FENCO PANEL
EXTERNAL WALL CLADDING SYSTEM

TECHNICAL INFORMATION
AND INSTALLATION MANUAL

FOR:

NCC 2019, Vol. 2, BCA Class 1 and Class 10 Buildings

AUSTRALIA FENCO LOW CARBON CONSTRUCTION PTY LTD
Apt 9 / 259 Canterbury Road, Forest Hill, Vic., 3131, Australia

Version 4.0 – 4 April 2022

Contents

Document Revision Status:

Date Issued	**Issue No:**	**Details:**
15 October 2019	Version 1.0	Initial Issue
25 February 2021	Version 2.0	Include Bushfire Performance up to BAL-FZ, and updated top-hat spacing details.
29 March 2021	Version 3.0	Include Typical Panel Layout in Fig.1. Amend 4.9 Optional Starter-Channel. Amend 6.1(6) max. top-hat spacing. Revised 7.1 Concrete Slab Rebate Detail. Revised 7.4 Wall to Balcony Detail
4 April 2022	Version 4.0	Included changes; Installation Steps 6.2(1) & 6.2(2); Notes to Construction Details; Section 3.2 add 'aluminium' windows; Section 7.5 Garage/Bulkhead/Overhang Detail;

1 Introduction

1.1 Fenco Panel External Wall Cladding System

Fenco Panel External Wall Cladding System uses an 80mm thick grey foamed ceramic wall panel fixed to steel top-hat battens as a cavity-battened external wall solution with a render coating system finish.

This technical information & installation manual is to be referenced by architects, builders & installers as a source of information regarding the selection, incorporation into the design, and installation specification to meet Building Code of Australia (BCA) requirements.

Fenco Panel External Wall Cladding System has been tested and certified to meet the following National Construction Code 2019 (NCC 2019) – Building Code of Australia, Volume 2 relevant performance requirements as an external wall cladding for Class 1 & 10 buildings:

- **Structure:** (P2.1.1 Structural stability and resistance to actions)
  Tested and appraised for wind actions up to and including AS 4055 Wind Class N4, and for AS/NZS 1170.2 serviceability wind loads of +0.82 kPa & -1.23 kPa and ultimate strength wind loads ±3.01 kPa.
- **Weatherproofing and Rising Damp:** (P2.2.2 Weatherproofing, P2.2.3 Rising Damp)
  Tested and appraised for resistance to moisture from the ground and the penetration of water for wind actions up to and including AS 4055 Wind Class N4, and for AS/NZS 1170.2 serviceability wind loads of +0.82 kPa & -1.23 kPa.
- **Bushfire** Tested up to BAL-FZ (includes BAL-Low, BAL-12.5, BAL-19 & BAL-40.)
- **Energy Efficiency:** (P2.6.1 Building)
  The tested Material R-value (R_m) of 80mm Fenco Panel is 0.44m^2K/W.

2 System Summary

Fenco Panel External Wall Cladding System is based on Fenco Panel, an 2400mm x 600mm x 80mm thick foamed ceramic panel weighing 43.8 kg (380kg/m^3). The panel is installed over horizontal top-hat battens that create a drained cavity to help improve the weather proofing performance of the external wall cladding system.

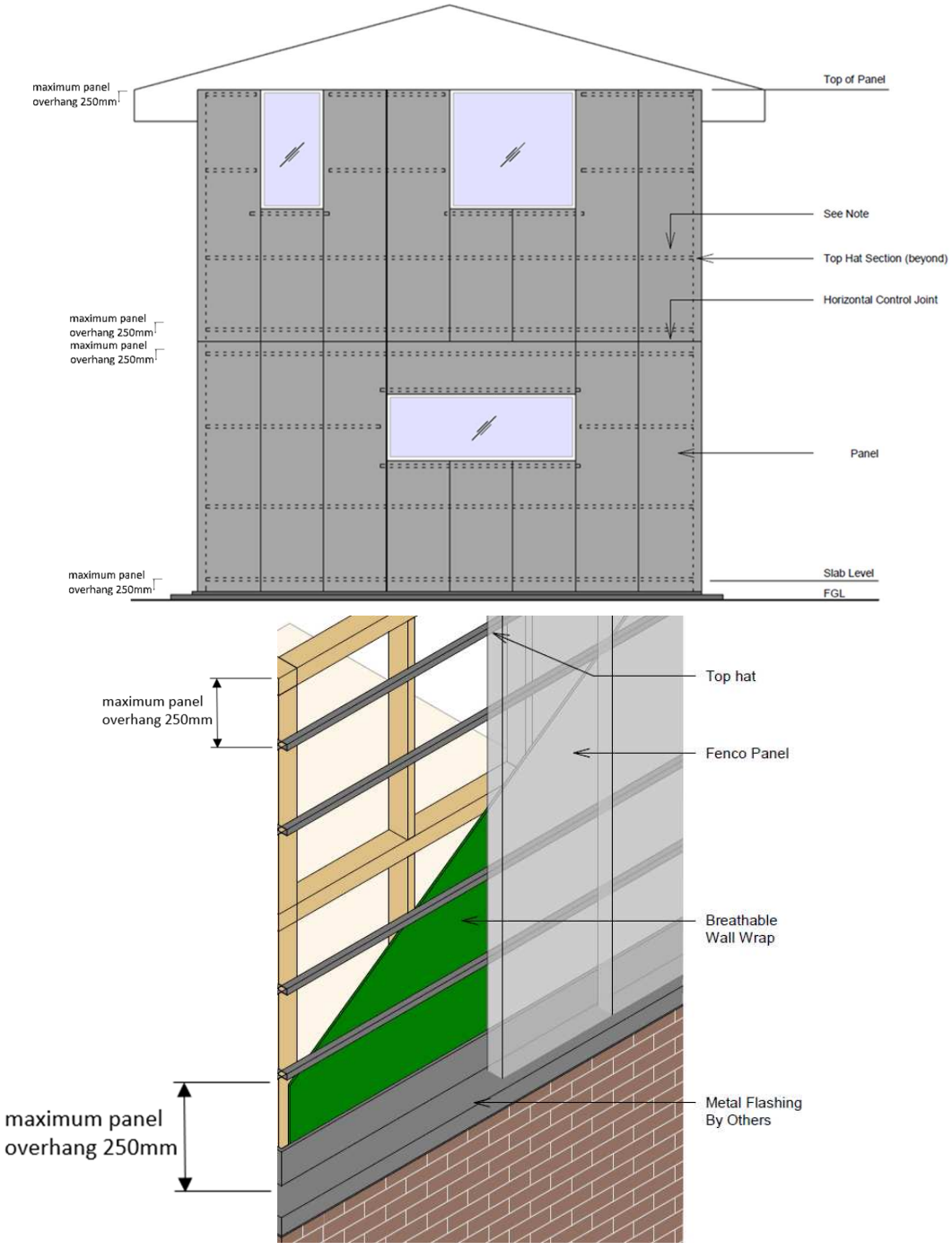


Figure 1: Fenco Panel External Wall Cladding System

The Fenco Panel External Wall Cladding System steel top-hat battens are fixed through breathable wall wrap onto studs at maximum spacing 450 mm spacing. The 80mm panel is finished on-site with a 3-layer polymer-modified render system. This incorporates an initial base coat of render, texture coat, and top membrane coat.

The design, selection and installation of any external wall cladding system must only be made by a building professional with a thorough understanding of all relevant local and national building requirements, including the technical aspects of the product and its proper use. Installation must only be performed by a tradesman under the direction of a Registered Builder both with an understanding of the system and its installation.

2.1 Benefits

Fenco Panel External Wall Cladding System External Wall panels are available as a standard size of 2400mm x 600mm x 80mm (43.7kg/m^2, 380kg/m^3).

Fenco Panel External Wall Cladding System benefits include:

- System tested for weatherproofing,
- Strong and rigid with impact resistance,
- Able to be used with well-known manufacturers render systems,
- R-value of 80mm panel is R0.44 (m^2K/W).

Fenco Panel External Wall Cladding System is tested in Australia for Australian design conditions.

3 National Construction Code (NCC) 2019

The NCC is a performance-based code that allows both Deemed-to-Satisfy, or Performance Solutions. Any external wall cladding system not included in the Deemed-to Satisfy provisions can only comply with the NCC as a Performance Solution. This includes all External Wall Cladding Systems not listed in BCA Volume 2.

External Walls are required to comply with BCA performance requirements including as a minimum, structure, damp & weatherproofing and energy efficiency.
Fenco Panel External Wall Cladding System has been tested and complies with these requirements.

3.1 Structural Performance

Fenco Panel External Wall Cladding System has been designed, tested and achieves the following wind load performances. It may be installed in AS 4055 Wind Classifications N1, N2, N3 and N4 only, and cannot be installed in cyclonic wind regions. Maximum wind loads for buildings designed in accordance with AS/NZS 1170.2 are +0.82 kPa & -1.23 kPa for serviceability and ±3.01 kPa for strength. The design wind loads for a building are provided by the builder and are based on the height and the site classification of the building in accordance with AS 4055 Wind Loads for Housing, or AS/NZS 1170.2.

Fenco Panel External Wall Cladding System is designed to resist wind loading only. All framing must be fully braced prior to installation of the top-hat battens. Control jointing, to allow for building movement. must be designed by the builder. Fenco Panel External Wall Cladding System is not load-bearing and attachments must be made directly to the structural framing.

Where Fenco Panel External Wall Cladding System is installed on buildings designed to AS 4055 wind load requirements, the;

- Height from ground level to the;
    - underside of eaves shall not exceed 6.0m, and
    - highest point of the roof, not including chimneys, shall not exceed 8.5m.
- Width including roofed verandas, excluding eaves, shall not exceed 16.0m.
- Length shall not exceed five times the width.
- Roof pitch shall not exceed 35 degrees.

3.2 Damp & Weatherproofing Performance

Fenco Panel External Wall Cladding System performance has been confirmed by testing in accordance with the verification method V2.2.1 in the NCC 2019.

Fenco Panel External Wall Cladding System complies with the NCC 2019 performance requirements for damp, weatherproofing for an external wall where;

- The serviceability limit state design wind pressure is up to N4, and
- has aluminium windows that comply with AS 2047, and
- has a Risk Score of 20 or less determined in accordance with NCC 2019, BCA Volume 2 Table V2.2.1a, see the following.

Table V2.2.1a – Risk factors and scores

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

3.3 Condensation Performance

As required by NCC 2019(Amdt.1) Cl.3.8.7.2, Fenco Panel External Wall Cladding System, incorporates a vapour permeable pliable building membrane in accordance with AS/NZS 4200.1:2017, installed in accordance with AS 4200.2:2017.

3.4 Bushfire Performance

Fenco Panel External Wall Cladding System performance has been confirmed by testing in accordance with AS/NZS 1530.4:2014 for an FRL of 30/30/30.
Construction details required to achieve this performance include: 80mm thickness Fenco Panel, 6mm thickness pre-blended cement render, horizontal steel top-hat battens, 90x45 MGP10 timber framing, light-duty sarking with a flammability index not greater than 5, 10mm plasterboard. Refer to EWFA Report No: 54286200.1 for specific detailing requirements, and AS 3959:2018 Clause 3.6 & Sections 4 to 9 for joints, vents and weepholes requirements in walls.
This result complies with *AS 3959:2018 Construction of buildings in bushfire-prone areas*, Clause 9.4.1(c) for walls in BAL-FZ, and Clause 3.4 for higher levels of construction to include walls in BAL-Low, BAL-12.5, BAL-19, BAL-29, BAL-40.

3.5 Thermal Performance

At 80mm thickness, the Fenco Panel has a Material R-value of R0.44 (m^2K/W).
The Fenco Panel External Wall Cladding System achieves high Total R-values with the addition of R2.7, 90mm thick glasswool batts within the framing cavity. This thermal performance may be used to satisfy the Total R-values required by NCC 2019, BCA Vol. 2 Part 3.12.1.4.

Fenco Panel External Wall Cladding System with breathable reflective wall wrap, R2.7, 90mm thick glasswool batts, and 10mm plasterboard lining achieves the following Total R-values in accordance with AS/NZS 4859.1 & .2:2018.

Fenco Panel External Wall Cladding System PANEL THICKNESS	Total R-value (m^2.K/W) (incorporating R2.7 glasswool batts)		
	Winter (Heat flow outwards)	Summer (Heat flow inwards)	Average
80 mm	3.20	3.07	3.13

4 Materials

The Fenco Panel External Wall Cladding System must only be installed with components that meet the specifications in this manual and the required building product standards.

The following materials are required to install the Fenco Panel External Wall Cladding System.

4.1 Damp Proof Course

Damp proof course (DPC), installed by builder, must meet the requirements of AS/NZS 2904.

