

**IAN BENNIE AND ASSOCIATES**

**TEST REPORT NO. 2018-067-S1**

**QT ECOSERIES EXTERIOR WALL  
CLADDING SYSTEM – CAVITY  
FIXED**

**Specimen tests to**

**VERIFICATION METHODS  
NCC-2016 FV1 & V2.2.1**

**for**

**QT Systems**

**December 2018**



Accredited Laboratory No. 2371  
Accredited for compliance with ISO/IEC 17025 - Testing.



# IAN BENNIE & ASSOCIATES PTY. LTD.

## Building Performance Testing

ACN : 007 133 253



### TEST REPORT NUMBER 2018-067-S1

**Test Client:** QT Systems

Unit 2/423 Bradman Street, Acacia Ridge Queensland.

#### **Specimen**

**Identification:** A QT EcoSeries Exterior Wall Cladding System – Cavity Fixed test specimen measuring 2300 mm in height x 3600 mm in width was installed on a timber stud wall by the client. The sample consisted of cladding panels with vertical battens on the studs. The sample included a 600 mm recess, window, meter box, wall junctions, control joints, parapet and balcony drainage conditions. Full details of the cladding system were provided by the Client and are included in Appendix C.

**Construction:** For the purposes of the NCC the specimen was deemed to be a Cavity Wall utilising appropriate breather wrap to prevent water ingress to the stud framing. For the purposes of observations during the test, acrylic sheets were used as the internal lining on the stud frame. Holes were introduced through the internal lining to create an air infiltration of 1.6 L/s.m<sup>2</sup> at 150 Pa of pressure on the sample, being the highest allowable infiltration rate specified in AS/NZS 4284.

**Test Method:** NCC-2016 Weatherproofing Verification Methods V2.2.1 and FV1 with test procedures in accordance with Australian Standard AS/NZS 4284:2008, Testing of building facades.

**Nominated serviceability limit state pressures:** + 820 Pa and -1230 Pa

(these are the serviceability limit state wind pressures for N4 and C2 housing classifications in accordance with AS 4055 Table 3.4)

**Test Location:** Ian Bennie & Associates  
Dandenong South, Victoria

**Sample(s) Received:** 2<sup>nd</sup> August 2018  
**Test Date:** 10<sup>th</sup> August 2018

**Requirement:** The compliance requirements of the NCC-2016 Weatherproofing Verification Methods V2.2.1 & FV1 are given in Appendix B.

**Conclusions:** The QT EcoSeries Exterior Wall Cladding System – Cavity Fixed passed all the compliance requirements of the NCC-2016 Weatherproofing Verification Methods V2.2.1 & FV1 at the nominated test parameters. Complete details of all tests conducted and results are given in the body of this report.

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**Report Distribution:**

Ian Bennie & Associates ..... 3  
QT Systems .....PDF



A handwritten signature in black ink, appearing to read 'D Dubout'.

Derek Dubout 15 December 2018  
Authorised Signatory

## **TEST METHODS & PARAMETERS**

### *Test Sequence*

NCC-2016 Weatherproofing test procedures were conducted in accordance with Australian Standard AS/NZS 4284:2008, Testing of building facades, as detailed in Appendix A in the following sequence:

#### **Static Pressure Wind Load Test.**

Positive and negative serviceability limit state pressures were applied to the external face of the specimen for periods of 1 minute each.

#### **Static Pressure Water Test.**

A water penetration test was then carried out in accordance with Clause 8.5 of AS/NZS 4284:2008 at a static pressure of 300 Pa for a period of 15 minutes.

#### **Cyclic Pressure Water Test.**

A water penetration test was then carried out in accordance with Clause 8.6 of AS/NZS 4284:2008 at the cyclic pressures of 245 - 490 Pa for 5 minutes.

#### **Cyclic Pressure Water Test with 6mm Holes in Cladding.**

6mm diameter holes were inserted in the external face of the specimen at the following locations:

- (AA) Wall/window joint at 3/4 height of the window
- (BB) Immediately above the window
- (CC) Through the external sealing of the vertical and horizontal control joints
- (DD) Above the meter box and the downpipe penetrations.

Water penetration test were then carried out in accordance with Clause 8.6 of AS/NZS 4284:2008 at the Static and Cyclic pressures as detailed above.

#### **Static Pressure Water Test with Internal Lining Removed.**

The internal acrylic lining of the sample was removed and a static water penetration test was then carried out in accordance with Clause 8.5 of AS/NZS 4284:2008 at a static pressure of 50Pa for a period of 15 minutes.



#### *Test Equipment*

Water was applied via sprays located 300 mm away from the outdoor face of the test specimen. Water flow rate to the sprays was measured with a calibrated pressure gauge to an accuracy of 2% and was maintained at a level of 0.05 l/s.m<sup>2</sup> over the test area throughout the test. Water application was maintained continuously and water was observed to evenly cover the exterior face of the test specimen. All pressure transducers are calibrated against NATA certified manometers and may be taken to have a measurement accuracy of 1%.

#### *Test Requirement*

As per the Compliance requirements of NCC-2016 Weatherproofing Verification Methods V2.2.1 and FV1 that are given in Appendix B.

### **TEST RESULTS**

#### **Static Pressure Wind Load Test**

The loads were sustained and there was no visible evidence of any cracking in the cladding.

#### **Static Pressure Water Test**

No leakage through the cladding system was observed during the test.

#### **Cyclic Pressure Water Test**

No leakage through the cladding system was observed during the test.

#### **Cyclic Pressure Water Test with 6mm Holes in Cladding**

No leakage through the cladding system was observed during the test.

#### **Static Pressure Water Test with Lining Removed**

No leakage through the cladding system was observed during the test. After the test the building wrap was cut away and there was evidence of water having penetrated cladding boards however there was no pooling of water on horizontal surfaces.

## APPENDIX A - TEST PROCEDURES FOR AS4284:2008

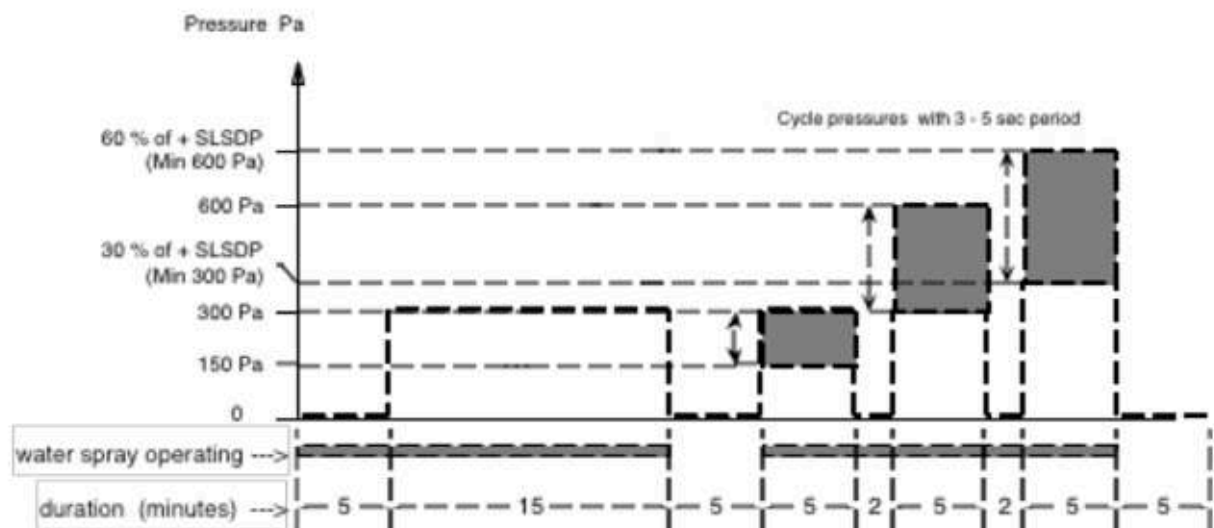
### Water Penetration Tests

### Test Parameters

<b>Test pressures :</b>	Static	<b>30% of <math>W_i</math> (at least 300 Pa)</b>	duration = 15 minutes
	Cyclic	<b>30% - 60% of <math>W_i</math></b>	duration = 5 minutes

