ALPHAPANEL®
DESIGN GUIDE

CONTENTS

Designing with XCEM AlphaPanel®

AlphaPanel® Design Guide has been prepared for general guidance. The document does does not replace the services of professional consultants, engineers, and designers. The information contained herein has been developed to provide useful guidance to project professional consultants, however is not intended to contain all relevant information and data. No liability can therefore be accepted by XCEM or other parties for its use.

The AlphaPanel® product range is undergoing constant research and development to further improve the product application, and integrate new knowledge and performance experience. The on-going development of the product and systems may result in changes to applications, recommended installation details, and performance characteristics. The latest copy of the design guide can be found at www.xcem.com.au. All wall systems detailed in this document and performance outcomes are as per their laboratory tested conditions. Hence, suitability of the product and wall systems in actual site conditions needs to be advised by a professionally qualified consultant.

Guarantee

XCEM guarantees its manufactured products for 7 years, subject to the terms and conditions noted on the AlphaPanel® Product Warranty. AlphaPanel® has been independently Certified in relation to Performance including but not limited to: Fire Performance, Acoustic Performance and Structural Adequacy. XCEM does not warrant the installation of the product; finishing of the product; its visual appearance on site; surface finish of the panels; minor surface cracks in the face of the panel; or any cracking of coating systems, renders, paints or fillers used between AlphaPanel® joints or on the AlphaPanel surface® (all performance testing on AlphaPanel® was conducted without any coating system. It is the responsibility of the finishing applicators to ensure that a suitable product specification has been utilised to provide the desired outcome.

Product Visual Properties

XCEM AlphaPanel® is a precast cementitious panel product. The nature of the product and its manufacturing process being a pre-cast product means that:

- The Tongue & Groove of the product as delivered may vary slightly in dimension.
- The pre-cast panel as delivered to site may contain pin holes, or bug holes in the panel surface. These surface defects do not adversely impact the performance of the product in regards to compliance requirements such as fire and acoustic performance. XCEM does not warrant the surface quality of the panels in relation to pin holes. It is the responsibility of the user and the finishing applicator to ensure that a suitable product specification has been utilised to coat the panel and provide the desired outcome.
- Because the AlphaPanel is a cementitious product, the product may be subject to minor surface cracking, such as craze cracking and minor horizontal cracks. All performance testing of the product was conducted with such cracking evident in the panel, so the appearance of these cracks in no way impacts the product in regards to compliance requirements such as structure, fire and acoustic performance. XCEM does not warrant the surface quality of the panels in relation to surface cracking over time. It is the responsibility of the user and the finishing applicator to ensure that a suitable product specification has been utilised to coat the panels and provide the desired outcome.

ALPHAPANEL®

AlphaPanel® is the premium concrete panel wall system for internal walls and external façade applications in multi-storey & low-rise residential, commercial, and industrial construction.

AlphaPanel® has been designed and tested to meet all requirements of the National Construction Code and the relevant Australian Standards.

AlphaPanel® is a non-combustible, high performing, lightweight, high strength, fibre reinforced precast concrete panel that is manufactured in New South Wales, Australia, by XCEM Pty Limited. XCEM's AlphaPanel is wholly Australian Made & Owned; XCEM is ISO 9001 accredited.

The erected AlphaPanel® wall is strong, durable, impact resistant and provides a solid concrete wall feel. AlphaPanel® can be used as external and internal walls in all building types, including:

- External façades for high-rise buildings
- Internal walls for high-rise buildings
- External walls for detached residential houses and low-rise multi-residential buildings
- Low-rise intertenancy and boundary walls
- Basement walls in multi-storey buildings
- External & Internal walls in light industrial construction

CodeMark Australia 30131 · Quality Management ISO 9001 Global-Mark.com.au® · Australian Made and Owned

BENEFITS OF ALPHAPANEL®

AlphaPanel® has significant benefits over pre-cast concrete, brick & block, AAC, plasterboard and FC sheeting.

01

High-Performance Concrete at the Right Price

AlphaPanel® is solid, high-strength fibre reinforced concrete, yet is more affordable than inferior products such as AAC panels, fibre cement sheets, and brick. AlphaPanel® is a true pre-cast concrete substitute at approximately 50% of the finished wall cost.

02

NSA Gains for Developers

The revolutionary AlphaPanel® wall systems are the slimmest footprint intertenancy and corridor systems available in the market. Substitution of AAC or plasterboard wall systems with AlphaPanel® creates on average an additional 1.5* square meters per apartment in Net Saleable Area (NSA), providing significant value for all stakeholders.

03

CodeMark Certified

AlphaPanel® is CodeMark Certified and fully compliant with all applicable NCC requirements and the relevant Australian Standards.

04

Crystalline Silica Free

AlphaPanel® contains no crystalline silica, eliminating risk of development of silicosis through inhalation of dust.

05

Fast

AlphaPanel® systems increase speed of construction, and reducing construction costs.

06

Australian Made & Owned

AlphaPanel® is 100% Australian Made & Owned. AlphaPanel® is manufactured at XCEM's state-of-the-art manufacturing facility located in the Southern Highlands of New South Wales.

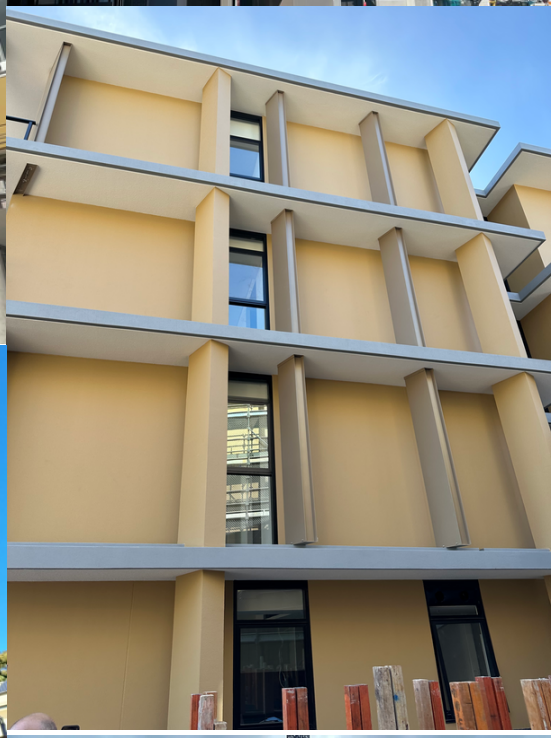
**Based on 100m2 of External, Intertenancy & Corridor walls per apartment.*

WALL SYSTEM COMPARISON

Presented below is a comparison of 35mm AlphaPanel® with 75mm AAC Panels and 125mm Pre-cast Concrete.

	35mm AlphaPanel®	75mm AAC Panels	125mm Pre-Cast Concrete
Material	Fibre Reinforced Concrete	Autoclaved Aerated Concrete	Pre-Cast Concrete
Thickness	35mm	75mm	>125mm
Compressive Strength	25.0 MPa	2.8 MPa	>20.0 MPa
Weight	35-45kg/m2	52kg/m2	>300kg/m2
Intertenancy Wall Footprint	147mm	228mm	NA
Corridor Wall Footprint	88mm	144mm	NA
External Wall Footprint	175mm	230mm	Variable
Contains Crystalline Silica (Severe Health Hazard - Risk of Silicosis)	No	Yes	Yes
Durability Testing - AS/NZS 2908.2, AS/NZS 2908.2 Annex B & AS/NZS 4456.10	Yes	No	NA
Sound Insulation of Panel	Rw 36	Rw 33	Rw 50
Fire Resistance Level of External Wall	120min	120min	120min
AS/NZ 4284 Weatherproofing Test	>4.0 kPa	1.07 kPa	NA
No Crane Required for Installation	Yes	Yes	No
Low Water Absorption (Porosity)	Yes	No	Yes
High Impact Resistance	Yes	No	Yes
High Abrasion Resistance	Yes	No	Yes
No Risk of Corrosion (Steel Reinforcement)	Yes	No	Yes
Low Maintenance	Yes	No	Yes
Cost	Low	Low	High






TECHNICAL SPECIFICATIONS

AlphaPanel® is a lightweight precast concrete panel made using XCEM's concrete technology and reinforced with fibres. It presents a hard, smooth surface, and has a density of 1,200 kg/m3.

Table 2.1 contains the material properties of AlphaPanel® determined through engineering calculations and assessment carried out by Enertren, following accepted engineering methodologies for concrete and fibre-reinforced materials. Testing was carried out by a laboratory accredited by NATA for Technical Competence (Accreditation No. 1393, Site No. 1386). The determination of characteristic strength and connection capacity values has been carried out in accordance with AS/NZS1170.0 Appendix B or AS 5146.2 Appendix B.

Table 2.1

Mean Dry Density, ρm,g.		1,200 kg/m3
Design Density (net actions ↓), ρd,sup		1,300 kg/m3
Design Density (net actions ↑), ρd,inf		1,200 kg/m3
Transport and Construction Density, ρtrans		1,300 kg/m3
Design Permanent Action3 (acting ↓), G		
Characteristic Compressive Strength, f 'c		25.0 MPa
Characteristic Flexural Strength, f 'ct		1.69 MPa
Modulus of Elasticity, Ec		10,500 MPa
Ultimate Limit State Bending Capacity, øM		
	35 mm AlphaPanel®	0.37 kNm/m
	50 mm AlphaPanel®	0.64 kNm/m
Drying Shrinkage,		
	28 Days	860 x10-6m/m
	56 Days	1,080 x10-6m/m
Thermal Conductivity, λ		0.279 W/m·K
Thermal Resistance, R-Value		
	35 mm AlphaPanel®	0.13 m2·K/W
	50 mm AlphaPanel®	0.18 m2·K/W

PRODUCT RANGE & PROPERTIES

Table 2.2 below presents the AlphaPanel product range and properties.

Table 2.2 Product Range & Properties

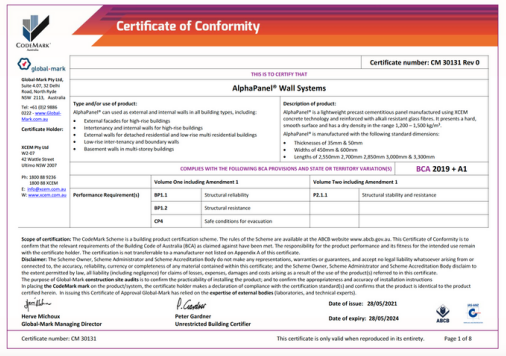
Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	2700, 3000, 3300	45kg/m2
50mm AlphaPanel®	450mm	2700, 3000, 3300	65kg/m2

NCC COMPLIANCE

AlphaPanel® has been extensively tested to meet all requirements of the NCC, this testing has proven AlphaPanel® to be one of the most superior building materials available in the Australian Construction Industry.

CODEMARK CERTIFICATION

AlphaPanel® wall systems are CodeMark Certified - Certificate Number CM30131. The CodeMark Scheme is a building product certification scheme. The rules of the Scheme are available at the ABCB website www.abcb.gov.au.



Certificate of Conformity

Certificate number: CM 30131 Rev 0

THIS IS TO CERTIFY THAT

AlphaPanel® Wall Systems

Type and/or use of product:

AlphaPanel® can used as external and internal walls in all building types, including:

- External facades for high-rise buildings
- Intertenancy and internal walls for high-rise buildings
- External walls for detached residential and low-rise multi residential buildings
- Low-rise inter-tenancy and boundary walls
- Basement walls in multi-storey buildings

Description of product:

AlphaPanel® is a lightweight precast cementitious panel manufactured using XCEM concrete technology and reinforced with alkali resistant glass fibres. It presents a hard, smooth surface and has a dry density in the range 1,200 – 1,500 kg/m³.

AlphaPanel® is manufactured with the following standard dimensions:

- Thicknesses of 35mm & 50mm
- Widths of 450mm & 600mm
- Lengths of 2,550mm 2,700mm 2,850mm 3,000mm & 3,300mm

COMPLIES WITH THE FOLLOWING BCA PROVISIONS AND STATE OR TERRITORY VARIATION(S) BCA 2019 + A1

Performance Requirement(s)	Volume One including Amendment 1		Volume Two including Amendment 1	
	BP1.1	Structural reliability	P2.1.1	Structural stability and resistance
	BP1.2	Structural resistance		
	CP4	Safe conditions for evacuation		

Scope of certification: The CodeMark Scheme is a building product certification scheme. The rules of the Scheme are available at the ABCB website www.abcb.gov.au. This Certificate of Conformity is to confirm that the relevant requirements of the Building Code of Australia (BCA) as claimed against have been met. The responsibility for the product performance and its fitness for the intended use remain with the certificate holder. The certification is not transferrable to a manufacturer not listed on Appendix A of this certificate.

Disclaimer: The Scheme Owner, Scheme Administrator and Scheme Accreditation Body do not make any representations, warranties or guarantees, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained within this certificate; and the Scheme Owner, Scheme Administrator and Scheme Accreditation Body disclaim to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages and costs arising as a result of the use of the product(s) referred to in this certificate.

The purpose of Global-Mark **construction site audits** is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions

In placing the **CodeMark** mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein. In issuing this Certificate of Approval Global-Mark has relied on the **expertise of external bodies** (laboratories, and technical experts).

Hervé Michoux
Global-Mark Managing Director

Peter Gardner
Unrestricted Building Certifier

Date of issue: 28/05/2021
Date of expiry: 28/05/2024

Certificate number: CM 30131 — This certificate is only valid when reproduced in its entirety. — Page 1 of 8

STRUCTURE

AlphaPanel® wall systems specified and installed in accordance with XCEM's technical literature, satisfy the following NCC performance requirements:

- Volume One – BP1.1 and BP1.2: The system has been designed to resist wind actions in accordance with AS1170.2 to the magnitudes specified for the nominated fixing method and spacings.
- Volume Two – P2.1.1: The cladding systems have been designed to resist wind actions in accordance with AS 4055 for non-cyclonic wind classes N1, N2, N3, N4 and N5, and cyclonic wind classes C1, C2 and C3 when fixed in accordance with the design tables in the relevant sections of this Design Guide.

The structural capacity of AlphaPanel® has been determined in accordance with standard test procedures for concrete, fibre-reinforced concrete, masonry, and autoclaved aerated concrete as advised by Enertren, and by testing conducted at a Registered Testing Laboratory (BEMAC Laboratories – NATA Accreditation No. 1393, Site No. 1386).

The test reports are evidence of suitability as per NCC Volume One A2.2(2)(a) and Volume Two A2.2(2)(a) satisfying the Assessment Method of NCC Volume One A5.2(1)(d) and Volume Two A5.2(1)(d). The interpretation of the results of those tests to the applications specified in Enertren Report XCM-001 V.6 constitutes evidence of suitability as per NCC Volume One A5.2(1)(e) and Volume Two A5.2(1)(e).

Panel Strength and Serviceability Testing

Full-scale panel load/deflection tests on 35 mm and 50 mm thick AlphaPanel® were based on the test method specified in AS 5146.2 Appendix P. The panels exhibited ductile behaviour under this four-point bend testing.

The stiffness of the panels from testing was used to determine the elastic modulus of the material, which was calculated to be:

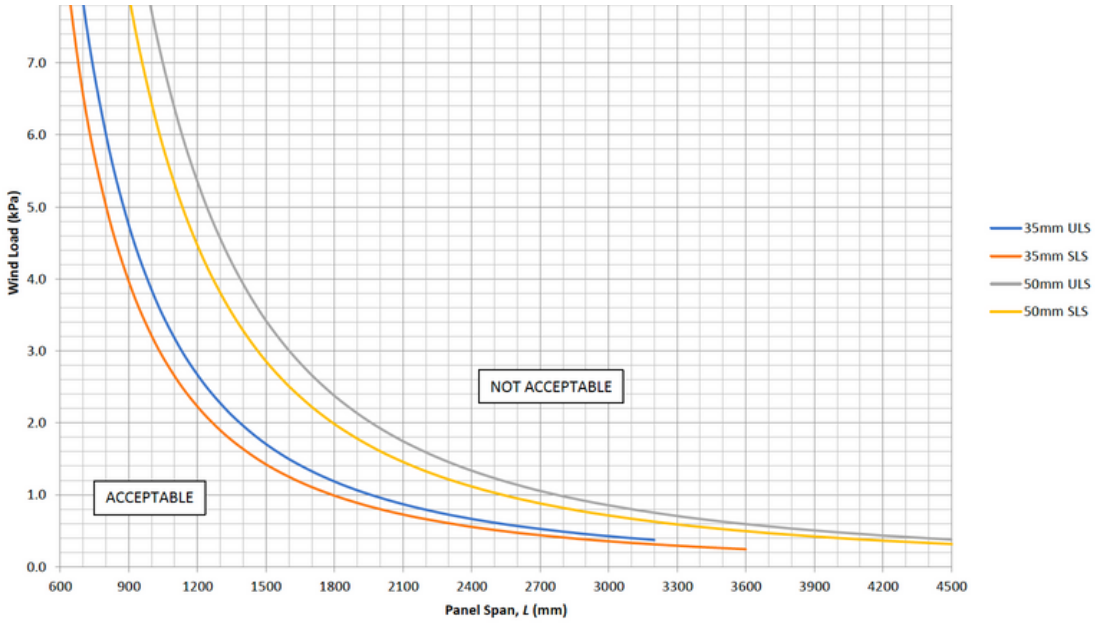
Ec = 10,500 MPa

The characteristic bending capacity of the panels was determined to be:

φM35 = 0.37 kNm/m
φM50 = 0.41 kNm/m

Figure 2.1 provides uniformly distributed ultimate load (Wu) and serviceability load (Ws) vs. panel span for 35 mm and 50 mm AlphaPanel®. This is based on the characteristic bending capacity per m length of wall, and a deflection limit of H/250 or limit of bending moment at first crack, respectively.

Figure 2.1: AlphaPanel® Span Chart



Connection Testing

The capacity of screw connections in AlphaPanel® was determined by testing with characteristic values determined in accordance with AS/NZS 1170.0 Appendix B. A capacity reduction factor of φ = 0.5 has been adopted for connection strength design. The connection strength for various fixing configurations in AlphaPanel® is as follows:

- No.12-11-30 Type 17 Hex Head Tek screw in pullout from AlphaPanel® – φNt,po = 0.80 kN
- No.8-12x45 Countersunk Head screw in head pull-through AlphaPanel® – φNt,pt = 1.70 kN
- No.12-11-30 Type 17 Hex Head Tek screw in shear in AlphaPanel® – φVb = 1.55 kN

FIRE

The fire performance of AlphaPanel® wall systems is based on testing carried out by CSIRO (NATA Accreditation No. 165, Site No. 3625) & Warringtonfire (NATA Accreditation No. 3277, Site No. 3270). For walls complying with NCC Volume One Specification C1.1 and Part G5, and NCC Volume Two 3.7.2.4 and Part 3.10.5:

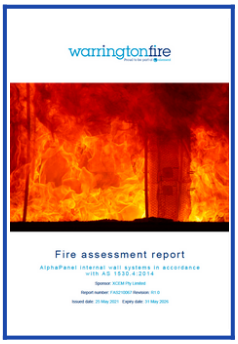
AlphaPanel® External Wall Systems as per Warringtonfire report FAS210087 R1.1

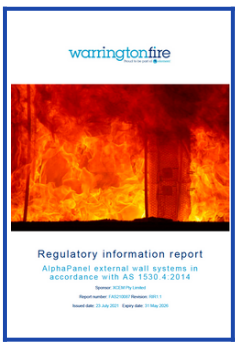
- 35mm AlphaPanel® + 13mm standard plasterboard -/120/90 (One Way)
- 35mm AlphaPanel® + 13mm fire-rated plasterboard -/120/120 (One Way)
- 50mm AlphaPanel® + 13mm standard plasterboard -/120/120 (One Way)
- 35mm AlphaPanel® + 35mm AlphaPanel® -/120/120 (Two Way)
- 35mm AlphaPanel® + 16mm fire-rated plasterboard 60/60/60 (Two Way)
- 35mm AlphaPanel® + 2 x 13mm fire-rated plasterboard 90/90/90 (Two Way)

AlphaPanel® Internal Wall Systems as per Warringtonfire report FAS210067 R1.0

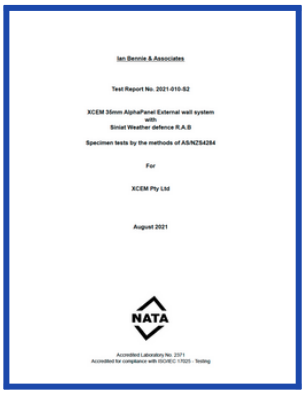
- 35mm AlphaPanel® + 13mm standard plasterboard -/60/60 (Two Way)
- 35mm AlphaPanel® + 16mm fire-rated plasterboard -/90/90 (Two Way)
- 35mm AlphaPanel® + 35mm AlphaPanel® -/120/120 (Two Way)
- 50mm AlphaPanel® -/120/90 (Two Way)
- 50mm AlphaPanel® + 13mm standard plasterboard -/120/120 (Two Way)

For compliance with NCC Volume One C1.9 and Schedule 3 and NCC Volume Two Schedule 3 for non-combustible building materials: Warringtonfire Test Certificate SFCRFT190393, AS 1530.1:1994 (R2016)– AlphaPanel® is not deemed combustible. For compliance with NCC Volume One Specification C3.15 & C3.4: Warringtonfire report FAS210171. The above test reports are evidence of suitability as per NCC Volume One A2.3(2)(a) & Volume Two A2.3(2)(a) satisfying the Assessment Method of NCC Volume One A5.2(1)(d) & Volume Two A5.2(1)(d).





WEATHERPROOFING


Ian Bennie & Associates

Test Report No. 2021-010-S2

XCEM 35mm AlphaPanel External wall system with Sinlat Weather defence R.A.B

Specimen tests by the methods of AS/NZS4284

For

XCEM Pty Ltd

August 2021

NATA


Ian Bennie & Associates

Test Report No. 2021-010-S1

XCEM 35mm AlphaPanel External wall system with Bradford Enviroseal RW vapour permeable wall wrap

Specimen tests by the methods of AS/NZS4284

For

XCEM Pty Ltd

August 2021

NATA

Compliance with NCC Volume One Part FP1 and NCC Volume Two BP2.2.2 is satisfied when the AlphaPanel® external wall system is detailed and installed in accordance with this Design Guide, and the referenced façade engineering report by Rickard Engineering.

AlphaPanel® has been tested at Ian Bennie & Associates Registered Testing Laboratory (NATA Accreditation No. 2371, Site No. 2364) in accordance with AS/NZS 4284 and meets the weatherproofing requirements for FP1.4 (test reports 2021-010-S1 & 2021-010-S2). The key performance achievements of the tests were AlphaPanel® cavity systems achieved 4kPa serviceability when AlphaPanel® was used in conjunction with a 13mm rigid air barrier, and 1.2kPa serviceability when AlphaPanel was used with a pliable membrane.

The basis of compliance is NCC Volume One A2.2(2)(a) and Two A2.2(2)(a) with evidence of compliance satisfying the Assessment Method of NCC Volume One A5.2(1)(e) and Volume Two A5.2(1)(e). In acordance with the NCC requirements, there are no Deemed to Satisfy Provisions to address weatherproofing external walls. A Performance Solution is to be developed to show that the proposed design meets the requirements of FP1.4.

SOUND TRANSMISSION & INSULATION

The acoustic performance of AlphaPanel® walls has been determined by PKA Consulting based on testing carried out at Resolute Testing Laboratories Pty Ltd (NATA Accreditation No.: 20089, Site No.: 23656). Refer to Report Ref.: PKA100XCM R01v2, Acoustic Performance Assessment – XCEM AlphaPanel® High-Rise Wall Systems for full details and conditions. The Sound Transmission and Insulation sections within the following wall system sections of this Design Guide provide a summary of the performance of AlphaPanel® relevant walls.

The basis of compliance with NCC Volume One F5.5 and NCC Volume Two Part 3.8.6 is NCC Volume One A2.3(2)(a) and Volume Two A2.3(2)(a) satisfying the Assessment Methods of NCC Volume One A5.2(1)(d) and (e) and Volume Two A5.2(1)(d) and (e).


PKA ACOUSTIC CONSULTING

ACOUSTIC PERFORMANCE ASSESSMENT

Product Name

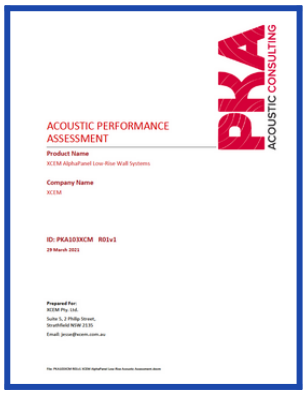
XCEM AlphaPanel High-Rise Wall Systems

Company Name

XCEM

ID: PKA100XCM R01v2

9 March 2020


PKA ACOUSTIC CONSULTING

ACOUSTIC PERFORMANCE ASSESSMENT

Product Name

XCEM AlphaPanel Low-Rise Wall Systems

Company Name

XCEM

ID: PKA103XCM R01v1

29 March 2021


Resolute

Client:

XCEM Pty Limited

W2-07, 42 Wattle Street,

Ultimo,

NSW 2007

Testing report:

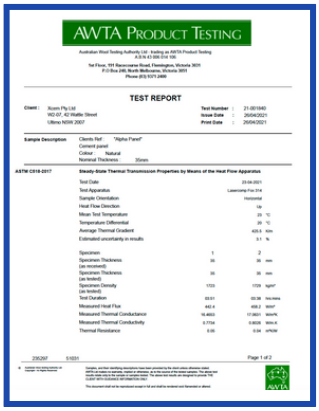
ENERGY EFFICIENCY

AlphaPanel® wall systems specified and installed in accordance with Enertren report XCM-001 V.6 and this Design Guide, contribute to compliance with the following NCC performance requirements:

- Volume One – JP1
- Volume Two – P2.6.1

The thermal conductivity of AlphaPanel® was determined by testing carried out by AWTA Product Testing (Test Number: 23-004787, ASTM C518-2017 Steady-State Thermal Transmission Properties by Means of the Heat Flow Apparatus). The average value of thermal conductivity of the specimens tested was as follows:

λ = 0.279 W/mK


AWTA PRODUCT TESTING

TEST REPORT

This test report is evidence of suitability as per NCC Volume Two A2.3(2)(a) satisfying the Assessment Method of NCC Volume Two A5.2(1)(d). AWTA Product Testing is a registered testing authority for heat and temperature testing – NATA Accreditation No. 1356. The element thermal resistance of AlphaPanel® is specified in Table 3.1.

Table 3.1: AlphaPanel® R-Value

AlphaPanel® Thickness (mm)	R-Value (m2K/W)
35mm AlphaPanel®	0.13
50mm AlphaPanel®	0.18

The above values shall be used as input to the Deemed-to-Satisfy Provisions for wall R-Value calculations. The element R-Value is used in wall system total R-Value calculations that include air-films, cavities, added insulation and other wall elements, such that the minimum total R-Value for an external wall system exceeds the minimum specified Deemed-to-Satisfy Total R-Value for a specified Climate Zone. These values are provided in: NCC Volume One – Clause J1.5 & NCC Volume Two – Clause 3.12.1.4.

BASIX must be used for Energy Efficiency compliance, therefore this data and the relevant wall total R-value must be referred to the project BASIX practitioner for incorporation into their assessment model for the buildings. If the wall framing is cold-formed steel, a thermal break providing R0.2 may need to be applied between the top hats and the steel stud frame as per NCC Volume One J0.5 or NCC Volume Two 3.12.1.4(d). Refer to BASIX practitioner for confirmation.

DURABILITY

In the context of the NCC, durability is the capability of a building or its components to remain serviceable over a specified time period. While there is not a specific major section in the NCC concerning durability, it is implied that the materials and components used and the construction and finishing of a building is completed such that the design life can be reliably achieved.

Design for durability involves selection of an appropriate strategy for reliability. The specified minimum performance at the target design life can be achieved by adopting one of a number of strategies as follows:

1. No maintenance or repair
2. With repair
3. With maintenance
4. With maintenance and repair

The location of elements within a building structure influences the strategy decision. For example, it is impractical to inspect, let alone maintain or repair components that are embedded within wall and floor cavities, so the design for durability should be focused on Strategy 1 from above – i.e. design life met through the properties of the component initially.

AlphaPanel®

AlphaPanel® is considered adequate for all external applications above the DPC as per masonry unit 'general purpose' requirements in AS 4773.1 Table 4.1 or AS 3700 Table 5.1. Where standing water may occur against AlphaPanel®, a waterproof tanking membrane must be applied to the surface, as is normal for most forms of construction. Waterproofing solutions that meet the requirements of AS 4654.1 shall be specified. Ensure the specified tanking membrane is compatible with and carries a specification for application on the AlphaPanel® material.

General durability tests were carried out in accordance with AS/NZS 2908.2: Clause 6.1 Bending strength; Clause 6.3 Frost resistance; Clause 6.4 Warm water; Clause 6.6 Soak-dry. A full-scale system test on 35mm AlphaPanel® with bonded tongue and groove joints was carried out in accordance with AS 2908.2 Annex B. After 50 cycles of heat and rain no water drops had formed on the unexposed side of the panels and no significant deterioration of the panels was observed.

Testing was also carried out in accordance with AS/NZS 4456.10 Method B to determine equivalent durability grade if considered as a masonry unit. After 40 cycles in sodium chloride solution, the mean total mass loss was 0.4124 g which is just outside the Exposure Grade classification requiring no greater than 0.4 g. After 40 cycles in sodium sulphate solution, the mean total mass loss was 0.1 g. This performance of AlphaPanel® is considered adequate for all external applications above the DPC and protected by a paint finish. For areas in buildings where 'general purpose' masonry units are specified in AS 4773.1 Table 4.1 or AS 3700 Table 5.1, durability is achieved without a paint finish.

Cold-formed steel members

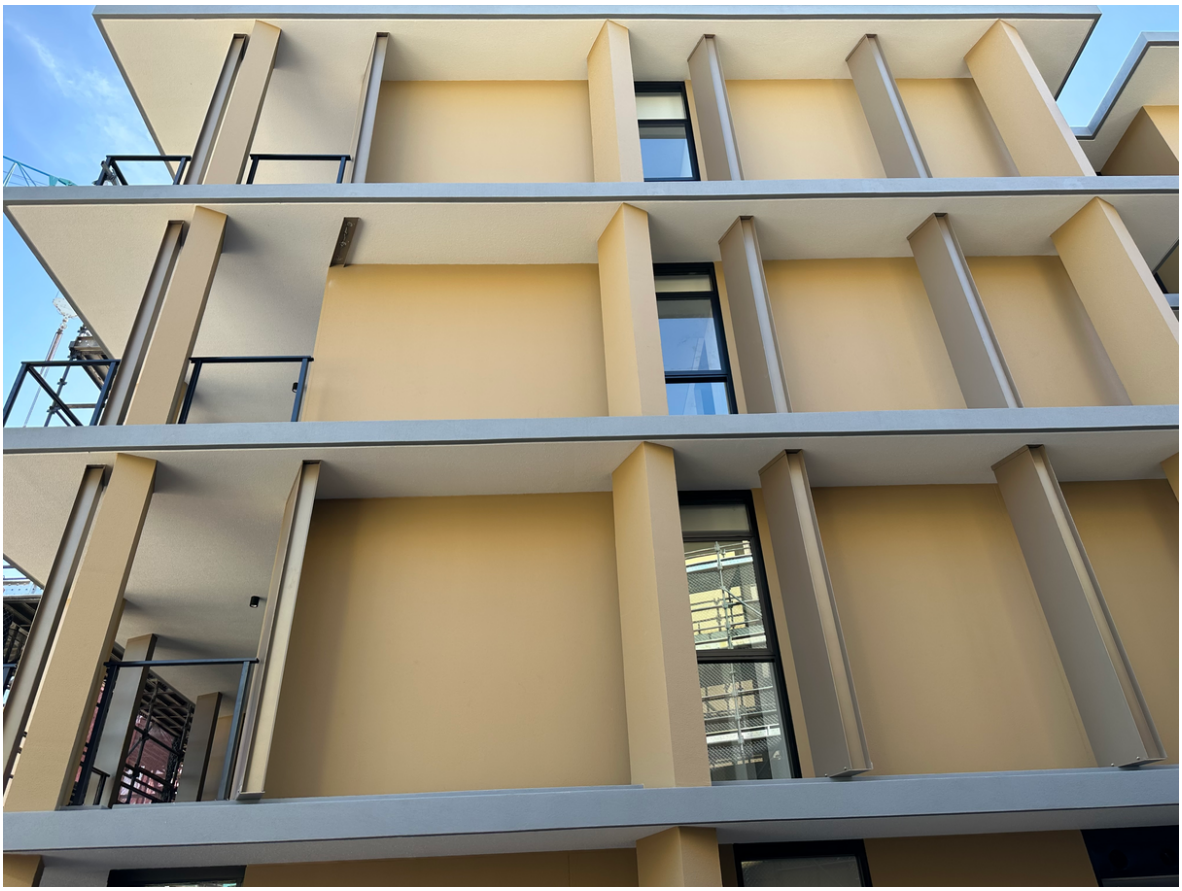
Cold-formed steel top hats shall have a minimum coating class of Z275 in accordance with AS 1397. This is considered acceptable for applications within the building envelope in areas greater than 300 m from breaking surf. The cavity is not considered to be within the building envelope, so top hat battens and baffles in this area may only be the minimum specification in areas more than 10 km from breaking surf and more than 1 km from large non-surf salt-water areas. For coastal locations and for components used in the cavity, refer to the cold-formed steel manufacturer's specifications for suitability of the specified product for the application at the project site. AS/NZS 2312 provides guidance on protection of steel against atmospheric corrosion. Connections, such as screws for fixing AlphaPanel® to top hats and fixing top hats to studs must have the appropriate durability class for the site and application. Not less than Class 3 in accordance with AS 3566.2 shall be used.

Condensation

The possibility of condensation occurring within building elements must be considered in the detailing and specification of the building fabric. The mechanism of condensation is through the behaviour of water vapour in air and is a function of the local climate and occupant behaviour. Water vapour condenses out of air on material surfaces that are below the dew point temperature. The presence of condensation within the building envelope can lead to a degradation of materials, therefore careful design through use of insulation and vapour barriers to prevent condensation, or the active control of the effects, must be undertaken specific to the site conditions. Refer to ABCB Guideline Document – Condensation in Buildings and NCC Volume One Part F6 and NCC Volume Two Part 3.8.7 for guidance.

ALPHAPANEL® HIGH-RISE EXTERNAL WALLS

AlphaPanel® External Wall Systems have revolutionised High-Rise Residential Construction.



COMPONENT SPECIFICATIONS

AlphaPanel® external wall (façade) comprises AlphaPanel® fixed to horizontal steel top hat battens that are fixed to non-load bearing steel framing installed between concrete slabs and soffits. It follows the principles of AS 5146 Part 3 Section 8, but with structural engineering design aspects developed for the properties of AlphaPanel®.

