

C E M I N T E L<sup>®</sup>



COMPRESSED SHEET  
External Flooring System

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## Introduction

Cemintel® Compressed Sheet is a compressed, autoclaved, cellulose fibre reinforced, cement sheet.

Compressed Sheet has a smooth flat surface and a square edge finish. It is a dense, high strength, durable building product.

This Cemintel External Flooring Design and Installation Guide recommends good building practice and has been prepared as a general guide of design considerations, system engineering information and installation procedures for common external applications. It assumes that the user has an intermediate knowledge level of building design and construction. In no way does it replace the services of the building professionals required to

design projects, nor is it an exhaustive guide of all possible scenarios.

It is the responsibility of the architect, designer and various engineering parties to ensure that the details in this Design and Installation Guide are appropriate for the intended application.

Cemintel Compressed Sheet can be installed externally as Flooring or as an interior floor substrate. This guide refers to external installations only as components differ depending on the installation.

Refer to the 'Cemintel Wet Areas Design and Installation Guide' for instructions regarding internal applications.

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# 022

PRODUCT OVERVIEW



## Panel Information

Cemintel Compressed Sheets are available in the following sizes for flooring.

Thickness (mm)	Width (mm)	Length (mm)				
		1800	2100	2400	2700	3000
15	900	•	•	•	•	•
	1200	•	•	•	•	•
18	900	•		•		•
	1200	•		•		•
24	1200			•		

## Product Specifications

Cemintel compressed fibre cement sheeting conforms to the requirements of AS/NZS 2908.2 – Cellulose cement products, Part: 2 – Flat sheets, Category 5, Type A.

Property	Manufacturing Tolerance
Mass (nominal) 15mm thickness	28kg/m <sup>2</sup>
Mass (nominal) 18mm thickness	34kg/m <sup>2</sup>
Mass (nominal) 24mm thickness	45kg/m <sup>2</sup>
Length	+0, -3mm
Width	+0, -3mm
Thickness	+10%, -0%
Diagonals Difference (max)	3mm
Edge Straightness deviation (max)	1.5mm

## Fire Resistance

In accordance with the NCC 2022 C2D10 (5)(d) [NCC 2019: C1.9 (e)(iv)] Cemintel fibre cement sheets can be used wherever non-combustible material is required by the code. Early Fire Hazard Indices for Compressed Sheet are:

Property	Value
Ignitability	0
Spread of Flame	0
Heat Evolved	0
Smoke Developed	1
Group Number	1
SMOGRA <sub>RC</sub>	<= 0.2 (m <sup>2</sup> /s <sup>2</sup> x 1000)
Average Specific Extinction Area	<250m <sup>2</sup> /kg

# 03

SYSTEM OVERVIEW

## 03

## SYSTEM OVERVIEW

## Applications

Cemintel Compressed Sheet provides a solid substrate for external flooring, both upper and lower storey verandahs, and non-saltwater pool surrounds in residential buildings.

The Compressed Sheet substrate system combined with the required waterproofing system may then be covered with your selection of tiles, pebble finishes, synthetic turf, outdoor carpets or suitable paint.

## Advantages

- Tough durable substrate.
- Termite resistant.
- Manufactured from highly durable and robust fibre cement – panels will not rot, swell or warp when correctly installed and maintained.
- Fire – fibre cement sheets can be used where non-combustible material is required under the NCC provisions.
- A suitable substrate for all forms of finishing.

## System Selection

Cemintel External Flooring Systems are available for different applications, surface finishes and drainage conditions. Refer to Table 3.01 for details.

For upper storey floors over habitable rooms, select from the waterproof systems range. Where waterproofing is not critical, such as over non-habitable ground, the water resistant system may be used.

## Waterproof Systems

### Mortar Bed With Separating Layer System

The Compressed Sheet panels are laid directly on joists and covered with a waterproof sheet membrane. A separating layer or slip-sheet then separates the membrane from the mortar bed to accommodate minor movement.

Drainage to the floor edge may be provided by fall in the sheets or in the mortar bed, or the mortar bed may drain to a sump. Control joints in tiling need not correspond with sheet joints.

### Tiles With Liquid Membrane System

This system has an applied waterproof membrane directly over the Compressed Sheet. Tiles are fixed over the membrane, and drainage is provided by fall in the sheets. Control joints in tiling must correspond with sheet joints.

### Trafficable Membrane System

Membrane systems, laid directly over Compressed Sheet, are available that are suitable for foot traffic.

## Water Resistant Systems

### Water Resistant System

The Compressed Sheets are laid directly on joists and protected with tiles or other surface material. Drainage is provided by fall in the sheets and control joints in tiling must correspond with sheet joints.

### Drip Sheet System

This system uses a non-structural fibre cement sheet to support a plastic sheet that drains to the edge of the floor. Compressed Sheet panels are then laid on packing strips, over the drip sheet, to form a substrate for tiles or other trafficable surfacing. Control joints in tiling must correspond with sheet joints.

The system is suitable for floors up to 3m wide, and sheet joints remain accessible for maintenance.

SYSTEM OVERVIEW



System Selection Table

TABLE 3.01 Cemintel Compressed Sheet Systems for External Flooring Applications

External Flooring System	DESCRIPTION
<b>WATERPROOF SYSTEMS</b>	
<p>Suitable for Tile, Slate and all surface finishes</p> <p>Adhesive</p> <p>Mortar Bed</p> <p>Slip Sheet</p> <p>Waterproof Membrane</p> <p>Cemintel™ Compressed Sheet</p>	<p><b>Mortar Bed with Separating Layer System</b></p> <ul style="list-style-type: none"> <li>• Drain to edge of floor or sump.</li> <li>• Tile control joints need not correspond with sheet joints.</li> <li>• Suitable for all floor widths.</li> <li>• Water proof system.</li> </ul>
<p>Tiles or other surface finish</p> <p>Compressed sheet and surface finish joints must coincide. Joints filled with sealant.</p> <p>Waterproof membrane</p> <p>Adhesive</p> <p>Cemintel™ Compressed Sheet</p>	<p><b>Tiles with Liquid Membrane System</b></p> <ul style="list-style-type: none"> <li>• Drain to edge of deck.</li> <li>• Tile control joint must correspond with panel joints.</li> <li>• Suitable for all deck widths.</li> <li>• Water proof system.</li> </ul>
<p>Trafficable waterproof membrane</p> <p>Cemintel™ Compressed Sheet</p>	<p><b>Trafficable Membrane System</b></p> <ul style="list-style-type: none"> <li>• Drain to edge of floor.</li> <li>• Suitable for all floor widths.</li> <li>• Water proof system.</li> </ul>
<b>WATER RESISTANT SYSTEMS</b>	
<p>Tiles or other surface finish</p> <p>Compressed sheet and surface finish joints must coincide. Joints filled with sealant.</p> <p>Adhesive</p> <p>Flashing</p> <p>Cemintel™ Compressed Sheet</p>	<p><b>Water Resistant System</b></p> <ul style="list-style-type: none"> <li>• Drain to edge of floor.</li> <li>• Tile control joint must correspond with panel joints.</li> <li>• Suitable for all floor widths.</li> <li>• Suitable for paint finish.</li> <li>• Water resistant system.</li> </ul>
<p>Tiles or other surface finish</p> <p>Compressed sheet and surface finish joints must coincide. Joints filled with sealant.</p> <p>Adhesive</p> <p>Cemintel™ Cladding Sheet</p> <p>Cemintel™ Cladding Plank strips</p> <p>Drip Sheet</p> <p>Cemintel™ Compressed Sheet</p>	<p><b>Drip Sheet System</b></p> <ul style="list-style-type: none"> <li>• Drain to edge of floor.</li> <li>• Tile control joint must correspond with panel joints.</li> <li>• Maximum 3m floor width.</li> <li>• Water resistant system.</li> </ul>

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# 04

DESIGN + AESTHETIC  
CONSIDERATIONS



## DESIGN + AESTHETIC CONSIDERATIONS



**This guide provides detailed installation information for flooring systems with Cemintel Compressed Sheet in timber and steel construction. This section outlines some important areas for consideration in determining an appropriate design of the Cemintel Flooring Systems. The following points are not exhaustive. It is the responsibility of the architect / building designer to ensure the design conforms to NCC requirements and other relevant building standards that may exist for that location. It is recommended that the architect/building designer assigns the responsibility for the flooring design to the project engineer.**

This installation guide should be read in conjunction with the NCC, and design information presented in the CSR Cemintel® Facades & Cladding – Design Guide and CSR Gyprock The Red Book publications.