**Water application rate : 0.05 L/m<sup>2</sup>.s**

### Water penetration test sequence

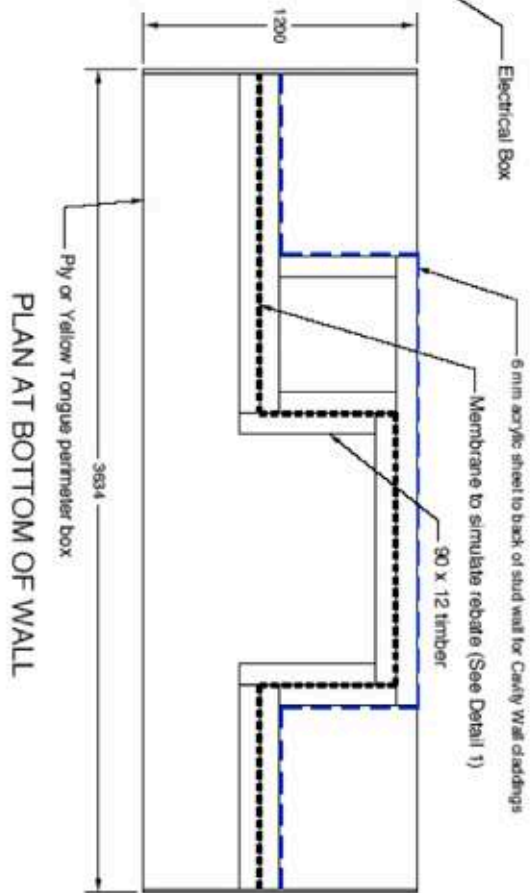
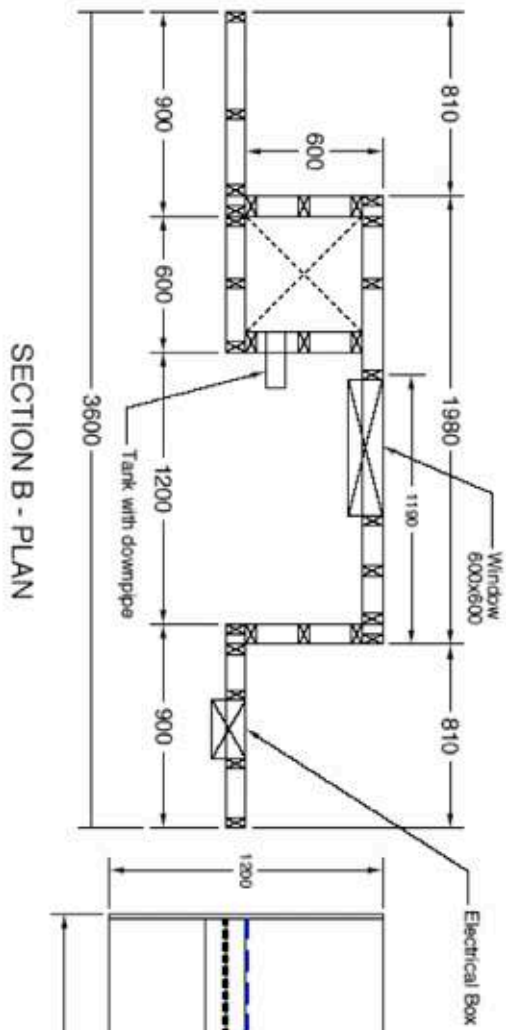
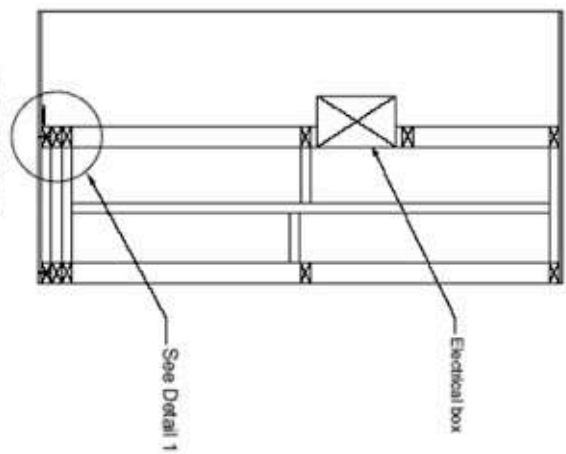
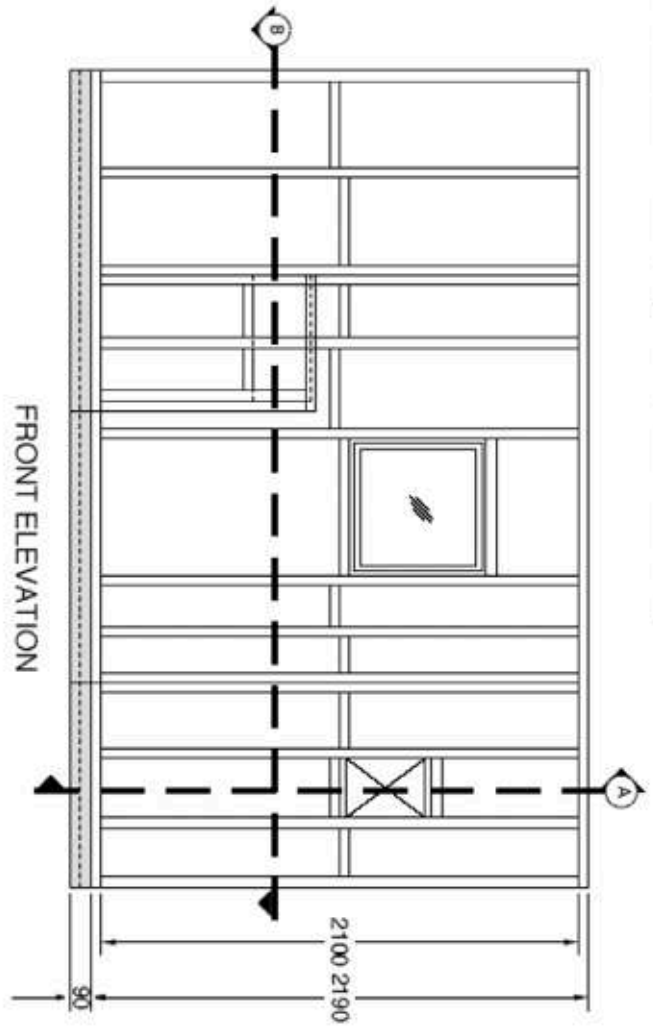


## **APPENDIX B - COMPLIANCE REQUIREMENTS**

### **Compliance requirements:**

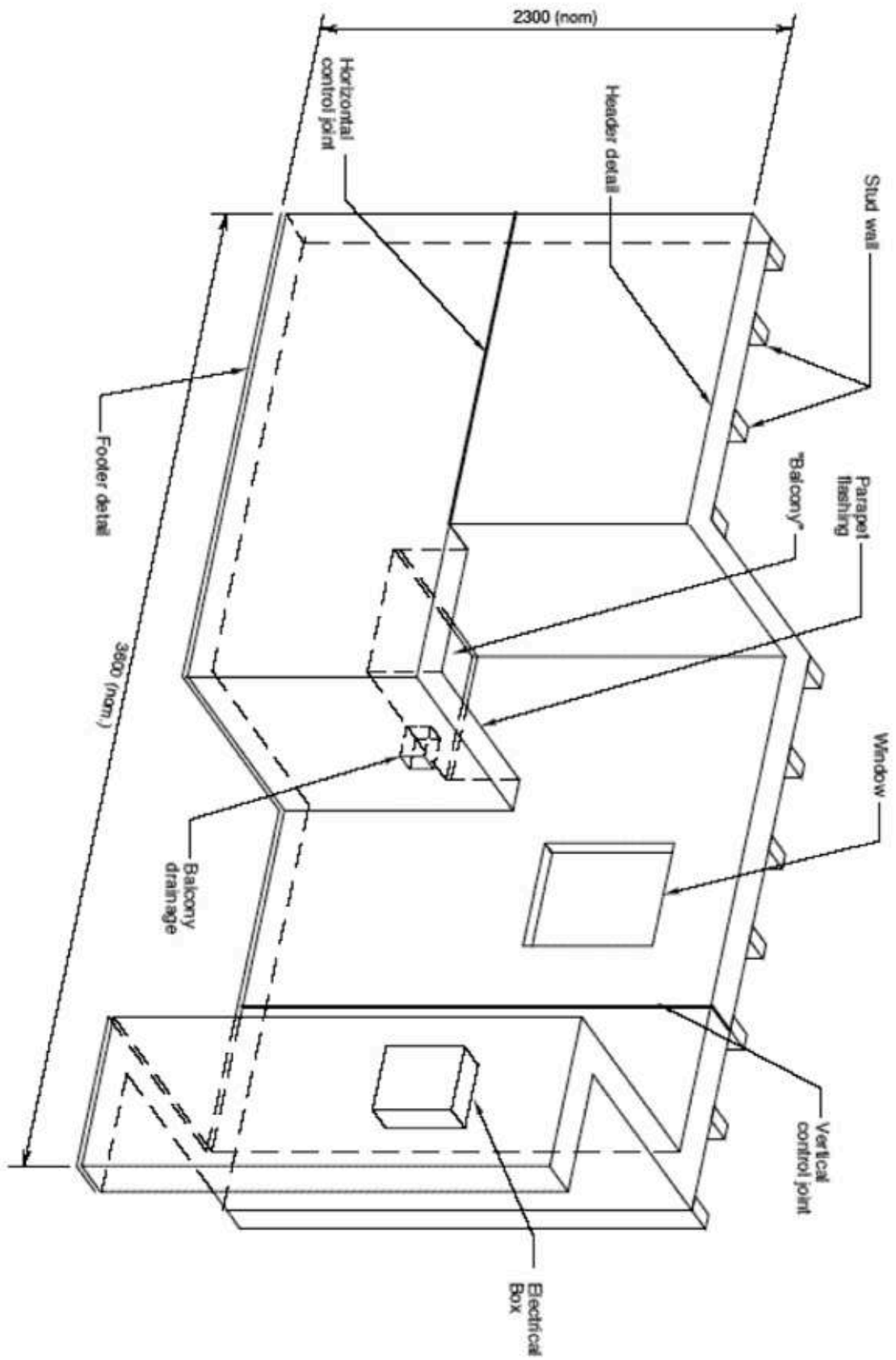
- (i) A *direct fix cladding wall* and *unique wall* are verified for compliance with **FP1.4** if there is no presence of water on the inside surface of the facade.
- (ii) A *cavity wall* is verified for compliance with **FP1.4** if there is no presence of water on the removed surface of the cavity, except that during the simulation of the failure of the primary weather-defence or sealing, water may —
  - (A) transfer to the removed surface of the cavity due to the introduced defects (6 mm holes); and
  - (B) contact, but not pool on, battens and other cavity surfaces.