- Framing: Cold-formed steel framing in accordance with NASH Standard and AS/NZS 4600, min. C92 x 1.15 mm BMT G300 lipped studs, Z275 or AZ150 coating in accordance with AS1397.
- Shelf angle: Min. 65 x 65 x 5 mm and providing min. 25 mm bearing to AlphaPanel®. Galvanised or stainless steel to project environment conditions. Refer to AS 2699.3.
- Top hat batten:
  - External installation – Min. 35 mm deep x 30 mm wide x 0.75 mm BMT G550 cold-formed steel, Z275 (min.) coating in accordance with AS 1397.
  - Internal installation – Min. 35 mm deep x 50 mm wide x 1.15 mm BMT G2 cold-formed steel, Z275 (min.) coating in accordance with AS 1397.
- Screws: In accordance with AS 3566 Part 1 and Part 2
  - Coating Class 3 – generally, to moderate exposure environments
  - Coating Class 4 – marine, > 100m from breaking surf
  - Grade 304 or 316 stainless steel – severe marine, < 100m from breaking surf (ensure potential for galvanic corrosion with top hats is checked)
- Plasterboard: As per Warringtonfire report FAS210087 R1.1:
  - For the specified wall system with an FRL of 60/60/60, fire-rated plasterboard is 16 mm Siniat FireShield plasterboard or any other 16 mm plasterboard that has been subjected to a load-bearing test / assessment for an FRL of 60/60/60.
  - For the specified wall system with an FRL of 90/90/90, fire-rated plasterboard is 2 × 13 mm Siniat FireShield plasterboards or any other 2 × 13 mm plasterboard that has been subjected to a load-bearing test / assessment for an FRL of 90/90/90.
- Flashings and DPC: In accordance with AS/NZS 2904.
- Sealants: External grade fire-rated polyurethane (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014), prepared and installed in conjunction with a backing rod.
- Flexible Sarking Membrane: Materials must comply with AS4200.1 and be classified as a Water Barrier plus achieve a Flammability Index of “Low” or < 5 (when tested to AS1530.2). Membranes must be installed in accordance with AS4200.2.

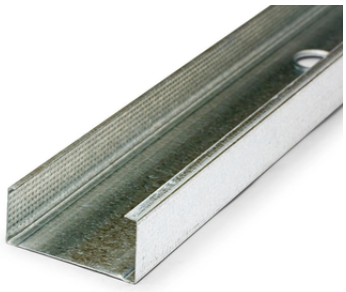
ALPHAPANEL® HIGH-RISE EXTERNAL WALLS COMPONENT LIST

ALPHAPANEL®

Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	3000, 3300	45kg/m2
50mm AlphaPanel®	450mm	3000, 3300	65kg/m2

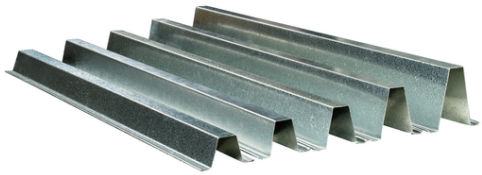
STEEL FRAMING

When used externally, AlphaPanel® is fixed to Cold-formed steel framing in accordance with NASH Standard and AS/NZS 4600, min. C92 x 1.15 mm BMT G300 lipped studs, Z275 or AZ150 coating in accordance with AS1397.



TOP HAT

Top Hats are used to fix AlphaPanel® to the structural steel frame. Top hats can be selected from sizes ranging from 35mm to 75mm. Min. 35 mm deep x 30 mm wide x 0.75 mm BMT G550 cold-formed steel, Z275 (min.) coating in accordance with AS 1397.



CAULKING COMPOUNDS

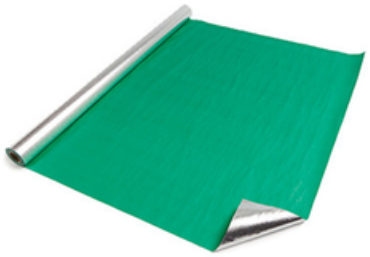
Use an Approved Fire-Rated Sealant to caulk all AlphaPanel® movement joints, control joints, deflection gaps and penetrations. For walls which require a fire rating use Botsik FireBan One or another External grade fire-rated polyurethane sealant (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014).

EARTHWOOL INSULATION

AlphaPanel® wall systems incorporate Earthwool Insulation. Please contact insulation suppliers, and ensure specifications meet those specified in this Design Guide.

WALL WRAP (CONDENSATION CONTROL MEMBRANE)

AlphaPanel® façade systems utilise a vapour permeable wall wrap to aid in the weatherproofing of the external wall system. The wall wrap also controls interstitial condensation and improves thermal performance of the system. Use a wall wrap which complies with the requirements as set out in this design guide or as specified by the project façade Engineer.



BACKING ROD

Backing rod is used to control the depth of sealant, please ensure the appropriate size backing rod is utilised for the gap required to be caulked. Please follow manufacturer's instructions.

PACKERS

The AlphaPanel® façade system utilises non-compressible & non-combustible packers both between the shelf angle and the slab edge and under panels in the slab to slab façade and balcony wall systems.

PRESSURE EQUALISATION SLOTS

Install pressure equalisation slots in accordance with manufacturer's instructions, and at the locations specified in this Design Guide.

DPC/FLASHING

DPC/Flashing installed in accordance with the specifications outlined by the project façade engineer.

WATERPOROOF MEMBRANE

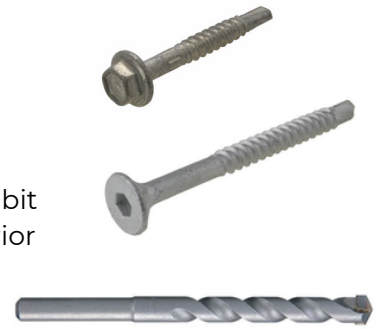
Waterproofing membrane must meet the requirements of AS 4654.1.

PLASTERBOARD

AlphaPanel® External wall systems incorporate internal plasterboard lining. Use specified plasterboard in accordance with this Design Guide, or as per the project Fire/Acoustic Engineer's specifications.

FIXINGS

Top hat to stud: No.12-14x20 mm Hex Head Tek screws.
AlphaPanel® to top hat: No.12-11x50 mm Bugle Head Tek screws.
Countersink AlphaPanel® before fixing: Use a countersink bit or a 14mm masonry drill bit (drill 5mm into AlphaPanel® prior to fixing).



In accordance with AS 3566 Part 1 and Part 2

CONNECTION SPECIFICATIONS

External (face) fixing of AlphaPanel®

Top hat to stud: 2 x No.12-14x20 mm Hex Head Tek screws to every stud
AlphaPanel® to top hat: No.12-11x50 mm Bugle Head Tek screw

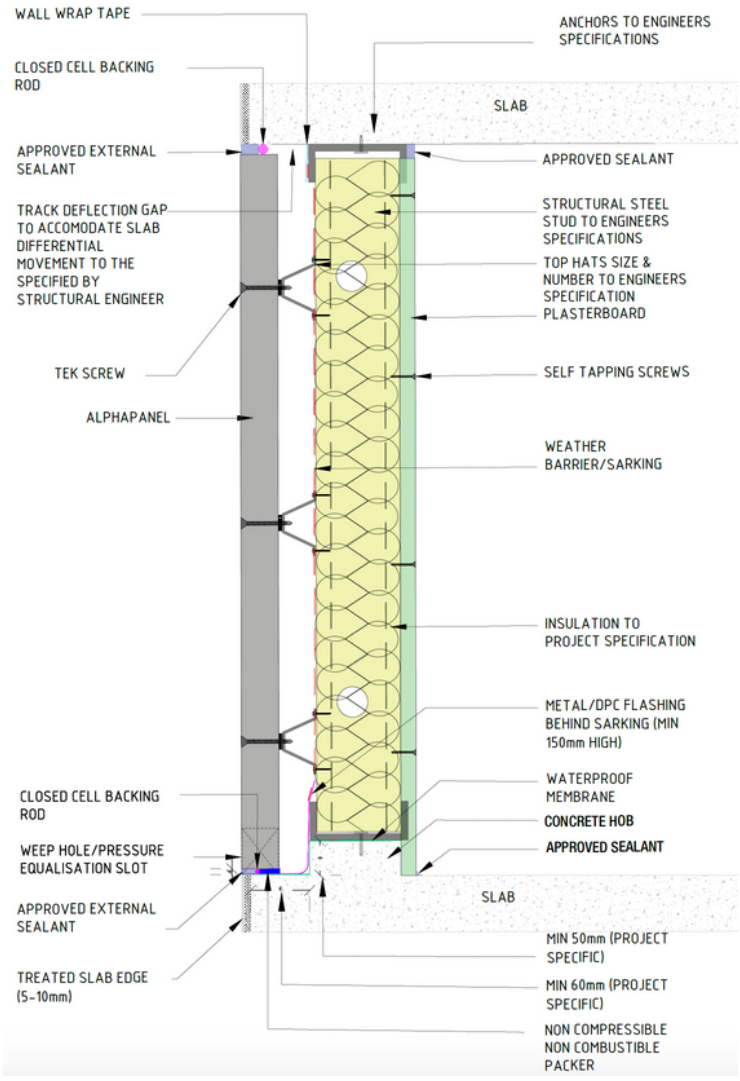
Internal fixing of AlphaPanel®

Top hat to AlphaPanel®: 2 x No.12-11x30 mm Bugle Head Type 17 screws (1 screw group)
Top hat batten to stud: 2 x No.12-14x20 mm Hex Head Tek screws to every stud

For 50 mm AlphaPanel®, the specifications in this section can still apply, except the screws fixing AlphaPanel® to the top hats become No.12-11x65 mm Bugle Head Type 17 or Hex Head Tek for external fixing and No.12-11x40 mm Hex Head Type 17 for internal fixing.

Figure 3.1 below shows the general configuration for external fixing method.

Figure 3.1: General AlphaPanel® External Wall System



SLABS AND STRUCTURE

Slabs supporting AlphaPanel® high-rise façades shall be designed, specified, and constructed in accordance with AS 3600.

Provision for movement, drying shrinkage, creep, and thermal expansion and contraction shall be nominated by the project engineer. The minimum provisions are as follows:

- Vertical control joints at 2.4 m max. ctrs and shall be min. 12 mm width.
- Horizontal control joint at underside of slab / edge beam / shelf angle to top of AlphaPanel® panel shall be min. 15 mm.
- Min. 12mm control joint at interfaces with other wall elements, such as concrete columns or walls.

APPLICATION

Vertical loads from the mass of the AlphaPanel® panels are carried by the slab edge or a structural steel shelf angle at the base of the wall. Lateral loads from wind and earthquake are resisted by the cold-formed steel framing backing the panels.

The frame design engineer shall design for wind actions calculated in accordance with AS/NZS 1170.2 as per the parameters provided by the project structural engineer. In accordance with AS/NZS 1170.2, local pressure factors (Kl) are applicable in the design of the following elements:

- AlphaPanel®
- Connection of AlphaPanel® to top hats
- Connection of the top hats to the steel studs

The studs supporting the top hats do not require design with local pressure factor loading. A maximum deflection limit of H/360 is recommended for studs under the full serviceability load (Ws), considering the worst case combined effects of wind pressure on the internal wall lining and wind pressure on the external face of the AlphaPanel®. This deflection limit is within a limit that AlphaPanel®, in accordance with the specifications, remains un-cracked in the serviceability limit state. Simple span with no end restraint shall be the assumed structural model for deflection calculations.

Internal wall linings must be designed and specified to withstand internal wind pressures over the studs at their nominated spacing. The minimum loading shall be as follows:

- Ultimate: Wu = 0.40 kPa
- Serviceability: Ws = 0.25 kPa

Normal lining specifications cover the above condition. For buildings in Regions B, C and D, and buildings over 25 m height in Region A, the internal wind pressures are likely to exceed the above values so this must be considered.

Restraint of the wall system and its components against earthquake actions shall be confirmed by the project engineer. Usually, wind actions govern the design specifications.

INSTALLATION

Top hat battens and AlphaPanel® shall be fixed to the cold-formed steel frame in accordance with the following notes and Table 4.1:

1. The façade design philosophy is pressure equalisation. This means the cavity behind the AlphaPanel® panel maintains the same pressure as that against the outside surface of the building. Wall sections that can experience different external pressures, such as at an external corner of a building where one side has positive pressure and the other side negative pressure, must be isolated from each other by an air seal in the cavity.
2. The wind pressures resisted by the configurations specified in Table 4.1 are only those acting on the external surface of the wall. This requires that internal wall linings provide effective resistance to internal wind pressures and that there is an air seal between internal linings to windows, doors, and other penetrations through the external wall system.
3. Top hats shall be evenly spaced with the bottom and top ones being min. 100mm and max. 250 mm from the ends of the AlphaPanel®.
4. Top hat specification:
    a. Rondo M535 (35mm depth x 0.75mm BMT G2), for a 35 mm cavity.
    b. Rondo H535 (35mm depth x 1.15mm BMT G2), for a 35 mm cavity.
    c. Rondo M550 (50mm depth x 0.75mm BMT G2), for a 50 mm cavity.
    d. Rondo H550 (50mm depth x 1.15mm BMT G2), for a 50 mm cavity.
5. Screw placement shall be 100 mm from each panel edge and with even spacing in between and in accordance with Table 4.1.
6. Provide additional top hat battens to window and door opening heads as required. A panel installed horizontally shall be supported by a minimum of two top hat battens and a minimum number of evenly spaced screws for the panel area equivalent that required for the main vertical panels in the same area.

Table 4.1: 35mm AlphaPanel® Façade Fixing Specification

Ultimate Wind Pressure W_u (kPa)	Maximum Tophat Spacing s_{th} (mm)	Minimum No. of Screws per 1200mm Panel per Tophat			Tophat Specification (note 3)			
		External Fixing		Internal Fixing (note 1)	Tophat Designation	Screw Fixing Specification, Tophat to Stud		
		0.75mm Tophat	1.15mm Tophat			Studs at 600mm Ctrs	Studs at 450mm Ctrs	Studs at 300mm Ctrs
0.5	1350	4	4	4x2	M535	2xNo.10	2xNo.10	2xNo.10
1.0	1200	4	4	4x2	M535	2xNo.10	2xNo.10	2xNo.10
1.5	1200	6	4	4x2	M535	2xNo.12	2xNo.10	2xNo.10
2.0	1100	7	5	4x2	M535	(note 2)	2xNo.12	2xNo.10
2.5	1000	8	6	5x2	M535	(note 2)	2xNo.14	2xNo.10
3.0	900	9	6	5x2	M535	(note 2)	2xNo.14	2xNo.12
3.5	850	10	6	6x2	M535	(note 2)	(note 2)	2xNo.12
4.0	800	-	7	6x2	H535	(note 2)	(note 2)	2xNo.12
4.5	750	-	7	6x2	H535	(note 2)	(note 2)	2xNo.12
5.0	700	-	8	7x2	H535	(note 2)	(note 2)	2xNo.12
5.5	700	-	8	7x2	H535	(note 2)	(note 2)	2xNo.14
6.0	650	-	9	8x2	H535	(note 2)	(note 2)	2xNo.14
6.5	650	-	9	8x2	H535	(note 2)	(note 2)	(note 2)
7.0	600	-	10	9x2	H535	(note 2)	(note 2)	(note 2)
7.5	600	-	10	10x2	H535	(note 2)	(note 2)	(note 2)
8.0	550	-	10	10x2	H535	(note 2)	(note 2)	(note 2)

Notes:

1. Internal fixing is 2 x screws through the 'feet' of the top hat at each location. For example, 4x2 indicates 8 screws in total across the panel at every top hat.
2. Refer to Enertren for alternatives, for example when the spacing of the top hats is reduced.
3. Internal fixing requires 1.15mm BMT G2 top hat.
4. Minimum 4 x top hats, evenly spaced at max. 900 mm ctrs.
5. Rondo M550 may be substituted for M535, and H550 for H535, to provide a 50 mm cavity.
6. Screw specification for fixing 35 mm AlphaPanel®:
    a. External fixing – No.12-11x50 Bugle Head Tek screw.
    b. Internal Fixing – No.12-11x30 Hex Head Type 17 screw.

FIRE

For typical high-rise multi-residential apartment buildings, the NCC defines the construction type as Building Class: 2 Type of Construction: A.

For walls complying with NCC Volume One Specification C1.1 and Part G5, and NCC Volume Two 3.7.2.4 and Part 3.10.5. The established FRL's of AlphaPanel® External Wall Systems as per Warringtonfire FAS210087 R1.1 are as follows:

- 35mm AlphaPanel® + 13mm standard plasterboard -/120/90 (One Way)
- 35mm AlphaPanel® + 13mm fire-rated plasterboard -/120/120 (One Way)
- 50mm AlphaPanel® + 13mm standard plasterboard -/120/120 (One Way)
- 35mm AlphaPanel® + 35mm AlphaPanel® -/120/120 (Two Way)
- 35mm AlphaPanel® + 16mm fire-rated plasterboard 60/60/60 (Two Way)
- 35mm AlphaPanel® + 2 x 13mm fire-rated plasterboard 90/90/90 (Two Way)

For compliance with NCC Volume One C1.9 and Schedule 3 and NCC Volume Two Schedule 3 for non-combustible building materials: Warringtonfire Test Certificate SFCRFT190393, AS 1530.1:1994 (R2016) – AlphaPanel® is not deemed combustible.

A fire engineer shall be consulted to provide advice on project compliance and detailing. The following shall be considered:

- The external wall is non-loadbearing, and the fire resistance is from a fire source on the outside of the wall. When a FRL is required to contain fire within a sole occupancy unit, appropriate fire-rated linings must be installed to the inside surface of the studs to the required FRL.
- Depending on building type and geometry, a fire-rated spandrel may be required between vertically aligned openings in different building levels as per NCC Volume One C2.6. This is achieved within the AlphaPanel® external wall by incorporating a spandrel with the following features:
  - A height of at least 900 mm between openings.
  - A height of at least 600 mmm above the upper surface of the intervening floor.
  - Internal linings to window heads and sills that provide min. FRL 60/60/60. Warrington fire report FAS210087 R1.1 confirms that an FRL of 60/60/60 is achieved when 16 mm fire-rated plasterboard is used as the internal lining with 35 mm AlphaPanel® external cladding.
  - Has fire stops (mineral fibre or fire-rated sealant to the required fire resistance period) at slab level to prevent fire transport up the cavity behind the AlphaPanel®, installed in accordance with this Design Guide.
- Fire stops are to be provided at floor level and at junctions with separation walls to prevent the spread of fire to other sole occupancy units, and also between any concrete column and the back of the AlphaPanel® at corners.
- Mineral wool, IBS rod, fire-rated sealants, fire insulating boards and the like can be used, with attention to the following:
  - Water and moisture management are important – if the back of the AlphaPanel® is wet or there is condensation on the sarking, it must not be transported to the interior of the external wall or to the floor of the building. Install suitable DPC and flashing as necessary to manage cavity moisture. Any bridging of the cavity represents a water ingress risk.
  - If the fire seal is located on the 'wet' side of the cavity flashings/sarking, it must be unaffected by, and be capable of maintaining its fire resistance properties in the presence of, water/moisture.

SOUND TRANSMISSION & INSULATION

The NCC does not currently specify acoustic requirement levels for external walls. Should this be a required design specification for a project, advice can be sought from an acoustic consultant. PKA Assessment Code XE7.1 provides an example of acoustic performance of standard AlphaPanel® external wall system:

- 35 mm AlphaPanel®
  - Min. 112 mm cavity consisting of:
  - Min. 20 mm top hats
  - Wall wrap
  - 92 mm steel studs 1.15 mm BMT at 600mm ctrs
  - 90 mm Earthwool R2.0
  - 13 mm standard plasterboard, 8.4 kg/m2 density
- **Result:** Rw+Ctr 41

WEATHERPROOFING & MOISTURE MANAGEMENT

To prevent damp conditions inside the building, it is necessary to ensure that water is prevented from passing from the outside of the facade to the internal surfaces. It is also necessary to ensure that condensation does not occur or that, in the event that it does occur in certain transient conditions, the resulting moisture is not trapped in wall areas where mould growth or corrosion (or other material degradation) could occur.

There are five modes of water ingress, or forces acting on water that can penetrate the façade of a building – gravity, kinetic energy, air pressure differentials, surface tension and capillary action. Additionally, water vapour in air and the condensation potential with temperature differentials through the cavity also provides a means for water to become present in an external wall element.

In order to manage the above, the AlphaPanel® façade system shall be designed and detailed as a rain screen with pressure equalised cavity. The principal barrier to water entry is the AlphaPanel®. An air barrier shall be maintained at the internal wall lining and the cavity must be closed vertically at regular junctions such as at a separation wall junction and each external corner, and at floor levels. The cavity side of the stud framing shall be protected by a wall wrap or sarking to prevent water entry to the inside of the building whilst allowing water vapour transport. The base of the panel shall be set down at least 100 mm below the floor level to prevent water at the base of the cavity from tracking to the inside of the building in the event that water penetrates the external skin. Weep holes shall be provided for cavity pressure equalisation, and to allow drainage of any accumulated water or moisture from the cavity. Flashings shall be provided at the base of the walls and heads of openings to direct water and moisture away from the frame. Refer to Ian Bennie & Associates Test Reports 2021-010-S1 & 2021-010-S2 (NATA Accreditation No. 2371, Site No. 2364) in accordance with AS/NZS 4284, as well as Rickard Engineering report ref.: 20297_210303 for further details. Refer to the following Australian Building Codes Board Guideline Documents for general related information: ABCB Guideline Document – Condensation in Buildings & ABCB Guideline Document – Durability in Buildings.

ENERGY EFFICIENCY

NCC Volume One Section J Clause J1.5 provides minimum total R-Values that an external wall can comply with to be 'Deemed-to-Satisfy', and are summarised in Table 4.2.

Table 4.2: NCC Volume One Deemed-to-Satisfy R-Values, Building Fabric

Climate Zone	Minimum Total R-Value (m^2K/W)	
	Class 2 common area, Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area	Class 3 or 9c building or Class 91 ward area
1	2.4	3.3
2	1.4	1.4
3	1.4	3.3
4	1.4	2.8
5	1.4	1.4
6	1.4	2.8
7	1.4	2.8
8	1.4	3.8

Tables 4.3 and 4.5 provide example system R-Value calculations for the AlphaPanel® façade wall system for use in determining compliance with those 'Deemed-to-Satisfy' requirements. The wall element R-values are based on ICANZ Handbook Version 3, modified from Table W0300.

Table 4.2: R-Value calculations 35mm AlphaPanel® façade wall system

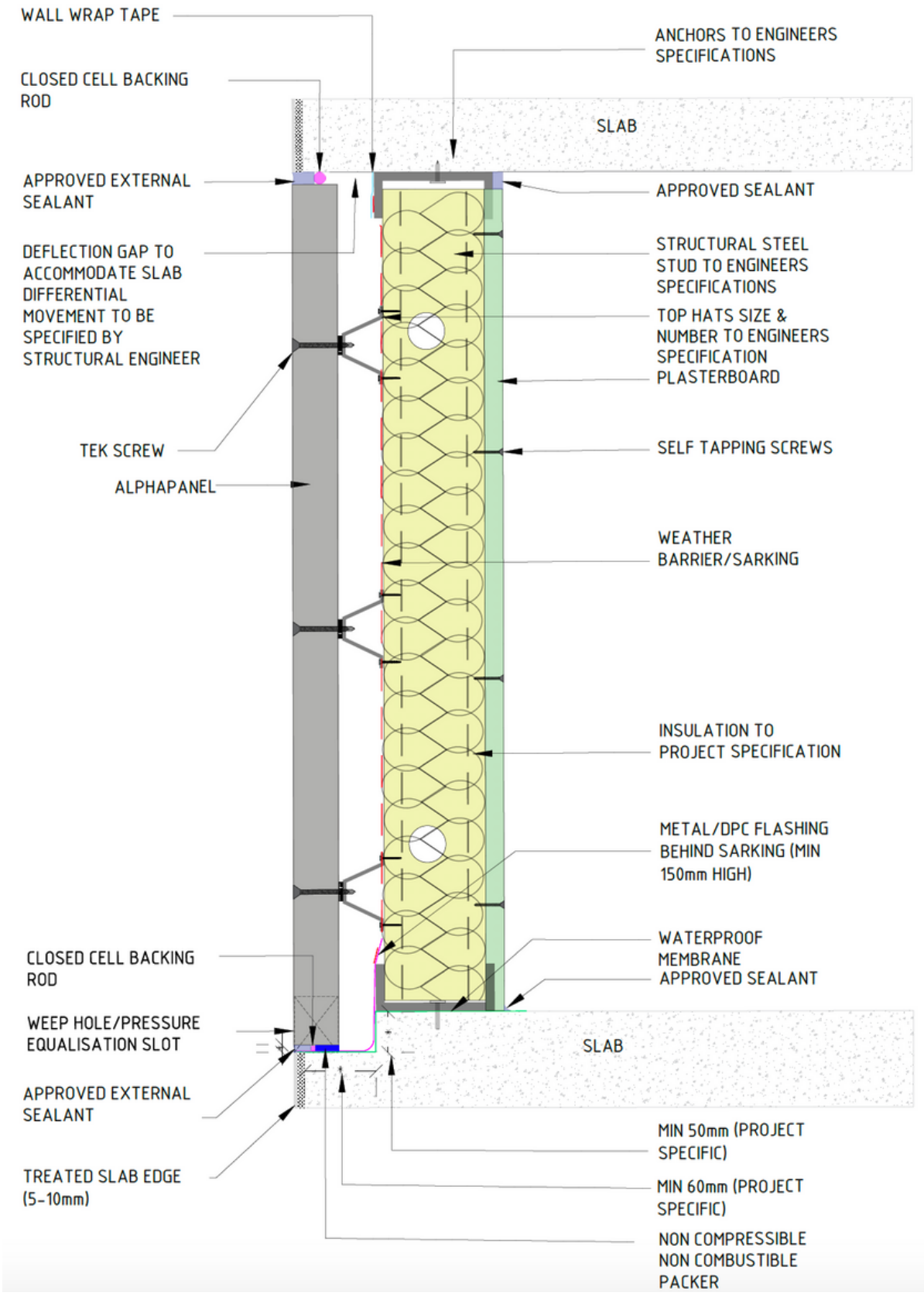
	R-Value (m^2K/W)											
	Wall Wrap / Sarking Type											
Wall Element	No Membrane		Vapour Permeable		Single-Sided Foil		Double-Sided Antiglare		Double-Sided Buble/Foam Foil R 0.2		Double-Sided Antiglare EPS Board R 0.37, 15mm	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Outdoor air film	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
35mm Alphapanel	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
25-50mm non-ventilated airspace			0.19	0.16	0.20	0.16	0.72	0.57	0.68	0.55	0.87	0.70
Sarking material R-value			0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.38	0.36
90mm airspace in studs	0.18	0.15	0.18	0.15	0.68	0.60	0.68	0.65	0.63	0.62	0.71	0.70
10mm plasterboard	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Indoor air film	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
System R-Value without insulation:	0.44	0.41	0.63	0.57	1.14	1.02	1.66	1.48	1.77	1.63	2.22	2.02
System Total R-Value with insulation												
Stud wall batts R1.5 (75mm)	2.04	1.84	2.04	1.84	2.04	1.84	2.64	2.34	2.74	2.54	3.14	2.84
Stud wall batts R2.0 (90mm)	2.54	2.34	2.54	2.34	2.54	2.34	3.14	2.84	3.34	3.04	3.74	3.34
Stud wall batts R2.5 (90mm)	3.04	2.84	3.04	2.84	3.04	2.84	3.64	3.34	3.84	3.54	4.24	3.84
Stud wall batts R2.7 (90mm)	3.34	3.04	3.34	3.04	3.34	3.04	3.94	3.54	4.04	3.74	4.44	4.04

Table 4.3: R-Value calculations 50mm AlphaPanel® façade wall system

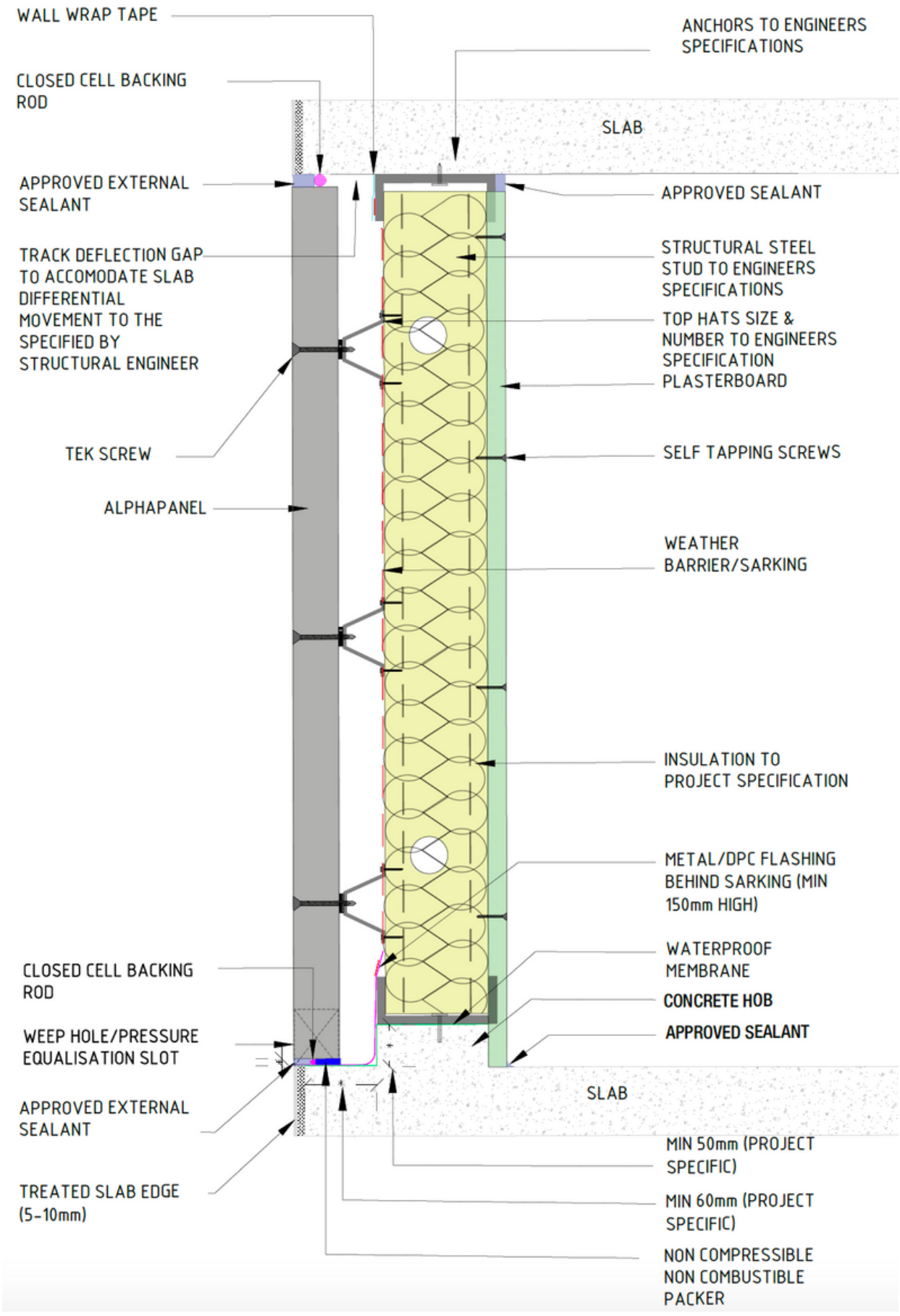
	R-Value (m^2K/W)											
	Wall Wrap / Sarking Type											
Wall Element	No Membrane		Vapour Permeable		Single-Sided Foil		Double-Sided Antiglare		Double-Sided Buble/Foam Foil R 0.2		Double-Sided Antiglare EPS Board R 0.37, 15mm	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Outdoor air film	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
50mm Alphapanel	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
25-50mm non-ventilated airspace			0.19	0.16	0.20	0.16	0.72	0.57	0.68	0.55	0.87	0.70
Sarking material R-value			0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.38	0.36
90mm airspace in studs	0.18	0.15	0.18	0.15	0.68	0.60	0.68	0.65	0.63	0.62	0.71	0.70
10mm plasterboard	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Indoor air film	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
System R-Value without insulation:	0.46	0.43	0.65	0.59	1.16	1.04	1.68	1.50	1.79	1.65	2.24	2.04
System Total R-Value with insulation												
Stud wall batts R1.5 (75mm)	2.06	1.86	2.06	1.86	2.06	1.86	2.66	2.36	2.76	2.56	3.16	2.86
Stud wall batts R2.0 (90mm)	2.56	2.36	2.56	2.36	2.56	2.36	3.16	2.86	3.36	3.06	3.76	3.36
Stud wall batts R2.5 (90mm)	3.06	2.86	3.06	2.86	3.06	2.86	3.66	3.36	3.86	3.56	4.26	3.86
Stud wall batts R2.7 (90mm)	3.36	3.06	3.36	3.06	3.36	3.06	3.96	3.56	4.06	3.76	4.46	4.06

STANDARD CONSTRUCTION DETAILS

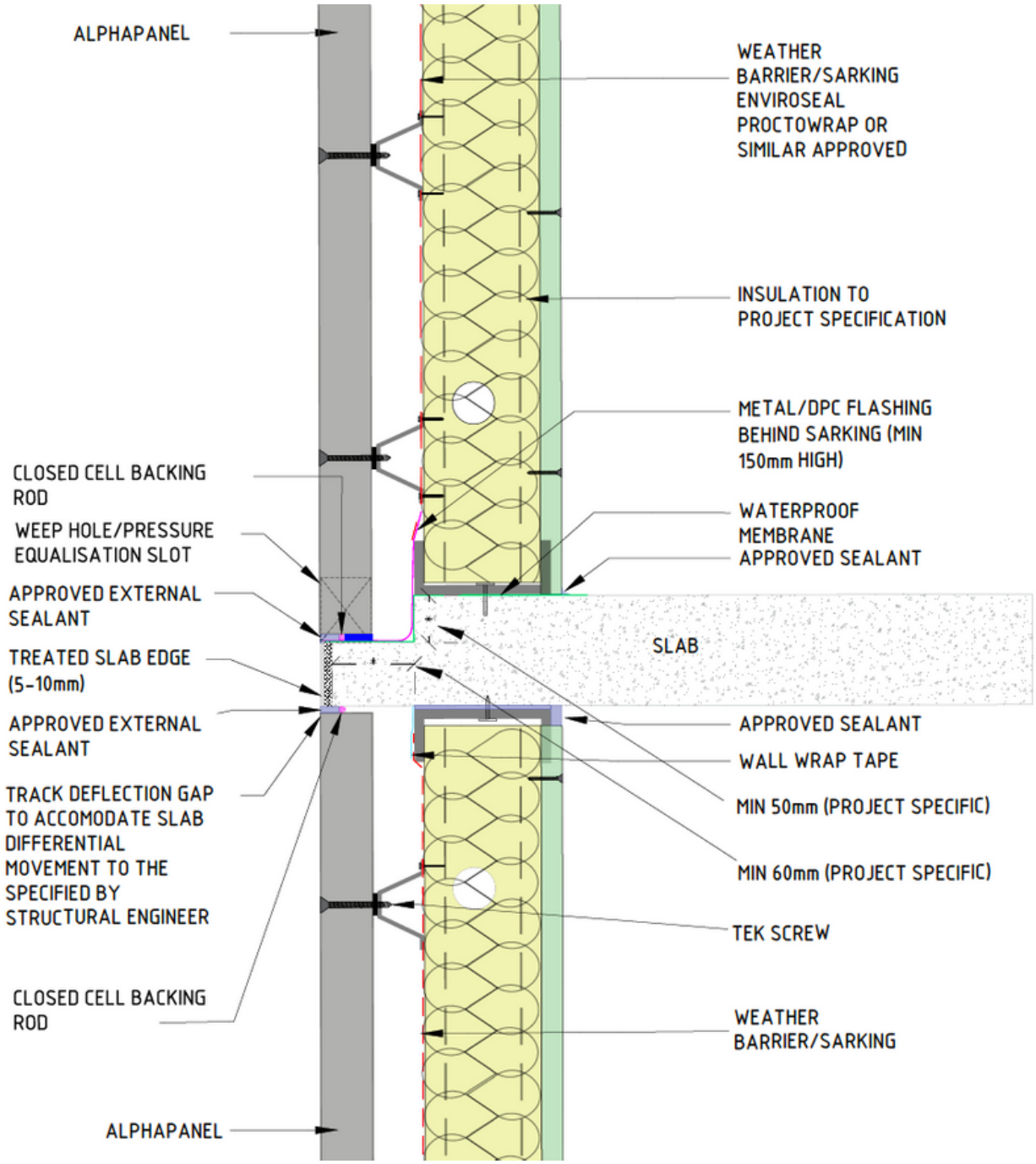
SL1.1 SLAB TO SLAB (SLAB REBATE)