4.2 Vapour Permeable Wall Wrap

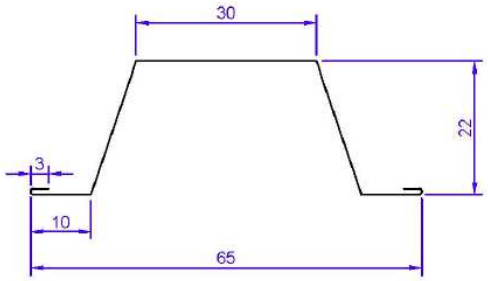
The framing must be wrapped with vapour permeable wall wrap product that meets the requirements of AS/NZS 4200.1. At a minimum it must be Medium Duty (MD) Classification and have a Low Flammability Classification, (Flammability Index (FI) equal or less than 5) in accordance with AS 1530.2.

4.3 Flashing tape

Flashing tape must be Aluminium faced Butyl Flashing Tape, 48mm wide x 1.5mm thick. It shall be used to seal the breathable wall wrap at windows, doors, electrical, plumbing, other services, and along the base of the wall (e.g., Tenacious Tapes – Waterproof/Sealing).

4.4 Top-Hat Battens

Battens used to fix the Fenco Panel to timber or steel framing shall be steel top-hats with minimum 22 mm depth, 0.42mm steel thickness, manufactured using TRUECORE® steel (aluminium/zinc alloy coated) complying with AS1397 G550, AM150 (550 MPa minimum yield stress).



4.5 Insulation

Insulation shall non-combustible glasswool batts within the framing cavity.

4.6 Fenco Panel

Only Fenco Panel 2400mm x 600mm x 80mm thick light grey foamed ceramic panel weighing 43.8 kg (380kg/m^3), as described in this manual, tested and supplied by Australia Fenco Low Carbon Construction can be used as part of the Fenco Panel External Wall Cladding System.

4.7 Mortar

Mortar to be used at Fenco Panel joints is sand, cement, lime based.

4.8 Screws

Screws shall be Class 3 (Class 4 in corrosive environments) to suit timber or steel framing. Screws must comply with the corrosion protection requirements of AS 4773 (Part 4 and Appendix C). Screws must penetrate at least 30mm into timber wall framing (e.g., when fixing top-hats), or at least 3-full threads through steel wall framing or through top-hats.

Screw Type	Application
12-11x35mm hex head type 17 screw	Top-hat to timber frame
10-16x16mm hex head self-drilling screw	Top-hat to steel frame
14-10x100mm hex head type 17 screw	Fix panel to top-hat

4.9 Starter Channel

Starter channel with weepholes in U-shape (boot) or L-shape, aluminium/PVC is optional on all exposed panel edges and as detailed for penetrations.

4.10 Aluminium/PVC External Angles

External angles must be 32 mm x 32 mm Aluminium or PVC and must be installed at openings and edges as detailed.

4.11 Backing Rod / Ableflex

The 'backing rod' material is a closed-cell polyethylene foam, 10 mm diameter as 'back-blocking' for flexible adhesive sealants placed in joints as detailed.

4.12 Coating System

Fenco panels require an appropriate external coating system and sealant detailing to ensure the following minimum performance for water resistance and vapour permeability of the building envelope is achieved. A simple paint coating is not adequate.

The selection of an appropriate coating system is the responsibility of the specifier, and installation is the responsibility of the builder.
Where a coating manufacturers' coating system is chosen for application to Fenco panels, the coating system must be warranted by the coating manufacturer as appropriate for external application to Autoclaved Aerated Concrete (AAC) substrate with the following minimum characteristics.

4.12.1 Surface Adhesion

The substrate preparation and coating application must be in accordance with the coating manufacturer's specification. Before applying the coating system in coastal areas, all Fenco panels must be thoroughly washed with fresh water to remove any salt residue. Also refer to any coating manufacturers' additional surface preparation requirements.

4.12.2 Water Resistance

The primary objective of the coating system is to prevent water ingress through it, yet allow vapour in and out of the Fenco Panel. The coating system shall have a tested water resistance transmission rate of <10 g/m^2/24hr/1kPa.

4.12.3 Water Vapour Permeability

For a coating to allow the 'escape' of water vapour, the coating system must be vapour permeable. The coating system shall be tested and achieve:
$W \cdot S_d \leq 0.2$ kg/(m.$h^{0.5}$), where;
coefficient of water absorption $W \leq 0.5$ kg/(m^2.$h^{0.5}$), and
equivalent air layer thickness of water vapour diffusion $S_d \leq 2$m.

4.12.4 Compatibility

Confirm the coating system is compatible with Fenco Panel and all other construction system components. Coating systems suitable for external application onto AAC substrates satisfy this requirement.

4.12.5 Elasticity

The coating system must be able to bridge a 1mm minimum crack width. The coating manufacturer can specify the minimum design specification (thickness), so that the coating is serviceable and durable.

4.13 Sealant

Sealant to be used at all articulation & control joints, penetrations, junctions with other substrates etc. shall be external grade acoustic and/or fire rated paintable sealant (e.g., Bostik Fireban one or Fuller Firesound).

5 Specifications

Fenco Panel External Wall Cladding System can only be installed once all wall framing is constructed and detailed to comply with the relevant regulations.
The design, location, placement, detailing, and correct installation of control joints is the joint responsibility of the Designer and Builder to ensure the structure and cladding system will accommodate any project specific movement.
Good building practice typically requires horizontal control joints located at each floor level, vertical control joints at 6 m maximum width, in-line with openings, where potential cracking may occur, and at all joints to dissimilar construction materials.

All elements of the design, supply, and correct installation of penetrations in the cladding system, including windows and doors are outside the scope of the Fenco Panel External Wall Cladding System. The Designer and Builder must ensure the building, including all weep holes and integral flashings in all cladding penetrations prevent the ingress of rainwater behind the Fenco Panel, and will drain to the outside of the building.

All elements of the specification, supply, and construction of light-gauge steel or timber wall framing do not form part of the Fenco Panel External Wall Cladding System. The Designer and Builder must ensure all framing has been constructed in accordance with the relevant requirements of either AS 1684.2 Residential Timber Framed Construction – Non–cyclonic areas, or NASH Standard Residential and low-rise steel framing, or another approriate standard.
Variations in the strength, stiffness, straighness, and squareness of the wall framing will affect the cladding system and must be corrected before the installation of the Fenco Panel External Wall Cladding System.

In all cases the Fenco Panel External Wall Cladding System may only be installed in accordance with this manual onto light-gauge steel or timber wall framing with a maximum stud spacing of 450mm.

6 Installation

Specification and incorporation of the Fenco Panel External Wall Cladding System into the building design, must be made by a Designer and Builder who are familiar with the application and technical aspects of the system, and have access to all the relevant technical information relating to the system.

Installation must be carried out by a competent carpenter or other tradesman under the direction of a Builder, both of whom are familiar with the method of installation and have access to all the relevant technical information relating to the system, including the installation instructions contained in this Manual.

6.1 Prior to Installation

1. Ensure the wall frame is square, level, and plumb.
2. Check that the stud spacing does not exceed 450 mm.
3. Ensure eave linings, flashings, damp proof course and termite protection are provided as per the project requirements and the specifications contained herein.
4. Ensure back blocking is installed for wall mounted services, downpipes, penetrations etc.
5. Ensure windows are aligned to meet the project specific detailing requirements for battens, finished reveal depth etc.
6. Check the maximum top-hat spacing does not exceed the requirements in Section 6.7.

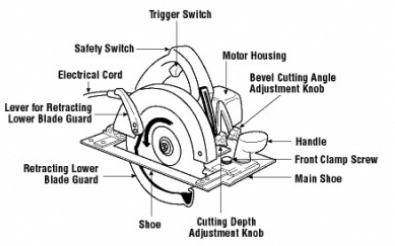
6.2 Installation Steps

1. Install breathable wall wrap in accordance with the manufacturers' instructions and in accordance with AS 4200.2:2017 ensuring that all joints, edges, and penetrations are sealed with flashing tape.
2. Once the wall wrap has been installed, where required flashing must be installed as required by the manufacturer specifications and the NCC.
3. Fix the horizontal steel top-hats in accordance with the project requirements for the design wind pressures.
    a. Check the top-hat vertical spacing.
    b. Check the screw type and number of screws for fixing the top-hat to the framing.
    c. Install top hats below and above openings. Ensuring panel edges are within 100mm to 250mm from the top-hat.

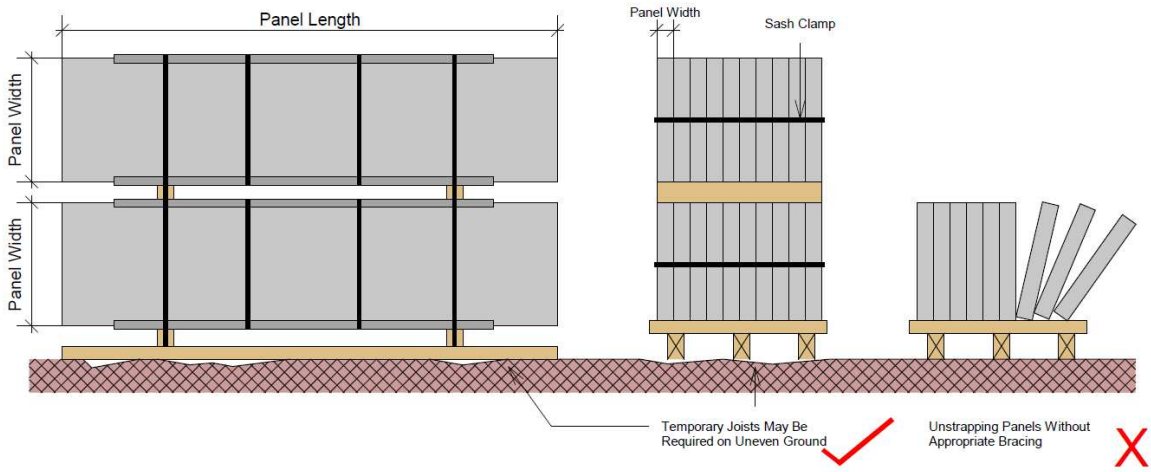
   d. Ensure top hats are discontinuous at control joints.
4. Install panels
   a. Corner panel installed first.
   b. Check required number of screws per top-hat per-panel.
   c. Check control joint layout
   d. Cut panel to suit as required.
   e. Apply Mortar to vertical and horizontal joints (not at control joints).
   f. Each panel must be screwed to at least 2 top-hats.
5. Form all control joints at the locations specified using backing rod and sealant as detailed in the construction drawings.
6. Coating:
   a. Apply the specified coating system in accordance with the coating manufacturer's specification.

6.3 Health & Safety

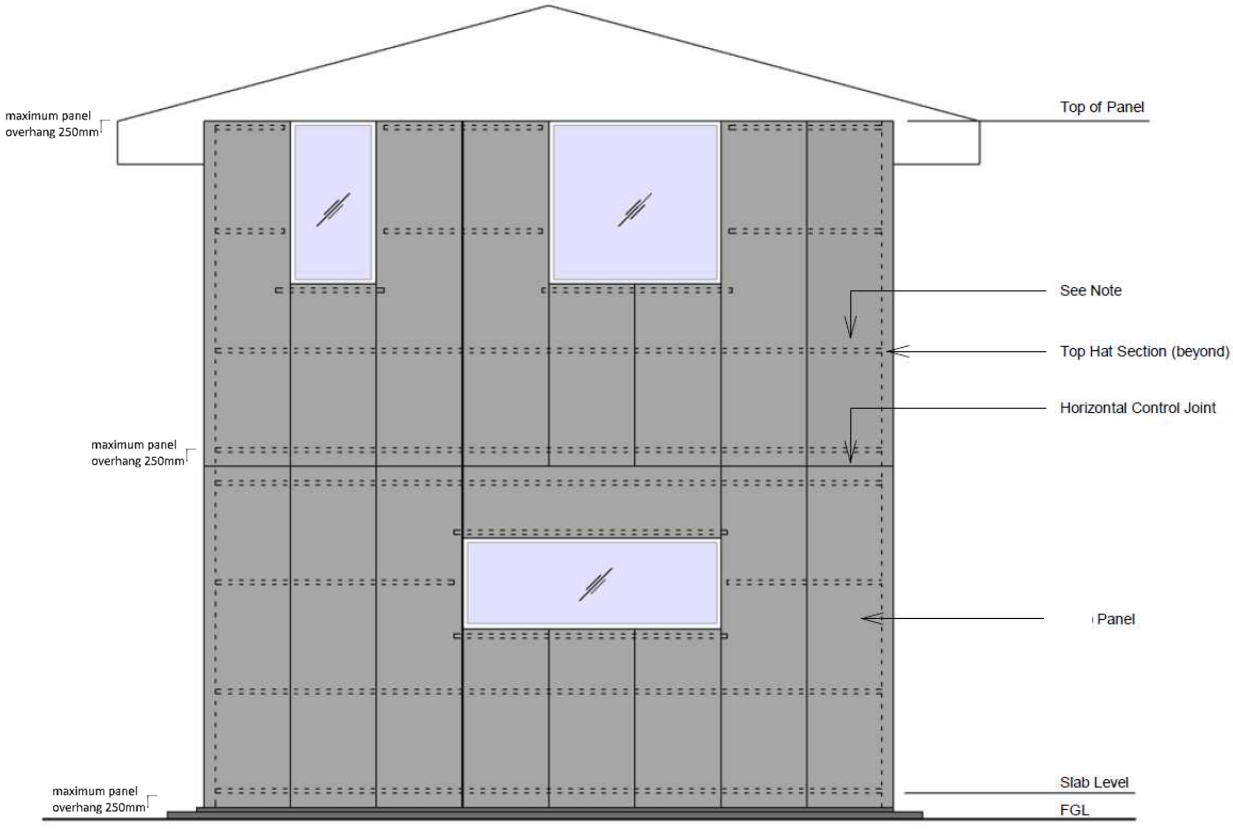
Installation instructions do not deal with specific site safety or safe work practices, these should be considered in conjunction with a suitable Material Safety Data Sheets prior to commencing installation. However, as with all building materials, the use of personal protective equipment is recommended. Basic safety clothing and gloves should be worn when handling or cutting the Fenco Panel External Wall Cladding System. When cutting Fenco Panel External Wall Cladding System External Wall Cladding with a power saw it is recommended that a face mask and protective glasses be worn. Quality assurance aspects of the construction process should be considered in conjunction with the necessary safety analyses.



