

CEMINTEL®



BARESTONE™ EXTERNAL
Design & Installation Guide

INTRODUCTION

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Introduction

Cemintel's Barestone External walling system combines a prefinished surface with a simple installation system that can be used for residential and commercial buildings.

This 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.

Barestone can be installed externally as a building facade or as an interior lining. This guide refers to **external installations** only as components differ depending on the installation.

Refer to the 'Design and Installation Guide for Cemintel Barestone Internal Installation' for instructions regarding internal applications.



PRODUCT OVERVIEW

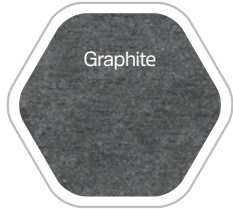
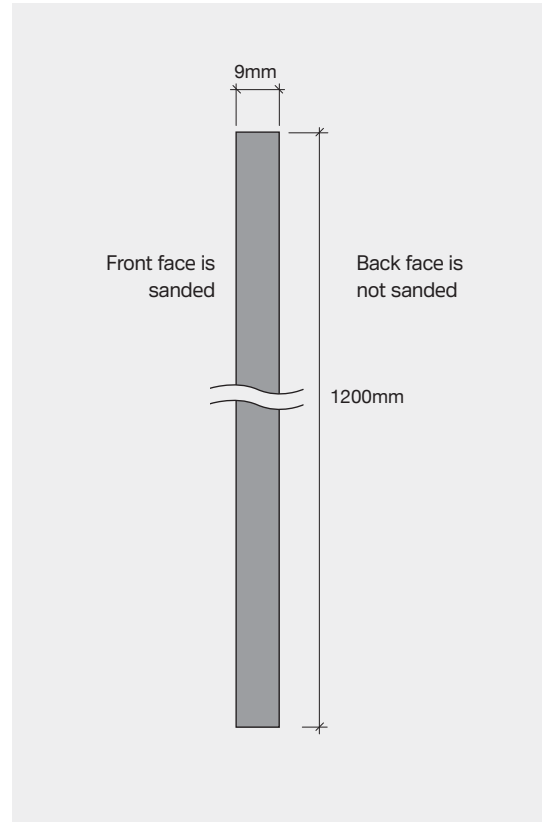
Panel Information

Barestone External panels provide a natural, raw appearance that blends seamlessly with its environment and easily adapts to modern, contemporary building designs. Barestone is available in four colours – Original, Ash, Lunar and Graphite. As with natural timber or stone, every piece is unique in colour and patterning, reflecting the qualities of the natural ingredients used in the manufacturing process.

The panels are prefinished, square edged, compressed fibre cement (CFC), consisting primarily of Portland Cement, cellulose fibre, air, and water. They feature Cemintel water-blocking technology and are factory sanded, ready for installation with the Cemintel Expresswall system.

Cemintel Barestone External panels are compressed to produce a dense 9mm panel that offers superior performance in terms of strength and durability, making Barestone External an excellent choice for commercial applications subject to higher wind loads.

Cemintel Barestone External cladding conforms to the requirements of AS/NZS 2908.2 – Cellulose-cement products, Part: 2 – Flat sheets, Category 5, Type A.



Product Specifications

Property	Specification	Manufacturing Tolerance	Relevant Standard
Panel Width	1200mm	+ 0.0mm / - 2.0mm	AS/NZS 2908.2
Panel Length	2400 and 3000mm	+ 0.0mm / - 2.0mm	AS/NZS 2908.2
Panel Thickness	9mm	+ 0.9mm/ - 0.0mm	AS/NZS 2908.2
Panel Weight (EMC)	17.8kg/m ²		AS/NZS 2908.2

Spectral Reflectivity Values

Product	Solar Reflectance %	Solar Absorbance %	Basix Colour	Relevant Standard
Barestone Original	39.8	60.2 (+ / - 1.2)	Medium	ASTM E903-12
Barestone Ash	23.0	76.1 (+ / - 0.7)	Dark	ASTM E903-12
Barestone Lunar	14.3	85.7 (+ / - 0.4)	Dark	ASTM E903-12
Barestone Graphite	8.7	91.3 (+ / - 0.3)	Dark	ASTM E903-12

Thickness (mm)	Width (mm)	Length (mm)	Mass (Nominal)	Panels per pack
9	1200	2400	17.8kg/m ²	20
9	1200	3000	17.8kg/m ²	20

03

SYSTEM OVERVIEW

03

SYSTEM OVERVIEW

Pressure Equalised Ventilated Cavity System

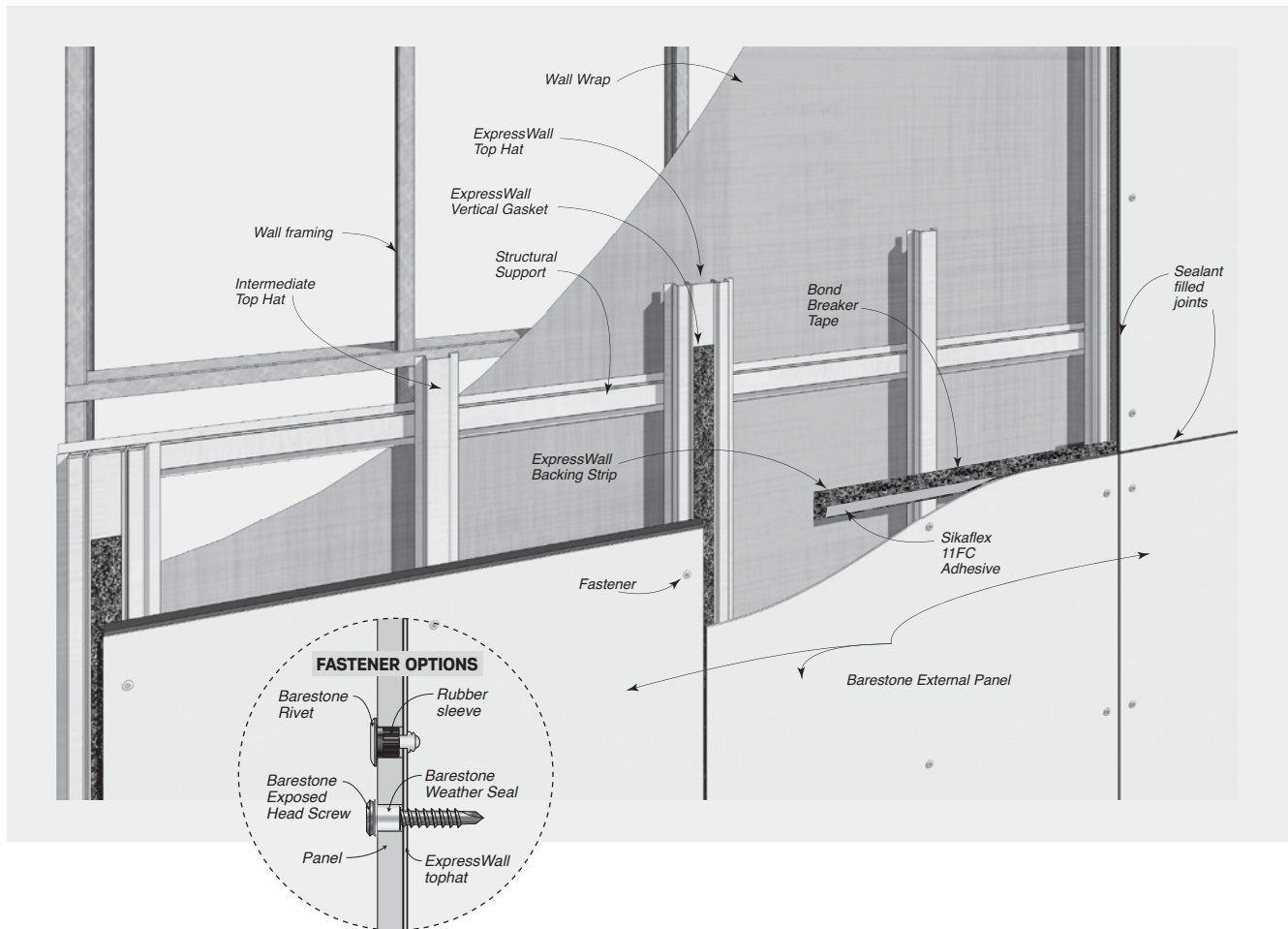
Cemintel Barestone External panels can be installed horizontally or vertically onto steel or timber stud framing or masonry/concrete using the proven and versatile Commercial ExpressWall® top hat fixing system. The ExpressWall system provides a versatile and durable façade which is suitable for an extensive range of building types. Panels are pre-drilled and then fixed with expressed joints to vertical metal top hats using either exposed head screws or Barestone rivets. A vertical gasket tape is placed on the top hat to

provide added weather resistance, and a backing strip is used at horizontal joints to reduce water ingress.

Panels are installed as a pressure equalised ventilated cavity system which is easy to install and delivers a high weather performance system. In certain conditions, eg. higher corrosive zones, there is the option of sealing joints and header to reduce the circulation of air behind the façade. This manual provides information on both systems.

Pressure Equalised Ventilated Cavity System

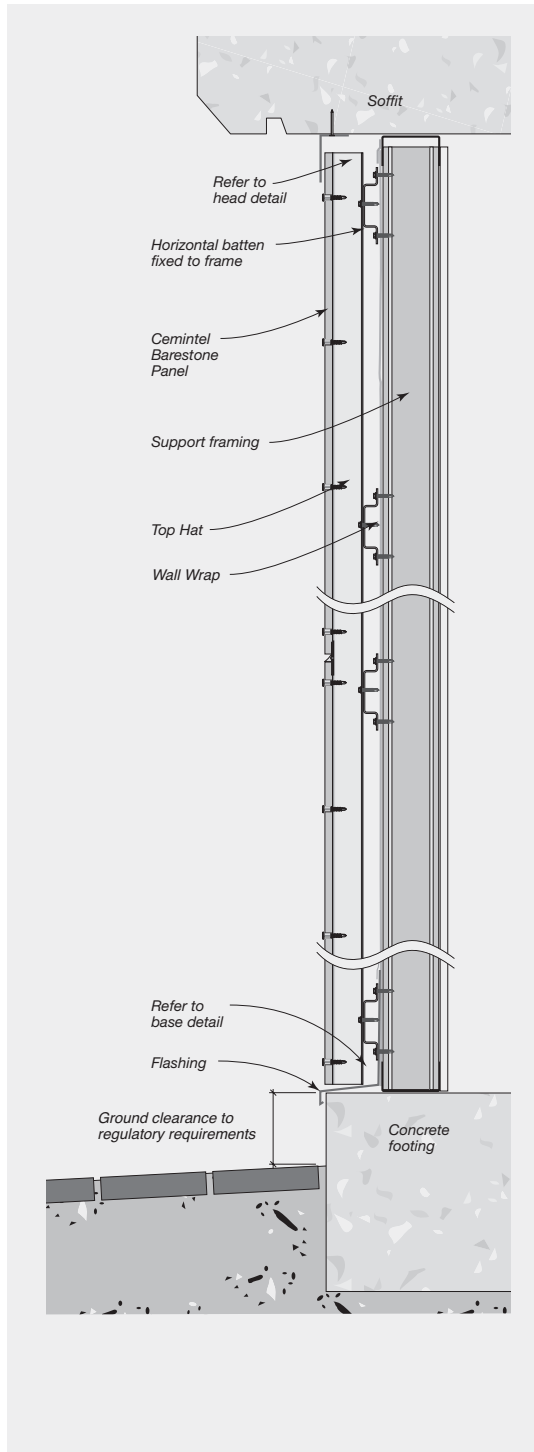
Cemintel Barestone is installed over an air barrier onto ExpressWall™ top hats using screws or rivets. This creates a pressure equalised cavity system which enhances weather resistance.



SYSTEM OVERVIEW



Typical Barestone External Wall System Cross Section for Steel Framing



In a pressure equalised system, a cavity is formed between an air barrier, cavity baffles at major corners and the panels. Openings around the base and top of the façade allow pressure equalisation, and create the drying benefits of air circulation and drainage. Cavity baffles limit the airflow between the cavities either side of a major corner. This system reduces the risk of moisture penetration and prevents moisture build up, allowing the building shell to dry out, creating a healthier, more breathable building.

Panels are installed to give an express jointed appearance. A vertical gasket tape is placed on the vertical top hat and a metal backing strip is placed at horizontal joints. Horizontal joints at base of wall and at inter-storey junctions are left open to maintain a ventilated cavity and to allow for moisture drainage.

The air barrier may consist of a wall wrap or rigid materials such as fibre cement, metal sheet, or masonry. The installation of Bradford Enviroseal™ CW-IT wall wrap and Cemintel Rigid Air Barrier as air barriers are detailed in this guide and the Cemintel Rigid Air Barrier Design and Installation Guide. Other wall wraps and sheet materials must be installed in accordance with manufacturer's instructions.

Masonry and concrete substrates must be sealed to act as an air barrier for an effective waterproofing system.

Sealant Filled Joints

In some applications, or for aesthetic purposes, it may be preferable to install Barestone External panels with joints that are sealant filled. In this case, horizontal backing strips are used and joints are sealed to minimise moisture getting into the cavity.

Cemintel Barestone External panels are to be drilled at fastener locations and then fixed onto supporting metal top hats using screws or Barestone rivets.

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SYSTEM OVERVIEW



Applications

Cemintel Barestone External is suitable for all building classes where metal top hats can be fixed to framing however, site environmental factors such as wind and corrosivity zones must be taken into account to determine its suitability for a particular application.

The panels and system have been designed to withstand ultimate wind pressures up to 7.0 kPa including cyclonic conditions.

Benefits of Cemintel Barestone External Panels with the ExpressWall Fixing System



- Low maintenance.
- No requirement for additional painting costs.
- Potential to speed up the construction process.
- Large format, lightweight panels are designed to be fixed to top hats which can be fixed to industry standard steel, timber or masonry structural frames.
- Cemintel's express jointed fixing system is widely recognised for its high performance.
- ExpressWall top hat has a wider fixing surface for increased installation tolerance, allowing panel movement with changes in wind pressures, thermal movement etc.
- Cemintel's pressure equalised ventilated cavity system allows for higher wind loads, minimises water ingress and allows air flow and drainage.
- Choice of fasteners (either exposed head screw or Barestone rivet) allows different aesthetic options.
- Suitable for Bushfire Attack Level up to 40 (BAL-40) when constructed in accordance with AS 3959.
- The unique Barestone rivet with pre-assembled rubber sleeve allows slight movement across the panel thereby reducing the stresses created where panels are installed with "fixed" points.
- Panels are easy to cut for openings e.g., around windows and power boxes.
- Termite resistant.
- Durable and weather resistant:
 - Provides effective protection against wind, rain and temperature extremes, mould and mildew.
 - 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.
- Systems are available for thermal, acoustic and fire requirements as part of an overall solution.

System Solutions

A technical Data Sheet can be downloaded from cemintel.com.au

Fire Resistance Level (FRL)	Up to 120/120/120, -/180/180 when used in a system with Gyprock fire grade plasterboard	Refer to Gyprock The Red Book
Bushfire Construction	BAL-40 (Construction for Bushfire Attack Level 40 for an external wall)	AS 3959
Weatherproofing	Suitable for serviceability wind pressures of +2.5kPa with Cemintel Rigid Air Barrier and +1.19kPa with Enviroseal CW-IT wall wrap, when installed as a pressure equalised system.	AS/NZS 4284
Wind actions (including Cyclonic)	Suitable for ultimate wind loads up to 7.0 kPa with Cemintel Rigid Air Barrier, including cyclonic conditions, and up to 2.5 kPa with Enviroseal CW-IT	AS/NZS 4284 & AS 4040.3

04

DESIGN + AESTHETIC
CONSIDERATIONS

04

DESIGN + AESTHETIC CONSIDERATIONS

This section outlines some important areas for consideration in determining whether Cemintel Barestone External is suitable for the required application. 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. This guide should be read in conjunction with the NCC.

Panels, top hats and structural framing are required to resist wind loads that are specific to the building site. Additional “local pressure factors” apply to the panels and top hats in accordance with the wind code AS/NZS 1170.2.

Once wind loads have been determined top hat spans, fastener spacings, and sheet fixing details can be selected from the appropriate tables in the ‘System Engineering’ section of this guide. It is also the responsibility of the Architect/Building Designer to select the appropriate corrosivity category.

Panel Appearance and Finish

As with natural timber and stone, every Barestone panel is unique in colour, patterning and texture. The combination of natural ingredients and the manufacturing process will result in variation whereby some panels may have larger areas of lighter or darker colouring. There may also be white or black mineral deposits appearing through the panel which come from the raw materials and the manufacturing process. This randomness and uniqueness is what gives Barestone its character and is not a fault.

Note that product may vary from sample materials provided and the architect/builder/installer/owner should ensure that variation in look between panels is acceptable and meets aesthetic requirements prior to installation.

Being prefinished, special care needs to be taken prior to and during installation to protect panels and prevent staining and scratching.

DESIGN + AESTHETIC CONSIDERATIONS

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Panel Layout

Panel layout should take into account the following:

- Aesthetic design.
- Top hat spacing to allow for expressed joint widths (Refer Fig. 4.01).
- 8-10mm recommended joint width.
- Type of structural support.
- Size and location of openings.
- Building size.
- Location of building control joints.

Panel layout can be in a grid pattern where vertical and horizontal joints are continuous (Refer Fig. 4.02 & Fig. 4.03). In these layouts, construction joints may be positioned behind any vertical or horizontal sheet joint (refer to “Construction Drawings & Details” section).

Panel layout can also be in a vertical or horizontal half-bond pattern where some joints are discontinuous (Refer Fig. 4.04 & Fig. 4.05).

This is not an exhaustive list of panel layouts.

FIGURE 4.01 Typical Top Hat set-out - 1200mm Width Vertical Panels with 10mm Joints shown

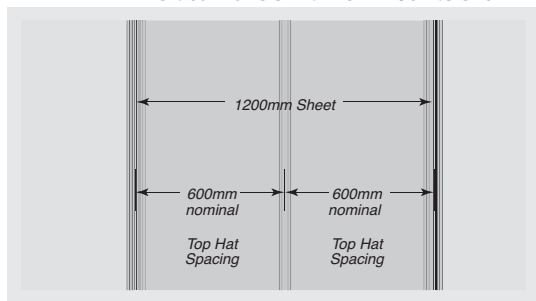


FIGURE 4.02 Horizontal Sheeting Aligned Grid Pattern

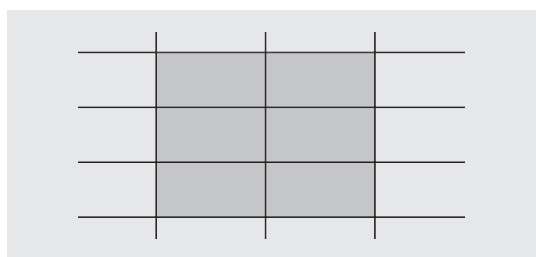


FIGURE 4.03 Vertical Sheeting Aligned Grid Pattern

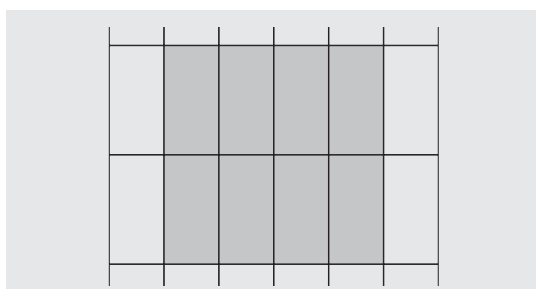


FIGURE 4.04 Horizontal Sheeting Half-bond Pattern

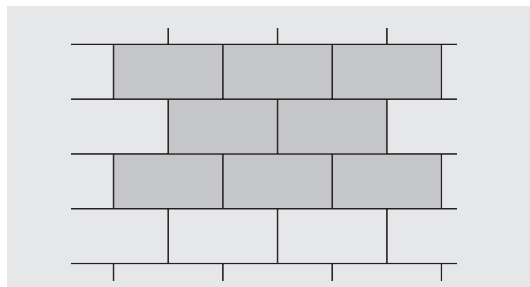


FIGURE 4.05 Vertical Sheeting Half-bond Pattern

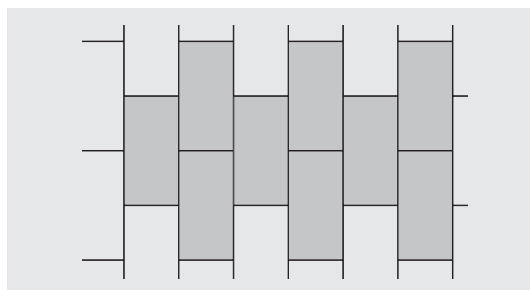
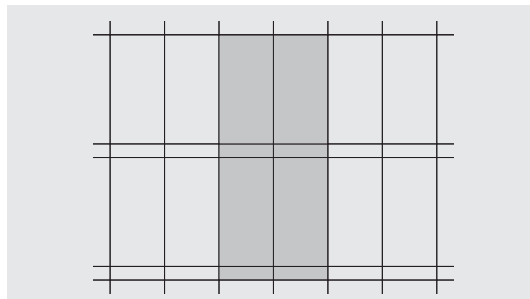


FIGURE 4.06 Skirt Panel (Floor to Floor in Excess of 3m)



Structural

Framing and Substrate Options

Barestone External panels and ExpressWall system can be fixed to either timber or steel framing, as well as to masonry and concrete substrates.

For timber and steel framing, the minimum requirement shall be in accordance with the following standards:

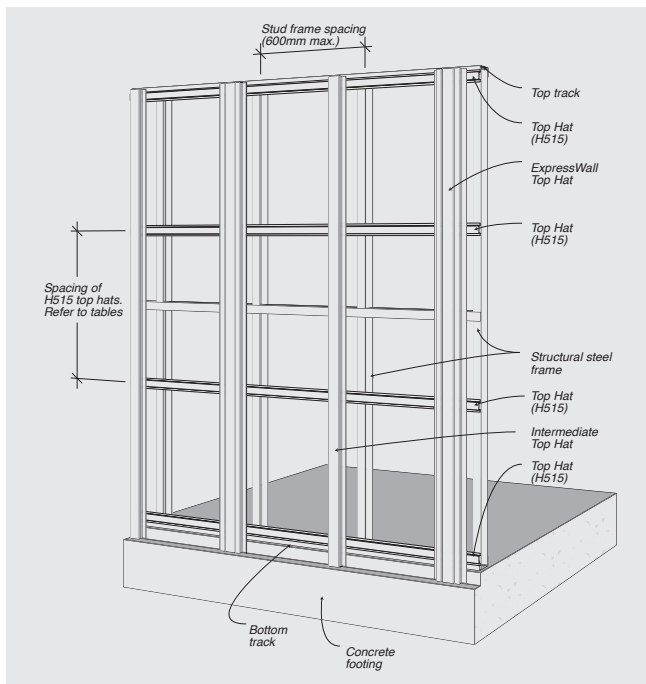
- AS 1720 – Timber Structures.
- AS 1684 – Residential Timber-Framed Construction.
- AS/NZS 4600 – Cold-Formed Steel Structures.
- AS 3623 – Domestic Metal Framing.

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DESIGN + AESTHETIC CONSIDERATIONS

Timber Stud or Steel Framing

Cemintel ExpressWall Top Hats and Intermediate Top Hats must be installed vertically on the wall. For stud framed walls, additional horizontal members may be required to enable the alignment of the top hats with panel joints. (Refer to Fig. 4.07).

FIGURE 4.07 Fixing to Timber or Steel Stud Framing

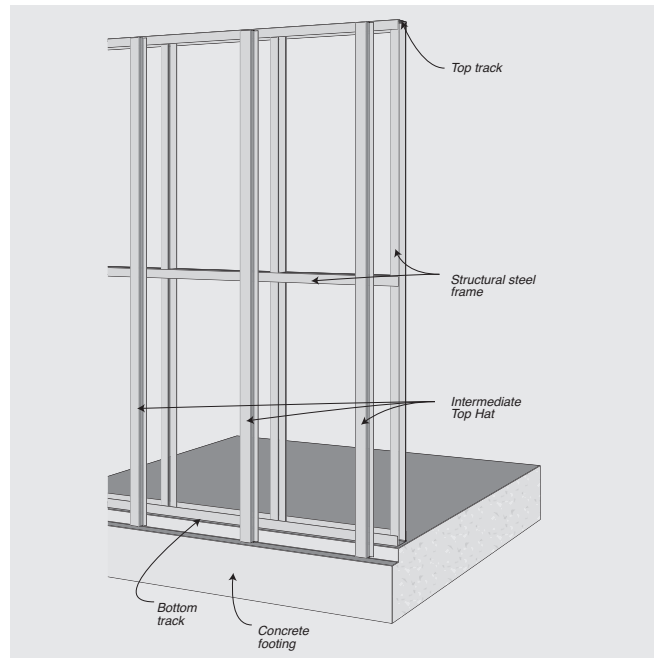
Alternatively ExpressWall framing can be fixed directly to appropriately designed steel or timber framing. The frame must be designed to support the top hats at the top and bottom of the wall and at cross members within the span of the wall (Refer Fig 4.08).

The connection of Top Hats to the structural frame requires engineering design. It is the responsibility of the project engineer to specify the connection of the top hats to the support structure.

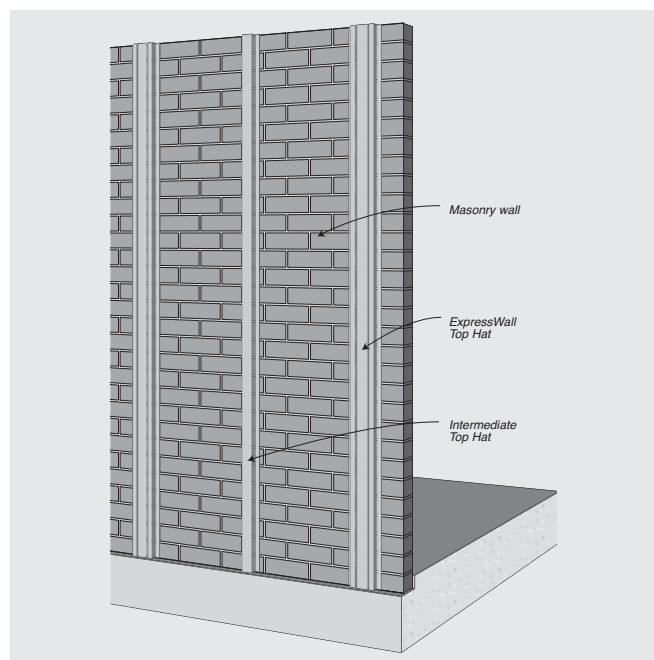
It is critical that the frame is true and plumb. Industry best practice for framed tolerance allows up to 5mm misalignment over a 3m distance. When retrofitting Barestone External to existing walls, the suitability of the substrate must be assessed.

AS/NZS 1170.0 Table C1 suggests that support framing be designed for a maximum deflection of $\text{span}/250$.

Span tables are located in 'System Engineering' section.

FIGURE 4.08 Fixing to Steel or Timber Framing**Masonry or Concrete Walls**

ExpressWall framing can also be fixed over masonry or concrete walls (Refer Fig. 4.09). All top hat connections must be designed by the project engineer.

FIGURE 4.09 Fixing to Masonry Wall

DESIGN + AESTHETIC CONSIDERATIONS

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Wind Pressures

Barestone External installation has been evaluated for use in all Australian wind zones up to and including N6 and Cyclonic C4 in accordance with AS 4055, and for wind pressures up to 7.0kPa under AS/NZS 1170.2 including cyclonic zones when fixed to steel framing. Fibre cement is not resistant to the projectile penetration specified in AS/NZS 1170.2.

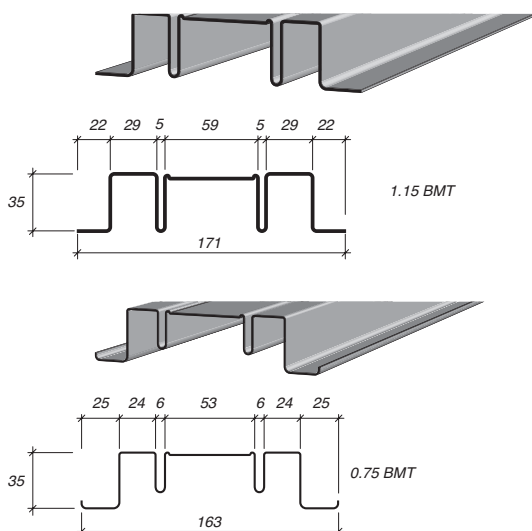
Cavity Baffle

Used vertically at the major corners or other areas of the building where differential cavity pressures either side of the corner can occur. The baffle provides an obstruction to limit the airflow between cavities and promote pressure equilisation in each wall cavity section.