### Framing

Cemintel External Flooring Systems can be fixed to either timber or steel floor joists at maximum 300mm, 400mm, 450mm and 600mm spacings, and joists and trimmers must have a fixing face width of 45mm or to floor joist manufacturer's requirements. Joists must run in the direction of the fall. To reduce edge trimming, the long edge of the compressed sheets should be installed parallel to the joist direction.

**Handy Hint:** Wherever possible, plan joist and sheet layout to coincide with tile modules to avoid the need to cut tiles.

All compressed sheet edges must be supported on framing. Sheet joints must be constructed with a 5mm minimum gap, and joist spacing must be adjusted to accommodate.

As a minimum requirement, framing shall be in accordance with the following standard:

- AS 1684 – Residential Timber-Framed Construction.
- AS 1720.1-Timber Structures - Design method.
- AS/NZS 4600 – Cold-Formed Steel Structures.
- National Construction Code (NCC).

Timber shall be seasoned or have reached an equilibrium moisture content of 16% or less at the time of framing. Unseasoned timber is not recommended.

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. Fixings to steel joists are suitable up to a 2.0mm base metal thickness (BMT), contact CSR Cemintel™ for fixing information where steel BMT is greater than 2.0mm.

### Movement Joints

All joints between compressed sheets must be constructed as movement joints to allow for differential movement in the materials and the structure. Movement joints in the sheets should be aligned with movement joints provided in the framing.

### Sheet Layout

Cemintel External Flooring System sheets are fixed directly to the floor joists. Sheets are laid with the long edge parallel to the joists and must align with the centreline of joists. The ends of the sheets must be supported by trimmers and bearers. Sheets may be laid in the direction of the fall. All perimeters must be supported on framing.

Where sheets are cantilevered at the outer edge of a floor, the sheet edge must not extend more than 100mm beyond the frame/support, no concentrated point loading is permitted on the cantilever, and the maximum UDL live loading is 3kPa. Balustrades and other fittings must be connected to the structural framing.

### Loads

Cemintel External Flooring Systems have been designed to satisfy the live loads associated with activities outlined in AS/NZS 1170.1:2002 Table 4.01 and appropriate load combinations in AS/NZS 1170.0:2002. Not suitable for vehicle wheel loads. The 'Specific Uses' presented in Table 4.01 reflect the minimum imposed live load actions listed in Table 3.1 of AS/NZS 1170.1. Contact DesignLINK for further information on higher live load requirements.

For the "Waterproof Systems", except the "Drip Sheet System", shown in Table 3.01, Table 4.01 presents the maximum allowable unfactored live loads. For brittle floor coverings (i.e., tiles, grout screeds, mortar beds, underlay etc.) live loads satisfy a span/500 and 3mm maximum deflection limit under serviceability loading, appropriate load combinations in AS/NZS 1170.0 and a maximum superimposed dead load of 2.0kPa. For non-brittle floor coverings live loads satisfy a span/200 and 3mm maximum deflection limit and a maximum superimposed dead load of 1kPa. The unfactored loads have been based on the Cemintel compressed fibre cement sheeting having an Equilibrium Moisture Content (EMC) condition. It is the responsibility of the designer to specify the water proof membranes or sealants to prevent moisture ingress into the Cemintel compressed fibre cement sheets to maintain the EMC condition.



## DESIGN + AESTHETIC CONSIDERATIONS

For the “Water Resistant System” and “Drip Sheet System” with the maximum joist spacing shown in Table 4.02, the maximum allowable unfactored live loads are 3.0kPa and 1.8kN to satisfy a span/500 and 3mm maximum deflection limit under serviceability loading and appropriate load combinations in AS/NZS 1170.0, a maximum superimposed dead load of 0.5kPa. The unfactored loads have been based on the Cemintel compressed fibre cement sheeting having a Saturated (WET) condition.

**Cemintel External Flooring Systems must be installed over a minimum of 3 supporting joists to form a minimum ‘Double Span’ installation.** The blocking and/or trimmer requirements to ALL the edges of the sheeting are nominated in this guide.

### Membranes

Waterproofing membranes must meet the requirements of AS 4654.1 Waterproofing membranes for external above-ground use Part 1: Materials and be installed in accordance with AS 4654.2 Waterproofing membranes for external above-ground use Part 2: Design and installation.

Membranes may be required to resist a range of conditions, including chemical attack, ultra-violet light, heat aging, and temperatures from  $-15^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Low temperatures can result in reduced flexibility, and high temperatures can result in softening of the membrane.

The standard has specific details for the termination of membranes at vertical upward and downward locations (i.e., wall/floor junctions and penetrations, floor step-downs, post assemblies, drainage, gutters) and minimum overlap and clearance distances for flashings.

The details include methods of sealing, anchoring and protecting the membrane terminations.

For floors up to 4m from the ground in wind classifications N1 to N3 and C1, the vertical upward termination height is 100mm minimum. The termination height will increase for higher wind classifications and exposure conditions, and for greater floor heights.

### Drainage

Regardless of whether the floor is to be waterproof or not, floors must have a fall to facilitate drainage and prevent ponding. Floors must not be constructed level, and a fall of at least 1 in 100 is recommended. Where possible the fall should be provided in the framing, or as an alternative may be provided in a topping screed.

Whenever possible avoid draining into a sump as this can lead to water building up to a depth above flashings. If this is unavoidable, the mortar bed with separating layer system must be used. The use of a gutter at the edge of the floor can assist in the reduction of staining and prevent water tracking under the tiles and membrane.

The interior floor level at doors and other openings must be at a sufficient level above the finished floor surface to prevent water entering the building. The step should be at least 100mm, and equal to the membrane vertical upward termination height.

The code has specific details for the termination of membranes at vertical upward and downward locations. For floors up to 4m from the ground in wind classifications N1 to N3 and C1, the vertical upward termination height is 100mm. This increases for higher wind classifications and exposure conditions, and for greater floor heights.

The details include methods of sealing, anchoring and protecting the membrane terminations.

### Coastal Areas

Cemintel External Flooring Systems are suitable for use in coastal areas – Corrosivity Category C3: Medium – defined as up to 1km from a surf beach, or more than 200m from the shore without breaking surf, i.e., sheltered bays. Consideration must also be given to local weather and topography features which can increase the distance that salt spray can travel, extending these nominal limits.

While the Cemintel compressed fibre cement sheets are not subject to corrosion, the sheets need to be waterproofed and the fixings and steel framing must have suitable corrosion resistance for the location. The designer can consider timber framing, steelwork with additional treatment and higher corrosion resistance fixings to achieve a suitable level of durability. The waterproofing membrane must be maintained in accordance with the manufacturer’s recommendations and any damaged areas replaced immediately.

### Fixing

Fixings should finish below the finished level of the Cemintel compressed fibre cement sheets and any indentation should be filled with joint sealant.

Refer to the following details for jointing and fixing information.

## DESIGN + AESTHETIC CONSIDERATIONS

**TABLE 4.01** Cemintel Compressed Sheet Flooring Systems (EMC) - 'Double Span' Sheet Installations

Cemintel Compressed Sheet Flooring Systems		Support Framing	Maximum Allowable Unfactored Floor Loadings			
Sheet Thickness (mm)	AS/NZS 1170.1 - Specific Uses	Max. Joist Spacing (mm)	Dead Load (kPa)	Live Load		
				UDL (kPa)	Concentrated Point Load (kN)	
					P <sub>350</sub>	P <sub>100</sub>
15	Category A1 & A2 Domestic and residential activities – general areas, private kitchens, laundries, bedrooms, hospital wards, hotel rooms, toilet areas, balconies, roofs used for roof type activities	450	1.0	5.0	1.8	2.0
		300	2.0			
18	Category A1 & A2 Domestic and residential activities – general areas, private kitchens, laundries, bedrooms, hospital wards, hotel rooms, toilet areas, balconies, roofs used for roof type activities	600	1.0	5.0	1.8	2.0
		400	2.0			
	All categories in buildings and structures with a concentrated live load action less than 4.0kN	450	1.0	7.5	1.8	4.0
		300	2.0			
	All categories in buildings and structures with a concentrated live load action less than 4.5kN	450	1.0	7.5	1.8	4.5
		300	2.0			
24	Category A1 & A2 Domestic and residential activities – general areas, private kitchens, laundries, bedrooms, hospital wards, hotel rooms, toilet areas, balconies, roofs used for roof type activities	600	1.0	5.0	1.8	2.0
		600	2.0			
	All categories in buildings and structures with a concentrated live load action less than 4.0kN	600	1.0	7.5	1.8	4.0
		600	2.0			
	All categories in buildings and structures with a concentrated live load action less than 4.5kN	600	1.0	7.5	1.8	4.5
		600	2.0			