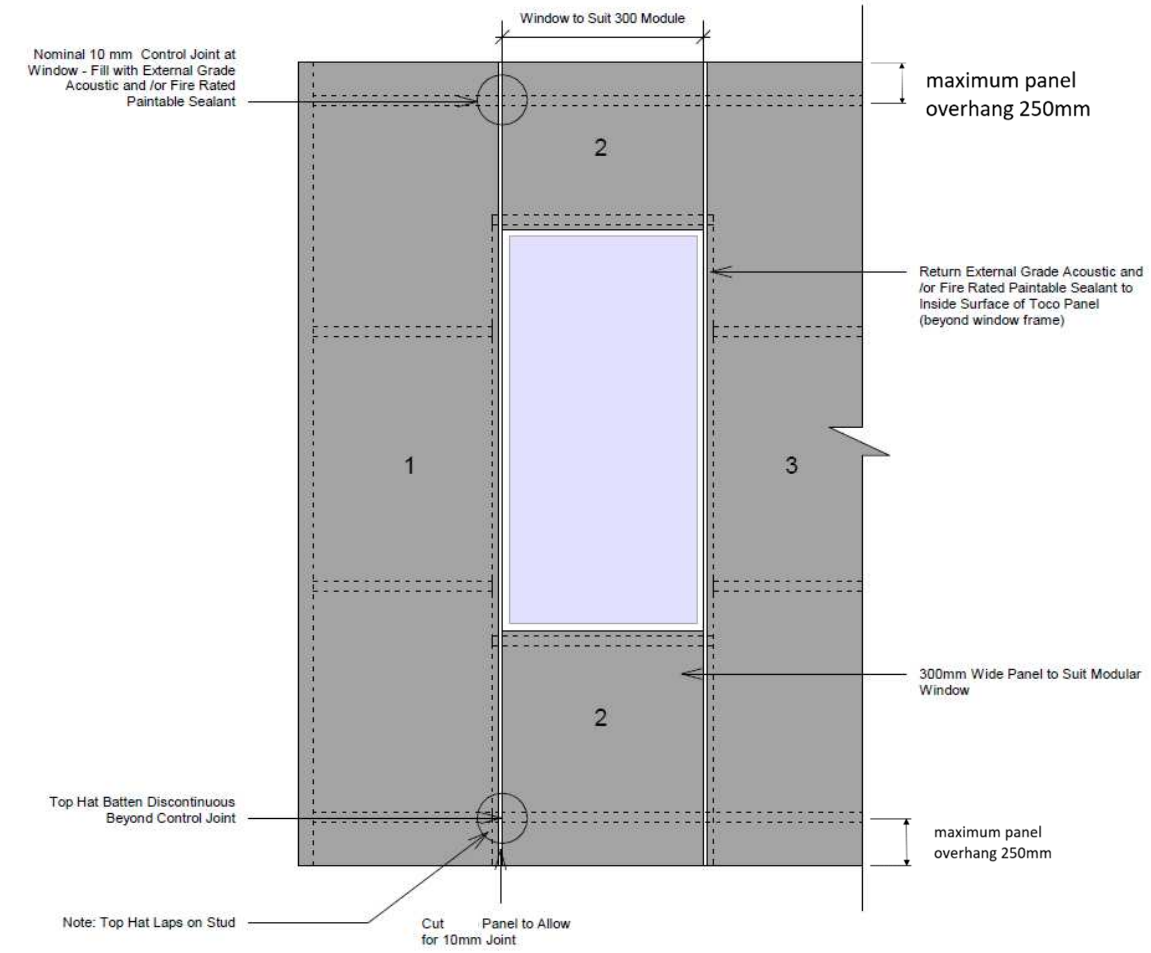
6.4 Panel Handling On-Site

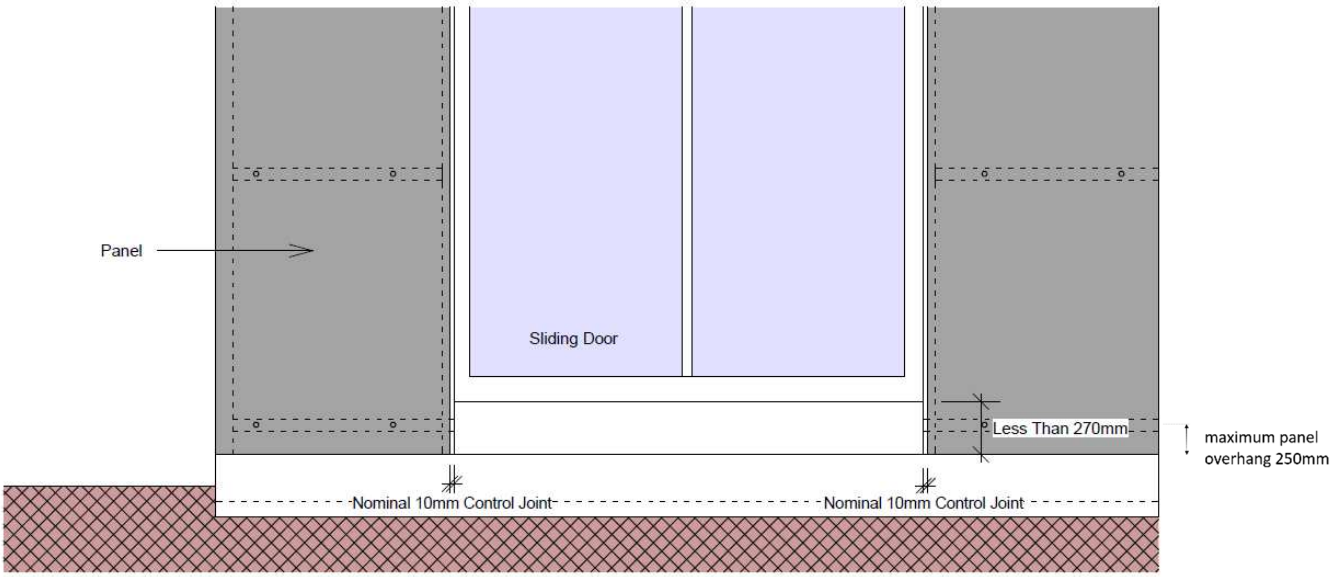


6.5 Typical Panel Layout



6.6 Typical Panel Layout for Openings





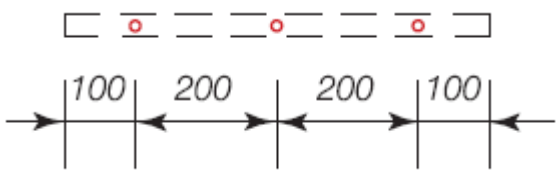
6.7 Top Hat Spacing

In all cases the maximum top-hat spacing shall not exceed those listed in the table below.
The maximum overhang of Fenco Panel from the top-hat batten is 250mm.
Top-hats must be fixed with two (2) screws to each stud as described in Section 4.8.

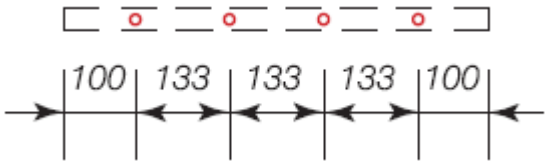
AS 4055 Wind Classification	**N1**		**N2**		**N3**		**N4**	
	Away from Corners	Within 1200mm of Corners	Away from Corners	Within 1200mm of Corners	Away from Corners	Within 1200mm of Corners	Away from Corners	Within 1200mm of Corners
Design Wind Pressure (kPa)	0.62	-0.94	0.86	-1.3	1.35	-2.03	2.01	-3.01
Max. top-hat spacing (mm)	1100	950	1000	750	750	650	650	550
Min. No. of Screws/top-hat	3	3	3	3	3	3	3	4
Min. No. top-hats/panel	3	3	3	4	4	4	4	5
Note: Panels up to 800mm length may be supported by min. 2 top-hats per panel, with max. top-hat spacing 450mm.								

6.8 Fixing Spacing and Edge Distances

Fenco Panel is 600mm width and fixed to the top-hat battens with the screw-types described in Section 4.8.
The minimum screw edge distance is 100mm.
The minimum number of screws per top hat is:
- 3 screws for N1, N2, N3, N4(away from corners), and

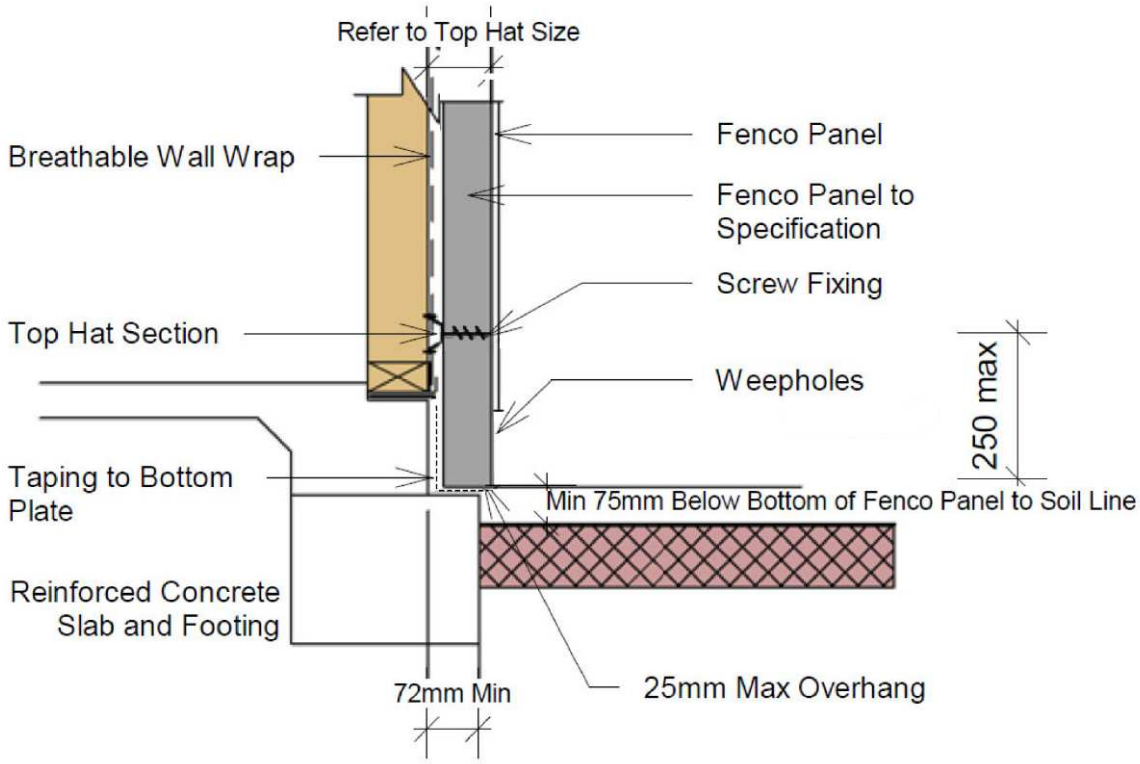


- 4 screws for N4(within 1200mm of corners).