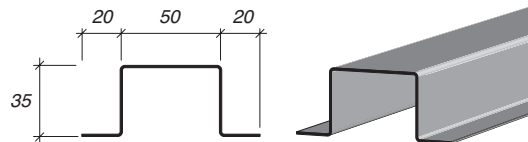
A cavity baffle solution can consist of a top hat section, Z-flashing, angle, channel, a backing rod and sealant, and/or self-adhesive expanding foam tape, that will bridge and close the cavity width or gaps between the corner sub-framing and air barrier layer. The baffle shall be suitable for the project design differential pressures. As required, use compatible sealants to close of any gaps between the baffle section and the air barrier layer, cladding and sub-framing.

Top Hats

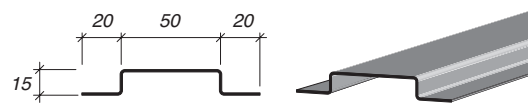
Cemintel's ExpressWall Top Hat is a purpose designed rolled steel section for supporting the vertical edges of the panels. The unique profile acts to accommodate movement of the sheets at the vertical joints. It is designed to be used in conjunction with the ExpressWall Vertical Gasket for added weather resistance. The ExpressWall Top Hat is manufactured from galvanised steel (Z275) and is available in 0.75mm and 1.15mm BMT.



Intermediate Top Hat is used to support the panels at intermediate locations in between ExpressWall top hats. The Intermediate top hat is a rolled steel section which is manufactured from galvanised steel (Z275) of 1.15mm BMT.



H515 Top Hat is installed horizontally to the face of steel or timber stud framing to support the ExpressWall Top Hats and Intermediate Top Hats. Top Hat H515 is a Rondo rolled steel section which is manufactured from galvanised steel (Z275) of 1.15mm BMT.



Pre-Drilling Panel Holes

Holes for screws and rivets must be pre-drilled. This activity can be done off-site prior to installation. For **exposed head screws**, use a 6.0-6.5mm masonry or ceramic drill bit. For **Barestone rivets**, a 9.5mm carbide tipped drill bit with centering tip must be used to accommodate the Barestone rivet. Do not use hammer action when drilling.

Clean dust out of holes.

Face Fixings

Panels can be fixed to top hats using either exposed head screws or Barestone Rivets. If choosing Barestone Rivets (recommended for more corrosive areas), specific Gesipa Accubird rivet gun accessories must be used to ensure correct fixing of the Barestone Rivet. Rivets are manufactured from stainless steel consisting of V4A stainless steel (equivalent to 316 grade) mandrels and V2A stainless steel (equivalent to 304 grade) sleeves.

Barestone rivets are available in either a natural or steel finish, depending on the desired aesthetic.

The Barestone rivet, with its unique rubber sleeve, allows a very slight movement across the whole panel thereby reducing the stresses created where panels are installed with "fixed" points.



DESIGN + AESTHETIC CONSIDERATIONS

Window & Door External Openings

Cemintel Barestone External is compatible with industry standard aluminium windows. Aluminium windows **MUST NOT** have sill drain holes that can direct water into the wall cavity.

With the cavity created by the top hat system, particular attention needs to be given to the set out of windows and doors.

The depth of the window needs to be taken into account in the design of the building frame so that the front face of the panel is properly aligned with the window and that the flashing is installed correctly.

If using a rigid air barrier or other sheeting, the thickness of this also needs to be accounted for to achieve a flush finish when determining window set out and reveal depths.

Cemintel recommends installing a sub frame with all windows. Refer to typical window detail drawing in 'Construction Drawings and Details' section of this guide.

Eaves Junction

Air is circulated within the wall cavity, and should not be vented into the roof space.

Control Joints

Movement Control Joints

Control joints provided in the panel layout should be aligned with movement control joints provided in the framing.

When undertaking building additions, a movement control joint must be installed at the junction of the existing framing and the new framing. Cladding systems must be discontinuous at this joint (refer to the "Construction Drawings and Details" section).

When setting out panels, design consideration should be given to the location of joints to ensure that minimum panel lengths are observed.

Horizontal Control Joints

A horizontal control joint is required beneath every floor junction to accommodate any expected deflection. The magnitude of the deflection must be verified by the project engineer (refer to the "Construction Details" section).

Vertical Control Joints

Vertical control joints to allow for differential movement are required at the supports of fascia trusses and at the junction of structural elements of different stiffness, such as between concrete columns and stud frames (refer to the "Construction Drawings and Details" section).

A control joint must also be installed when a masonry wall adjoins framed construction, and at the junction of framed additions or existing buildings, to allow for differential movement. Refer to 'Construction Drawings and Details' section.

Vertical joints in panels must be aligned and extend for the full height of continuous panelling, although additional joints may be placed over openings for ease of installation. As the joints are expressed, consideration to the positioning of joints is important for aesthetic reasons. Placing joints at sides or above openings, or the use of full height windows can reduce the visual impact of joints.

ExpressWall Top Hats in both 1.15mm BMT ('1.15BMT') and 0.75mm BMT ('0.75BMT') steel have been designed to elastically deform when pressure is applied during panel fixing. They have a recessed area to accept a vertical gasket tape which is made from closed cell foam with good weathering and UV resistance. It has a low compression set and low water permeability.

Structural Bracing

Cemintel Barestone panels are indirectly attached to the structural framing by way of metal top hats. As a consequence, they are not designed to provide wall bracing.

If required, bracing must be provided in the structural framing with methods such as sheet or strap bracing. Where sheet bracing is used, the entire wall framing to be clad with Barestone panels must be sheathed to maintain a uniform fixing plane.

Note: window setout will be affected.

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.

Refer to your local pest management service, the NCC, AS 3660: Termite Management, and your local building authorities for more information about the requirements for the design of a suitable termite management system.

DESIGN + AESTHETIC CONSIDERATIONS

Moisture Management

To ensure occupant health, safety and comfort and to protect the building's water sensitive materials from damage, a condensation management strategy with the following objectives is required:

- Prevent external weather entering the building;
- Mitigate the risks associated with the accumulation of internal moisture in a building; and
- Provide construction systems that have a drainage and drying potential.

The National Construction Code (NCC) 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.

CSR provides several product options for thermal and moisture control, and use as air barriers. The project designer, architect or engineer is responsible for determining what is appropriate for the application.

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 design and installation guides, 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.

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

Air Barriers

An air barrier behind the cladding is an essential part of the Barestone weatherproofing system. 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. The extent of the barrier, including the treatment at corners and at interactions with other facade elements, must be considered by the facade designer. Vertical cavity barriers may be required at

some locations to ensure effective positive pressure zones exist within the cavity, typically at building corners.

For conventionally installed wall wrap/vapour control membrane layers, typically the internal plasterboard lining is considered the predominant air barrier in the external wall system. Alternatively, the inner lining of the ventilated and drained cavity (i.e., wall wrap, rigid air barrier, waterproofing layer, backpan) can be the air barrier. The design must ensure the air barrier is structurally adequate to resist the imposed design wind pressures.

Properly designed rigid air barriers including, fibre cement, masonry, concrete, timber and metal sheeting all require respective detailing and sealing to be utilised as an air barrier. Alternatively, various properly designed wall wraps may be utilised. The maximum serviceability limit state wind pressure may be governed by the type of air barrier / air seal selected.

The serviceability wind pressure for the building is used to determine the suitability of a weatherproofing system. However, the design pressure for the air barrier is dependent on factors such as cavity depth, ventilation openings, and any panel gaps. The air barrier should be designed to resist the building ultimate wind pressure unless a lower value is determined by the facade engineer.

The Barestone system with a cavity wall configuration using Cemintel Rigid Air Barrier has been tested and assessed to AS 4284 to withstand water ingress for serviceability limit state wind pressures up to +/- 2.5kPa, and a maximum design ultimate limit state wind pressures up to +/- 7.0kPa. Table 4.04 and Table 4.05 provide the ultimate design pressure capacity of the Cemintel Rigid Air Barrier for different structural framing arrangements and sheet orientations.

Wall wraps can provide a water resistant and air tight barrier when installed appropriately. When installed in accordance with the Soft Air Barrier construction details in this guide, the Bradford Enviroseal CW-IT wall wrap has been assessed as an air barrier for a maximum design ultimate limit state wind pressures up to +/- 2.5kPa. It is recommended that wall wraps used as an air barrier have an air resistance greater than 0.1 MN/m³ when tested to ISO 5636-5. Wall wraps in Table 4.02 meet this air resistance requirement. The construction details for a soft air barrier or rigid air barrier are presented in the 'Construction Drawings and Details' section of this guide and the Cemintel Rigid Air Barrier Design & Installation Guide, respectively.



DESIGN + AESTHETIC CONSIDERATIONS

Condensation

Condensation occurs as warm, moist 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 nonabsorptive materials such as steel and glass reach saturation quickly. Water can then accumulate and must be allowed to dry or drain away via a cavity. Moist surfaces and the right environment can lead to mould, creating potential 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 and R-Value).
- Passive and mechanical ventilation.
- Air tightness.
- The building envelope's ability to allow or prevent the movement of vapour.
- The building envelope's ability to act as a water barrier behind the primary cladding element.
- The drying potential provided by a building envelope.

CSR recommends that architects/designers undertake a condensation risk analysis prior to selecting vapour control membranes. A rigid air barrier may be required where buildings are subject to higher wind loads, and in some climate zones may require the incorporation of a vapour control membrane in addition to the rigid 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 Australian Building and Construction Board (ABCB), "Condensation in Buildings Handbook", 3rd Edition 2019, discusses the condensation risks and provides guidance on managing condensation. This guidance includes review of Bureau of Meteorology climate statistics (including 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.

Vapour Control/Vapour Permeable Membranes

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 internal lining of a building.

The appropriate wall wrap 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.

The wall wrap must have a 'water barrier' classification to AS/NZ 4201.4. A non-water barrier classification is not suitable. Wraps included in this manual, and Cemintel Rigid Air Barrier, have achieved the classification water barrier. 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.

For conventionally installed wall wraps, the requirement to seal joins and penetrations may vary depending upon NCC, AS 4200.2 and/or state requirements, CSR recommends sealing the external wall wrap/sarking to maintain vapour and wind 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.

Note: 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. CSR recommends seeking expert advice prior specifying systems for these regions.

Additional literature on this subject is available from CSIRO/BRANZ/ASHRAE/ABCB and CSR DesignLINK can help with this assessment.

DESIGN + AESTHETIC CONSIDERATIONS

**TABLE 4.01** Recommended CSR Products for Moisture Management of Walls

Climate Zone	Guidance on Vapour Control	Performance and Category	Recommended CSR Products ⁽¹⁾ (Refer to Table 4.02)
Warm humid, High humidity or Hot-dry (tropical, coastal, inland) climates (Zone 1, 2, 3)	Where vapour flow is typically inward, such as where the building is airconditioned for cooling, the membrane should function as a vapour barrier. Climates with varying diurnal and seasonal temperature changes 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.	Vapour Barrier Class 1 or 2 or Vapour Permeable Class 3 or 4	<ul style="list-style-type: none"> • Bradford Thermoseal Wall Wrap • Bradford Thermoseal Wall Wrap XP • Cemintel Rigid Air Barrier with a vapour barrier membrane • Cemintel Rigid Air Barrier • Bradford Enviroseal RW/CW/CW-IT Wall Wrap
Hot-Dry or Warm Temperate (coastal & inland) climates (Zones 4, 5)	These climates have varying diurnal and seasonal temperature changes that can affect the direction of the water vapour flow. A vapour permeable membrane outside the insulation is required 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.	Vapour Permeable Class 3 or 4	<ul style="list-style-type: none"> • Bradford Enviroseal RW/CW/CW-IT Wall Wrap • Cemintel Rigid Air Barrier
Mild or Cool Temperate, or Cold (alpine) 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.	Vapour Permeable Class 4	<ul style="list-style-type: none"> • Bradford Enviroseal RW/CW/CW-IT Wall Wrap • Cemintel Rigid Air Barrier⁽²⁾

(1) Expert guidance based on local experience should be sought.

(2) 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. CSR recommends seeking expert advice prior specifying systems for these regions.

TABLE 4.02 Vapour Control Properties of CSR Products

Product	Vapour Permeance Class AS 4200.1	Vapour Permeance ASTM E 96 (µg/N.s)	Weather exposure limit prior to cladding
Bradford Thermoseal Wall Wrap XP	Class 1	≤ 0.0022	4 weeks
Bradford Thermoseal Firespec	Class 2	0.0022 to 0.1429	4 weeks
Bradford Thermoseal Wall Wrap	Class 2	0.0022 to 0.1429	4 weeks
Cemintel Rigid Air Barrier	Class 3	0.25	6 months (panel) 2 months (tape)
Bradford Enviroseal CW/CW-IT Wall Wrap	Class 4	> 1.1403	6 weeks
Bradford Enviroseal RW Wall Wrap	Class 4	> 1.1403	6 weeks

DESIGN + AESTHETIC CONSIDERATIONS

Cemintel Soft Air Barrier

Soft Air Barrier to be installed in the following wind load situations

TABLE 4.03 Wall Wrap and Plasti-Grip spacing requirements for the following wind loads

Stud Spacing (mm)	Maximum Bradford Plasti-Grip Washer Spacing (mm)								
	Ultimate Design Wind Pressure (kPa)								
	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
300	300	300	300	300	300	300	300	300	300
400	300	300	300	300	300	300	250	250	200
450	300	300	300	300	300	250	250	200	200
600	300	300	300	300	250	200	-	-	-

Note: Screw fixings for attaching washers to timber or steel framing shall be a minimum 8g self-drilling screws. Screws into timber shall have a minimum 25mm embedment.

Cemintel Rigid Air Barrier

Cemintel Rigid Air Barrier sheet installed in the vertical direction

TABLE 4.04

Stud Centres (mm)	Maximum Wind Loading (Ultimate) (kPa)
600	1.14
450	2.03
400	2.57
300	4.57

Cemintel Rigid Air Barrier sheet installed in the horizontal direction

TABLE 4.05

Stud Centres (mm)	Maximum Wind Loading (Ultimate) (kPa)
600	1.76
450	3.13
400	3.96
300	7.00

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

Energy Efficiency & Thermal Design

Energy efficiency requirements for buildings are set out in the NCC, 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 provision of appropriate sealing of the building envelope. Check with local building authorities for minimum insulation requirements. The level of insulation provided by a wall is described by its Total R-Value.

Thermal Performance of Cemintel Wall Systems

The 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 NCC.

The Total R-Values presented in The Red Book are based on assumptions in accordance with the methods of AS/NZS 4859.1 – Thermal insulation materials for 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. 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 Bridging

Thermal bridging is a path of least resistance for heat to travel, which can significantly reduce the effectiveness of insulation. An example is where a steel stud with high thermal conductivity interrupts the insulation layer. This can result in internal heat loss on a cold day and internal heat gain on a hot day. At thermal bridging locations, condensation may occur where warm, moist air contacts a colder surface.

The detrimental impact of a thermal bridge can be diminished with the installation of a thermal break, which increases the resistance for heat to travel at the thermal bridging locations. Typically, the thermal break has low thermal conductivity.

DESIGN + AESTHETIC CONSIDERATIONS



Thermal Break

For some situations, e.g. Class 2 building or Class 4 parts of a building, an envelope consisting of a metal framed wall with and external fibre-cement cladding and an internal lining directly fixed to the frame, NCC2022 J3D6 (1) [2019: J0.5] requires a thermal break to be installed between all points of contact between the external fibre-cement cladding and the metal frame. The thermal break shall have a minimum R-Value of R0.2.

The Australian Building and Construction Board (ABCB), “Energy efficiency NCC Volume One Handbook”, June 2019, advises a thermal break is not needed if a secondary framing member, orientated perpendicular to the metal frame, is installed between the metal frame and lightweight external cladding. This is the case for the ExpressWall framing system, the cladding is indirectly fixed to the structural framing with secondary members (top hats) perpendicular to the structural framing (i.e., studs), therefore no thermal break is required at the connection of the horizontal top hat and the vertical structural stud framing.

The Barestone systems have a ‘well ventilated’ cavity and the project designer, architect or engineer is responsible for assessing the thermal bridging and determining the thermal break requirements to ensure the wall system provides an adequate Total R-Value inclusive of thermal bridging.

For the Cemintel direct fixed wall systems, the external cladding is in direct contact with the metal framing a thermal break is applied to the face of the frame to meet the deemed to satisfy requirements of the NCC.

NCC Requirements

NCC 2022 includes changes to energy efficiency requirements. These requirements will express the R-Value of the building fabric system as the Total R-Value inclusive of thermal bridging. The Total R-Value will consider the project specific external wall configuration and materials used, so that the detrimental impact of the thermal bridging on the added insulation is captured.

Additional to the effects of thermal bridging through the framing paths of the structure, the designer will need to allow for the following:

- 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;
- wall cavity ventilation; 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 Section J of the NCC.

For projects conforming to NCC versions prior to the NCC 2022, thermal bridging consideration is not required in the Total R-Value calculation for all building classes, such as:

- Class 1 to Class 10 buildings (all building classes) for NCC 2016 Amdt. 1 Volume One and NCC 2016 Amdt. 1 Volume Two (and earlier).
- Class 1 and Class 10 only for NCC 2019 (incl. Amdt. 1) Volume Two.

For product information, refer to ‘Components’ section of this guide. Note, the insulation also improves the acoustic performance of the wall against outside noise.

Building Envelope Sealing

Building envelope sealing is pertinent to the energy efficiency performance of a building. NCC 2022 J1V4 [2019: JV4] outlines a method to verify compliance with the building sealing requirements in NCC 2022 Part J5 [2019: Part J3].

Solar Reflectance/Absorptance

Cemintel Barestone has been tested to ASTM E 903-96 ‘Standard Test Method for Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres’.

TABLE 4.06 Barestone Solar Properties

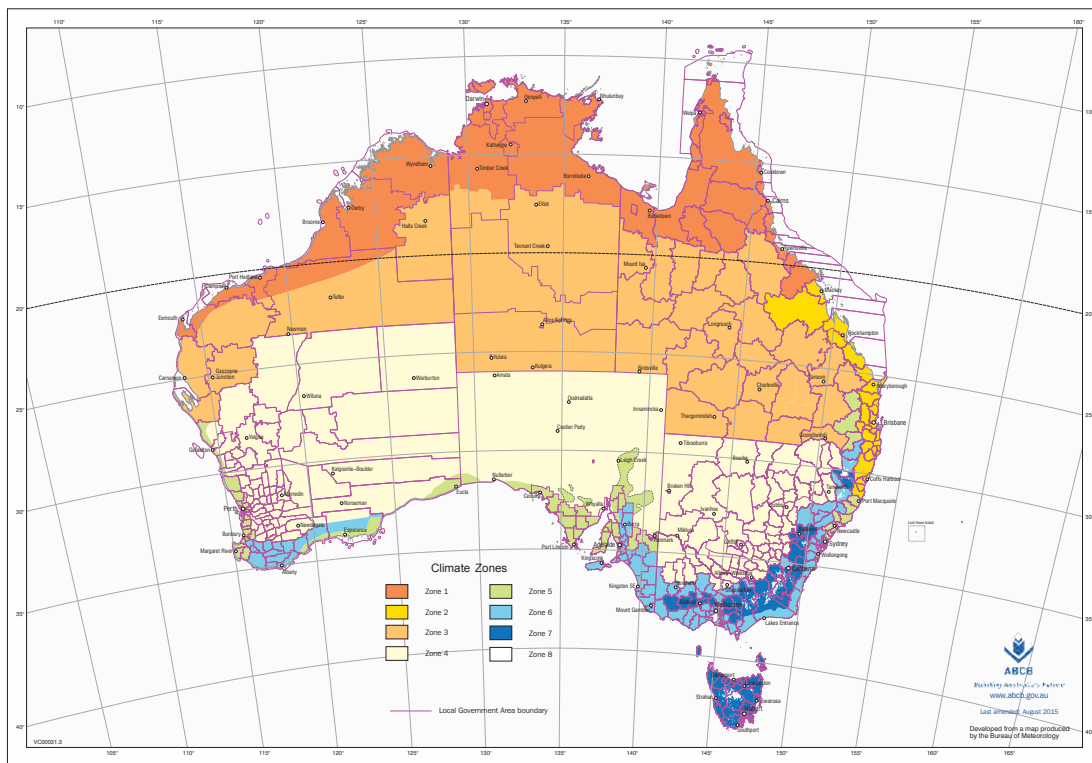
Barestone Product	Solar Reflectance %	Solar Absorptance %	BASIX Colour
Original	39.8	60.2	Medium
Ash	23.9	76.1	Dark
Lunar	14.3	85.7	Dark
Graphite	8.7	91.33	Dark

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DESIGN + AESTHETIC CONSIDERATIONS

Climate Zones for Thermal Design

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



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

Step 2: From Table 4.07, 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 building classes are defined by the NCC.)

Step 3: Refer to the roof, wall or floor system applicable to your construction type to determine Total R-Value.

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 4.07 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&10	Summer	Winter						
Class 2-9	Summer						Winter	

DESIGN + AESTHETIC CONSIDERATIONS



Fire Performance

Façade Fire Performance

With respect to the Deemed-to-Satisfy requirements of NCC 2022 Volume One, C2D10 [2019: C1.9] allows that fibre-reinforced cement sheeting may be used wherever a non-combustible material is required. Cemintel Barestone is fibre-reinforced cement sheeting and is therefore suitable as a component of, for example, external walls of buildings that are of Type A or B construction. A similar allowance is made in the Acceptable Construction section of NCC 2022 Volume Two.

Bradford Enviroseal and Thermoseal products are also suitable for use where a non-combustible sarking-type material is required as they do not exceed 1mm in thickness and have a Flammability Index ≤ 5 .

Fire Rated Wall Construction

Cemintel Barestone External can be used in conjunction with Gyprock fire grade plasterboard as part of a fire rated wall. Systems may be selected from Gyprock The Red Book series of; The Red Book 01, The Red Book 02 and The Red Book 03.

Extreme Climate Conditions

Bushfire Zones

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 is the responsibility of the project designer to assess the bushfire adequacy of the wall system and determine any additional details to satisfy the project bushfire requirements (refer to the NCC, AS 3959 and any other relevant regulatory requirements).

Protection against bushfire attack requires a comprehensive and systematic approach to ensure the construction of the whole wall system is considered, that includes the specification of fire-resistant linings, framing, cavity treatment and other materials (e.g., insulation, external wall cladding), and construction details for the external walls and junctions to neighbouring elements (e.g., eaves, decks and floors). Bushfire zone walls require specific treatments, such as but not limited to, all joints in the external surface material (cladding) of walls shall be covered, sealed, overlapped, backed or butt-jointed, inclusion of a sarking-type material applied over the frame prior to fixing any external cladding, and at all gaps (e.g., vents and weepholes) in external walls shall be screened with a mesh with a maximum aperture of 2mm, made of corrosion-resistant steel or bronze. Also mesh coverings may be required at the wall head, base, all gaps, eaves and junctions with roofs, etc., to ensure appropriate protection from fire and ember attack.

In accordance with AS 3959, the Cemintel Barestone External sheets comply with the minimum thickness requirements of fibre-cement external cladding of Section 8 Construction Requirements for Bushfire Attack Level 40 (BAL-40) for an external wall. Barestone External wall systems can be suitable for use on buildings constructed in accordance with AS 3959 with a BAL rating up to and including BAL-40.

Cemintel Barestone External wall systems can achieve a 30/30/30 FRL rating (or higher) from the outside with the addition of a suitable Gyprock Fyrchek MR plasterboard lining to the outside of the framing, (refer to Gyprock The Red Book

01 Design Guide) and installed according to regulations and AS 3959 Section 9 Construction Requirements for Bushfire Attack Level FZ (BAL-FZ) for an external wall. Note that a 10m setback applies from the edge of the classified vegetation to the building.

Corrosive Zones

Consideration of corrosivity zones should be taken into account. While Barestone External panels are not subject to corrosion, consideration needs to be made regarding the impact of climate conditions on system components such as screws, rivets and metal framing.

Corrosivity zones are detailed in AS 4312-2019 and set out in Table 4.08 at the end of this section.

Barestone External panels installed with the ExpressWall fixing system is a pressure equalised ventilated cavity system and may be used in environmental zones up to and including C3 – Medium.

Walls must be sufficiently exposed from above so that rain can perform natural wash-down of the wall. Otherwise all walls which are protected by soffits must be washed down twice per year to remove salt and debris build up, particularly around window/door openings.

Note that a white deposit may develop on stainless screw heads over time. This can be prevented by regular washdown of the façade and the fastener heads.

The Architect/Building Designer is responsible for assessing the site in accordance with the standard and local conditions.

Barestone External panels installed with the ExpressWall fixing system is not suitable for Corrosivity Zone C5 – Very High. This includes the beachfront in regions of rough seas and surf beaches, and inland for several hundred metres, eg. around Newcastle extending over half a kilometre from the coast. It also includes aggressive industrial areas where the environment may be acidic with a pH of less than 5.



DESIGN + AESTHETIC CONSIDERATIONS

Corrosivity Categories

ISO 9223 has suggested five corrosivity zones based on the first year corrosion rate of mild steel. Refer to AS 4312-2019 for details regarding Australian Atmospheric Corrosivity Categories.

Some general statements from this document are below.

TABLE 4.08

ISO 9223 Category	Corrosivity	Steel Corrosion rate $\mu\text{m/y}$	Typical environment
C1	Very low	<1.3	Dry indoors
C2	Low (most areas of Australia at least 50km from the coast or at least 1km from sheltered bays would be in this category)	1.3-25	Arid/urban inland
C3	Medium (from 1km to 10-50km from breaking surf – much of metropolitan Wollongong, Sydney, Newcastle and Gold Coast are in this category)	25-50	Coastal or industrial
C4	High (primarily coastal areas - from several hundred metres to about 1km inland from breaking surf or from the shoreline to around 50m for sheltered bays)	50-80	Sea shore (calm)
C5	Very high (industrial or marine) – common offshore and on the beachfront in regions of rough seas and surf beaches – can extend inland for several hundred metres (in some areas of Newcastle extends around 500m)	80-200	Sea shore (surf)
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 (severe surf) of exposed coasts

Cyclonic Zones

Cyclonic testing on the ExpressWall system has been successfully carried out for positive and negative wind pressures of up to 7.0 kPa. **In cyclonic areas, ExpressWall and Intermediate top hats of 1.15mm BMT must be used and a minimum 14-G hex head screws are required for fixing top hats to steel sub-framing.** Wind loads in this guide refer to ultimate limit state design wind pressures.

Temperature Extremes

Barestone External is not recommended for use in freezing conditions where the ExpressPanel is in contact with snow drifts or extremely hot conditions (that is above 60°C).

Other Design Considerations

Services

The ExpressWall fixing system will accommodate services that are run through the framing. Any notches or holes formed must be considered in the framing design.

Renovations

When undertaking building renovations, remove all cladding, 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 misalignment over 3000mm).

Install additional framing, insulation, air barrier and flashing as required.

Limitations

Barestone is not suitable for the following applications:

- Walls with a non-vertical face.
- Wet areas such as bathrooms.
- Chimney cladding.
- Exposure to temperatures greater than 60°C.
- Roofs, parapet cappings, sills and similar horizontal or near horizontal surfaces.
- Contact with standing snow or ice.
- As a substrate for fixing tiles.

The above listing is not intended to be comprehensive. If in doubt, please contact Cemintel.

DESIGN + AESTHETIC CONSIDERATIONS



Wash Down Process

Panels have been coated with a factory finish. Consequently, 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.

When cleaning the panels 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.
- 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 (50kh/cm²) 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 panel. When diluting the neutral detergent, follow the manufacturer's instructions and use the weakest solution possible.

For newly installed panels, wash down thoroughly in accordance with the Barestone cleaning instructions to remove debris collected on the surface of the panel during the transportation, installation and construction process.

Inspection, Repair and Maintenance

The durability of the Cemintel Barestone External range 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 wash-down 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.

Recoating

To refresh the appearance of the panel, Cemintel Barestone External can be recoated with the Cemintel Edge Sealer. This will also enhance the water resistance of the panel and consequently minimise the absorption of environmental pollutants. Prior to recoating, the surface should be cleaned (refer above) and allowed to dry thoroughly (3 days in sunny conditions). Cemintel Edge Sealer can then be applied simply with a roller. Always test first in a non-conspicuous area.

