires a minimum thermal resistance, R = 0.2, i.e., Cemintel Thermal Break product.

For systems with structural timber battens (i.e., 35mm or thicker), no additional thermal break will be required if the timber battens meet the thermal break requirements of the BCA. For 'off stud' fixed steel top hats, a thermal break is not required as the sheets are not directly connected to the steel framing supporting the internal linings.

FIGURE 3.05 Typical Thermal Break Layer for a Direct Fixed Cladding System



Thermal Bridging

The Total R-value calculations in The Red Book are based on the path of the insulation only. No allowance has been made for the effects of thermal bridging through the framing paths of the structure, gaps in the bulk insulation layer in the wall system due to structural framing (i.e., studs, noggings, perimeter of wall openings) and services obstructing or limiting wall insulation coverage, slab edge insulation, and the effects of air leakage due to unsealed architraves, unsealed door jambs, unsealed gaps between windows and the masonry wall or services penetrating the inner leaf. These effects are to be compensated for as outlined in BCA Volume One Section J.

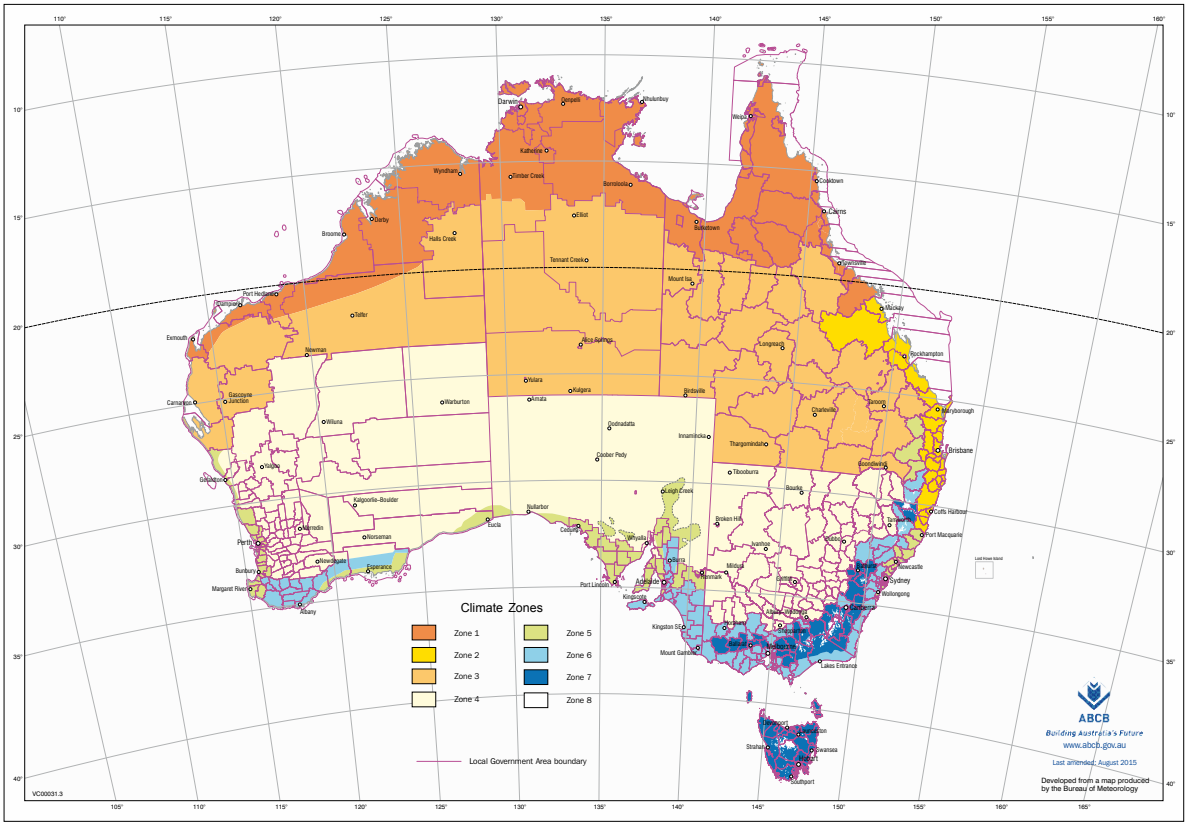
Note a penetration through the wall system allowing air infiltration may affect the thermal performance and potentially provide a direct transfer path of humid air into the construction system increasing the risk of interstitial condensation.

Building Envelope Sealing

Envelope sealing is pertinent to the energy efficiency performance of a building. BCA Volume One outlines a method (JV4) to verify compliance with the building sealing requirements in Part J3.

CLIMATE ZONES FOR THERMAL DESIGN

The following map and table show the performance levels required for walls (and floors) under the NCC and BCA.



Step 1: Determine which Climate Zone your project is located in Australia from the map above.

Step 2: From Table 9, determine the design conditions ('Summer' heat flow in or 'Winter' heat flow out) according to the Building Class and Climate Zone for your project. (Note, the Building Class descriptions are defined by the NCC.)

Step 3: Refer to The Red Book and wall system applicable to your construction type to determine Total R-Value of the wall system.

Note: Some applications may achieve Total R-Values sufficient to comply with the minimum performance levels of the Deemed-to-Satisfy requirements contained in the Energy Efficiency Provision of the NCC.

TABLE 9 Design Conditions ('Summer' heat flow in or 'Winter' heat flow out). Source: ICANZ Handbook

Climate Zone	**1**	**2**		**3**	**4**	**5**	**6**	**7**	**8**
		<300m Altitude	>300m Altitude						
Class 1 & Class 10	Summer		Winter						
Class 2-9	Summer							Winter	

FIRE RESISTANCE PERFORMANCE

Fire Rated External Wall Systems

In accordance with the fire safety requirements of the BCA, walls within close proximity to the property boundary or when exposed to a fire source are required to have a Fire Rating Level (FRL from outside only). Walls may include:

- External walls within a Bushfire Attack Level – Flame Zone (BAL-FZ);
- External walls to Class 1 buildings within 900mm of the boundary including Zero-Lot walls; and
- External walls adjacent an external fire source (i.e., electrical sub-station).

Cemintel claddings, weatherboards and façade products are deemed suitable for use where a non-combustible material is required in accordance with with Section C1.9 of the NCC BCA Volume One and Part 3.7.1.1 of the NCC BCA Volume Two and can be used wherever a non-combustible material is required. The Red Book provides information on the fire resistance level (FRL) of the various Cemintel wall systems. The FRL values for the various Cemintel claddings in conjunction with other fire-rated linings are shown in Table 10.

It is important to maintain the ventilation at the head and base of walls, but also to reduce the risk of ember penetration. All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed to prevent gaps greater than 3mm. Vents in external walls shall be screened with a mesh with a maximum aperture of 2mm, made of corrosion resistant steel or bronze, except where they are less than 3mm. Refer to the BCA and AS3959 for additional requirements and further details.

Important: For fire rated systems, the length of ALL fasteners MUST BE increased to allow for the extra thickness of the fire-rated linings and maintain fastener capacity. Note, nail fixing through multiple layers can be difficult and screw fixings are the preferred method of construction.

The internal (room) wall linings form part of the Fire Rated External Wall Systems shown in Table 10. In areas where the linings are omitted – such as the junctions of walls, floor and roof framing, in the roof space, and at service penetrations – additional treatment is necessary by the provision of Supplementary Fire Zone Protection.

TABLE 10 Bushfire Attack Level (BAL) and Fire Resistance Level (FRL) Ratings for Cemintel External Wall Systems

Cemintel Product	**Cemintel System**	**Bushfire Zone Walls**		**Fire Rated External Wall Systems**		
		Cladding fixed over Sarking + 1x10mm Gyprock Standard Plasterboard to Internal face	Refer to Cemintel Wall System Solutions Tables[2]	Refer to Cemintel Wall System Solutions Tables		
	Thickness	**Bushfire Attack Level (BAL)**		**Fire Resistance Level (FRL)**		
Headland® Weatherboards	10	BAL-LOW	BAL-FZ[1]	30/30/30 (from outside only)	60/60/60 (from outside only)	90/90/90 (from outside only)
Scarborborough® Weatherboards	12	BAL-40				
Balmoral™ Weatherboards	16	BAL-40				
Plank	7.5	BAL-29				
Endeavour® Weatherboards	10	BAL-LOW				
Aspect Cladding®	12	BAL-40				
Edge™ Cladding	9	BAL-29				
SimpleLine®	8.5	BAL-29				
Mosaic®	8	BAL-29				
Cladding Sheet	6	BAL-29				
Texture Base Sheet	7.5	BAL-29				

Note: [1] BAL-FZ walls must have a minimum setback distance of 10m from classified vegetation. Also refer to local building regulations.
[2] Requires Gyprock Fyrchek MR Plasterboard layer to exterior of framing.

Supplementary Fire Zone Protection

The treatment options for Supplementary Fire Zone Protection could consist of the following:

- Addition of fire rated layer of Gyprock Fyrchek plasterboard and/or Bradford Fibretex Rockwool products; and
- Additional timber studs and framing to provide sacrificial fire blocking and insulation.

For additional assistance, contact project fire engineer.

Wall Framing Fire Resistance

The wall systems in The Red Book are suitable for the stated FRL when designed in accordance with the structural requirements of this section.

Most CSR fire rated steel stud wall systems have been designed with fire protection that limits the temperature of the steel framing to a maximum of 450°C at the FRL stated. Therefore, the structural design of the framing need only provide for normal temperature conditions, and no additional consideration of fire rating is required.

In some systems this temperature is exceeded and the axial capacity of the stud must be reduced to compensate for the loss of strength. The percentage reduction is noted for each affected systems.

The fire design of timber framing is based on the principle that a particular level of char is acceptable without compromising the performance of the wall. CSR has carried out testing to verify the char limit, and where it is exceeded, the allowable axial capacity of the stud is reduced to account for the loss of section. The systems are noted with an Axial Capacity Reduction (ACR) Group number. In these systems, the designer must increase the applied loads by a percentage, as shown in Table 11 to compensate for the axial capacity reduction.

To protect structural steel beams and columns that are entirely within a wall, the FRL of the wall system must be at least equivalent to that required by the structural member. For example, a wall system with FRL 90/90/90 provides FRL 90/–/– for a steel column within the wall.