7 Construction Details

7.1 Concrete Slab Rebate

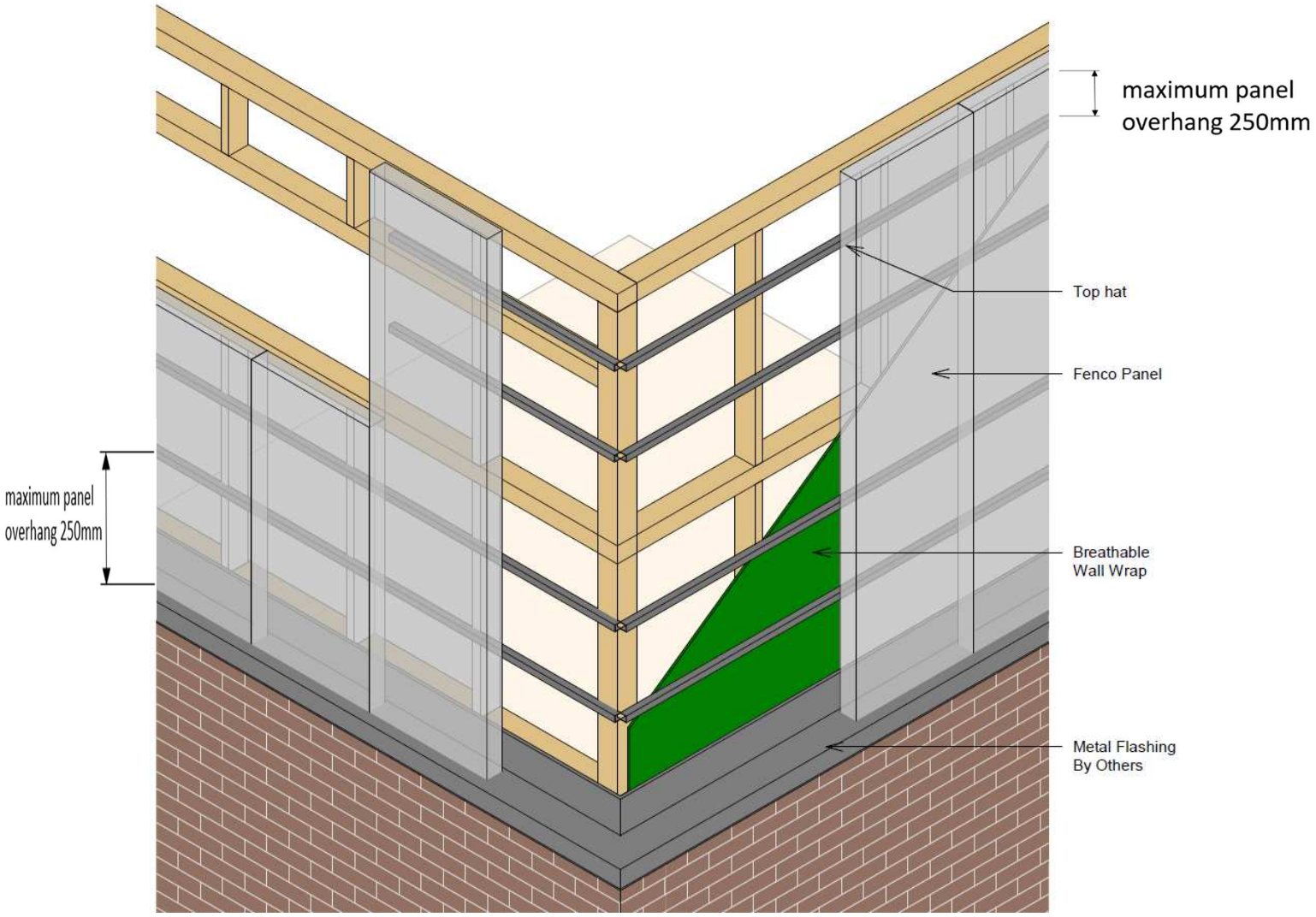


Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

As-tested, bottom-edge without starter channel, Wall Wrap taped to DPC.