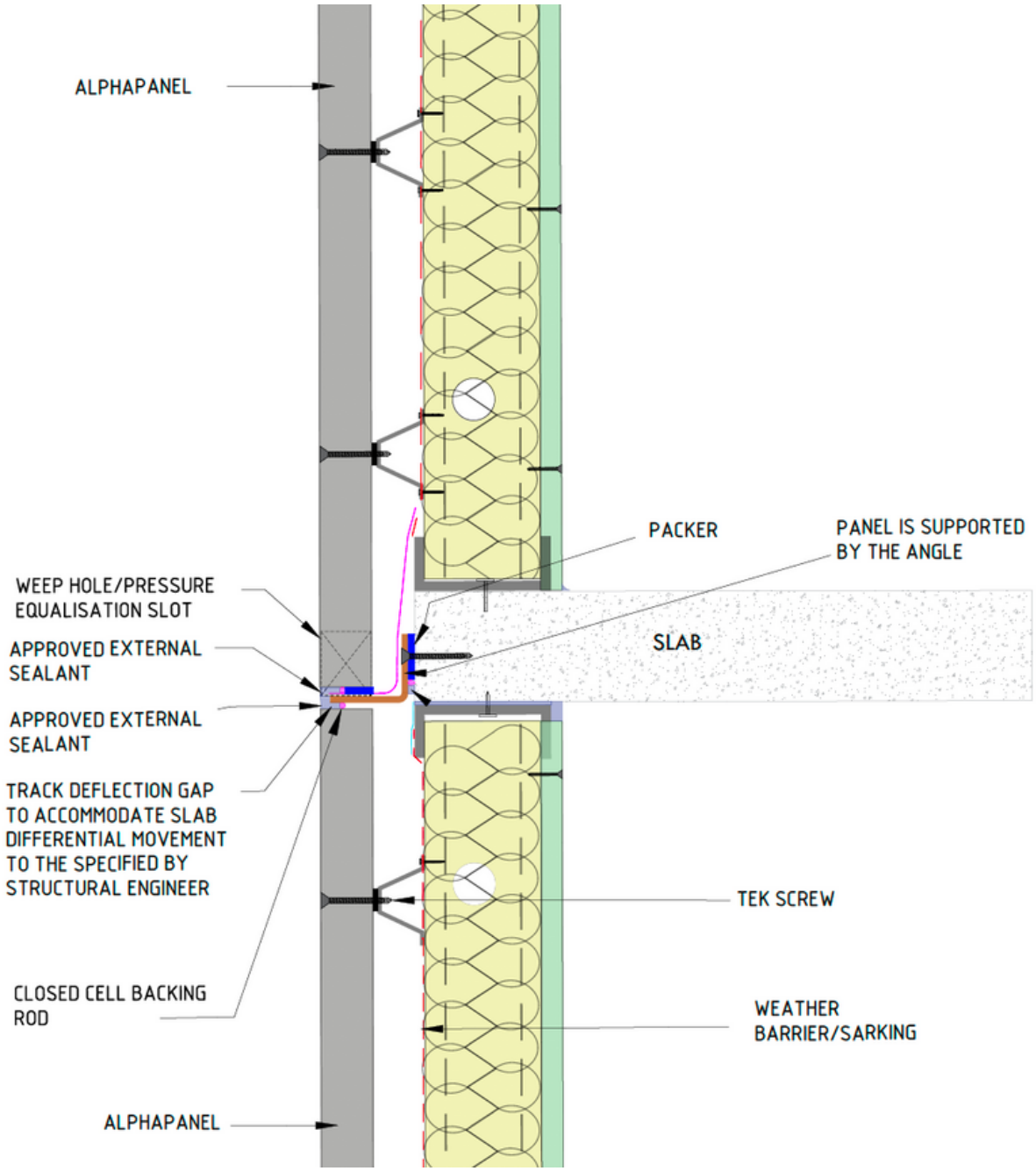
SL1.2 SLAB TO SLAB (HOB)



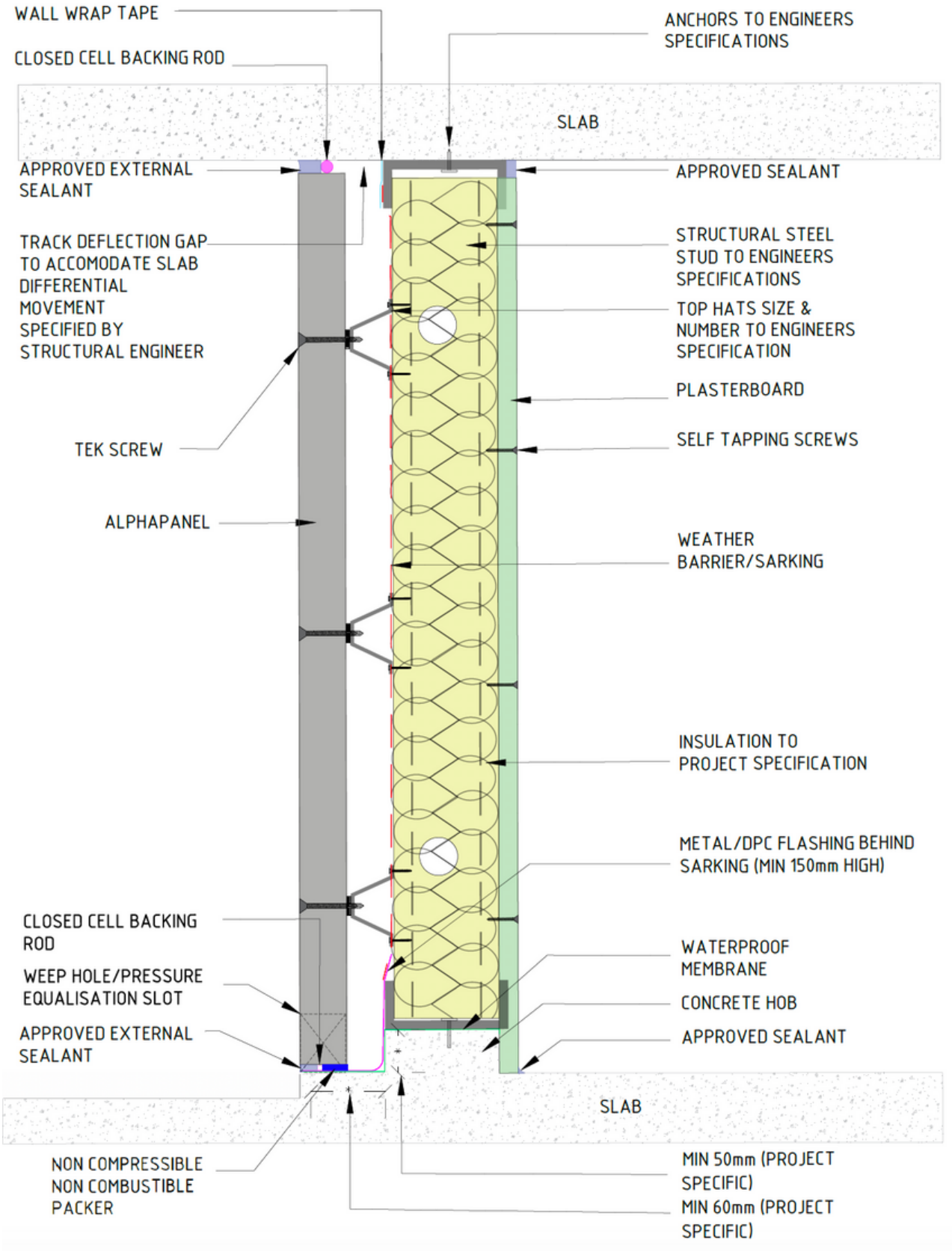
SL1.3 SLAB TO SLAB CONNECTION



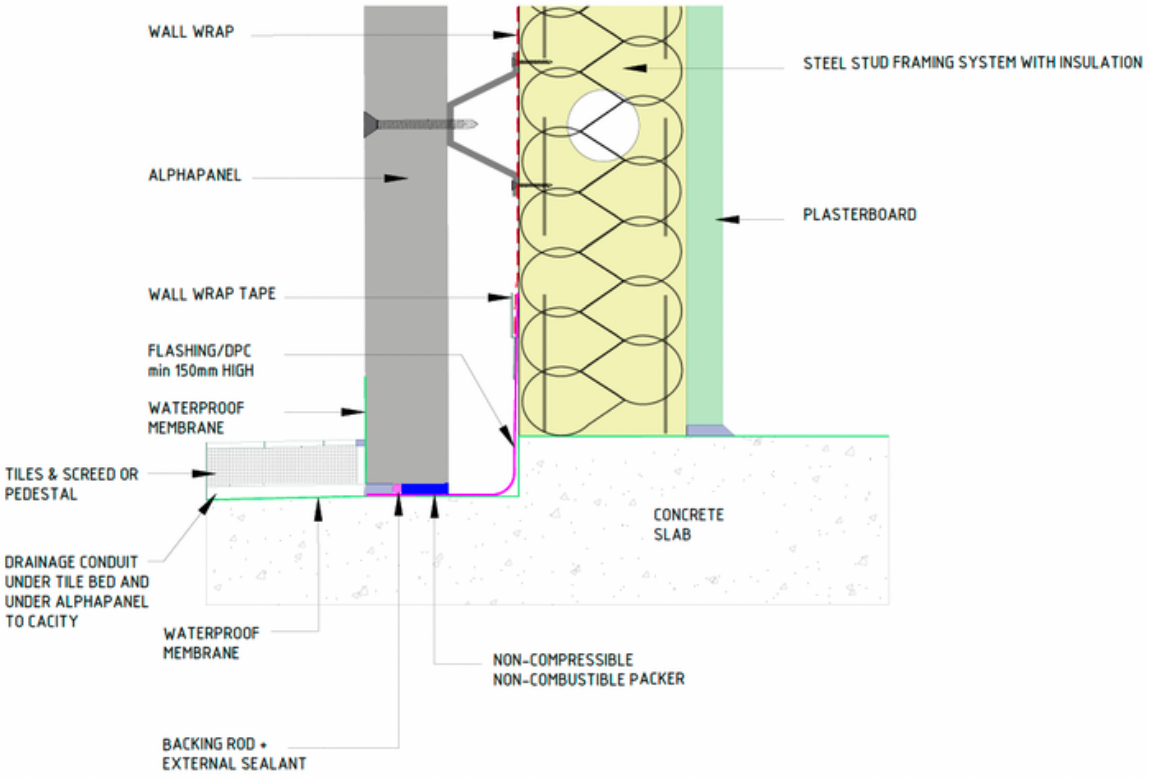
SA1.1 SHELF ANGLE CONNECTION



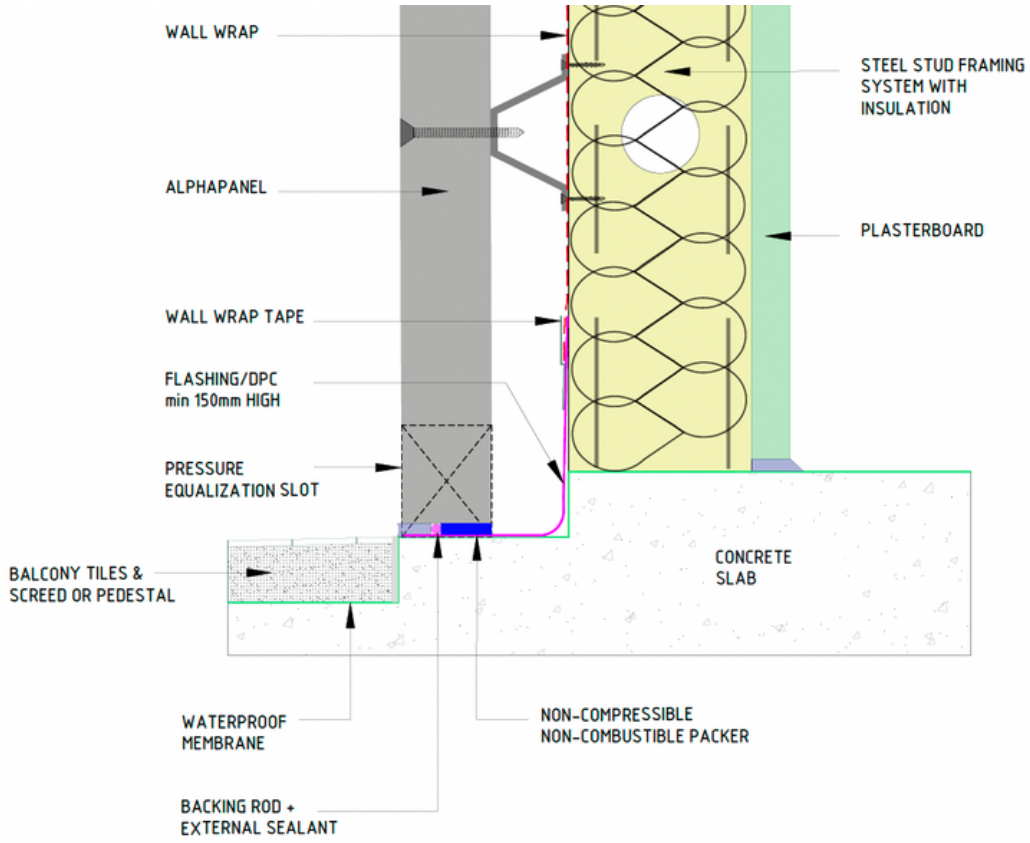
BW1.1 BALCONY WALL



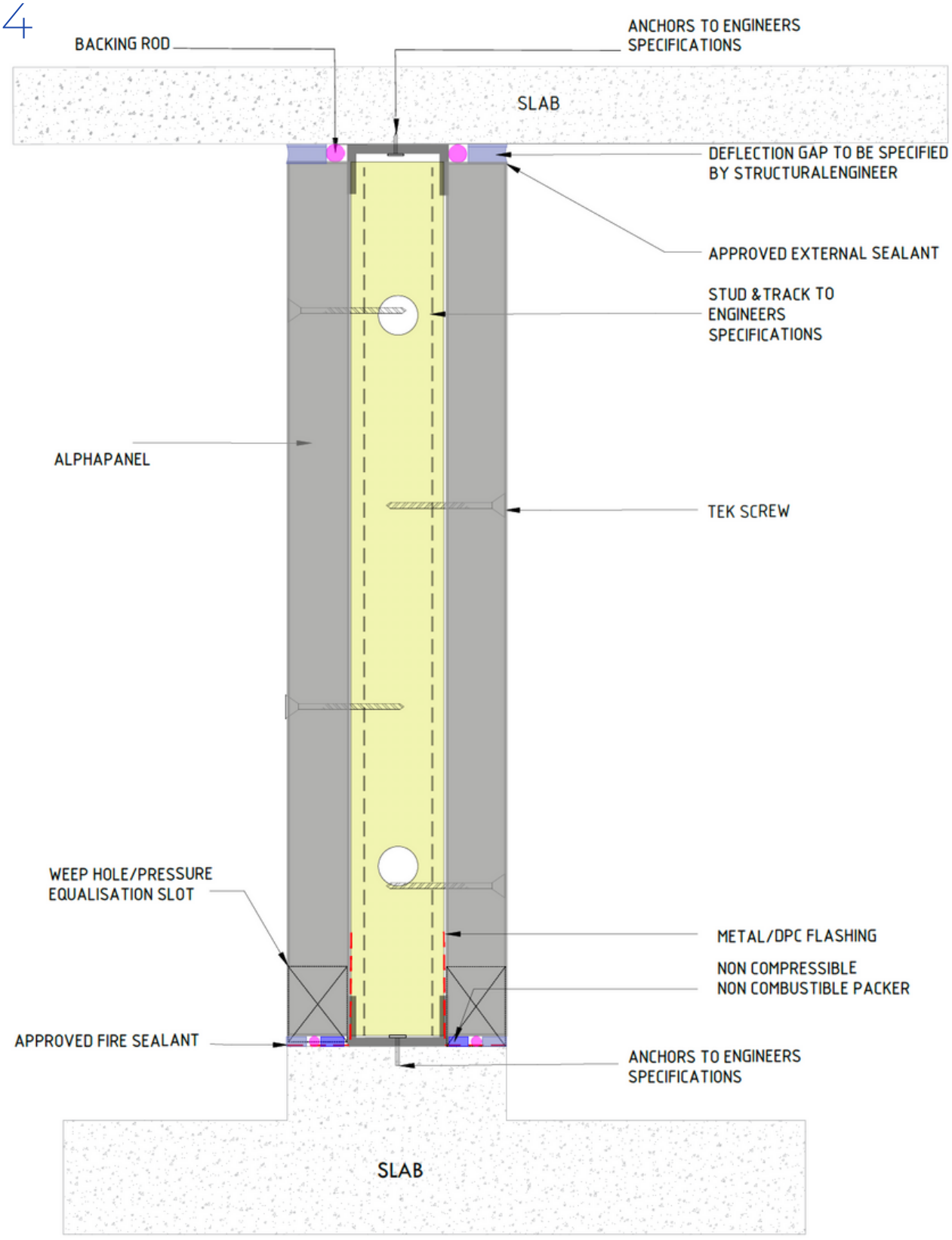
BW1.2 BALCONY WALL (SINGLE STEP DOWN)



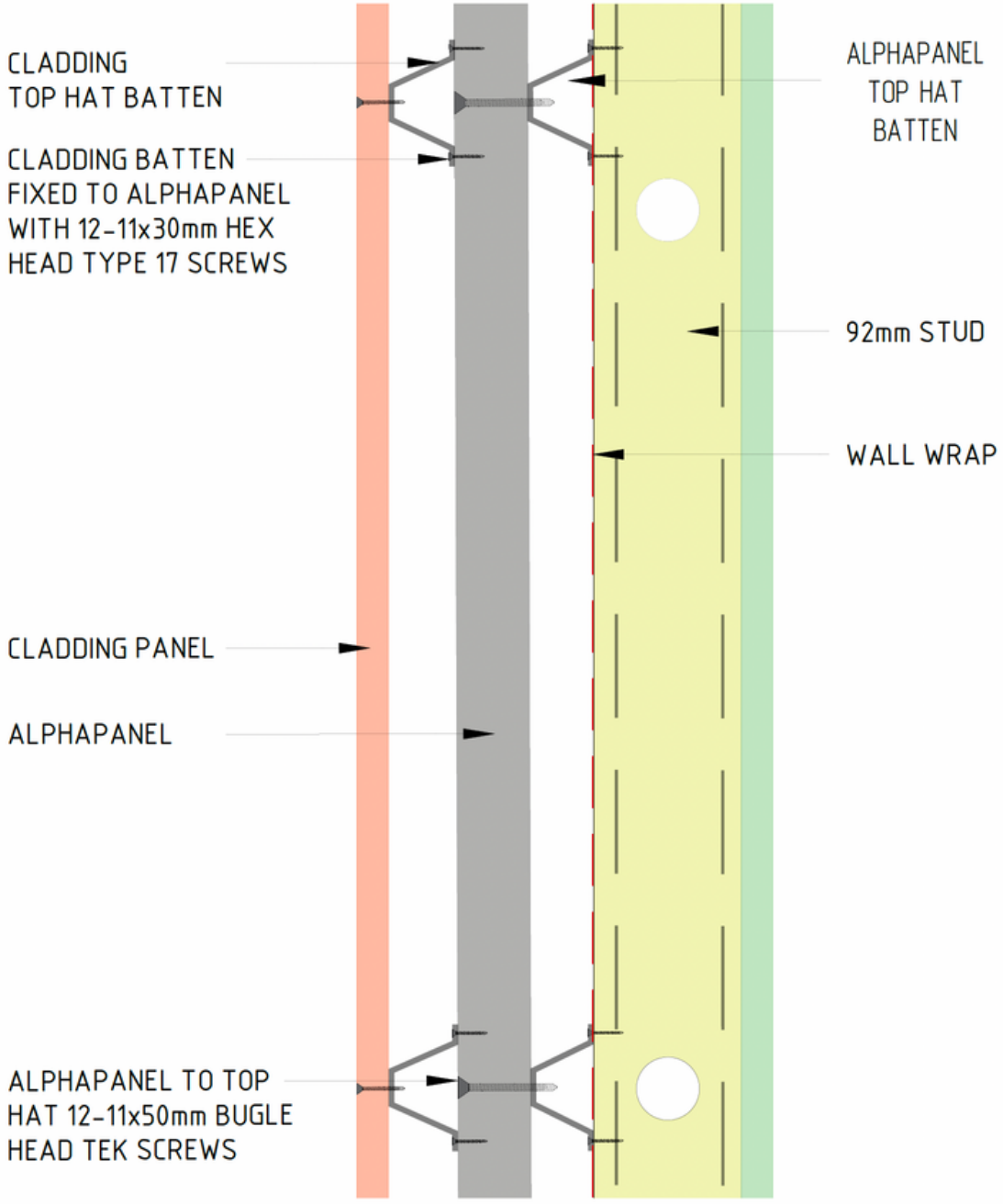
BW1.3 BALCONY WALL (DOUBLE STEP DOWN)



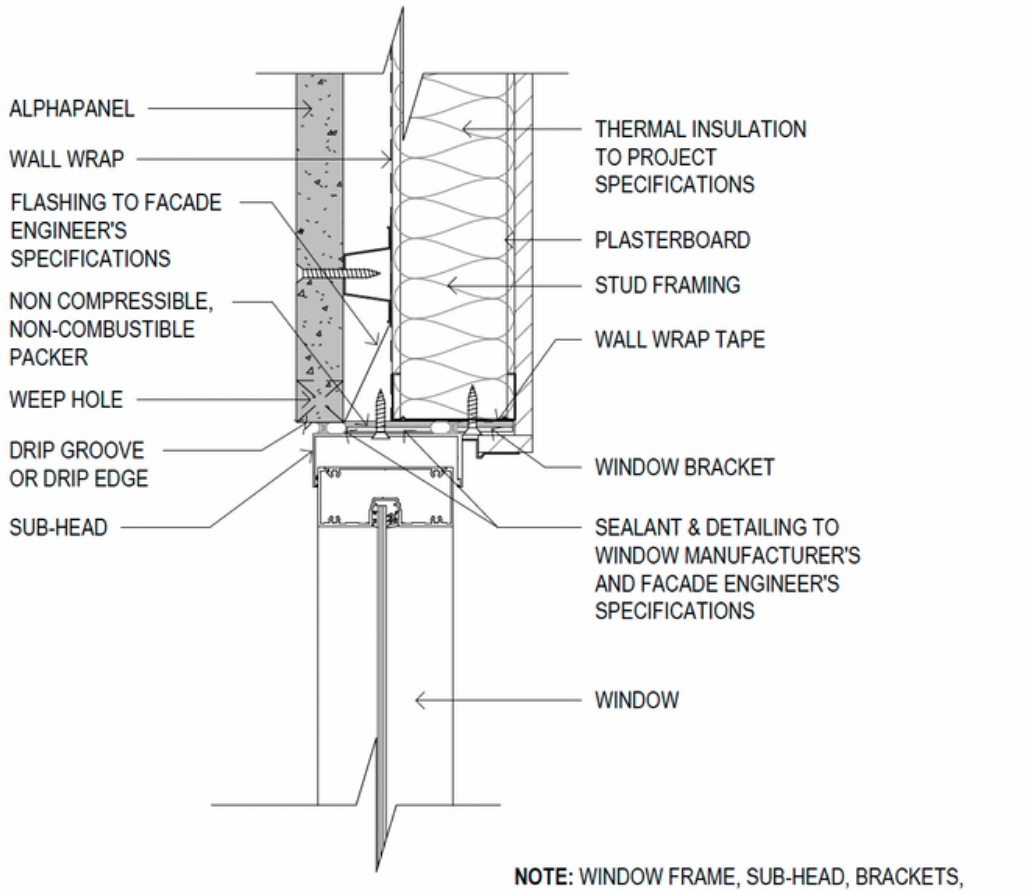
BW1.4 BALCONY BLADE WALL



CL1.1 USE OF ALPHAPANEL® AS SUBSTRATE WITH ADDITIONAL CLADDING

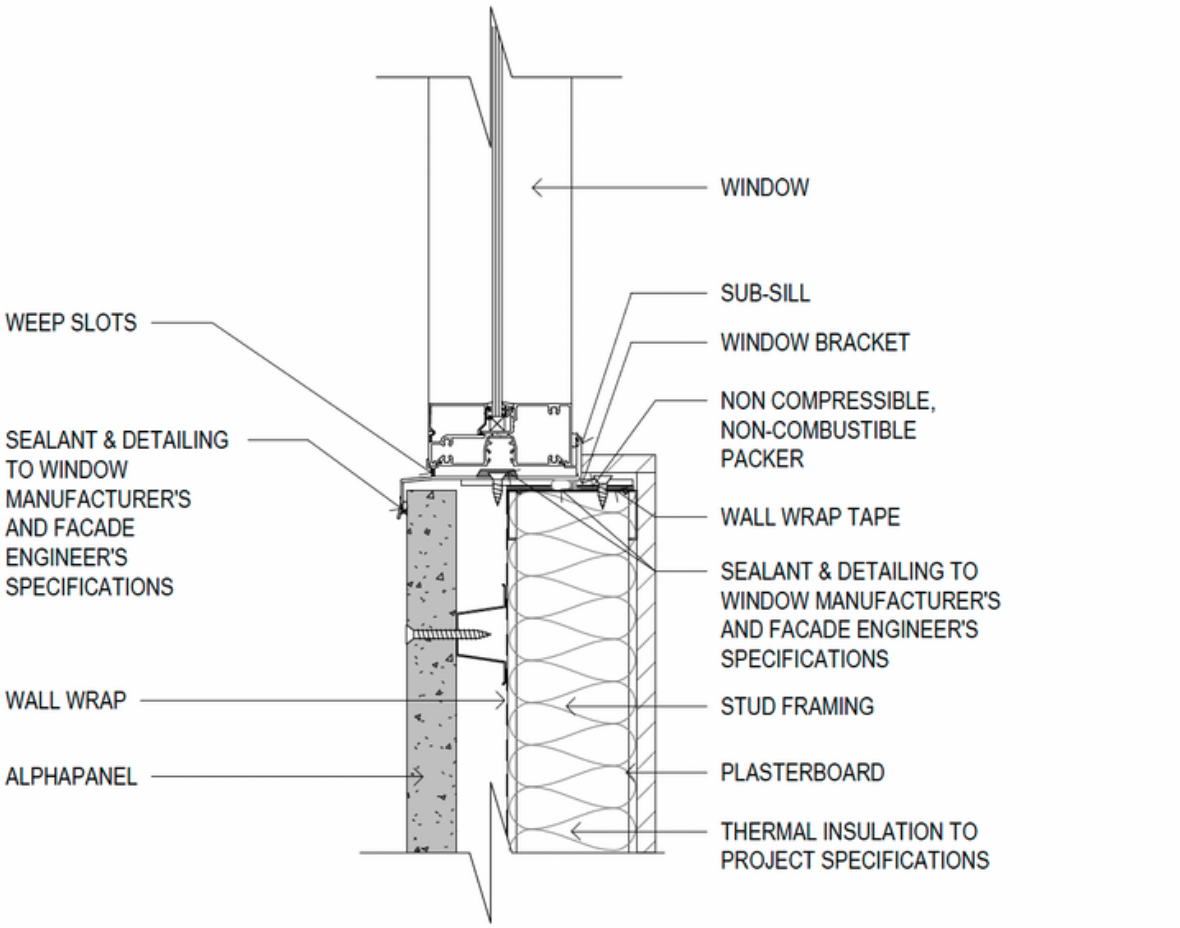


W1.1 WINDOW HEAD



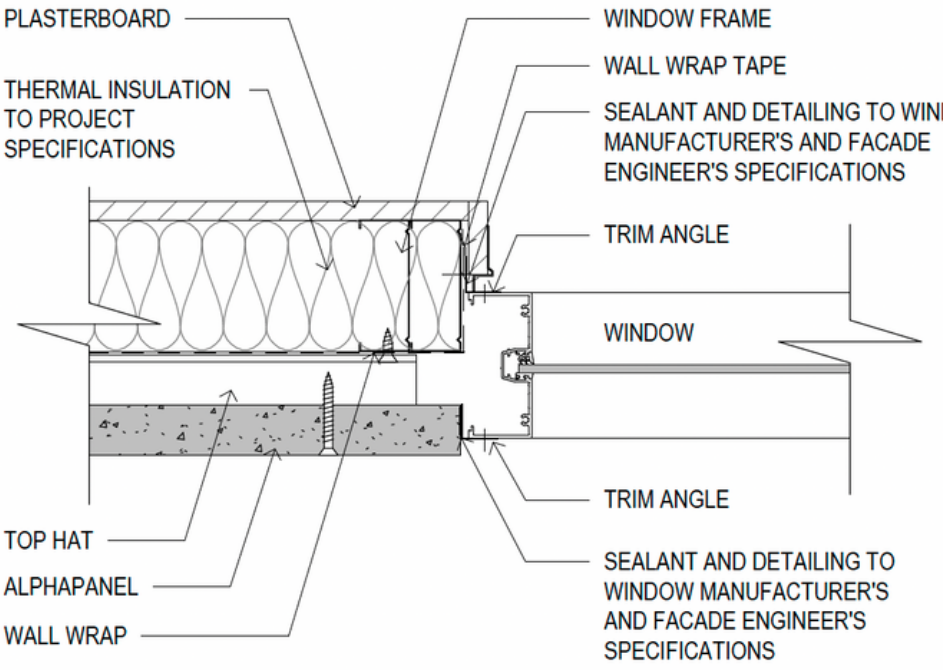
NOTE: WINDOW FRAME, SUB-HEAD, BRACKETS, CONNECTIONS AND SEALANT (WATER/ AIR SEAL) DETAILS TO WINDOW MANUFACTURER'S AND FACADE ENGINEER'S SPECIFICATIONS

W1.2 WINDOW SILL



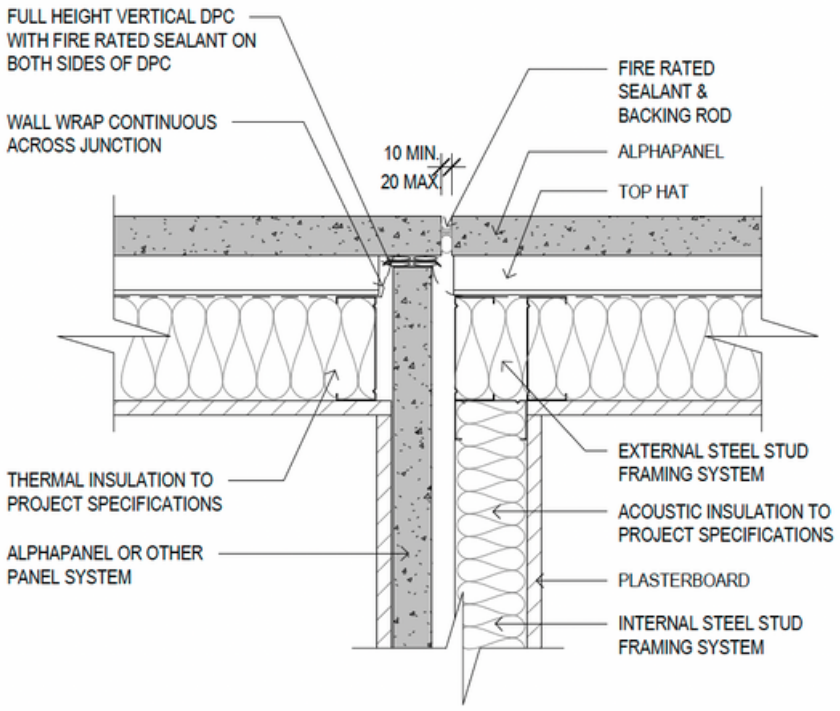
NOTE: WINDOW FRAME, SUB-SILL, BRACKETS, CONNECTIONS AND SEALANT (WATER/ AIR SEAL) DETAILS TO WINDOW MANUFACTURER'S AND FACADE ENGINEER'S SPECIFICATIONS

W1.3 WINDOW JAMB

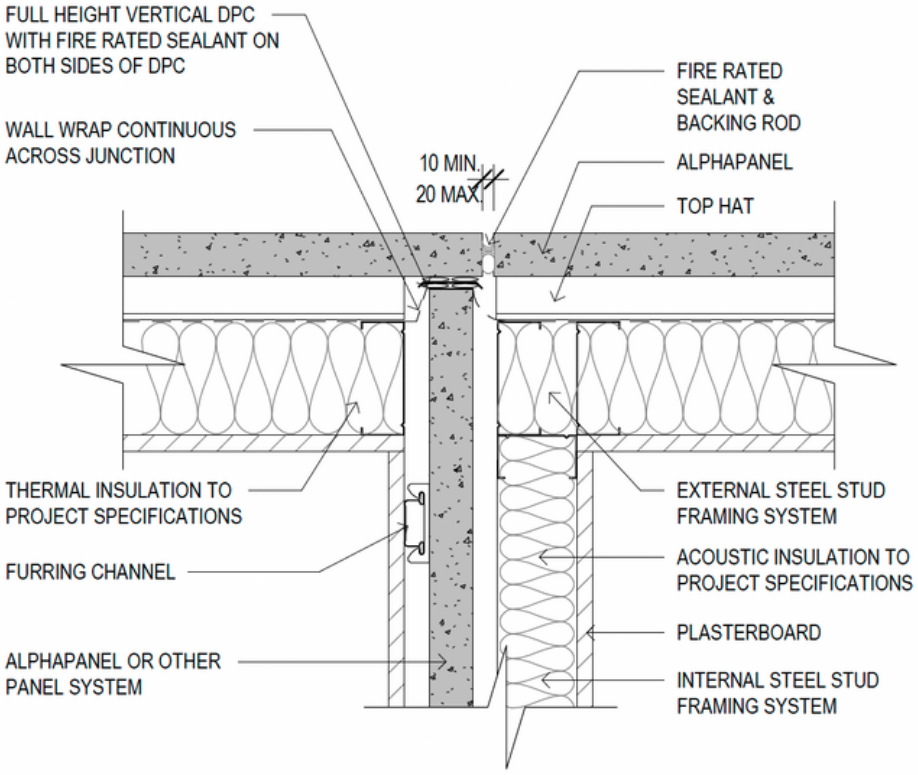


NOTE: WINDOW FRAME, TRIM ANGLES (OR SUB JAMB), CONNECTIONS AND SEALANT (WATER/ AIR SEAL) DETAILS TO WINDOW MANUFACTURER'S AND FACADE ENGINEER'S SPECIFICATIONS