TABLE 11 Axial Capacity Reduction (ACR) due to the effect of timber char

Timber Size	Group1	Group2	Group3
90 x 45	0%	0%	25%
90 x 35	0%	10%	30%
70 x 45	3%	25%	40%
70 x 35	8%	35%	45%

Wall Framing and Lining

Walls required to have an FRL must comply with the following:

- Steel framing must have base metal thickness (BMT) of up to 1.6mm;
- Timber studs must be a minimum 70 x 35mm and be spaced at 600mm maximum centres;
- Wall plates must be fixed to the fire rated support structure with steel fasteners, such as expansion anchors, easy drive masonry anchors and power driven fasteners;
- Fyrchek and Cemintel fibre cement products must be mechanically fixed only, adhesive is not to be relied on;
- Linings that do not contribute to the system FRL may use adhesive;
- In external areas, Gyprock Fyrchek MR or other Gyprock moisture grade, fire resistant plasterboard must be used in lieu of Gyprock Fyrchek;
- For single fire-rated layer systems and the first layer of multilayer systems, butt joints must be backed by either a stud or nogging;
- For multi-layer fire-rated vertically sheeted applications, outer layer butt joints may be reinforced using laminating screws without the need for framing support;
- All systems require jointing and finishing of the outer layer only. As a minimum, Gyprock paper tape and a single base coat finish may be used. On the external side of wall systems Wet Area of ultra base may be used to reduce the possibility of mould formation; and
- Fixing information for the fire-rated layer systems is outlined in the Cemintel product installation guides and The Red Book.

For additional information on frame design and detailing, including treatment at junctions, sub-floor and roof areas, cavity barriers and penetrations, contact DesignLINK.

The Fire Resistance Level (FRL) of the systems detailed in the Cemintel product installation guides and The Red Book will not be detrimentally affected by:

- Increasing the thickness of the wall;
- Increasing the cross-sectional dimensions of the framing elements;
- Decreasing the stud spacing;
- Decreasing the fixing centres of wall sheet materials;
- The inclusion of bulk cavity insulation materials such as Glasswool, Rockwool and Polyester;
- Additional layers of plasterboard or Cemintel fibre cement;
- Wall curved in plan with a radius of curvature no less than 3m;
- The attachment of light weight fixtures through to the framing; and
- The addition of timber or fibre cement sheets.

Bushfire Prone Zones

Protection against bushfire attack requires a comprehensive and systematic approach that may include the specification of fire-resistant linings and other materials (e.g., insulation), and construction details for external walls, roofs and decks. Bushfire zone walls also require specific treatments, such as mesh coverings at wall head, base, all gaps, eaves and junctions with roofs, etc., to ensure appropriate fire and ember resistance.

In accordance with AS3959, Cemintel cladding products are suitable as an external wall lining for buildings in bushfire zones when installed as a CAVITY system (i.e., Cemintel cladding fixed over battens or top hats).

A Bushfire Attack Level (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). Refer to Table 10 for the BAL ratings of the Cemintel external wall systems presented in The Red Book.

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. Figure 3.06 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.

Roof & Eaves Design

Refer to the Cemintel Construction Guide for Bushfire Areas, available at www.cemintel.com.au and the Bradford™ Bushfire Roofing Systems Design Guide, available at www.bradfordinsulation.com.au. It is not recommended that air from the wall cavity be vented into the roof or eaves space.

Spread of Fire

With regards to compliance with BCA requirements to avoid the Spread of Fire via the façade, the Cemintel systems in The Red Book are adequate for residential buildings and satisfy the Deemed-to-Satisfy Provisions of Type C Construction commercial buildings. Note the Type C Construction limits the maximum rise of storeys depending on the class of the building. Type A and B Construction buildings will require a Cavity Fix wall system with steel top hats and non-combustible components..

FIGURE 3.06 BAL Ratings

BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	BAL-Low
Direct exposure to flames from the fire front in addition to heat flux of greater than **40kW/m^2** and ember attack.	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	Increasing levels of ember attack and ignition of debris with an increasing heat flux of up to **29kW/m^2**	Increasing levels of ember attack and ignition of debris with an increasing heat flux of up to **19kW/m^2**	Ember attack with heat flux of up to **12.5kW/m^2**	There is insufficient risk to warrant specific construction requirements

- BAL – Low: There is insufficient risk to warrant specific construction requirements.
- BAL – 12.5: Ember attack.
- BAL – 19: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux.
- BAL – 29: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux.
- BAL – 40: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux and with the increased likelihood of exposure to flames.
- BAL – FZ: Direct exposure to flames from fire, in addition to heat flux and ember attack.
- BAL ratings for all Cemintel products are available for download at cemintel.com.au/technical
- Also refer to the publication Bushfire Roofing Systems Design Guide for assistance with roofing designs – available at www.bradfordinsulation.com.au.

03 TECHNICAL INFORMATION

ACOUSTIC PERFORMANCE

The performance of the as-built system may be affected by sound flanking, the effectiveness of workmanship and caulking, the presence and treatment of penetrations, and the inclusion of structural elements and bridging items. Refer to appropriate information on addressing these issues in Section B and Section J of the CSR Gyprock® The Red Book™ 01 publication.

General Notes:

- The acoustic performance of system solutions may be adversely affected by the use of studs with different BMT, width or closer spacings than those specified, or by the use of additional linings fixed on battens.
- In non-fire rated systems, to attain the stated acoustic performance, use Gyprock® Wet Area Acrylic Sealant or Gyprock® Fire Mastic.
- The acoustic performance of CSR wall systems IS NOT adversely affected by the order of lining sheets that are fixed direct to framing.

Generally, the introduction of a cavity behind the external cladding layer will reduce the sound insulation (R_w & $R_w + C_{tr}$ values) of the wall system. For further information of sound insulation performance of wall systems, contact CSR DesignLINK.

EXTREME CLIMATE CONDITIONS

Coastal Areas

Cemintel Cavity Fix wall system with metal framing may be used in coastal areas – Corrosivity Category C3: Medium – defined as up to 1km from a surf beach, or less than 50m from a shore without breaking surf. Consideration must also be given to local weather and topographical features that can cause an increase in the distance that salt spray can travel, extending these nominal limits.

To resist corrosion in these areas, salt laden air must be excluded from the wall frame cavity, for instance by lapping and sealing the flashing at corners and joins. All walls must be sufficiently exposed from above so that rain can perform natural wash down of the wall. Walls that are protected by soffits above must be washed down twice per year, to remove salt build-up, particularly around window/door openings. Refer to the Cemintel product installation guide for information on the correct fasteners.

Corrosive Zones/Categories

The corrosivity zones must be taken into account. While Cemintel claddings are not subject to corrosion, consideration needs to be made regarding the impact of climate conditions on system components such as fasteners and steel framing.

ISO 9223 has suggested six corrosivity categories based on the first year of corrosion rate of mild steel. Corrosivity categories are detailed in AS 4312 – Atmospheric corrosivity zones in Australia – and are set out in Table 12 with some general statements.

It is the responsibility of the architect/building designer to select the appropriate corrosivity category in accordance with the standard and local site conditions and provide the corrosion protection specifications. For Corrosivity Category C4: High – use fibre cement or timber battens or aluminium framing and appropriate fixings.

The durability of the Cemintel wall system can be enhanced by periodic inspection and maintenance. Inspections should include examination of the coatings, flashings and seals. Paint finishes must be maintained in accordance with the manufacturer's recommendations. Any cracked or damaged finish or seals which would allow water ingress, must be repaired immediately by recoating or resealing the affected area, or by removing the panel and replacing. Any damaged flashings or sheets must be replaced as for new work.

The durability of the system can also be increased by the additional treatment of steelwork, and by painting all exposed sealants to the sealant manufacturer's recommendations. Ensure ventilation and drainage gaps between the cladding and flashing are kept clear of any debris. The requirements for corrosive environments are shown in Table 13.

Temperature Extremes

Cemintel claddings are not designed to be in contact with snow or ice build-up for extended periods, such as is experienced in alpine areas subject to snow drifts. Cemintel claddings also not warranted for extreme heat conditions (that is above 50°C).

TABLE 12 Details of Atmospheric Corrosivity Categories in Australia

ISO 9223 Category	Corrosivity	Mild Steel Corrosion Rate µm/y	Typical Environment
C1	Very low - common for air-conditioned and heated commercial buildings, and locations remote from marine or industrial influence.	<1.3	Dry indoors
C2	Low (most areas of Australia) - at least 50km from the coast (Canberra, Ballarat, Toowoomba, Alice Springs) or at least 1km from sheltered bays (Melbourne, Geelong, Hobart Launceston) in this category.	1.3 - 25	Arid/urban inland
C3	Medium (coastal areas) - in sheltered areas (Port Phillip Bay), this category occurs within 50m to 500m of the shoreline. Less sheltered or less turbulent seas (Adelaide, Brisbane, Perth), this category extends from 0.5km of the shoreline to between 5km - 15km inland. For breaking surf and rough seas, this category extends from 1km of the shoreline to between 10km - 50km, and possibly 100km depending on winds and topography. In quiet tropical areas, lies within 0.5km to 1km band of shoreline. (Found in much of metropolitan areas of Wollongong, Sydney, Newcastle and Gold Coast)	25 - 50	Coastal or industrial
C4	High (primarily coastal areas) - found on offshore structures and within 50m inland of the shoreline of sheltered bays. At semi-sheltered or less turbulent coasts, this category occurs 50m to 500m of the shoreline. For surf and rough seas it extends from 0.5km to 1km from the shoreline. In tropical areas, adopt a C4/C5 category within a 100m to 500m band from the coast.	50 - 80	Sea shore (calm) of sheltered coastal bays
C5	Very high (industrial or marine) – from 50m to 500m inland of the shoreline of coasts exposed to surf or very rough seas - can extend 100m to 500m in tropical locations. For semi-sheltered coasts, found on offshore structures and within 50m inland of the shoreline.	80 - 200	Sea shore (surf) of exposed coasts & semi-sheltered coasts
CX	Extreme (industrial or marine) - found on offshore structures and within 50m inland of the shoreline of coasts exposed to surf or very rough seas - can extend 200m under the most severe sea conditions and 100m in tropical locations.	200 - 700	Sea shore (surf) of exposed coasts

TABLE 13 Requirements for Corrosive Environments

Corrosivity Category (AS 4312)	Fixing	Additional Maintenance
C1: Very Low / C2: Low	Class 3	-
C3: Medium	Class 3	Wash-down
C4: High	Class 4 / Stainless Steel	Wash-down
C5: Very High	Product specific	Periodic wash-down and inspections
CX: Extreme	Product specific	Periodic wash-down and inspections

OTHER DESIGN CONSIDERATIONS

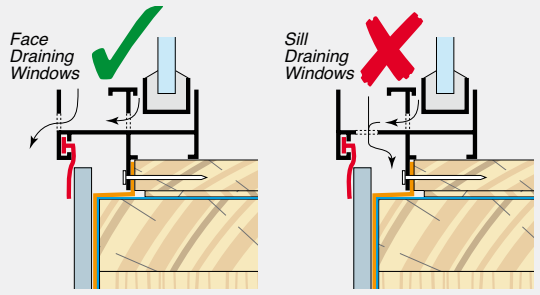
Window Selection

The Cemintel wall systems are designed to accept standard aluminium or timber framed windows. Aluminium windows MUST NOT have sill drain holes which can direct water behind the cladding, unless noted otherwise in the Cemintel product installation guide of the system. Windows with face draining format MUST be used, refer to Figure 3.07. Window reveal sizes should be determined based on the chosen window frame and stud configuration.