Notes:

- DL dead load, i.e., weight of the floor framing and Cemintel CFC Flooring sheets, and excludes a ceiling dead load. Maximum load factor of 1.2.
- SDL superimposed dead load, i.e., weight of the floor coverings, such as, carpet, underlay, grout, mortar bed and tiles. Maximum load factor of 1.2.
- UDL uniformly distributed live load, AS/NZS 1170.1:2002 Table 3.1. Maximum load factor of 1.5.
- P350 concentrated live load applied to a 350mm<sup>2</sup> bearing area. Refer to Note 1, AS/NZS 1170.1:2002 Table 3.1. Maximum load factor of 1.5.
- P100 concentrate point live load applied to a 100mm x 100mm bearing area (0.01m<sup>2</sup>). Refer AS/NZS 1170.1:2002 Cl.3.2(b). Maximum load factor of 1.5.
- $\Psi_s = 0.7$ , for uniformly distributed loading, as per AS/NZS 1170.0:2002 Table 4.1.
- $\Psi_s = 1.0$ , for concentrated point loading, as per AS/NZS 1170.0:2002 Table 4.1.
- \* For serviceability limit state the deflection limit criteria is; non-brittle floor covering and SDLmax of 1kPa is Span/200; and brittle floor covering and SDLmax of 2kPa is Span/500.

**TABLE 4.02** Maximum Joist Spacing (mm) of Cemintel Compressed Sheet Flooring Systems (WET) ('Double Span' Sheet Installations, all edges of Compressed Sheet supported with no cantilevers)

Cemintel Compressed Sheet		Maximum Joist Spacing (mm)	
Thickness (mm)	Width (mm)	Maximum Allowable Unfactored Live Load	
		UDL = 3kPa	P=1.8kN
15	900	450	300
	1200	400	300
18	900	450	300
	1200	600	300
24	1200	600	600



## DESIGN + AESTHETIC CONSIDERATIONS

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### Wash Down Process

Prior to protective coating application on newly installed sheets, wash down thoroughly in accordance with the Cemintel Compressed Sheet cleaning instructions to remove debris collected on the surface of the sheet during the transportation, installation and construction process. Remove all products from the surface after cleaning. Ensure the surface of the sheets are prepared in accordance with the protective coating requirements.

When cleaning the sheets the following is recommended –

- Normal dirt can be removed with a soft brush and warm water up to 50 degrees Celsius, 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.
- Sheets 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 sheets using the 'normal dirt' procedure above.
- When rinsing down panels, use no more than 700 psi (50kg/cm<sup>2</sup>) of water pressure at a minimum of 3m distance from the face of the wall. Water pressure should be applied downward to avoid forcing water into joints.
- Use neutral detergent with a soft cloth or soft brush when removing dirty spots from a sheet. When diluting the neutral detergent, follow the manufacturer's instructions and use the weakest solution possible.

### Inspection, Repair and Maintenance

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

Regularly inspect sheet surfaces and follow wash-down procedures when required.

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

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

# 05

COMPONENTS + ACCESSORIES




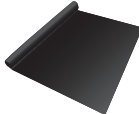

## 05

## COMPONENTS + ACCESSORIES

Note: Codes can change from time to time. Refer to the website for the current list of components prior to ordering.

## Accessories

**Note: The length of the fixings will need to be increased to ensure the same or greater embedment depth is obtained when fixing the 24mm thick Cemintel Compressed Sheet panels.**

Accessories	Description	Size / Colour	Quantity	Product Code
<b>FLOORING FIXINGS</b>				
	<b>Flooring Screws for Steel Framing</b> – Used for direct fixing Compressed Sheet panels to steel framing. To suit a minimum 0.75mm BMT G2 framing. Pre-drill Compressed Sheet and countersink heads.			
	• Drill point, CSK countersunk head, galvanised	10g x 30mm	Supplied by others	
	• Winged, CSK countersunk head, galvanised	10g x 40mm	Supplied by others	
	<b>Flooring Screw for Timber Framing</b> – Used for direct fixing Compressed Sheet panels to a minimum MGP10 timber framing. Pre-drill Compressed Sheet and countersink heads.			
	• Type 17, CSK countersunk head, galvanised	10g x 50mm	Supplied by others	
	<b>Screw for Drip Mould</b> – Used for direct fixing drip mould to underside of Compressed Sheet.			
	• Metal thread self-tapping, CSK countersunk head, galvanised	8g x 15mm	Supplied by others	
	<b>Nail for 4.5mm Cladding Sheet</b> – Used for direct fixing 4.5mm Cladding Sheet to timber framing.			
	• Clout, galvanised	2.0mmø x 25mm	Supplied by others	
	<b>Nail for 7.5mm Cladding Sheet</b> – Used for direct fixing 7.5mm Cladding Plank Packing Strips to timber framing.			
	• Clout, galvanised	2.8mmø x 40mm	Supplied by others	
<b>FLASHINGS, SHEETS, MEMBRANES, REINFORCEMENT</b>				
	<b>Slip Sheet</b> – Use for a bond breaker and slip layer between WPM and mortar. • 0.2mm Polyethylene (Polythene) Sheet to AS 2870			
			Supplied by others	
	<b>Membrane</b> – Used for Water Proof Membrane (WPM) or as required by system, may incorporate joint reinforcing. • a flexible sheet or liquid membrane to AS 4654.1			
			Supplied by others	
	<b>Mortar Bed And Steel Reinforcement</b> – Used to create profile of surface finish. • As required for the system to AS 3958.1			
			Supplied by others	
	<b>Wall/Floor Joint Flashing</b> • PVC Angle Mould 4mm x 47mm x 47mm			
			Supplied by others	
	<b>Edge Drip Mould</b> – Used to prevent water tracking along underside of Compressed Sheet. • Aluminium or PVC Angle 12mm x 12mm			
			Supplied by others	
	<b>Drip Sheet</b> – Used for direct water to edge of flooring. Tape joints with 48mm reinforced aluminium foil tape (493 tape or equivalent). • 0.2mm Polyethylene (Polythene) Sheet to AS 2870			
			Supplied by others	
	<b>Flashing</b> – Used as a water barrier for the framing. • Alcor™ or equivalent			
			Supplied by others	
<b>OTHER TOOLS</b>				
	<b>Countersinking Tool</b> – A tungsten carbide tipped tool specifically designed for drilling and countersinking. • Countersinking tool			
			1 each	22116
	<b>Sealant</b> – Used to seal joints for control joints, junctions etc. • Sikaflex Sealant PRO Grey			
		310mL tube (GREY)	1 each	11378
	<b>Backing Rod</b> – Used to enable correct filling of joints with sealant. The diameter of backing rod must be appropriate for the width of the gap being filled. • Backing rod			
		10mm diameter x 50m roll	1 each	11177





SYSTEM ENGINEERING, INSTALLATION  
+ CONSTRUCTION DETAILS



## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

### Design, Detailing and Performance Responsibilities

Cemintel engages independent testing laboratories to test and report on the performance of a wall in accordance with the relevant Australian Standards. Consultants use these reports as the basis for opinions (estimates of laboratory performance) they issue for variations or different arrangements to the tested system. Using their experience, the consultant will make judgement about on-site installed performance of various walls.

#### Project Consultants (Structural, Fire, Acoustic, Façade etc.)

These consultants are typically responsible for the following:

- Opinions on expected laboratory performance of wall configurations that vary from actual test configuration, such as substitution of products and components;
- Judgements about expected field performance using laboratory test reports and practical experience;
- Design, specification and certification of structural, fire, acoustic, durability, weather tightness and any other required performance criteria for individual projects.

The design and selection of building elements, such as wall and floors and their integration into the building considering the following:

- Interface of different building elements including the structure/substrate;
- Wall and floor junctions;
- Penetrations;
- Flashing issues;
- Room / building geometry; and
- Acoustic and water penetration field-testing.

#### Design Responsibility

Cladding, air barrier, battens and top hats, and structural framing are required to resist wind and earthquake loads that are specific to the building and the site. Additional 'local pressure factors' can apply to cladding and the supporting battens and top hats in accordance with the Australian Standard AS 4055 - Wind loads for housing or AS/NZS 1170.2 - Wind actions. It is recommended that the Architect/ Building Designer assigns the responsibility for the façade design to the Project Engineer. Once loads have been determined, the battens and top hat spans, fastener spacing, air barrier construction details, and cladding fixing details may be selected from the appropriate tables in this guide and in the 'Cemintel Facades & Cladding Design Guide'. It is also the responsibility of the Architect / Building

Designer to select the appropriate corrosivity category. Refer to appropriate details in this guide.