NCC Verification Sample - Stud Wall Details



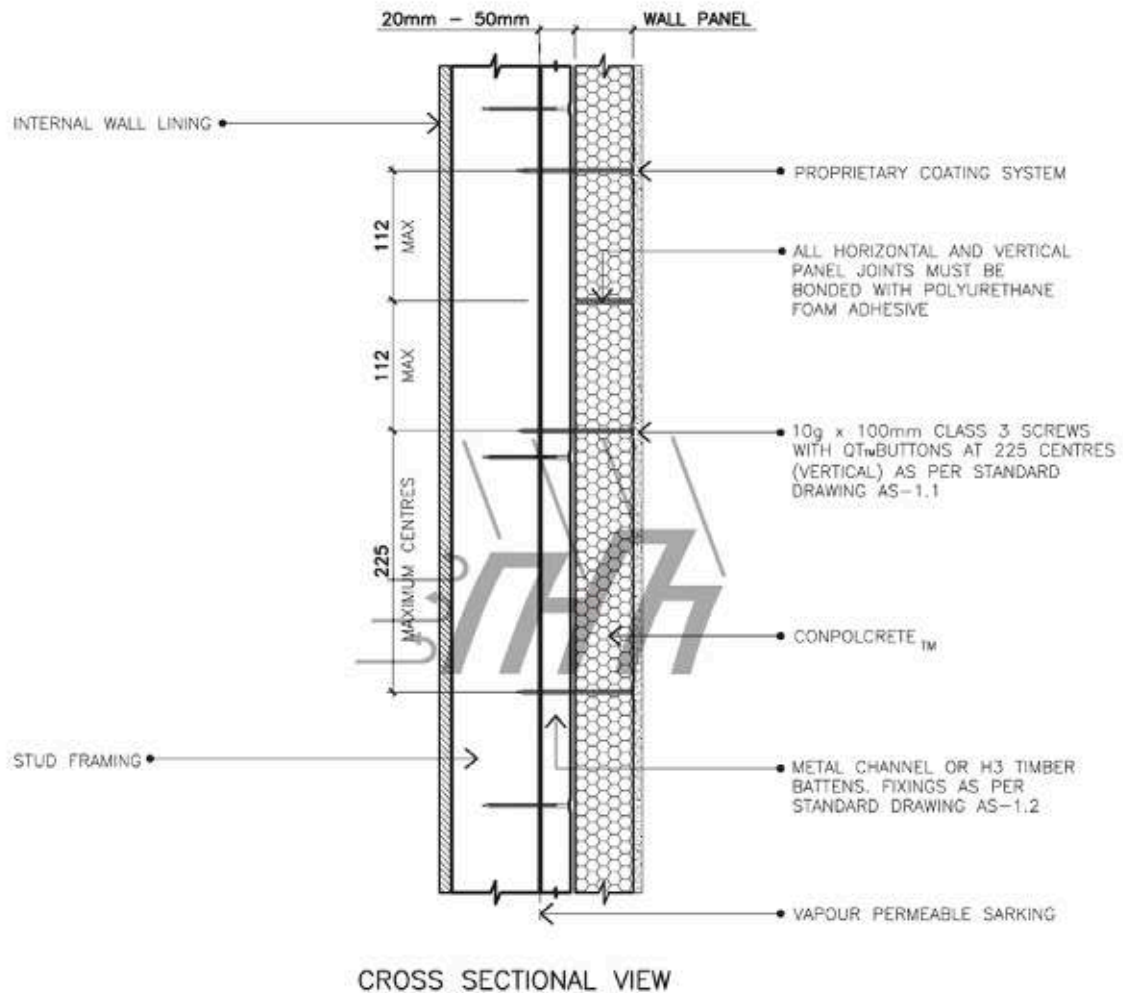


# NCC Verification Sample - Nominal cladding configuration for testing in small IBA rig.





## EcoSeries Exterior Wall Panel

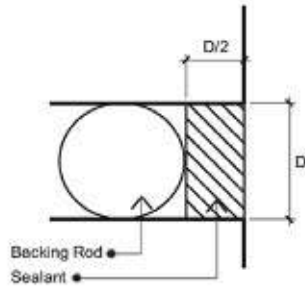


QTmECOSeries WALL PANEL  
TYPICAL CONSTRUCTION DETAIL  
SCALE: A4=1:5

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-1.3



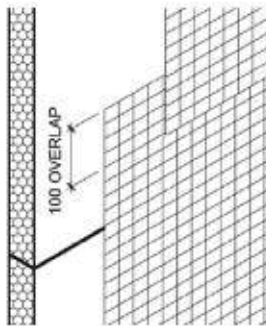
## MISCELLANEOUS DETAILS (AS)



### General Sealant Notes

1. Use an exterior grade weathersealing sealant for exterior wall construction and as a general purpose gap-filling. Apply in accordance manufacturers recommendations.
2. Sealant must only contact a maximum of two surfaces.
3. For sealant to work effectively, the sealant must be applied as shown in the adjacent sketch, Opening Width (D) x Depth (D/2) half the width. Use packing rod as required.
4. Ensure surfaces are in good condition clean and free from oil, dust, loose materials including old sealant and release agents.
5. Apply masking tape to surfaces where contact with sealant is not required. Tape should be removed before sealant cures.
6. Smooth the surface of the sealant, ensure excess sealant is removed.
7. Refer manufacturers curing or drying times before painting.

### SEALANT APPLICATION DETAIL



QT-FullMesh OVERLAP

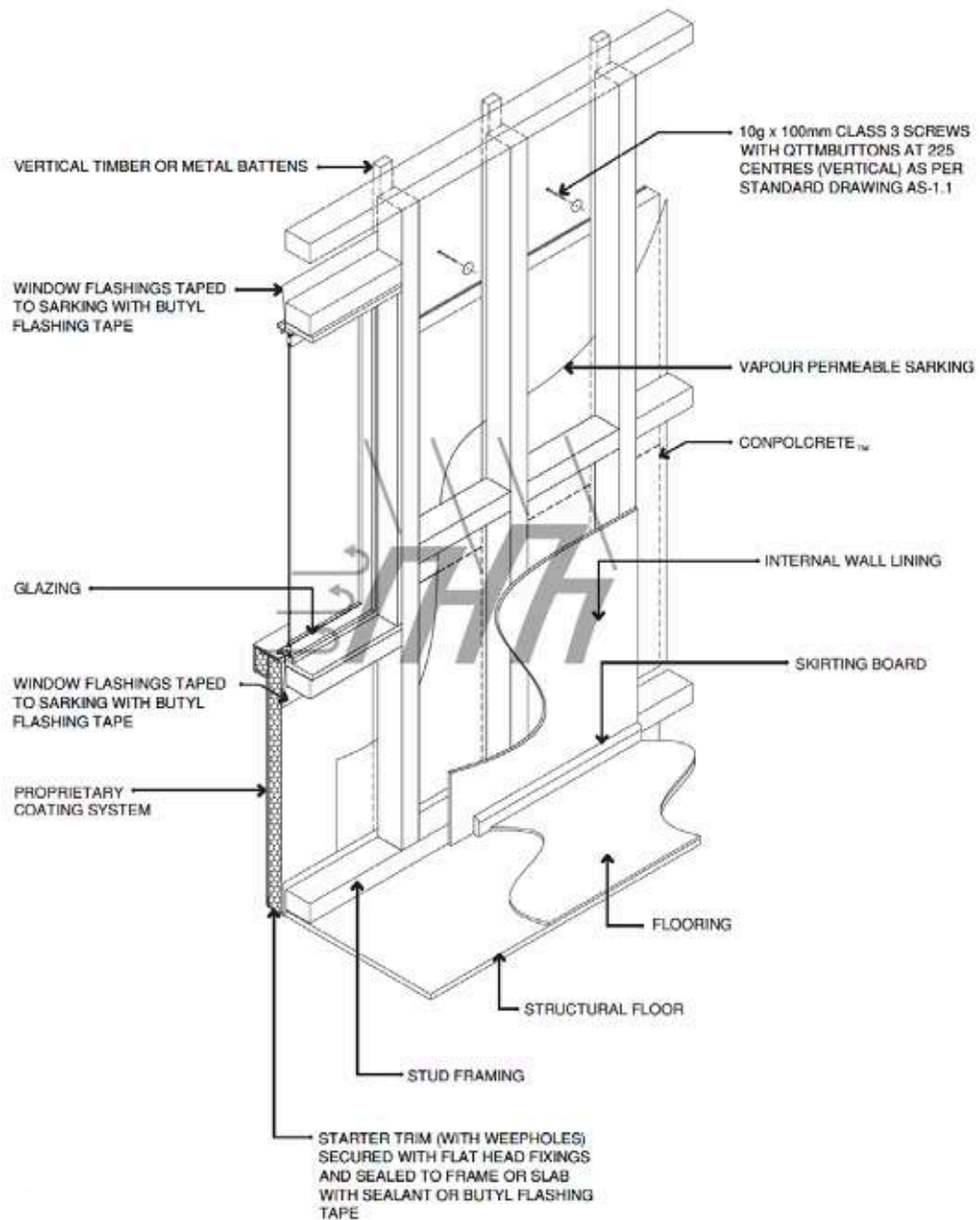
### Reinforced Plaster Notes

1. Trowel an even coat of base coat render over the entire wall face. While base coat is still wet, embed QT-FullMesh or a mesh that the Coating Manufactures deems suitable. (Follow Proprietary Coating Manufacturers Instructions)
2. Lay QT-FullMesh or Coating Manufactures equivalent mesh onto wall in strips 1 metre wide, overlapping edges by at least 100mm
3. Additional reinforcement (QT-45° Mesh) is still required around opening corners Refer Drawing AS-2.6
4. Internal and External corners also require reinforcement (QT-CornerMesh) Refer Drawing AS-3.1, AS-3.1.1, AS-3.2 & AS-3.2.1