Jamb flashing is required in all cases, and for ease of installation, these should be included when ordering windows.

Various window types can be installed in the Cemintel wall systems in a similar manner, by varying the timber reveal depth to suit the overall wall thickness.

FIGURE 3.07 Window Drainage



Termite Management

There is a wide variety of methods for managing termite entry to buildings and selecting the appropriate method for any structure depends on specific risk factors and the form of construction. Measures for termite management have not been addressed in this guide.

Refer to your local pest management service, the BCA, AS3660 Termite management standards and your local building authorities for more information about the requirements for the design of a suitable termite management system.

Services

Any penetrations formed must be considered in the framing design and must be effectively sealed to maintain the weather resistance of the façade.

For cavity installations, the battens may be locally removed for up to 100mm to allow services to pass outside the frame. Note additional framing for off-stud battens may be required to support the end of the batten.

Renovations

When undertaking building renovations, remove all cladding and wall wrap and insulation from the original wall framing. Ensure the condition of the framing is in accordance with current requirements and is as true and as plumb as possible (within accepted industry tolerances of 5mm over 3000mm).

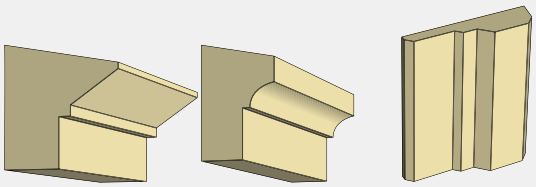
Remediate and/or install additional framing, insulation, air barrier and flashing as required to achieve the equivalent construction details shown in the relevant Cemintel product installation guide.

Specialist Profiles

Preformed architectural profiles, refer Figure 3.08, may be used to create a feature around window openings, doorways and the like. These lightweight shapes can be installed quickly and easily. These profiles should be securely bonded to Cemintel cladding in accordance with the profile manufacturer's instructions.

Where moulds are used to hide movement joints they must be allowed to move over the joint. The mould should be attached to one sheet only. Refer to Cemintel product installation guide for further information and construction details.

FIGURE 3.08 Architectural Profiles



A typical Window Sill profile | A typical Parapet or Stringer profile | A typical Window Moulding profile

Limitations

Cemintel claddings in this guide are unsuitable for the following applications: non-vertical framing (e.g., parapet capping); water features; chimney cladding; water features; and chimney cladding. Also refer to the 'Temperature Extremes', 'Corrosive Zones/Categories' and 'Coastal Areas' sections for further information.

Cemintel Wall Systems in The Red Book 01

The CSR Gyprock The Red Book 01 outlines a range of wall systems for Cemintel cladding products. The wall system tables have been reproduced in this section. It is recommended that wall system tables in The Red Book 01 be used to ensure the current performance information is referenced. The Cemintel claddings have been separated into weatherboard and sheet products as shown in the Table 14.

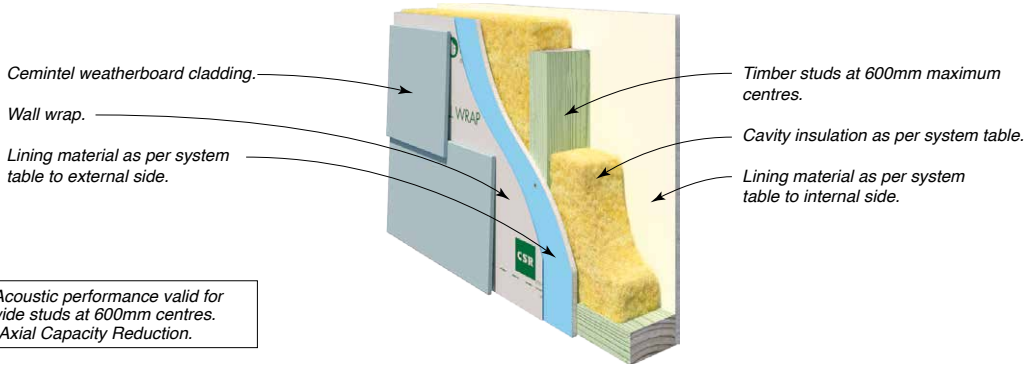
TABLE 14 Cemintel External Cladding Products

Weatherboard Products
Headland® Weatherboards
Endeavour® Weatherboards
Scarborough® Weatherboards
Balmoral™ Weatherboards
Aspect Cladding®
Plank
Sheet Products
Cladding Sheet
Texture Base Sheet
SimpleLine®
Edge™ Cladding
Mosiac®

04 CEMINTEL WALL SYSTEM SOLUTIONS

TABLE 15 Cemintel Weatherboards – Direct Fixed – Timber Frame

SYSTEM SPECIFICATIONS **Cemintel Weatherboards – Direct Fixed – Timber Frame**



NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres.
**ACR = Axial Capacity Reduction.*

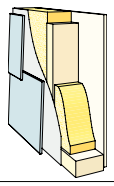
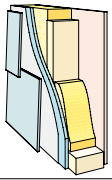
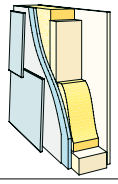
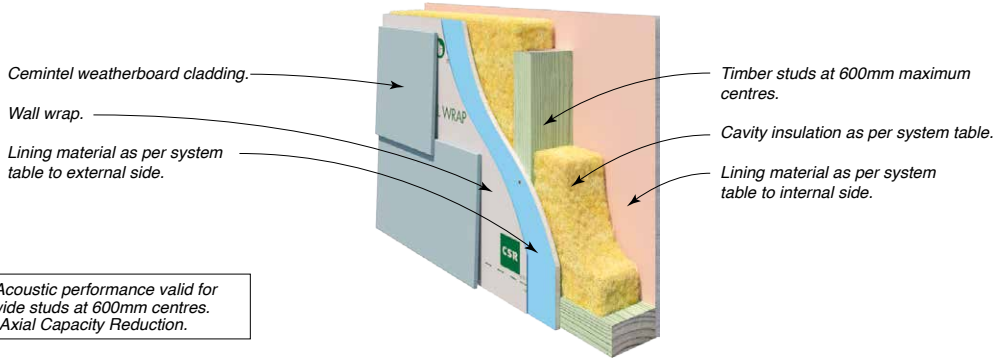
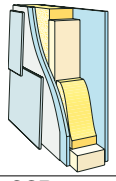
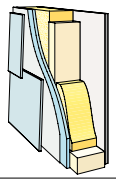
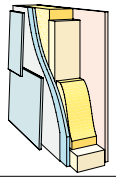
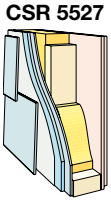
SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	**70**		**90**	
FRL Report/Opinion	**SYSTEM N°**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**
– /– / –	**CSR 5502** 	EXTERNAL WALL SIDE • Nil INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	36/27	1.5/1.7	38/29	1.5/1.7
			(b) 90 Gold Batts R2.0	–	–	38/29	2.1/2.3
			(c) 90 Gold Batts R2.5	–	–	39/30	2.6/2.8
			Min. Wall Thickness mm	90		110	
30/30/30 (from both sides) FAR2303	**CSR 5505** 	EXTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	42/33	1.6/1.8	44/35	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	44/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	45/36	2.7/2.9
			Min. Wall Thickness mm	106		126	
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5510** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	39/30	1.6/1.8	41/32	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	41/32	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	42/33	2.7/2.9
			Min. Wall Thickness mm	106		126	

TABLE 16 **Cemintel Weatherboards – Direct Fixed – Timber Frame**

SYSTEM SPECIFICATIONS Cemintel Weatherboards – Direct Fixed – Timber Frame



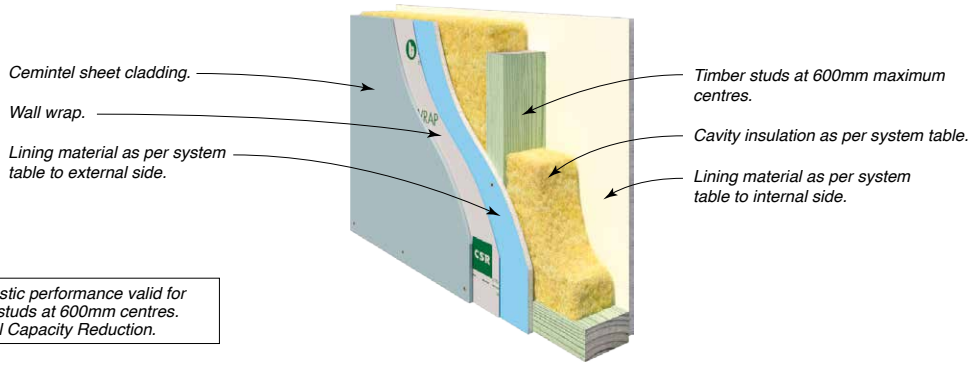
*NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres. *ACR = Axial Capacity Reduction.*

SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	70		90	
FRL Report/Opinion	**SYSTEM Nº**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5512** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Aquachek Plasterboard.	(a) 75 Gold Batts R1.5	41/32	1.6/1.8	43/34	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	43/34	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	44/35	2.7/2.9
			Min. Wall Thickness mm	106		126	
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5514** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Superchek Plasterboard.	(a) 75 Gold Batts R1.5	42/33	1.6/1.8	44/35	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	44/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	45/36	2.7/2.9
			Min. Wall Thickness mm	106		126	
60/60/60 (from both sides) FAR2303	**CSR 5520** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	43/35	1.6/1.8	45/37	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	45/37	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/38	2.7/2.9
			Min. Wall Thickness mm	112		132	
60/60/60 90/90/90* (from both sides) *ACR Group 3 FAR2303	**CSR 5527** 	EXTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard (against frame) • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 2 x 13mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	47/39	1.6/1.8	49/41	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	49/41	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	50/42	2.7/2.9
			Min. Wall Thickness mm	128		148	