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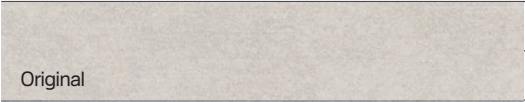

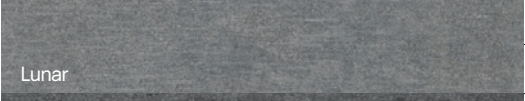

COMPONENTS + ACCESSORIES

COMPONENTS + ACCESSORIES



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

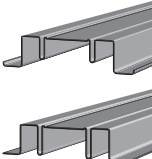
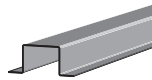



Panels

	Panel Dimensions (mm)	Product Code
 Original	9 x 1200 x 2400	99487
	9 x 1200 x 3000	99486
 Ash	9 x 1200 x 2400*	193224
	9 x 1200 x 3000	193226
 Lunar	9 x 1200 x 2400*	193220
	9 x 1200 x 3000	193222
 Graphite	9 x 1200 x 2400*	195273
	9 x 1200 x 3000	194885

*Customised solutions can be provided upon request. Please contact Cemintel® on 1300 236 468

Accessories







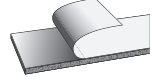
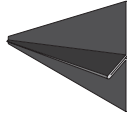
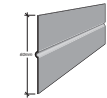





Note: The length of the fixings will need to be increased to ensure the same or greater embedment depth is obtained when additional layers are added, such as a Rigid Air Barrier (RAB), fire-rated linings, and/or thermal break materials.

Accessories	Description	Size / Colour	Quantity	Product Code
TOP HATS				
	ExpressWall Top Hat – is a purpose designed rolled steel section for supporting the vertical edges of the panels. The unique profile also acts to accommodate movement of the panels at the vertical joints. It is designed to be used in conjunction with the ExpressWall vertical gasket. Screws must be carefully installed in 0.75 BMT ExpressWall top hats to avoid thread stripping.			
	ExpressWall Top Hat 0.75BMT – mass = 1.97kg/m	6000mm	1 each	84746
	ExpressWall Top Hat 1.15BMT – mass = 3.25kg/m (suitable for cyclonic zones)	6000mm	1 each	39124
	Intermediate Top Hat – is used to support the panels at locations other than vertical joints. Intermediate top hat is a Rondo rolled steel section which is manufactured from galvanised steel (Z275) of 1.15BMT.			
	Intermediate Top Hat 1.15BMT – mass = 1.38kg/m	3600mm	1 each	21086
	Intermediate Top Hat 1.15BMT – mass = 1.38kg/m	7200mm	1 each	21083
	H515 Top Hat – is fixed to structural steel framing to support the ExpressWall and Intermediate Top Hats. Top Hat H515 is a Rondo rolled steel section which is manufactured from galvanised (Z275) steel of 1.15mm BMT.			
	Top Hat H515 15x50x15mm 1.15BMT – mass = 0.91kg/m	3600mm	1 each	12884
	Top Hat H515 15x50x15mm 1.15BMT – mass = 0.91kg/m	6000mm	1 each	454074
FASTENERS				
	Barestone Rivet – for fixing Barestone panels to top hat framing. Rivets have an attached EPDM (TPS-SEBS) gasket and are manufactured from V4A stainless steel (equivalent to 316 grade) mandrels and V2A stainless steel (equivalent to 304 grade) sleeves. Rivet heads are colour matched to the panel. Note: Use only the Barestone Rivet and Rivet Gun Head. (Refer to Tools in this section).			
		4x18mm		
		Natural (Original)	100	189370
		Greyish (Ash)	100	162686
		Blueish (Lunar)	100	162687
	Exposed Head Screws 10Gx30mm Exposed Wafer Head Galvanised Class 3. The exposed head screw has a buttress thread which is designed to provide maximum holding power in light gauge steel. It is available in Class 3 finish. Suitable for 1.15 BMT top hats.			
			1000 per pack	114070

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COMPONENTS + ACCESSORIES













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

Note: The length of the fixings will need to be increased to ensure the same or greater embedment depth is obtained when additional layers are added, such as a Rigid Air Barrier (RAB), fire-rated linings, and/or thermal break materials.				
Accessories	Description	Size / Colour	Quantity	Product Code
	Exposed Head Screws 10Gx35mm Exposed Wafer Head SS302 (zinc coated stainless steel). The exposed head screw has a buttress thread which is designed to provide maximum holding power in light gauge steel. It is available in Stainless Steel (grade 302). Suitable for 1.15 BMT top hats. Not suitable for use in C4 environments.		1000 per pack	122235
	Weather Seal Gasket. The ExpressWall weather seal is a grey, UV stabilised nylon washer. It is used with ExpressWall exposed head screws to provide an interference fit, delivering high weather resistance and acting to lock the screw into position.		1000 per pack	36484
	Hex Head Screws – for fixing vertical ExpressWall Top Hats and Intermediate Top Hats to H515 or steel framing of minimum 1.15mm BMT in non-cyclonic areas. Hex head self drilling screw 12G-14x20mm, Class 3.	12G-14 x 20mm	Supplied by others	
	Hex Head Screws – for fixing horizontal H515 Top Hats to steel framing minimum 0.75mm BMT and for fixing ExpressWall Top Hats and Intermediate Top Hats to H515 or other steel framing of minimum 1.15mm BMT in cyclonic areas. Hex head self drilling screw 14G, Class 3.		Supplied by others	
	Hex Head Screws Type 17 – for fixing H515 top hats to timber framing in non-cyclonic areas. Hex head self drilling type 17 screw 12Gx25mm, Class 3.		Supplied by others	
	Drill Bit Ø 6.0mm/6.5mm – for drilling accurate holes to install Barestone panel with exposed head screws.		Supplied by others	
GASKETS				
	ExpressWall Vertical Gasket - Gaska 1510 self-adhesive tape is made from EPDM closed cell foam which has high UV resistance. The gasket has adhesive on one side (with a release paper) and is adhered to the ExpressWall Top Hat to prevent moisture entry at vertical points.	3.2mm x 48mm x 23mm Black	1 each	133978
BACKING STRIPS				
	Angled Backing Strip – a rolled aluminium section designed to deflect water and create an attractive expressed joint appearance at horizontal joints. Suitable only where a non-sealed façade system is appropriate.	3040mm	1 each	132681
	ExpressWall Backing Strip – may be used in lieu of Angled Backing Strip for sealant filled system option.	1194mm 2394mm 2994mm	1 each 1 each 1 each	21089 21088 21087
	Bond Breaker Tape – Tesa 7492. Required where horizontal joints are sealed.	3.2mm x 48mm x 25m	1 each	13172
OTHER				
	Corner Backing Angle – metal angle flashing used in some corners. Manufactured from steel with Galvalume AZ150 corrosion resistant coating.	50mm x 50mm x 3030mm	1 each	111498
	Adhesive – for fixing spacer at head junction. Sikaflex 11FC Grey For use as a backing strip adhesive when installing ExpressWall Backing strips	310mL tube	1 each	39378
Other Tools				
	Sealant – is used to seal joints for control joints, junctions etc. Sikaflex Sealant PRO Grey	310mL tube	1 each	11378
	Backing Rod – for sealant backing – used to enable correct filling of joints with sealant. Also used as an air seal at window openings and construction junctions. The diameter of backing rod must be appropriate for the width of the gap being filled.	10mm diameter x 50m roll	1 each	11177
	Cemintel Edge Sealer – for sealing panel edges after on-site cutting.	200ml 2ltr	1 each 1 each	100166 180928
	Flashing & Capping – flashings are to be designed and installed in accordance with SAA-HB39 2015 and good building practice.		Supplied by others	

COMPONENTS + ACCESSORIES

05

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

Accessories	Description	Size / Colour	Quantity	Product Code
CSR RIGID AIR BARRIER/WALL WRAPS				
	Cemintel Rigid Air Barrier*	1200mm x 3000mm x 6mm	Pack of 30 sheets	170076
	Enviroseal™ RW Plus Classification – Class 4 Vapour Permeable	1350mm x 30m	1 roll	483000
		1500mm x 30m	1 roll	478759
	Enviroseal™ RW Classification – Class 4 Vapour Permeable	1500mm x 50m	1 roll	118153
	Enviroseal™ CW Classification – Class 4 Vapour Permeable	1500mm x 50m	1 roll	114175
	Enviroseal™ CW-IT Classification – Class 4 Vapour Permeable	1500mm x 50m	1 roll	134863
	Thermoseal™ Wall Wrap Classification – Non-permeable reflective Water Barrier	1350mm x 30m 1350mm x 60m	1 roll 1 roll	40483 15128
	Thermoseal™ Firespec Classification – Non-permeable reflective Water Barrier	1500mm x 30m	1 roll	164674
	Enviroseal Hightack Tape – used to seal wall wrap at overlap joins, around openings, for repairs and at flashings. Black, single sided, aggressive adhesive tape with a high initial grab and flexible carrier.	60mm x 25m	1 roll	160950 155170
	Enviroseal SLS Flexi Tape – used to tape corners of openings.	60mm x 25m	1 roll	117688
	Enviroseal™ Double Sided Tape	24mm x 50m	1 roll	121430
	Reinforced Aluminium Foil Tape	48mm x 50m	1 carton (24)	17366
	Bradford Plasti-Grip Washers	45 x 5mm	1 carton (1000)	136770
INSULATION				
	Bradford Gold HP Wall Batts – R2.0 (75mm)	1160mm x 420mm	12 pack	152166
		1160mm x 570mm	12 pack	152192
	Bradford Gold HP Wall Batts – R2.5 (90mm)	1160mm x 420mm	9 pack	181430
		1160mm x 570mm	9 pack	181471
	Bradford Gold HP Wall Batts – R2.7 (90mm)	1160mm x 420mm	5 pack	152191
		1160mm x 570mm	5 pack	152197
TOOLS – When using Barestone Rivets the following tools must be used				
	Surround Drill Bit Ø 9.5mm – for drilling accurate holes in the Barestone panel to accept the Barestone rivet. Fits standard 10mm drill chuck.		1 each	132673
	Surround Drill Bit Ø 4.1mm – for use with Rivet Centralising Tool to drill accurate rivet holes into the Top Hats.		1 each	132675
	Surround Rivet Centralising Tool – for drilling accurate rivet holes in the top hats. Fits a 10mm drill chuck to ensure that the 4.1mm rivet hole is perfectly centred in the pre-drilled panel.		1 each	132674
	Surround Blind Rivet Gun – Cemintel recommends the use of the GESIPA® Accubird Battery Operated Blind Rivet Gun.		1 each	470824
	Surround Rivet Gun Nose Piece – required to achieve the correct rivet fixing and offset. Attaches to the Gesipa Accubird battery operated, blind rivet gun and ensures the correct spacing of the rivet head from the panel face. Also designed to seat the larger rivet head correctly and prevent damage to the coloured rivet head. Note: Standard rivet gun nose piece is NOT ACCEPTABLE.		1 each	132676
OTHER TOOLS				
	Makita Plunge Saw Kit (1300W) includes 1400mm guide rail and bonus 165mm fibre cement saw blade – excellent for cutting cement based sheets. Must be used with a dust extraction system.	165mm	1	165485
	Makita 165mm Fibre Cement Saw Blade – ideal for use with the Makita Plunge saw and other 165mm circular saws fitted with vacuum extraction systems.	165mmx20x4T	1	165486
	Dust Extraction		1	Supplied by others
	Grinder Tool		1	Supplied by others

* Cemintel Rigid Air Barrier can be made in a range of sizes. Minimum order quantities and lead times apply. Contact Cemintel for more information.



SYSTEM ENGINEERING

SYSTEM ENGINEERING



Design, Detailing And Performance Responsibilities

Barestone External Wall System

Cemintel engages independent testing laboratories to test and report on the performance of a wall in accordance with the relevant Australian Standards. Consultants with relevant experience will use these test reports to provide opinions and assessments that extend the tested arrangement to include various on-site installation configurations and details that meet appropriate criteria performance.

Project Consultants (Structural, Fire, Acoustic, 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 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.

This involves 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 and to the structure / substrate.
- Wall and floor junctions.
- Penetrations.
- Flashing issues.
- Room / building geometry.
- Acoustic and water penetration field-testing.

Design Responsibility

Panels, top hats and structural framing are required to resist wind loads that are specific to the building site. Additional 'local pressure factors' can apply to the panels and top hats in accordance with the wind code AS/NZS 1170.2. It is recommended that the Architect/Building Designer assigns the responsibility for the facade design to the Project Engineer. Once wind loads have been determined, top hat spans, fastener spacings, and sheet fixing details may be selected from the appropriate tables in this manual.

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 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.
- The project consultants' responsibilities detailed above if one is not engaged in the project.

Cemintel does not provide consulting services. Cemintel only provides information that has been prepared by others and therefore shall not be considered experts in the field.

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 Architect/Building Designer and engineering parties to ensure that the details in this design guide are appropriate for the intended 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 in a specific project application.

Note: it is the responsibility of the Project Engineer to specify the connection of the top hats to the support structure. It is also the responsibility of the Project Engineer to calculate the wind loads for the cladding of a project.



SYSTEM ENGINEERING

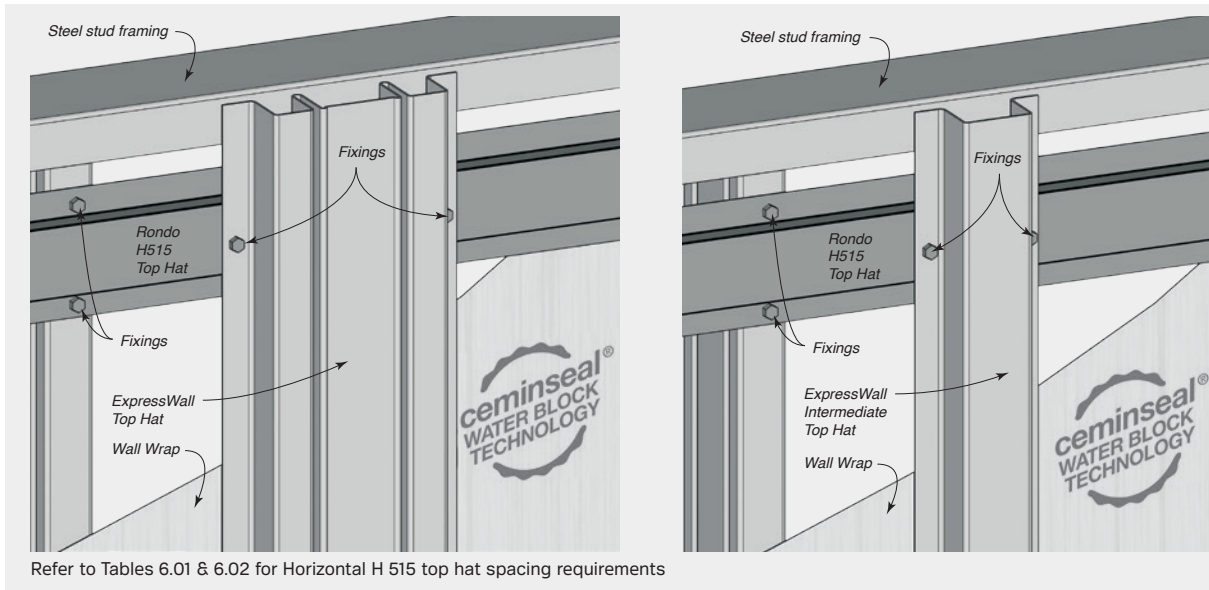
Stud Wall support framing

ExpressWall top hats and intermediate top hats can be fixed to vertical structurally designed timber MGP10 or higher grade timber, or steel support framing of minimum 0.75mm BMT.

The ExpressWall top hats and intermediate top hats can be supported by horizontally installed H515 top hats fixed at top

and bottom of the wall and at required spacing through the height of the wall. The stud frame walls designed to meet the structural requirements of the project, need to be designed to also support the top hat configurations and Barestone cladding.

FIGURE 6.01 ExpressWall Top Hats and Intermediate Top Hats fixed over horizontal H515 Top Hats, fixed to structural stud frames

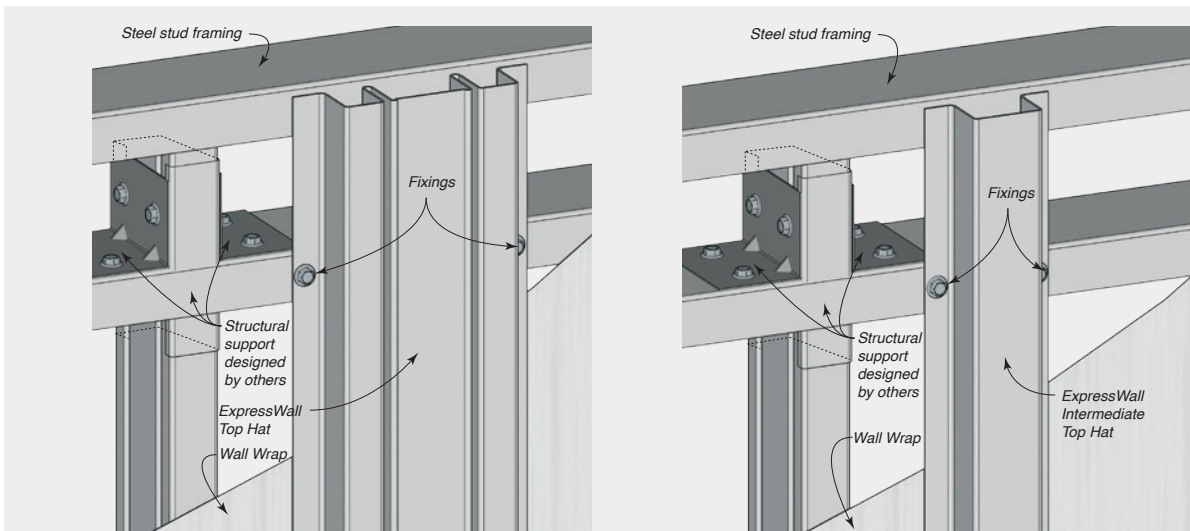


Horizontal Structural Wall Supports

ExpressWall Top Hats and Intermediate Top Hats may be fixed to horizontal structurally designed timber or steel support framing of minimum 1.15mm BMT, without the use of horizontal top hats. It is the responsibility of the project engineer to specify the support structure.

ExpressWall Top Hats and Intermediate Top Hats can be fixed at bottom plates and at horizontal structural supports positioned at required spacings. Where top plate deflection is required, such as underside of inter-storey junction, the wall framing will need to be appropriately designed to provide additional structural support for the fixing of the vertical top hats.

FIGURE 6.02 ExpressWall Top Hats and Intermediate Top Hats fixed over horizontal structural wall supports



Refer to Tables 6.03 & 6.04 for Vertical ExpressWall Top Hats and Intermediate Top Hats spacing requirements

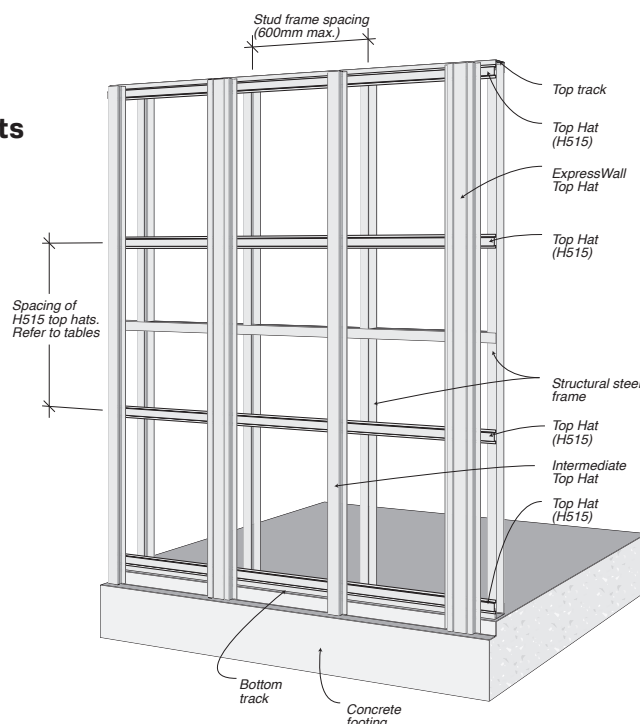
SYSTEM ENGINEERING



Spacing of Horizontal H515 Top Hats

Span Tables / Wind Loads

ExpressWall Top Hats and Intermediate Top Hats can be fixed to appropriately designed timber or steel stud framing. The frame must be designed to support top hats at the top and bottom of the wall, and at cross members. Installing H515 top hats horizontally over the designed framing provides cross members to which the ExpressWall Top Hats and Intermediate Top Hats can be fixed to.



H515 Horizontal Top Hats – RESIDENTIAL – AS 4055 Compliant, NCC Classes 1 and 10 Buildings – General & Corner Zones

TABLE 6.01

Wind Classification (AS4055)	Spacing of H515 Top Hats - Horizontal Top Hats Fixed to Three or More Studs - Timber & Steel Framing			
	Studs 0.75BMT @ 600mm centres maximum		Studs 1.15BMT or Timber Studs @ 600mm centres maximum	
	General Zones	Corner Zones	General Zones	Corner Zones
N1	1500	1500	1750	1750
N2	1500	1250	1750	1400
N3/C1	1400	750	1650	900
N4/C2	950	500	1125	600
N5/C3	625	325	750	400
N6/C4	475	250	550	300

Note: H515 Horizontal Top Hats connection to steel stud frame of minimum 0.75mm BMT use 2 x 14g hex head screws at each stud. For timber wall studs MGP10 or higher grade timber use 2 x 12g-11TPI x 25mm Type 17 hex head screws at each stud.

H515 Horizontal Top Hats – COMMERCIAL – NCC Class 2 to 9 Buildings

TABLE 6.02

Design Wind Pressure (Ultimate) kPa	Spacing of H515 Top Hats - Horizontal Top Hats Fixed to Three or More Studs - Timber & Steel Framing			
	Studs 0.75BMT Stud Spacing (mm)		Studs 1.15BMT or Timber Studs Stud Spacing (mm)	
	450	600	450	600
1.0	1750	1450	1950	1750
1.5	1150	950	1300	1150
2.0	850	700	950	850
2.5	700	550	750	700
3.0	550	450	650	550
3.5	500	400	550	500
4.0	400	350	450	400
4.5	350	300	400	350
5.0	350	250	350	350
5.5	300	250	350	300
6.0	300	200	300	250
6.5	250	200	300	250
7.0	250	200	250	250

Note: H515 Horizontal Top Hats connection to steel stud frame of minimum 0.75mm BMT use 2 x 14g hex head screws at each stud. For timber wall studs MGP10 or higher grade timber use 2 x 12g-11TPI x 25mm Type 17 hex head screws at each stud.



SYSTEM ENGINEERING

ExpressWall and Intermediate Top Hat Spacings

The design capacities of the Cemintel Barestone External wall system are in limit state format and intended for use with AS/NZS 1170.2.

To obtain equivalent permissible load capacity, divide the “ultimate wind capacity” in Table 6.04 or Table 6.06 by 1.5.

The top hat capacities have been calculated in accordance with AS/NZS 4600: Cold Formed Steel Structures and are applicable for 0.75BMT and 1.15BMT ExpressWall top hats and for 1.15BMT

Intermediate top hats. **In cyclonic regions, use the 1.15mm BMT thick ExpressWall Top Hats with 14g hex head screws.** The deflection of the top hats as detailed in these tables is no more than span/250 when subjected to serviceability wind load of 68% of ultimate wind loads.

Top hat spacing will vary depending on wind loads and panels may be installed with Single Spans (Refer Fig. 6.03) or Double Spans (Refer Fig. 6.04). Top hat spacing is nominal and may be increased by up to 20mm to accommodate panel joint width.

ExpressWall and Intermediate Top Hats

– RESIDENTIAL – AS 4055 Compliant, NCC Classes 1 and 10 Buildings

TABLE 6.03

Design Wind Pressure (Ultimate) kPa	Maximum Span of Vertical ExpressWall and Intermediate Top Hats			
	Spacing of Vertical Top Hats (mm)			
	Nominal: Suitable for additional 10mm to fit with express joint width.			
	General Zones		Corner Zones	
	400	600	400	600
N1	2650	2350	2150	1900
N2	2650	2350	2150	1900
N3/C1	2300	2050	1900	1550
N4/C2	2050	1750	1600	1250
N5/C3	1800	1450	1250	1000
N6/C4	1550	1200	1050	800

See notes below.

ExpressWall and Intermediate Top Hats

– COMMERCIAL – NCC Class 2 to 9 Buildings

TABLE 6.04

Design Wind Pressure (Ultimate) kPa	Maximum Span of Vertical ExpressWall and Intermediate Top Hats			
	Spacing of Vertical Top Hats (mm)			
	Nominal: Suitable for additional 10mm to fit with express joint width.			
300	400	450	600	
1.0	2450	2250	2150	1950
1.5	2150	1950	1900	1700
2.0	1950	1800	1700	1550
2.5	1800	1650	1600	NA
3.0	1700	1550	1450	NA
3.5	1600	1400	NA	NA
4.0	1550	1300	NA	NA
4.5	1450	1200	NA	NA
5.0	1350	1150	NA	NA
5.5	1300	1100	NA	NA
6.0	1200	1000	NA	NA
6.5	1150	950	NA	NA
7.0	1100	950	NA	NA

Notes for Tables 6.03 & 6.04

Maximum Span for Single or Double Spans.

Values suitable only when Barestone panels are fixed to three or more top hats.

NA Limited by Barestone panel span

Cantilever maximum 0.2 x adjacent span

Note: Vertical ExpressWall Top Hats and 1.15mm BMT Intermediate Top Hats connection to horizontal H515 Top Hat or structural steel support of minimum 1.15mm BMT use 2 x 12g-14TPI x 20mm. In Cyclonic conditions, use 1.15mm BMT ExpressWall Top Hats with 14g hex head screws.

FIGURE 6.03 Single Top Hat Span Installation

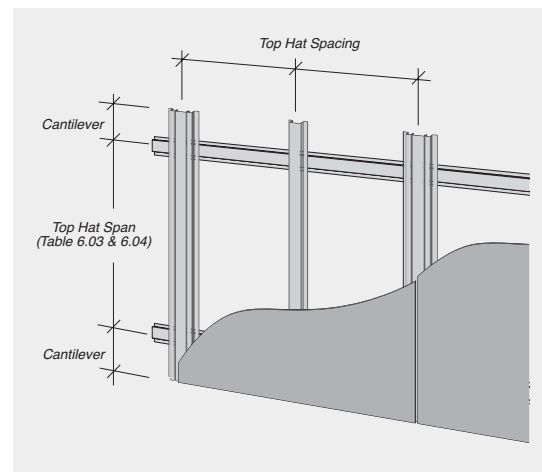
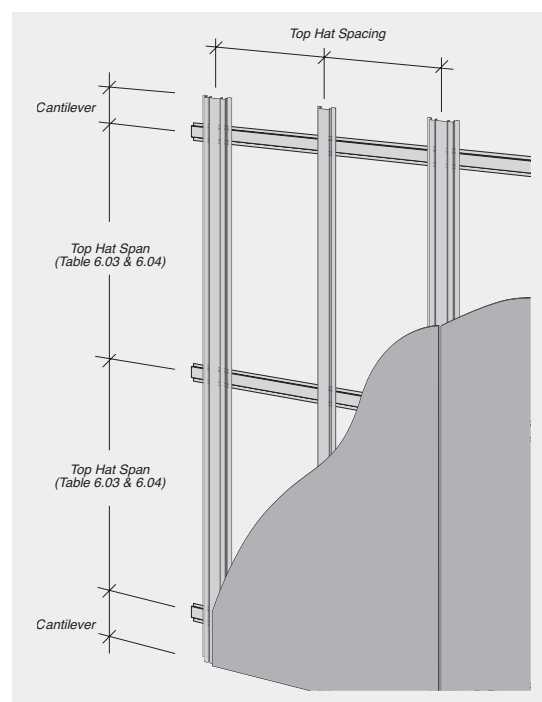


FIGURE 6.04 Double Top Hat Span Installation



SYSTEM ENGINEERING



Panel Fixing Requirements

FIGURE 6.05 Vertical Sheet Fixing

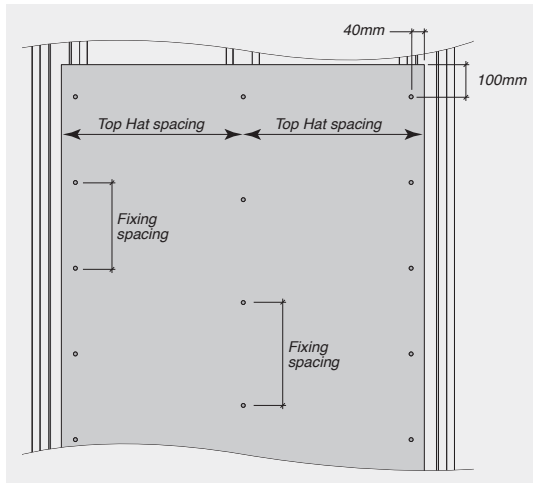


FIGURE 6.06 Horizontal Sheet Fixing

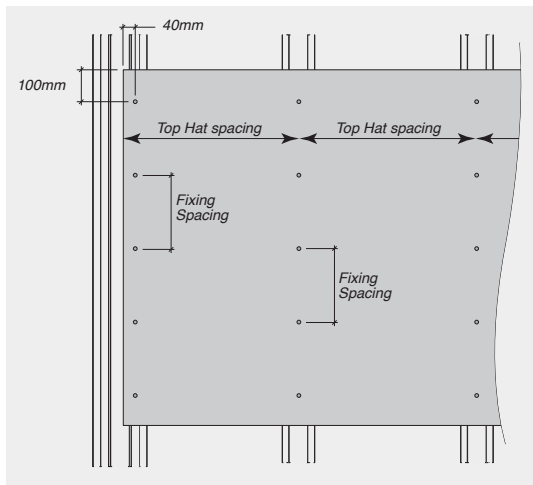
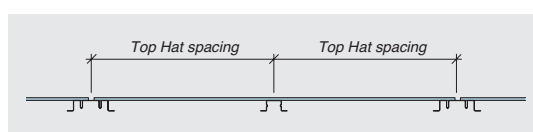


FIGURE 6.07 Panel Fixed to Two Top Hats Only



FIGURE 6.08 Panel Fixed to Three or More Top Hats



Note: Barestone panels fixed to vertical ExpressWall Top Hats and 1.15mm BMT Intermediate Top Hats using Barestone stainless steel rivet fasteners (4 x 18mm shaft, 15mm head).