REF No.	QTES-001
REV:	C
DATE:	2/9/18
DETAIL No.	AS-1.5

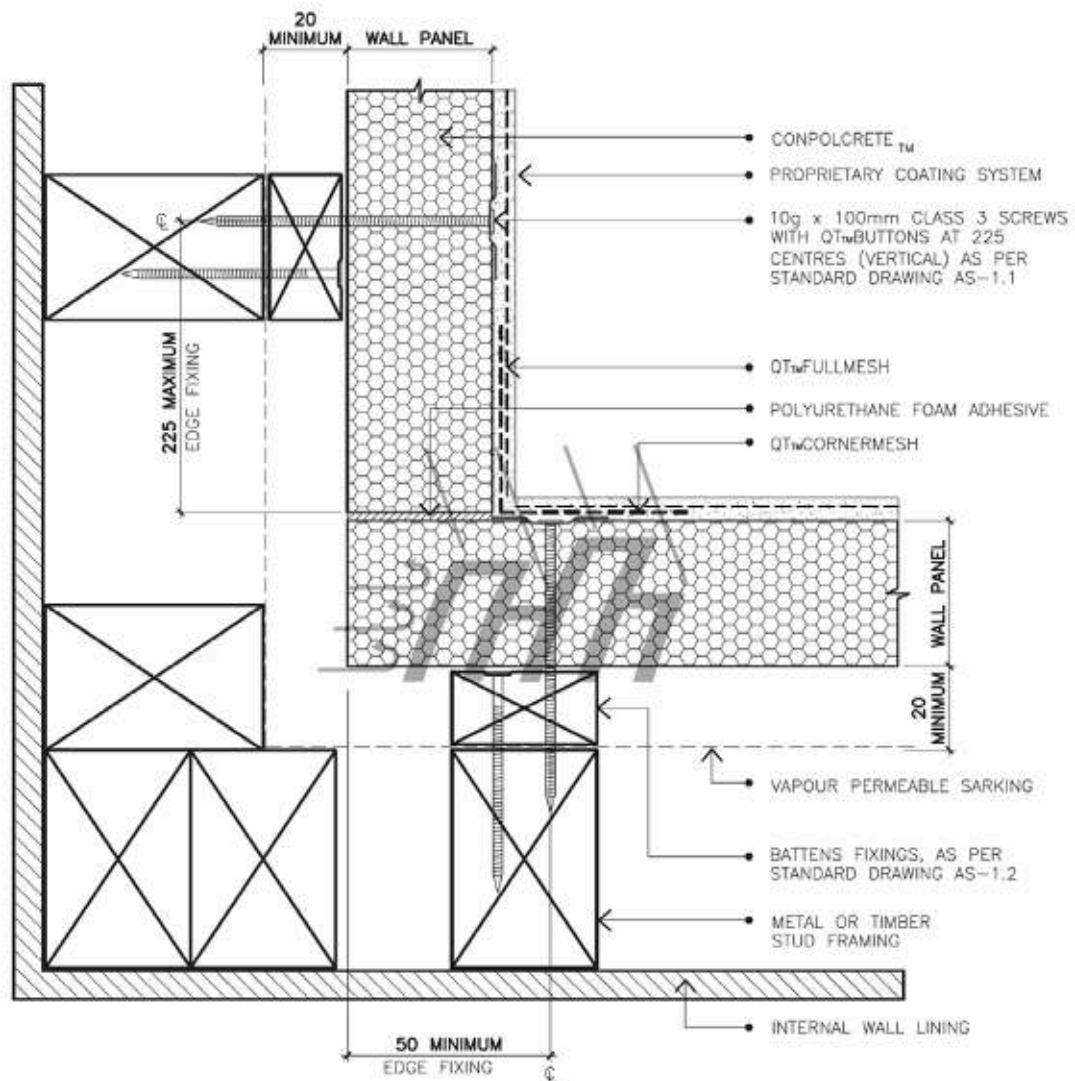


## EcoSeries Exterior Wall Panel



**FULL WALL SECTION  
TIMBER OR METAL BATTEN SYSTEM**

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-2.2

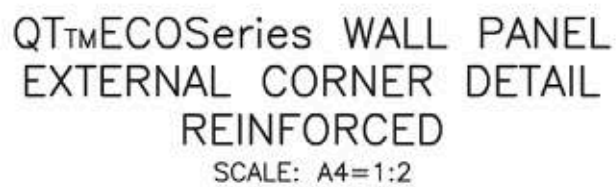


QT™ECOSeries WALL PANEL  
TYPICAL INTERNAL CORNER DETAIL  
REINFORCED

SCALE: A4=1:2

REF No.	QTES-001
REV:	C
DATE:	2/9/18
DETAIL No.	AS-3.1.1

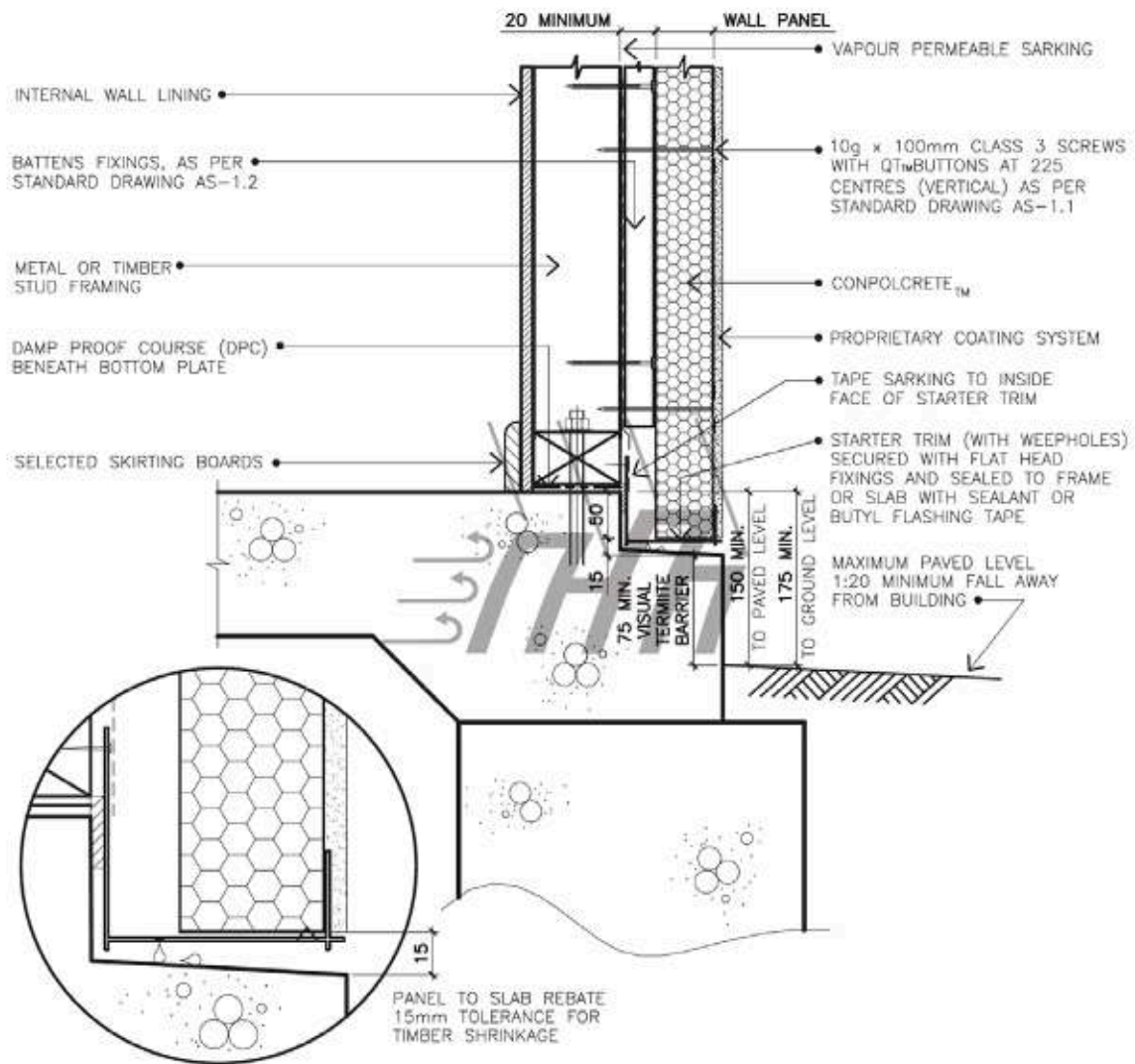




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## EcoSeries Exterior Wall Panel