04 CEMINTEL WALL SYSTEM SOLUTIONS

TABLE 17 **Cemintel Sheet – Direct Fixed – Timber Frame**

SYSTEM SPECIFICATIONS Cemintel Sheet – Direct Fixed – Timber Frame



NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres.
**ACR = Axial Capacity Reduction.*

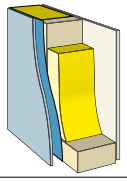
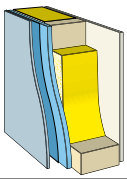
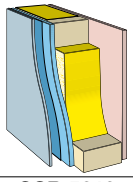
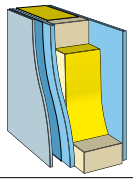
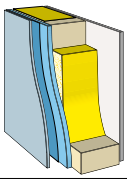
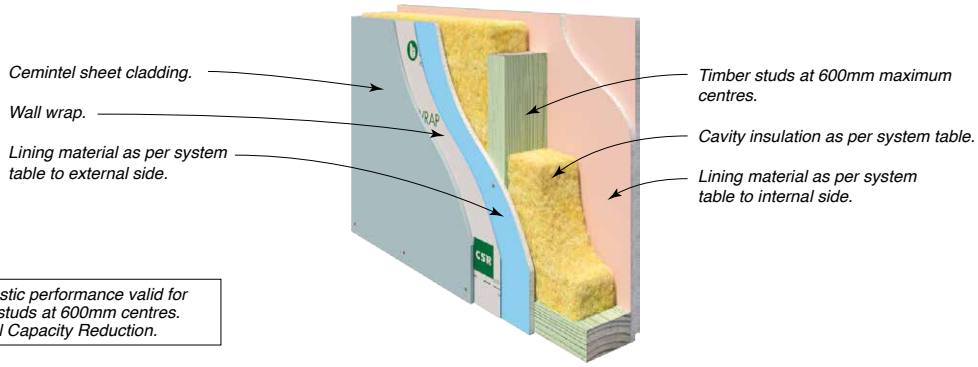
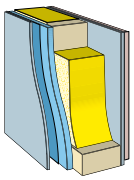
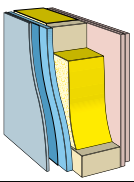
SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	70		90	
FRL Report/Opinion	**SYSTEM Nº**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$
– /– / –	**CSR 5603** 	EXTERNAL WALL SIDE • Nil INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	36/27	1.5/1.7	38/29	1.5/1.7
			(b) 90 Gold Batts R2.0	–	–	38/29	2.1/2.3
			(c) 90 Gold Batts R2.5	–	–	39/30	2.6/2.8
			Wall Thickness mm	91		111	
60/60/60* (from outside only) *ACR Group 1 FAR2303	**CSR 5605** 	EXTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	40/31	1.6/1.8	42/33	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	42/33	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/34	2.7/2.9
			Wall Thickness mm	104		124	
60/60/60* (from both sides) *ACR Group 1 FAR2303	**CSR 5608** 	EXTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	43/34	1.6/1.8	45/36	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	45/36	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/37	2.7/2.9
			Wall Thickness mm	110		130	
60/60/60 (from outside only) FAR2303	**CSR 5613** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Aquachek Plasterboard.	(a) 75 Gold Batts R1.5	42/33	1.6/1.8	44/35	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	44/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	45/36	2.7/2.9
			Wall Thickness mm	107		127	
60/60/60 (from outside only) FAR2303	**CSR 5615** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Superchek Plasterboard.	(a) 75 Gold Batts R1.5	43/34	1.6/1.8	45/36	1.6/1.8
			(b) 90 Gold Batts R2.0	–	–	45/36	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/37	2.7/2.9
			Wall Thickness mm	107		127	

TABLE 18 **Cemintel Sheet – Direct Fixed – Timber Frame**

SYSTEM SPECIFICATIONS Cemintel Sheet – Direct Fixed – Timber Frame



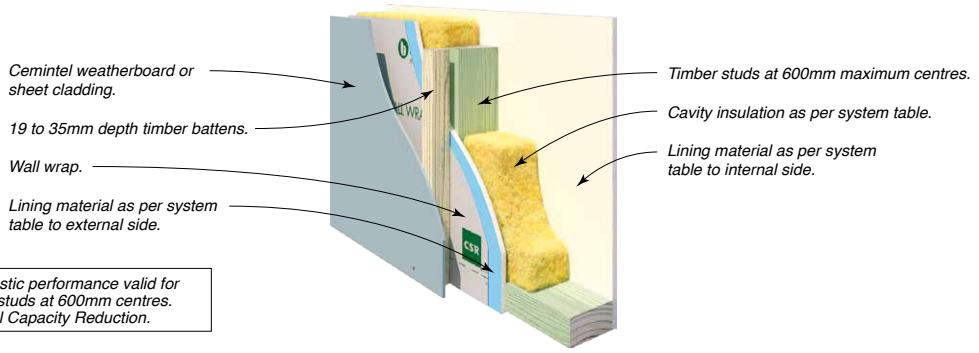
NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres.
**ACR = Axial Capacity Reduction.*

SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	**70**		**90**	
FRL Report/Opinion	**SYSTEM N°**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**
60/60/60 90/90/90* (from both sides) *ACR Group 3 FAR2303	**CSR 5618** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard (against frame) • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	47/39	1.6/1.8	49/41	1.6/1.8
			(b) 90 Gold Batts R2.0	-	–	49/41	2.2/2.4
			(c) 90 Gold Batts R2.5	-	–	50/42	2.7/2.9
			Wall Thickness mm	119		139	
60/60/60 90/90/90* (from both sides) *ACR Group 3 FAR2303	**CSR 5623** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 2 x 13mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	47/39	1.6/1.8	49/41	1.6/1.8
			(b) 90 Gold Batts R2.0	-	–	49/41	2.2/2.4
			(c) 90 Gold Batts R2.5	-	–	50/42	2.7/2.9
			Wall Thickness mm	123		143	

04 CEMINTEL WALL SYSTEM SOLUTIONS

TABLE 19 **Cemintel Sheet or Weatherboard – With Cavity – Timber Frame**

SYSTEM SPECIFICATIONS **Cemintel Sheet or Weatherboard – With Cavity – Timber Frame**



NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres.
**ACR = Axial Capacity Reduction.*

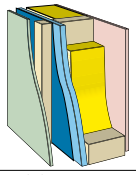
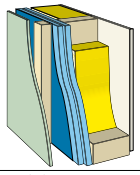
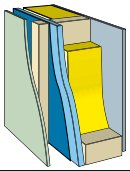
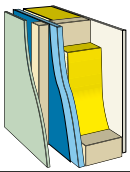
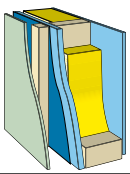
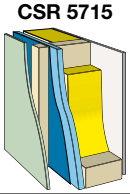
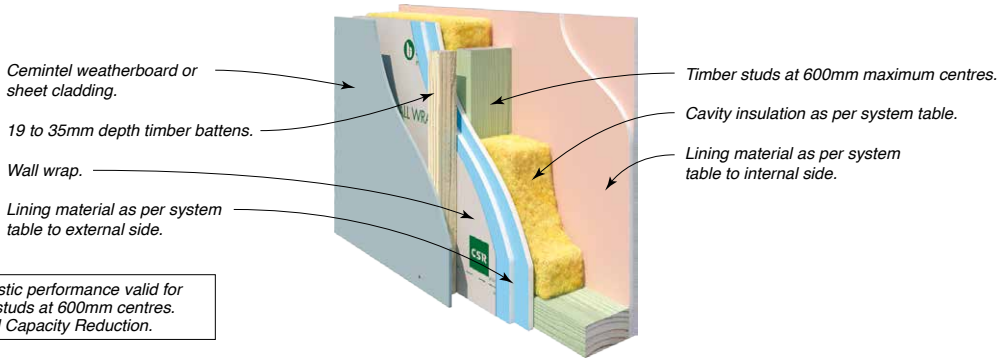
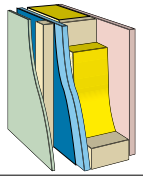
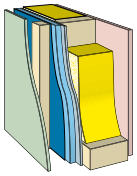
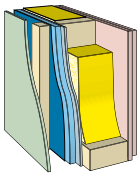
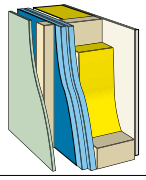
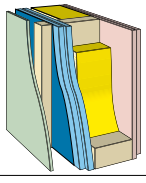
SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	70		90	
FRL Report/Opinion	**SYSTEM N°**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**
30/30/30 (from both sides) FAR2303	**CSR 5703** 	EXTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	40/30	1.6/1.7	42/32	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	42/32	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/33	2.6/2.9
			Min. Wall Thickness mm	121		141	
90/90/90 (from outside only) FAR2303	**CSR 5706** 	EXTERNAL WALL SIDE • 2 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	40/29	1.6/1.7	42/31	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	42/31	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/32	2.6/2.9
			Min. Wall Thickness mm	131		151	
30/30/30 (from outside only) FAR2303	**CSR 5709** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard.	(a) 75 Gold Batts R1.5	40/30	1.6/1.7	42/32	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	42/32	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/33	2.6/2.9
			Min. Wall Thickness mm	117		137	
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5711** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	38/27	1.6/1.7	40/29	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	40/29	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	41/30	2.6/2.9
			Min. Wall Thickness mm	121		141	
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5713** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Aquachek Plasterboard.	(a) 75 Gold Batts R1.5	39/28	1.6/1.7	41/30	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	41/30	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	42/31	2.6/2.9
			Min. Wall Thickness mm	121		141	
60/60/60* (from outside only) *ACR Group 2 FAR2303	**CSR 5715** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Superchek Plasterboard.	(a) 75 Gold Batts R1.5	40/30	1.6/1.7	42/32	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	42/32	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/33	2.6/2.9
			Min. Wall Thickness mm	121		141	

TABLE 20 Cemintel Sheet or Weatherboard – With Cavity – Timber Frame

SYSTEM SPECIFICATIONS Cemintel Sheet or Weatherboard – With Cavity – Timber Frame