Panel Fixing Requirements – RESIDENTIAL – AS 4055 Compliant, NCC Classes 1 and 10 Buildings - General & Corner Zones

TABLE 6.05

Wind Classification (AS4055)	General Zones		Corner Zones	
	Max. Top Hat Spacing (mm)	Max. Fixing Spacing (mm)	Max. Top Hat Spacing (mm)	Max. Fixing Spacing (mm)
N1	600	600	600	600
N2	600	600	600	600
N3/C1	500	600	500	450
N4/C2	500	550	400	350
N5/C3	400	450	400	300
N6/C4	400	350	300	250

Panels fixed to Two & Three or More Top Hats.
See notes below.

Panel Fixing Requirements – COMMERCIAL – NCC Class 2 to 9 Buildings

TABLE 6.06

Design Wind Pressure (Ultimate) kPa	Panel Fixing Requirements and Maximum Top Hat Spacings	
	Max. Top Hat Spacing (mm)	Max. Fixing Spacing (mm)
	Panel Fixed to Two Top Hats	Panel Fixed to Three or more Top Hats At ExpressWall and Intermediate Top Hats
1.0	600	600
1.5	500	600
2.0	500	450
2.5	400	450
3.0	400	350
3.5	400	300
4.0	400	300
4.5	300	300
5.0	300	300
5.5	300	250
6.0	300	250
6.5	300	200
7.0	300	200

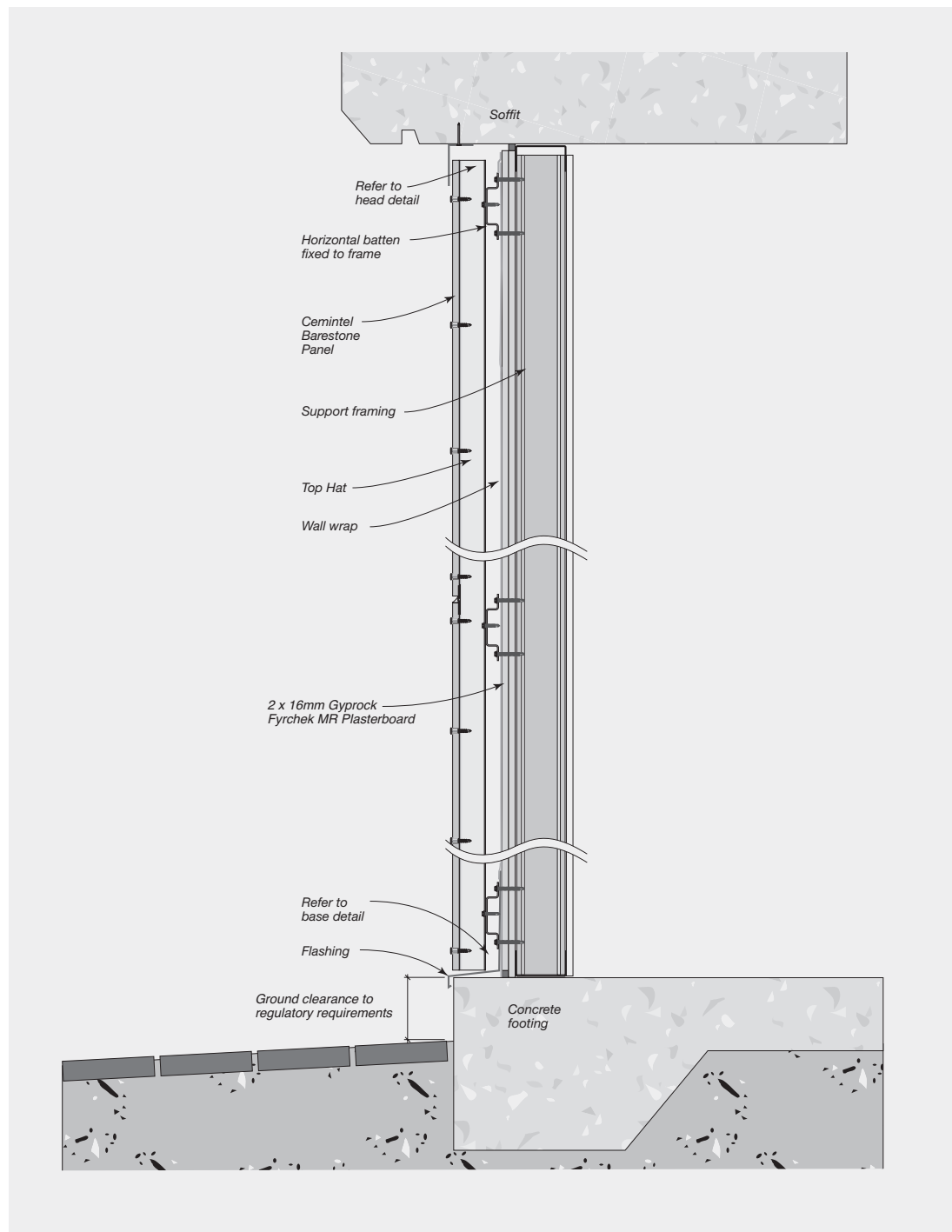
Notes for Tables 6.05 & 6.06

Barestone panels fixed to vertical ExpressWall Top Hats and 1.15mm BMT Intermediate Top Hats using wafer head ExpressWall Exposed Head Screws, fine or buttress thread, Class 3 or stainless steel, 10g x 30mm minimum or Barestone stainless steel rivet fasteners (4 x 18mm shaft, 15mm head).

Care should be taken when fixing screws to 0.75 BMT ExpressWall Top Hats as screws can strip in the lighter gauge steel. The use of a screw gun with torque control to prevent overdriving screws is recommended.



SYSTEM ENGINEERING

FIGURE 6.09 Typical Barestone External Fire Rated Installation. Pressure Equalised Ventilated Cavity System

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INSTALLATION



Check quality and quantity of panels and components before installing. If there is any sign of damage or visible defects in panels, or the colour/finish is not in keeping with the owner's aesthetic requirements DO NOT INSTALL. Contact Cemintel to address any issues.

CHECKLIST – Prior to Installation

The following pre-install checklist may assist to ensure you have the best possible outcome when using Barestone External.

- ☐ Ensure substrate is straight and plumb. Pack studs to straighten if necessary (timber frames as per AS 1684, steel frames as per AS/NZS 4600). Industry best practice for frame tolerance is 5mm misalignment over 3000mm.
- ☐ Ensure studs are correctly located and of the appropriate thickness.
- ☐ Confirm bracing is in place. Where sheet bracing is used behind panels, the entire wall area needs to be braced or bracing sheet packers fixed to the frame to ensure a uniform fixing plane.
- ☐ Remove any concrete that may foul the cladding line, particularly at steps in slabs and isolated columns.
- ☐ Ensure there is adequate ground clearance to the bottom edge of the Barestone panels as per regulatory requirements (including for water/rain runoff and termite management). These can vary from 50-150mm depending on type of ground and termite requirements.
- ☐ Confirm your panel layout to determine the location of joints and identify where additional studs are required.
- ☐ Flashings, membranes and air barrier should be correctly installed, overlapped and taped at joints, prior to fixing panels.
- ☐ Install windows so that the back of the front face of the window (or any other protrusions including doors or meter boxes) will be flush with the face of the panels.
- ☐ Fit Head flashings over windows, doors and other penetrations.
- ☐ Confirm the chosen eaves/soffit details and prepare accordingly.
- ☐ Consider the need for structural support for fixtures such as pergolas and balconies. No loads may be carried by the cladding.
- ☐ Confirm membranes and flashings for balcony areas have been installed in accordance with manufacturers' specifications.
- ☐ Arrange for a pre-cladding inspection by the appropriate local building authority if required.



INSTALLATION

07

Installation Set-Out

Appropriate panel fixing layout and top hat spacing should be suitable for the project design wind pressure. It is recommended that fasteners be fixed

100mm from the top and bottom edges of the panel and 40mm in from the side of the panels.

FIGURE 7.01 Horizontal Sheet Fixing

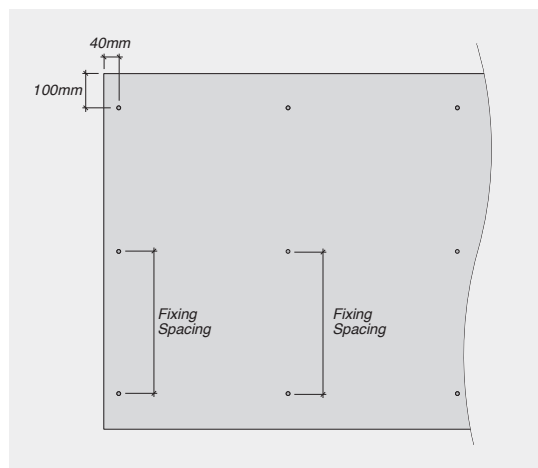
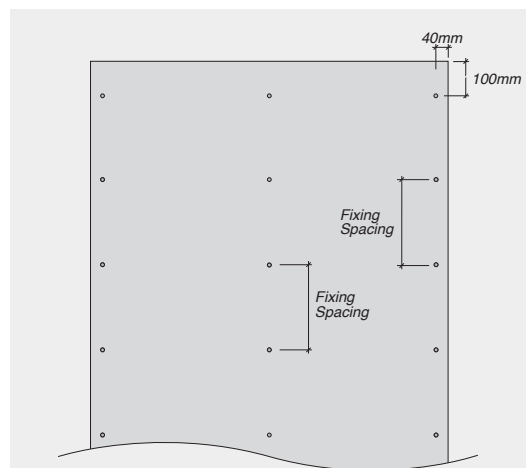


FIGURE 7.02 Vertical Sheet Fixing



Panels must be fixed in accordance with the tables set out in 'System Engineering' section. This provides fixing Requirements and Maximum Top Hat Spacings for 1200mm wide panels based on 2 top hats or 3 or more top hats.

Installation for Timber and Steel Framing

Refer to 'System Engineering' and 'Construction Drawings and Details' sections for specific fixing information.

Step 1 – Install air barrier – as per Cemintel Rigid Air Barrier Design & Installation Guide or soft air barrier as per details in this guide.

Step 2 – Fix base flashing to base of wall over air barrier (wall wrap or rigid air barrier) taping top edge of flashing to air barrier.

Step 3 – Fix cavity baffle and top hats. Fix cavity baffle to suit cavity depth at major corners nominated by the project designer. Fix H515 top hats horizontally where required to substrate as per 'System Engineering' section requirements. Fix ExpressWall and intermediate top hats vertically to H515 framing as per 'System Engineering' section requirements.

Step 4 – Prepare panels. Cut panels as required. Run a fine sandpaper block along the edge of the cut panel (taking care not to scratch the panels surface). Seal cut edges with Cemintel's recommended edge sealant to protect against moisture entering the panels.

Step 5 – Pre-drill panel holes. This should be done prior to lifting panels into place and can be done off site. Panel holes need to be drilled a minimum 100mm from the horizontal edge and a minimum of 40mm from the vertical edge (refer to 'System Engineering Section').

If using exposed head screws, use the 6.0 – 6.5mm drill bit (Refer Fig. 7.03).

If using Barestone rivets, use the recommended Cemintel 9.5mm carbide tipped drill bit with centreing tip (Refer Fig. 7.04).

FIGURE 7.03 Pre-drilling Panels – Screw Fix

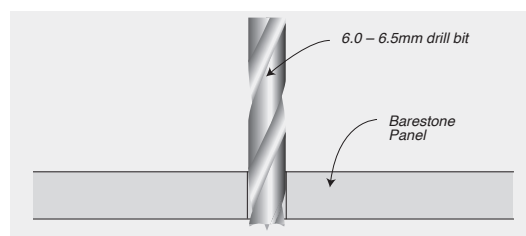
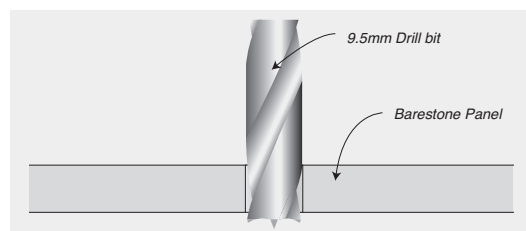


FIGURE 7.04 Pre-drilling Panels – Rivet Fix



07

INSTALLATION

The size of the hole drilled is designed to match the size of the rivet rubber sleeve or the screw with weather seal inserted. The use of other tools for this purpose may reduce fixing capacity and reduce the weather resistance of the system.

DO NOT use hammering action when drilling. For efficiency you can neatly stack 3 or 4 sheets and drill through all at the same time. Take care to avoid damaging the panel with the drill chuck when approaching the end of the hole by using a timber block.

Clean/sweep away any dust from holes as this can stick to the panel.

Step 6 – Install Vertical gaskets to the ExpressWall Top Hats for the full extent of panels. Take care not to stretch the gasket when installing (Refer Fig. 7.05). When joining gasket, cut ends cleanly and push together before adhering. When top hat is discontinuous, butt ends together tightly and continue gasket over the joint. If a gap is present, install a steel strip to support the gasket (Refer Fig. 7.06).

FIGURE 7.05 Vertical Gasket – Screw Fixed or Rivet Fixed

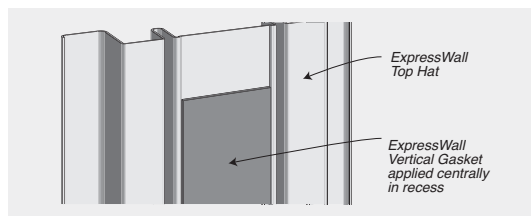
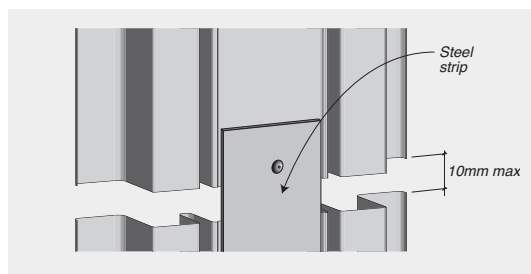
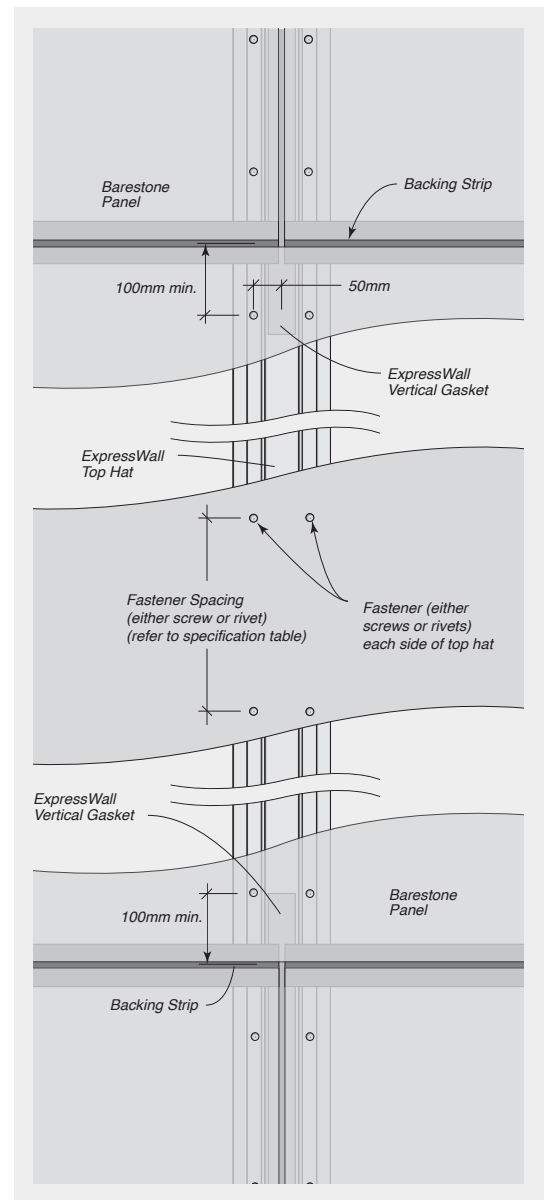


FIGURE 7.06 Gasket Support at Discontinuous Joint – Screw Fixed or Rivet Fixed



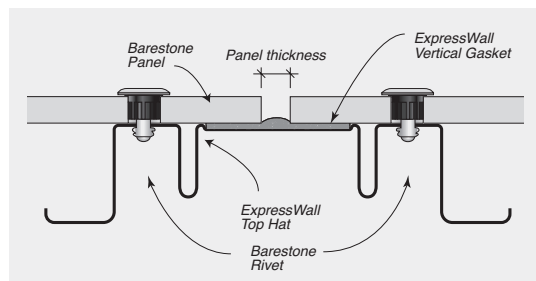
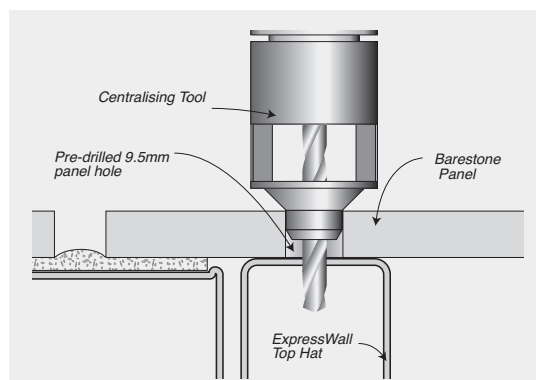
At the beginning and end of a vertical joint, such as with sheets installed in a half-bond pattern, continue the vertical gasket past the horizontal joint by 100mm minimum (Refer Fig. 7.07).

FIGURE 7.07 Vertical Gasket and Fixing Detail for Half-Bond Panel Layout – Screw or Rivet Fixed



INSTALLATION

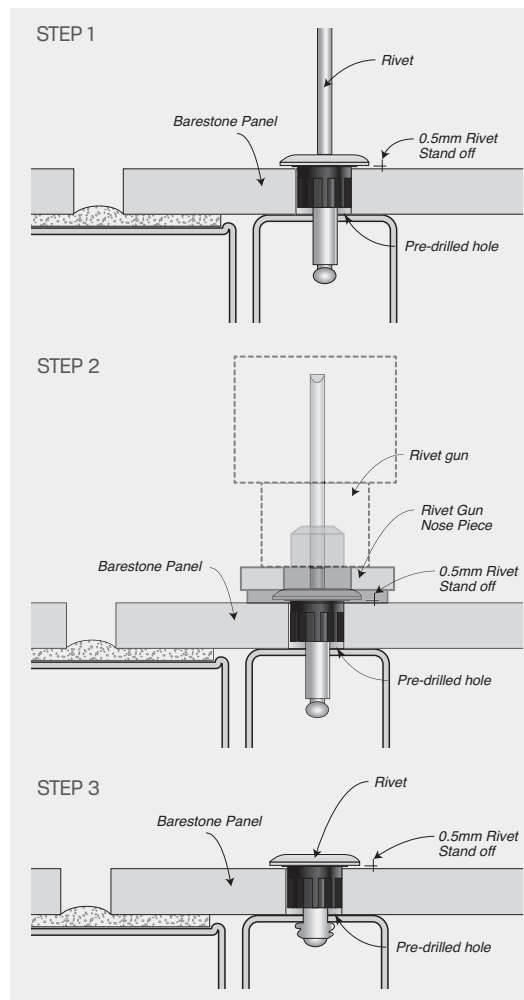
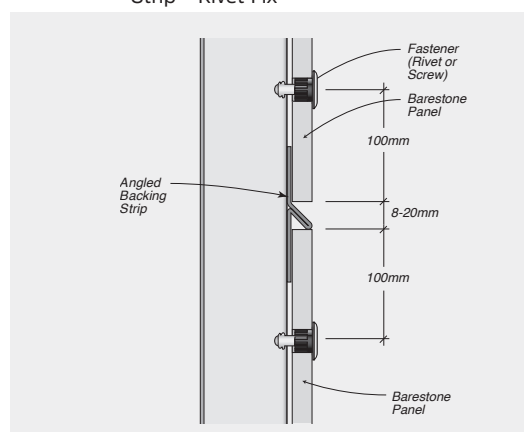
07

FIGURE 7.08 Vertical Joint Detail – Rivet Fixed**FIGURE 7.09** Centralising Tool**Step 7 – Install wall panels.**

7a) When fixing panel using rivets lift panel into place, clamp down level to identify horizontal and vertical planes. Using the Rivet Centralising Tool, drill 4.1mm rivet holes through the pre-drilled panel holes into the top hats. This specialised tool creates a rivet hole, which matches the size of the shaft of the rivet, precisely in the centre of the panel hole (Refer Fig. 7.09).

Fix panel using rivets – Install Rivet Gun nose piece onto the Gesipa Accubird battery operated blind rivet gun. The nose piece has a slight concave shape which serves to create a small (0.5mm) clearance between the panel face and the rivet flange. This enables differential movement of the frame while reducing damage to the panel face. Fix panel starting at the bottom corner. Place the rivet gun with the rivet gun head onto the rivet shaft. Push the panel firmly against the framing/gaskets and operate the gun to pull the rivet through panel hole into the predrilled top hat.

Before fixing top rivets to panel, insert Angled Backing Strip along horizontal joint. Clip corners at an angle and bend. Barestone Panels are generally installed with a nominal 8-10mm wide expressed joint in both horizontal and vertical directions (a small cut piece of panel can be used as a spacer to easily measure joint widths and ensure consistency). Once positioned, fasten top row of rivets.

FIGURE 7.10 Fixing with Rivets**FIGURE 7.11** Horizontal Joint Detail with Angled Backing Strip – Rivet Fix

To seal the groove in the backing strip at the ends, apply a small section of gasket to the rear of the backing strip. This will be forced into the recess and seal the end of the strip. Alternatively use Sikaflex 11FC to fill the groove.

A fillet of Sikaflex 11FC is then placed along the top edge of the panel. This ensures that the joint drains and salt and dirt do not build up in the joint.

7b) When fixing panel using exposed head screws When using the ExpressWall Backing Strip, ensure ExpressWall backing strip is 6mm shorter overall than the width of the panel (cut to length if necessary).

Install the ExpressWall weather seal into the pre-

drilled hole in the panel. Drive the exposed head screw through the weather seal and into the top hat using an electric screw gun. Cemintel recommends the use of a screw gun with torque control to prevent overdriving of screws. Exposed head screws can be used with 1.15BMT top hats – care should be taken when fixing Exposed Head Screws to 0.75BMT ExpressWall Top Hats as screws can strip in the lighter gauge. (Refer Fig. 7.15).

Joint widths – While panels are generally installed with a nominal 8-10mm wide horizontal and vertical expressed joint. However joints up to 20mm can be formed provided additional care is taken during installation to ensure that panel edges cover the joint gaskets by a minimum of 10mm.

FIGURE 7.12 ExpressWall Backing Strip Positioning

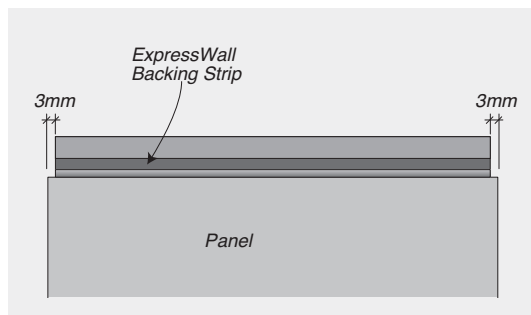


FIGURE 7.13 Horizontal Joint with ExpressWall Backing Strip

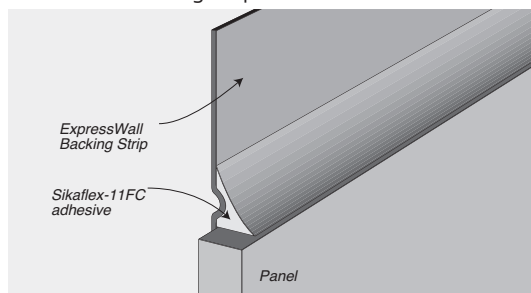


FIGURE 7.14 Sealing Ends of ExpressWall Backing Strip

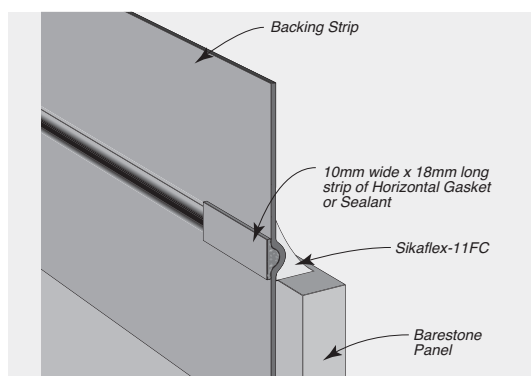


FIGURE 7.15 Vertical Joint

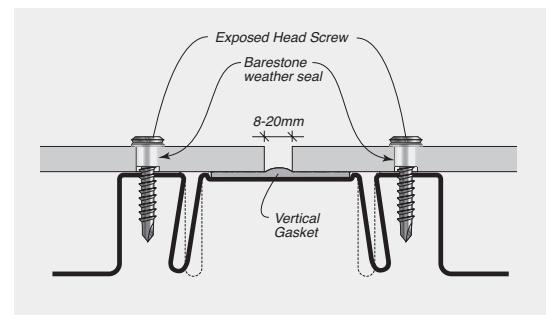
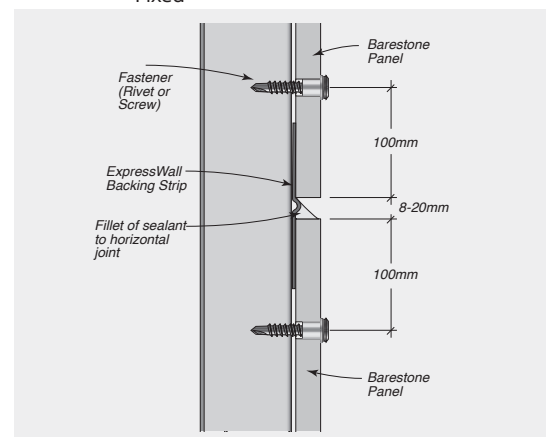


FIGURE 7.16 Horizontal Joint Detail with ExpressWall Backing Strip – Sealant Filled and Screw Fixed



INSTALLATION

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In certain conditions such as corrosive environments or where there is a preference to have flush sealed joints, horizontal and vertical joints may be filled with recommended joint sealant and in accordance with manufacturer's instructions. Base of walls including horizontal joints at inter-storey junctions must

remain open, to allow pressure equalisation to be maintained and for any water moisture to drain from the cavity. Refer to the sealant filled joint details of the "Construction Drawings and Details" section of this manual.