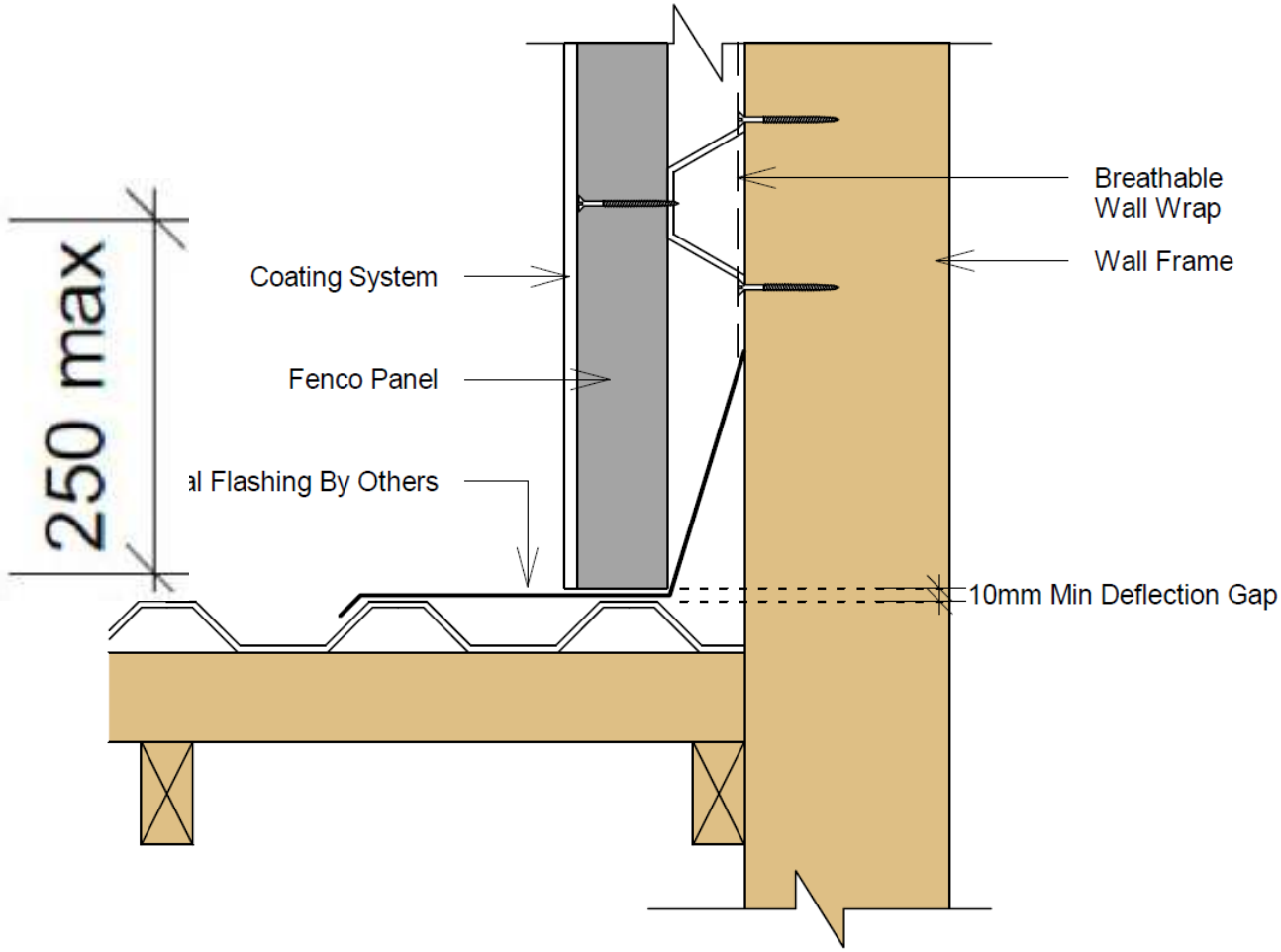
7.2 Panel Over Masonry Wall



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

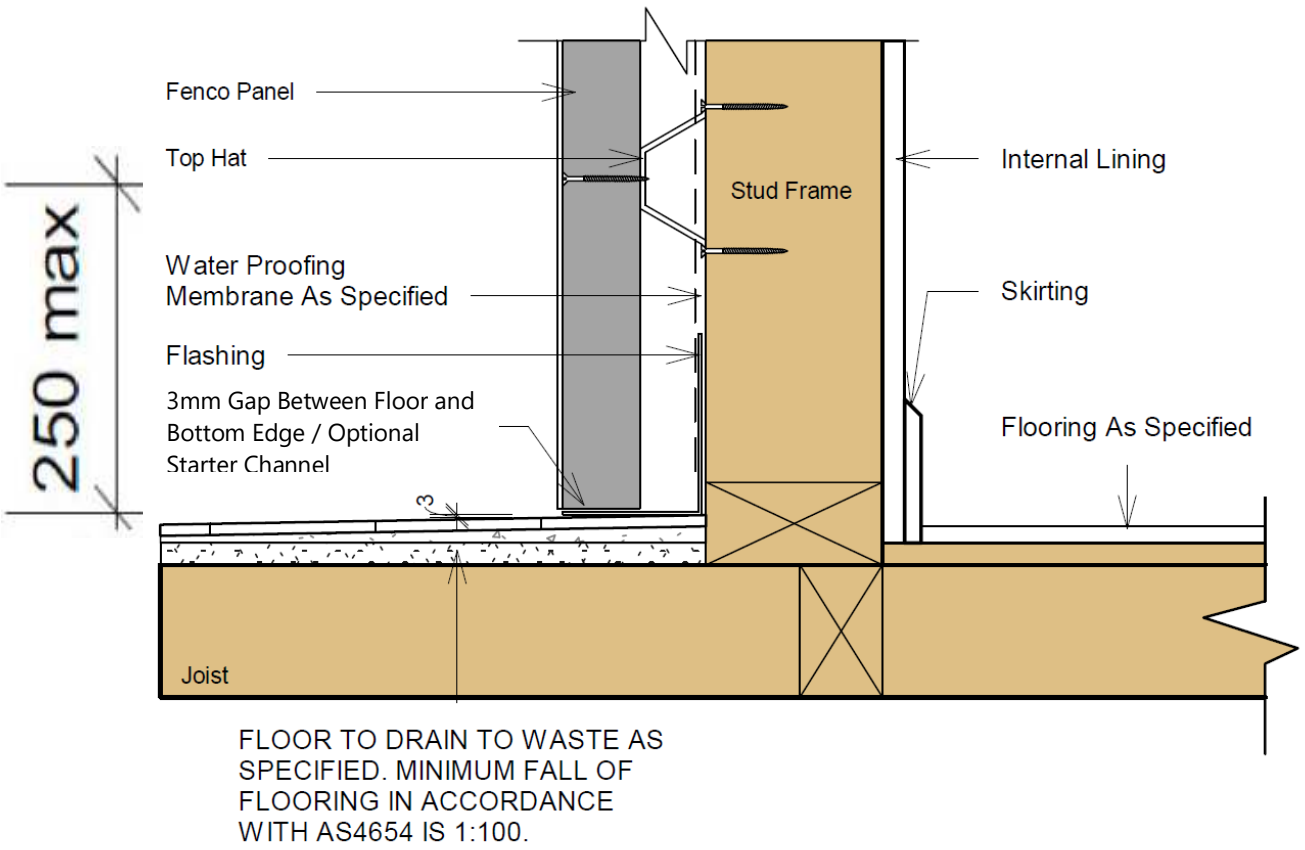
7.3 Wall Over Roof



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

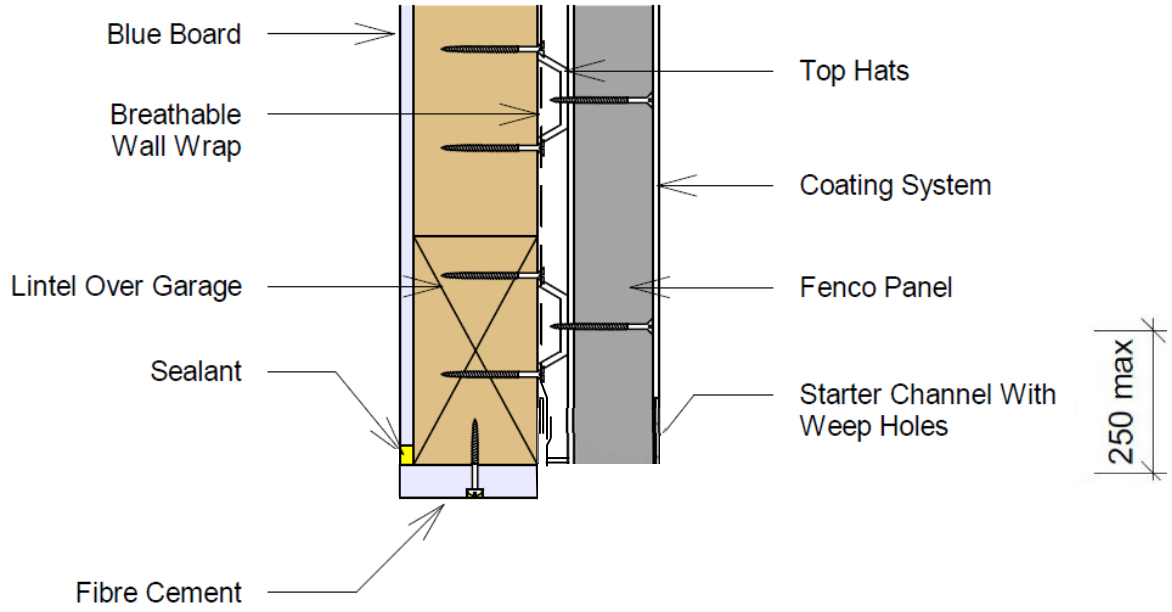
7.4 Wall to Balcony



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

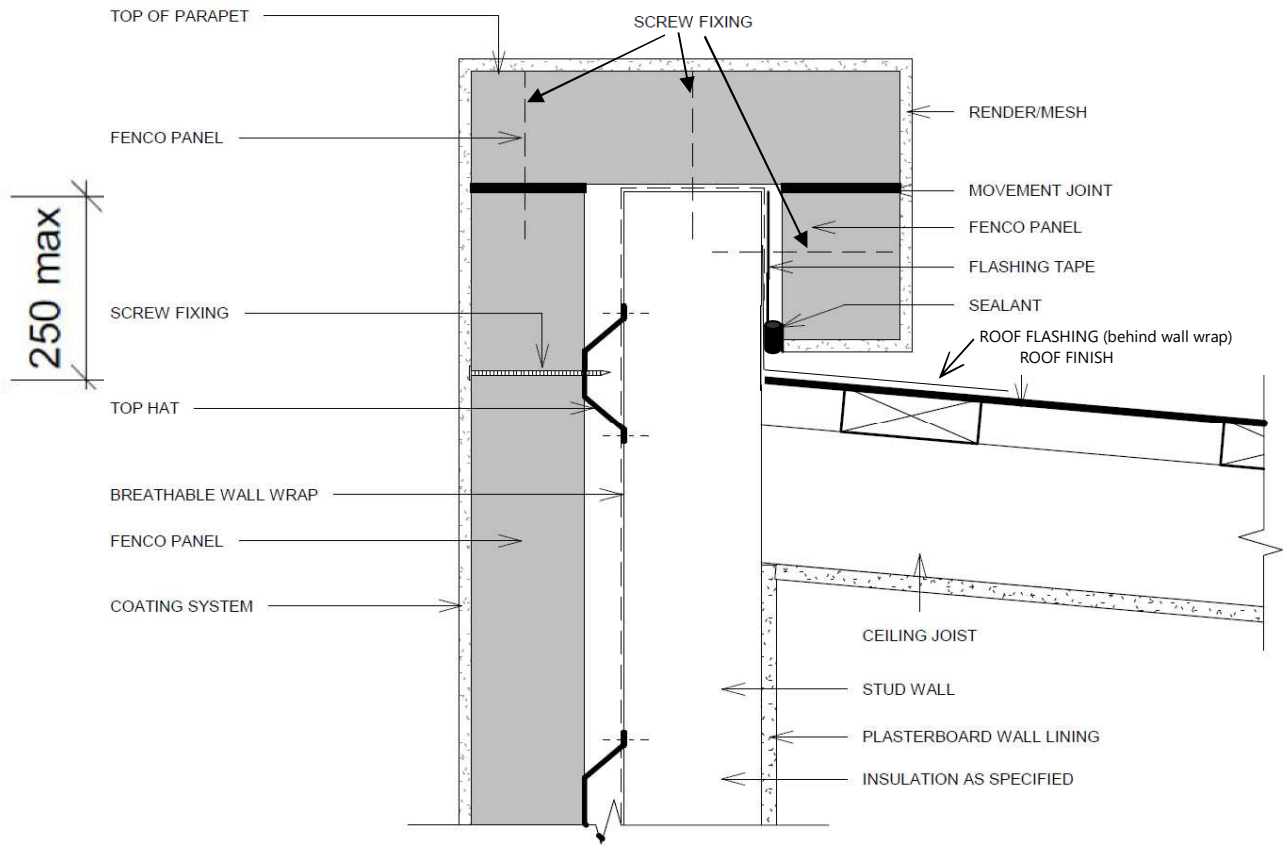
7.5 Garage / Bulkhead / Overhang / Drip



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

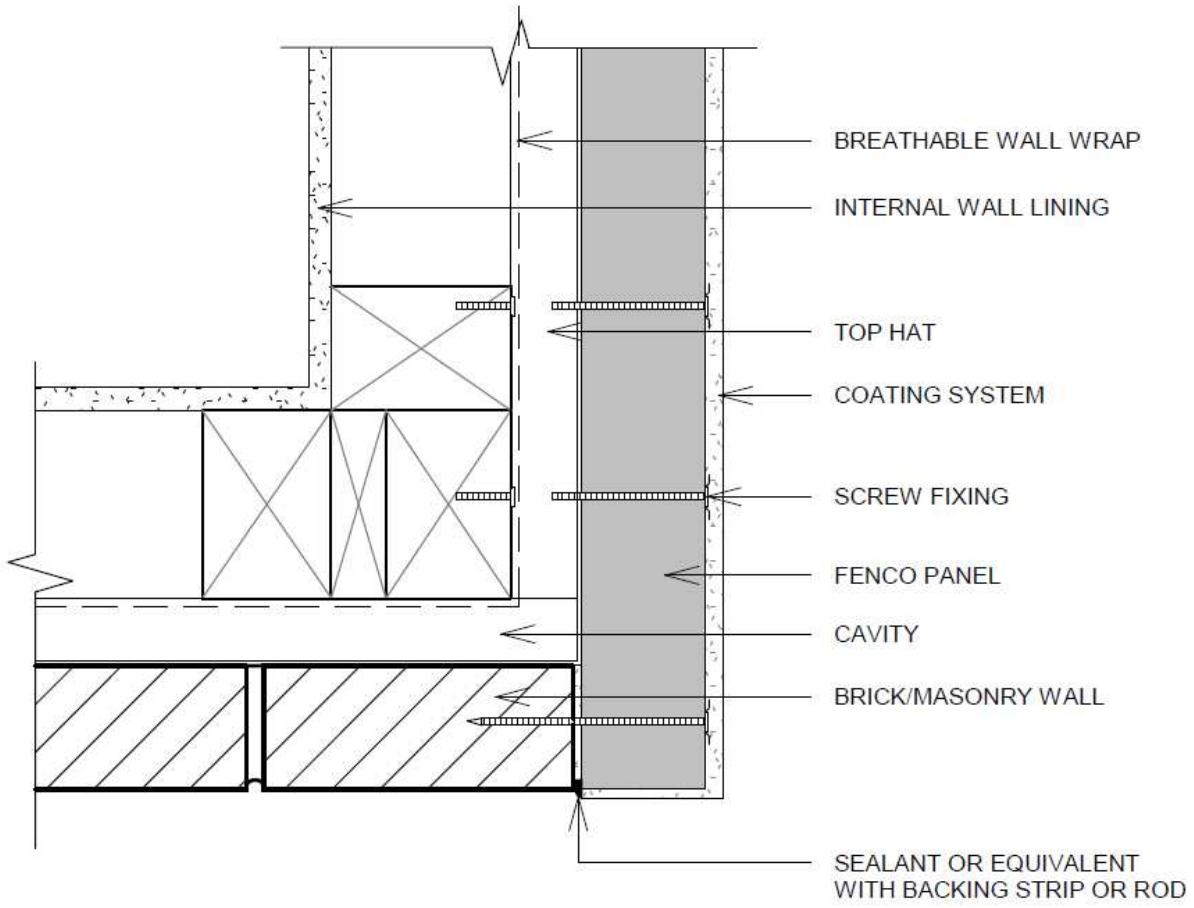
7.6 Parapet Detail



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

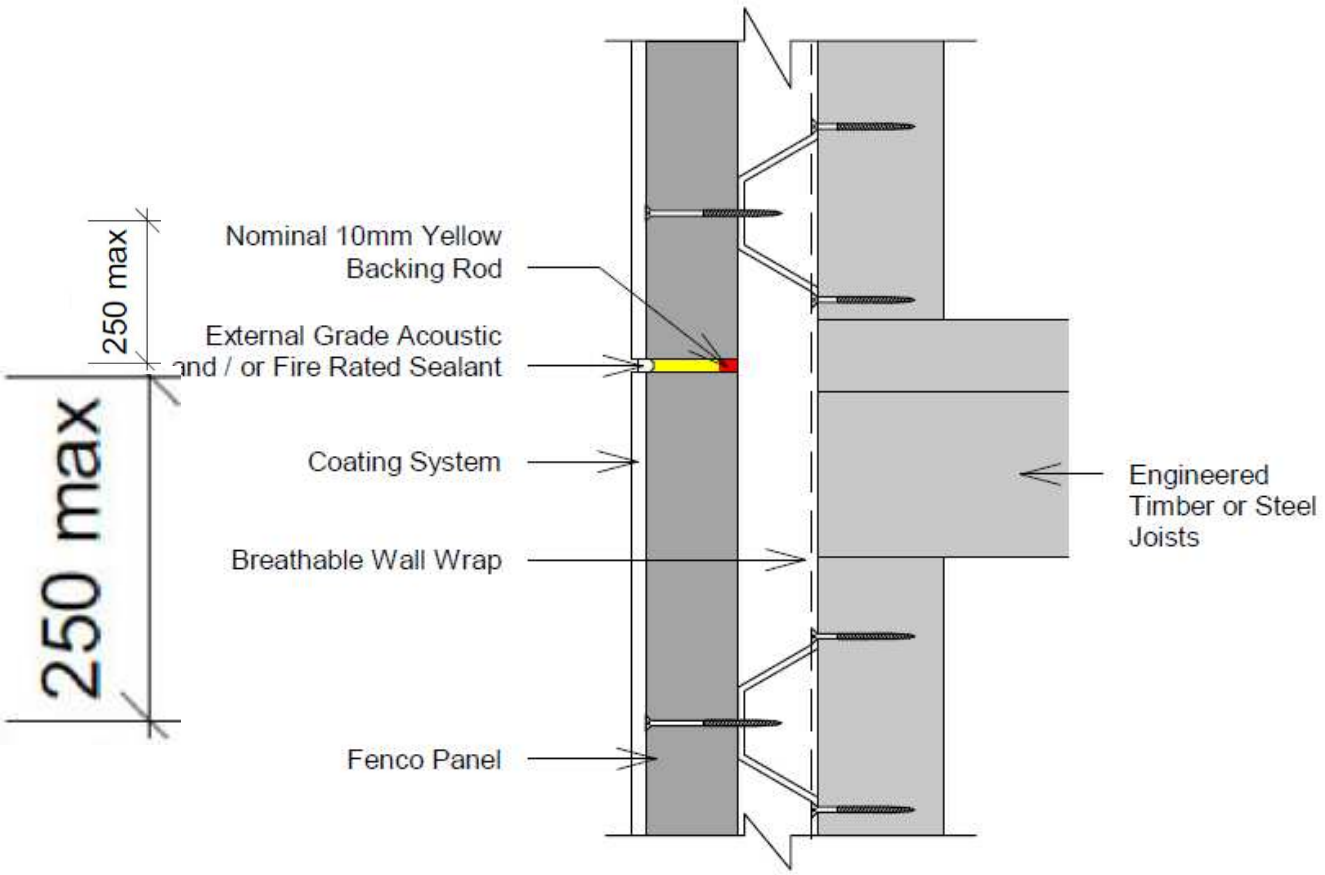
7.7 Junction to Masonry Wall



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

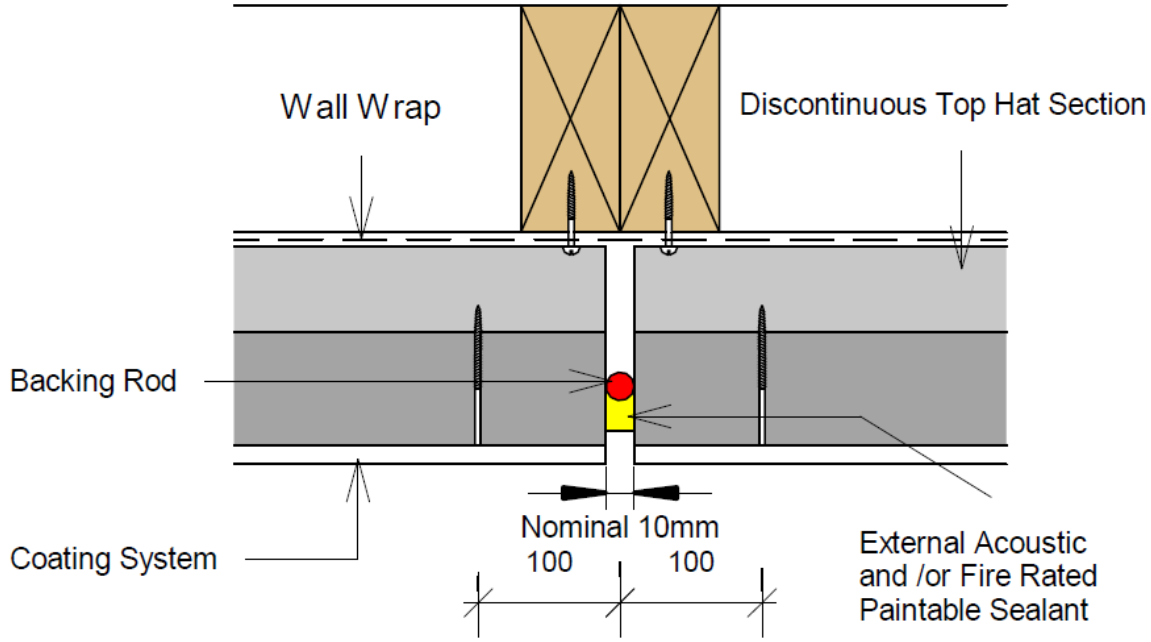
7.8 Horizontal Expansion Joint



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

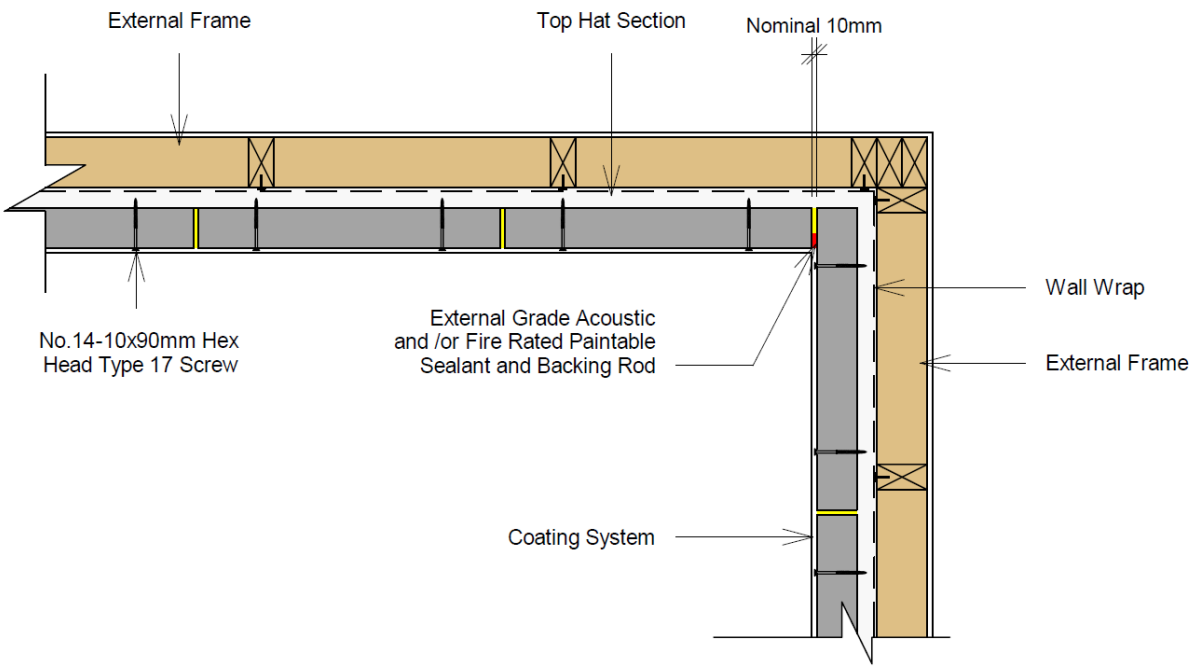
7.9 Vertical Expansion Joint



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

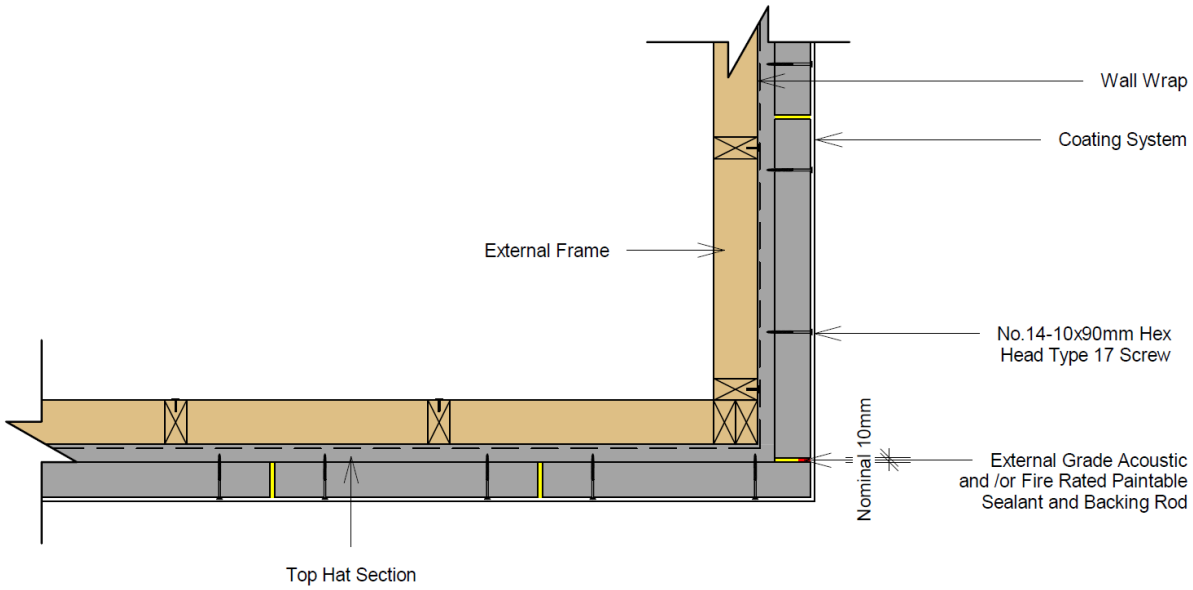
7.10 Internal Corner



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

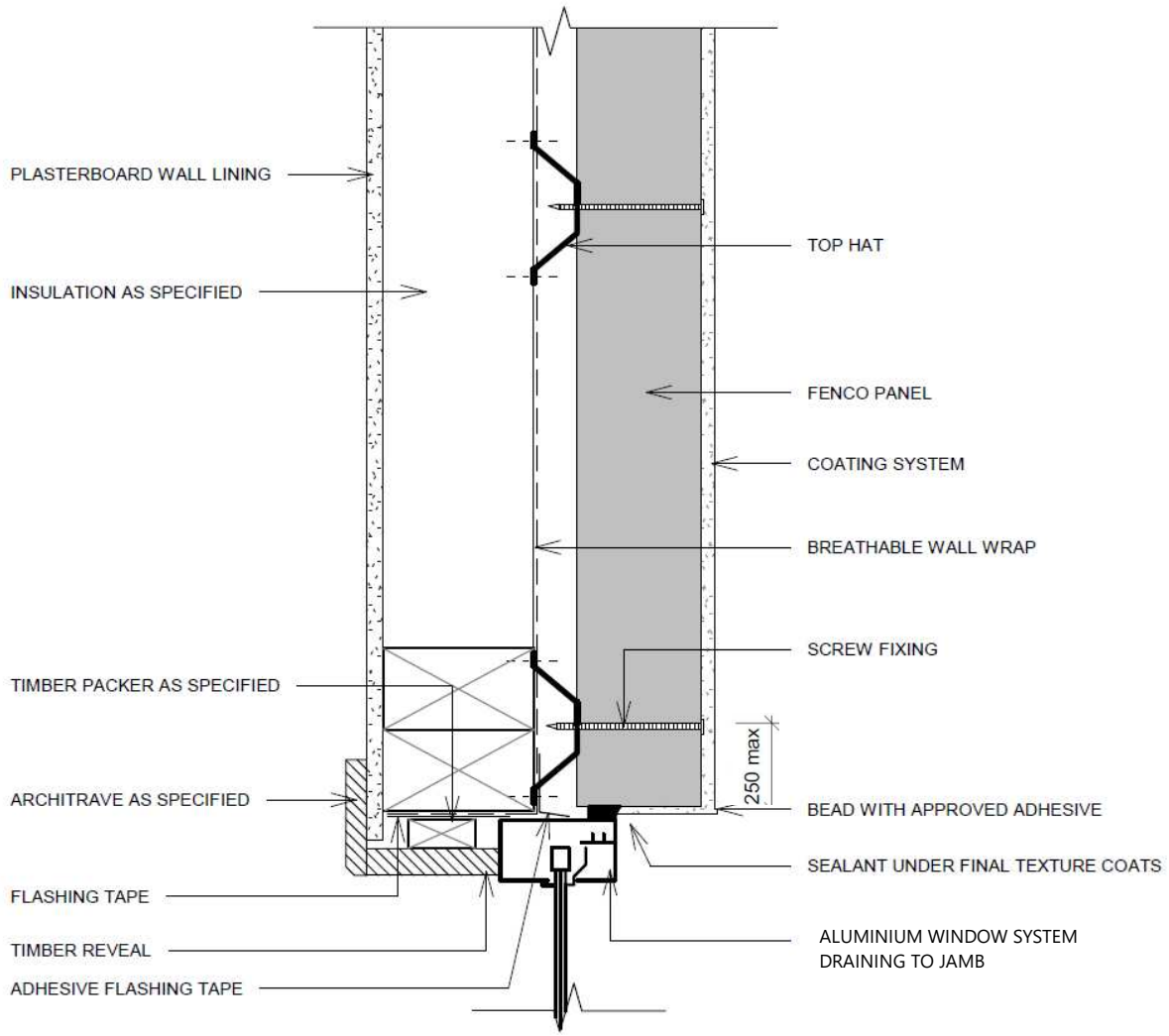
7.11 External Corner



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

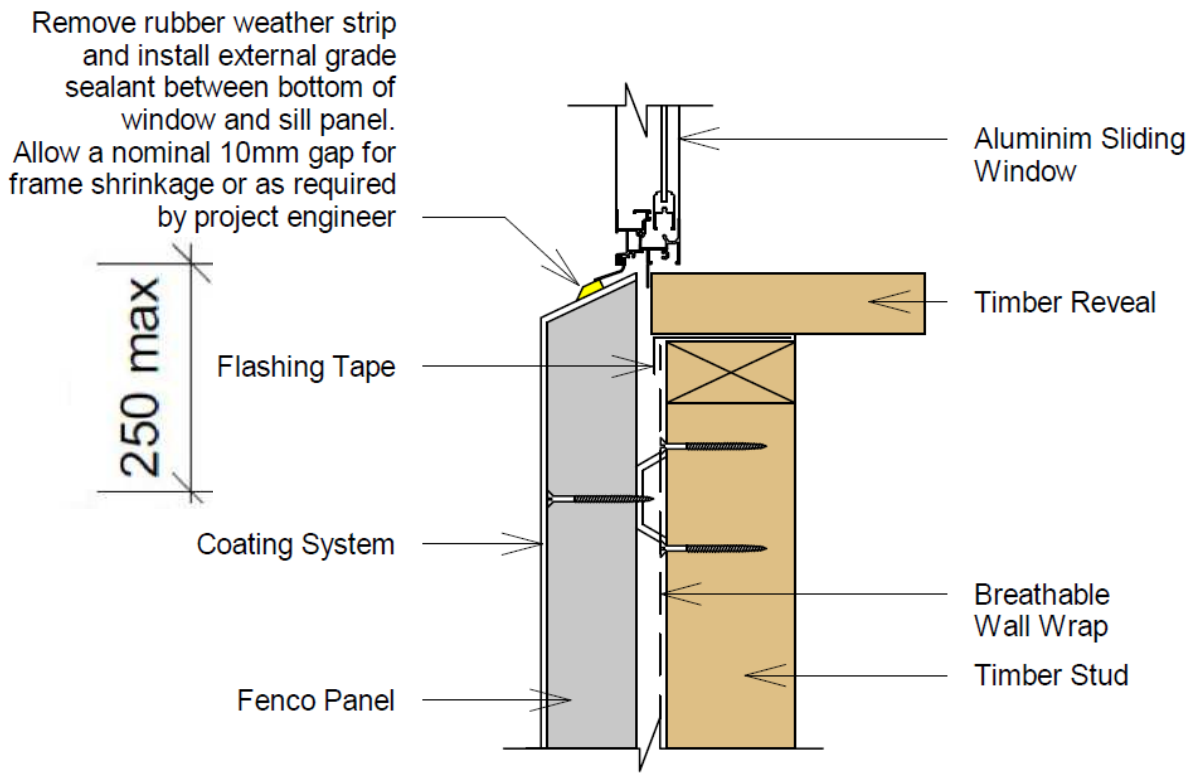
7.12 Window Head



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

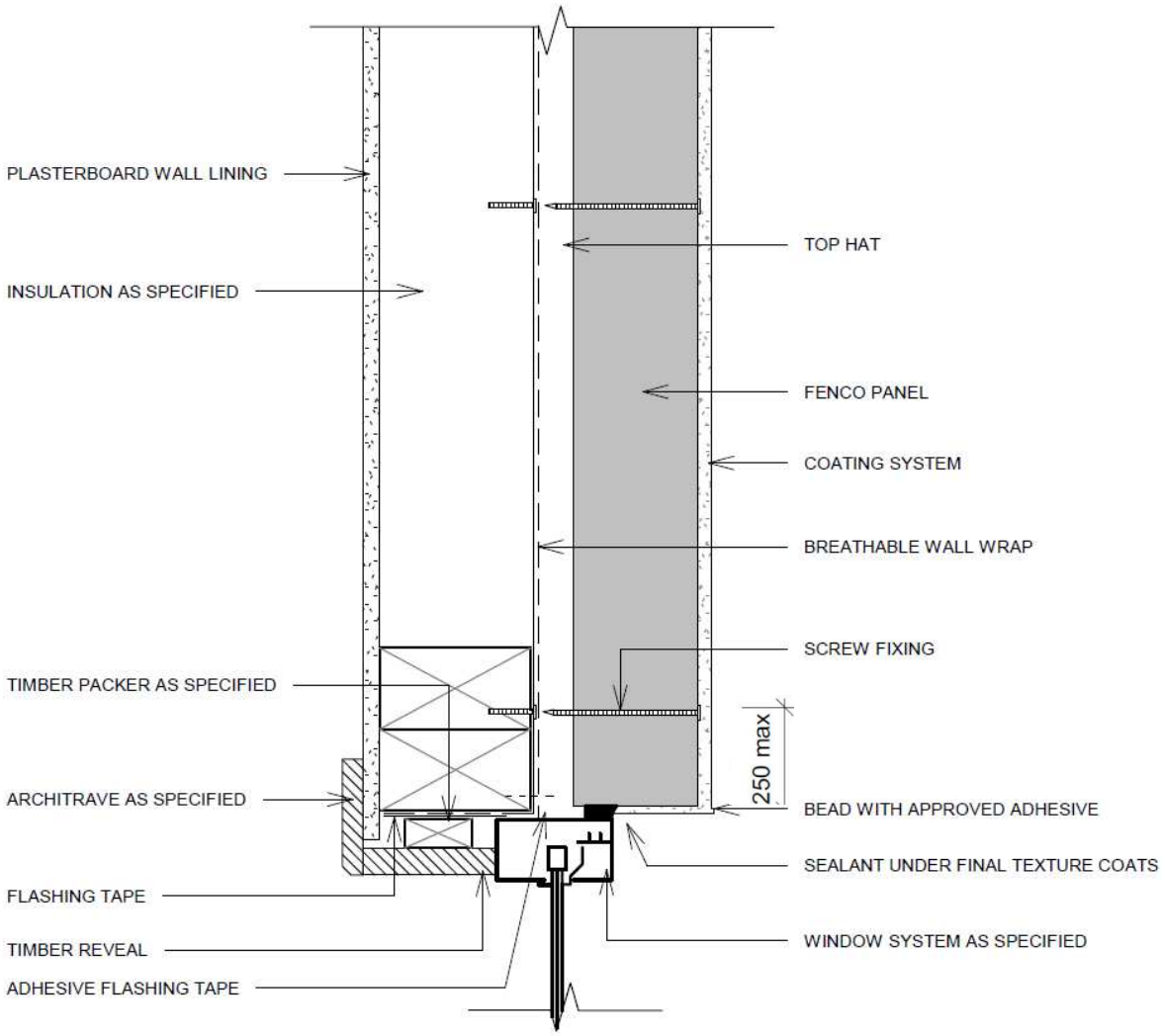
7.13 Window Sill



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

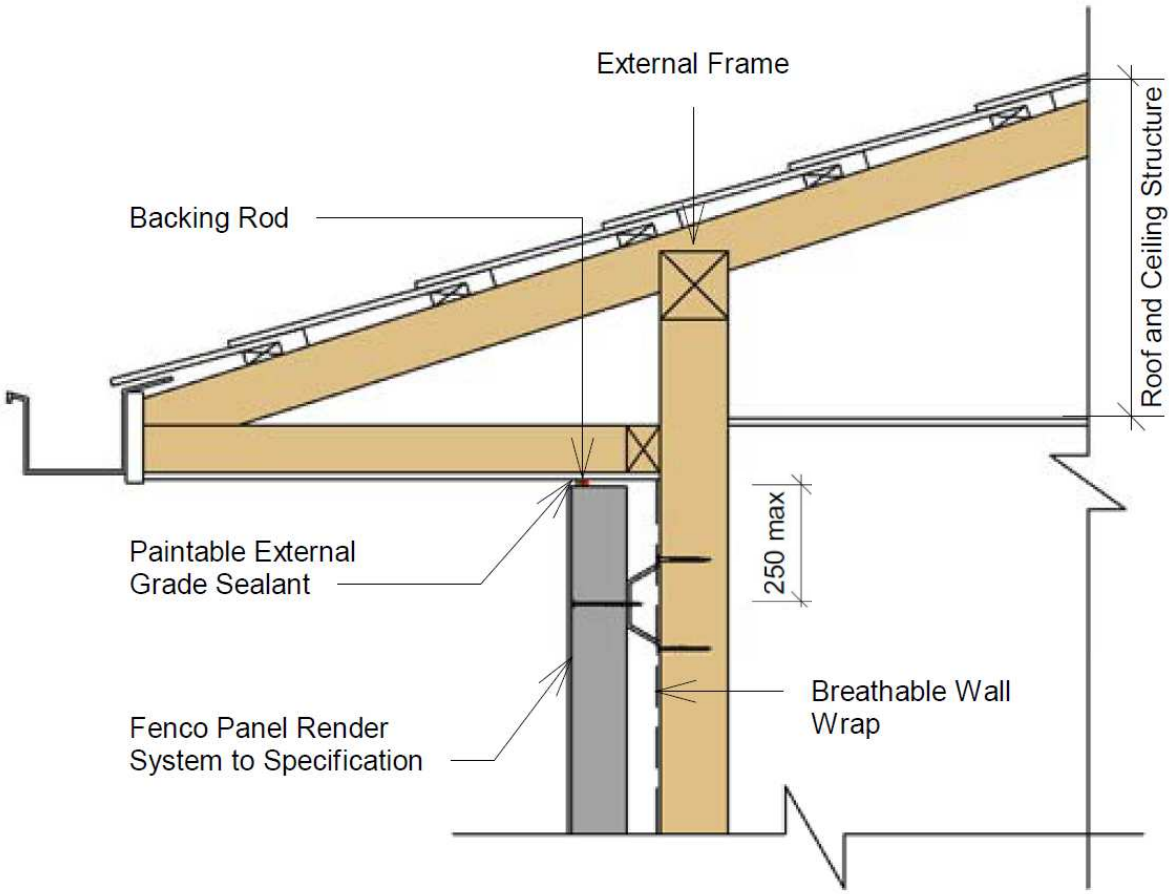
7.14 Window Jamb



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

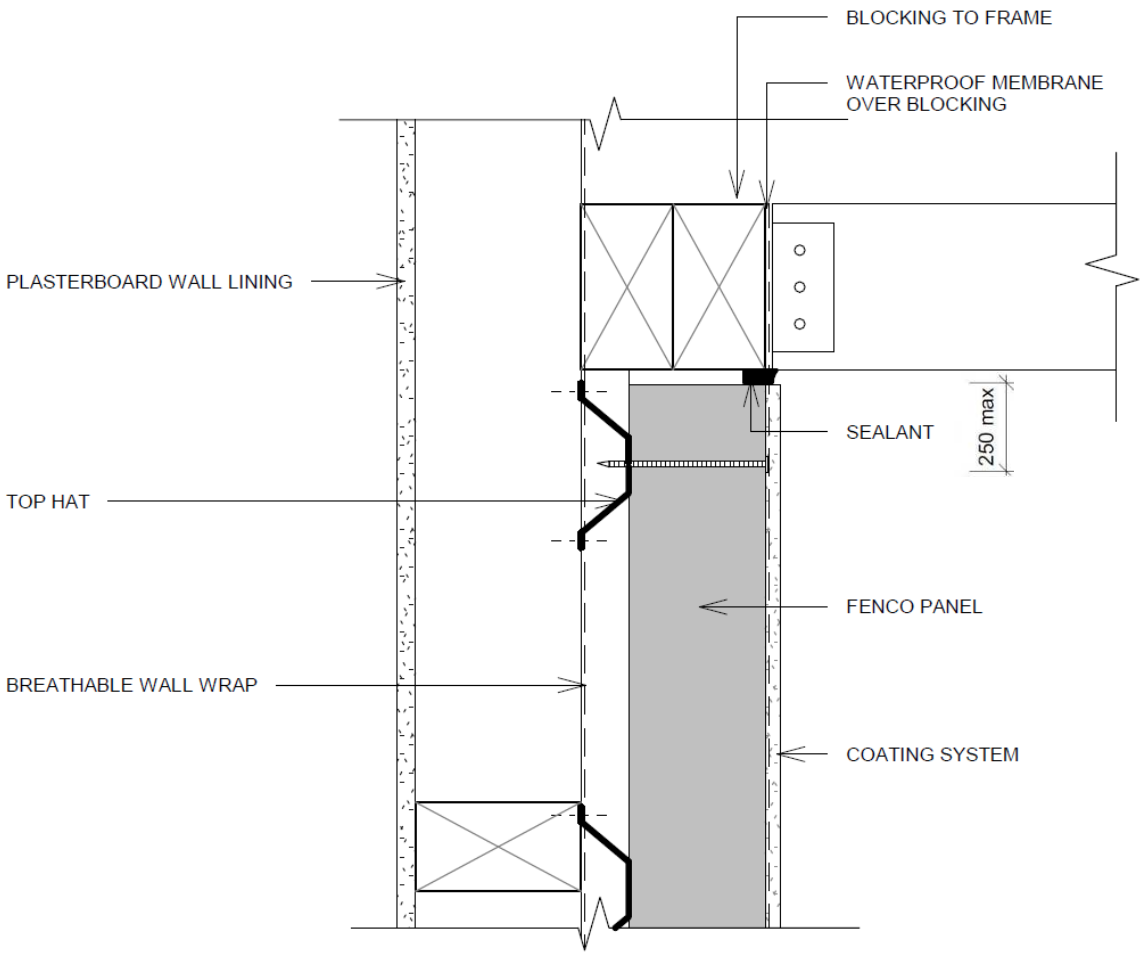
7.15 Eave Soffit