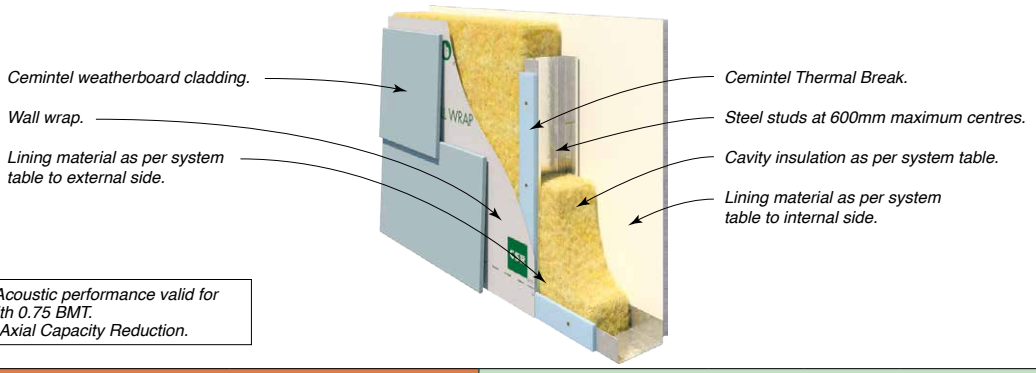
NOTE: Acoustic performance valid for 35mm wide studs at 600mm centres.
**ACR = Axial Capacity Reduction.*

SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	**70**		**90**	
FRL Report/Opinion	**SYSTEM N°**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**
60/60/60 (from both sides) FAR2303	**CSR 5716** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	41/31	1.6/1.7	43/33	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	43/33	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	44/34	2.6/2.9
			Min. Wall Thickness mm	127		147	
60/60/60 (from both sides) **90/90/90*** (from outside only) *ACR Group 3 FAR2303	**CSR 5718** 	EXTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard, (against studs). • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	43/33	1.6/1.7	45/35	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	45/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/36	2.6/2.9
			Min. Wall Thickness mm	133		153	
90/90/90* (from both sides) ACR Group 3 FAR2303	**CSR 5720** 	EXTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard (against studs). • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 2 x 13mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	45/36	1.6/1.7	47/38	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	47/38	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	48/39	2.6/2.9
			Min. Wall Thickness mm	143		163	
120/120/120 (from outside only) FAR2303	**CSR 5722** 	EXTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	41/30	1.6/1.7	43/32	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	43/32	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	44/33	2.6/2.9
			Min. Wall Thickness mm	137		157	
120/120/120 (from both sides) FAR2303	**CSR 5724** 	EXTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	46/37	1.6/1.7	48/39	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	48/39	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	49/40	2.6/2.9
			Min. Wall Thickness mm	159		179	

04 CEMINTEL WALL SYSTEM SOLUTIONS

TABLE 21 Cemintel Weatherboards – Direct Fixed – Steel Frame

SYSTEM SPECIFICATIONS **Cemintel Weatherboards – Direct Fixed – Steel Frame**



NOTE: Acoustic performance valid for studs with 0.75 BMT.
**ACR = Axial Capacity Reduction.*

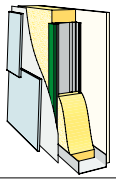
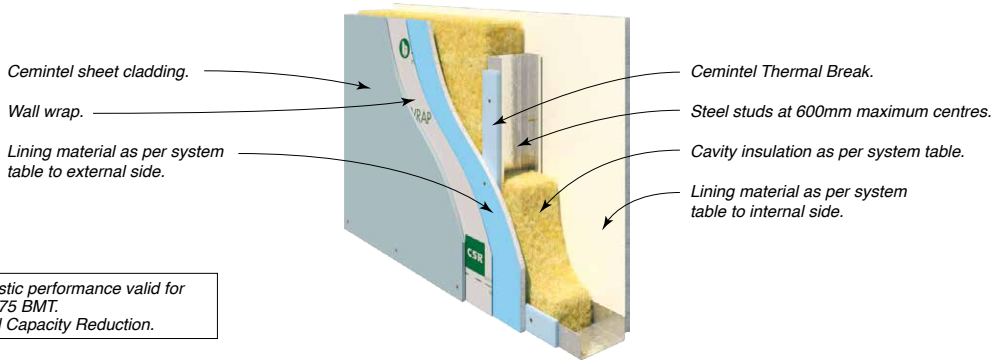
SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
FRL Report/Opinion	SYSTEM Nº	WALL LININGS	STUD DEPTH mm	70		90	
			CAVITY INFILL (Refer to TABLE B6)	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$
– /– / –	CSR 5010 	EXTERNAL WALL SIDE • Nil INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	39/30	1.5/1.7	41/32	1.5/1.7
			(b) 90 Gold Batts R2.0	–	–	41/32	2.1/2.3
			(c) 90 Gold Batts R2.5	–	–	42/33	2.6/2.8
			Min. Wall Thickness mm	96		116	

TABLE 22 Cemintel Sheets – Direct Fixed – Steel Frame



NOTE: Acoustic performance valid for studs with 0.75 BMT.
**ACR = Axial Capacity Reduction.*

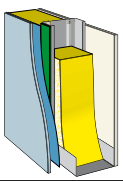
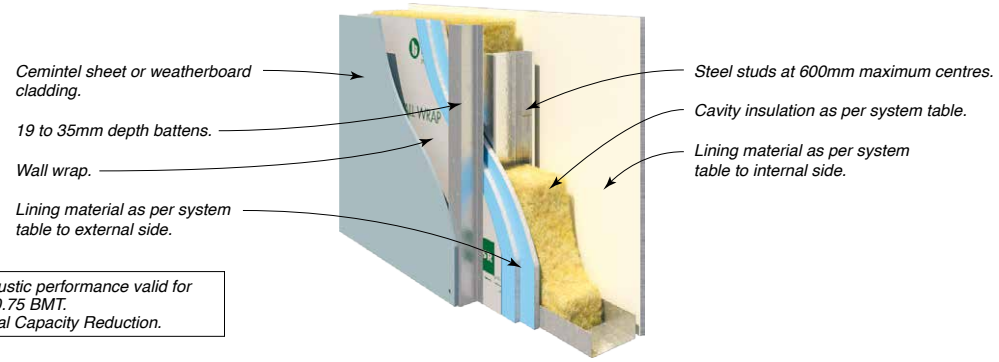
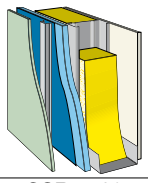
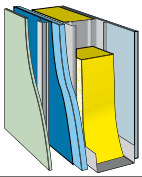
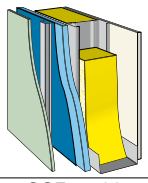
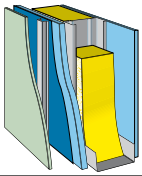
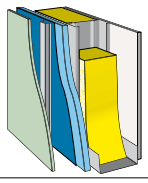
SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
FRL Report/Opinion	SYSTEM Nº	WALL LININGS	STUD DEPTH mm	70		90	
			CAVITY INFILL (Refer to TABLE B6)	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$
– /– / –	CSR 5030 	EXTERNAL WALL SIDE • Nil. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	40/31	1.5/1.7	41/32	1.5/1.7
			(b) 90 Gold Batts R2.0	–	–	41/32	2.1/2.3
			(c) 90 Gold Batts R2.5	–	–	42/33	2.6/2.8
			Wall Thickness mm	92		112	

TABLE 23 Cemintel Sheet or Weatherboards – With Cavity – Steel Frame

SYSTEM SPECIFICATIONS Cemintel Sheet or Weatherboards – With Cavity – Steel Frame



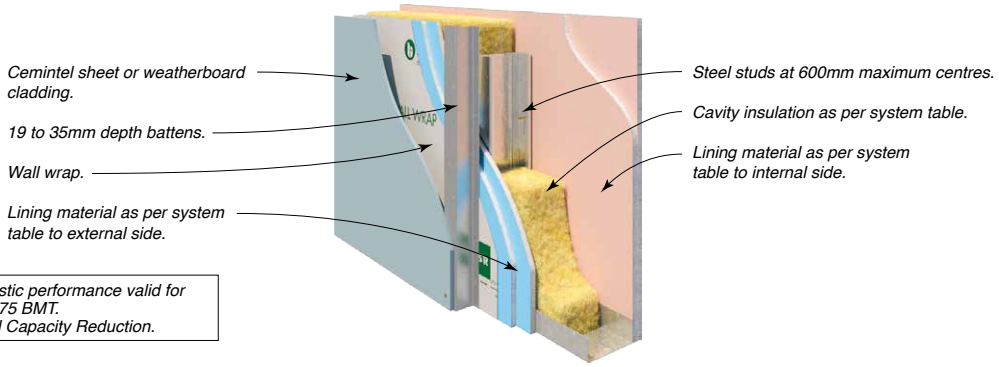
NOTE: Acoustic performance valid for studs with 0.75 BMT.
**ACR = Axial Capacity Reduction.*

SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	**70**		**90**	
FRL Report/Opinion	**SYSTEM N°**	**WALL LININGS**	**CAVITY INFILL** (Refer to TABLE B6)	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**	**R_w / R_w+C_{tr}**	**$R_{t(sum)}$ / $R_{t(win)}$**
30/30/30 (from outside only) FC 12946	**CSR 5152** 	EXTERNAL WALL SIDE • 1 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	39/28	1.6/1.7	41/30	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	41/30	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	42/31	2.6/2.9
			Minimum Wall Thickness mm	118		138	
30/30/30 (from outside only) FC 12946	**CSR 5160** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 6mm CeminSeal Wallboard.	(a) 75 Gold Batts R1.5	43/33	1.6/1.7	45/35	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	45/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/36	2.6/2.9
			Minimum Wall Thickness mm	117		137	
60/60/60* (from outside only) *ACR 5% FC 12946	**CSR 5161** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	40/29	1.6/1.7	42/31	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	42/31	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	43/32	2.6/2.9
			Minimum Wall Thickness mm	121		141	
60/60/60* (from outside only) *ACR 5% FC 12946	**CSR 5163** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Aquachek Plasterboard.	(a) 75 Gold Batts R1.5	42/31	1.6/1.7	44/33	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	44/33	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	45/34	2.6/2.9
			Minimum Wall Thickness mm	121		141	
60/60/60* (from outside only) *ACR 5% FC 12946	**CSR 5165** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Superchek Plasterboard.	(a) 75 Gold Batts R1.5	43/33	1.6/1.7	45/35	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	45/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/36	2.6/2.9
			Minimum Wall Thickness mm	121		141	