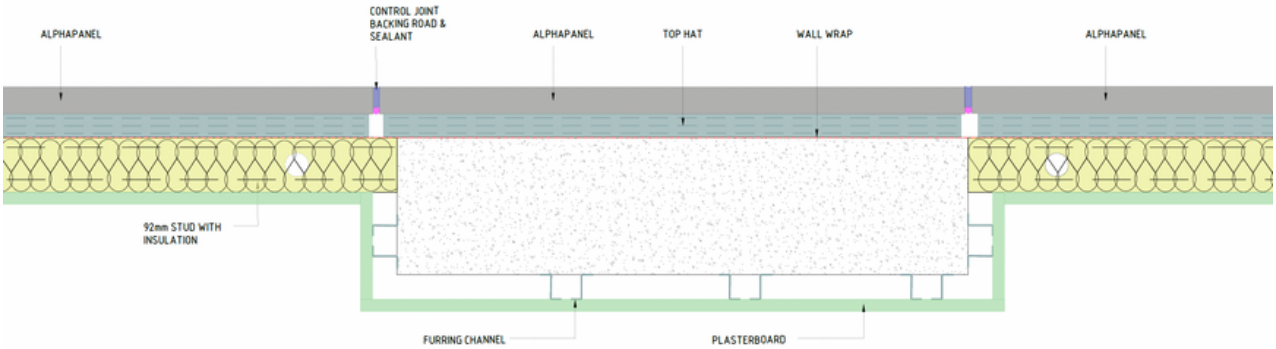
XJ1.1.1 ALPHAPANEL® & ALTERNATE WALL SYSTEM JUNCTION - 1



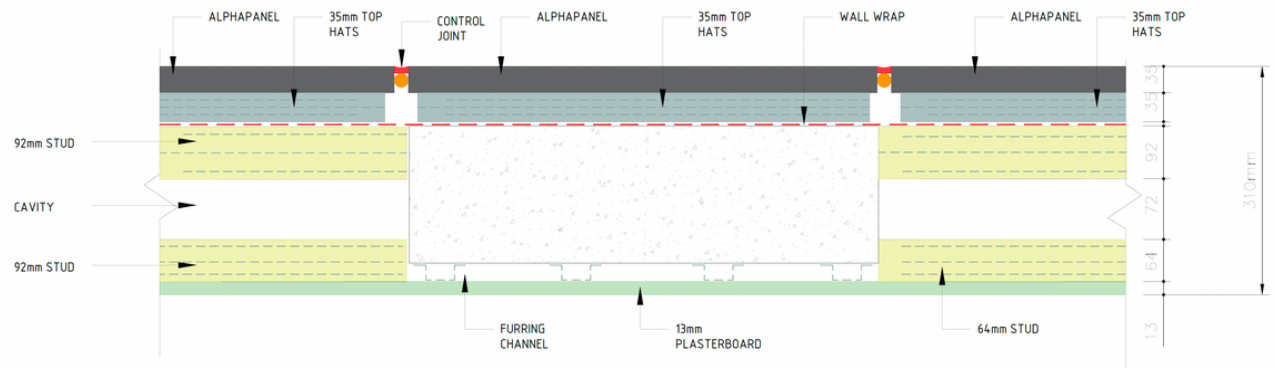
XJ1.1.2 ALPHAPANEL® & ALTERNATE WALL SYSTEM JUNCTION - 2



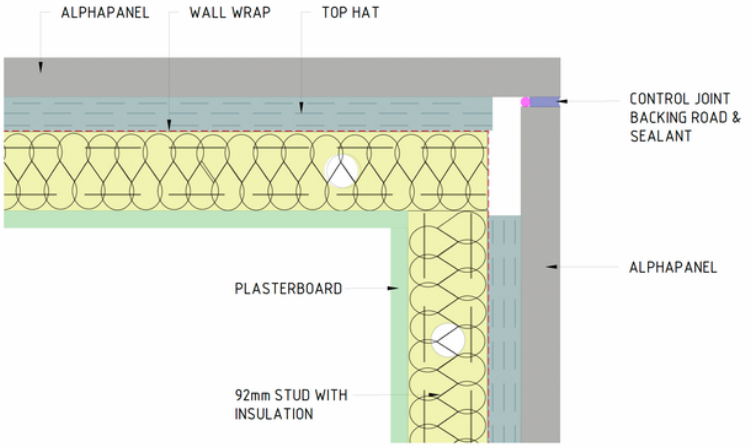
XJ1.2 ALPHAPANEL® & COLUMN JUNCTION (BOXED)



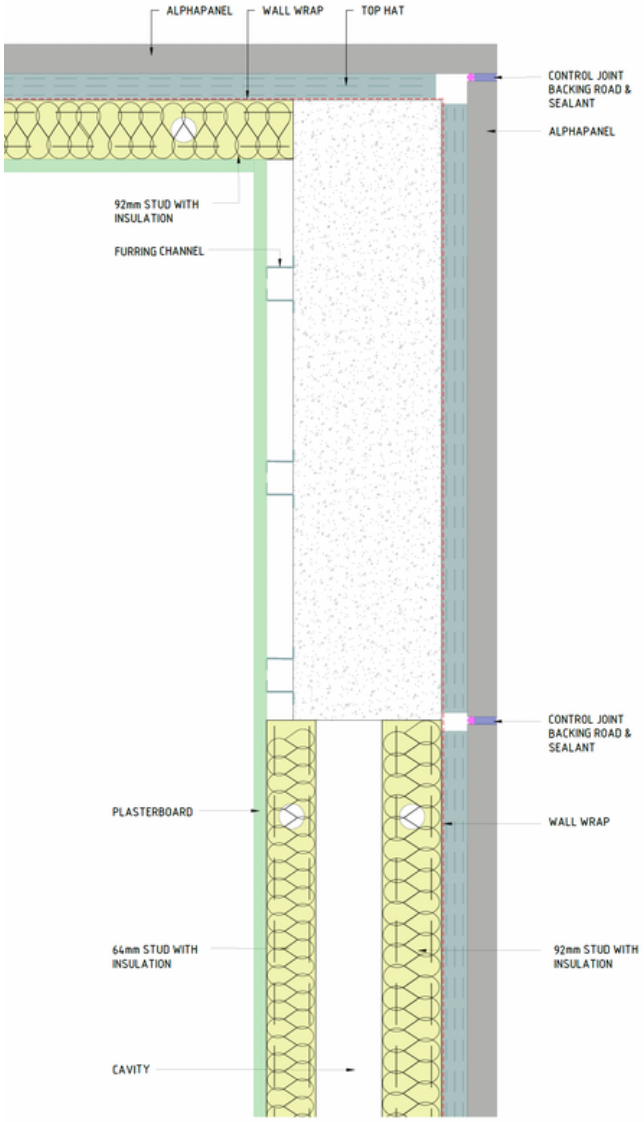
XJ1.5 ALPHAPANEL® & COLUMN JUNCTION (CONCEALED) OPTION 3



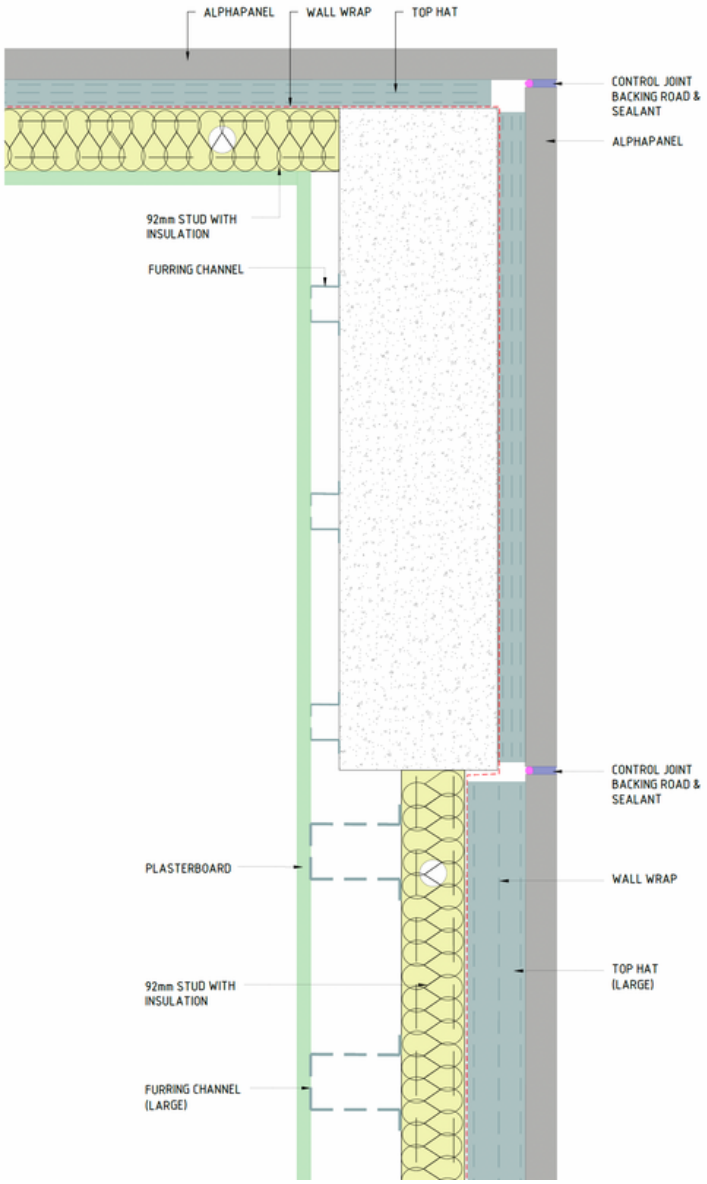
XJ1.6 EXTERNAL CORNER



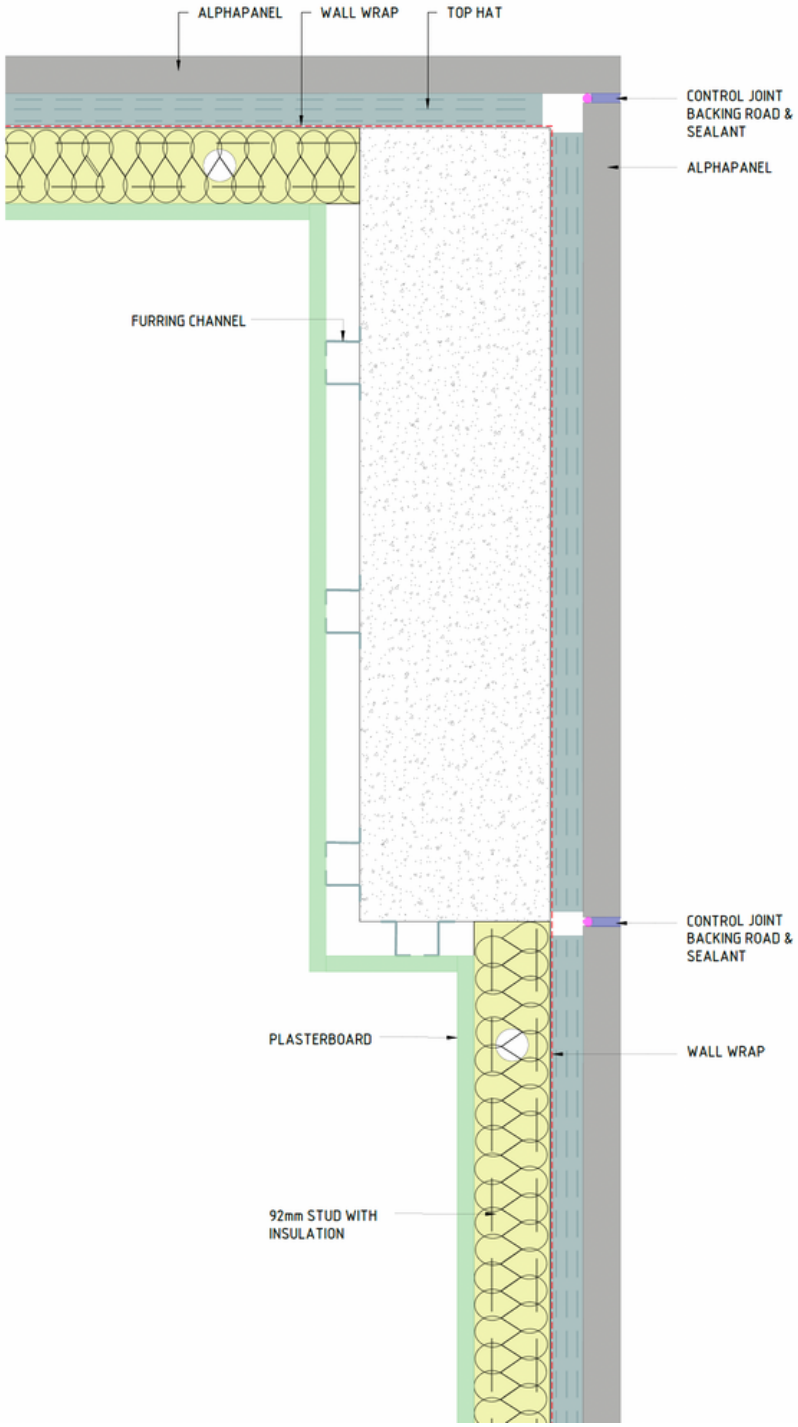
XJ1.7 EXTERNAL CORNER (CONCEALED COLUMN) OPTION 1



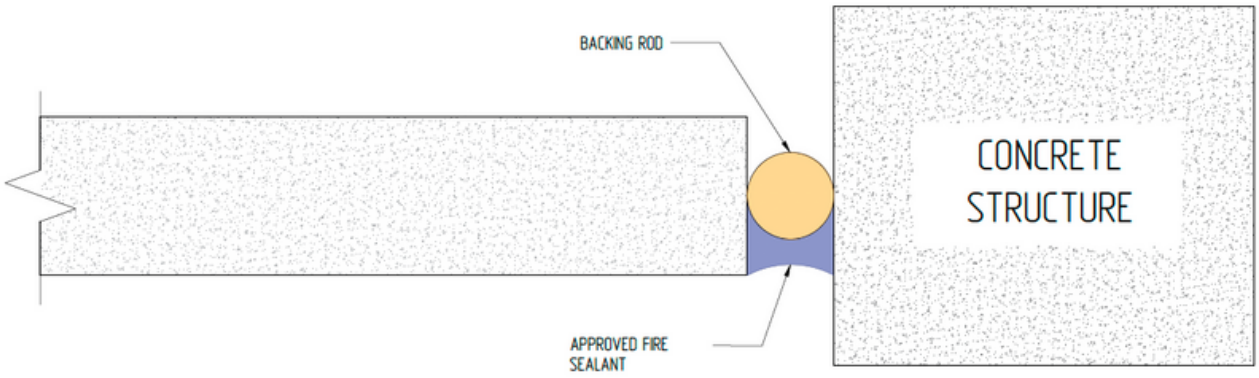
XJ1.8 EXTERNAL CORNER (CONCEALED COLUMN) OPTION 2



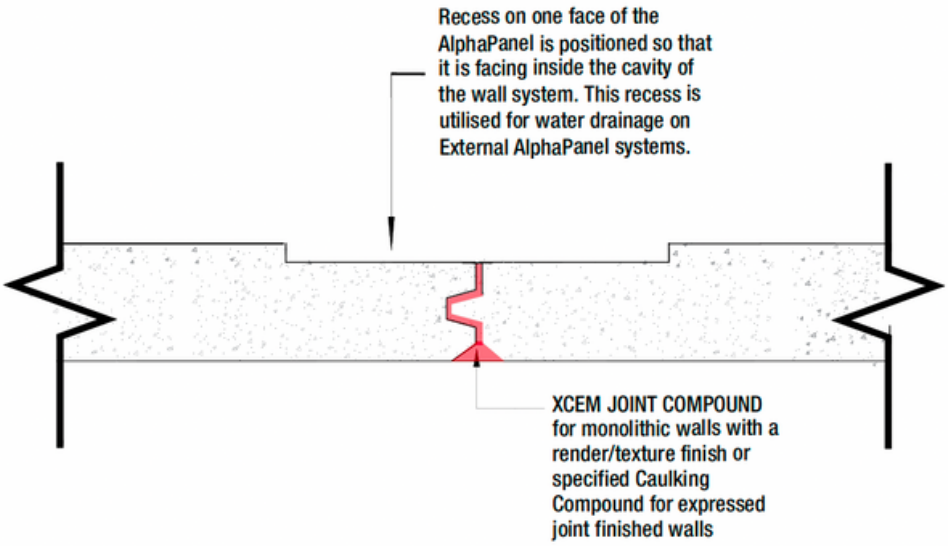
XJ1.9 EXTERNAL CORNER (BOXED COLUMN)



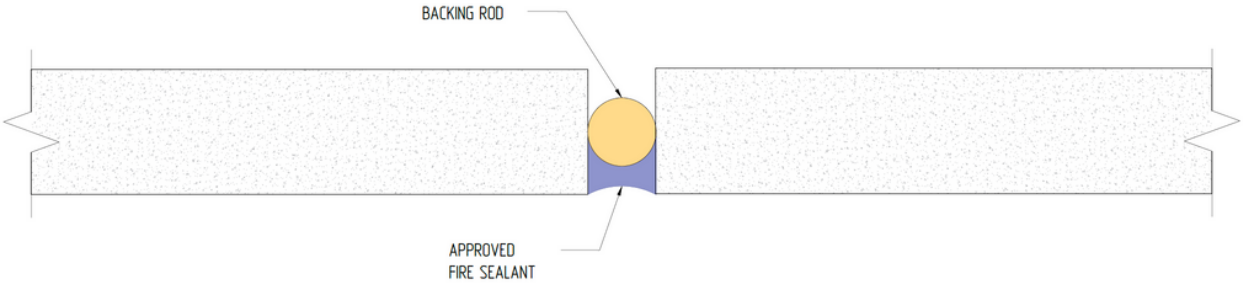
XJ1.3 PANEL TO ALTERNATE SYSTEM MOVEMENT JOINT



XJ1.4 EXTERNAL PANEL TO PANEL SET JOINT



XJ1.5 PANEL TO PANEL CONTROL JOINT



CONSTRUCTION NOTES

The Installer shall refer to the project drawings and specifications and shall perform work to the quality standards agreed with the builder. The notes below are important from an engineering and compliance perspective.

1. Cold-formed steel (CFS) components supporting AlphaPanel® wall systems shall be as follows:
    1.1. Lipped C92 x 1.15 mm BMT G2 (min.) studs at max. 600 mm ctrs. – design to be carried out and certified by CFS framing supplier or their nominated engineer.
    1.2. Structural deflection track at top of wall – to be designed and certified by CFS framing supplier or their nominated engineer, including fixing to concrete structure. The deflection track shall allow for adequate movement of the slab at the top of the stud wall.
    1.3. Provide slotted brackets as required if the capacity of the deflection track is insufficient for the localised reaction load from a stud or jamb stud.
    1.4. Base track and anchorage – to be designed and certified by CFS framing supplier or their nominated engineer. Provide a DPC between base track and a concrete slab.
    1.5. Top hats – Rondo sections and fixings as per Table 4.1 and have a coating class of min. Z275.
    1.6. Cold-formed steel framing members shall be galvanised as per project specifications and shall not be less than Z275 or AZ150.
    1.7. Screws shall be min. Class 3 in accordance with AS 3566.2. Class 4 or stainless steel screws are required in marine and severe environments. Refer to project specifications.
    1.8. Framed heads to openings shall be designed to support the mass of AlphaPanel®, and must be free to move within the deflection track.
2. The AlphaPanel® shall be evenly supported:
    2.1. within the J-track, or over the base angle; or,
    2.2. on a structural steel shelf angle that provides at least 25 mm even bearing; or,
    2.3. on the slab.
3. Joins in the shelf angle must be fire-sealed and the shelf-angle must be fire-sealed to the slab edge unless an additional fire stop is used between the back of the AlphaPanel® element and the slab edge.
4. AlphaPanel® shall be supported by top hat battens min. 100mm and max. 250 mm from each end, then evenly spaced between.
5. DPC shall be installed to the first batten or min. 150 mm above finished slab level and shall be expressed to the outside of the wall.
6. Wall wrap shall overlap the DPC by min. 100 mm. Tape wall wrap to DPC, around the perimeter and at all laps.
7. Provide nom. 10-20mm gap between top of panel and the concrete soffit or steel shelf angle to allow for deflection. Check against project engineer's specifications for specific allowances.
8. AlphaPanel® shall be fixed to top hats with the screws as specified in the relevant section of this Design Guide. Space screws 100 mm from each edge of the panel and evenly spaced in between. For panels of width less than 600mm, the spacing shall be equivalent.
9. For external fixing, if required, drill pilot holes Ø4mm in AlphaPanel®. Do not drill through top hat.
10. For internal fixing of AlphaPanel®, pre-drill top hat and if required, drill pilot holes Ø4mm in AlphaPanel®.

11. For monolithic/rendered walls AlphaPanel® joints are to be bonded using XCEM Joint Compound (2-part Epoxy Adhesive), or for expressed joint walls AlphaPanel® joints are to be bonded using a specified external caulking compound.
12. Provide 1,200 mm2 weep holes at max. 2,400 mm ctrs.
13. Provide vertical control joints (min. 12 mm wide) at the following locations:
    13.1. Max. 2,400 mm ctrs. or as specified by the project engineer, whichever is lesser.
    13.2. Where wall height changes by greater than 20%.
    13.3. A change in wall thickness.
    13.4. Locations corresponding to structure (slab) control joints.
    13.5. Generally at corners.
    13.6. Windows and doors.
    13.7. Junctions of different wall system types.
14. Top hat battens must be discontinuous behind control joints.
15. It is important to establish concrete tolerances that result in the un-rendered slab edge and any columns being located behind the finished AlphaPanel® wall system. Position the finished AlphaPanel® wall plane so that it is 5mm proud of the un-rendered slab edge. This will eliminate the need for scabbling of the edge beam and/or building out the wall surface.
16. Seal control joints with backing rod and external grade polyurethane sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014., 12 mm width x 6 mm depth.
17. Fire-rated sealants shall be approved for the application by the manufacturer. The contractor must follow the manufacturer's specifications and ensure surfaces to be bonded are clean, free of dust and debris, and prepared and primed as required.
18. Min. panel width when trimmed shall be 200 mm.
19. Flashing and sealing of windows is to be in accordance with the specifications and detailing supplied by the window manufacturer and facade engineer.
20. Coating of AlphaPanel® shall be in accordance with a specified system from coating supplier.
21. A fire seal must be provided in the following locations:
    21.1. Inter-floor junction – between the back of AlphaPanel® and the floor concrete edge beam when the panels are supported on a shelf angle, unless the angle is sealed to the slab edge and all joins in the shelf angle are fire sealed.
    21.2. Across the junction between a separating wall (party wall) and the back of the AlphaPanel® panel used in the façade wall.
    21.3. Between any column and the back of the AlphaPanel® at junctions between sole-occupancy units.
22. Mineral wool, IBS rod, fire-rated sealants, fire insulating boards and the like may be used as a fire seal with attention to the following:
    22.1. The fire resistance must be at least equivalent to that required by the wall system for the application.
    22.2. Water and moisture management are important – if the back of the AlphaPanel® is wet or there is condensation on the sarking, it must not be transported to the interior of the external wall or to the floor of the building. Install suitable DPC and flashing as necessary to manage cavity moisture. Any bridging of the cavity represents a water ingress risk.
    22.3. If the fire seal is located on the 'wet' side of the cavity, it must be unaffected and must maintain its fire resistance properties in the presence of water/moisture.

23. To achieve effective rain screen performance, attention must be paid to the following detailing elements:
    23.1. Horizontal airflow is to be eliminated by providing a cavity baffle at all external corners and at maximum 12 m centres along walls.
    23.2. Baffle or provide air-tight fire seal or flashing at interfloor junctions. Usually, a continuous shelf angle is sufficient provided joints are sealed and any gaps between it and the floor structure are sealed.
    23.3. Provide minimum 500 mm2 of air vents per m length of wall at the base of the wall to allow sufficient volume for cavity pressure equalisation.
    23.4. Provide a suitably robust wall wrap to the cavity face of the steel studs.
    23.5. Ensure the wall wrap is sealed to the structure preventing airflow from the (top hat) cavity to the inside of the building (stud cavity).
    23.6. Provide an airseal around the internal lining to prevent airflow between the inside of the building and the stud cavity.
    23.7. Check the internal airseal path through window and door elements to ensure no leaks are present.
    23.8. As it can be difficult to achieve perfect rain screen performance, attention must be paid to the detailing of elements that bridge the cavity to ensure water is not forced into the building past the wall wrap. Any water ingress must be drained to the base of the cavity and exited at each building level.
24. Minimum Shelf angle specification for compliance with AS 1530.4:2014 as per Warringtonfire report FAS210087 R1.1 is minimum 65 x 65 x 5mm equal angle fixed to the slab using minimum M10 anchors at 1200mm centres is capable of resisting the weight of the AlphaPanels® (please consult with project engineer for confirmation):

Description	Value
Load per metre	178.5kg/m
Fixing spacing	1.2m
Uniform load on the angle	1.75 kN/m
Maximum bending moment	0.32 kNm
Yield strength of steel at ambient temperature	320 MPa
Calculated flexural capacity of the angle - 65 X 65 X 5 EA	0.73 kNm
Safety factor	0.43 < 1
Design Feasibility	SAFE

DOCUMENTATION

It is recommended that a façade engineer be engaged to create a specification for the project and to oversee creation of site specific details.

The information necessary to construct the AlphaPanel® wall systems shall be as required in AS 5146 Part 1, summarised in AS 5146 Part 3 – Appendix A.

ALPHAPANEL® HIGH-RISE INTERNAL WALLS

AlphaPanel® internal wall systems are the slimmest footprint intertenancy and corridor systems available in the market. Substitution of AAC or plasterboard wall systems with AlphaPanel® creates on average an additional 1.5 square meters per apartment in Net Saleable Area (NSA).

COMPONENT SPECIFICATIONS

Wall types considered in this section of the Design Guide are non-loadbearing internal walls that include separating walls, intertenancy walls, corridor walls, service riser walls, pod partition walls, and general partition walls. AlphaPanel® is the key element of a composite non-load-bearing partition wall with fire resistance and acoustic insulation suitable for separation between sole-occupancy units in multi-storey concrete frame structures.

- Panel: 35 mm thick or 50 mm thick AlphaPanel®, 600mm or 450 mm wide and max. 3,300 mm length.
- Base restraint: XCEM base angle; or XCEM J-track; or 50x50x0.8 mm BMT G2 Z275 (min.) slotted angle, 3x No.12-11x30 Type 17 hex head screws per 600mm wide panel, max. 200mm ctrs.
- Panel head restraint: XCEM head angle; or XCEM deflection track; or 75x50x1.15 mm BMT G2 Z275 slotted angle, 3x No.12-11x30 Type 17 hex head screws per 600mm wide panel, max. 200mm ctrs.
- Framing: Cold-formed steel framing in accordance with AS/NZS 4600. Min. C64 x 0.50 mm BMT G2 lipped studs, base track, and deflection track to suit and furring channels min. 0.42 mm BMT, Z275 coating in accordance with AS 1397.
- Furring Channel: 28mm Furring Channel 0.5BMT
- Screws: In accordance with AS 3566 Part 1 and Part 2 Coating Class to project specifications
- Sealants: Fire-rated (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014) and acoustic rated, prepared and installed in conjunction with a backing rod.

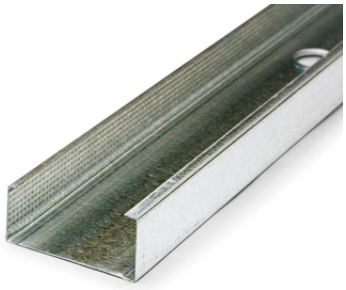
ALPHAPANEL® HIGH-RISE INTERNAL WALLS COMPONENT LIST

ALPHAPANEL®

Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	2850, 3000, 3300	45kg/m2
50mm AlphaPanel®	450mm	2850, 3000, 3300	65kg/m2

STEEL FRAMING

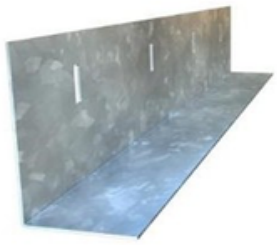
Cold-formed steel framing in accordance with AS/NZS 4600. Min. C64 x 0.50 mm BMT G2 lipped studs, base track, and deflection track to suit and furring channels min. 0.42 mm BMT, Z275 coating in accordance with AS 1397.



HEAD & BASE ANGLES

Galvanised Slotted Angles are used for Internal fixing of AlphaPanel® wall systems.

Head Restraint - 75 x 50 x 1.15 BMT G2 Z275 (min.) Slotted Angle
Base Restraint - 50 x 50 x 0.8 BMT G2 Z275 (min.) Slotted Angle



CAULKING COMPOUNDS

Use an Approved Fire-Rated Sealant to caulk all AlphaPanel movement joints, control joints, deflection gaps and penetrations. For walls which require a fire rating use Botsik FireBan One or another approved acoustic and fire-rated sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014.

EARTHWOOL INSULATION

AlphaPanel® wall systems incorporate Earthwool Insulation. Please contact insulation suppliers, and ensure specifications meet those specified in this Design Guide.

BACKING ROD

Backing rod is used to control the depth of sealant, please ensure the appropriate size backing rod is utilised for the gap required to be caulked. Please follow manufacturer's instructions.

FURRING CHANNEL CLIPS

Some AlphaPanel® internal wall systems utilise adjustable clips to mount furring channels to AlphaPanel®.

FURRING CHANNEL

28mm Furring Channel 0.5BMT mounted on the adjustable clips.

PLASTERBOARD

AlphaPanel® Internal wall systems incorporate plasterboard lining. Use specified plasterboard in accordance with this Design Guide, or the project Fire/Acoustic Engineer's specifications.

FIXINGS

Slotted Angle to concrete soffit & slab: Drive pins and concrete nails (check size and suitability with supplier).

Slotted Angle to AlphaPanel®: No.12-11x30 Type 17 hex head screws. Pre-drill AlphaPanel® first with a 4mm Masonry drill bit.

Adjustable Clip to AlphaPanel®: 6 Gauge, 25mm, drill point, fine thread, plasterboard screws. AlphaPanel does not require pre-drilling when using this screw.

Plasterboard to Furring Channel: 6 Gauge, 25mm, drill point, fine thread, plasterboard screws.

Door Frame to AlphaPanel®: 14 Gauge, 50mm long, Type 17 Coarse thread bugle head screws. Pre-drill AlphaPanel first with a 4mm drill bit.

Pre-drilling of AlphaPanel®: 4mm Masonry drill bit.

In accordance with AS 3566 Part 1 and Part 2

STRUCTURE

Engineering design of AlphaPanel® is based on accepted engineering principles for design of partition wall elements and fibre-reinforced concrete panels, together with testing conducted by Mahaffey Associates and calculations in accordance with AS 1170.0 Appendix B. The structural adequacy of 35 mm AlphaPanel® of maximum length 3,300 mm and its lateral restraints and fixings is satisfied for the following wind actions:

- Ultimate Limit State Wind Pressure: Wu = 0.375 kPa
- Serviceability Limit State Wind Pressure: for mid-height deflection limit of Ws = 0.25 kPa, $\delta \leq H / 250$

And the following imposed action:

- Live load, horizontal, applied mid-height: for strength, and mid-height deflection limit of Q = 0.7 kN, $\delta \leq H / 160$

Exclusions:

- Actions other than those specified above.
- The design of associated cold-formed steel framing. Refer to the manufacturer's design literature and project specifications.
- The design of plasterboard lining elements. Refer to manufacturer's design literature and project specifications.

See Figure 2.1 for ultimate wind pressure (Wu) and serviceability wind pressure (Ws) vs. AlphaPanel® span in the vertical plane.

FIRE

NCC Volume One Specification C1.1 Table 3 for Type A construction in Class 2, 3 and 4 (part) specifies the requirements for non-loadbearing internal common walls or bounding walls. For walls complying with NCC Volume One Specification C1.1 and Part G5, and NCC Volume Two 3.7.2.4 and Part 3.10.5:

AlphaPanel® Internal Wall Systems as per Warringtonfire FAS210067 R1.0:

- 35mm AlphaPanel® + 13mm standard plasterboard -/60/60 (Two Way)
- 35mm AlphaPanel® + 16mm fire-rated plasterboard -/90/90 (Two Way)
- 35mm AlphaPanel® + 35mm AlphaPanel® -/120/120 (Two Way)
- 50mm AlphaPanel® -/120/90 (Two Way)
- 50mm AlphaPanel® + 13mm standard plasterboard -/120/120 (Two Way)

For compliance with NCC Volume One Specification C3.15 & C3.4: Warringtonfire report FAS210171.

The above test reports are evidence of suitability as per NCC Volume One A2.3(2)(a) and Volume Two A2.3(2)(a) satisfying the Assessment Method of NCC Volume One A5.2(1)(d) and Volume Two A5.2(1)(d). For best project outcomes it is recommended that a fire engineering consultant be engaged to provide full project specifications and consideration of junctions and other project specific detailing.

SOUND TRANSMISSION & INSULATION

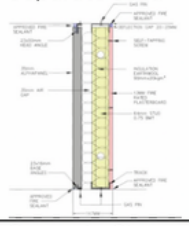
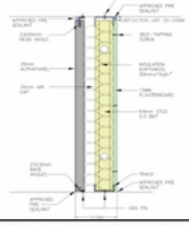
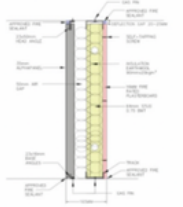
Common walls between sole-occupancy units must satisfy the acoustic insulation requirement of Rw+Ctr ≥ 50, where Rw is the weighted sound reduction index and Ctr is a correction factor weighted to low-frequency sounds (a negative number). Some common walls must also satisfy a requirement that impact noise is not transmitted across it. Walls with a cavity of 20mm minimum are deemed-to-comply with this discontinuous construction requirement. Walls with a cavity may only be connected via the structure at the periphery.

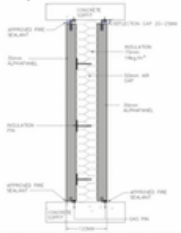
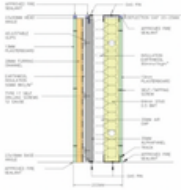
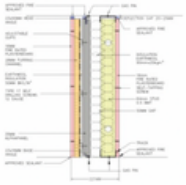
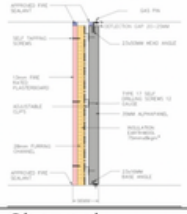
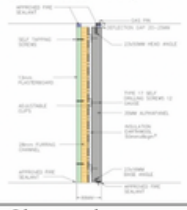
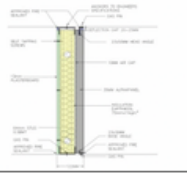
The acoustic performance of AlphaPanel® walls has been determined by PKA Consulting based on testing carried out at Resolute Testing Laboratories Pty Ltd (NATA Accreditation No.: 20089, Site No.: 23656). Refer to Report Ref.: PKA100XCM R01v2, Acoustic Performance Assessment – XCEM AlphaPanel® High-Rise Wall Systems for full details and conditions. .

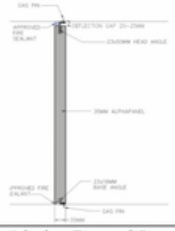
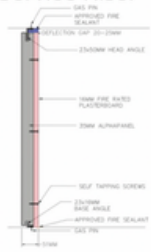
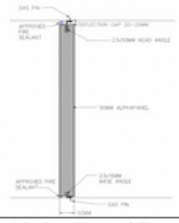
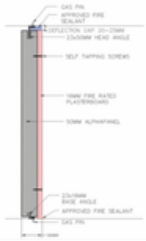
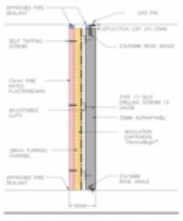
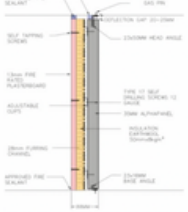
The basis of compliance with NCC Volume One F5.5 and NCC Volume Two Part 3.8.6 is NCC Volume One A2.3(2)(a) and Volume Two A2.3(2)(a) satisfying the Assessment Methods of NCC Volume One A5.2(1)(d) and (e) and Volume Two A5.2(1)(d) and (e).

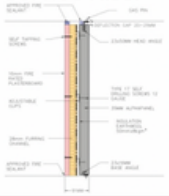
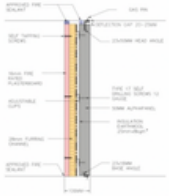
Typical wall configurations and ratings are provided in Table 5.1. It is recommended that an acoustic engineering consultant be engaged to provide full project specifications and consideration of junctions and other project specific detailing.