SCALE: A4=1:2

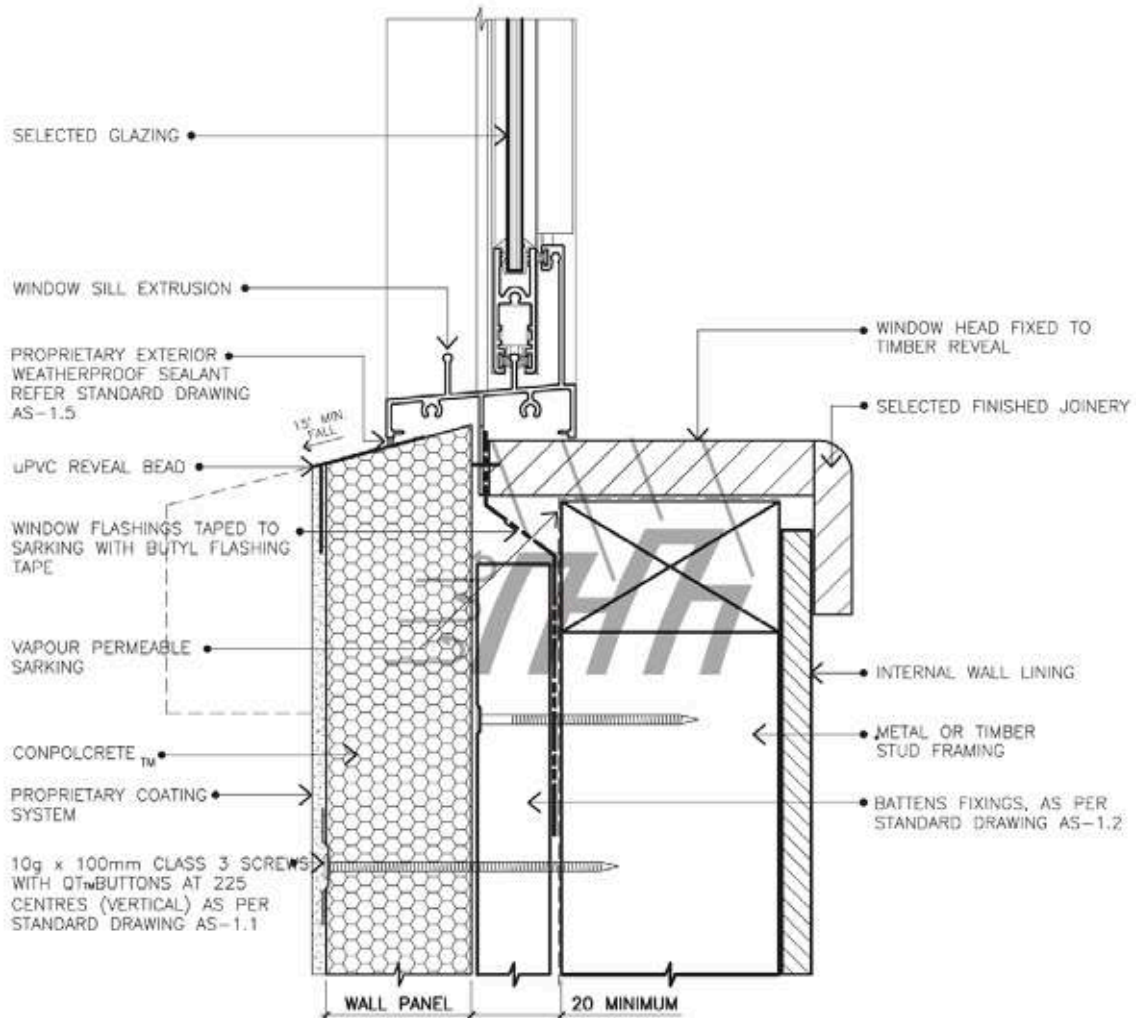
### SLAB-ON-GROUND REBATED SLAB TYPE 1

SCALE: A4=1:5

REF No.	QTES-001
REV:	C
DATE:	2/9/18
DETAIL No.	AS-4.1



## EcoSeries Exterior Wall Panel



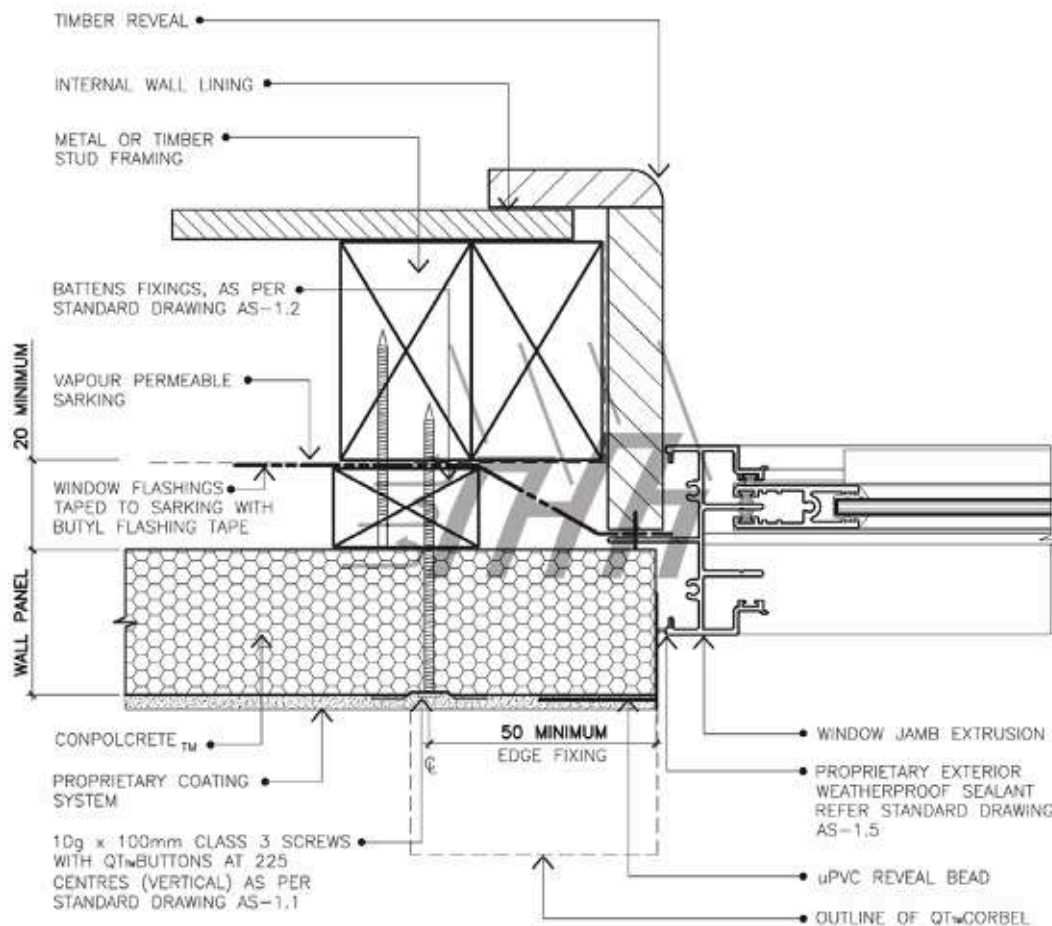
### WINDOW SILL DETAIL (AS) TYPE 1

SCALE: A4=1:2

REF No.	QTES-001
REV:	C
DATE:	2/9/18
DETAIL No.	AS-5.1



## EcoSeries Exterior Wall Panel



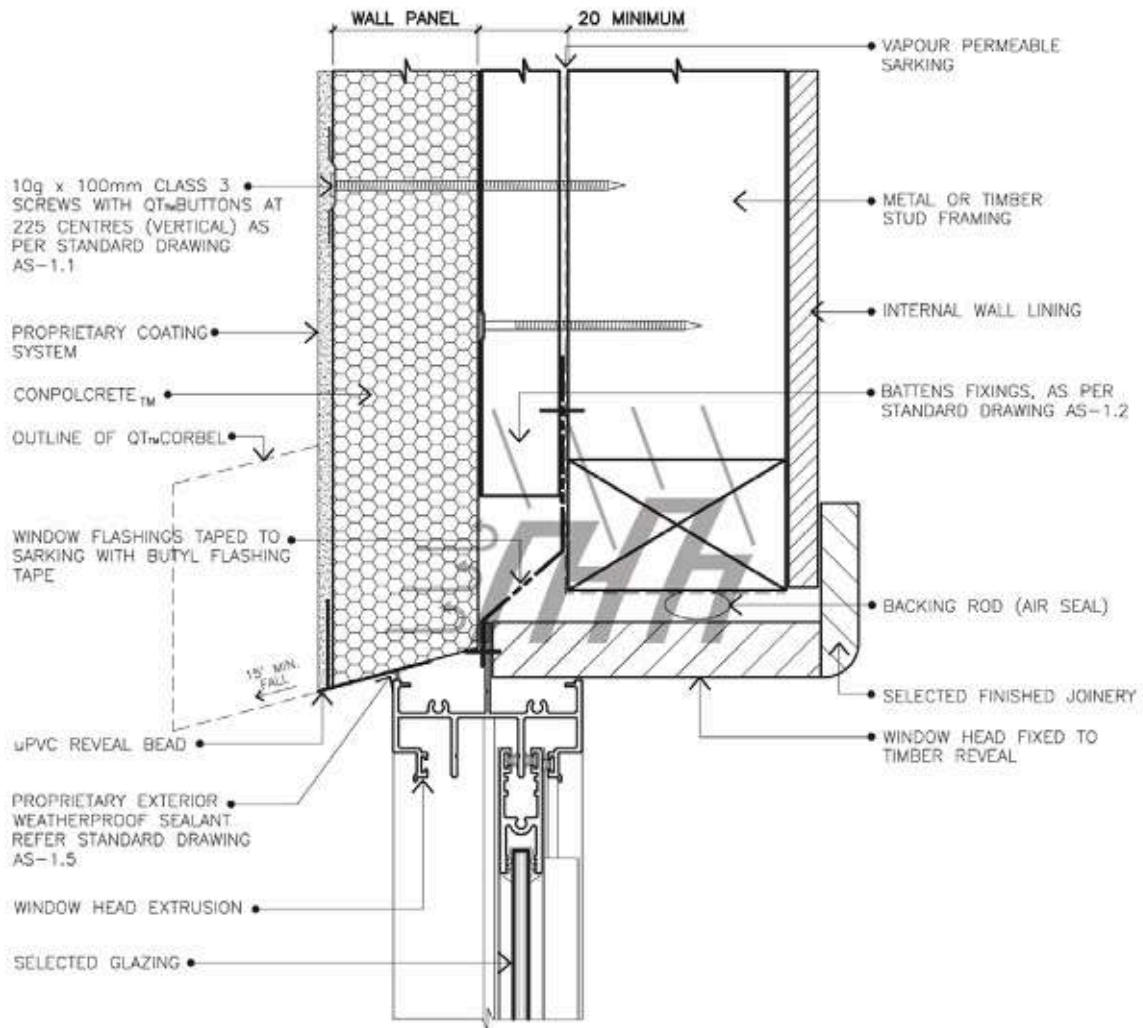
### WINDOW JAMB DETAIL (AS) TYPE 1

SCALE: A4=1:2

REF. No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.2



## EcoSeries Exterior Wall Panel



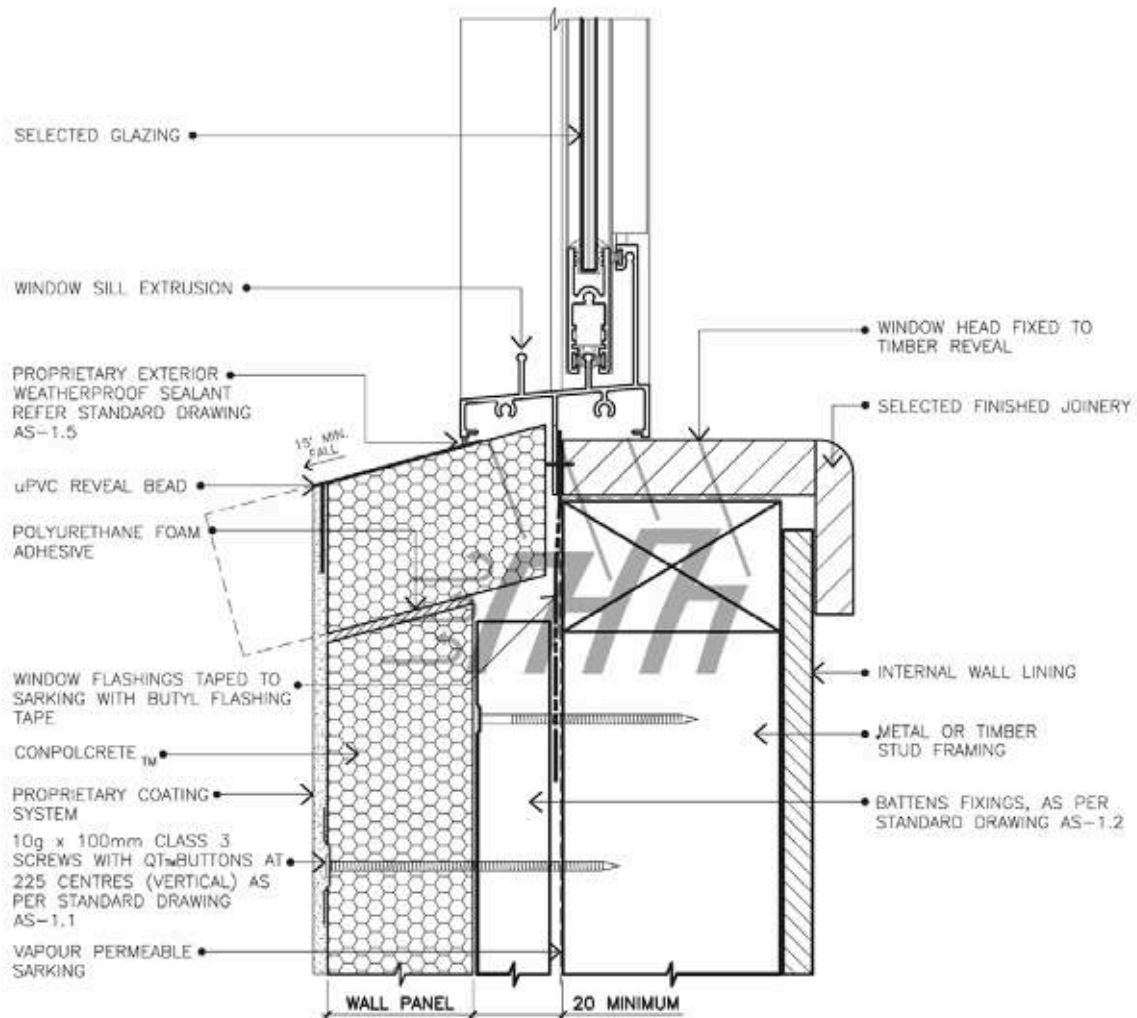
WINDOW HEAD DETAIL (AS)  
TYPE 1  
SCALE: A4=1:2