The performance levels of walls documented in this guide, and the 'Cemintel Facades & Cladding Design Guide' and CSR Gyprock® The Red Book™ publications are either what is reported in a test or the documented opinion of consultants. Performance in projects is typically the responsibility of:

#### Project Certifier and/or Builder

These professionals are typically responsible for:

- Identifying the performance requirements for the project in accordance with the NCC and clearly communicating this to the relevant parties;
- Applicability of any performance characteristics supplied by Cemintel including test and opinions for the project.

Cemintel does not provide consulting services. Cemintel provides technical information that has been prepared in consultation with third party subject expert consultants for the presentation of information presented in this guide. This guide may be subject to amendment or change as required or as deemed necessary. The most up to date version of this guide should be referred to and shall be available at the Cemintel website [cemintel.com.au](http://cemintel.com.au).

Any party using the information contained in this guide or supplied by Cemintel in the course of a project must satisfy themselves that it is true, current and appropriate for the application, consequently accepting responsibility for its use.

It is the responsibility of the building designer, architect, engineer and project consultants to ensure that the information and details in this guide and the performance of the Cemintel system is suitable for the intended project application.

The recommendations in this guide are formulated along the lines of good building practice but are not intended to be an exhaustive statement of all relevant data.

Cemintel is not responsible for the performance of constructed walls, including field performance, and does not interpret or make judgements about performance requirements in the NCC.

Note: It is the responsibility of the Project Engineer/ Frame Designer to specify the connection of the structural noggings to the structural framing for any off-stud battens or top hats. It is also the responsibility of the project engineer to calculate the wind loads and earthquake loads for the cladding, air barrier and support framing of the façade on a project.

## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS



### Mortar Bed With Separating Layer

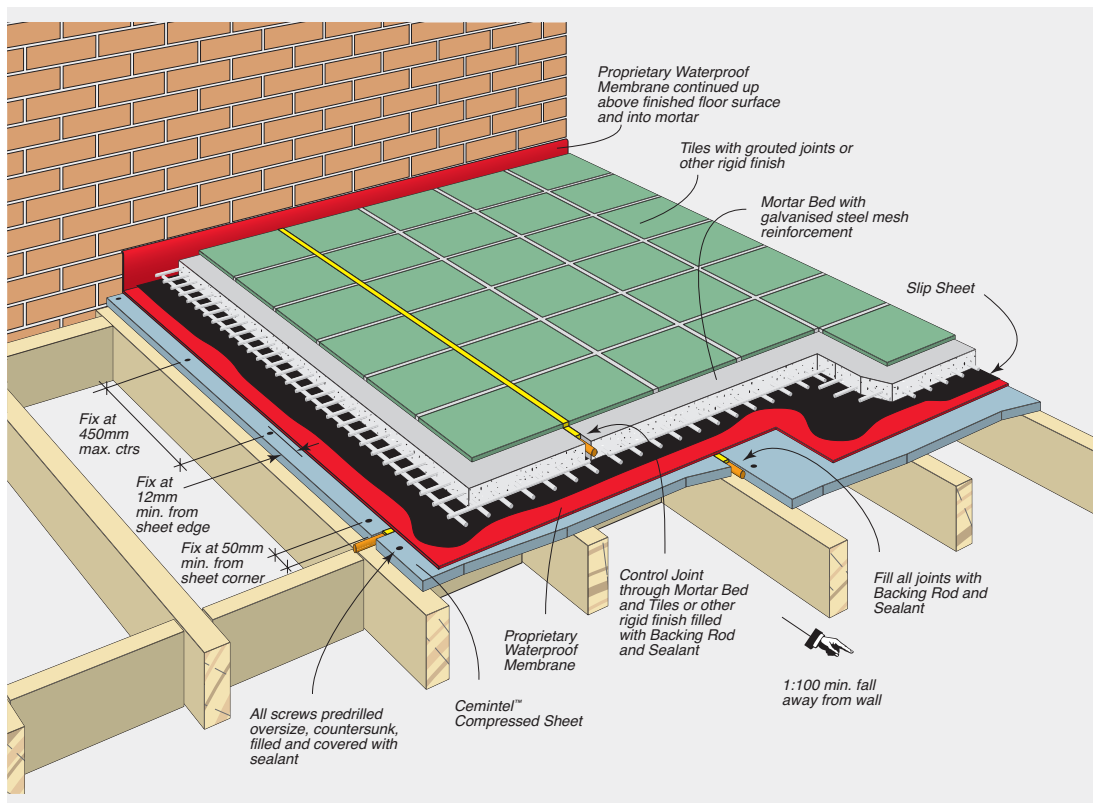
This system has compressed sheet fixed directly to floor joists, with a flexible membrane installed on top to provide waterproofing.

The flexible membrane is covered with a separating or slip sheet, and a reinforced mortar bed is then laid to support the tiles or other finish.

This system may be used for floors that exceed 3 metres in width, and it is ideal for floors where drainage is restricted or directed to a central sump.

Control joints in the mortar bed/finish do not have to coincide with compressed sheet joints. This allows uninterrupted tile surfaces of up to 4.5m x 4.5m between control joints to suit the tile module.

**FIGURE 6.01** Construction of Mortar Bed with Separating Layer





## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

### INSTALLATION

#### Fixing And Jointing Sheets

Cemintel Compressed Sheets are fixed directly to the floor joists. Sheets may be laid in either direction relative to the slope and a support member is required at all sheet edges. Leave 5mm between sheet edges and 5 to 10mm at wall junctions.

Screw fix to each joist at 450mm maximum centres. Screws must be a minimum 12mm from a sheet edge and 50mm from a corner.

Screw holes must be pre-drilled and countersunk 3mm below surface. Allow 1mm clearance over diameter of screw. Screw holes must be cleaned and filled with flexible sealant before screw is placed. Once screws are in place, cover screw heads with flexible sealant. This will ensure fasteners are watertight.

**Handy Hint:** To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling and remove once screw is in place and covered with sealant.

#### Jointing

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering. Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved. Press foam backing rod into joint, pressing down firmly against joist, leaving approximately 6mm gap at top. Fill remainder of joint with flexible sealant, finishing just below the sheet surface. Joints must be smoothed within 10 minutes. Remove masking tape and allow sealant to dry for approximately 24 hours.

#### Membrane

A proprietary membrane system must be used. This should be installed by a specialist waterproofing contractor, and a waterproof guarantee provided.

#### Separating Layer

To protect the membrane during tiling, and to separate the movement of the substructure and the tiled surface, a heavy duty plastic sheet must be installed over the membrane.

#### Mortar Bed

A mortar bed is laid over the slip sheet to provide a suitable surface for tiling.

Control joints must be installed at 4.5m maximum spacings in both directions.

The mortar bed must be 40mm minimum thick and reinforced with galvanised mesh.

The mortar bed should be allowed to cure for approximately 10 days before tiling commences.

#### Tiling

Do not tile over control joints in the mortar bed.

When selecting tiles ensure they are suitable for external use. An appropriate adhesive recommended for external use must be used.

In all cases, the tile and tile adhesive manufacturer's instructions should be followed.

For further advice, refer to Australian Standard AS 3958.1 Ceramic tiles - Guide to the installation of ceramic tiles.

SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS



FIGURE 6.02 Wall/Floor Junction Option 1

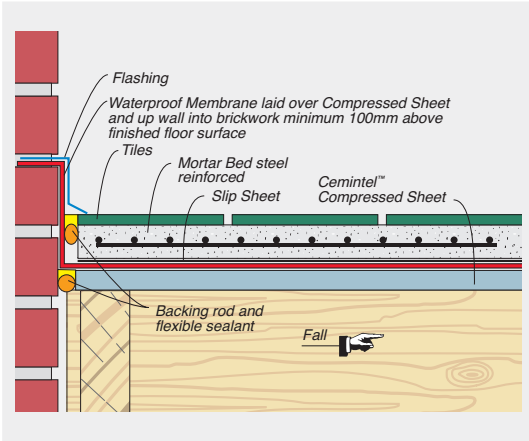


FIGURE 6.03 Wall/Floor Junction Option 2

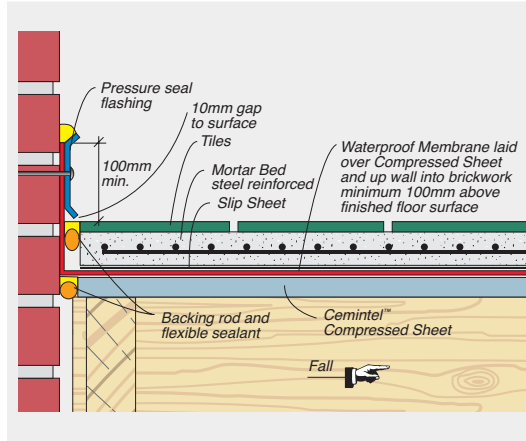


FIGURE 6.04 Edge Finish

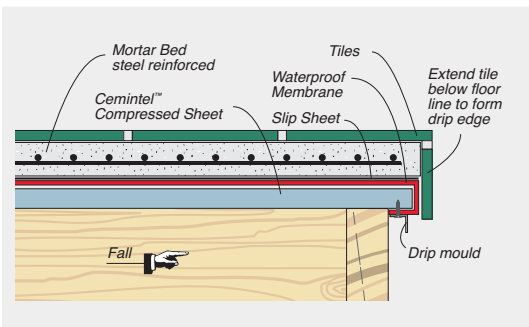


FIGURE 6.05 Control Joint Through Mortar Bed and Rigid Finish

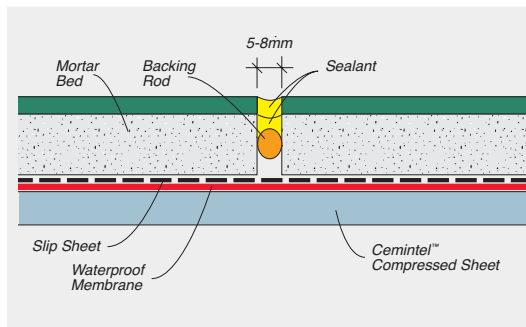


FIGURE 6.06 Door Sill

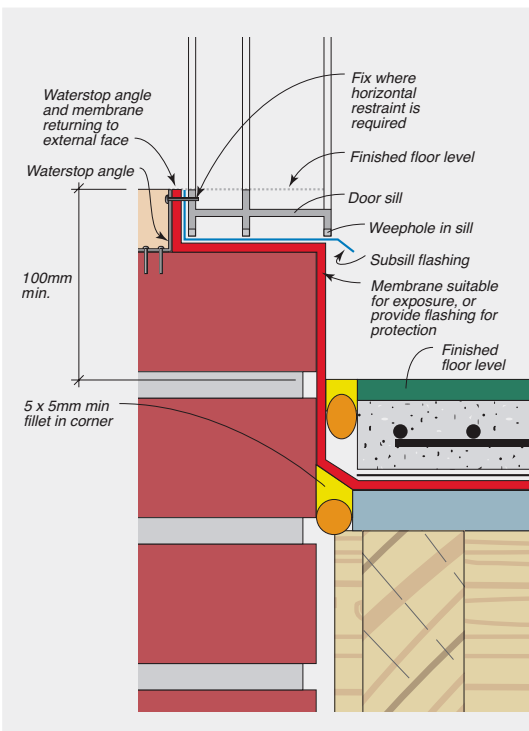
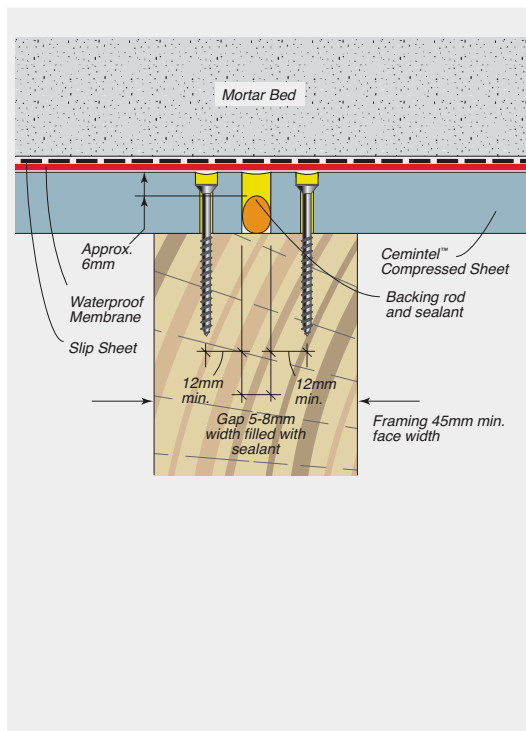


FIGURE 6.07 Sheet Fixing and Jointing





## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

### Tiles with Liquid Membrane & Trafficable Membrane Systems

These systems are treated together as they have similar sheet fixing and waterproofing details. With no mortar bed, these systems are of minimum thickness, which is an advantage where threshold step height is low, and are lightweight to reduce the load on floor joists.

#### INSTALLATION

##### Fixing And Jointing Sheets

Cemintel Compressed Sheets are fixed directly to the floor joists. Sheets may be laid in either direction relative to the slope and a support member is required at all sheet edges. Leave 5mm between sheet edges and 5 to 10mm at wall junctions.

Screw fix to each joist at 450mm maximum centres. Screws must be a minimum 12mm from a sheet edge and 50mm from a corner.

Screw holes must be pre-drilled and countersunk 3mm below surface. Allow 1mm clearance over diameter of screw. Screw holes must be cleaned and filled with flexible sealant before screw is placed. Once screws are in place, cover screw heads with flexible sealant. This will ensure fasteners are watertight.

**Handy Hint:** To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling and remove once screw is in place and covered with sealant.

##### Jointing

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering. Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved. Press foam backing rod into joint, pressing down firmly against joist, leaving approximately 6mm gap at top. Fill remainder of joint with flexible sealant, finishing just below the sheet surface. Joints must be smoothed within 10 minutes. Remove masking tape and allow sealant to dry for approximately 24 hours.

##### Membrane

A proprietary membrane system must be used. This should be installed by a specialist waterproofing contractor, and a waterproof guarantee provided.

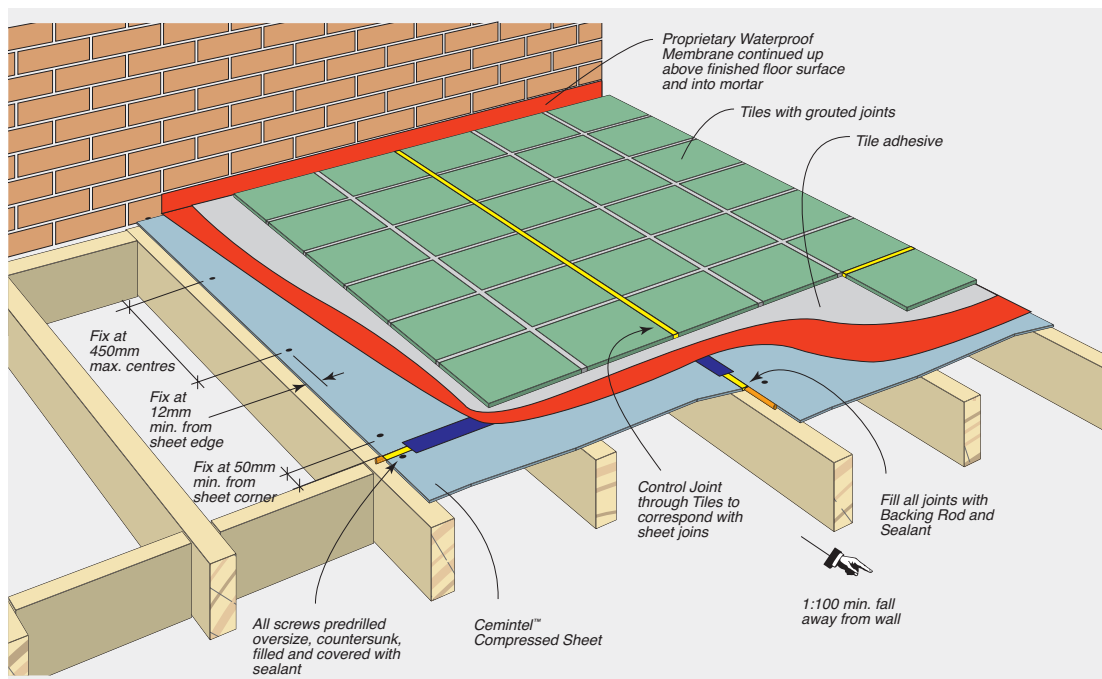
##### Finishes

##### Do not tile over control joints.

When selecting tiles ensure they are suitable for external use and an appropriate adhesive is selected. In all cases the tile and tile adhesive manufacturer's instructions should be followed.

For further advice, refer to Australian Standard AS 3958.1 Ceramic tiles - Guide to the installation of ceramic tiles.