Table 5.1: AlphaPanel® Internal Wall System Acoustic & Fire Performance

Wall Type		Description	Wall Thickness	Rw	Rw+Ctr	FRL
XI1.1	Separate Stud 	35 mm AlphaPanel® 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.75 mm BMT at 600mm ctrs • 90 mm Earthwool Sound Shield insulation, 20 kg/m3 density 13 mm fire-rated plasterboard, 10.5 kg/m2 density	147 mm	60	54	-/60/60
XI1.2	Separate Stud 	35 mm AlphaPanel® Min. 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm ctrs • 90 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	147 mm	58	50	-/60/60
XI1.3	Separate Stud 	35 mm AlphaPanel® Min. 114 mm cavity consisting of: • 50 mm gap • 64 mm steel studs 0.75 mm BMT at 600mm ctrs • 90 mm HD Earthwool, min. 20 kg/m3 density 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	165 mm	61	55	-/90/90

Wall Type		Description	Wall Thickness	Rw	Rw+Ctr	FRL
XI2.1	Dual AlphaPanel® 	35 mm AlphaPanel® Min. 50 mm cavity consisting of: • 50 mm gap • 75 mm HD Earthwool, min. 18 kg/m3 density 35 mm AlphaPanel®	120 mm	57	51	-/120/120
XI3.1	Separate Stud + Channel 	13 mm standard plasterboard, min. 8.4 kg/m2 density Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50mm Earthwool, min. 8 kg/m3 density 35 mm AlphaPanel® Min. 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm • 90 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	200 mm	63	50	-/60/60
XI3.2	Separate Stud + Channel 	16 mm fire-rated plasterboard, min. 12.4 kg/m2 density min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50 mm Earthwool, min. 8 kg/m3 density 35 mm AlphaPanel® Min. 114 mm cavity consisting of: • 50 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm • 90 mm HD Earthwool, min. 20 kg/m3 density 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	221 mm	66	55	-/90/90
XC4.1	Channel – Corridor Wall 	35 mm AlphaPanel® Min. 48 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 75 mm Earthwool, min. 11 kg/m3 density 13 mm fire-rated plasterboard, min. 10.4 kg/m2 density	96 mm	56	49	-/60/60
XC4.2	Channel – Corridor Wall 	35 mm AlphaPanel® Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	88 mm	52	42	-/60/60
XC4.3	Channel – Corridor Wall 	35 mm AlphaPanel® Min. 74 mm cavity consisting of: • 10 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm ctrs • 75 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	122 mm	55	46	-/60/60

Wall Type		Description	Wall Thickness	Rw	Rw+Ctr	FRL
XS5.1	AlphaPanel® – Service Riser 	35 mm AlphaPanel®	35 mm	36	33	-/60/45
XS5.2	AlphaPanel® – Service Riser 	35 mm AlphaPanel® 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	51 mm	37	34	-/90/90
XS5.3	AlphaPanel® – Service Riser 	50 mm AlphaPanel®	50 mm	40	37	-/120/90
XS5.4	AlphaPanel® – Service Riser 	50 mm AlphaPanel® 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	66 mm	41	38	-/120/120
XS6.1	Channel – Service Riser 	35 mm AlphaPanel® Min. 48 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 75 mm Earthwool, min. 11 kg/m3 density 13 mm fire-rated plasterboard, min. 10.4 kg/m2 density	96 mm	56	49	-/60/60
XS6.2	Channel – Service Riser 	35 mm AlphaPanel® Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50 mm Earthwool, min. 11 kg/m3 density 13 mm fire-rated plasterboard, min. 10.4 kg/m2 density	88 mm	53	44	-/60/60

Wall Type		Description	Wall Thickness	Rw	Rw+Ctr	FRL
XS6.3	Channel – Service Riser 	35 mm AlphaPanel® Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50 mm Earthwool, min. 11 kg/m3 density 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	91 mm	54	46	-/90/90
XS6.4	Channel – Service Riser 	50 mm AlphaPanel® Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 25 mm Earthwool, min. 11 kg/m3 density 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	106 mm	55	46	-/120/120

Notes:
1. Wall types 1, 2 and 3 are not suitable for installation of water services to both sides. Concealed water services supplying the plasterboard side only is acceptable.
2. Wall types 4, 5 and 6 are suitable for installation of water services to both sides, e.g. kitchen/kitchen or bathroom/kitchen.

ENERGY EFFICIENCY

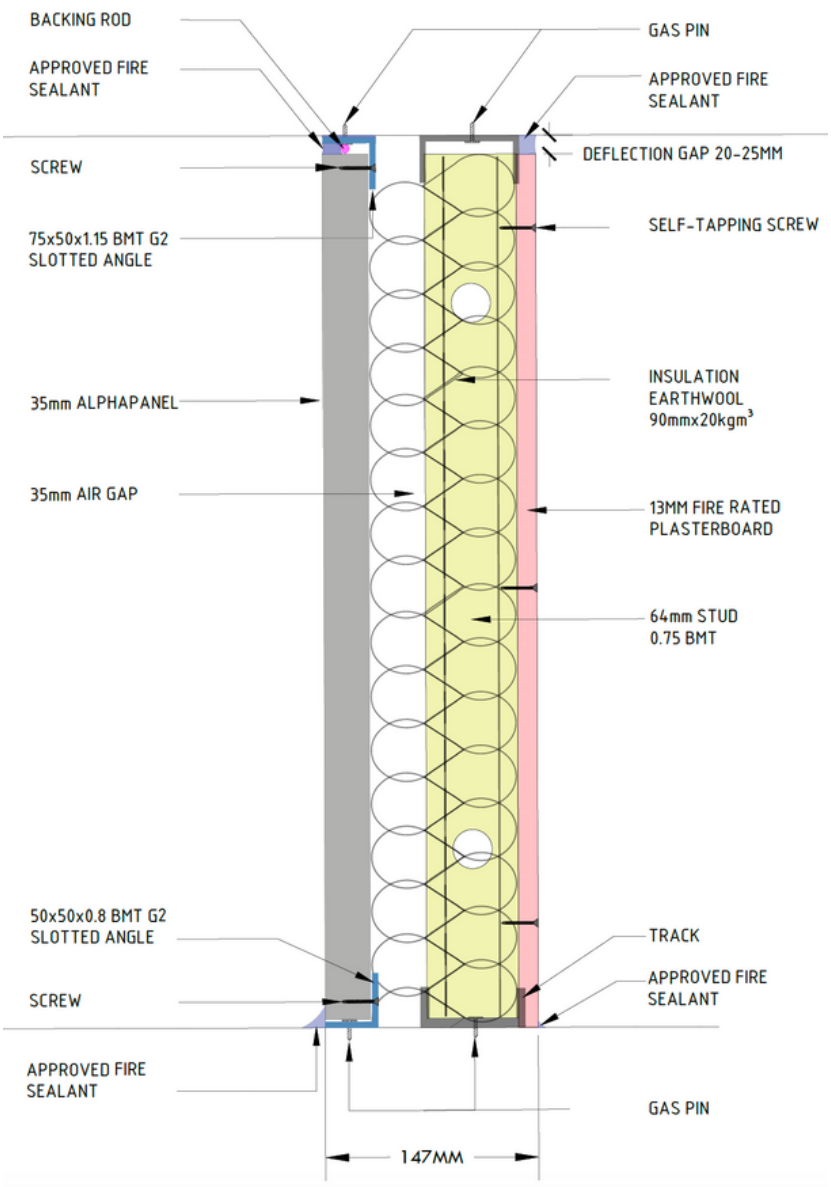
The R-Value for AlphaPanel® is as follows:
- 35mm AlphaPanel® – 0.044 m2K/W
- 50mm AlphaPanel® – 0.063 m2K/W

This element R-Value is used in wall system R-Value calculations that include air-films, cavities added insulation and other wall elements such that the minimum total R-Value for an envelope wall system exceeds the minimum specified Deemed-to-Satisfy Total R-Value for a specified Climate Zone.

STANDARD CONSTRUCTION DETAILS

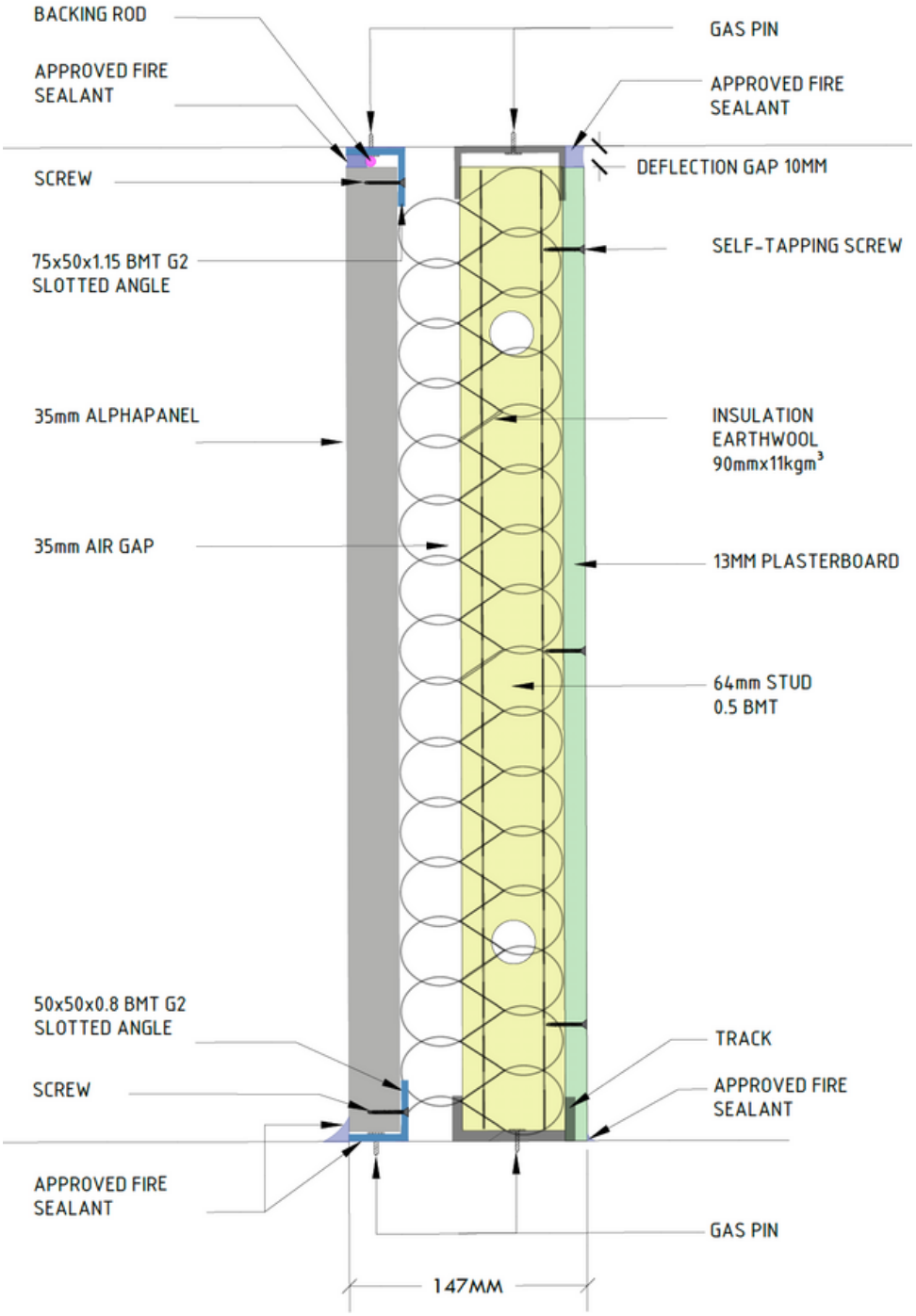
See Table 5.1 for full list of available AlphaPanel® Internal Wall Systems. This section outlines construction details of the more common systems AlphaPanel® Internal Wall Systems.

XI1.1 INTERTENANCY WALL SYSTEM



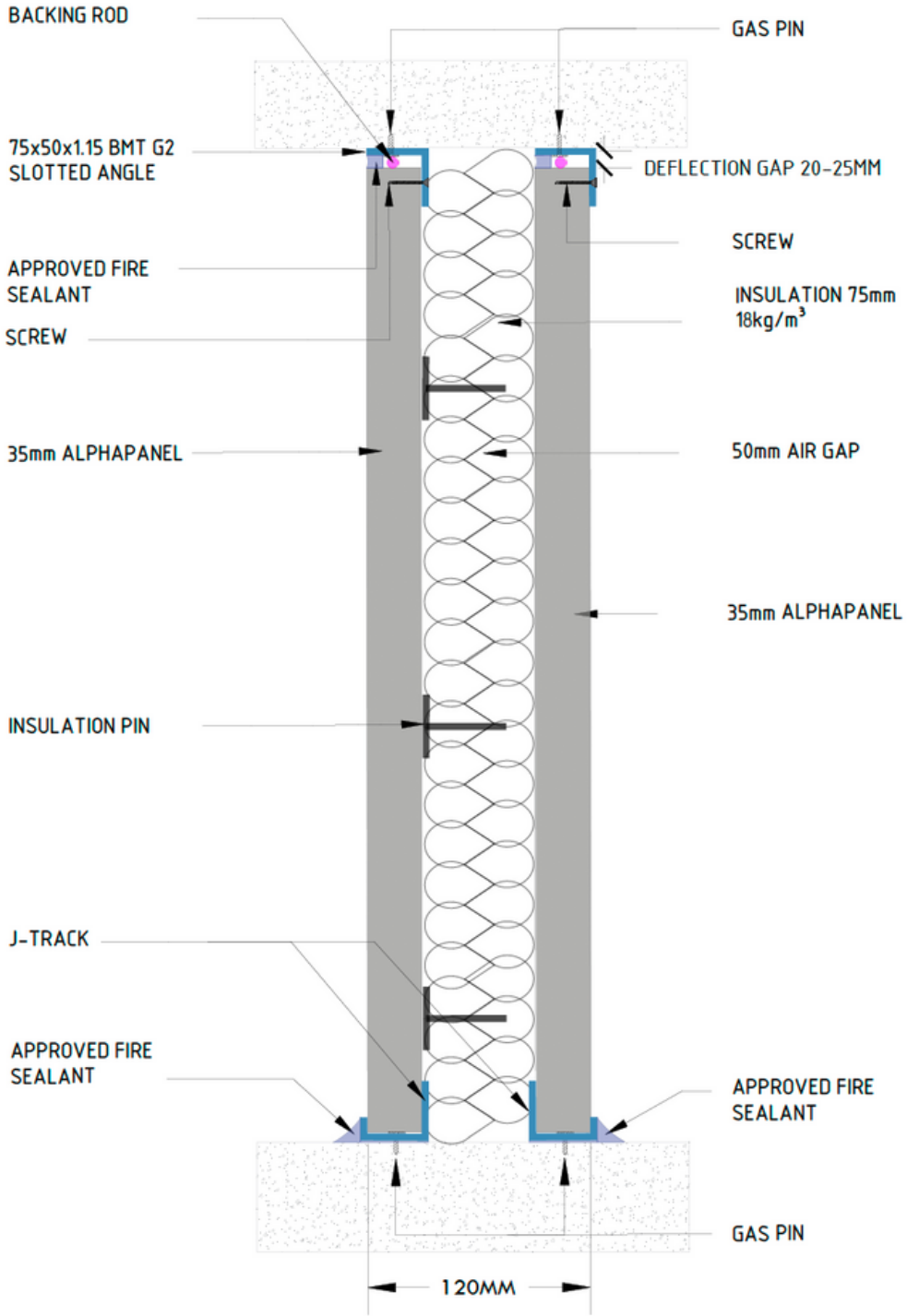
Wall Type	Description	Wall Thickness	R_w	R_w+C_{tr}	FRL
XI1.1	35 mm AlphaPanel® 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.75 mm BMT at 600mm ctrs • 90 mm Earthwool Sound Shield insulation, 20 kg/m3 density 13 mm fire-rated plasterboard, 10.5 kg/m2 density	147 mm	60	54	-/60/60
	NCC Requirement			50	-/60/60

XI1.2 INTERTENANCY WALL SYSTEM



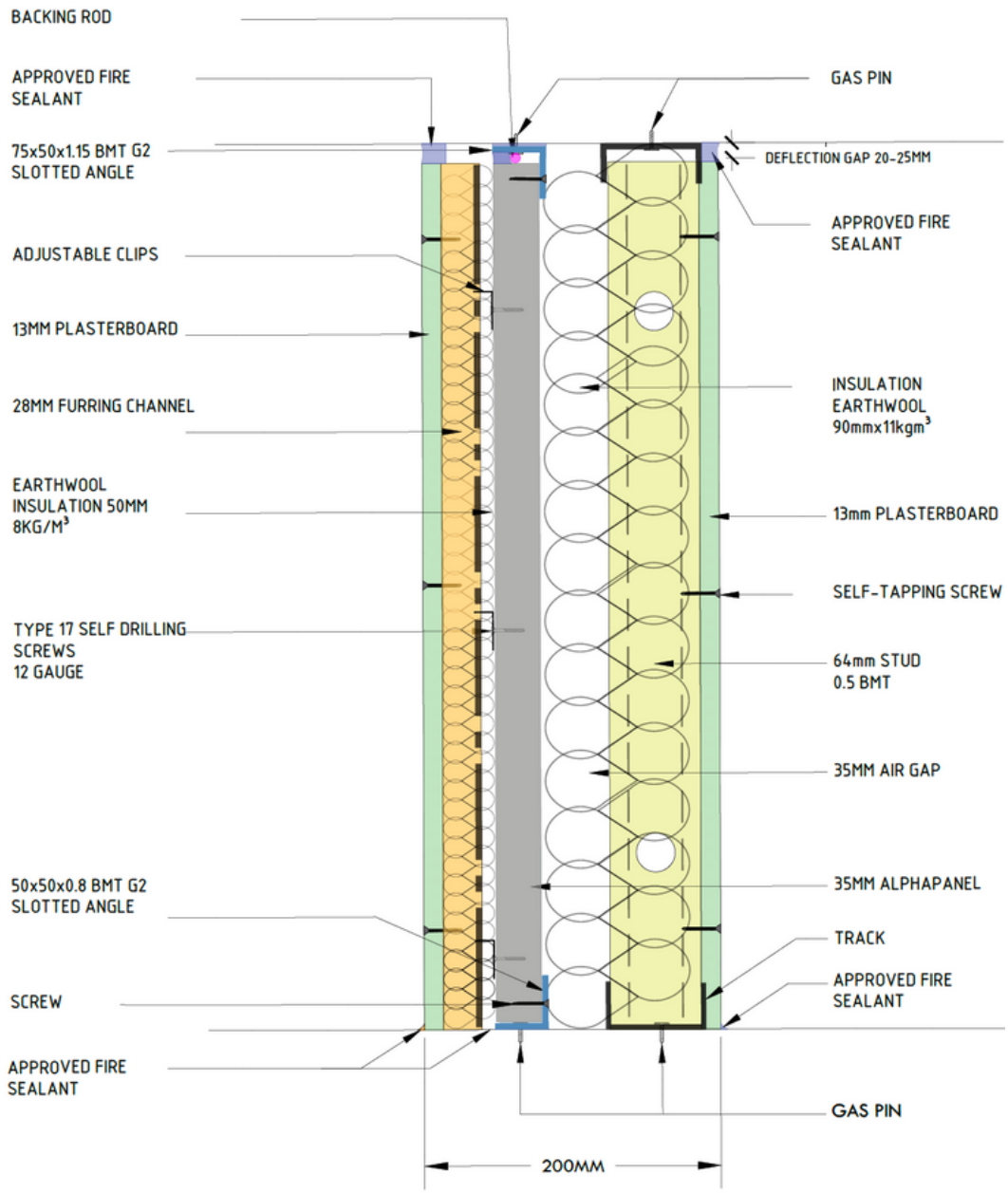
Wall Type	Description	Wall Thickness	R_w	R_w+C_{tr}	FRL
XI1.2	35 mm AlphaPanel® Min. 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm ctrs • 90 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	147 mm	58	50	-/60/60
		NCC Requirement		50	-/60/60

XI2.1 INTERTENANCY WALL SYSTEM



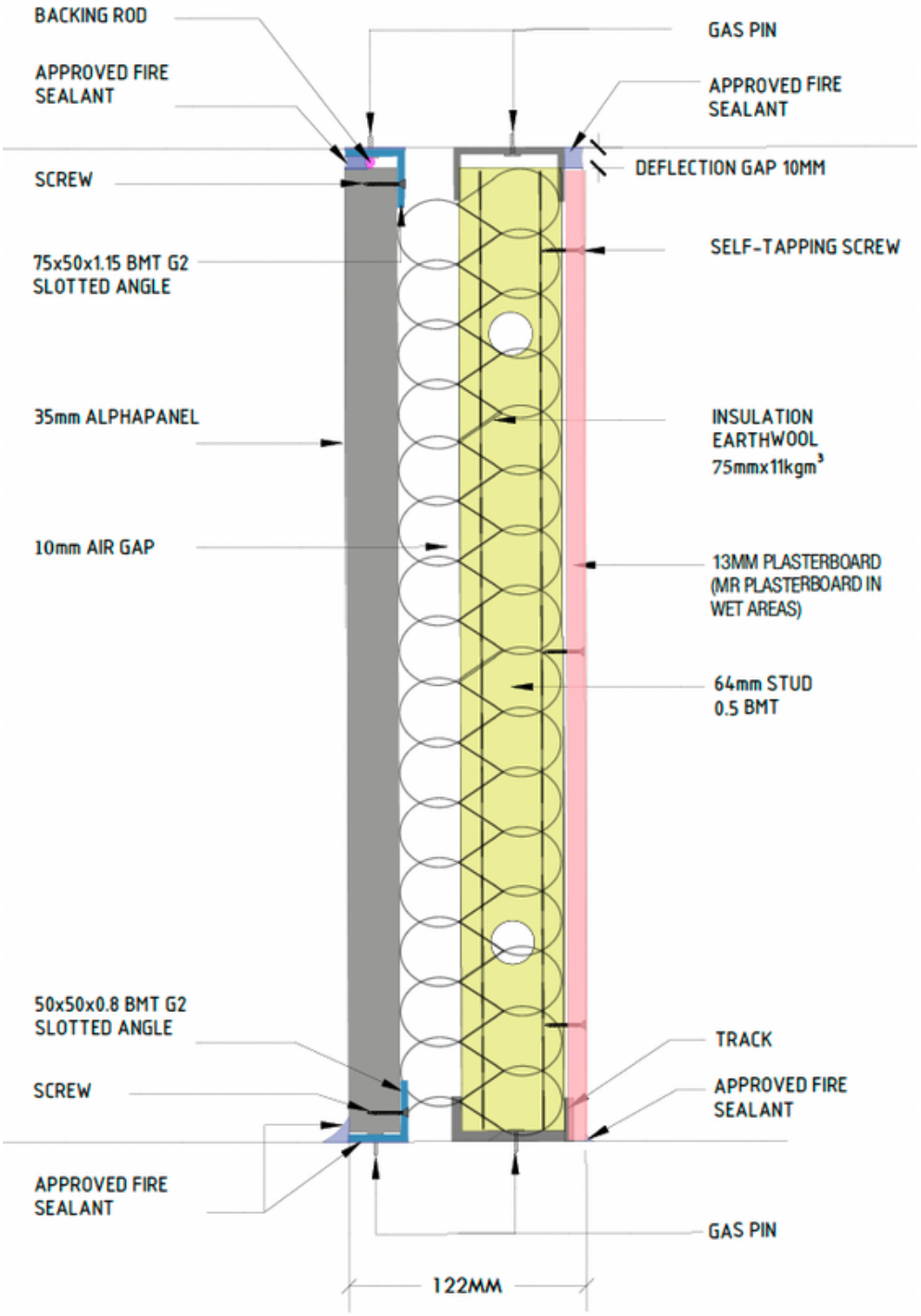
Wall Type	Description	Wall Thickness	Rw	Rw+Ctr	FRL
XI2.1	35 mm AlphaPanel® Min. 50 mm cavity consisting of: • 50 mm gap • 75 mm HD Earthwool, min. 18 kg/m3 density 35 mm AlphaPanel®	120 mm	57	51	-/120/120
	NCC Requirement			50	-/60/60

X13.1 INTERTENANCY WALL SYSTEM



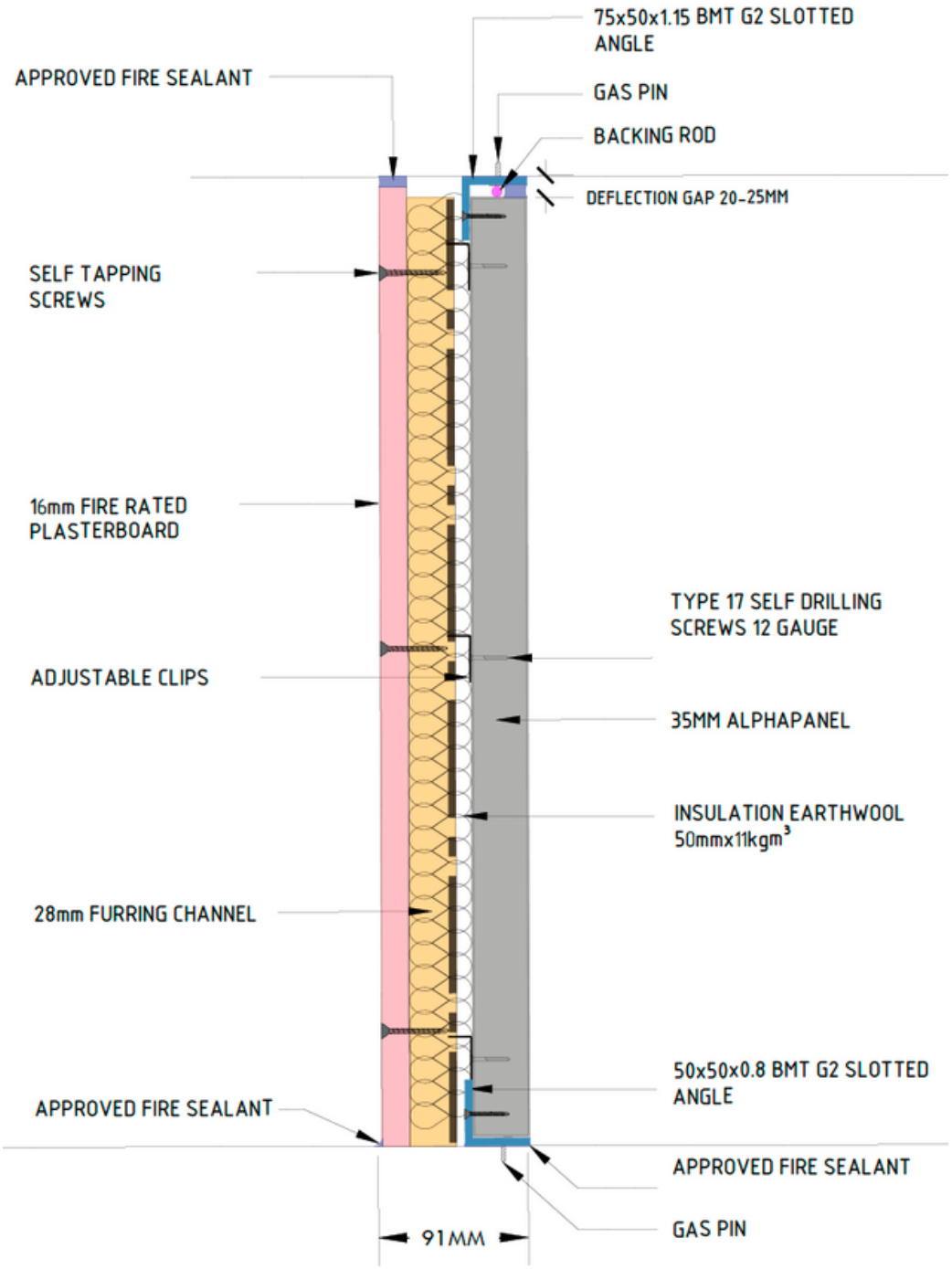
Wall Type	Description	Wall Thickness	Rw	Rw+Ctr	FRL
X13.1	13 mm standard plasterboard, min. 8.4 kg/m2 density Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50mm Earthwool, min. 8 kg/m3 density 35 mm AlphaPanel® Min. 99 mm cavity consisting of: • 35 mm gap • 64 mm steel studs 0.50 mm BMT at 600mm • 90 mm Earthwool, min. 11 kg/m3 density 13 mm standard plasterboard, min. 8.4 kg/m2 density	200 mm	63	50	-/60/60
	NCC Requirement			50	-/60/60

XC4.3 CORRIDOR WALL SYSTEM



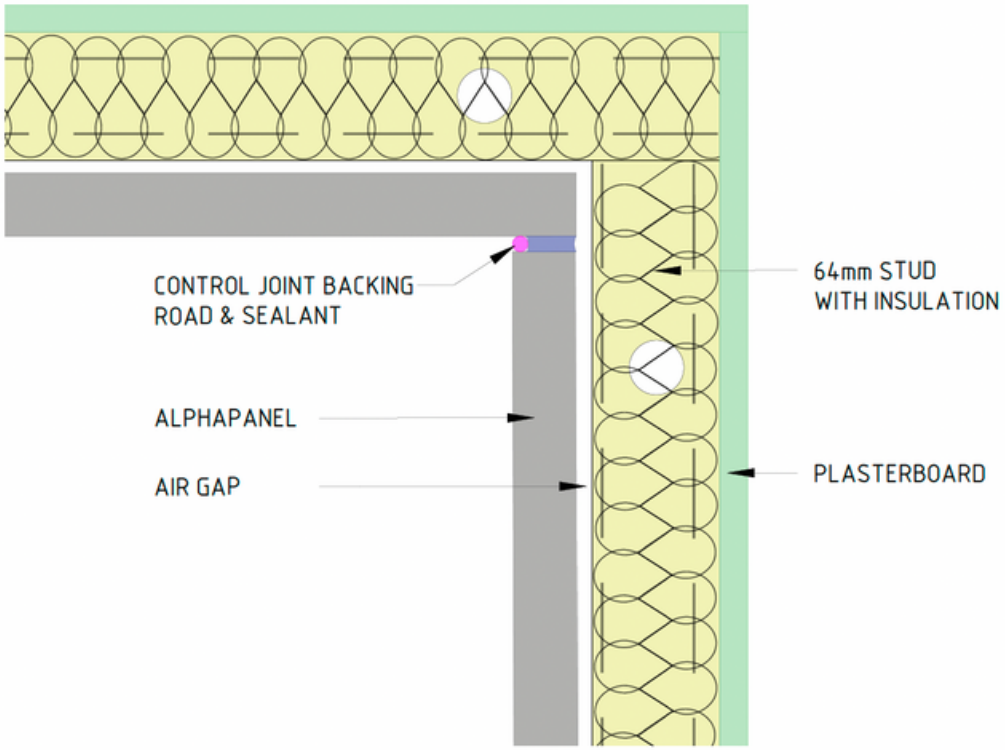
Wall Type	Description	Wall Thickness	Rw	Rw + Ctr	FRL
XC4.3	35mm AlphaPanel Min. 74mm cavity consiting of: 10mm Air Gap 64mm studs 0.5mm BMT at 600mm ctrs 75mm Earthwool, min 11kg/m3 density 13mm Fire-Rated Plasterboard	122mm	55	46	-/60/60
	NCC Requirement		50		-/60/60

XS6.3 SERVICE RISER SYSTEM (HABITABLE)

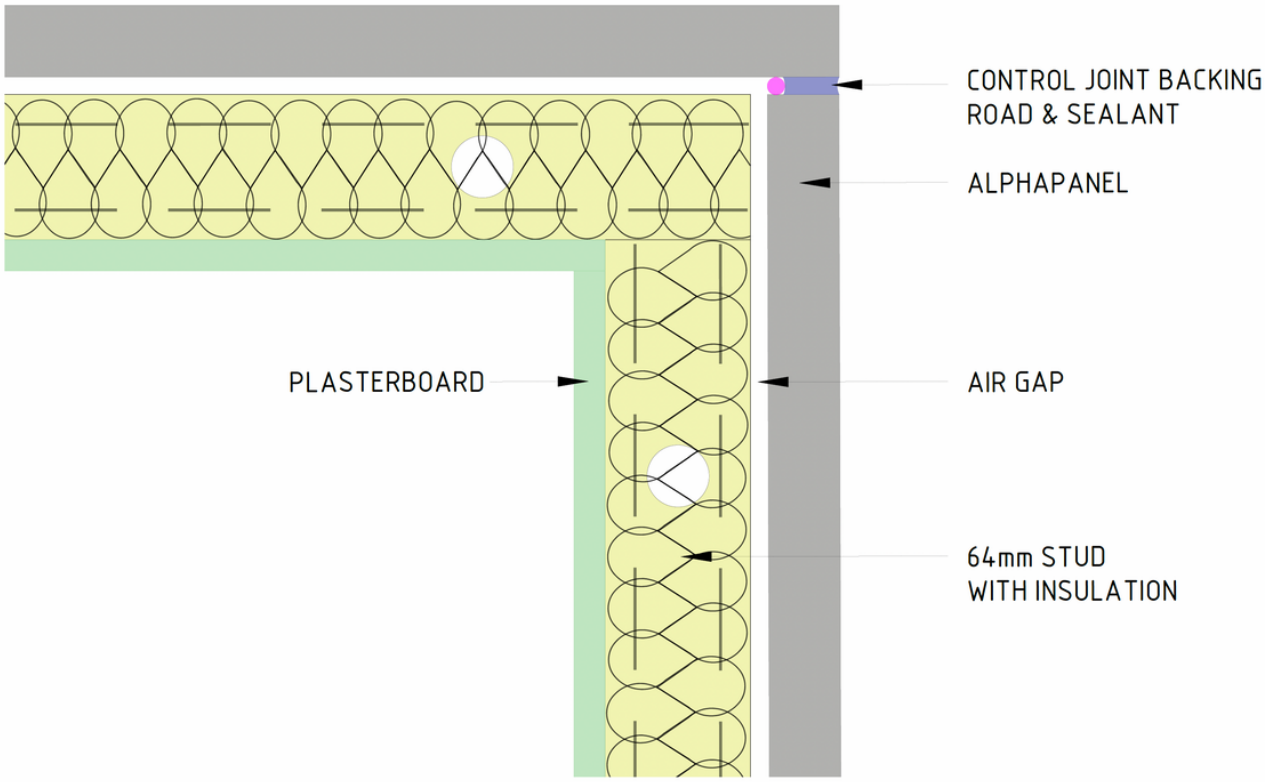


Wall Type	Description	Wall Thickness	Rw	Rw+Ctr	FRL
XS6.3	35 mm AlphaPanel® Min. 40 mm cavity consisting of: • 28 mm furring channels at 600 mm ctrs on adjustable clips • 50 mm Earthwool, min. 11 kg/m3 density 16 mm fire-rated plasterboard, min. 12.4 kg/m2 density	91 mm	54	46	-/90/90
	NCC Requirement			40	-/90/90