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

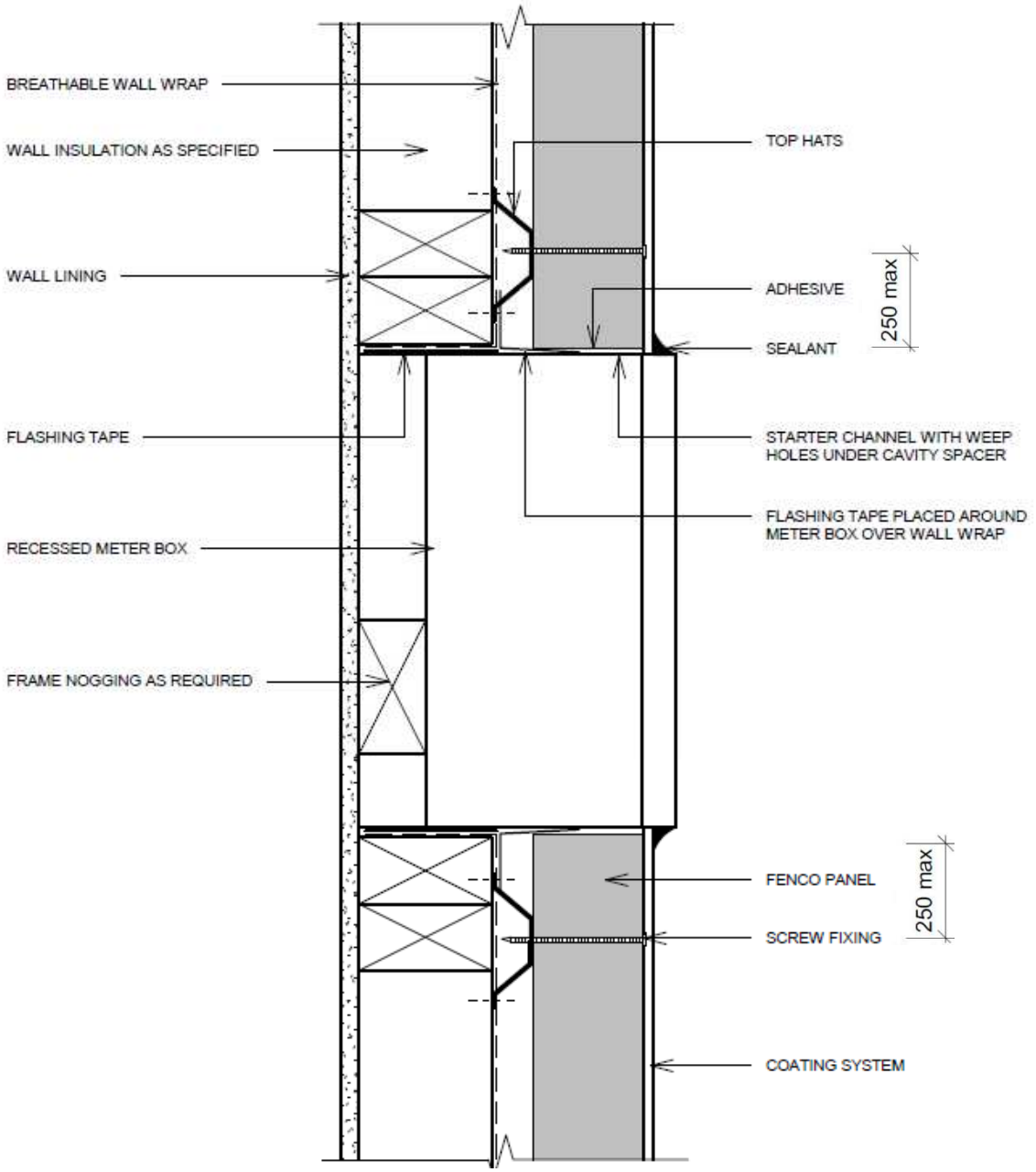
7.16 Beam Penetration



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

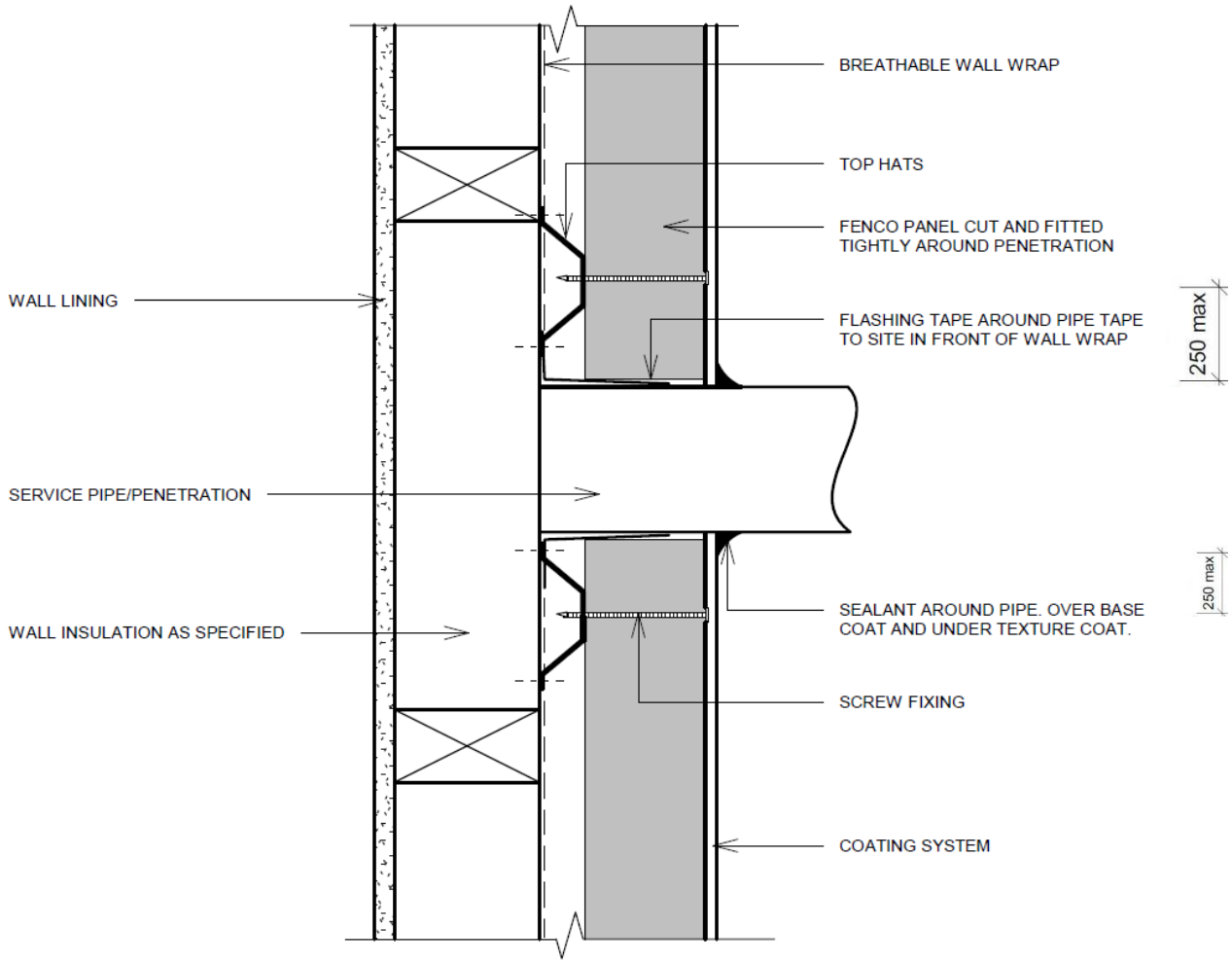
7.17 Large Penetration



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

7.18 Service Penetration

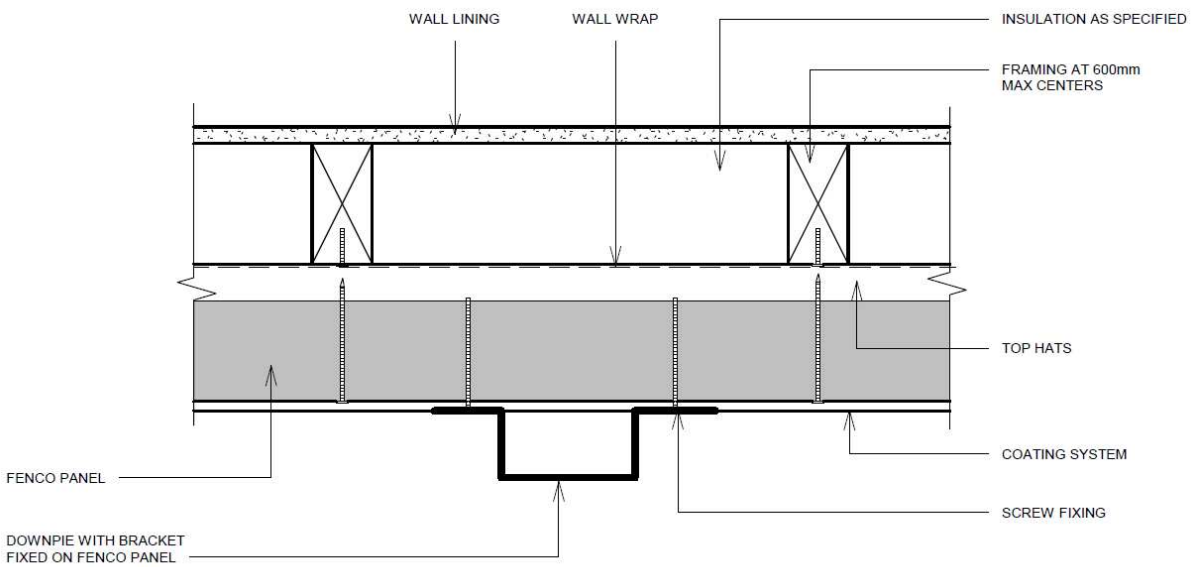


NOTE: IN ALL CASES SCREW FIXINGS ARE MADE INTO FRAMING, NOT INTO ADDITIONAL WALL INSULATION

Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

7.19 Downpipe Fixing



Notes:

1) Batten spacing must be determined by a qualified engineer in accordance with Section 6.7).
2) Top-hats shall be fastened direct to timber framing with 12-11x35mm hex head type 17 screws (min 30mm penetration into framing), or to steel framing with 10-16x16mm hex head self-drilling screws (min. 3-full threads into framing).
3) 80mm Fenco Panels shall be fastened in direct contact with top-hats with 14-10x100mm hex head type 17 screws finishing flush with the panel external surface (min. 20mm penetration through the top-hat).
4) Wall framing specification, supply & construction (steel or timber) 'by others' must be in accordance with AS1684.2, NASH Standard, or another appropriate standard.
5) Specification of the Fenco Panel External Wall Cladding System must be made by a Designer or Builder familiar with the application, all technical aspects, and system technical information.
6) Installation must be by a competent carpenter/tradesman under the direction of a Builder, all with access to system technical information and the installation instructions contained in this Manual.

8 Warranty