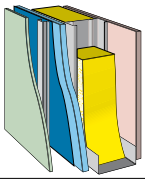
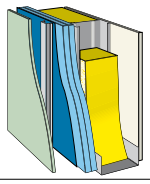
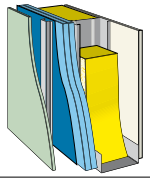
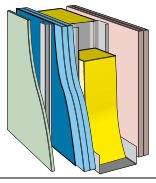
04 CEMINTEL WALL SYSTEM SOLUTIONS

TABLE 24 Cemintel Sheet or Weatherboards – With Cavity – Steel Frame

SYSTEM SPECIFICATIONS Cemintel Sheet or Weatherboards – With Cavity – Steel Frame



NOTE: Acoustic performance valid for studs with 0.75 BMT.
**ACR = Axial Capacity Reduction.*

SYSTEM SPECIFICATION			ACOUSTIC OPINION: PKA-A119				
			STUD DEPTH mm	70		90	
FRL Report/Opinion	SYSTEM Nº	WALL LININGS	CAVITY INFILL (Refer to TABLE B6)	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$	R_w / R_w+C_{tr}	$R_{t(sum)}$ / $R_{t(win)}$
60/60/60 **90/90/90*** (from both sides) *ACR 15% FC 12946	**CSR 5168** 	EXTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	45/35	1.6/1.7	47/37	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	47/37	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	48/38	2.6/2.9
			Minimum Wall Thickness mm	127		147	
90/90/90 (from outside only) FC 12946	**CSR 5170** 	EXTERNAL WALL SIDE • 2 x 13mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	43/32	1.6/1.7	45/34	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	45/34	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	46/35	2.6/2.9
			Minimum Wall Thickness mm	131		151	
120/120/120 (from outside only) FC 12946	**CSR 5172** 	EXTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 1 x 10mm Gyprock Plus Plasterboard.	(a) 75 Gold Batts R1.5	44/33	1.6/1.7	46/35	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	46/35	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	47/36	2.6/2.9
			Minimum Wall Thickness mm	137		157	
120/120/120 **– /180/180** (from both sides) FC 12946	**CSR 5174** 	EXTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek MR Plasterboard. INTERNAL WALL SIDE • 2 x 16mm Gyprock Fyrchek Plasterboard.	(a) 75 Gold Batts R1.5	50/41	1.6/1.7	52/43	1.6/1.7
			(b) 90 Gold Batts R2.0	–	–	52/43	2.2/2.4
			(c) 90 Gold Batts R2.5	–	–	53/44	2.6/2.9
			Minimum Wall Thickness mm	159		179	

DESIGN TABLES – CAVITY SYSTEM FRAMING

05

Cavity System – Cladding Fixed Through Battens to Structural Framing

For cavity systems with the cladding fixed to the structural framing (i.e., studs), the battens act as a spacer to generate the required cavity width with the cladding fixed through the batten and to the structural framing using a nail or screw. These battens are referred to as non-structural battens and include the following types:

- 20mm maximum timber; and
- 19mm Cemintel FC Batten.

The Cemintel FC Batten can be difficult to install a screw and it is recommended pre-drilling the battens for fixing into timber framing and using a 'Wing tek' styled screw for fixing to steel framing. Important: the fastener length shall be increased to accommodate the thicknesses of additional layers and ensure the minimum required fastener embedment depth is achieved.

Cavity System – Cladding Fixed to the Batten/Top Hat Framing

For cavity systems with the cladding fixed to the battens/top hats, these systems have a wider cavity behind the external Cemintel cladding. The battens and top hats that support the claddings are referred to as structural battens or structural top hats. The battens and top hats have adequate capacity to support the cladding and are fixed at larger fastener spacing centres than the fastener spacing of cladding over non-structural battens. Important: the designer should ensure the durability is adequate to suit the application.

With the exception of the Mosaic, Edge and SimpleLine claddings, the Cemintel FC Batten shall not be used as a structural batten.

It is recommended to align the structural studs and battens/top hats. Refer to Stud Set-Out to minimise the additional structural framing and design required to support the structural battens/top hats position Off-Stud.

Typically a minimum timber batten depth of 35mm will be required to provide adequate embedment depth of the cladding fixing. Lengths of fixings need to consider the protruding fixing depth to ensure the wall wrap is not damage by the screw, and the length of the cutting head to ensure sufficient thread engagement of the screw and top hat.

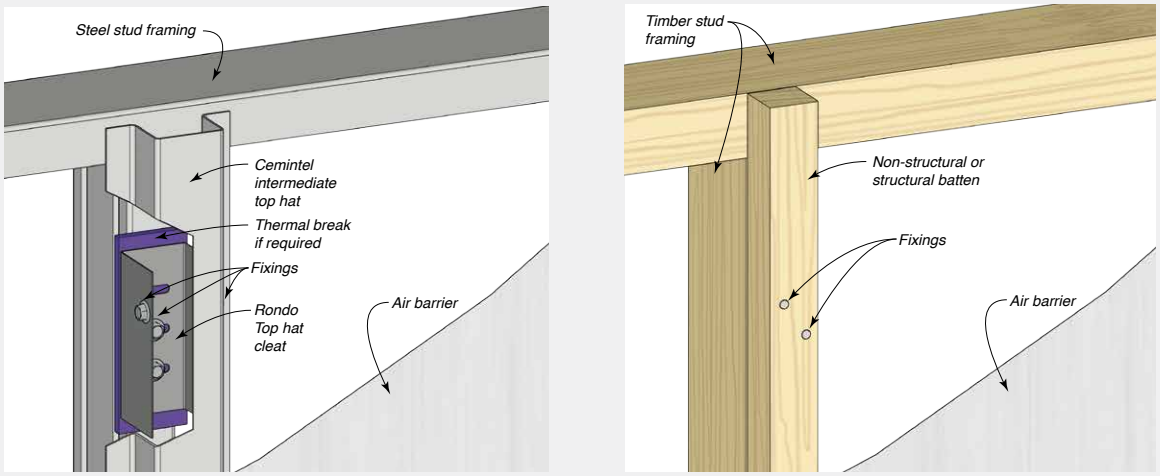
Batten and Top Hat Arrangements

Stud Wall Support Framing – 'On-Stud' Fixing

Structural and non-structural timber battens and top hats may be fixed 'on-stud' to the stud of the structural wall framing designed from MGP10 or higher grade timber framing, or a minimum 0.5mm BMT steel framing depending on wall system, refer to Figure 5.01. The battens and top hats should be arranged to not restrict the structural movement of the wall framing.

The stud frame walls designed to meet the structural requirements of the project, need to be designed to also support the cladding and associated battens and top hats.

FIGURE 5.01 Structural Timber Battens and Steel Top Hats Fixed to Studs of the Structural Framing – 'On-Stud' Fixing



05

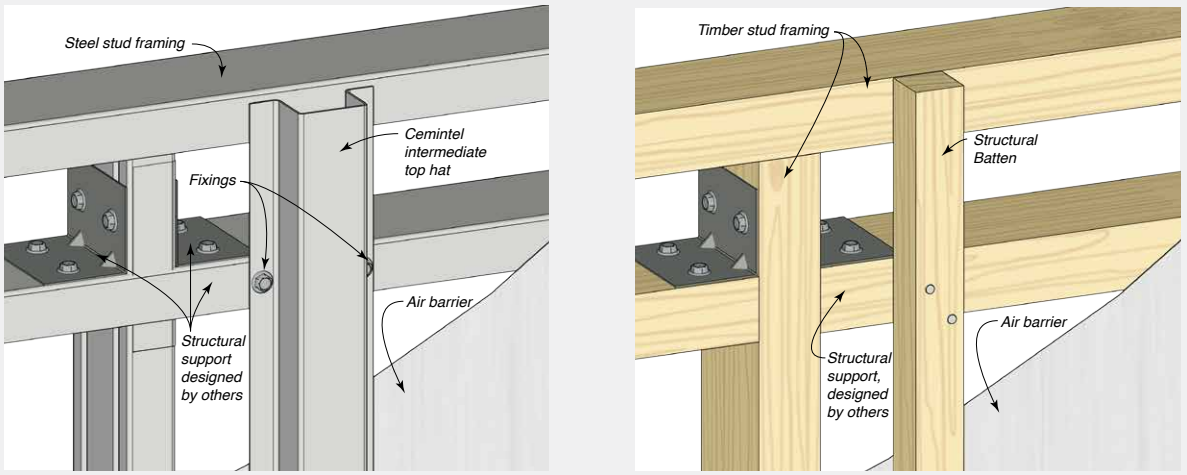
DESIGN TABLES – CAVITY SYSTEM FRAMING

Horizontal Structural Wall Supports – 'Off-Stud' Fixing

Structural timber battens and steel top hats may be fixed 'off-stud' to horizontal structurally designed timber or steel support framing of a minimum 1.15mm BMT, refer to Figure 5.02. It is the responsibility of the project engineer to specify this additional horizontal support structure and connections with an equivalent or better performance than those documented in this guide.

Where the top plates and bottom plates of the structural framing permit movement, such as deflection at an inter-storey junction, the wall framing will require additional horizontal structural supports near the plates for the battens and top hats. Also the battens and top hats will need to be discontinuous with an adequate gap to accommodate the structural movement.