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.3





## EcoSeries Exterior Wall Panel



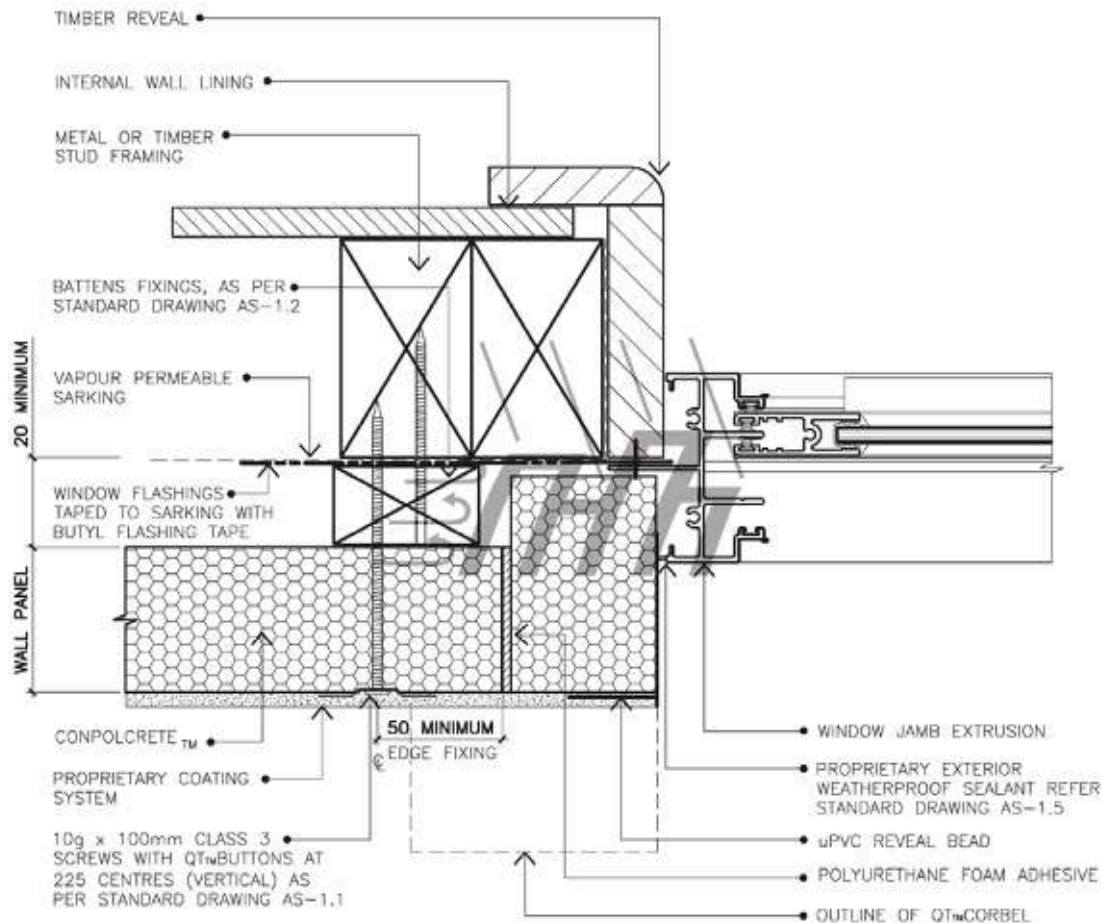
### WINDOW SILL DETAIL (AS) TYPE 2

SCALE: A4=1:2

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.4



## EcoSeries Exterior Wall Panel



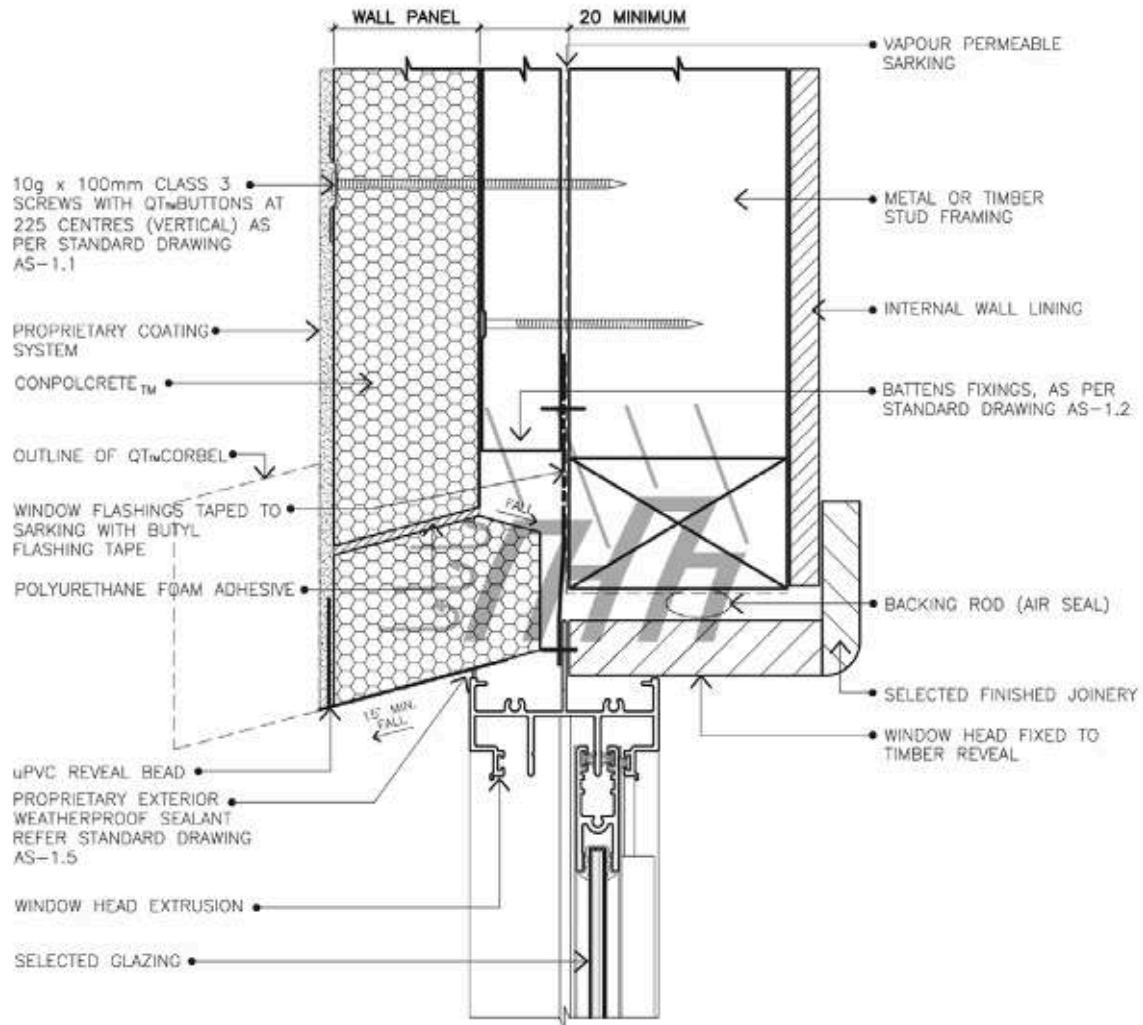
### WINDOW JAMB DETAIL (AS) TYPE 2

SCALE: A4=1:2

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.5



## EcoSeries Exterior Wall Panel



WINDOW HEAD DETAIL (AS)  
TYPE 2  
SCALE: A4=1:2

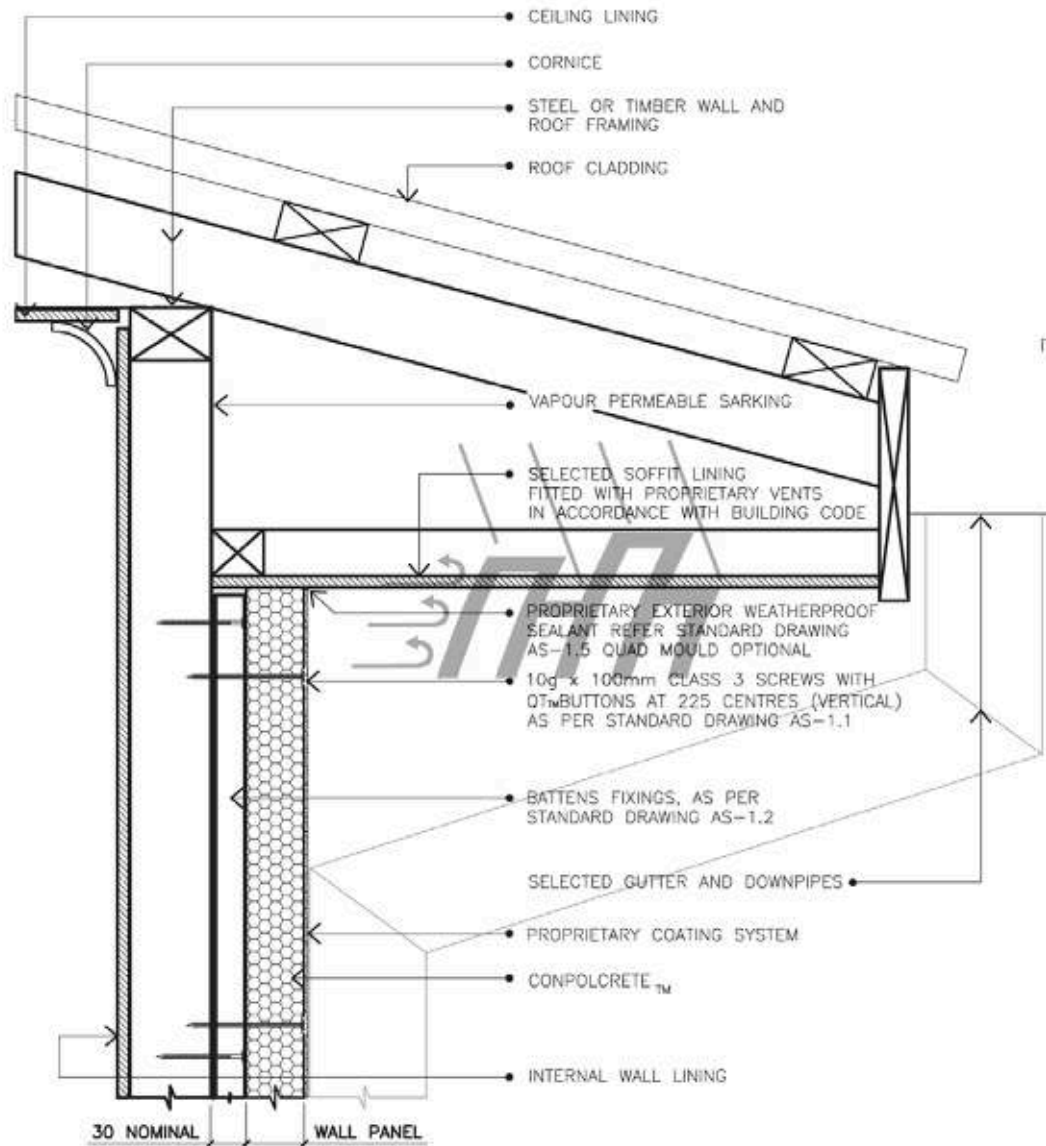
REF. No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.6



REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-5.7



## EcoSeries Exterior Wall Panel



### SOFFIT DETAIL TYPE 1

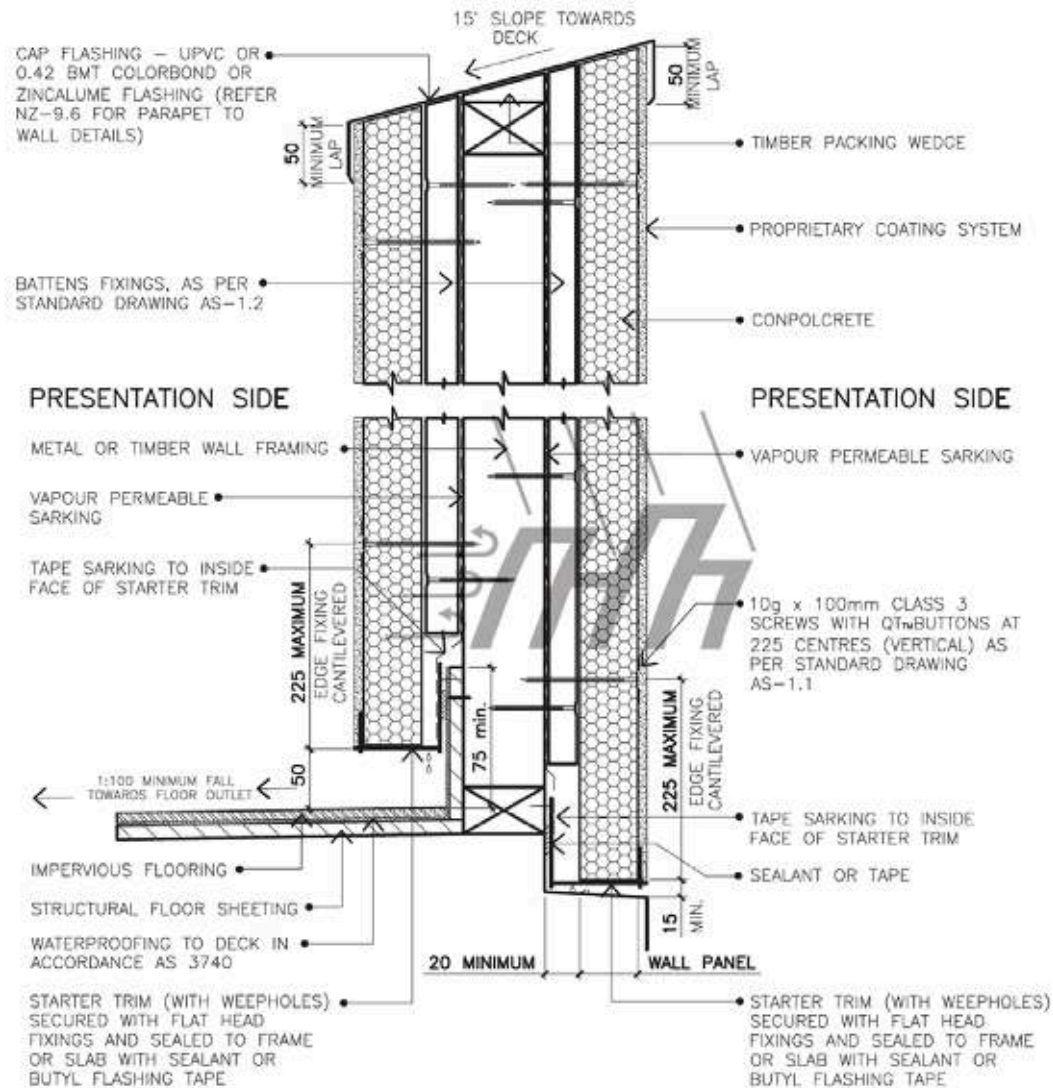
SCALE: A4=1:5

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-6.1





## EcoSeries Exterior Wall Panel



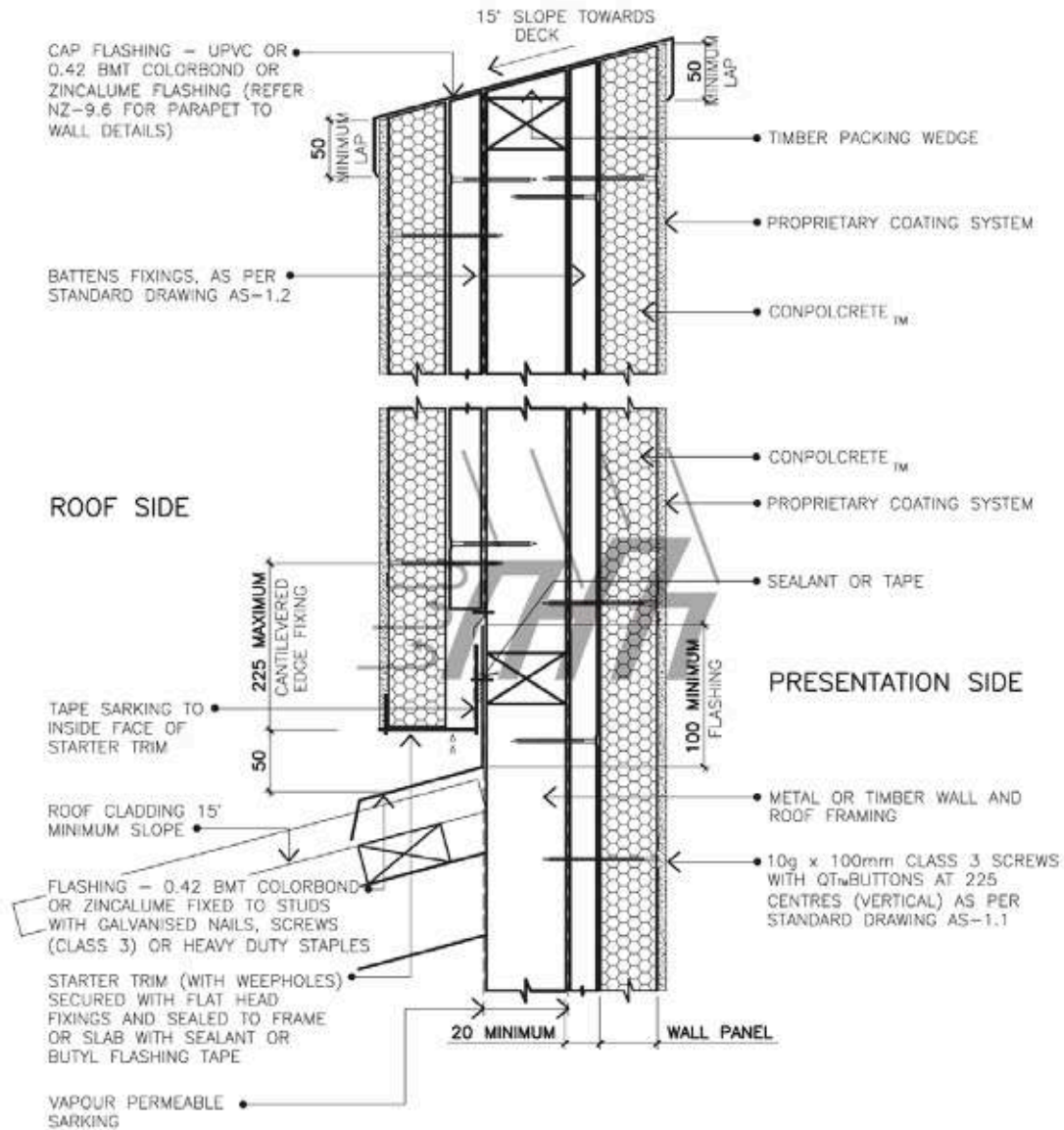
### BALUSTRADE EXPOSED TYPE 1

SCALE: A4=1:5

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-9.2



## EcoSeries Exterior Wall Panel



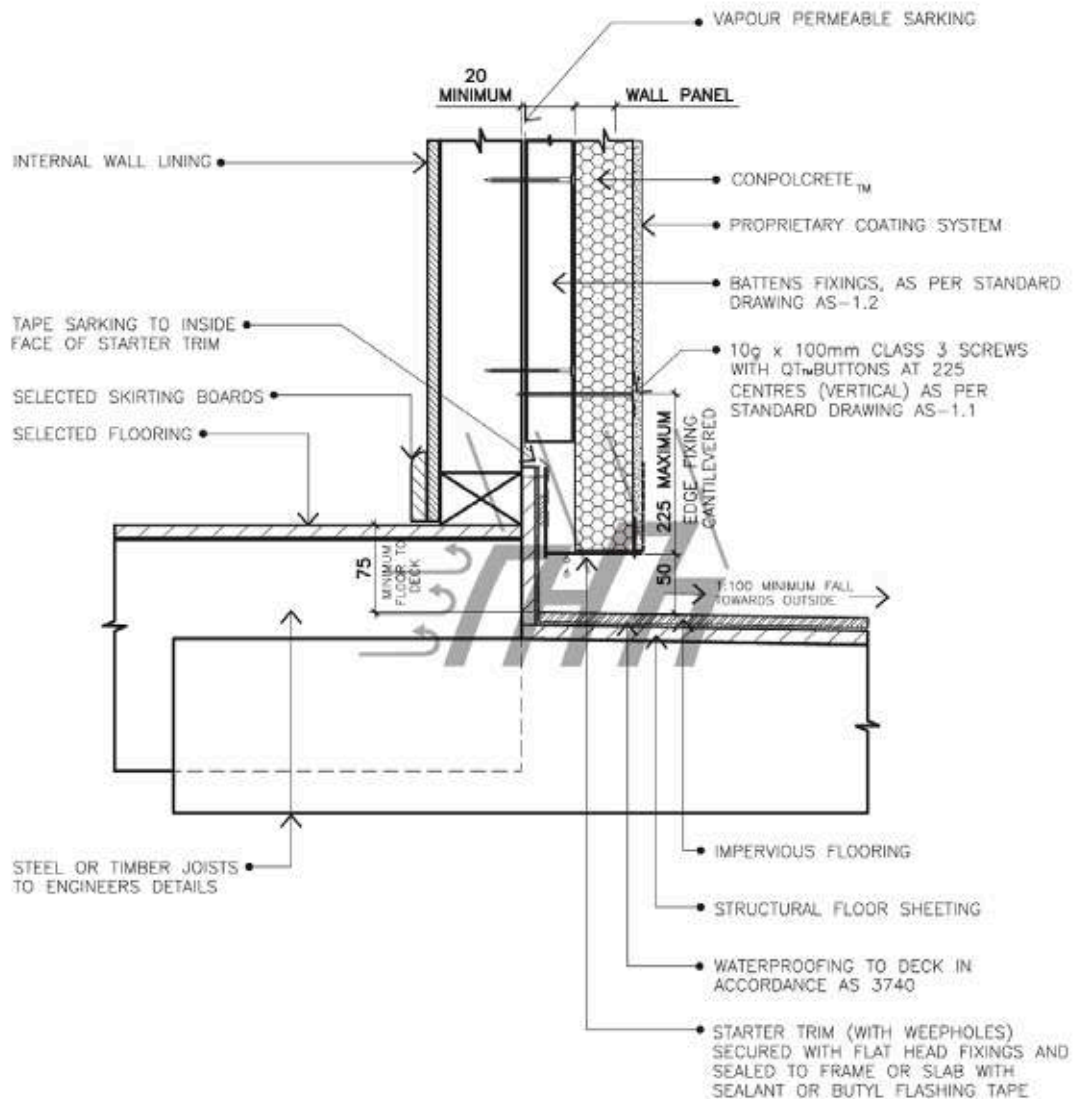
### PARAPET TO ROOF DETAIL TYPE 1

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REV:	B