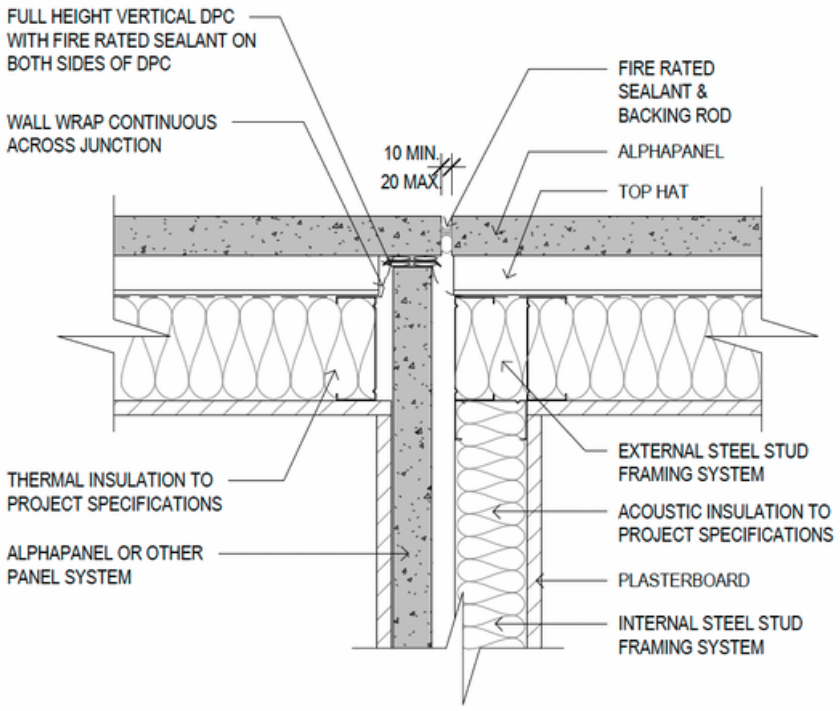
C1.1 INTERNAL CORNER



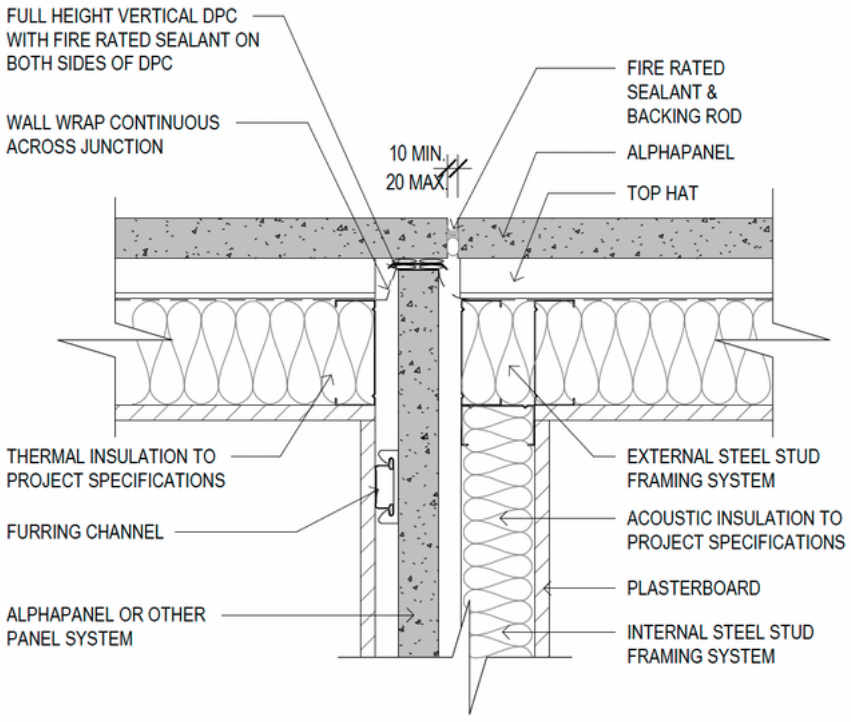
C1.2 EXTERNAL CORNER



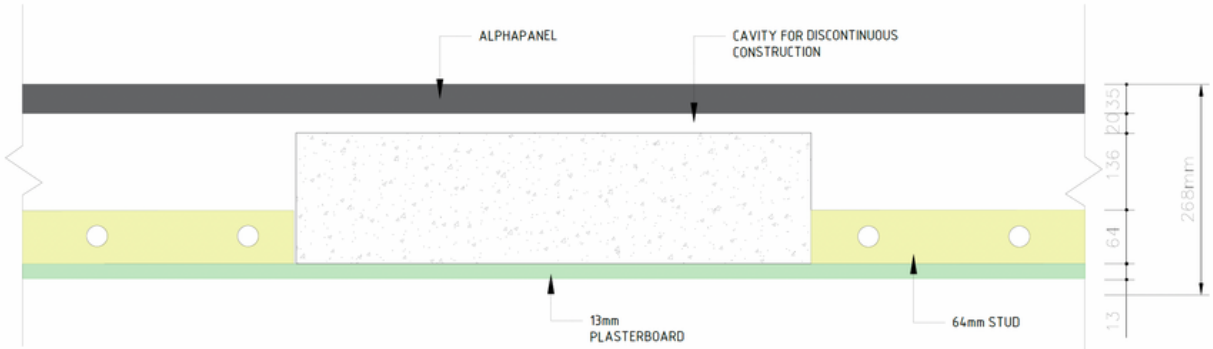
IJ1.1.1 ALPHAPANEL® & ALTERNATE WALL SYSTEM JUNCTION - 1



IJ1.1.2 ALPHAPANEL® & ALTERNATE WALL SYSTEM JUNCTION - 2

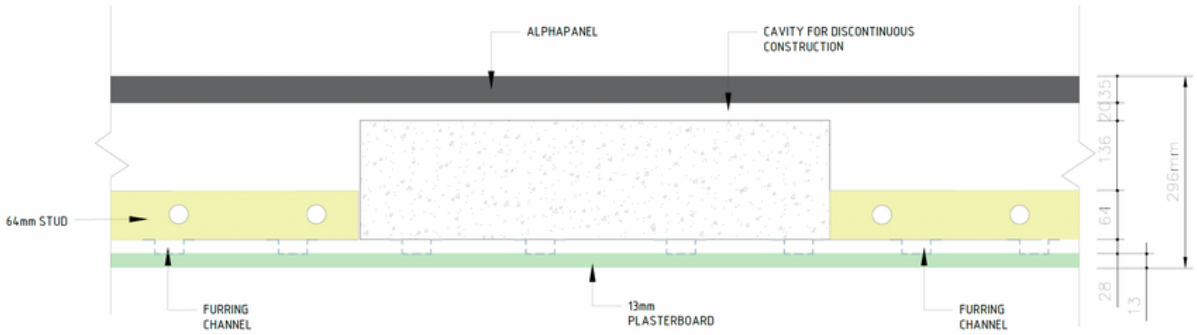


IJ1.2 ALPHAPANEL® & INTERNAL CONCEALED COLUMN JUNCTION (OPTION 1)



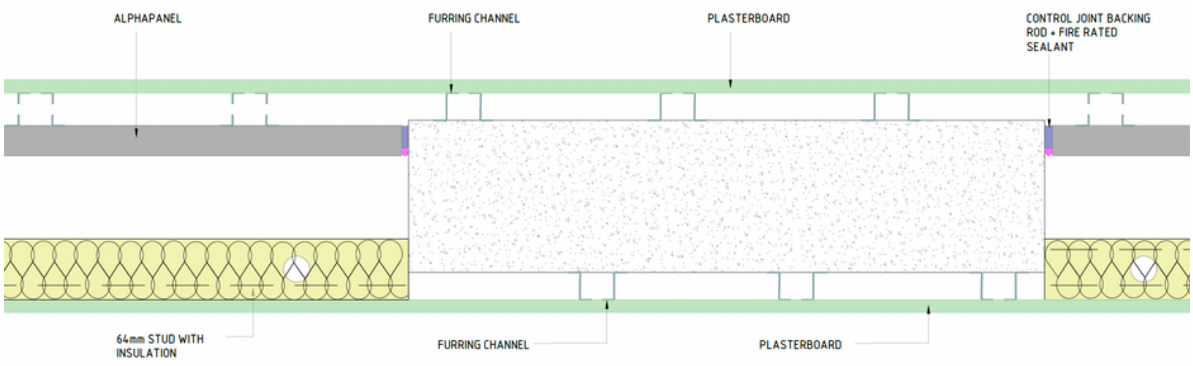
NOTE: CAVITY B/W COLUMN & ALPHAPANNEL DEPENDS ON ACOUSTIC REQUIREMENTS

IJ1.3 ALPHAPANEL® & INTERNAL CONCEALED COLUMN JUNCTION (OPTION 2)



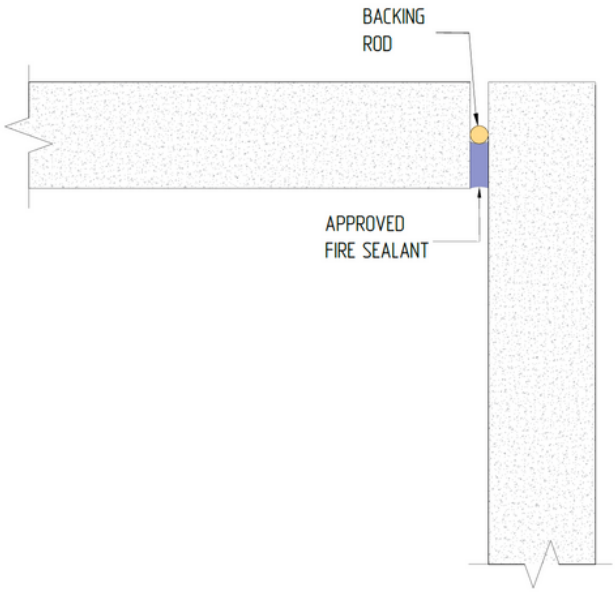
NOTE: CAVITY B/W COLUMN & ALPHAPANNEL DEPENDS ON ACOUSTIC REQUIREMENTS

IJ1.4 ALPHAPANEL® & INTERNAL CONEALED COLUMN JUNCTION (OPTION 3)

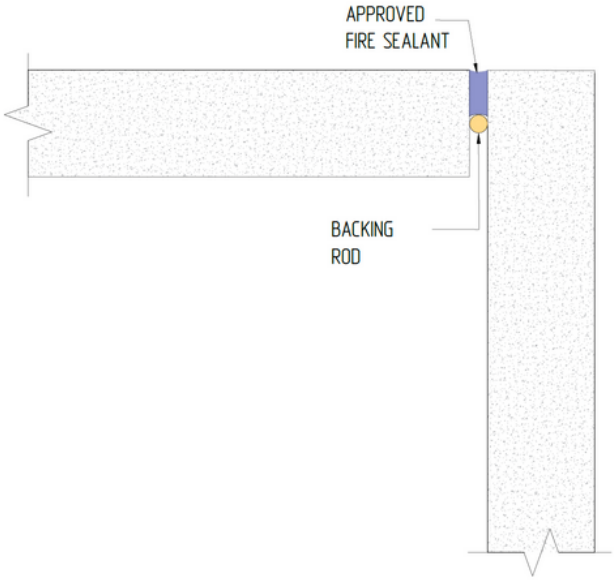


IJ1.2 PANEL CORNER CONTROL JOINT

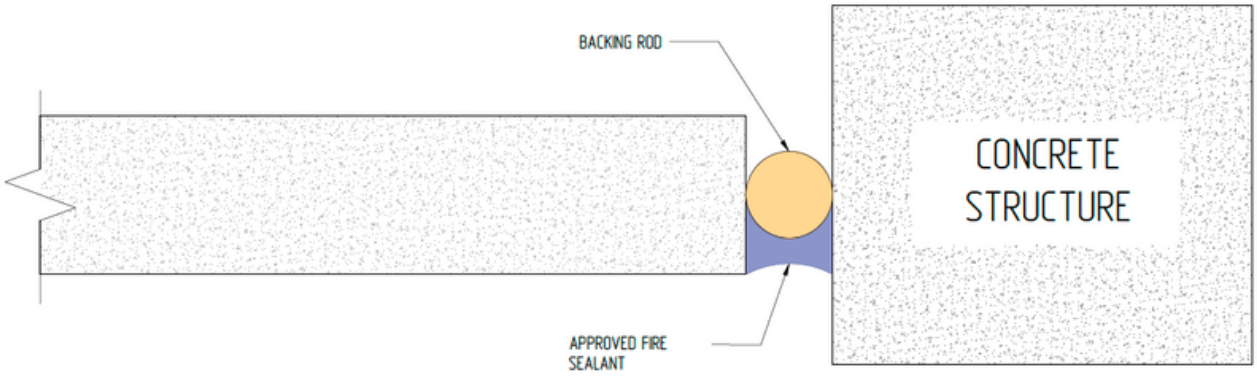
INTERNAL CORNER



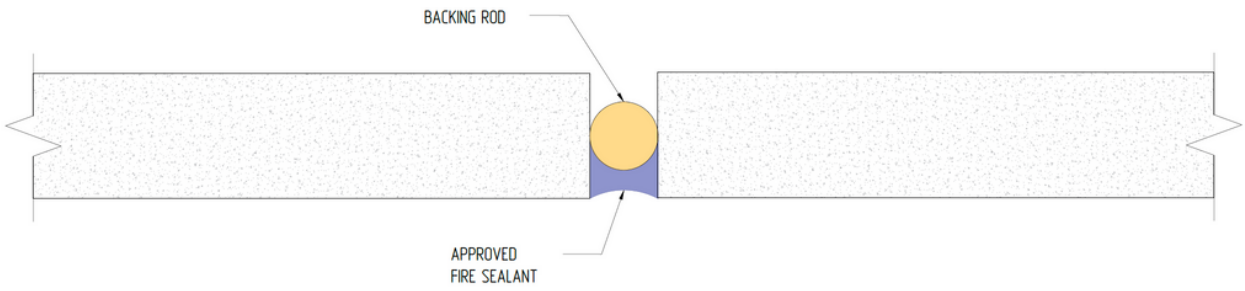
EXTERNAL CORNER



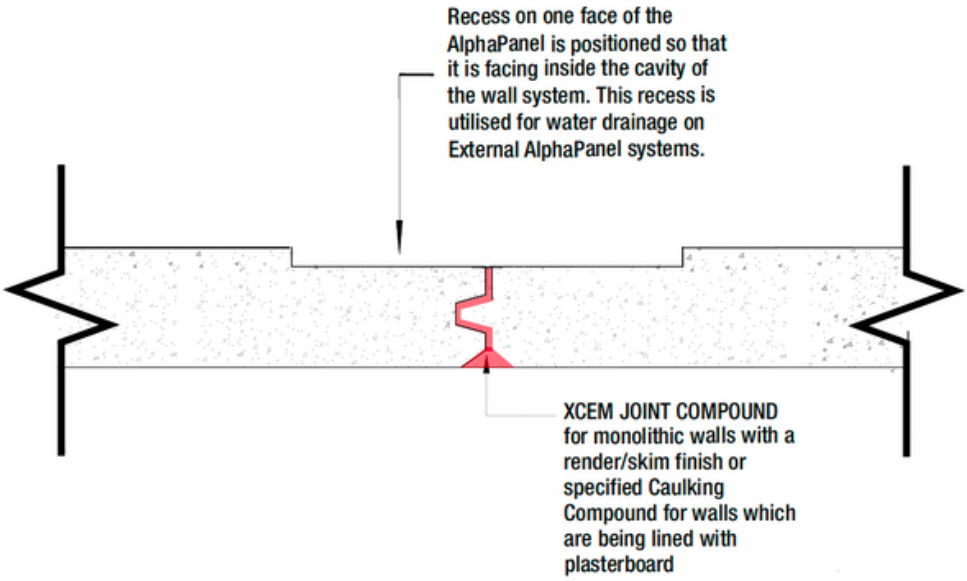
IJ1.3 PANEL TO ALTERNATE SYSTEM MOVEMENT JOINT



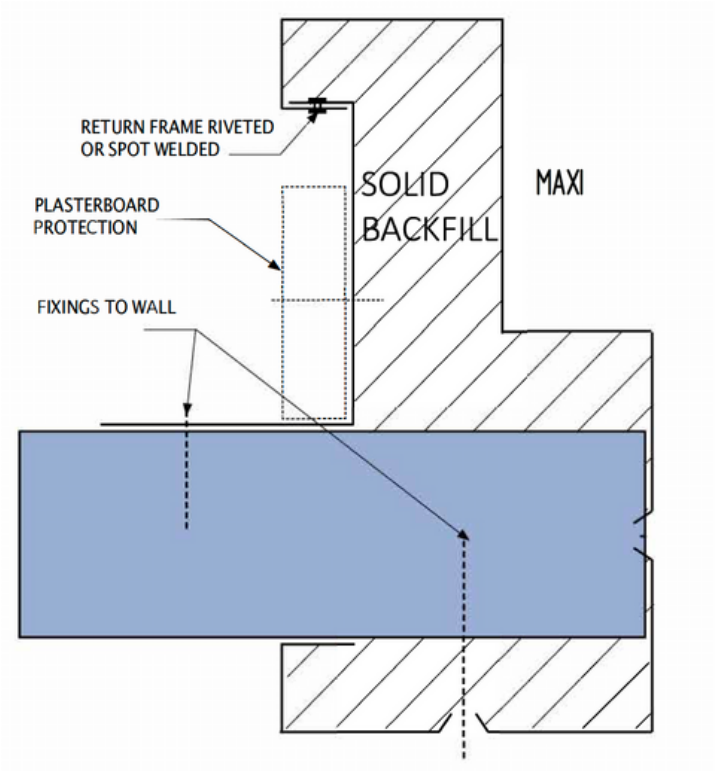
IJ1.4 PANEL TO PANEL CONTROL JOINT

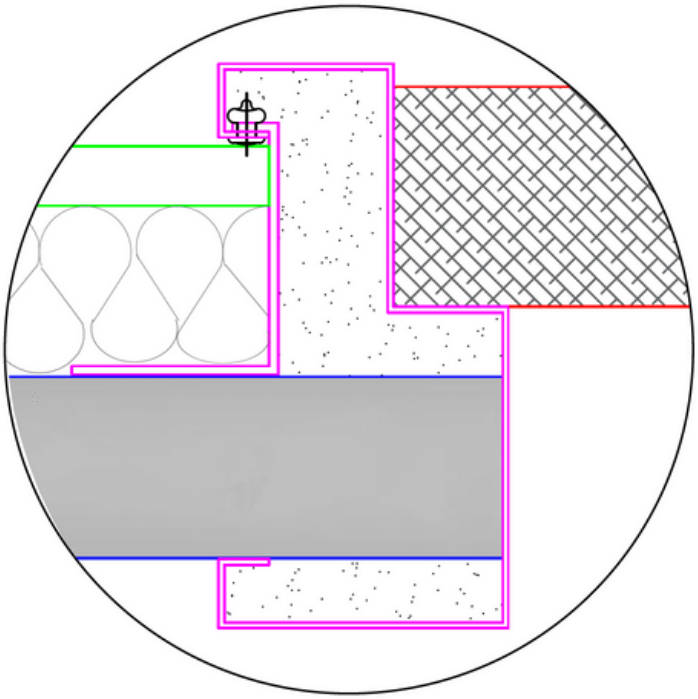


IJ1.5 INTERNAL PANEL TO PANEL JOINT



FD.1 FIRE DOOR FRAME





CONSTRUCTION NOTES

The Installer is to refer to the project drawings and specifications and shall perform work to the agreed quality standards. The notes below are important from an engineering and compliance perspective.

1. Nom. 10-15mm gap (max. 20mm) between top of panel and soffit to allow for slab deflection, creep and column shortening. Check against project engineer's specifications to ensure sufficient allowance is provided.
2. Wall base configuration options, fixed to concrete substrate using concrete anchors to engineer's specifications:
    2.1. J-track.
    2.2. Base angle.
    2.3. 50x50x0.8 mm BMT G2 Z275 slotted angle, 3x No.12-11x30 Type 17 hex head screws per 600mm wide panel, max. 200mm ctrs. Drill pilot holes Ø4mm in AlphaPanel®.
3. Wall head configuration options, fixed to concrete substrate using concrete anchors to engineer's specifications:
    3.1. Deflection track.
    3.2. Head angle.
    3.3. 75x50x1.15 mm BMT G2 Z275 slotted angle, 3x No.12-11x30 Type 17 hex head screws per 600mm wide panel, max. 200mm ctrs. Drill pilot holes Ø4mm in AlphaPanel®.
4. Angle and track anchorage – Min. M8 x 50mm expanding concrete anchor (dynabolt) at max. 600mm ctrs, or 2 x min. Ø3.0mm power actuated fasteners at max. 300 mm ctrs.
5. AlphaPanel® joints are to be bonded using XCEM Joint Compound (2-part Epoxy Adhesive).
    5.1. After panels are bonded with Joint Compound, fill v-groove on face of AlphaPanel® with XCEM Joint Compound (2-part Epoxy Adhesive).
    5.2. Wipe off excess Joint Compound and fill any voids.
    5.3. After Joint Compound has dried, set AlphaPanel® joints using Internal Base & Top Coat & Sand.
6. Provide control joints in walls corresponding to structure control joints and at max. 2.4m ctrs. Backing rod and fire rated sealant are to be applied to the AlphaPanel® leaf to maintain fire and acoustic integrity. Use a sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014.
7. Fire and acoustic rated sealants shall be approved for the application by the manufacturer. The contractor must follow the manufacturer's specifications and ensure surfaces to be bonded are clean, free of dust and debris and primed as required.
8. Apply fire rated sealant to base and top of wall sealing between AlphaPanel® and concrete slab and soffit in the case of angle restraints, and between the tracks in the case of J-track and deflection track restraints.
9. Heads to openings, max. 1,000mm. All joints shall be made with XCEM Joint Compound.
10. Opening widths greater than 1,000mm – seek advice of Enertren.
11. All perimeter edges of plasterboard and other lining materials shall be sealed to concrete elements with approved fire rated sealant.
12. Penetrations up to 150 mm wide may be made in AlphaPanel® without any additional support and maintain structural adequacy. Only one penetration per panel is permitted. Any variation to these limitations shall be referred to Enertren.
13. Fire and acoustic treatment of penetrations shall be in accordance with Warringtonfire report FAS210171 & PKA Acoustic Report Ref.: PKA100XCM R01v2, or as specified by the project fire and acoustic consultants.
14. Waterproofing of wet areas shall be in accordance with NCC Volume One F1.7 and AS 3740.

ALPHAPANEL® BASEMENT WALLS

AlphaPanel® is the material of choice for basement plenum and fire-rated walls. Installation is fast, and eliminates wet trades.

CONSTRUCTION NOTES & NCC COMPLIANCE

For Details on Component Specifications, NCC Compliance & Construction notes, refer to Section 5 of this Design Guide (AlphaPanel® Internal Walls - High Rise). Note that AlphaPanel® Basement Walls may require Stainless Steel Tracks, Angles & Fixings as specified by the Project Engineer.

ALPHAPANEL® BASEMENT WALLS COMPONENT LIST

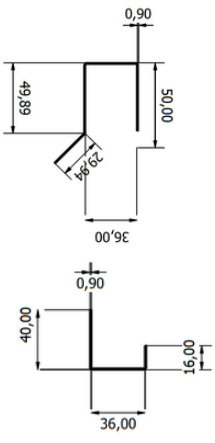
ALPHAPANEL®

Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	2850, 3000, 3300	45kg/m2
50mm AlphaPanel®	450mm	2850, 3000, 3300	65kg/m2

STAINLESS STEEL (GRADE 304) C & J TRACKS (BASEMENT PLENUM WALLS)

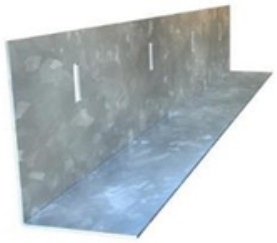
Stainless Steel C & J Tracks used as head and base restraint for AlphaPanel® plenum walls.

C (Head) Track - 0.9mm BMT SS304 50mm x 36mm x 60mm +36mm Drip Tray
J (Base) Track - 0.9mm SS304 16mm x 36mm x 40mm



HEAD & BASE ANGLES (FIRE-RATED BASEMENT WALLS)

Slotted Angles are used for fixing of fire-rated AlphaPanel® basement wall systems. Please check with project engineer to determine appropriate durability class for the site and application (Stainless or Galvanised).



Head Restraint - 75 x 50 x 1.15 BMT Slotted Angle
Base Restraint - 50 x 50 x 0.8 BMT Slotted Angle

XCEM JOINT COMPOUND (2-Part Epoxy)

XCEM's Joint Compound is a 2-Part Epoxy, used to bond AlphaPanel® joints together. XCEM Joint Compound is supplied in 10kg kits.
Note: Do not leave excess Joint Compound on the face of the AlphaPanel as it dries very hard and can be difficult to remove.

CAULKING COMPOUNDS

Use an Approved Sealant to caulk all AlphaPanel joints, movement joints, control joints, deflection gaps and penetrations. For walls which require a fire rating use Botsik FireBan One or another sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014.

BACKING ROD

Backing rod is used to control the depth of sealant, please ensure the appropriate size backing rod is utilised for the gap required to be caulked. Please follow manufacturer's instructions.

FIXINGS

Slotted Angle to concrete slab/hob & soffit:

- When using Stainless C & J tracks, fix with Stainless Steel drive pins (check size and suitability with supplier).
- When using Galvanised Angles, fix with galvanised drive pins and concrete nails (check size and suitability with supplier).

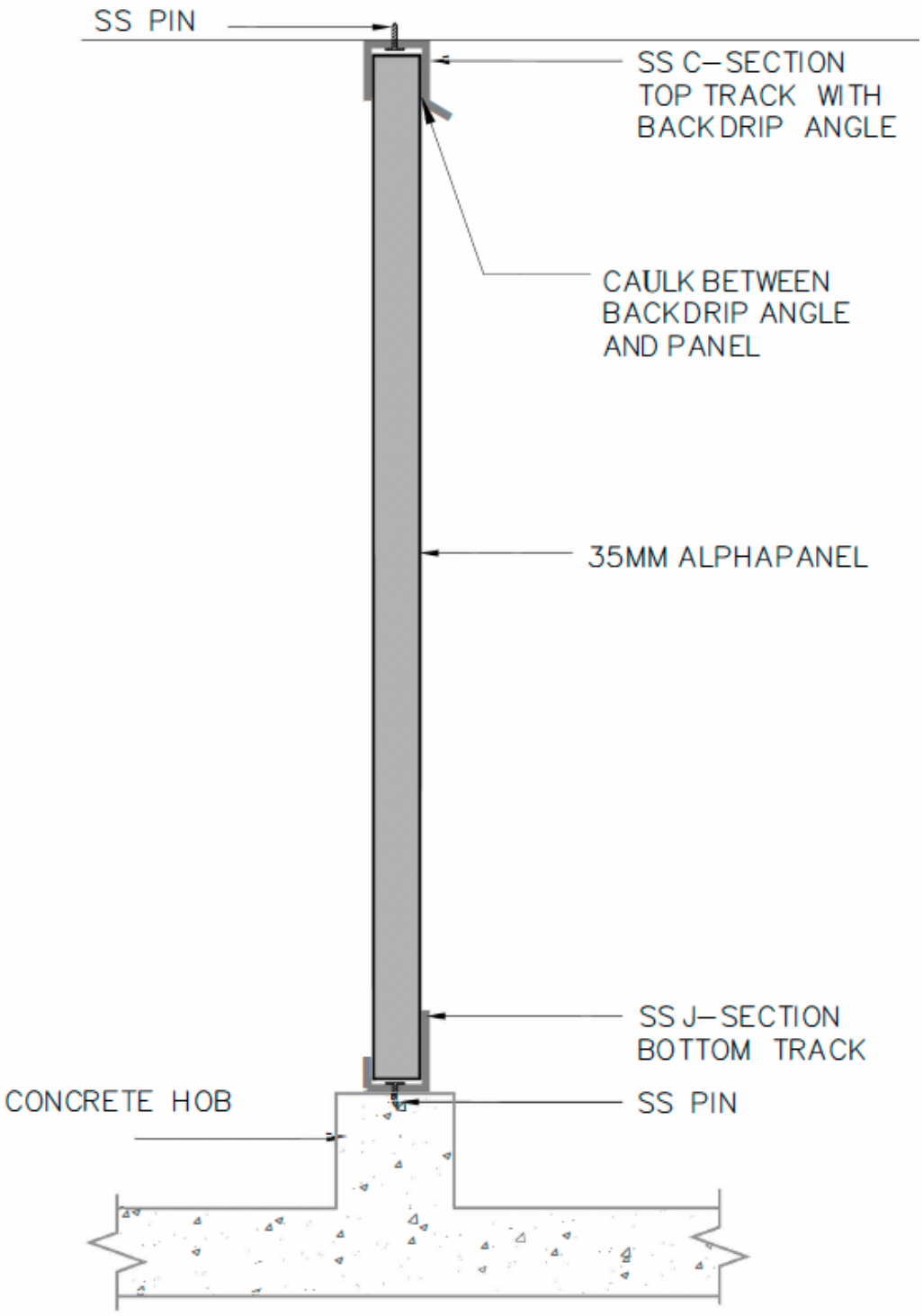
Slotted Angle to AlphaPanel®: No.12-11x30 Type 17 Hex Head screws. Pre-drill AlphaPanel® first with a 4mm Masonry drill bit.

Door Frame to AlphaPanel®: 14 Gauge, 50mm long, Type 17 Coarse thread Bugle Head screws. Pre-drill AlphaPanel first with a 4mm drill bit.

Pre-drilling of AlphaPanel®: 4mm Masonry drill bit.

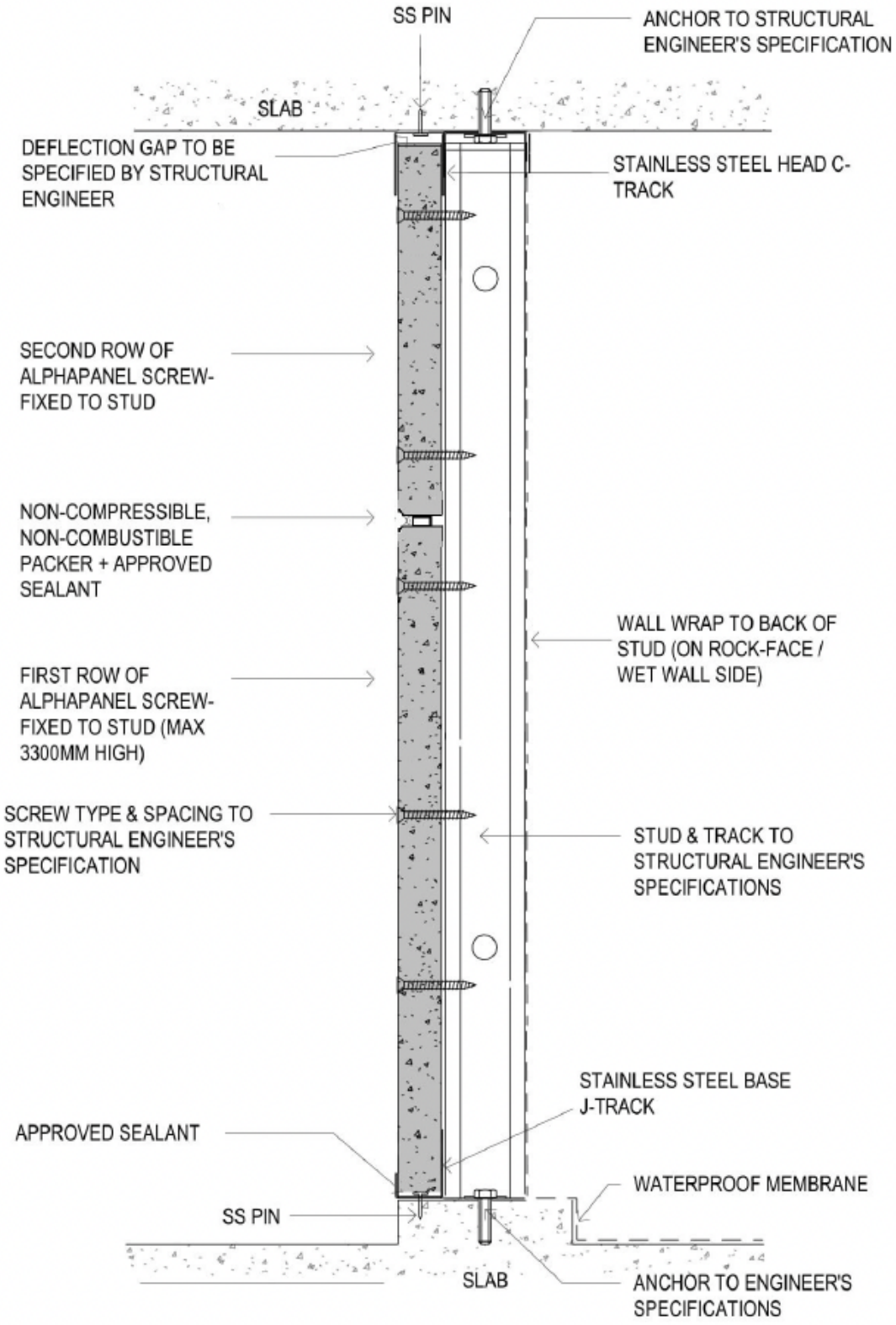
In accordance with AS 3566 Part 1 and Part 2

XB1.1 PLENUM WALL SYSTEM

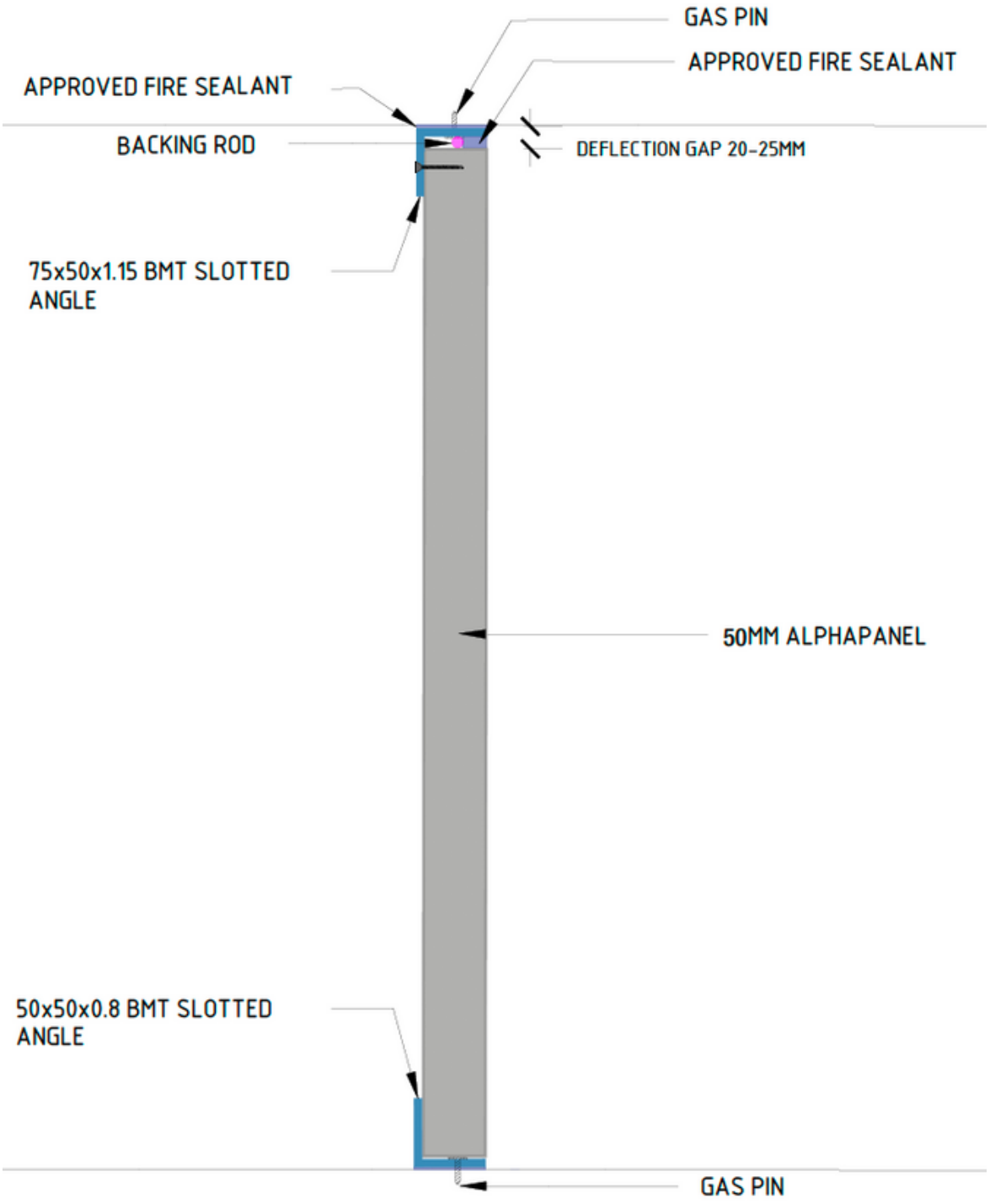


Wall Type	Description	Wall Thickness	R_w	R_w+C_{tr}	FRL
XB1.1	35 mm AlphaPanel® Plenum wall. Suitable for non-fire-rated basement wall applications including covering the excavated rock face around the perimeter of the basement as well as plenum walls.	35 mm	36	33	-/60/45