FIGURE 5.02 Structural Timber Battens and Steel Top Hats Fixed to Additional Horizontal Structural Supports – 'Off-Stud' Fixing



Design Tables – Cemintel Sheet Products

FIGURE 5.03 Typical Cemintel FC Batten Installation

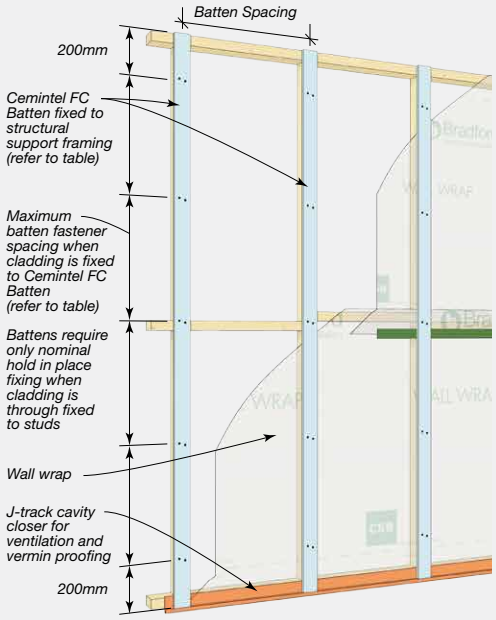


TABLE 25 **Cemintel Sheet Product Systems – Design Tables for DOUBLE SPAN Cemintel FC Batten Fastener Spacing – RESIDENTIAL (Class 1 and Class 10)**

NOTE: This table applies to the fasteners to fix the structural Cemintel FC Batten when used for fixing Mosaic, Edge and SimpleLine claddings to the batten. Provide a double (2) nail or a single screw fixing, U.N.O., at the timber batten connections. The minimum structural grade of the timber framing is MGP10 and the minimum steel framing is 0.50mm BMT. The structural capacity of all support locations to be confirmed by the project engineer.
When cladding is fixed through the battens and into the structural framing, then the battens require nominal fixing to hold in-place during the cladding installation. The maximum span values are applicable in General Zones and Corner Zones. Provide fasteners in accordance with Cemintel product installation guide.

Cemintel FC Batten Spacing (mm)	Wind Classification	Maximum Cemintel FC Batten Fastener Spacing – Double Span (mm)			
		Structural Framing Type			
		Timber*		Steel	
				0.5mm BMT	0.75mm BMT
		Structural Framing Type			
		2 – 2.8mmø x 50mm Nails	1 – 8-10 x 50mm Screw	1 – 10-18 x 30mm FibreTEKS® Screw	1 – 10-18 x 30mm FibreTEKS® Screw
300	N1	800	800	800	800
	N2	800	800	800	800
	N3/C1	600	600	600	600
	N4/C2	500	500	500	500
	N5/C3	350	400	400	400
450	N1	700	700	700	700
	N2	650	650	650	650
	N3/C1	500	500	500	500
	N4/C2	350	400	400	400
	N5/C3	200	350	250	350
600	N1	650	650	650	650
	N2	550	550	550	550
	N3/C1	400	450	450	450
	N4/C2	250	350	300	350
	N5/C3	180	300	200	300

① GENERAL ZONES – Wall areas greater than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
② CORNER ZONES – Wall areas less than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
NOTE: Loads based on AS 4055 with Factored external pressure coefficient, kl.Cp,e = -1.3 & ±0.7
* - denotes a 600mm maximum batten span where sheets are to be hand nailed.
U.N.O. – denotes unless noted otherwise.

05 DESIGN TABLES – CAVITY SYSTEM FRAMING

FIGURE 5.04 Typical Timber Batten Installation

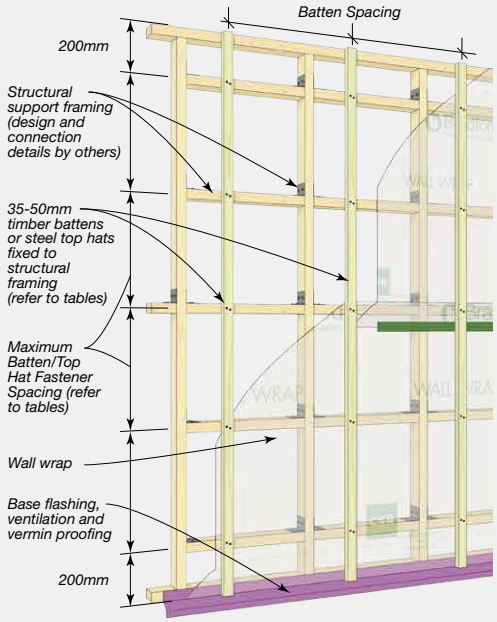


TABLE 26 **Cemintel SHEET Product Systems – Design Tables for Batten / Top Hat Fastener Spacing – RESIDENTIAL (Class 1 and Class 10)**

NOTE: This table applies to structural battens and top hats that support Cemintel Sheet Products.

NOTE: This table applies to the fasteners to fix the structural battens (45mm/70mm wide x 35mm thick F5/MGP10 minimum timber battens) and steel top hats (0.75mm BMT) to framing. Provide a double (2) nail or a single screw fixing, U.N.O., at the timber batten connections. The minimum structural grade of the timber framing is MGP10 and the minimum steel framing is 0.50mm BMT. The structural capacity of all support locations to be confirmed by the project engineer. Provide fasteners in accordance with Cemintel product installation guide.

Maximum Batten Spacing (mm)	Wind Classification	Maximum Batten/Top Hat Fastener Spacing (mm)					
		Batten Type and Wind Load Zone					
		Timber Batten* 45mm (w) x 35mm (d)		Timber Batten* 70mm (w) x 35mm (d)		Intermediate Top Hat 35mm (d) x 0.75mm BMT	
		General Zone ①	Corner Zone ②	General Zone ①	Corner Zone ②	General Zone ①	Corner Zone ②
300	N2	1600	1000	1850	1000	2600	1450
	N3/C1	1200	650	1200	650	1700	900
	N4/C2	800	400	800	400	1150	600
	N5/C3	550	250	550	250	750	400
400/450	N2	1250	650	1250	650	1750	950
	N3/C1	800	400	800	400	1150	600
	N4/C2	500	250	500	250	750	400
600	N1	1250	700	1300	700	1850	1000
	N2	900	500	900	500	1350	700
	N3/C1	600	300	600	300	850	450

① GENERAL ZONES – Wall areas greater than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
② CORNER ZONES – Wall areas less than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
NOTE: Loads based on AS 4055 with Factored external pressure coefficient, , kl.Cp,e = -1.3 & ±0.7
* - denotes a 600mm maximum batten span where sheets are to be hand nailed.
U.N.O. – denotes unless noted otherwise.

DESIGN TABLES – CAVITY SYSTEM FRAMING

05

FIGURE 5.05 Typical Timber Batten Installation

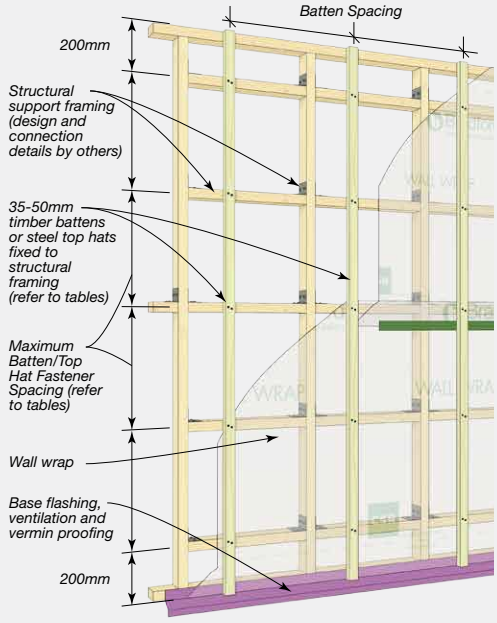


TABLE 27 **Cemintel SHEET Product Systems – Design Tables for Batten / Top Hat Fastener Spacing – COMMERCIAL (Class 2 to Class 9)**

NOTE: This table applies to structural battens and top hats that support Cemintel Sheet Products.

NOTE: This table applies to the fasteners to fix the structural battens (45mm/70mm wide x 35mm thick F5/MGP10 minimum timber battens) and steel top hats (0.75mm BMT) to framing. Provide a double (2) nail or a single screw fixing, U.N.O., at the timber batten connections. The minimum structural grade of the timber framing is MGP10 and the minimum steel framing is 0.50mm BMT. The structural capacity of all support locations to be confirmed by the project engineer. Provide fasteners in accordance with Cemintel product installation guide.

Maximum Batten Spacing (mm)	Design Ultimate Limit State Pressure (kPa)	Maximum Batten/Top Hat Fastener Spacing (mm)					
		Batten Type and Support Framing					
		Timber Batten* 45mm (w) x 35mm (d)		Timber Batten* 70mm (w) x 35mm (d)		Intermediate Top Hat 35mm (d) x 0.75mm BMT	
		Timber	Steel	Timber	Steel	Timber	Steel
300	1	1250	1250	1450	1250	2550	2550
	1.5	1100	800	1100	800	1750	1200
	2	800	600	800	600	1550	900
	2.5	650	500	650	500	1350	700
	3	550	400	550	400	1200	600
	3.5	450	350	450	350	1100	500
	4	400	300	400	300	1000	450
	4.5	350	250	350	250	900	400
	5	300	250	300	250	850	350
400/450	1	1100	800	1100	800	2250	2250
	1.5	700	550	700	550	1450	800
	2	550	400	550	400	1200	600
	2.5	400	300	400	300	1050	450
	3	350	250	350	250	900	400
	3.5	300	200	300	200	850	300
600	1	800	600	800	600	2000	1800
	1.5	550	400	550	400	1200	600
	2	400	300	400	300	1000	450

NOTE: Loads based on AS/NZS 1170.2 with Factored external pressure coefficient, $k_l.C_{p,e}$ = -1.3 & ±0.7
* - denotes a 600mm maximum batten span where sheets are to be hand nailed.

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DESIGN TABLES – CAVITY SYSTEM FRAMING

Design Tables – Cemintel Weatherboard Products

FIGURE 5.06 Typical Timber Batten Installation

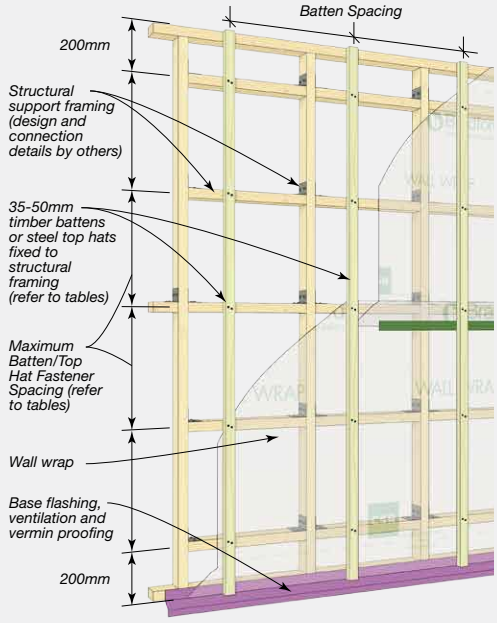

TABLE 28 **Cemintel WEATHRBOARD Product Systems – Design Tables for Batten / Top Hat Fastener Spacing – RESIDENTIAL (Class 1 and Class 10)**

NOTE: This table applies to structural battens and top hats that support Cemintel Weatherboard Products.