DATE:	2/9/18
DETAIL No.	AS-9.3



## EcoSeries Exterior Wall Panel



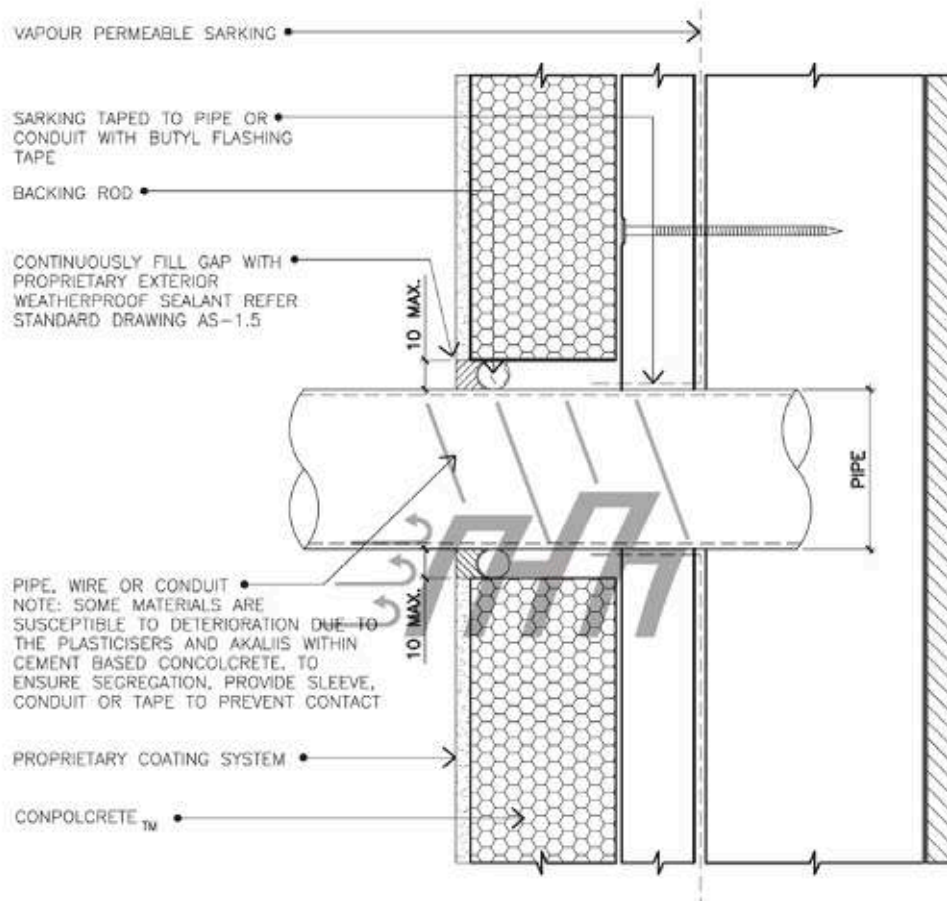
### DECK OR PATIO DETAIL

SCALE: A4=1:5

REF No.	QTES-001
REV:	B
DATE:	2/9/18
DETAIL No.	AS-10.1



## EcoSeries Exterior Wall Panel



CROSS SECTION

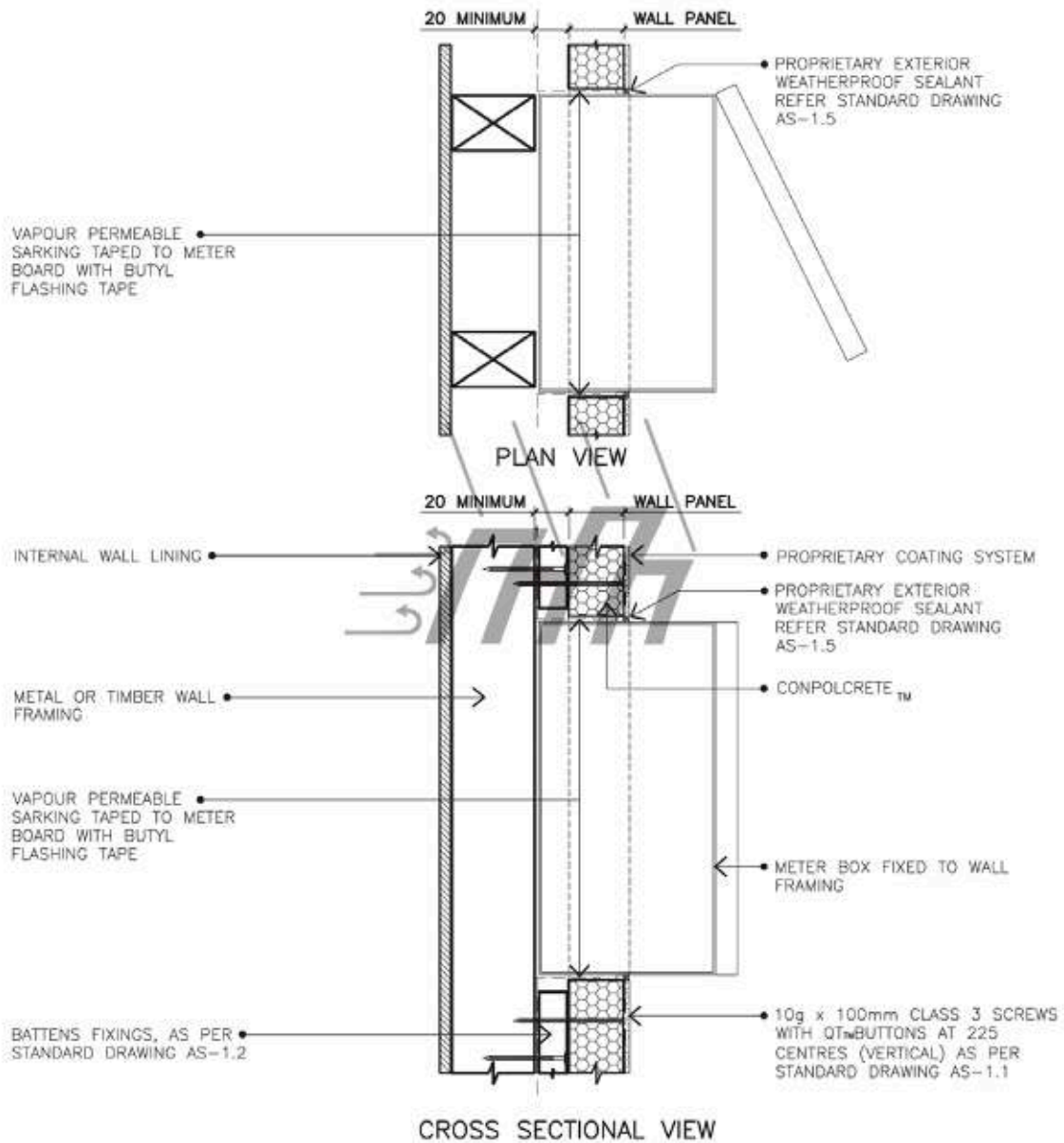
### PIPE PENETRATION THROUGH CONPOLCRETE

SCALE: A4=1:2

REF No.	QTES-001
REV:	B
DATE:	4/9/18
DETAIL No.	AS-12.2



## EcoSeries Exterior Wall Panel



### TYPICAL METER BOARD FIXING DETAIL

SCALE: A4=1:5

REF No.	QTES-001
REV:	C
DATE:	2/9/18
DETAIL No.	AS-12.5