**FIGURE 6.08** Construction of Drip Sheet System





SYSTEM ENGINEERING, INSTALLATION  
+ CONSTRUCTION DETAILS



FIGURE 6.09 Sheet Joint Detail

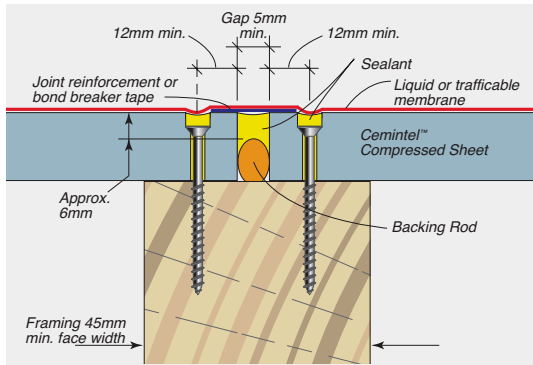


FIGURE 6.10 Edge Finishing Detail

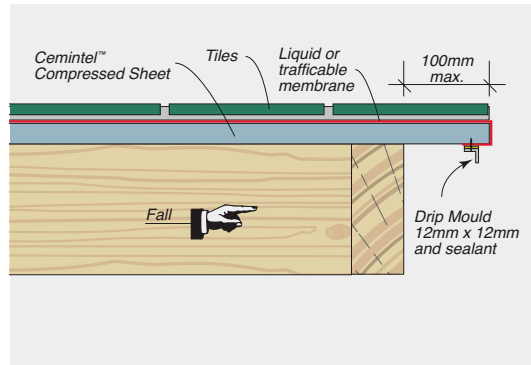


FIGURE 6.11 Wall/Floor Junction

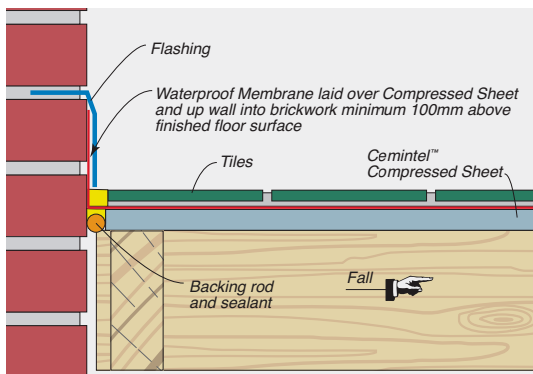


FIGURE 6.12 Wall/Floor Junction

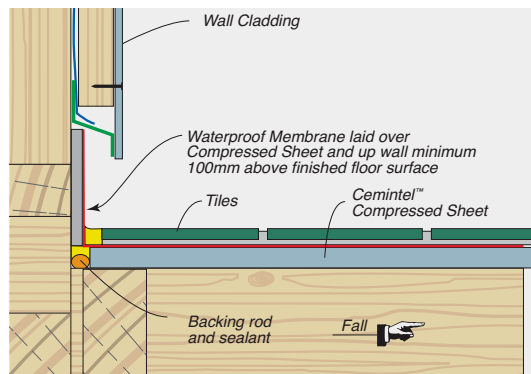


FIGURE 6.13 Metal Post Support

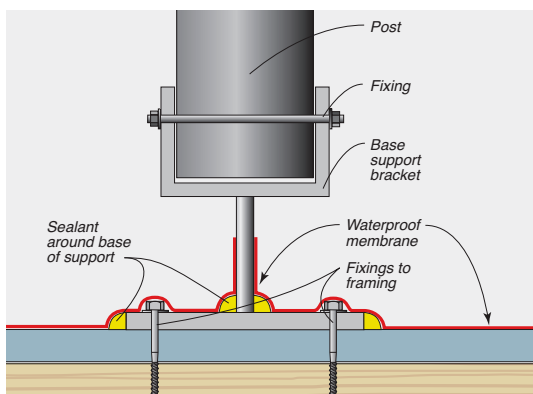


FIGURE 6.14 Pipe Penetration Detail

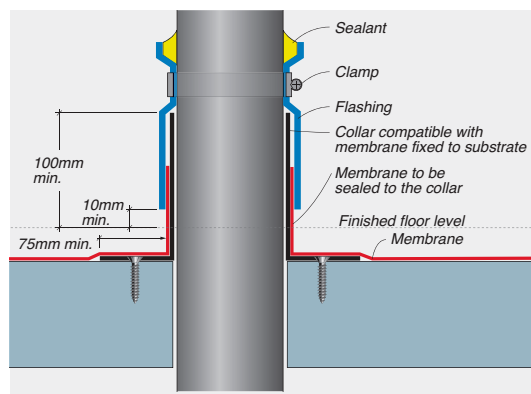
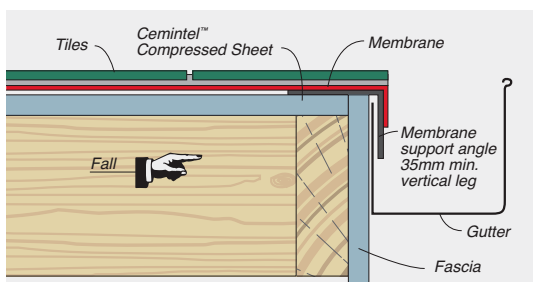


FIGURE 6.15 Gutter Support



Note: Framing, such as a balustrade, must be fixed to the structural framing of the floor.



## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

### Water Resistant System

Floors that are not required to be completely waterproof should be constructed to minimise the penetration of water to avoid dry rot in timber framing.

Timber and structural specifications must comply with the relevant building authority requirements.

Timber should be treated exterior grade, or where untreated timber is used, the top of the joists must be flooded with a timber preservative available from paint suppliers.

In addition, flashing must be used to protect the timber framing. Flashing must extend 50mm down the sides of the joists and trimmers.

Alcor™ flashing or equivalent is recommended.

### INSTALLATION

#### Fixing Compressed Sheets

Sheets may be fixed parallel to, or across joists. Prior to fixing, ensure that all joints will be fully supported by a framing member, and allow for 5mm joint gaps.

Sheets must be fixed to the frame leaving a 5mm minimum gap between each sheet. This gap is important to accommodate movement of the building materials and structure.

Sheets laid parallel to joists are screw fixed at 450mm centres maximum along sheet edges and in the body of the sheet. Screws must be a minimum of 12mm from edge of sheet and 50mm from corners.

Sheets laid across joists should be fixed with 3 screws per joist for 900mm sheets, and 4 screws per joist for 1200mm sheets.

Screw holes must be pre-drilled and head countersunk 3mm below surface. Allow 1mm clearance over diameter of screw. Screw holes must be cleaned and filled with flexible sealant before screw is placed. Once screws are in place, cover screw heads with flexible sealant. This will ensure fasteners are water tight.

**Handy Hint:** To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling and remove once screw is in place and covered with sealant.

### Jointing

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering.

Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved.

Press foam backing rod into joint pressing down firmly against joist leaving approximately 6mm gap at top. Fill remainder of joint with flexible sealant, finishing just below the sheet surface. Joints must be smoothed within 10 minutes.

Remove masking tape and allow sealant to dry for approximately 24 hours.

### Wall/Floor Junction

Flashing must be used at wall/floor junctions. PVC flashing 47 x 47mm is adhered to compressed sheet floor only, to allow for frame movement.

Metal over-flashing such as Alcor™ or lead flashing is then installed from the wall. Tuck up behind wall cladding or into brick work.

### Finishes

Floors may be finished with artificial grass, outdoor carpet, pebble finishes, tiles or paint. Floors must not be left bare.

It is critical that rigid finishes such as pebble or tiles do not cover the sheet joints.

Cantilevered sheet ends must not extend more than 100mm beyond framing/support. A 12 x 12mm angle drip mould should be installed to underside near sheet edge to prevent staining of the walls. Fix into place with self tapping screws at 300mm centres.