NOTE: This table applies to the fasteners to fix the structural battens (45mm/70mm wide x 35mm thick F5/MGP10 minimum timber battens) and steel top hats (0.75mm BMT) to framing. Provide a double (2) nail or a single screw fixing, U.N.O., at the timber batten connections. The minimum structural grade of the timber framing is MGP10 and the minimum steel framing is 0.50mm BMT. The structural capacity of all support locations to be confirmed by the project engineer. Provide fasteners in accordance with Cemintel product installation guide.

Maximum Batten Spacing (mm)	Wind Classification	Maximum Batten/Top Hat Fastener Spacing (mm)					
		Batten Type and Wind Load Zone					
		Timber Batten* 45mm (w) x 35mm (d)		Timber Batten* 70mm (w) x 35mm (d)		Intermediate Top Hat 35mm (d) x 0.75mm BMT	
		General Zone ①	Corner Zone ②	General Zone ①	Corner Zone ②	General Zone ①	Corner Zone ②
300	N2	1200	750	1375	750	1950	1075
	N3/C1	900	475	900	475	1275	675
	N4/C2	600	300	600	300	850	450
	N5/C3	400	175	400	175	550	300
400/450	N2	925	475	925	475	1300	700
	N3/C1	600	300	600	300	850	450
	N4/C2	375	175	375	175	550	300
600	N1	925	525	975	525	1375	750
	N2	675	375	675	375	1000	525
	N3/C1	450	225	450	225	625	325

① GENERAL ZONES – Wall areas greater than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
② CORNER ZONES – Wall areas less than 1200mm from an External Building Corner for Buildings satisfying the AS 4055 geometry limits.
NOTE: Loads based on AS 4055 with Factored external pressure coefficient, kl.Cp,e = -1.3 & ±0.7
* - denotes a 600mm maximum batten span where sheets are to be hand nailed.
U.N.O. – denotes unless noted otherwise.

DESIGN TABLES – CAVITY SYSTEM FRAMING

05

FIGURE 5.07 Typical Timber Batten Installation

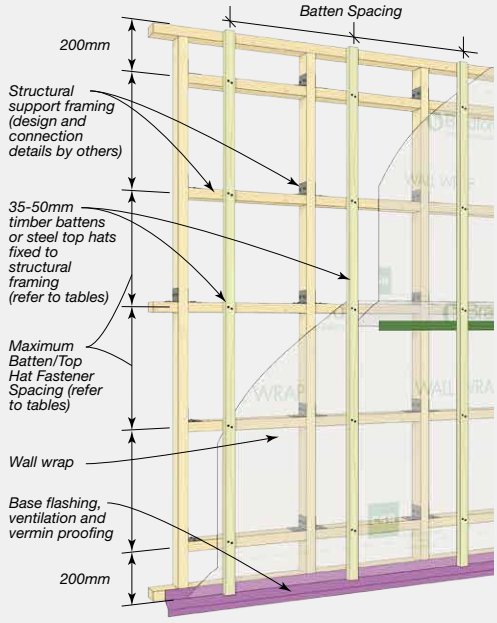

TABLE 29 **Cemintel WEATHERBOARD Product Systems – Design Tables for Batten / Top Hat Fastener Spacing – COMMERCIAL (Class 2 to Class 9)**

NOTE: This table applies to structural battens and top hats that support Cemintel Weatherboard Products.

NOTE: This table applies to the fasteners to fix the structural battens (45mm/70mm wide x 35mm thick F5/MGP10 minimum timber battens) and steel top hats (0.75mm BMT) to framing. Provide a double (2) nail or a single screw fixing, U.N.O., at the timber batten connections. The minimum structural grade of the timber framing is MGP10 and the minimum steel framing is 0.50mm BMT. The structural capacity of all support locations to be confirmed by the project engineer. Provide fasteners in accordance with Cemintel product installation guide.

Maximum Batten Spacing (mm)	Design Ultimate Limit State Pressure (kPa)	Maximum Batten/Top Hat Fastener Spacing (mm)					
		Batten Type and Support Framing					
		Timber Batten* 45mm (w) x 35mm (d)		Timber Batten* 70mm (w) x 35mm (d)		Intermediate Top Hat 35mm (d) x 0.75mm BMT	
		Timber	Steel	Timber	Steel	Timber	Steel
300	1	925	925	1075	925	1900	1900
	1.5	825	600	825	600	1300	900
	2	600	450	600	450	1150	675
	2.5	475	375	475	375	1000	525
	3	400	300	400	300	900	450
	3.5	325	250	325	250	825	375
	4	300	225	300	225	750	325
	4.5	250	175	250	175	675	300
	5	225	175	225	175	625	250
400/450	1	825	600	825	600	1675	1675
	1.5	525	400	525	400	1075	600
	2	400	300	400	300	900	450
	2.5	300	225	300	225	775	325
	3	250	175	250	175	675	300
	3.5	225	150	225	150	625	225
600	1	600	450	600	450	1500	1350
	1.5	400	300	400	300	900	450
	2	300	225	300	225	750	325

NOTE: Loads based on AS/NZS 1170.2 with Factored external pressure coefficient, $k_l.C_{p,e}$ = -1.3 & ±0.7
* - denotes a 600mm maximum batten span where sheets are to be hand nailed.

06

SAFETY, HANDLING + GENERAL CARE

Health, Safety and Personal Protection Equipment (PPE)

Cemintel products contain silicas that are harmful if inhaled. Protective clothing and breathing equipment should be worn when cutting products.

When cutting, drilling or grinding Balmoral Weatherboards using power tools, always ensure the work area is properly ventilated.

An approved dust mask (AS 1715 and AS 1716) and safety glass (AS 1337) must be worn. Cemintel recommends that hearing protection also be worn.

Safety Data Sheet information is available at www.cemintel.com.au

Managing Respirable Crystalline Silica dust

Crystalline Silica is everywhere. It is found naturally in stone, rocks, sand, gravel and clay. Sand is one of the raw materials in Fibre Cement. Respirable Crystalline Silica dust is the fine dust that's created when you use power tools to cut, drill, grind, chip or sand materials and products that contain crystalline silica. This dust is of concern due to its size as it gets caught deep in your lungs and can cause long term damage.

IF YOU USE THE CORRECT EQUIPMENT FIBRE CEMENT IS SAFE TO USE.

Cemintel Safety Requirements	
1 - Cut Outdoors*	The ventilation outdoors is greater than that indoors, and therefore should reduce exposure.
2 - Use On-Tool Dust Extraction	Use on-tool dust extraction when using power tools to drill and cut Fibre Cement, with a vacuum that contains a HEPA M Class filter.
3 - Correct Equipment	Use a plunge saw with a specifically designed Fibre Cement blade
4 - Don't Sweep, Vacuum instead	When completing your work vacuum with a HEPA M Class filter, rather than a broom as sweeping creates more dust.
5 - Use a Respirator	Use a half face P1 or P2 respirator. It is essential that the respirators are Fit Tested and workers are cleanly shaven to obtain a good sea

* Even though not recommended, indoor cutting can be completed when using an onsite cutting room with exhaust ventilation and a M class filter at a minimum, on-tool dust extraction with a vacuum with a HEPA M Class filter, a Full Face P2 respirator and conducting local occupational and static air monitoring to validate effectiveness of control measures.

Handling & General Care

Storage

Cemintel products must be stacked flat, clear of the ground and supported at 300mm maximum centres on a level platform unless noted otherwise. Sheets must be kept dry, preferably stored inside the building. Panels must be dry prior to fixing, hence if it is necessary to store outside, the product must be protected from the weather.

Handling

Cemintel products may be treated and must be handled with care during handling so as to avoid damage to edges and ends. Panels should be carried horizontally on edge by at least two people.

Cutting

Panels should be cut from the back using a power saw. Cemintel recommends using the Makita Plunge Saw Kit (1300kW) with guide rail and appropriate blade and vacuum extraction system.

All exposed cut edges MUST BE SEALED TO PREVENT MOISTURE ABSORPTION. Refer to 'Components' table for appropriate materials.

Penetrations

Penetrations in panels may be cut or drilled prior to installation. Cut from the back or drill from the front. Cut penetrations oversize by 8-10mm all around. Mask, prime and fill gaps with sealant in accordance with recommended methods and products.

WARRANTY, CLEANING + MAINTENANCE

07

Warranty

The product warranty duration is shown in the relevant Cemintel product installation guide.

The full product warranty is available for download at **www.cemintel.com.au**

Wash Down Process

An external coating system must be applied and maintenance of the coating system shall be in accordance with coating manufacturer's recommendation. The following is recommended as a minimum maintenance regime:

- Where sufficiently exposed, rain can perform a natural wash down of the wall and ongoing maintenance should be limited to occasional rinse down or using a soft cloth or soft brush (like a dust pan brush).
- Walls which are protected by soffits above must be washed down twice per year to remove salt and debris build up particularly at joints.
- Normal dirt can be removed with a soft brush and warm water up to 50 degrees, to which a small amount of dishwashing liquid or soap has been added. The panels should be rinsed with clear water before they dry.
- Calcifications should be removed with a 5% sulfamic acid solution or with a commercial lime remover. The façade should be rinsed with clear water after cleaning.
- Panels discoloured by algal growth should be treated with an algicide without bleaching agents. This application should be allowed to take effect for several days. Afterwards, clean the panels using the 'normal dirt' procedure above.
- When rinsing down panels, use no more than 700 psi (50kg/cm^2) of water pressure at a minimum of 3m to 3.5m distance from the face of the wall. Water pressure should be applied downward to avoid forcing water into joints and gaps.
- Use neutral detergent with a soft cloth or soft brush when removing dirty spots from a panel. When diluting the neutral detergent, follow the manufacturer's instructions and use the weakest solution possible.

Inspection, Repair and Maintenance

The durability of Cemintel wall systems can be enhanced by periodic inspection and maintenance. Inspections should include examination of the coatings, flashings and seals. Any cracked or damaged finish or seals which would allow water ingress must be repaired immediately by resealing the affected area, or by removing the panel and replacing sealant. Any damaged flashings, sheets or sealant must be replaced as for new work.

Regularly inspect panel surfaces and follow washdown procedures when required.

Ensure ventilation and drainage gaps between panels and flashings are clear of any debris.

It is recommended storing additional panels in case any panels are damaged in the future.

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10/2020