XB1.4 PLENUM WALL HEIGHT >3300MM

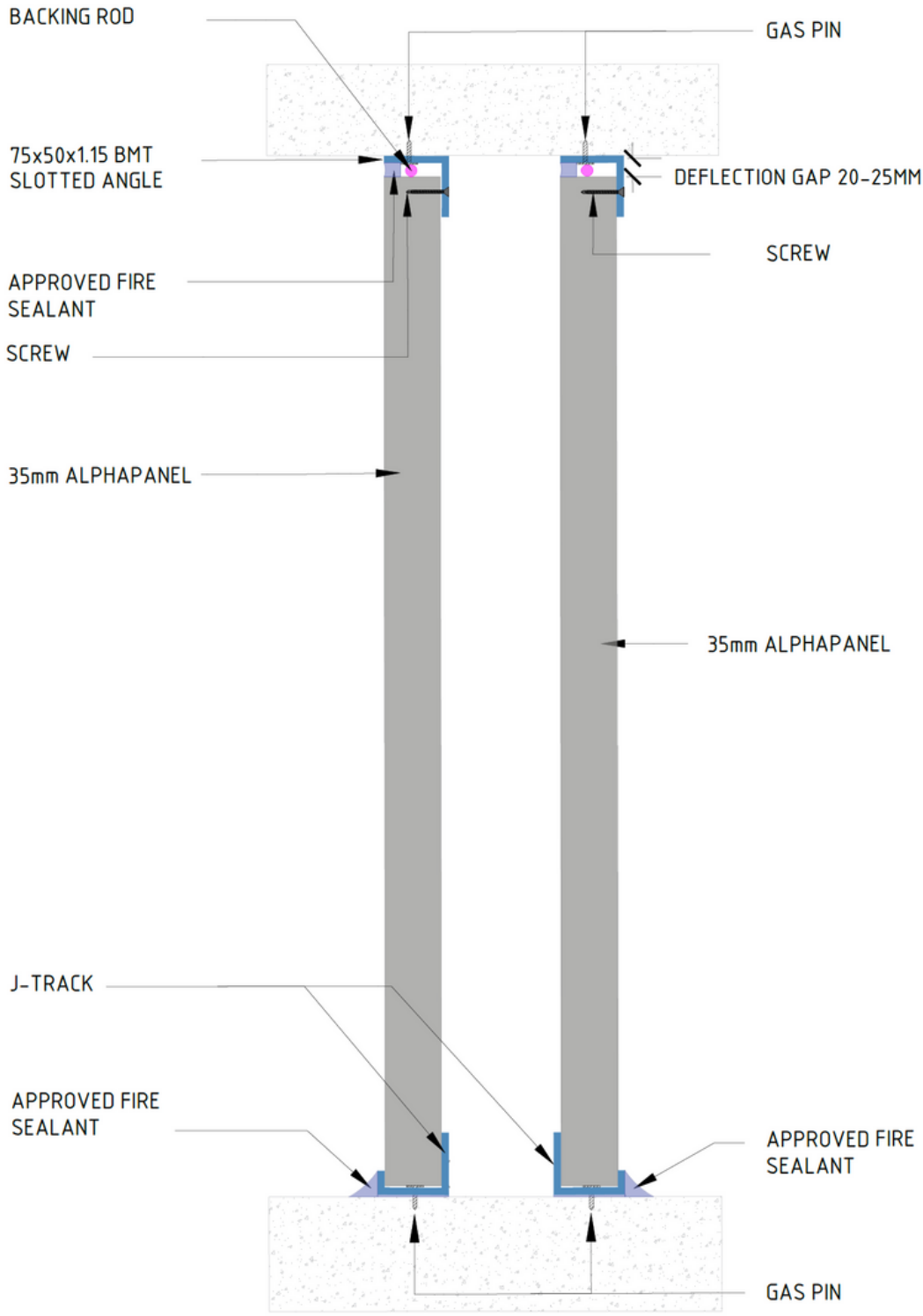


XB1.2 90 MIN FIRE-RATED BASEMENT SYSTEM



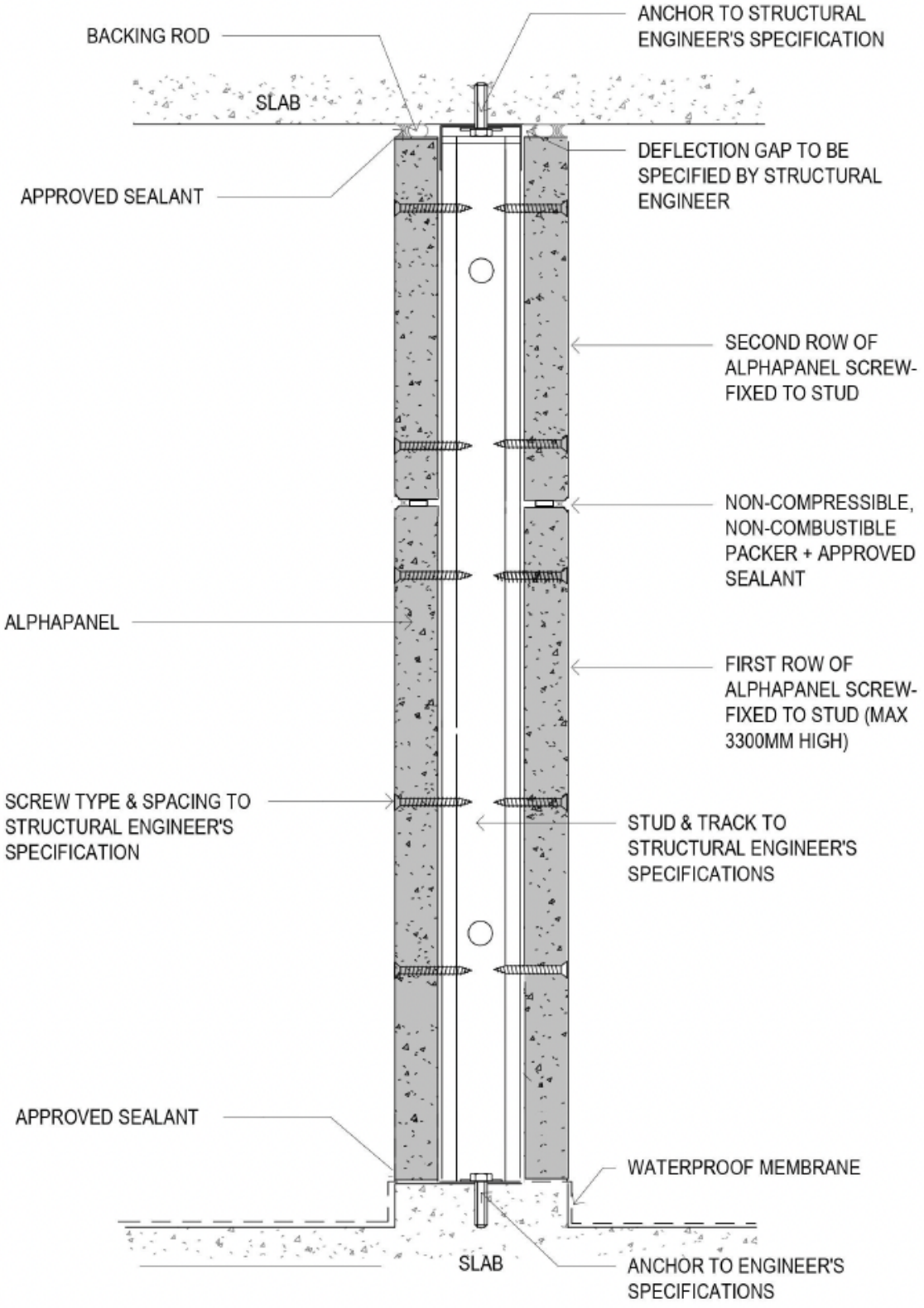
Wall Type	Description	Wall Thickness	R_w	R_w+C_{tr}	FRL
XB1.2	50 mm AlphaPanel® fire-rated basement wall. Suitable for all 90min FRL basement applications.	50 mm	40	37	-/120/90

XB1.3 2HR FIRE-RATED BASEMENT SYSTEM



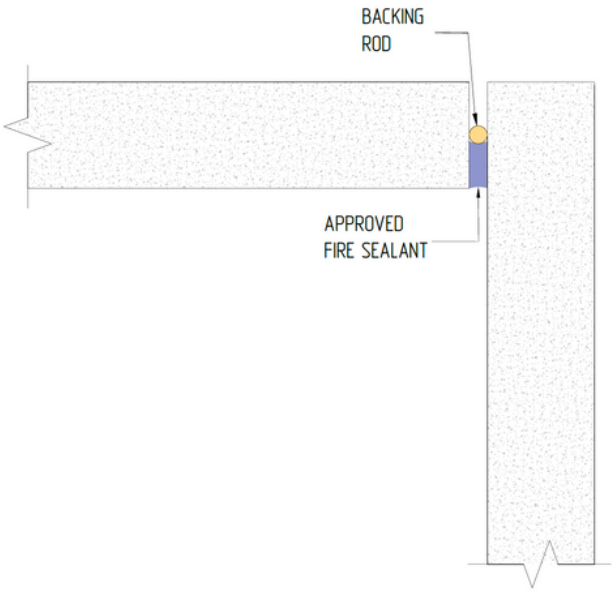
Wall Type	Description	Wall Thickness	R_w	R_w+C_{tr}	FRL
XB1.3	Dual 35 mm AlphaPanel® fire-rated basement wall system. Suitable for all 120min FRL basement applications.	minimum 90 mm	NA	NA	-/120/120

XB1.4 2HR FIRE-RATED BASEMENT HEIGHT >3300MM

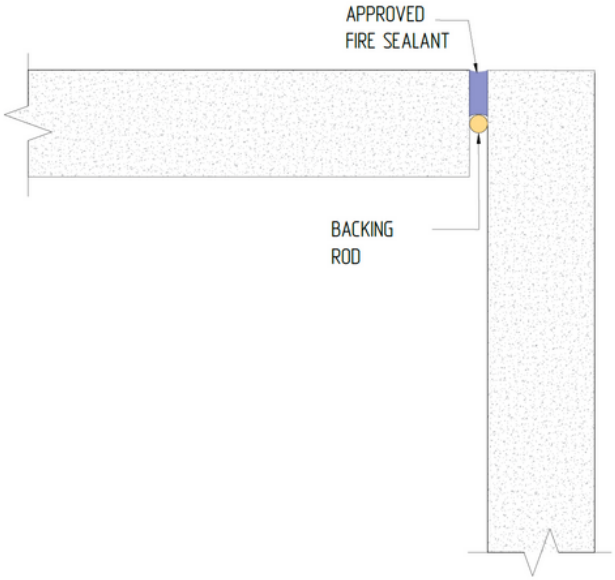


BJ1.1 PANEL CORNER CONTROL JOINT

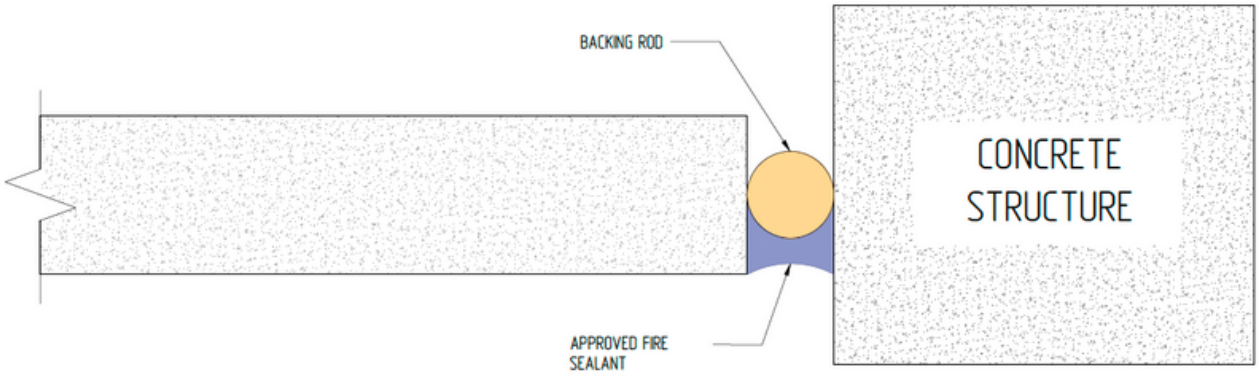
INTERNAL CORNER



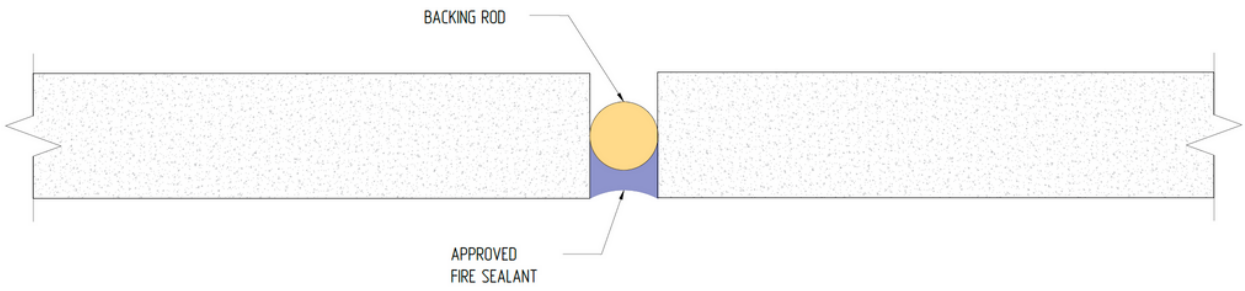
EXTERNAL CORNER



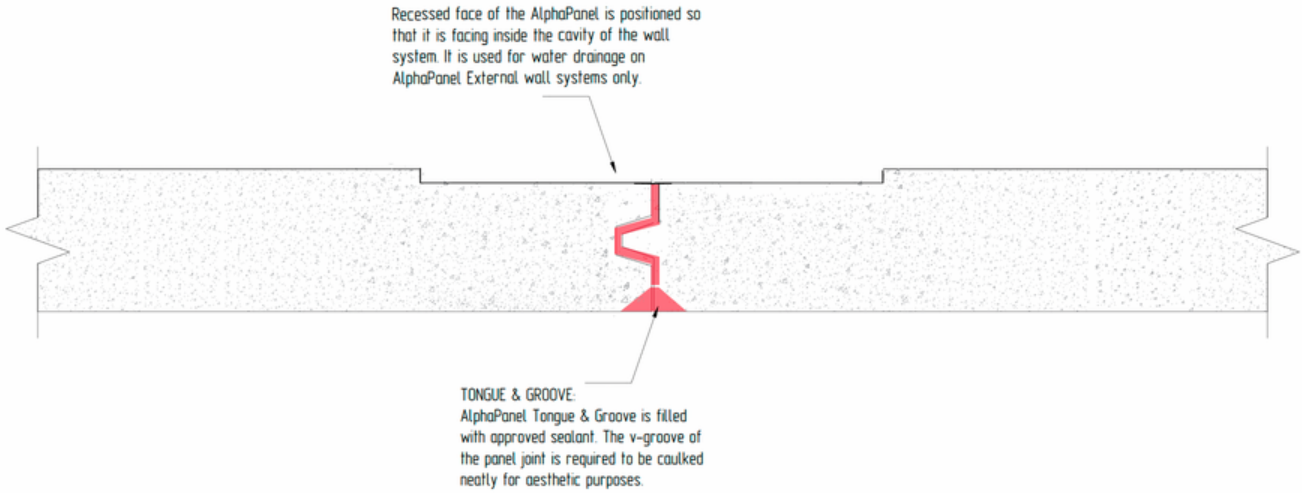
BJ1.2 PANEL TO ALTERNATE SYSTEM MOVEMENT JOINT



BJ1.3 PANEL TO PANEL CONTROL JOINT



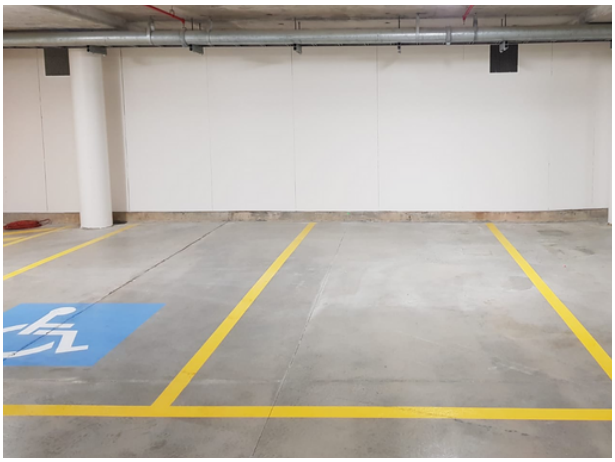
BJ1.4 BASEMENT PANEL TO PANEL JOINT



BASEMENT FINISHING

AlphaPanel® basement v-groove joints are neatly presented with a finishing caulk.

If a paint finish is desired, follow paint specification from relevant paint supplier for AlphaPanel® wall systems.



ALPHAPANEL® HOUSE & LOW-RISE EXTERNAL WALLS

AlphaPanel® is the premium and logical choice for Developers, Builders, Architects and Engineers seeking a low cost, fast to install and high performing cladding system with a premium finish.

COMPONENT SPECIFICATIONS

AlphaPanel® residential external walls comprise 35 mm or 50 mm thick AlphaPanel® fixed to steel top hat battens which are fixed to structural timber or steel framing within the scope of NCC Volume Two Class 1 and Class 10 buildings Deemed-to-Satisfy Provisions. The geometric limits of AS 4055 Clause 1.2 apply to buildings designed and constructed in accordance with these specifications. In summary:

- Maximum height to underside of eaves – 6.0 m.
- Maximum height to top of roof – 8.5 m.
- Maximum width, including roofed verandahs, but excluding eaves – 16.0 m.
- Maximum length, including roofed verandahs, but excluding eaves – 5 x width.
- Maximum roof pitch – 35°.

- Framing: Timber framing in accordance with AS 1684 series, or Cold-formed steel framing in accordance with NASH Standard.
- Top hats: Min. 24 mm deep x 30 mm wide x 0.42 mm BMT G550 cold-formed steel, min. Z275 coating in accordance with AS 1397.
- Screws: In accordance with AS 3566 Part 1 and Part 2
  - Coating Class 3 – generally, to moderate exposure environments
  - Coating Class 4 – marine, > 100m from breaking surf
  - Grade 304 or 316 stainless steel – severe marine, < 100m from breaking surf
- Flashings and DPC: In accordance with AS/NZS 2904.
- Sealants: External grade fire-rated polyurethane (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014), prepared and installed in conjunction with a backing rod.
- Flexible Sarking Membrane: Materials must comply with AS4200.1 and be classified as a Water Barrier plus achieve a Flammability Index of “Low” or < 5 (when tested to AS1530.2). Membranes must be installed in accordance with AS4200.2.
- XCEM Joint Compound: 2-Part Epoxy used for panel to panel fixed joints, and used to fill v-groove of AlphaPanel's®.
- Coatings: Coating of AlphaPanel® shall be in accordance with coating/render specifications from a specified supplier.

ALPHAPANEL® HOUSE & LOW-RISE EXTERNAL WALLS COMPONENT LIST

ALPHAPANEL®

Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	3000, 3300	35kg/m2
50mm AlphaPanel®	450mm	3000, 3300	50kg/m2

FRAMING

Timber framing in accordance with AS 1684 series, or Cold-formed steel framing in accordance with NASH Standard

TOP HAT

Top Hats are used to fix AlphaPanel® to the frame. Min. 24 mm deep x 30 mm wide x 0.42 mm BMT G550 cold-formed steel, min. Z275 coating in accordance with AS 1397.

XCEM JOINT COMPOUND (2-Part Epoxy)

XCEM's Joint Compound is a 2-Part Epoxy, used to bond AlphaPanel® joints together. The v-groove on the face of the AlphaPanel® is filled the XCEM's Joint Compound then scraped flush. XCEM Joint Compound is supplied in Cannisters. Note: Do not leave excess Joint Compound on the face of the AlphaPanel as it dries very hard and can be difficult to remove.

CAULKING COMPOUNDS

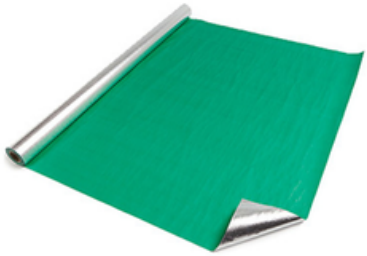
Use an Approved Fire-Rated Sealant to caulk all AlphaPanel® movement joints, control joints, deflection gaps and penetrations. For walls which require a fire rating use Botsik FireBan One or another External grade fire-rated polyurethane sealant (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014).

EARTHWOOL INSULATION

AlphaPanel® wall systems incorporate Earthwool Insulation. Please contact insulation suppliers, and ensure specifications meet those specified in this Design Guide.

WALL WRAP (CONDENSATION CONTROL MEMBRANE)

AlphaPanel® façade systems utilise a vapour permeable wall wrap to aid in the weatherproofing of the external wall system. The wall wrap also controls interstitial condensation and improves thermal performance of the system. Use a wall wrap which complies with the requirements as set out in this design guide or as specified by the project façade Engineer.



BACKING ROD

Backing rod is used to control the depth of sealant, please ensure the appropriate size backing rod is utilised for the gap required to be caulked. Please follow manufacturer's instructions.

PACKERS

The AlphaPanel® façade system utilises non-compressible & non-combustible packers.

PRESSURE EQUALISATION SLOTS

Install pressure equalisation slots in accordance with manufacturer's instructions, and at the locations specified in this Design Guide.

DPC/FLASHING

DPC/Flashing installed in accordance with the required specifications.

WATERPOROOF MEMBRANE

Waterproofing membrane must meet the requirements of AS 4654.1.

PLASTERBOARD

AlphaPanel® External wall systems incorporate internal plasterboard lining. Use specified plasterboard in accordance with this Design Guide, or as per the project Fire/Acoustic Engineer's specifications.

FIXINGS

Top hat to Timber stud: No.12-14x20 mm Hex Head Tek screws.
Top hat to Steel stud: No.10-16x16 mm Hex Head Tek screws.
AlphaPanel® to top hat: No.12-11x50 mm Bugle Head Tek screws.
Countersink AlphaPanel® before fixing: Use a countersink bit or a 14mm masonry drill bit (drill 5mm into AlphaPanel® prior to fixing).

In accordance with AS 3566 Part 1 and Part 2

CONNECTION SPECIFICATIONS

External fixing of AlphaPanel®

Top hat batten to stud: Timber – 2 x No.12-11x35 mm Hex Head Type 17 screws
Steel – 2 x No.10-16x16 mm Hex Head Tek screws

AlphaPanel® to top hat: No.12-11x50 mm Bugle Head Tek screws

- End distance – Min. 100 mm, max. 250 mm (unless otherwise specified).
- Edge distance – Nom. 100 mm.

For 50 mm AlphaPanel®, the specifications in this section can still apply, except the screws fixing AlphaPanel® to the top hats become No.12-11x65 mm Bugle Head Tek for external fixing.

SLABS AND STRUCTURE

Slabs and footings supporting AlphaPanel® residential external walls and framed internal walls shall be designed, specified, and constructed in accordance with AS 2870 for a minimum construction category of “masonry veneer”.

GENERAL FIXING SPECIFICATIONS

Top hat battens and AlphaPanel® panels shall be fixed to the structural frame in accordance with Table 7.1. The Wind Class is as specified in AS 4055 for residential buildings. The corner zone is defined in AS 4055 as “SC” and applies to walls within 1,200 mm of external building corners.

Table 7.1: AlphaPanel® General External House Fixing Specifications

Wind Class	Max. Stud Spacing (mm)	Maximum Spacing of Tophats s_{th} (mm)		Minimum Number of Screws Per Tophat (per 600 mm panel width)
		General Areas	Corner Zone	
N1	600	1,100	1,100	2
N2	600	1,100	1,100	2
N3	600	1,100	900	3
N4	450	1,000	700	3
N5	450	800	600	4
C1	450	1,100	900	3
C2	450	1,000	700	3
C3	450	800	600	4

Notes:

1. The wind pressures resisted by the configurations specified in Table 7.1 are only those acting on the external surface of the wall. This requires that internal wall linings provide effective resistance to internal wind pressures and that there is an air seal between internal linings to windows, doors and other penetrations through the external wall system.
2. Top hat battens shall be evenly spaced with the end ones being min. 100 mm and max. 250 mm from the ends of the AlphaPanel®.
3. Screw placement shall be 100 mm from each panel edge and evenly distributed across the panel width where more than 2 are required. For panels of width different to the specified 600mm, the equivalent number of screws per metre of wall shall be achieved.
4. Provide additional top hat battens to window and door opening heads as required. A panel installed horizontally shall be supported by a minimum of two top hat battens and a minimum number of evenly spaced screws for the panel area equivalent that required for the main vertical panels in the same area.

FIRE

The established FRL's of AlphaPanel® External Wall Systems as per Warringtonfire FAS210087 R1.1 are as follows:

- 35mm AlphaPanel® + 13mm standard plasterboard -/120/90 (One Way)
- 35mm AlphaPanel® + 13mm fire-rated plasterboard -/120/120 (One Way)
- 50mm AlphaPanel® + 13mm standard plasterboard -/120/120 (One Way)
- 35mm AlphaPanel® + 35mm AlphaPanel® -/120/120 (Two Way)
- 35mm AlphaPanel® + 16mm fire-rated plasterboard 60/60/60 (Two Way)
- 35mm AlphaPanel® + 2 x 13mm fire-rated plasterboard 90/90/90 (Two Way)

For compliance with NCC Volume One C1.9 and Schedule 3 and NCC Volume Two Schedule 3 for non-combustible building materials: Warringtonfire Test Certificate SFCRFT190393, AS 1530.1:1994 (R2016) – AlphaPanel® is not deemed combustible.

AS 3959 Section 9.4 permits walls that have achieved an FRL of 30/30/30 or -/30/30 in BAL-FZ. Please see assessment Fire Assessment report IGNS-8395 I01 R00 on the applicable use and compliance of the AlphaPanel against the requirements of the National Construction Code – Volume One and Two – Building Code of Australia 2019 including Amendment 1 (BCA) to be used as a non-combustible material within Bushfire Prone Areas for application in buildings of Class 1, 2 to 9 for Type A, B and C construction.

SOUND TRANSMISSION & INSULATION

The NCC does not currently specify acoustic requirement levels for external walls. Should this be a required design specification for a project, advice can be sought from an acoustic consultant. PKA Assessment Code XE7.1 provides an example of acoustic performance of standard AlphaPanel® external wall system:

- 35 mm AlphaPanel®
  - Min. 112 mm cavity consisting of:
  - Min. 20 mm top hats
  - Wall wrap
  - 92 mm steel studs 1.15 mm BMT at 600mm ctrs
  - 90 mm Earthwool R2.0
  - 13 mm standard plasterboard, 8.4 kg/m2 density
- **Result:** Rw+Ctr 41

WEATHERPROOFING & MOISTURE MANAGEMENT

To prevent damp conditions inside the building, it is necessary to ensure that water is prevented from passing from the outside of the facade to the internal surfaces. It is also necessary to ensure that condensation does not occur or that, in the event that it does occur in certain transient conditions, the resulting moisture is not trapped in wall areas where mould growth or corrosion (or other material degradation) could occur.

There are five modes of water ingress, or forces acting on water that can penetrate the façade of a building – gravity, kinetic energy, air pressure differentials, surface tension and capillary action. Additionally, water vapour in air and the condensation potential with temperature differentials through the cavity also provides a means for water to become present in an external wall element.

In order to manage the above, the AlphaPanel® façade system shall be designed and detailed as a rain screen with pressure equalised cavity. The principal barrier to water entry is the AlphaPanel®. An air barrier shall be maintained at the internal wall lining and the cavity must be closed vertically at regular junctions such as at a separation wall junction and each external corner, and at floor levels. The cavity side of the stud framing shall be protected by a wall wrap or sarking to prevent water entry to the inside of the building whilst allowing water vapour transport. The base of the panel shall be set down at least 100 mm below the floor level to prevent water at the base of the cavity from tracking to the inside of the building in the event that water penetrates the external skin. Weep holes shall be provided for cavity pressure equalisation, and to allow drainage of any accumulated water or moisture from the cavity. Flashings shall be provided at the base of the walls and heads of openings to direct water and moisture away from the frame. Refer to Ian Bennie & Associates Test Reports 2021-010-S1 & 2021-010-S2 (NATA Accreditation No. 2371, Site No. 2364) in accordance with AS/NZS 4284, as well as Rickard Engineering report ref.: 20297_210303 for further details. Refer to the following Australian Building Codes Board Guideline Documents for general related information: ABCB Guideline Document – Condensation in Buildings & ABCB Guideline Document – Durability in Buildings.

ENERGY EFFICIENCY

NCC Volume Two Part 3.12 – Clause 3.12.1.4 provides minimum total R-Values that an external wall can comply with to be 'Deemed-to-Satisfy', and is summarised in Table 7.2. Refer to NCC Volume Two Clause 3.12.1.4 for other options, such as when the external wall is shaded.

Table 7.2: NCC Volume Two Deemed-to-Satisfy R-Values, Building Fabric – External Walls

Climate Zone	Minimum Total R-Value (m^2K/W)
1, 2, 3, 4, 5, 6, 7	2.8
8	3.8

The R-Value for AlphaPanel® is as follows:

- 35mm AlphaPanel® – 0.13 m2K/W
- 50mm AlphaPanel® – 0.18 m2K/W

Tables 7.3 and 7.4 provide example system R-Value calculations for the AlphaPanel® House & Low-Rise external wall system for use in determining compliance with those 'Deemed-to- Satisfy' requirements. The wall element R-values are based on ICANZ Handbook Version 3, modified from Table W0300.

Table 7.2: R-Value calculations 35mm AlphaPanel® façade wall system

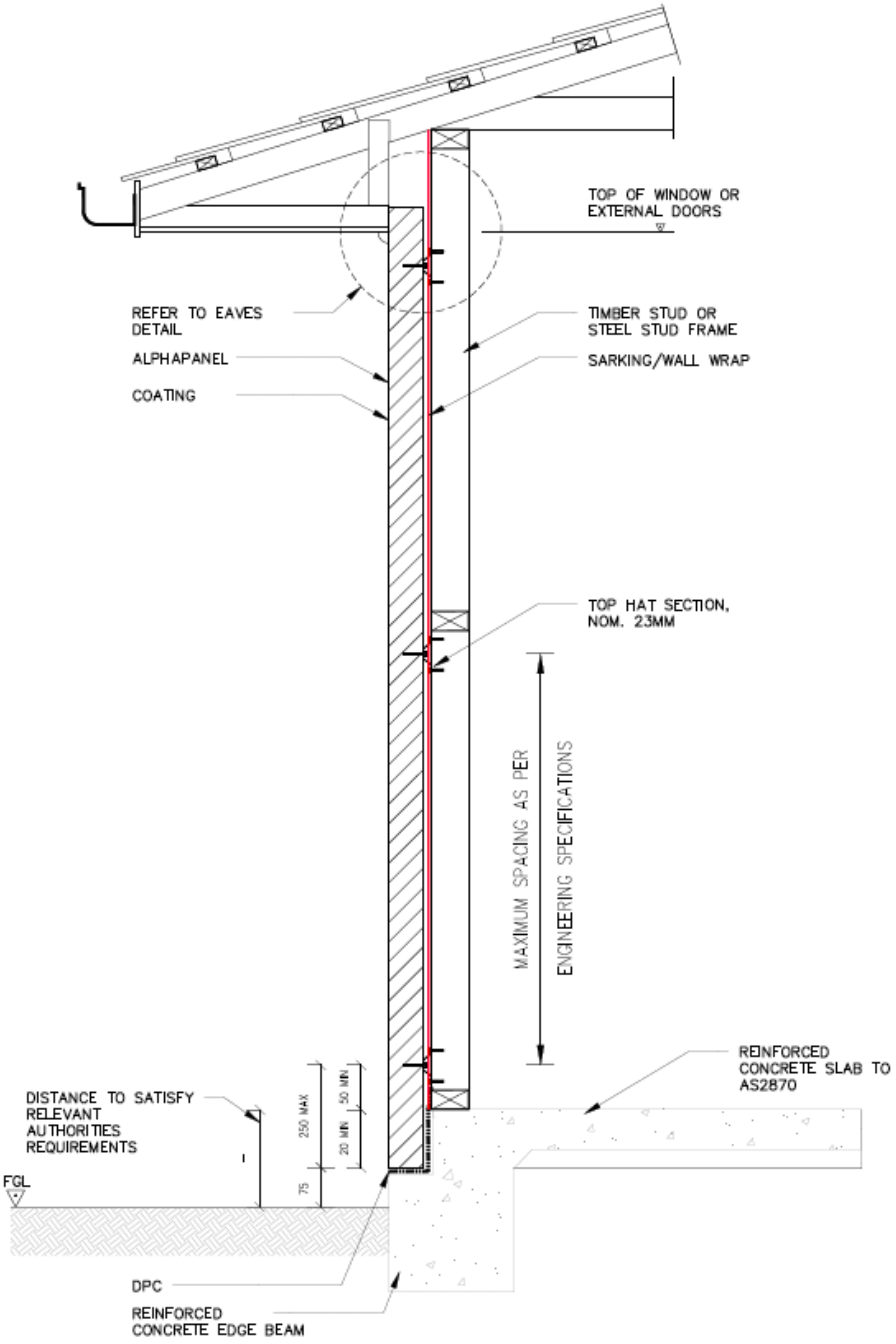
	R-Value (m^2K/W)											
	Wall Wrap / Sarking Type											
Wall Element	No Membrane		Vapour Permeable		Single-Sided Foil		Double-Sided Antiglare		Double-Sided Buble/Foam Foil R 0.2		Double-Sided Antiglare EPS Board R 0.37, 15mm	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Outdoor air film	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
35mm Alphapanel	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
25-50mm non-ventilated airspace			0.19	0.16	0.20	0.16	0.72	0.57	0.68	0.55	0.87	0.70
Sarking material R-value			0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.38	0.36
90mm airspace in studs	0.18	0.15	0.18	0.15	0.68	0.60	0.68	0.65	0.63	0.62	0.71	0.70
10mm plasterboard	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Indoor air film	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
System R-Value without insulation:	0.44	0.41	0.63	0.57	1.14	1.02	1.66	1.48	1.77	1.63	2.22	2.02
System Total R-Value with insulation												
Stud wall batts R1.5 (75mm)	2.04	1.84	2.04	1.84	2.04	1.84	2.64	2.34	2.74	2.54	3.14	2.84
Stud wall batts R2.0 (90mm)	2.54	2.34	2.54	2.34	2.54	2.34	3.14	2.84	3.34	3.04	3.74	3.34
Stud wall batts R2.5 (90mm)	3.04	2.84	3.04	2.84	3.04	2.84	3.64	3.34	3.84	3.54	4.24	3.84
Stud wall batts R2.7 (90mm)	3.34	3.04	3.34	3.04	3.34	3.04	3.94	3.54	4.04	3.74	4.44	4.04