SYSTEM ENGINEERING, INSTALLATION  
+ CONSTRUCTION DETAILS



FIGURE 6.16 Construction of Floor Using Water Resistant System

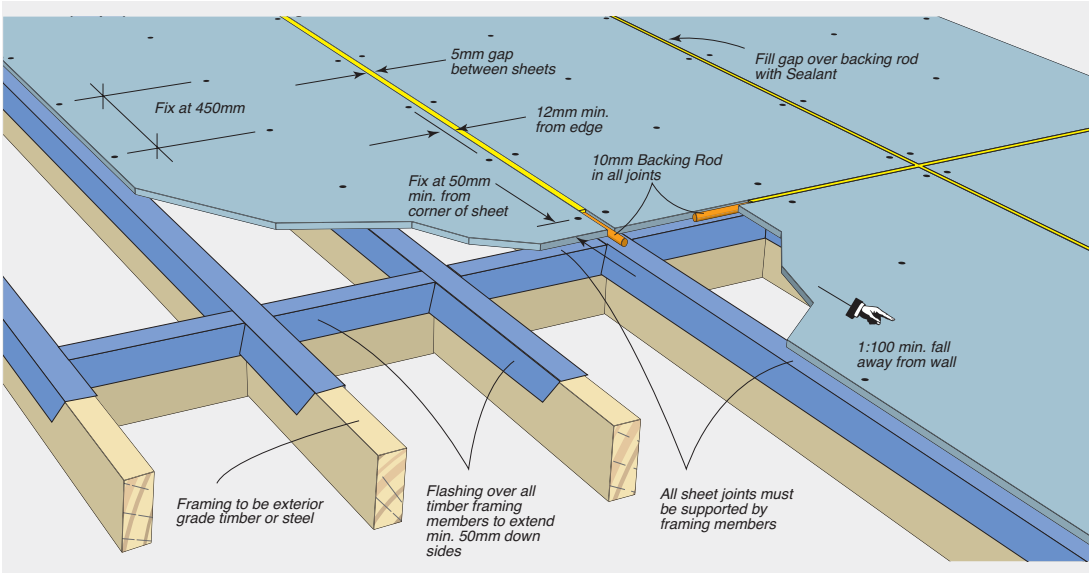


FIGURE 6.17 Sheet Fixing and Joint Sealing

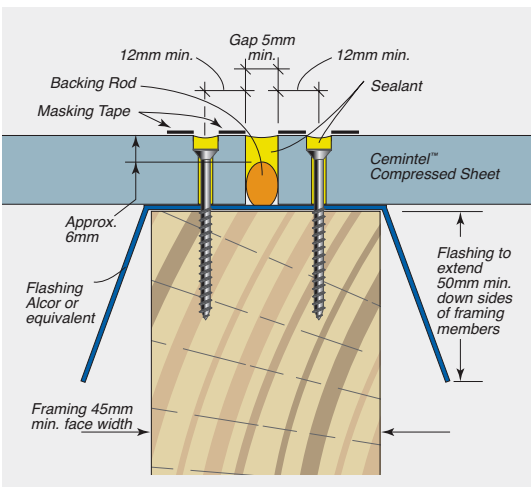


FIGURE 6.18 Edge Finish

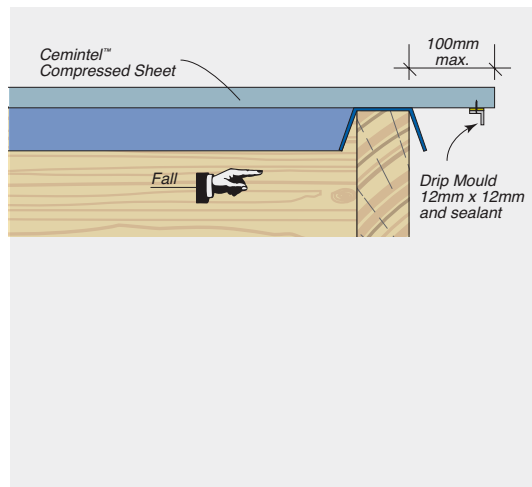


FIGURE 6.19 Wall/Floor Junction Timber

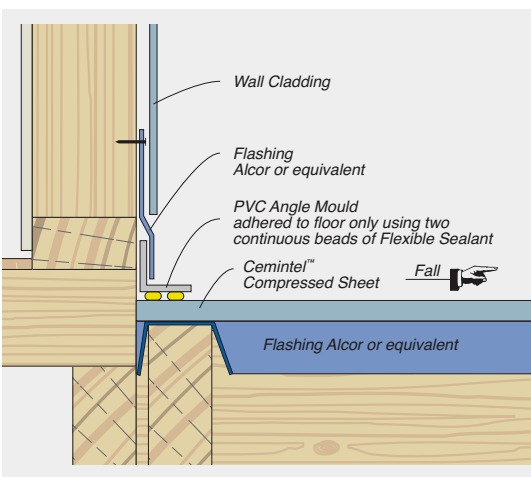
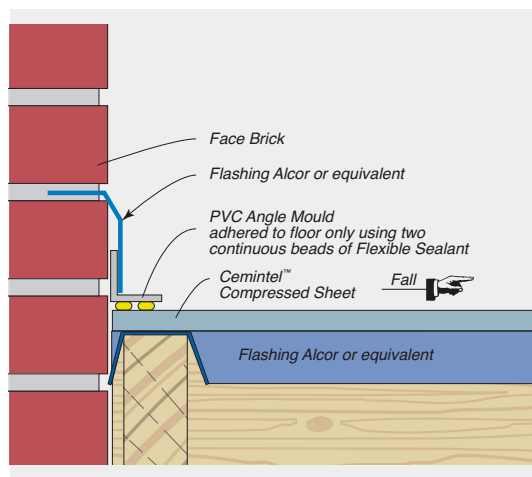


FIGURE 6.20 Wall/Floor Junction Masonry





## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

### Drip Sheet System

The drip sheet system consists of fixing 4.5mm thick Cemintel Cladding Sheet to the floor joists, which is then covered with a heavy duty plastic Drip Sheet supported on packing strips.

The compressed sheet is then installed over the top. All joints and screw heads are filled with sealant. A trafficable surface is then applied.

Floors must be constructed with adequate drainage. This system is not suitable where water is directed to a central sump. The floor must not exceed 3 metres in width as joint supports interrupt drainage.

### INSTALLATION

#### Drip Sheet And Support

Cemintel Cladding Sheet of 4.5mm thickness is fixed to floor joists to support the plastic drip sheet. Nail cladding sheet to all joists at 200mm centres maximum using 2.0 x 25mm nails. Nails must be minimum 12mm from sheet edges and 50mm from corners.

Strips of Cemintel Cladding Plank 7.5mm x 40mm or 50mm are positioned directly over joists and nailed into position using 2.8 x 40mm nails.

Drip sheet must be slightly dished between packing strips so it can act as a self draining chamber to dispose of condensation.

The plastic drip sheet is installed to control condensation and temporary minor leaks. Overlap all joints and seal with tape.

Allow for a minimum downturn around outside edges of 150mm, and an upturn of at least 50mm above finished floor level at walls and vertical surfaces.

#### Fixing Compressed Sheet

Compressed Sheets should be installed with the long edge parallel to the joists.

Sheets must be fixed to the frame leaving a 5mm minimum gap between each sheet. This gap is important to accommodate movement of the building materials and structure.

Prior to fixing, ensure that all joints will be supported by a framing member, and joist spacing allows for the 5mm joint gap.

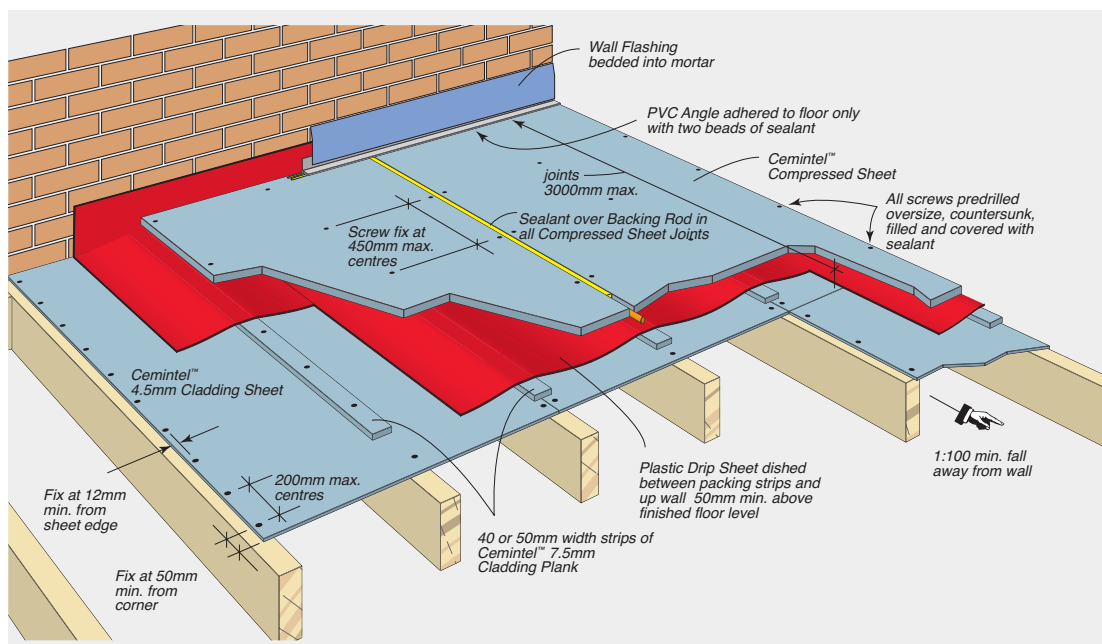
Sheets are screw fixed at 450mm centres maximum along sheet edges and in the body of the sheet

Screws must be kept a minimum of 12mm from edge of sheet and 50mm from corners.