FIGURE 7.17 Joint Construction – Sealed Option

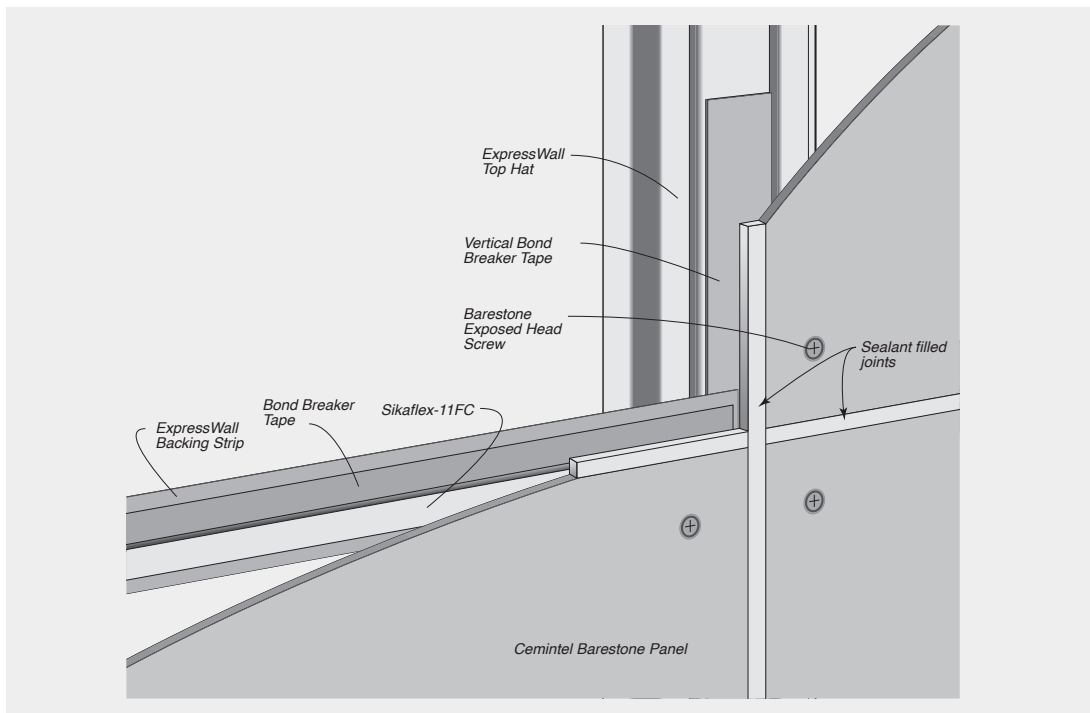


FIGURE 7.18 Horizontal Joint Sealed Side

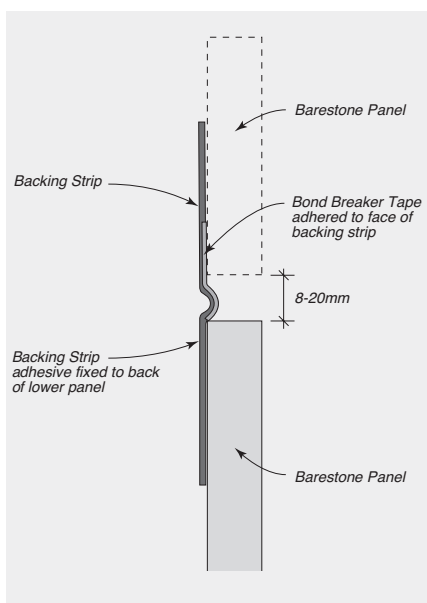


FIGURE 7.19 Horizontal Joint Sealed Side

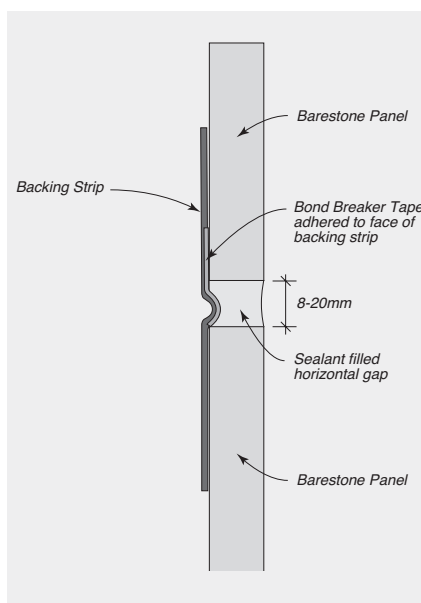


FIGURE 7.20 Backing Strip & Bond Breaker Tape

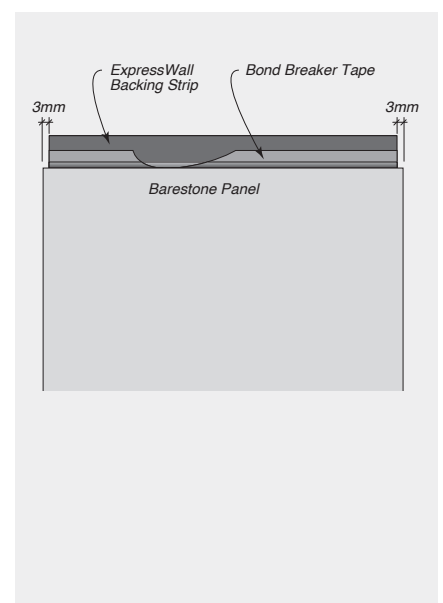
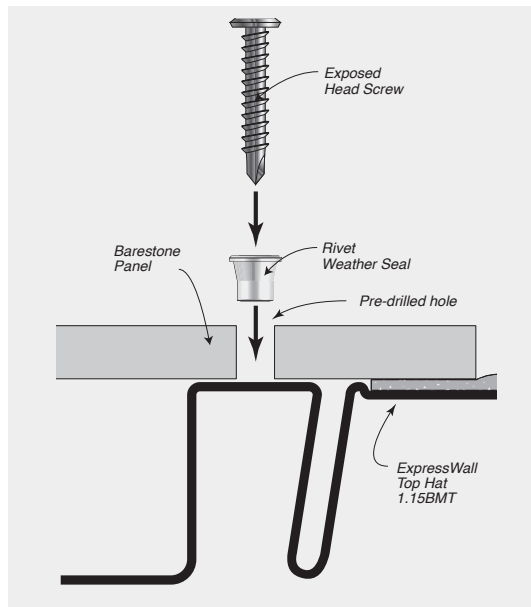
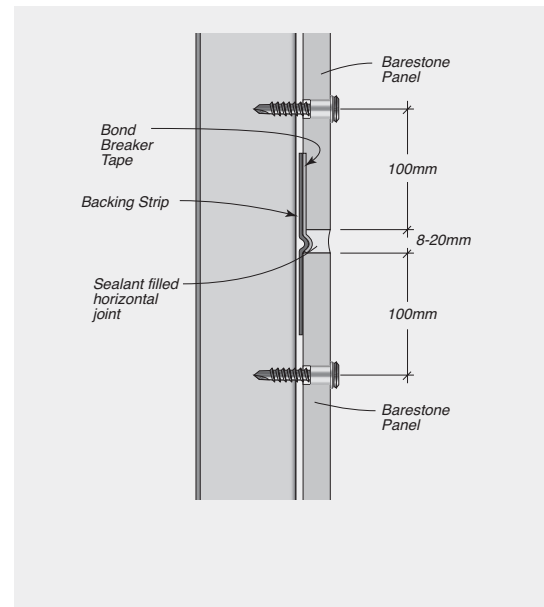
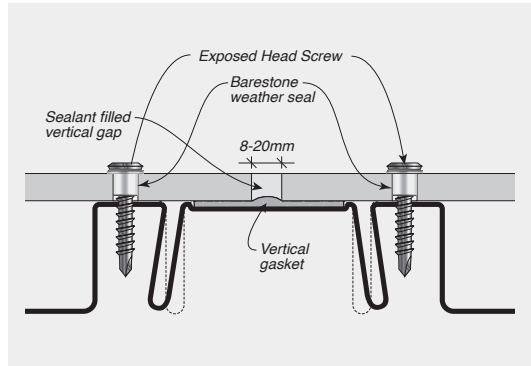


FIGURE 7.21 Fixing Panels – Screw Fixed**FIGURE 7.22** Horizontal Joint Fixing – Sealed Option**FIGURE 7.23** Vertical Joint – Sealed Option

INSTALLATION

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Installation of Cemintel Rigid Air Barrier™

The Cemintel Rigid Air Barrier may be installed horizontally or vertically across the frame. An appropriate panel fixing layout should be selected for the project design wind pressure and frame spacing. Panels must be fixed in accordance with the tables set out in the Cemintel Rigid Air Barrier Design & Installation Guide.

Panels are fixed to timber framing using nails to steel framing using screws. A small joint (maximum 3mm) is acceptable. Joints are taped using HighTack tape to form an air barrier. Similarly, all corners, penetrations and junctions are sealed with HighTack tape or with flexible sealant.

All flashings should be fixed over the top of the Rigid Air Barrier and taped with HighTack tape.



Check quality and quantity of panels and components before installing. If there is any sign of damage or visible defects in panels DO NOT INSTALL. Contact Cemintel to address any issues.

Procedure for Horizontal or Vertical Sheet Application

- 1 Cut sheets to ensure vertical joints are supported by studs and horizontal joints are backed by noggings.
- 2 Position sheets (refer to Head & Base details in 'Construction Details' section). Screw fix (to steel frame) or nail (to timber frame) at the detailed fastener centres.
- 3 Install adjacent sheets.
- 4 Seal vertical joints, horizontal joints, and corners with HighTack tape. Seal junctions and penetrations with Sikaflex Pro flexible sealant.
- 5 Seal any openings in head, sill and jamb framing with HighTack tape.
- 6 Apply SLS FlexiTape to corners of window and door openings.

FIGURE 7.24 Typical Rigid Air Barrier Installation

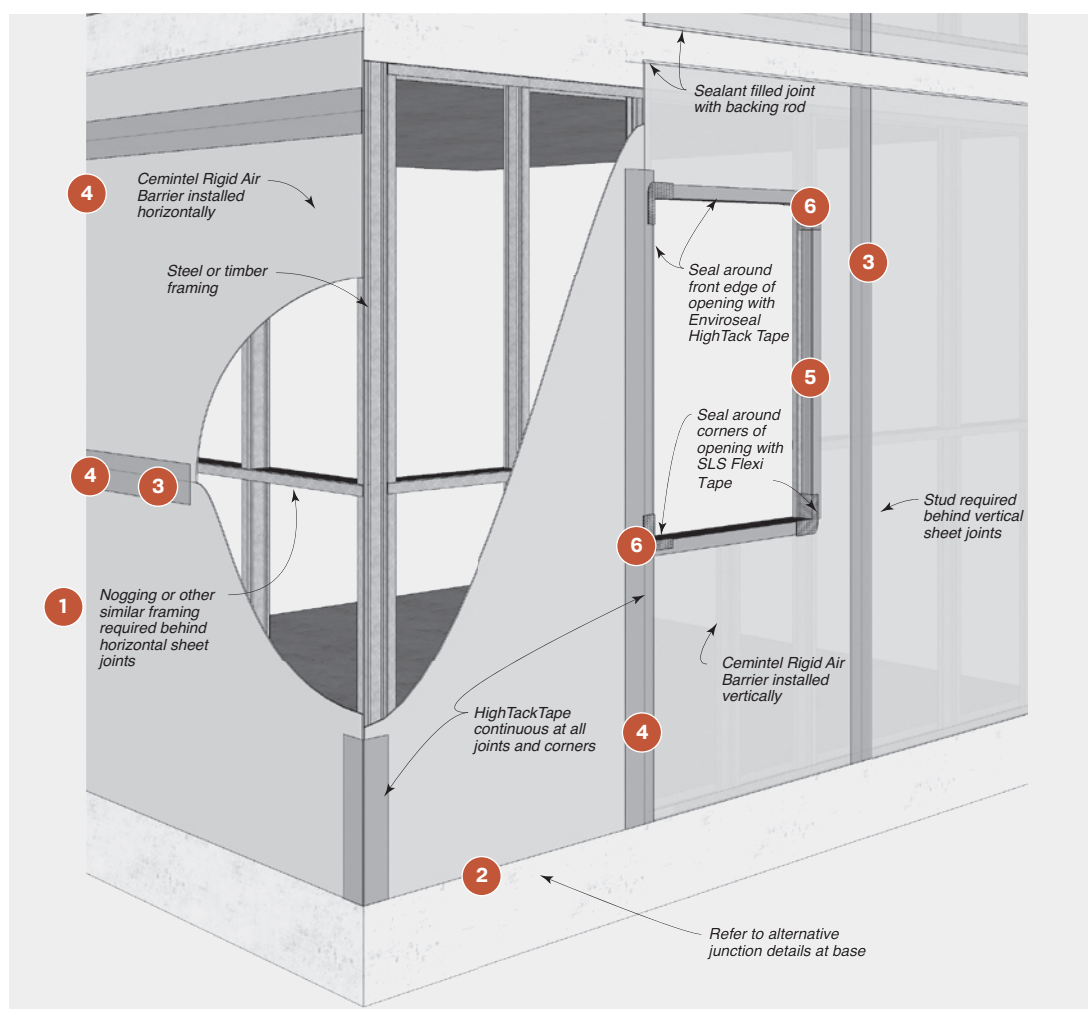
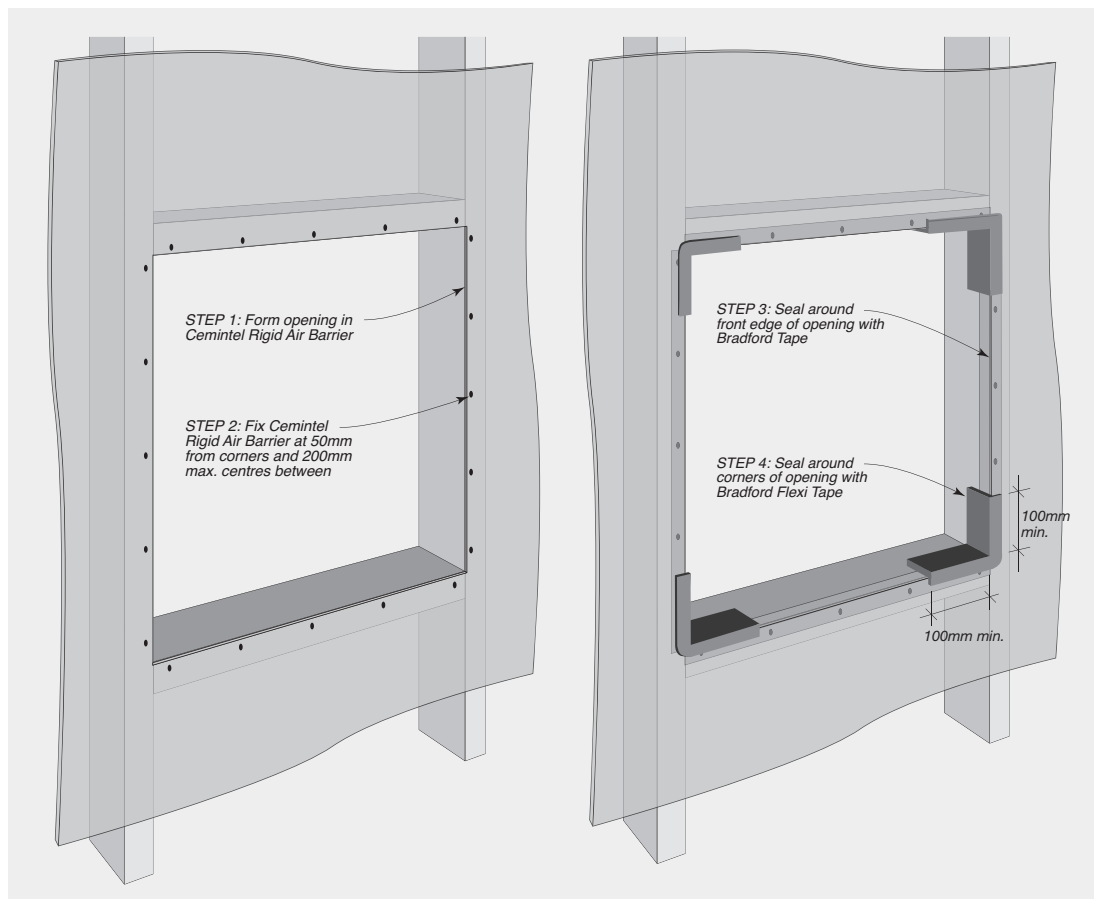


FIGURE 7.25 Treatment at Window/Door Openings – Rigid Air Barrier

INSTALLATION

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Installation of Soft Air Barriers

Wall wraps intended to be used as air barriers are fixed to timber or steel framing. Enviroseal™ CW-IT has an inbuilt adhesive strip which allows fast, consistent and reliable sealing to adjoining rolls of CW-IT.

At internal corners, penetrations and perimeters of areas with wall wrap, a metal strip is required to restrain the wall wrap edges. The wall wrap is then

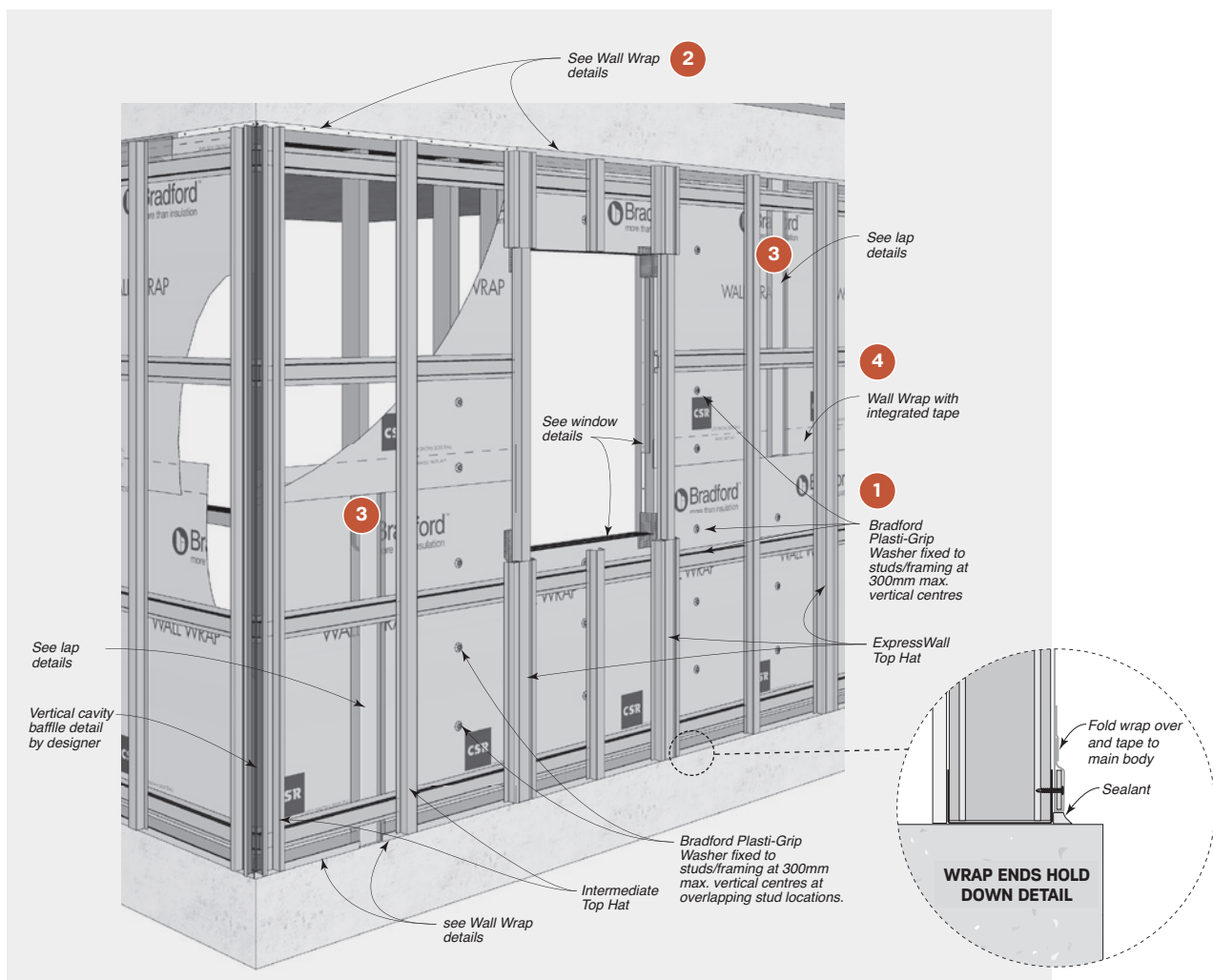
folded over and taped to the main body wrap with HighTack Tape. As detailed, sealant or tape is to be applied to maintain an effective air seal.

All flashings should be fixed over the top of the wall wrap and taped.

Procedure for Installation of Soft Air Barriers

- 1 Install wall wrap to outside face of timber or steel wall framing using Bradford Plasti-Grip Washers. Horizontal laps must be overlapped by 150mm.
- 2 Install minimum 20mm x 1.6mm aluminium strips horizontally at head and base of wall. Pass wall wrap under aluminium strip and fix strip at 100mm max. cts. Then fold wall wrap back over strip and tape with HighTack tape to main body.

FIGURE 7.26 Typical Soft Air Barrier Installation

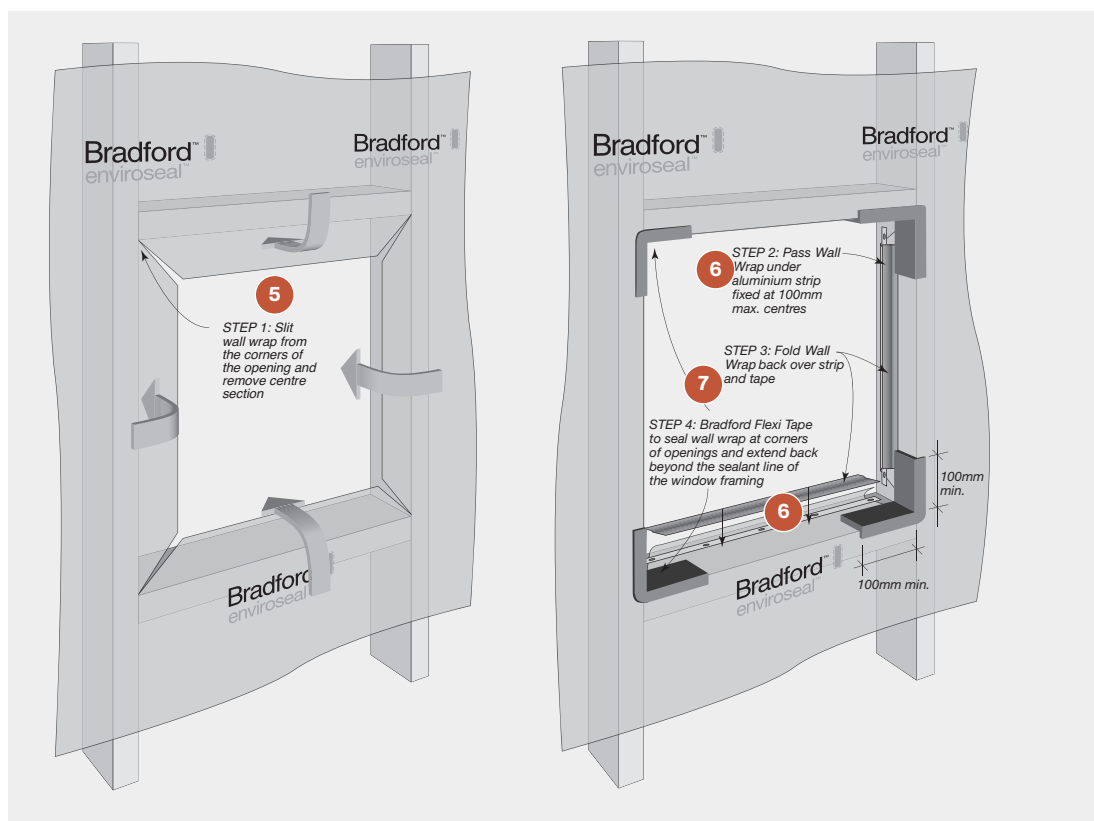


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INSTALLATION

- 3 Install aluminium strips at vertical joints/ends/corners (where required). Pass wall wrap under aluminium strip and fix at 100mm max cts. Fold wall wrap back over strip and tape with HighTack tape to main body.
- 4 Enviroseal™ CW-IT to be overlapped at horizontal joints and taped continuously with in-built adhesive strip. Vertical lap joints to be overlapped across adjoining studs, fixed with Bradford Plasti-Grip Washers, aluminium strips and taped with HighTack tape along overlap joint. (Refer to Table 4.03).
- 5 At openings, cut the wrap at 45 degrees from each corner to the centre.
- 6 Pass wall wrap under aluminium strip and fix at 100mm max. cts. Then fold wall wrap back over strip and tape with HighTack tape, cutting away any excess wall wrap.
- 7 Apply SLS Flexi Tape to the corners of window and door openings. Press tape over the frame edge onto the face of the wall wrap.