Australia Fenco Low Carbon Construction Pty Ltd (Fenco) warrants for a period of (20) years ("the warranty period") from the date of purchase that all Fenco products ("the product") will be free from defects due to faulty manufacture or materials, and will be resistant to cracking, rotting, fire and damage to the extent set out in Fenco published literature current at the time of installation, and strictly subject to the conditions set out below.

The Warranty is strictly subject to the following conditions:-

1. The product, and any other products including fasteners and joining systems, applied to, or used in conjunction with the product must be used and installed strictly in accordance with the approved installation manual at the time of installation.
2. Under no circumstances will Fenco be liable for defects arising from:
    a. A failure to use and/or install the product, or any products, strictly in accordance with the product installation manual.
    b. Render coating system not recommended or applied to Fenco Panels, Render system must be applied as stated in coating system.
    c. Defective materials not supplied by Fenco; or
    d. Impact.
3. Fenco will not be liable for breach of Warranty, and no breach of Warranty claim will be accepted, unless the Claimant makes a written claim and provides proof of purchase within 30 days of the alleged defect becoming apparent.
4. This Warranty is not transferable under any circumstances without the prior written consent of Fenco.
5. A Claimant's sole remedy for breach of Warranty is (at Fenco option) that Fenco will either replace or repair the defect, supply replacement product, or pay for the cost of replacement or rectification of the affected product.
6. Under no circumstances shall Fenco be liable for any consequential loss, property damage or personal injury, economic loss or loss of profits, arising in Contract or negligence or howsoever arising.
   Without limiting the foregoing, Fenco will not be liable for any claims, damages or defects arising from or in any way attributable to poor or defective workmanship, defective materials or poor design or detailing, settlement or structural movement and/or movement or materials to which the product is attached, incorrect design of the structure, acts of God

including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, normal wear and tear, or growth of any organism on any product surface.

7. The express warranties set out above are in lieu of all other representations, warranties, or conditions, express or implied including but not limited to implied warranties or conditions of merchantable quality and fitness for a particular purpose, and those arising by statute or otherwise in law or from a course of dealing or use of trade and which are excluded to the fullest extent permitted by law.
8. The joint and coating system must be applied by experienced applicators, as suggested by the joint and coating manufacturer.
   Any sand-based rendering systems must use ionised sand bases.
   The selected joint and coating system must be applied to dry, clean sheet only. application must be completed within 30 days of the sheets being fixed on site.
   It is the applicator's responsibility to use the appropriate compounds in the coating system sufficient to eliminate cracking of the joints under normal building settlement conditions.