Screw heads must be countersunk below sheet surface. Screw holes must be pre-drilled using a CSR Counter Sinking Tool. Screw holes must be cleaned and filled with flexible sealant. Once screws are in place, cover screw heads with flexible sealant.

**Handy Hint:** To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling, then remove once screw is in place and covered with sealant.

**FIGURE 6.21** Construction of Drip Sheet System



## SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS



### Jointing

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering. Scrub sheet edges with a wet brush and allow to dry before applying sealant.

Joints must not be covered by tiles or other rigid finishes. All joints are constructed as movement joints which must be carried through the finish layer. Failure to comply will result in cracking and water leakage.

Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved.

Place foam backing rod into joint, pressing down firmly against packing strip, and leaving approximately 6mm gap at top.

Fill remainder of joint with flexible sealant, finishing just below the sheet surface.

Remove masking tape and allow sealant to dry for approximately 24 hours. Sealant joints must remain accessible for future maintenance.

Floors may be finished with artificial grass, outdoor carpet, pebble finishes, tiles or paint. The surface must not be left bare. It is critical that rigid finishes such as pebble finishes or tiles do not cover the sheet joints.

### Wall/Floor Junctions

Flashing must be used at wall/floor junctions. PVC angle flashing 47 x 47mm is adhered to floor only to allow for frame movement.

Metal over-flashing such as Alcor™ or lead flashing is then installed from the wall. Tuck over-flashing up behind wall cladding or through brick work.

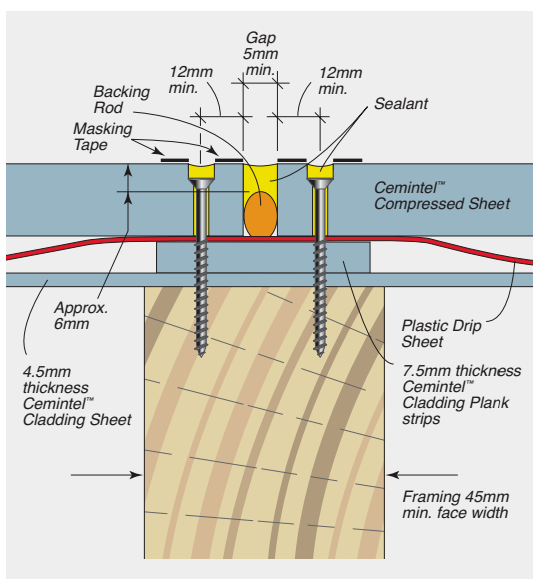
Ensure drip sheet upturn is not less than 50mm above finished floor surface (in high wind areas increase to 100mm).

### Edge Finish

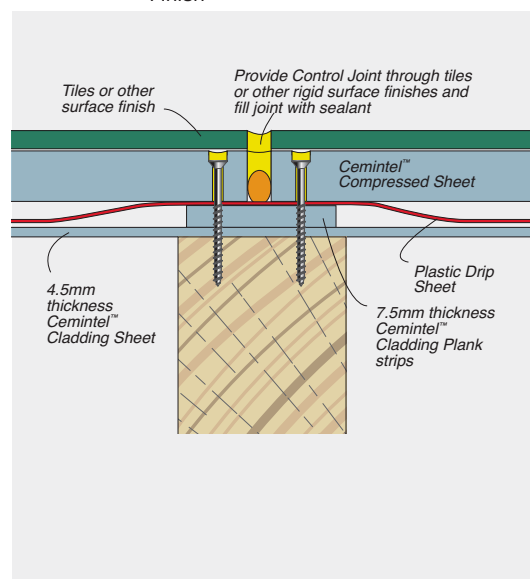
Sheet must not extend more than 100mm beyond framing/support. A drip line must be installed to the underside, near sheet edge, to prevent staining of the walls.

Fix a 12 x 12mm drip mould into place with sealant and self tapping screws at 300mm maximum centres. Alternatively, a 3 x 3mm groove may be cut into the underside of the sheet.

**FIGURE 6.22** Sheet Fixing and Jointing



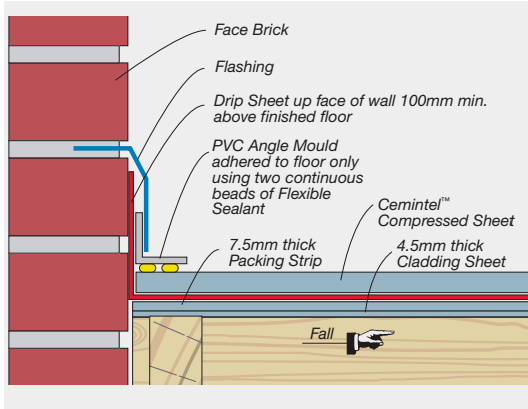
**FIGURE 6.23** Movement Joint Through Rigid Surface Finish



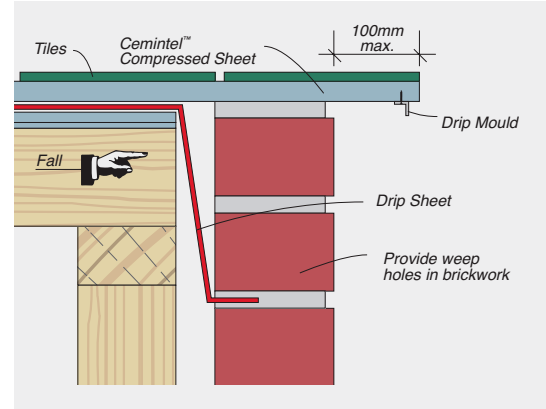


SYSTEM ENGINEERING, INSTALLATION + CONSTRUCTION DETAILS

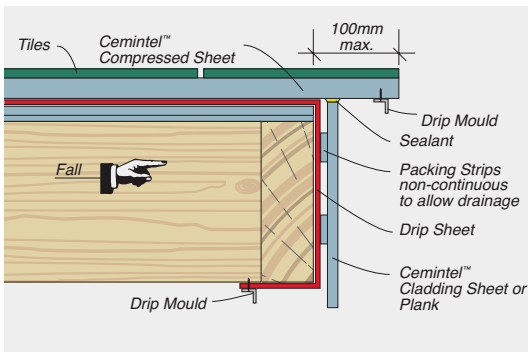
**FIGURE 6.24** Wall/Floor Junction



**FIGURE 6.25** Edge Finish Details



**FIGURE 6.26** Edge Finish Detail







SAFETY, HANDLING,  
GENERAL CARE + WARRANTY

## SAFETY, HANDLING, GENERAL CARE + WARRANTY



### Health, Safety and Personal Protection Equipment (PPE)

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

When cutting, drilling or grinding fibre cement panels using power tools, always ensure the work area is properly ventilated.

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

Safety Data Sheet information is available at [www.cemintel.com.au](http://www.cemintel.com.au)

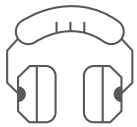


### Managing Respirable Crystalline Silica Dust

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 SAFETY EQUIPMENT AND PPE, 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 Saw and Blade	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 Correct 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 seal.

\* 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.

## Safety & Handling

### Storage

All Cemintel panels must be stacked flat, clear of the ground and supported at 300mm maximum centres on a level platform. Panels 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

Prefinished products and must be treated with care during handling to avoid damage to edges, ends and prefinished surface. Panels should be carried horizontally on edge by at least two people.

Consideration should be given to planning the order of other trades that might stain or damage the panels.

Any splashings of mud, cement, mortar and the like should be removed immediately.

### Cutting

Panels should be fully supported and cut from the back using a power saw. Cemintel recommends using the Makita Plunge Cut Saw with guide rail and appropriate blade, together with the appropriate dust extraction system. All exposed cut edges **MUST BE SEALED WITH CEMINTEL EDGE SEALER TO PREVENT MOISTURE ABSORPTION.**

### Mitres

It is not recommended to mitre panel edges as this can cause delamination of the face.

### Penetrations

Penetrations in panels may be cut or drilled prior to installation. Cut from the back or drill from the front. Mask, prime and fill gaps with sealant in accordance with recommended methods and products.

## Warranty

Compressed Sheet panels have a product warranty of 25 years. The full product warranty is available for download at [www.cemintel.com.au](http://www.cemintel.com.au)

## NOTES

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08/2023