FIGURE 7.27 Treatment at Window/Door Openings - Soft Air Barrier





CONSTRUCTION DETAILS



CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

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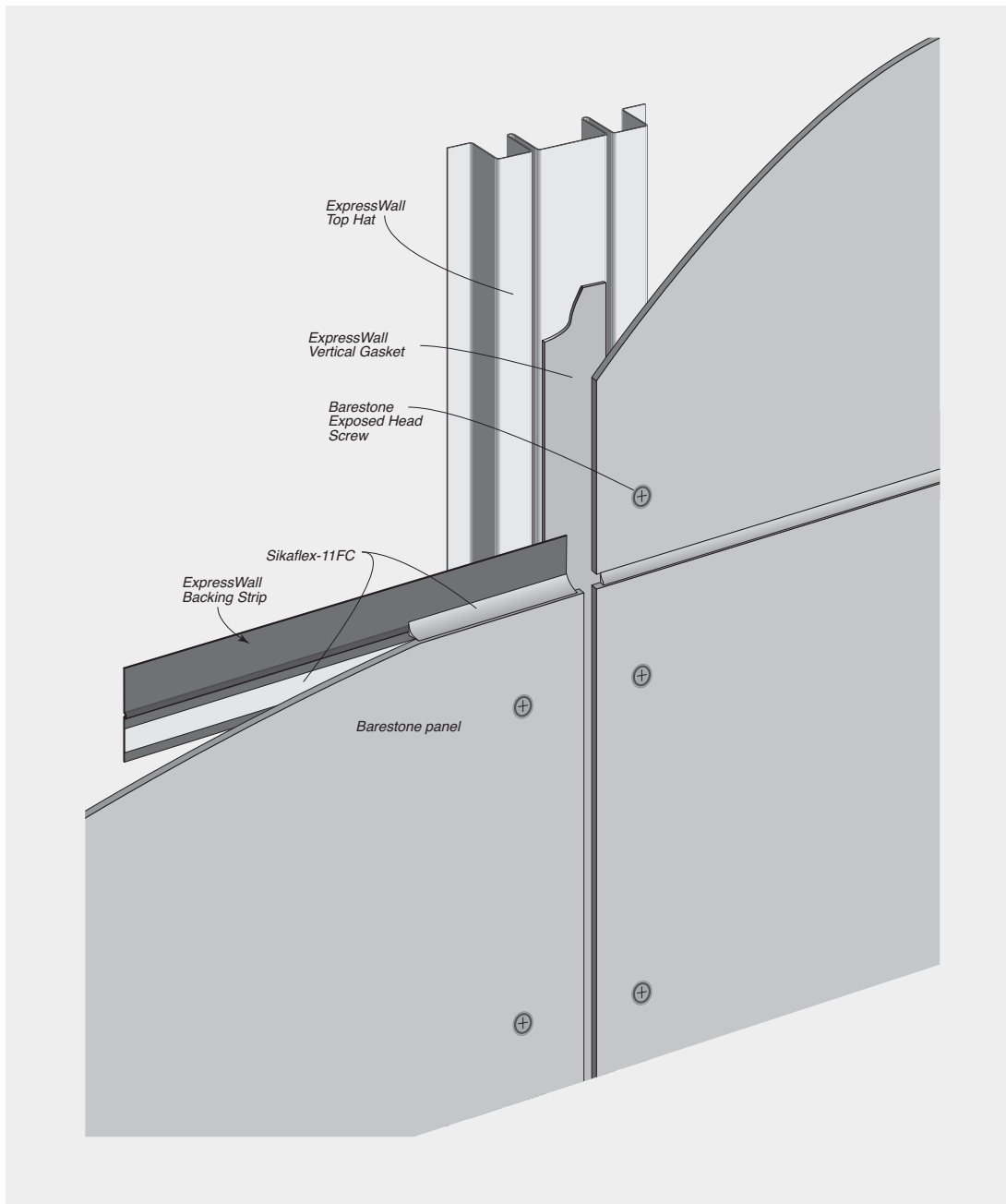
CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.01 Joint Construction – Ventilated Cavity System





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.02 10mm Horizontal Joint – Sealant Filled and Screw Fixed

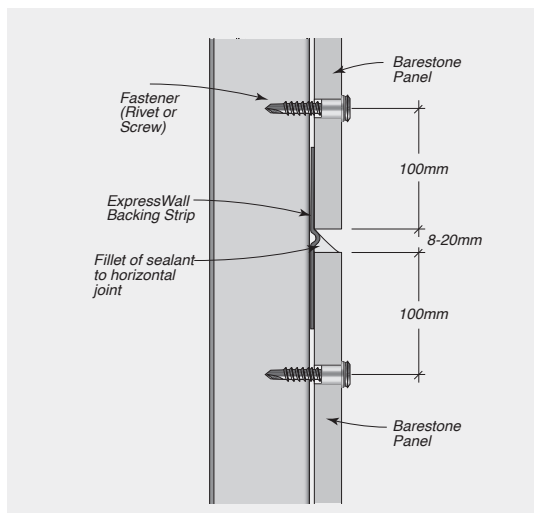


FIGURE 8.03 Horizontal Joint – Angled Backing Strip

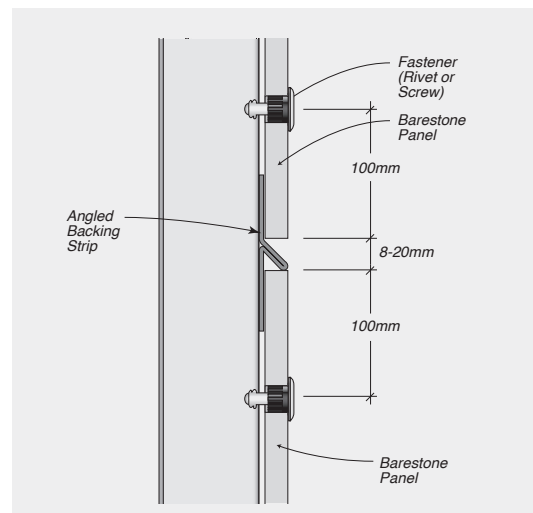


FIGURE 8.04 Vertical Joint – Exposed Head Screw

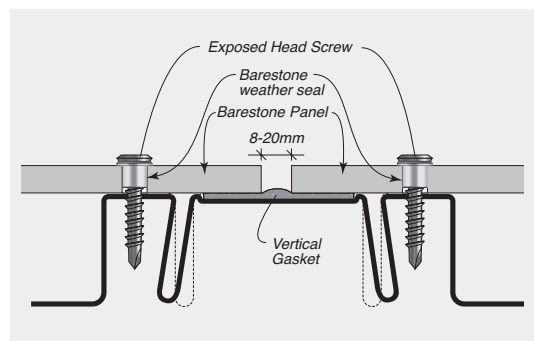
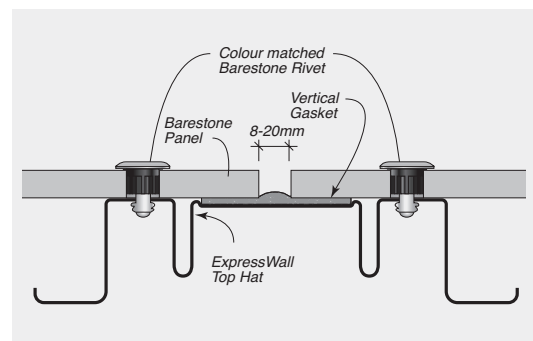


FIGURE 8.05 Vertical Joint – Rivet



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.06 Typical ExpressWall System Cross Section for Steel Framing

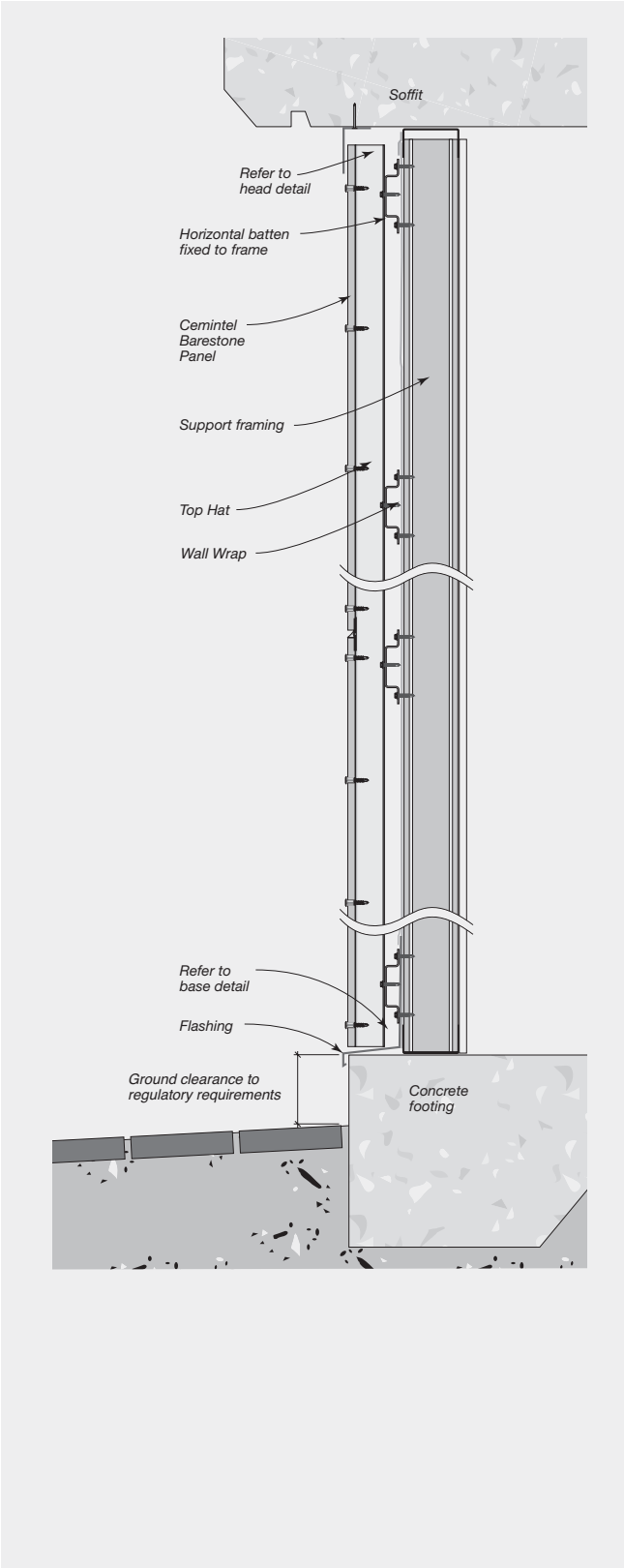


FIGURE 8.07 Eaves/Deflection Head – Ventilated

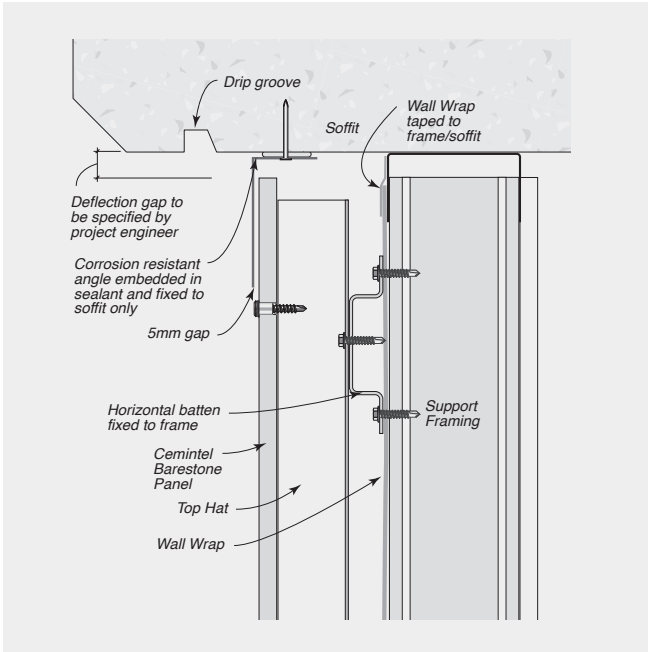
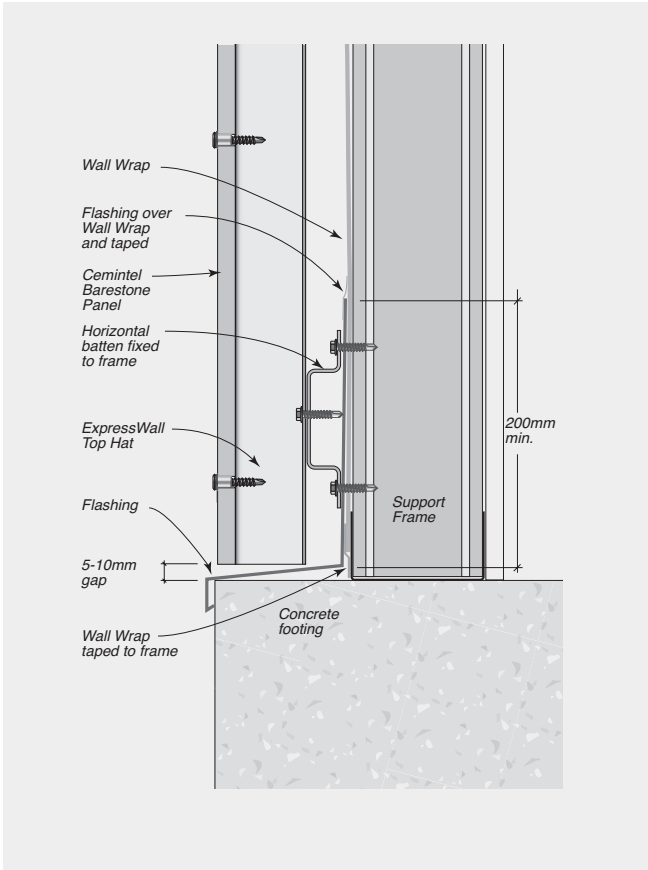


FIGURE 8.08 Base Detail – Drained





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.09 External Corner

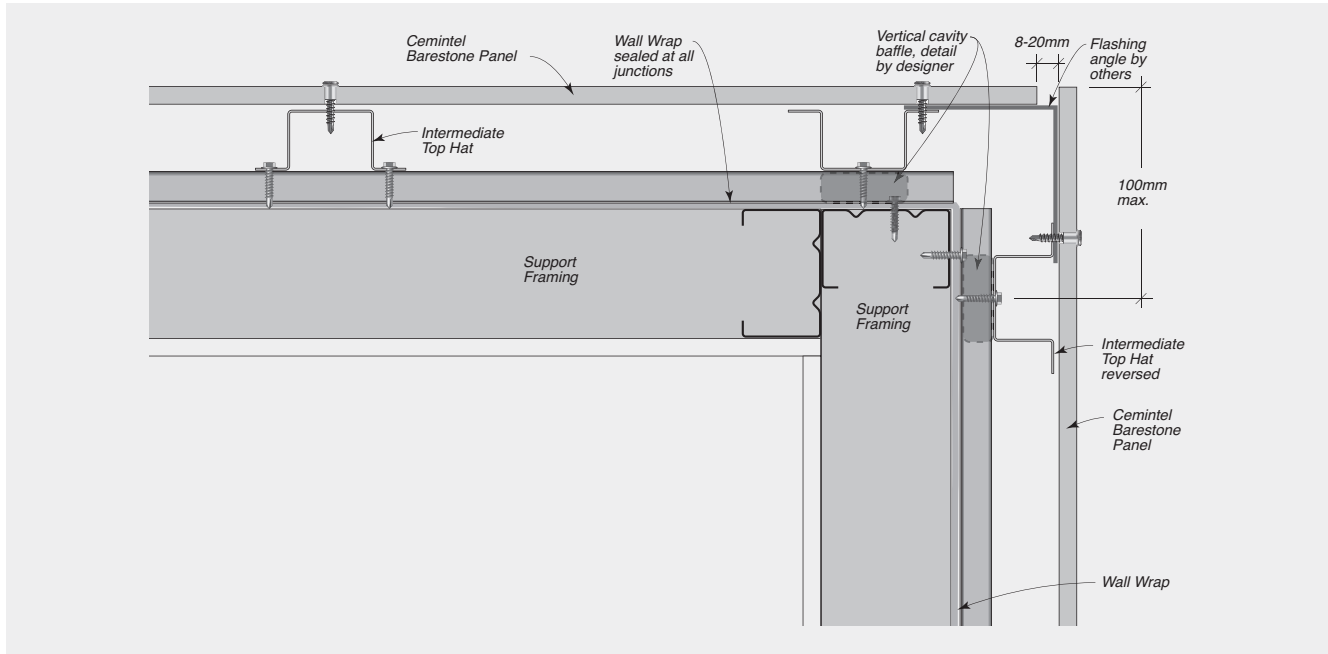


FIGURE 8.10 External Corner – Obtuse Angle

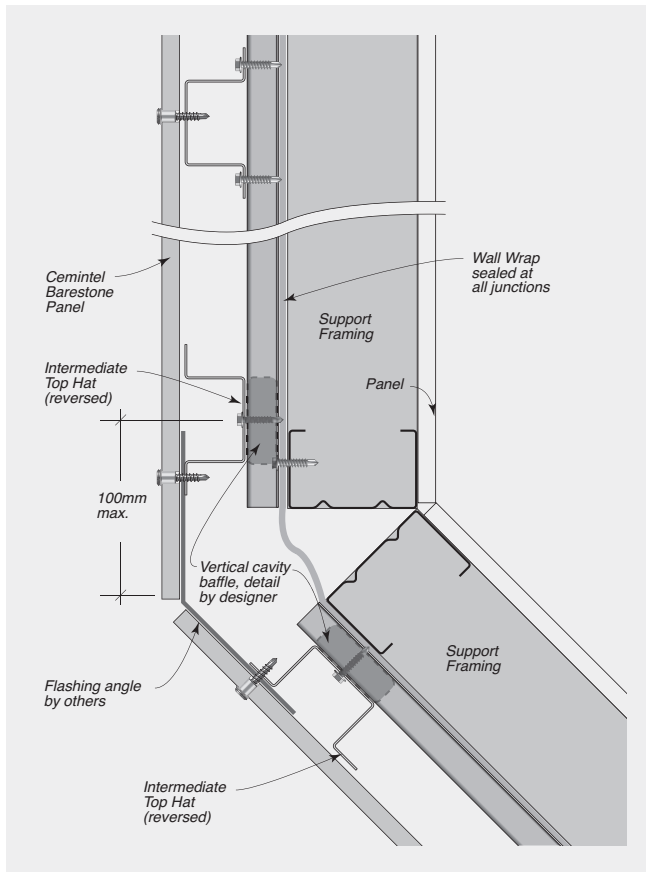
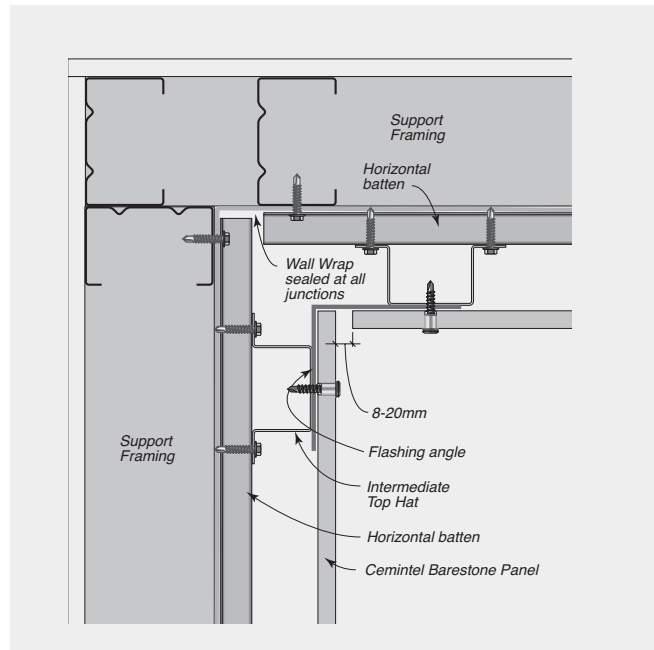


FIGURE 8.11 Internal Corner Detail



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.12 Framed Soffit

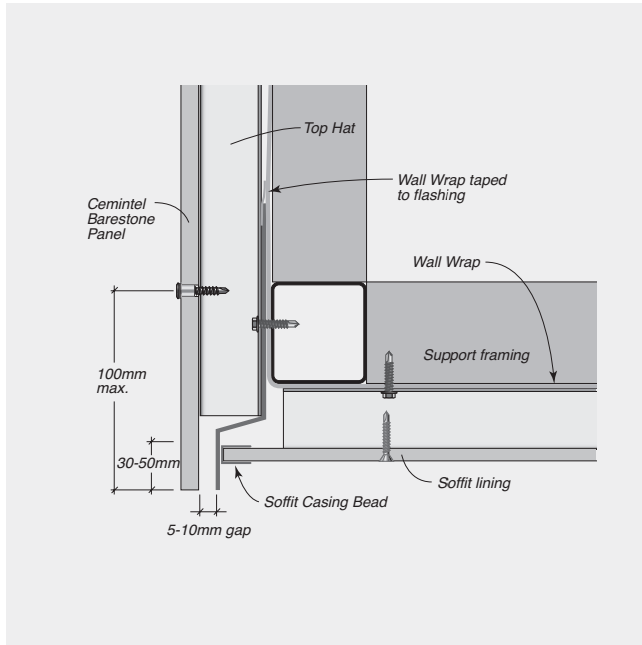


FIGURE 8.13 Control Joint – Vertical

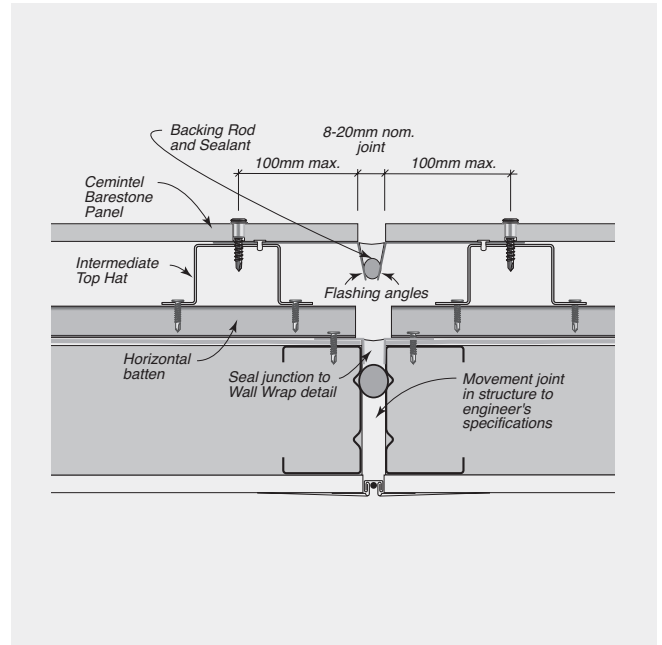


FIGURE 8.14 Inter-Storey Junction with Flashing

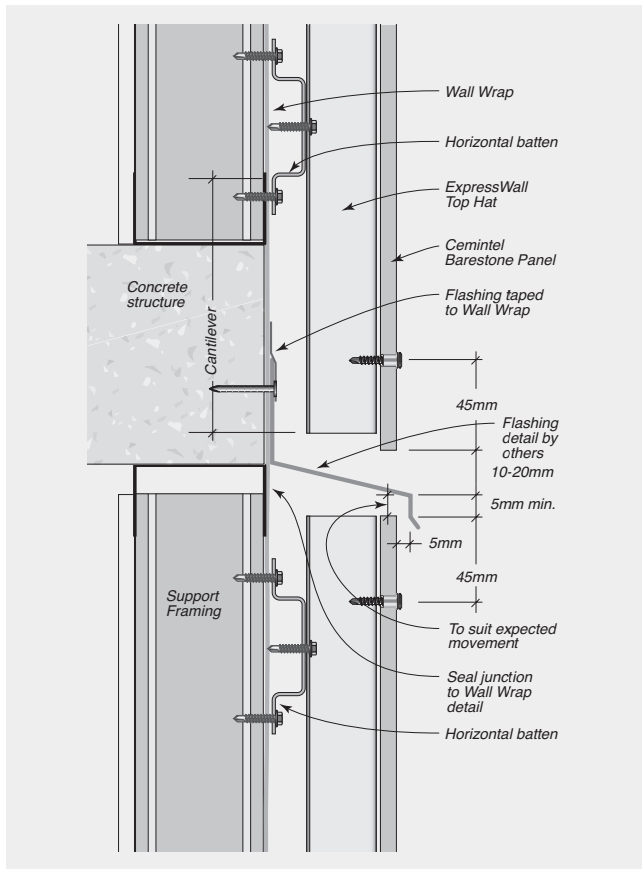
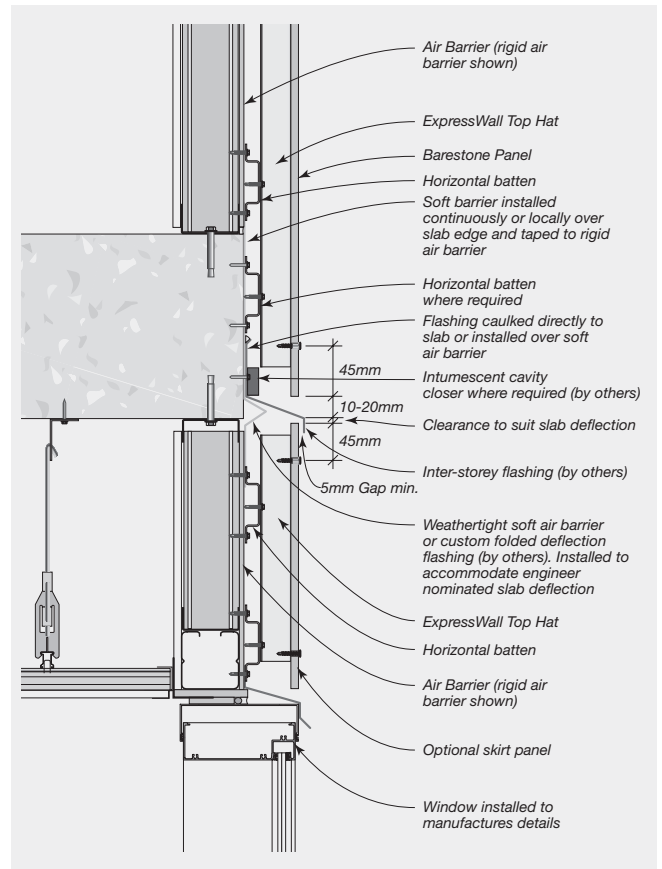


FIGURE 8.15 Inter-Storey Junction with Flashing





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.16 Abutment

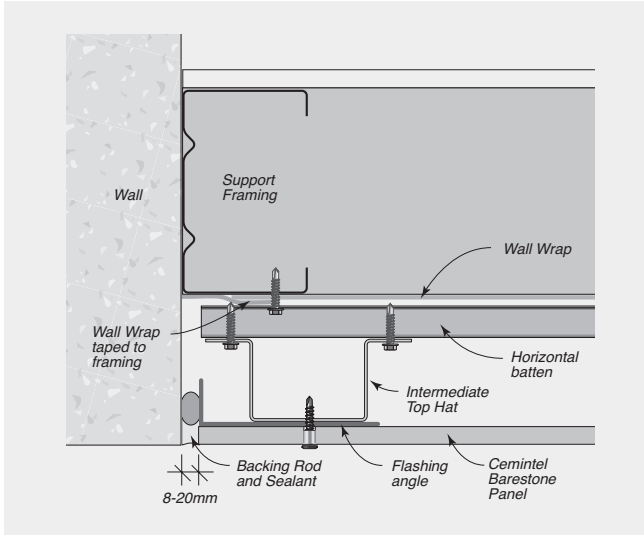


FIGURE 8.17 Vertical Gasket and Fixing Detail for Half-bond Panel Layout

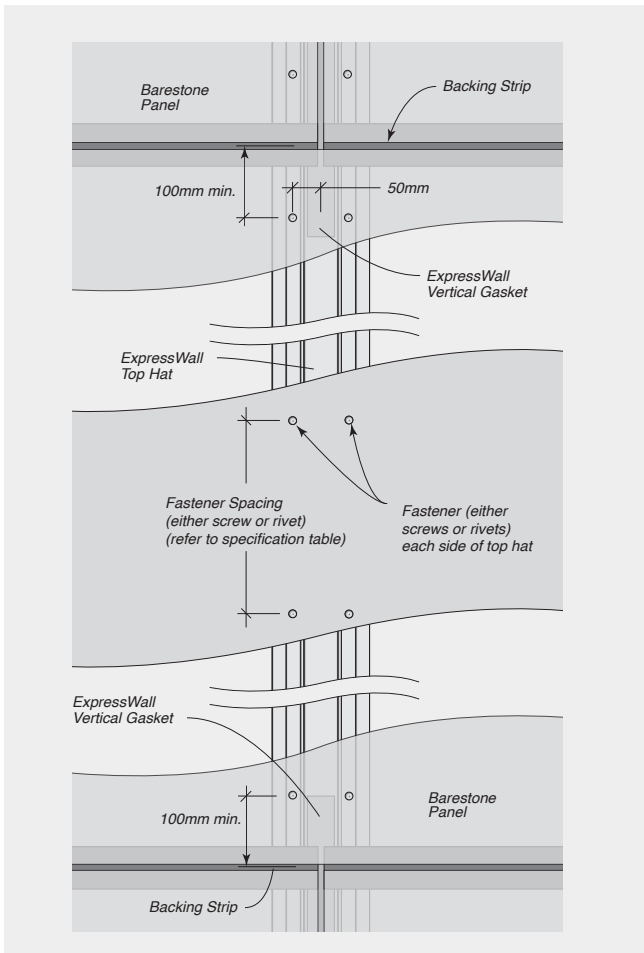
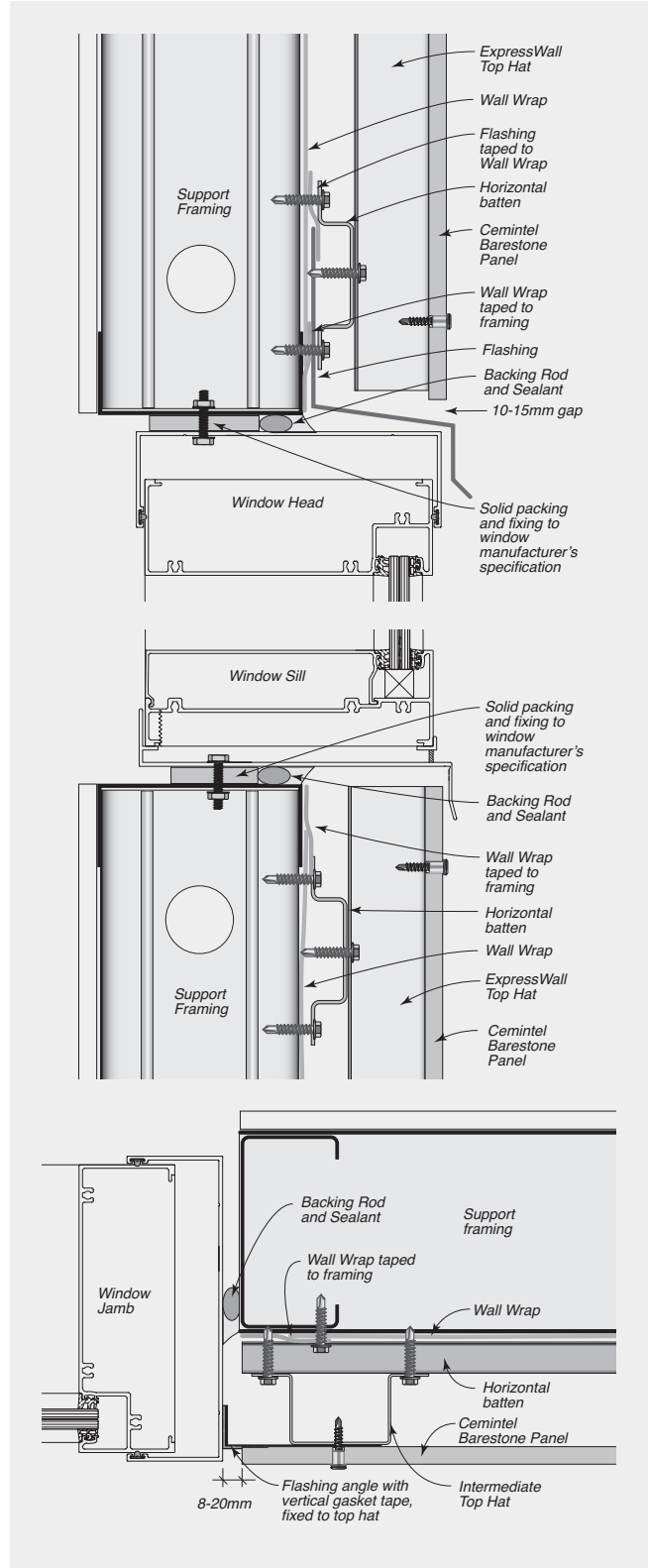


FIGURE 8.18 Typical Window Installation



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.19 Parapet Capping

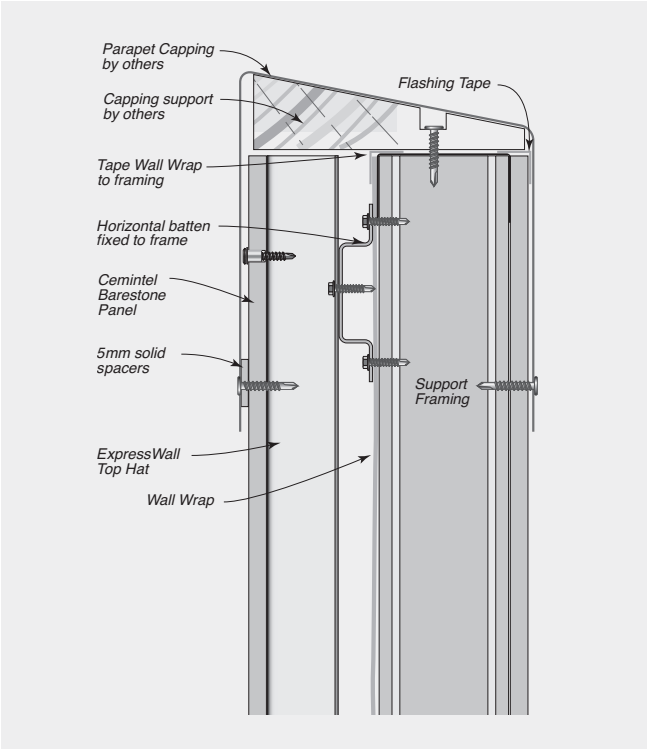


FIGURE 8.20 Balcony Base

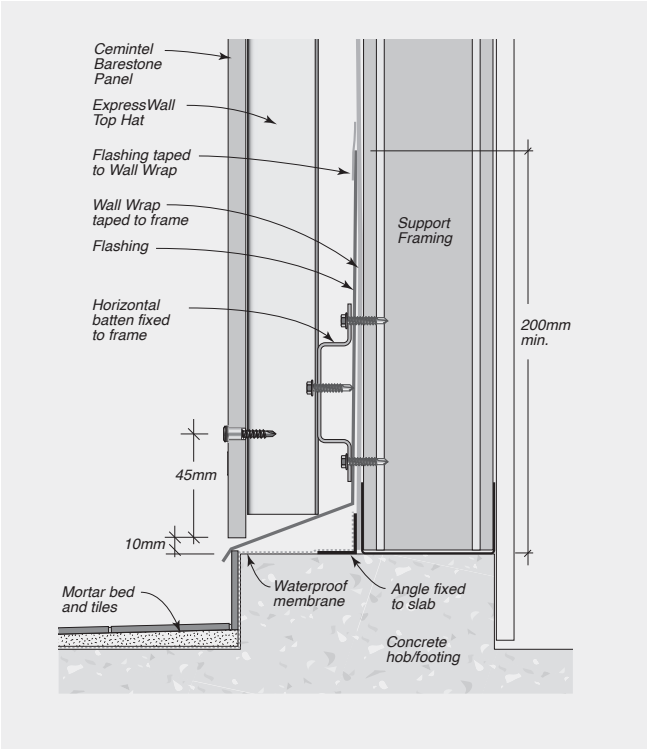
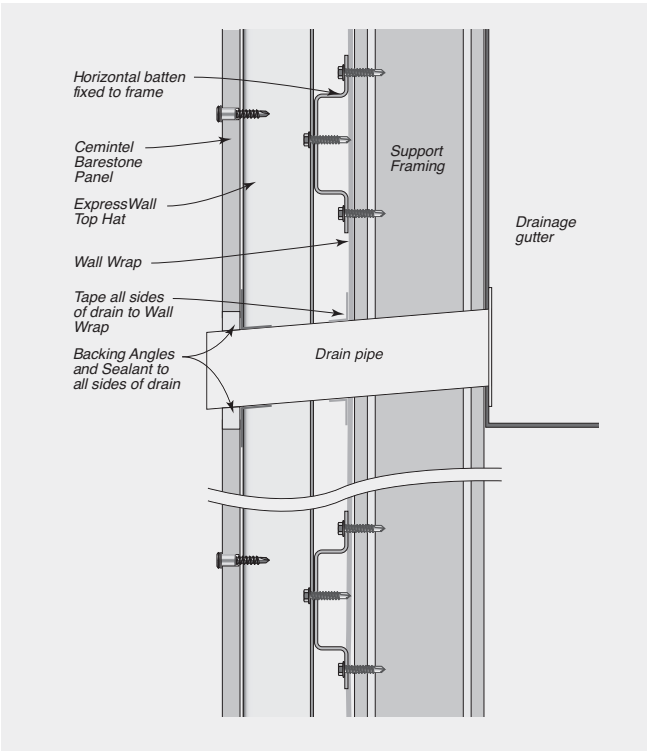


FIGURE 8.21 Typical Drain





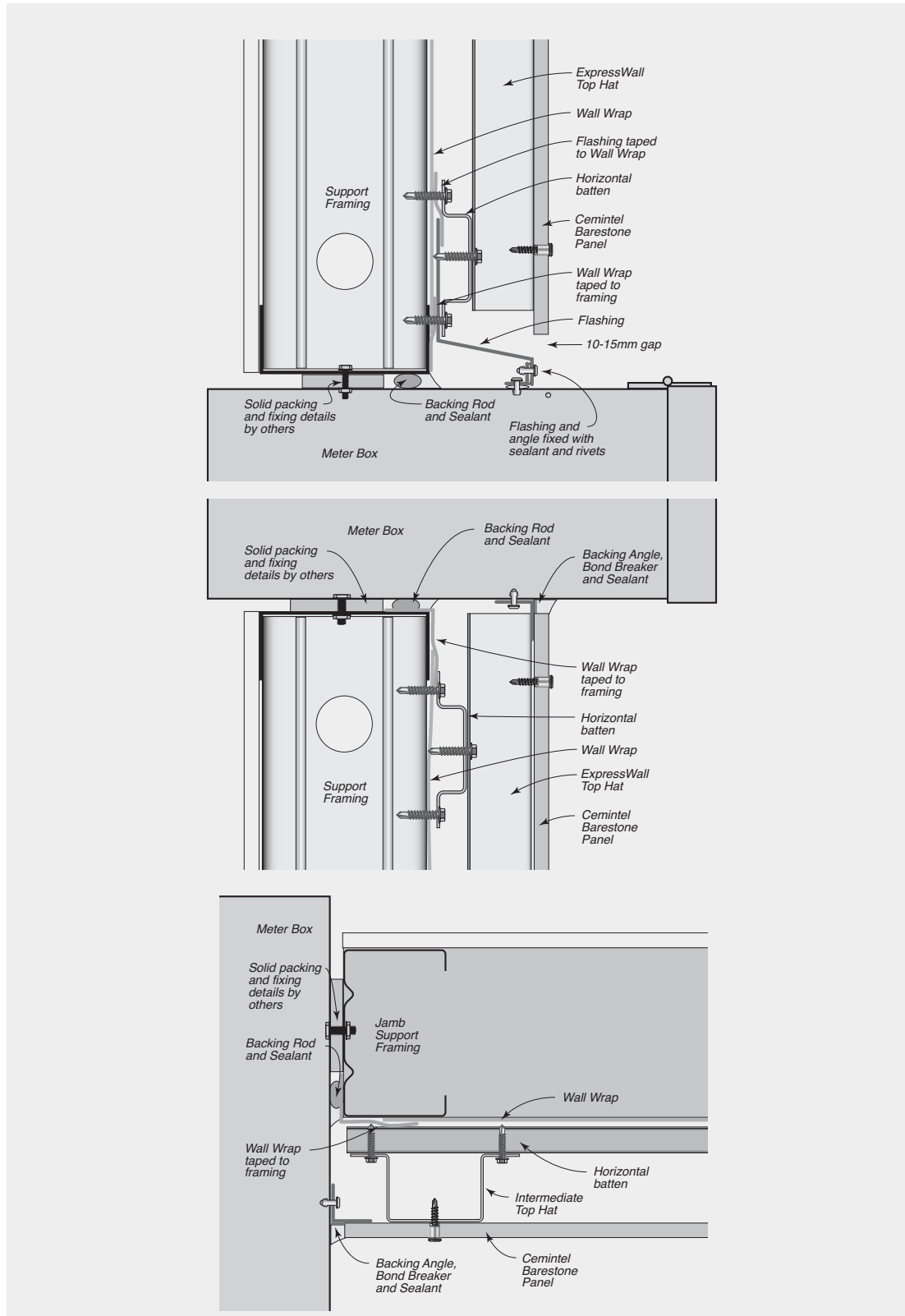
CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System

FIGURE 8.22 Typical Power/Meter Box

Note: Refer to local authority for specific meter box installation requirements.



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System – Sealant Filled Joint Details

FIGURE 8.23 Sealant Filled Joint Construction – Ventilated Cavity System

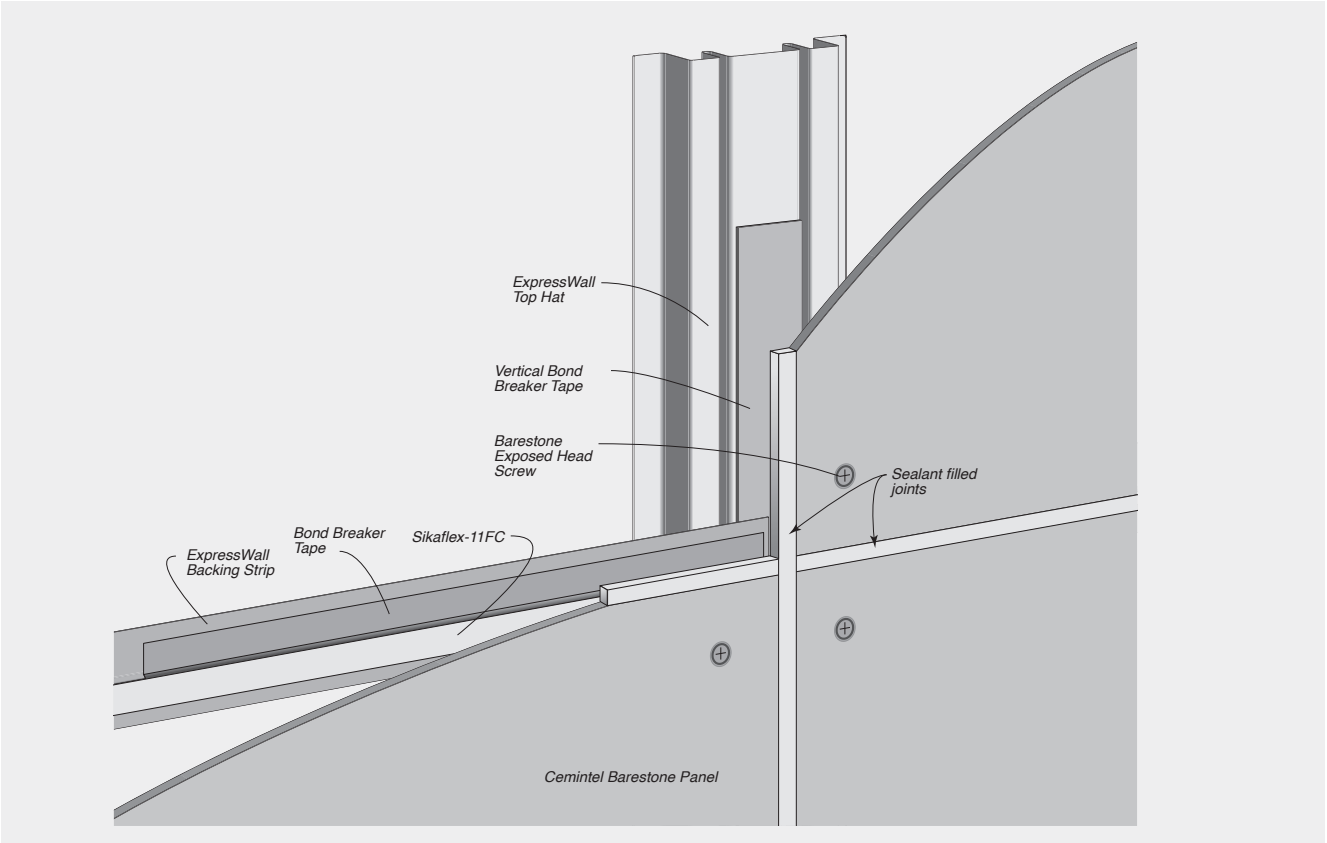


FIGURE 8.24 Backing Strip Preparation

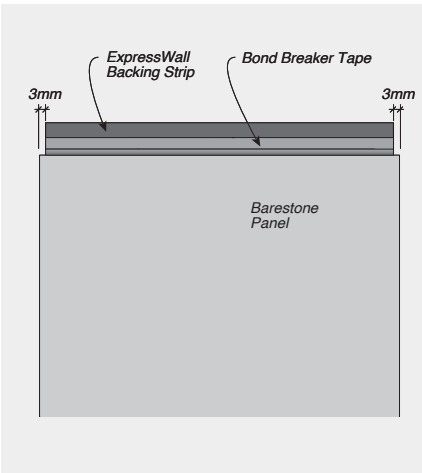


FIGURE 8.25 Horizontal Joint – Sealant filled

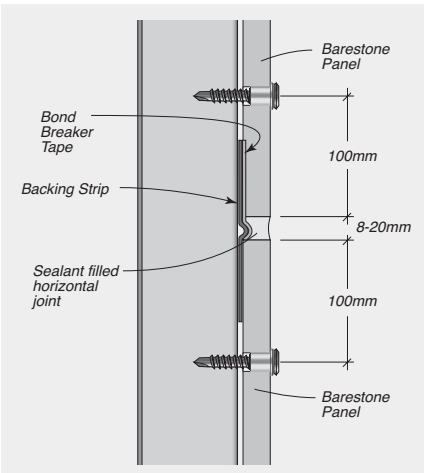
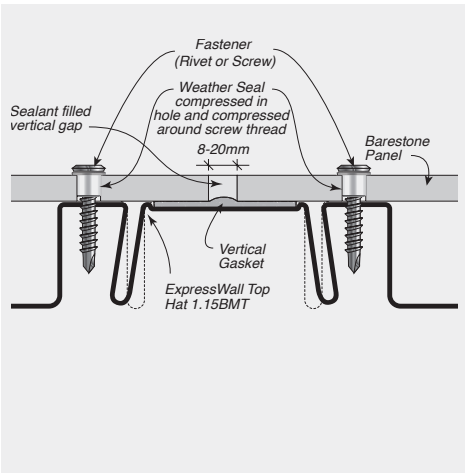


FIGURE 8.26 Vertical Joint – Sealant filled





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System – Sealant Filled Joint Details

FIGURE 8.27 Typical ExpressWall System Cross Section for Steel Framing – Joints sealant filled

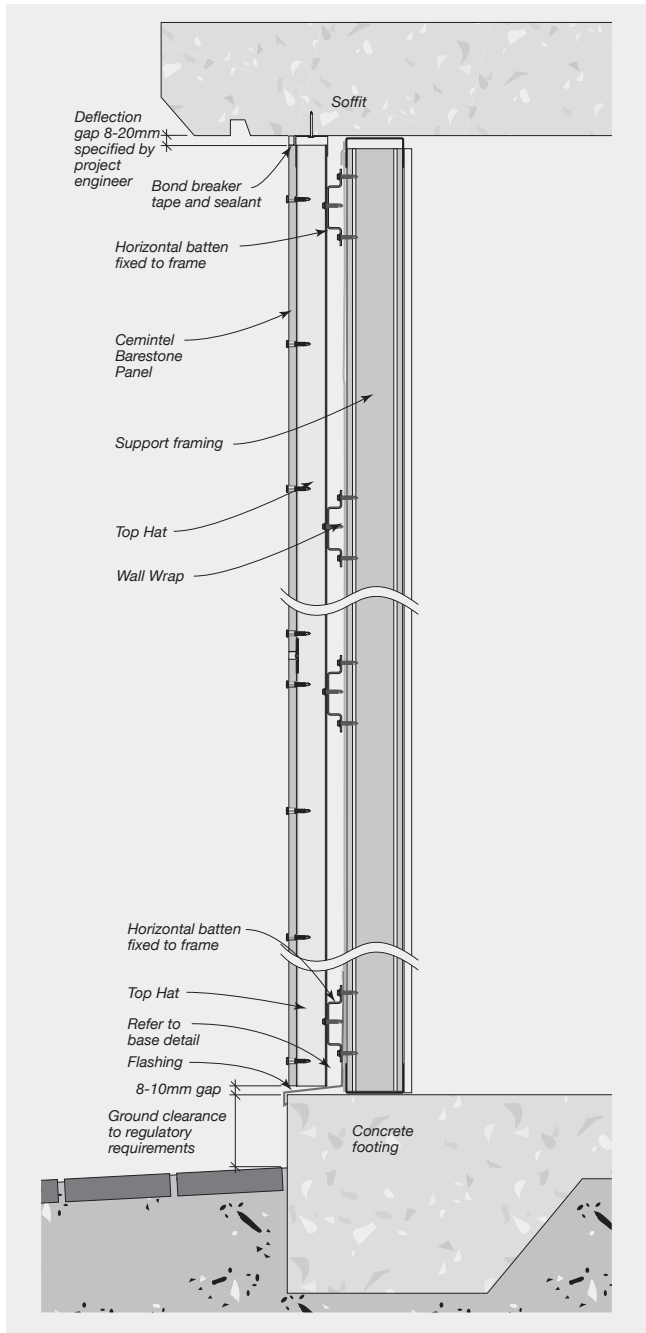


FIGURE 8.28 Eaves/Deflection Head – Sealant filled

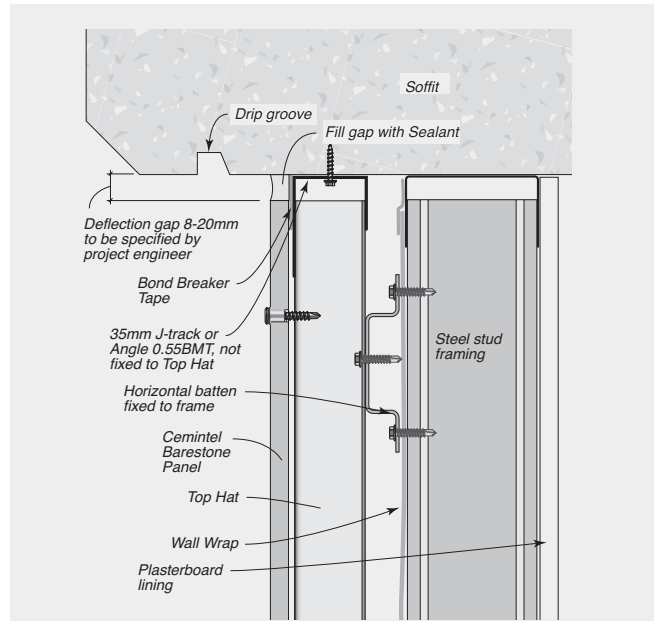
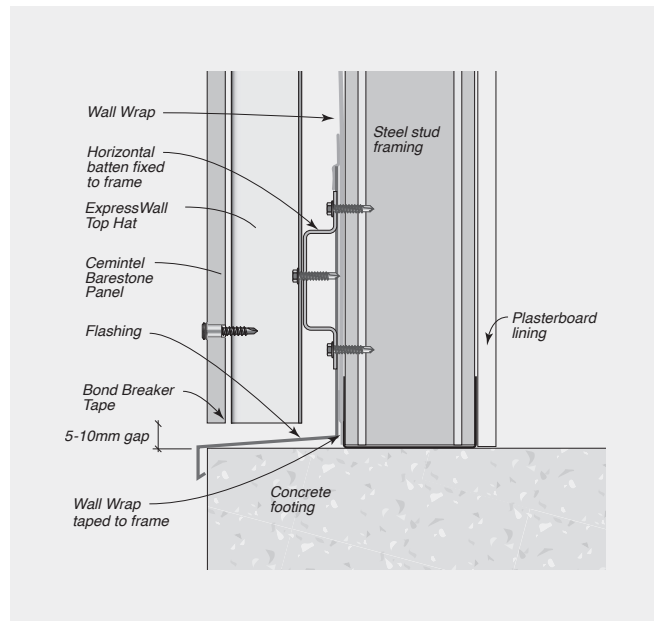


FIGURE 8.29 Base Detail – Drained



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Ventilated Cavity System – Sealant Filled Joint Details

FIGURE 8.30 Internal Corner Detail – Sealant filled

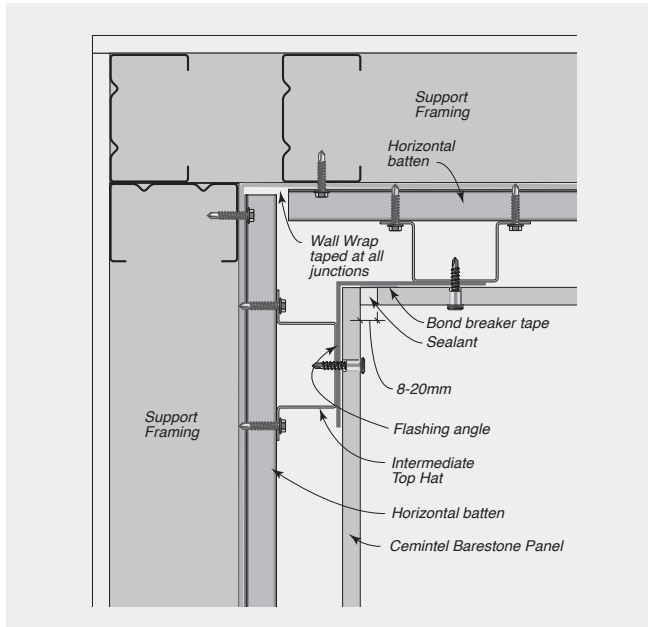
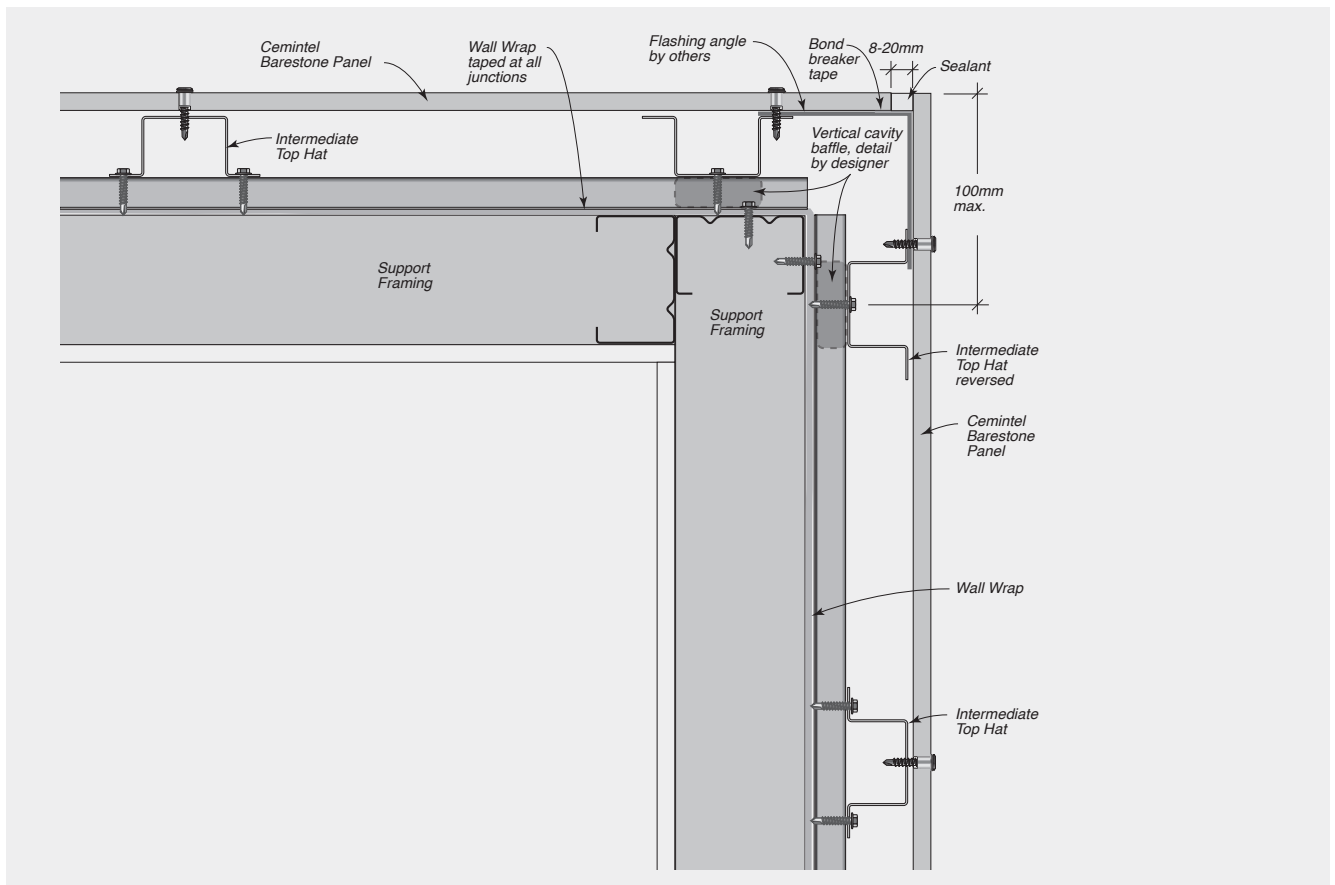


FIGURE 8.31 External Corner – Sealant filled



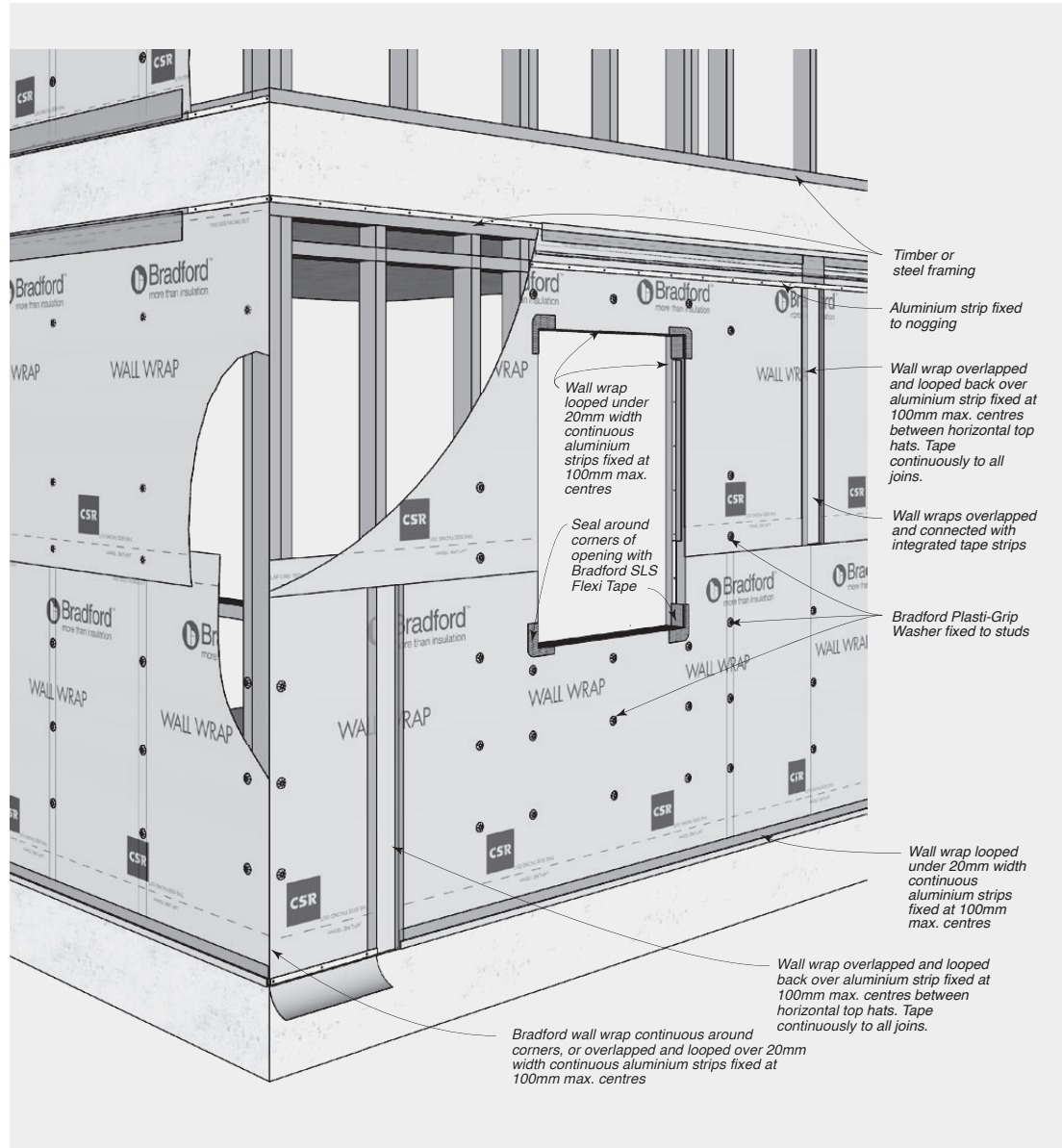


CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.32 Typical Installation Overview – Soft Air Barrier



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.33 External Corner – Wall Wrap Continuous

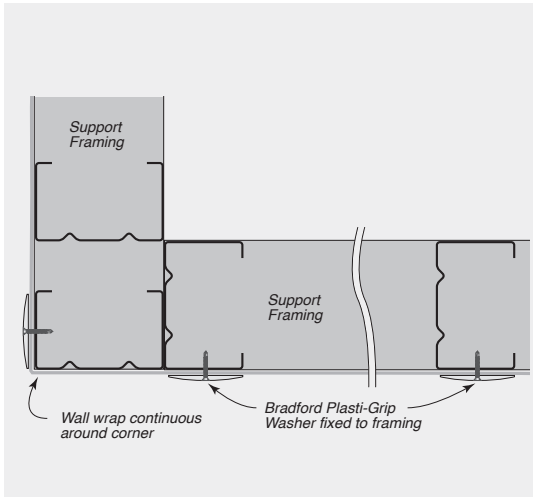


FIGURE 8.34 External Corner – Wall Wrap Overlapped

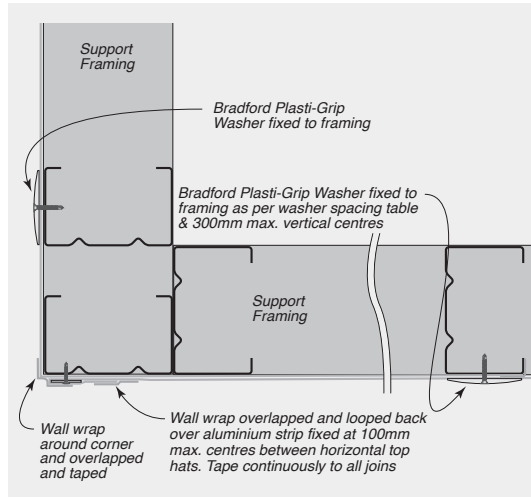


FIGURE 8.35 Internal Corner – Wall Wrap Continuous

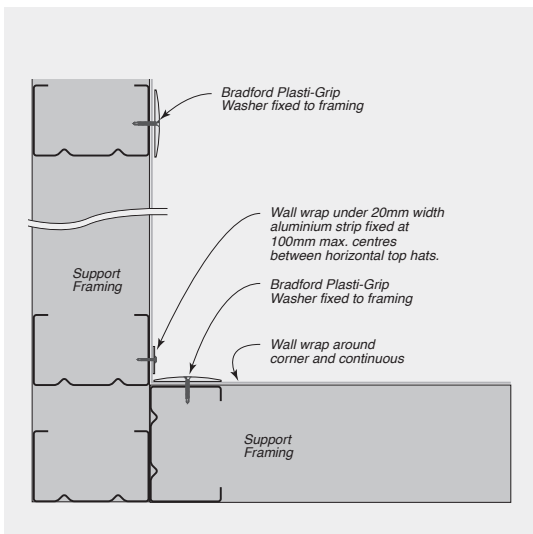


FIGURE 8.36 Internal Corner – Wall Wrap Overlapped

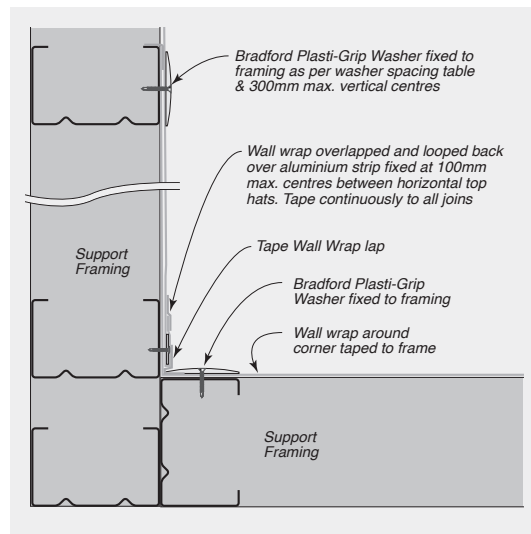
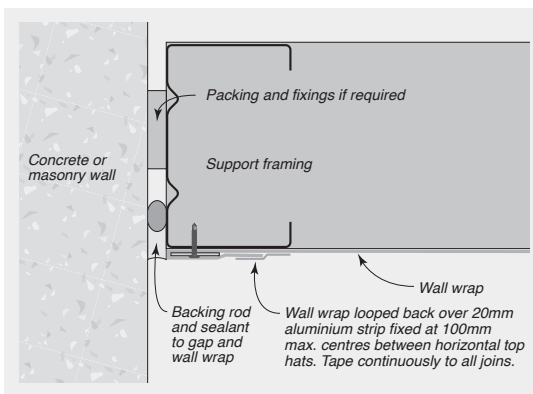


FIGURE 8.37 Abutment to Concrete or Masonry Wall





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.38 Wall Wrap Installation to Wall, Soffit and Base

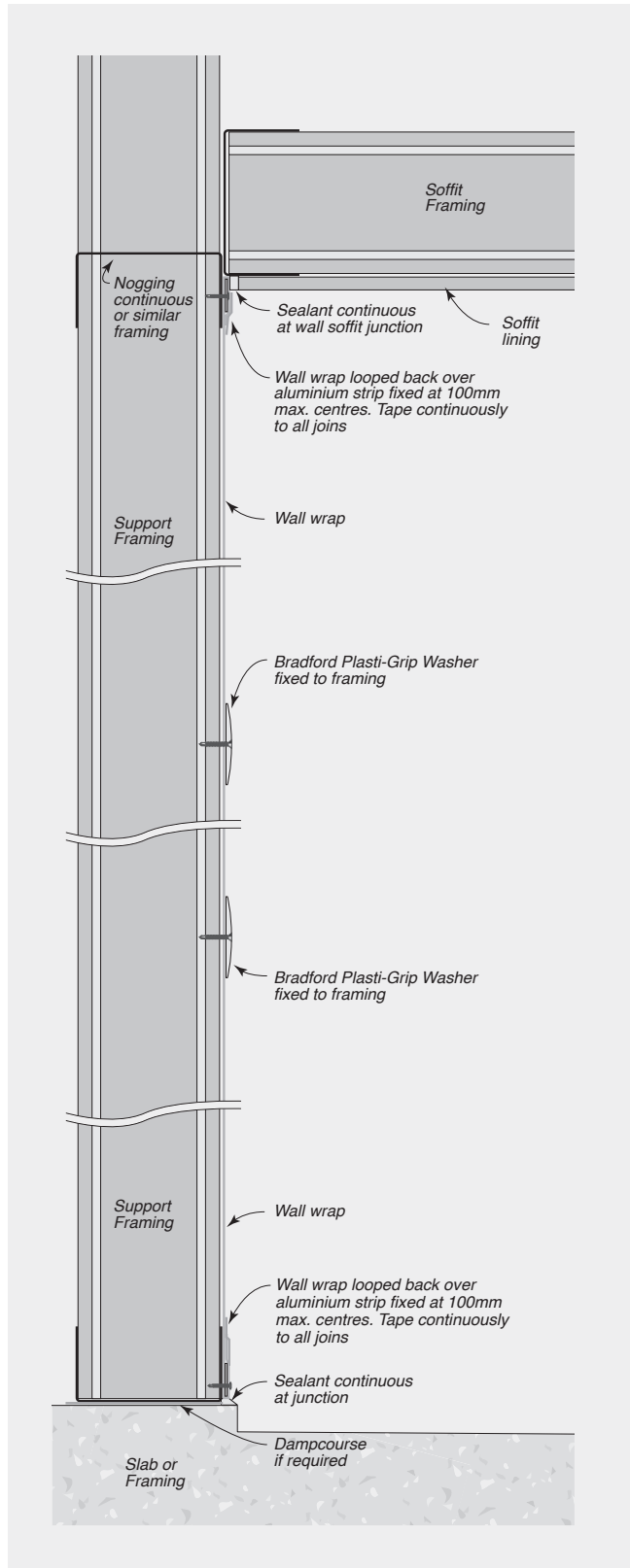
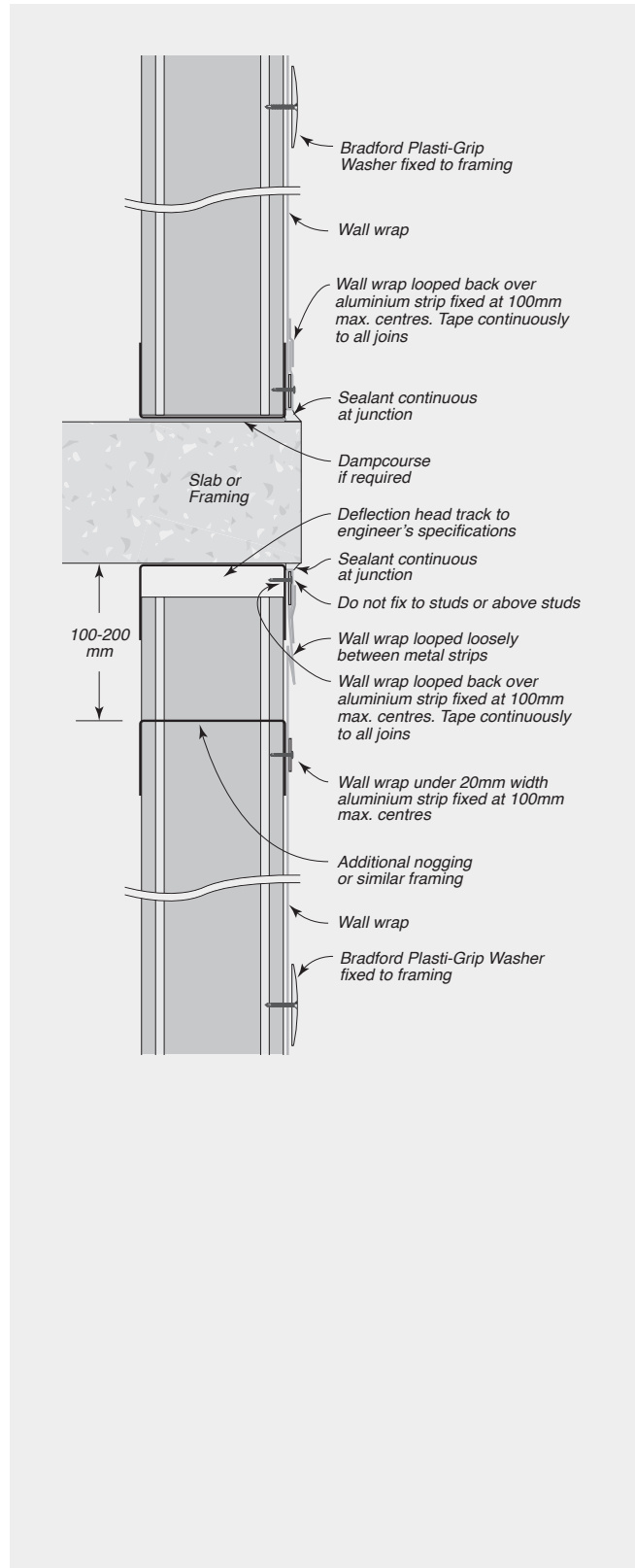


FIGURE 8.39 Wall Wrap Installation at Intermediate Level Junction – Non-loadbearing Steel Framing With Deflection Head



CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.40 Vertical Wall Wrap Junction – Overlapped Double Strip Join

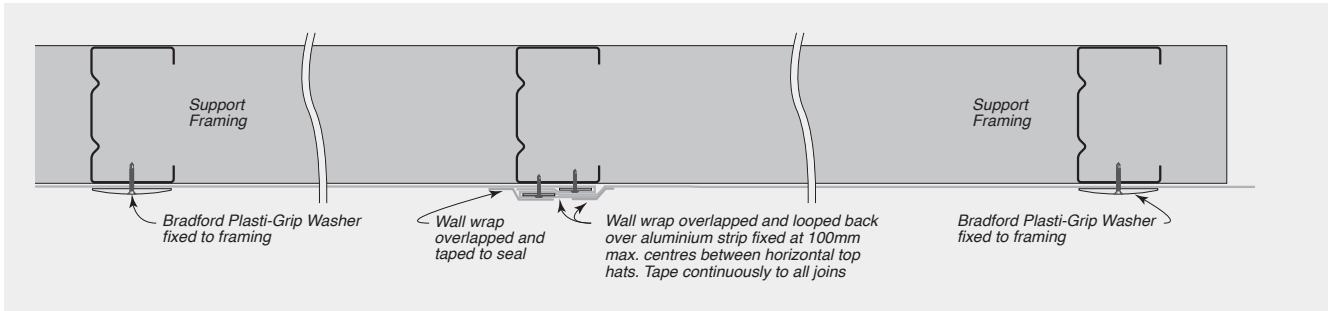


FIGURE 8.41 Vertical Wall Wrap Junction – Overlapped Single Strip Join

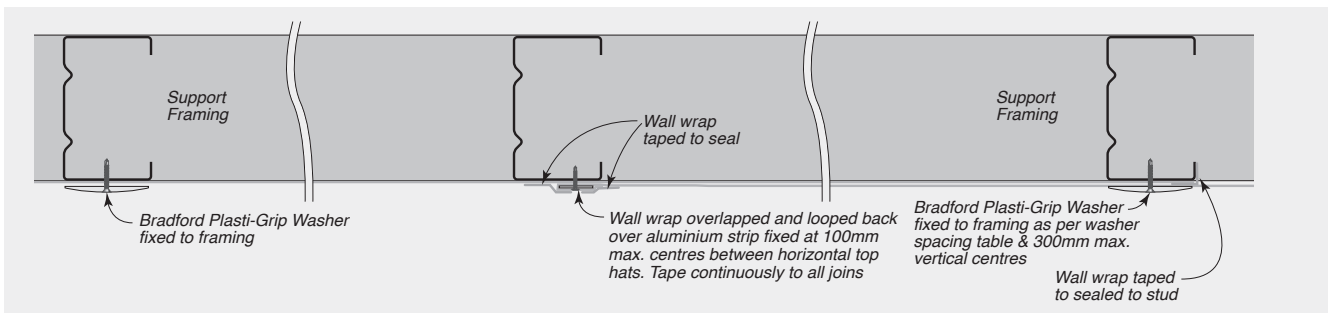


FIGURE 8.42 Vertical Wall Wrap Junction – At Control Joint

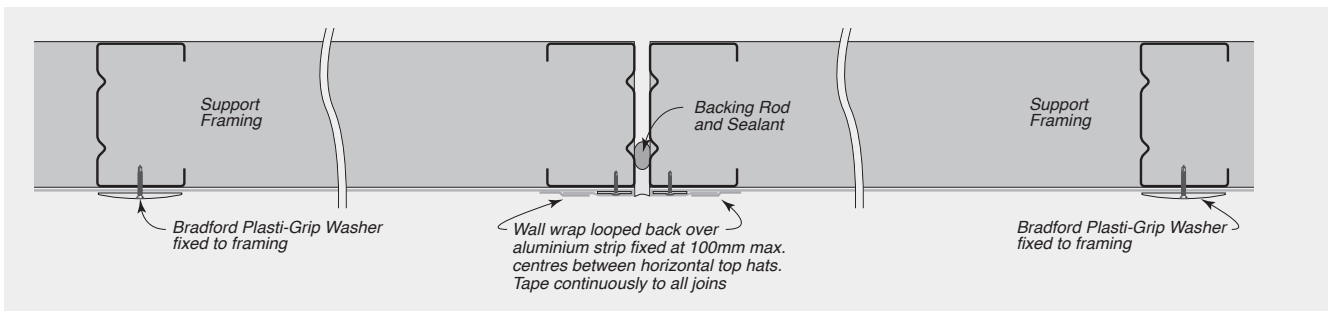
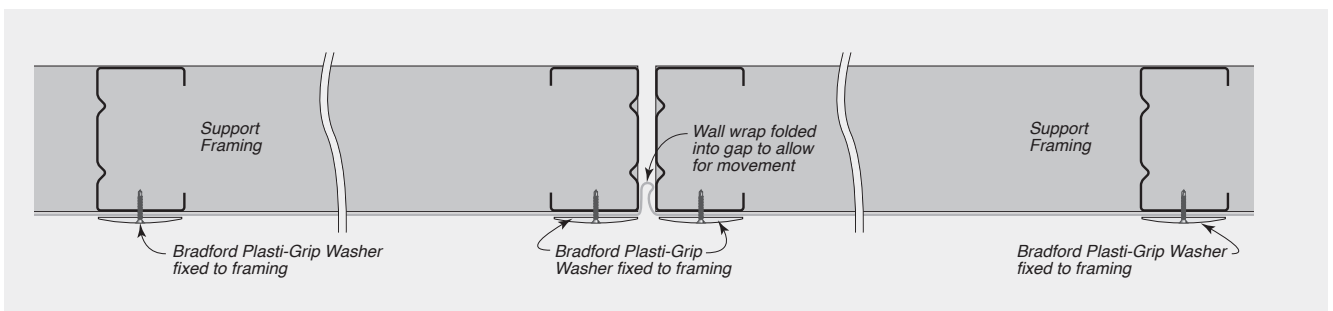


FIGURE 8.43 Vertical Wall Wrap Junction – No Lap Double Washer





CONSTRUCTION DETAILS

Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.44 Wall Wrap Installation at Window/Door Opening

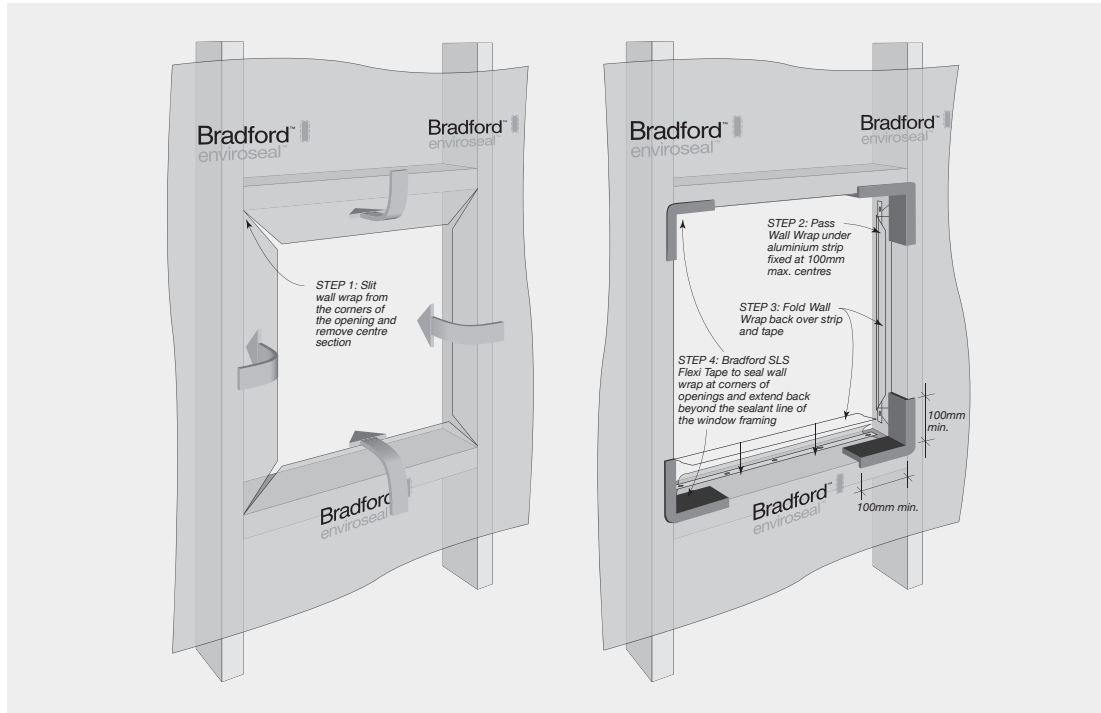
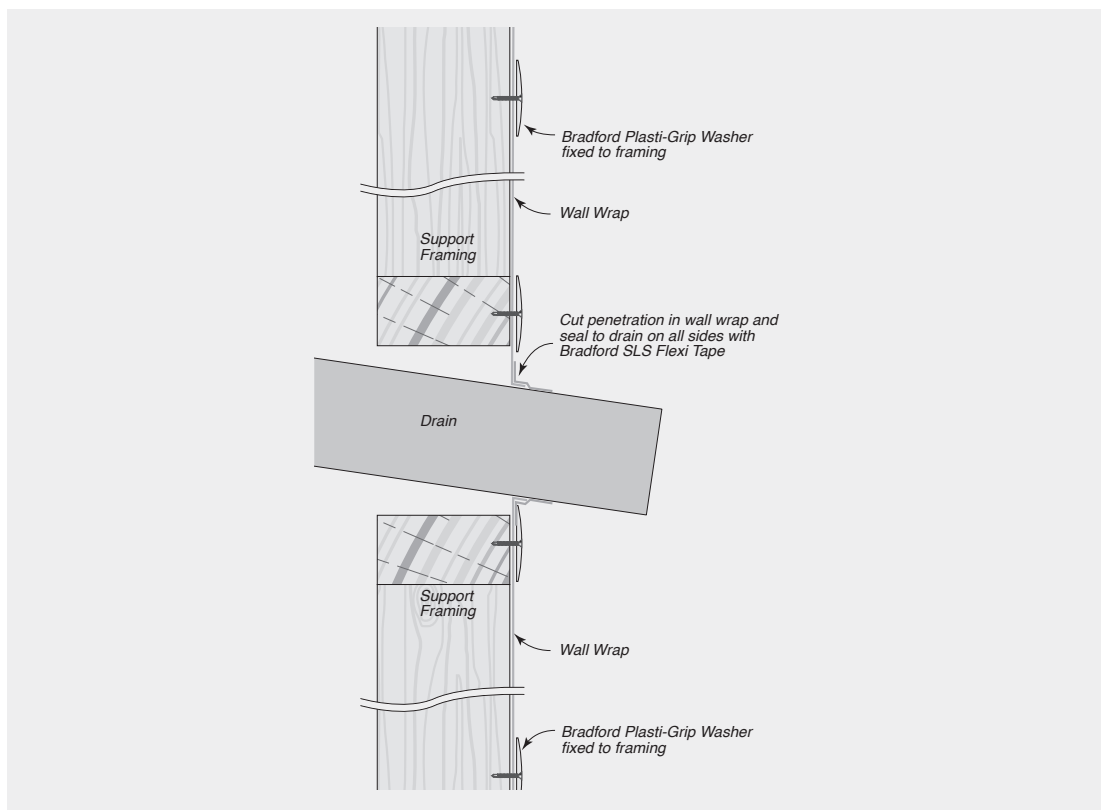


FIGURE 8.45 Wall Wrap Installation at Drain Penetration – Timber or Steel Framing



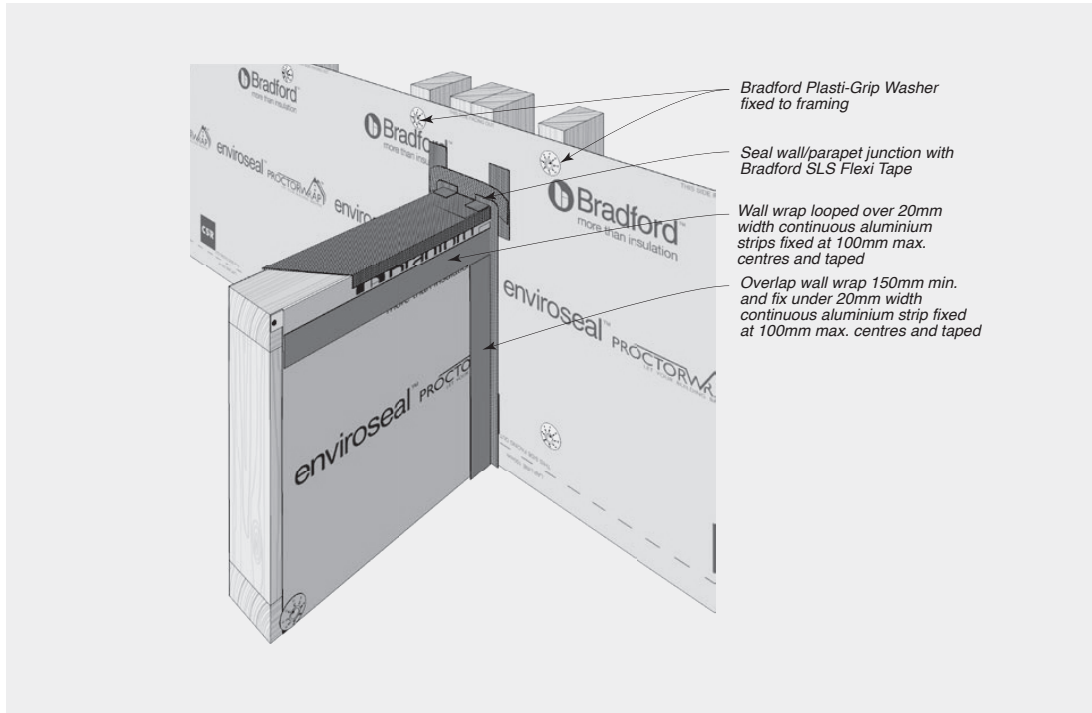
CONSTRUCTION DETAILS



Note: Drawings are interchangeable for timber or steel substrates with the exception of the fasteners.

Soft Air Barrier

FIGURE 8.46 Wall Wrap Installation at Parapet Junction – Timber or Steel Framing





SAFETY, HANDLING, GENERAL CARE
+ WARRANTY

SAFETY, HANDLING, GENERAL CARE + WARRANTY



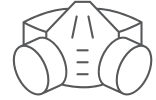
Health, Safety and Personal Protection Equipment (PPE)

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

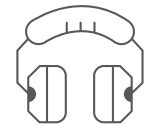


Managing Respirable Crystalline Silica Dust

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, and Maintenance

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.

Warranty

Cemintel Barestone External panels have a product warranty of 10 years.

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

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.



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