Table 7.3: R-Value calculations 50mm AlphaPanel® façade wall system

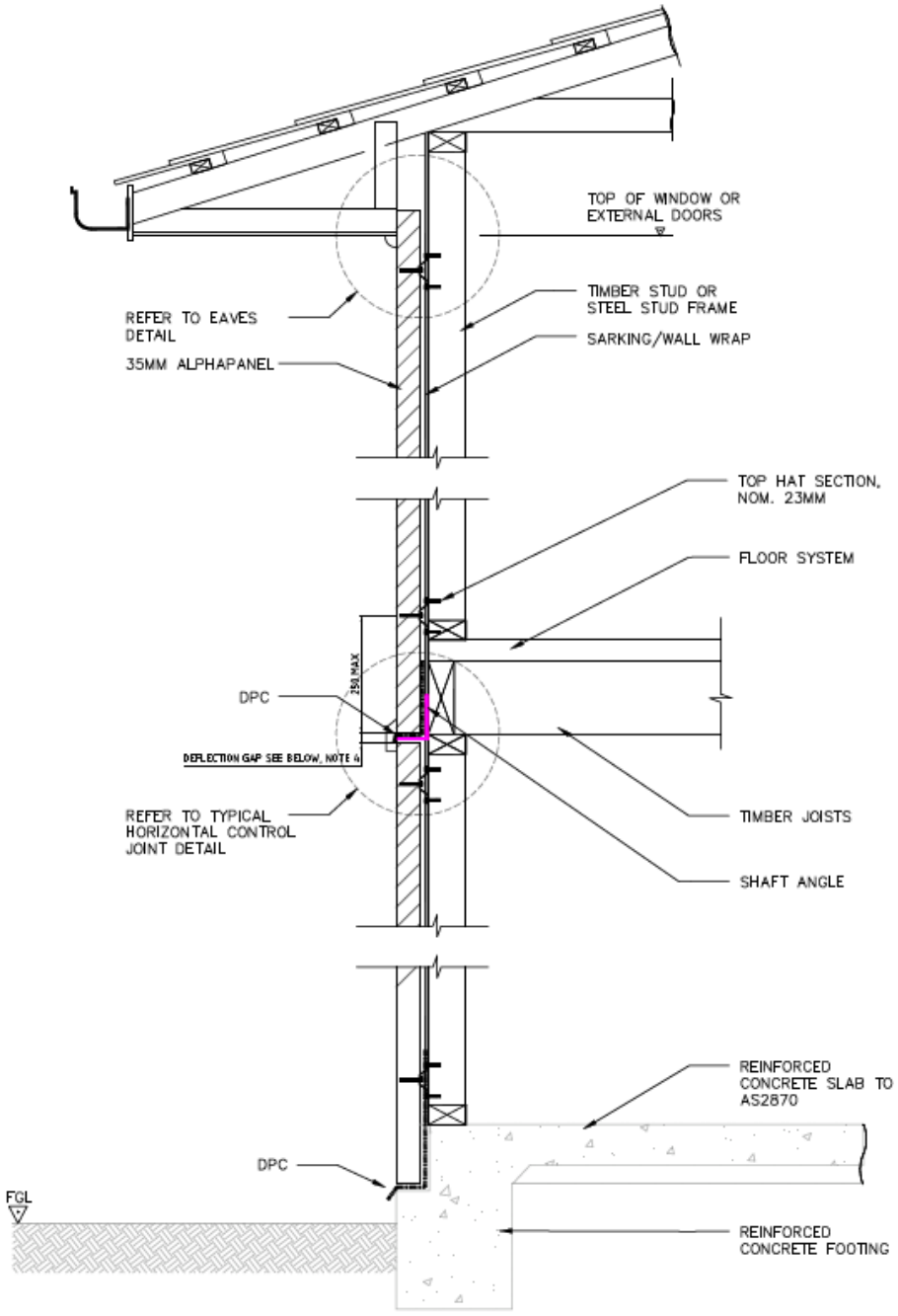
	R-Value (m^2K/W)											
	Wall Wrap / Sarking Type											
Wall Element	No Membrane		Vapour Permeable		Single-Sided Foil		Double-Sided Antiglare		Double-Sided Buble/Foam Foil R 0.2		Double-Sided Antiglare EPS Board R 0.37, 15mm	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Outdoor air film	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
50mm Alphapanel	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
25-50mm non-ventilated airspace			0.19	0.16	0.20	0.16	0.72	0.57	0.68	0.55	0.87	0.70
Sarking material R-value			0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.38	0.36
90mm airspace in studs	0.18	0.15	0.18	0.15	0.68	0.60	0.68	0.65	0.63	0.62	0.71	0.70
10mm plasterboard	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Indoor air film	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
System R-Value without insulation:	0.46	0.43	0.65	0.59	1.16	1.04	1.68	1.50	1.79	1.65	2.24	2.04
System Total R-Value with insulation												
Stud wall batts R1.5 (75mm)	2.06	1.86	2.06	1.86	2.06	1.86	2.66	2.36	2.76	2.56	3.16	2.86
Stud wall batts R2.0 (90mm)	2.56	2.36	2.56	2.36	2.56	2.36	3.16	2.86	3.36	3.06	3.76	3.36
Stud wall batts R2.5 (90mm)	3.06	2.86	3.06	2.86	3.06	2.86	3.66	3.36	3.86	3.56	4.26	3.86
Stud wall batts R2.7 (90mm)	3.36	3.06	3.36	3.06	3.36	3.06	3.96	3.56	4.06	3.76	4.46	4.06

STANDARD CONSTRUCTION DETAILS

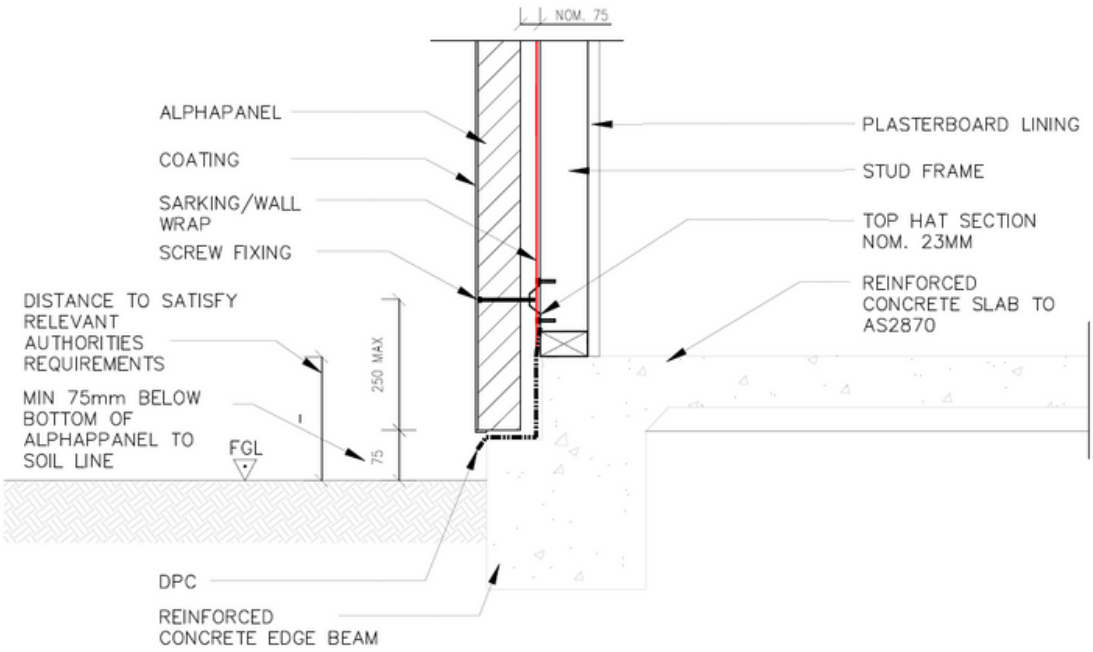
LX1.1 SINGLE STOREY



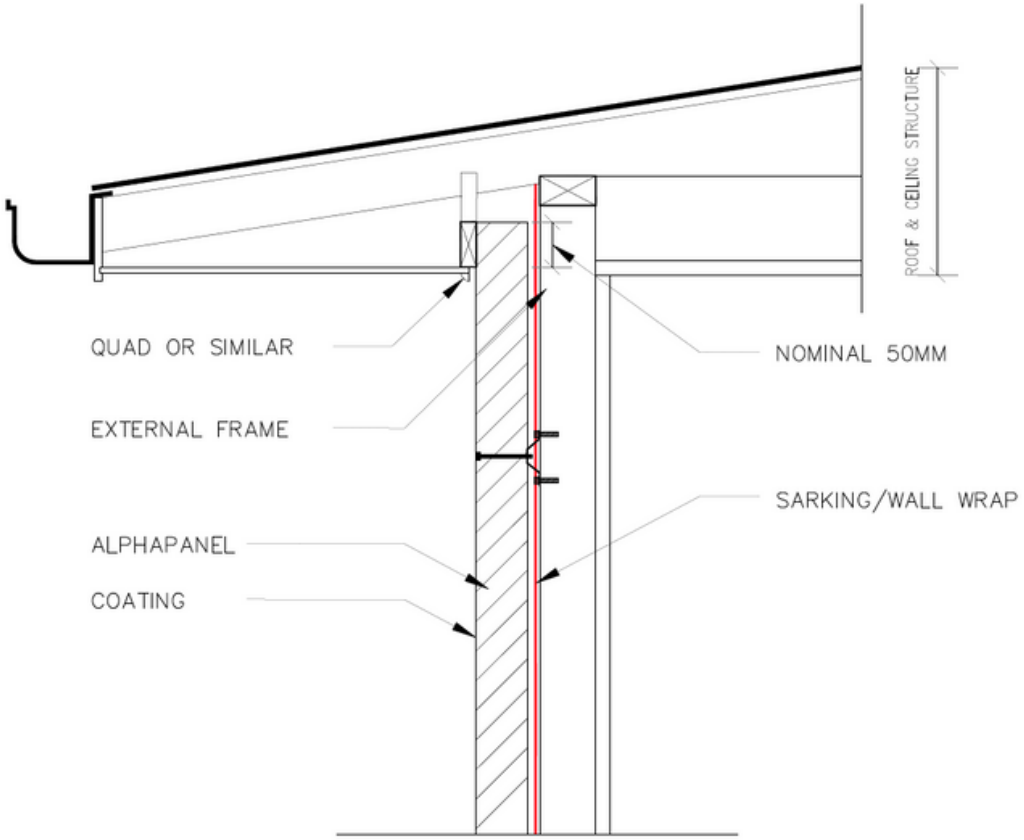
LX1.2 TWO STOREY



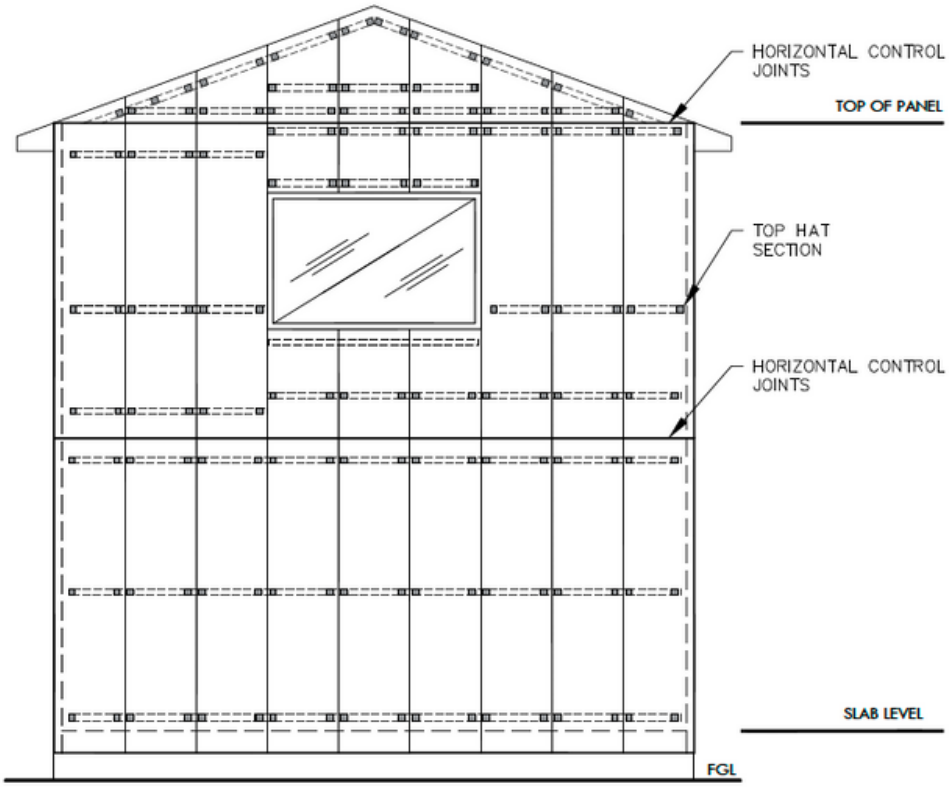
LX1.3 BASE OF WALL



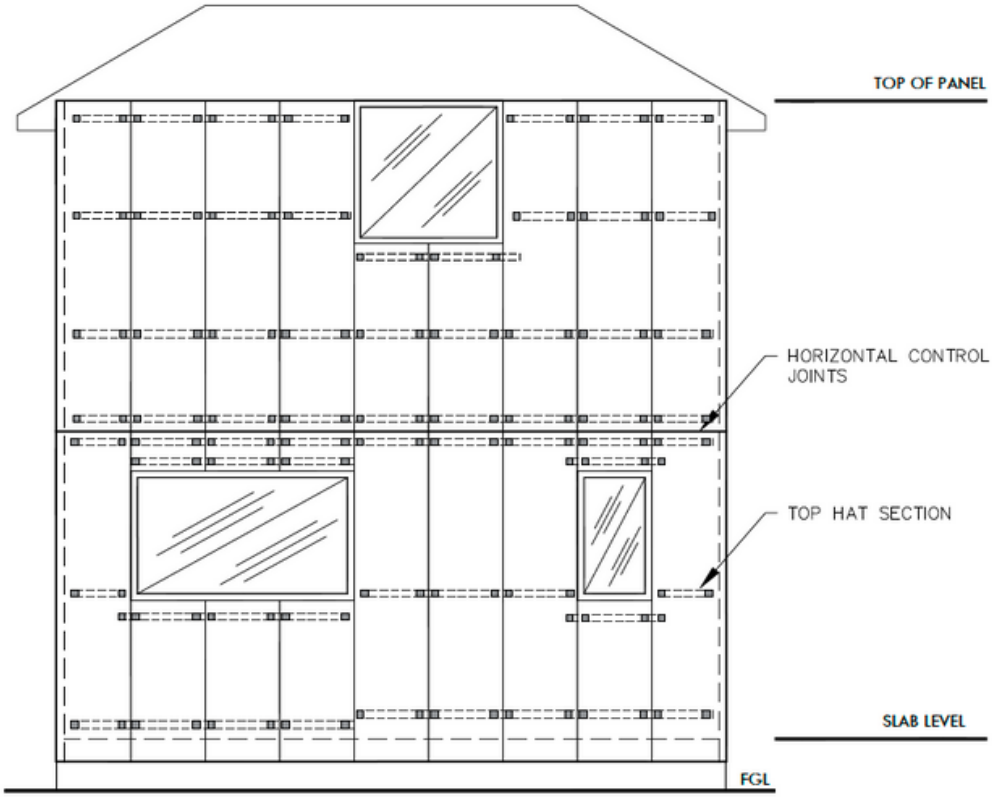
LX1.4 EAVES



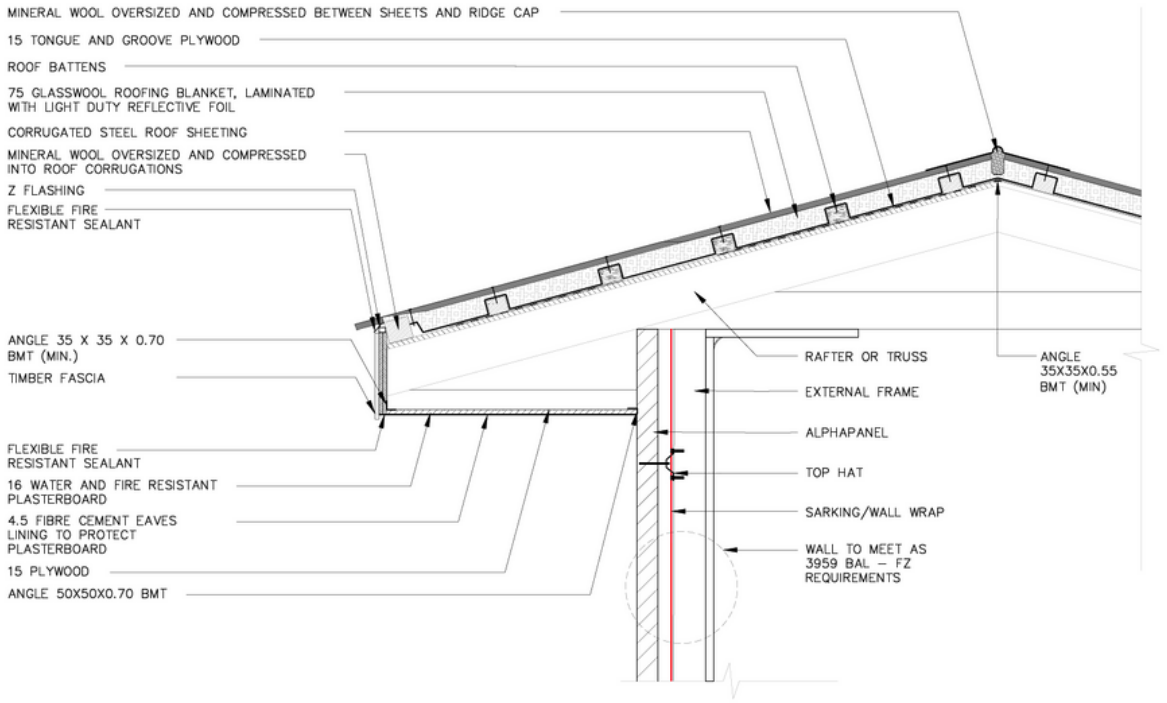
LX1.5 GABLE ROOF



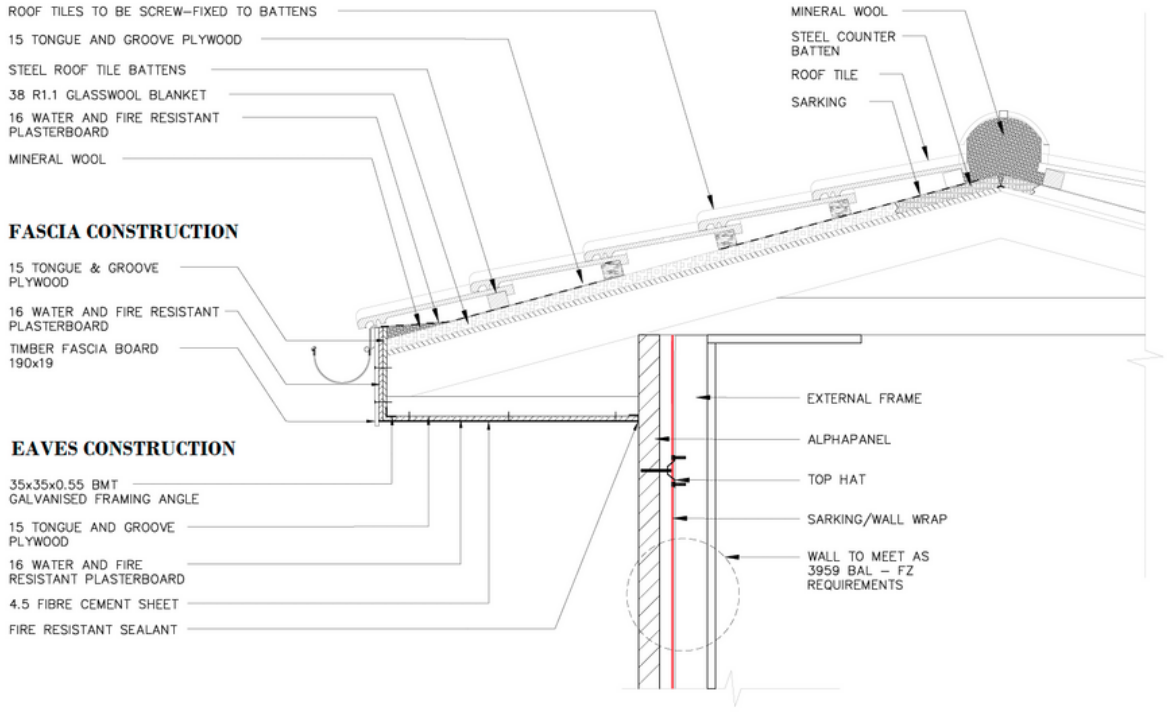
LX1.6 HIP ROOF



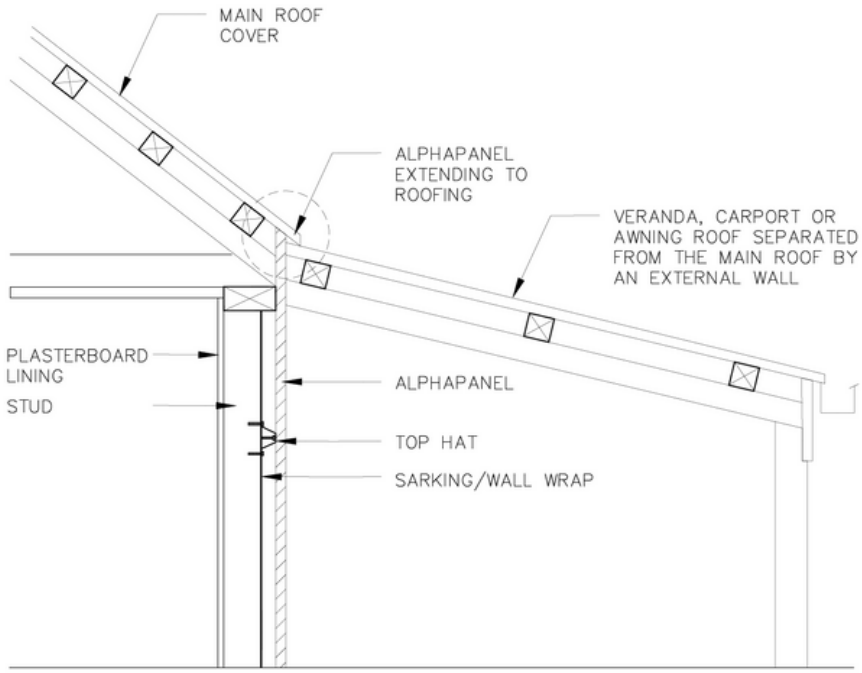
LX1.7 SHEETED ROOF



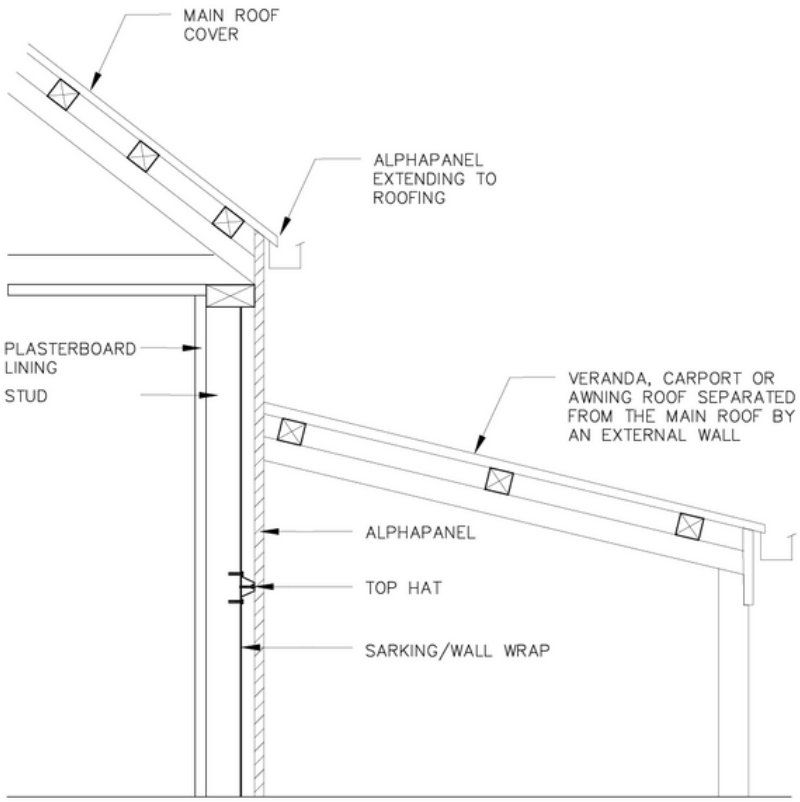
LX1.8 TILED ROOF



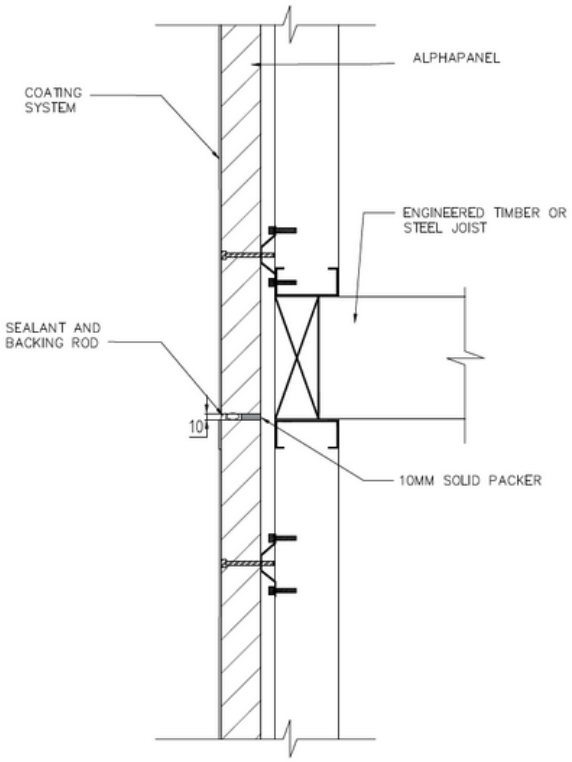
LX1.9 CONTINUOUS ROOF



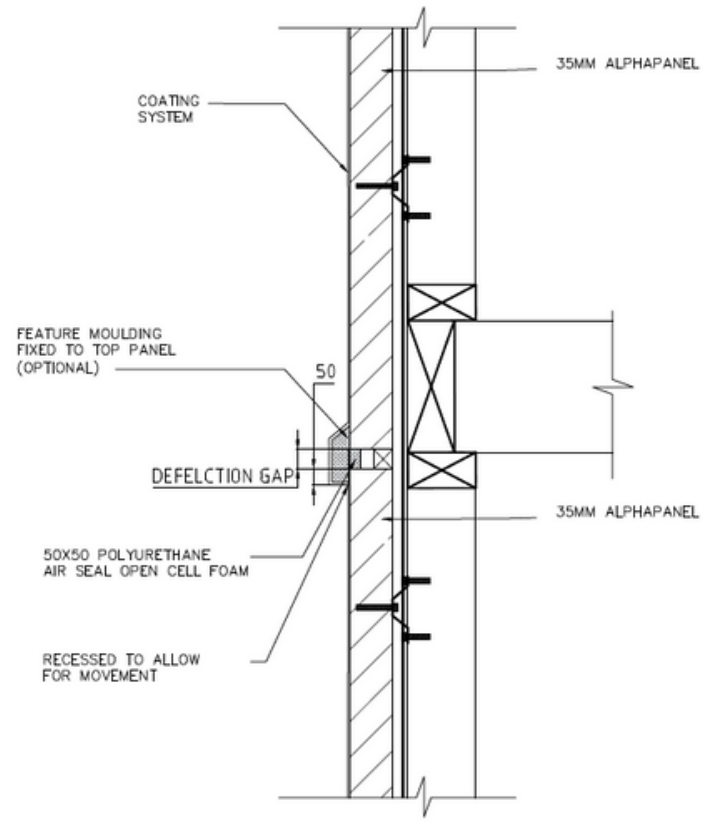
LX1.10 DISCONTINUOUS ROOF



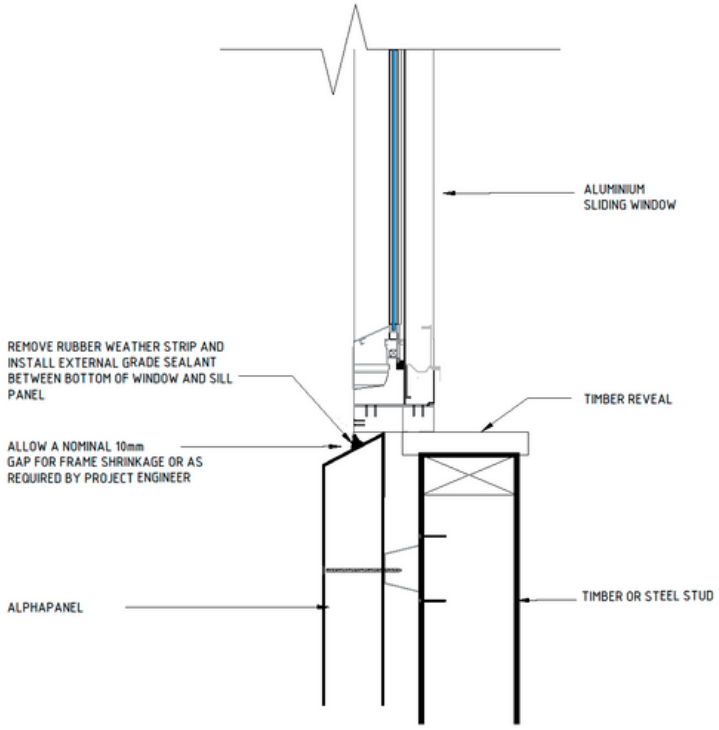
LX1.11 HORIZONTAL CONTROL JOINT (STEEL FRAMING)



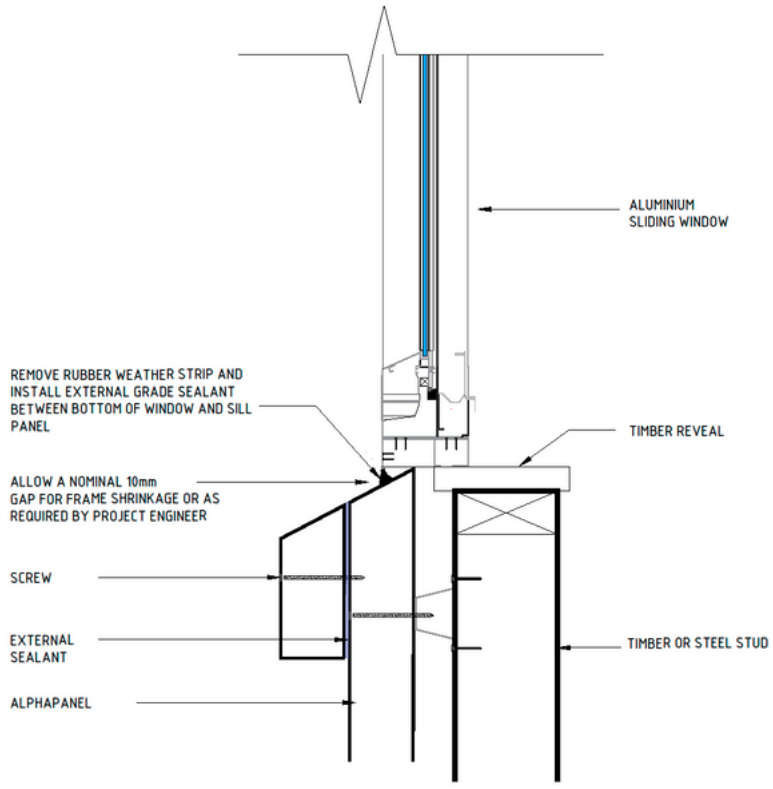
LX1.12 HORIZONTAL CONTROL JOINT (TIMBER FRAMING)



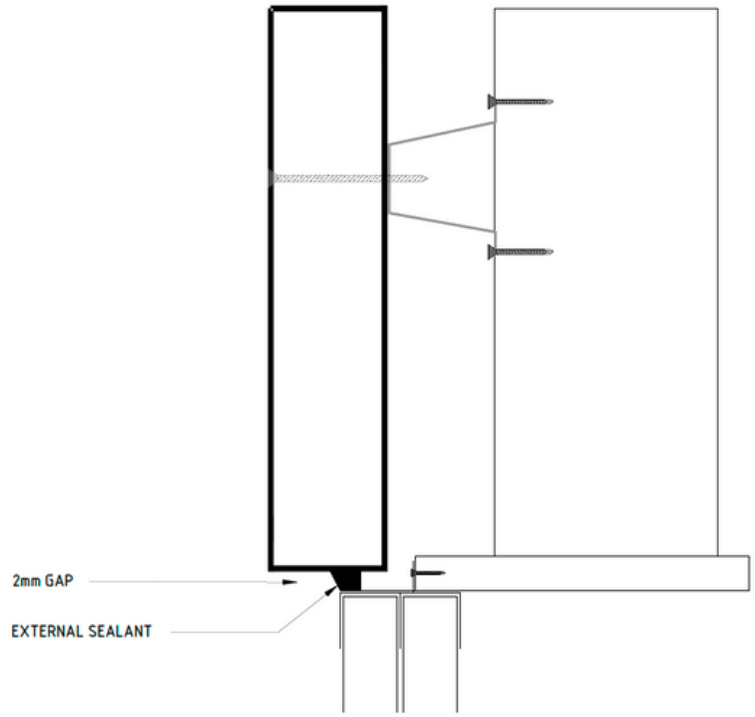
LX1.13 WINDOW SILL OPTION 1 (ALUMINIUM FRAME)



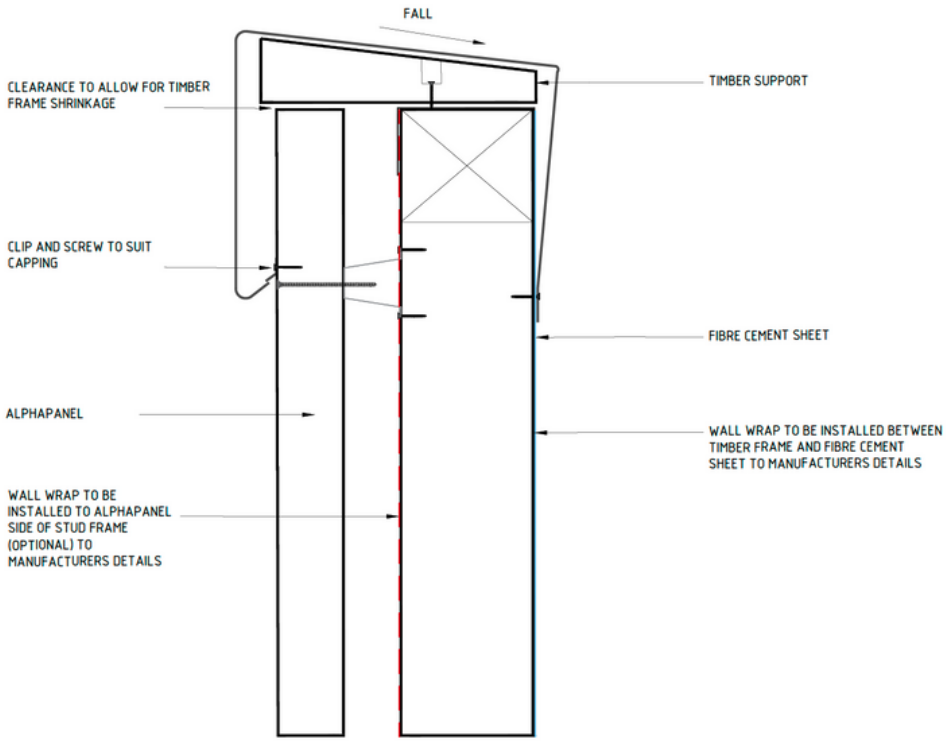
LX1.14 WINDOW SILL OPITION 2 (ALUMINIUM FRAME)



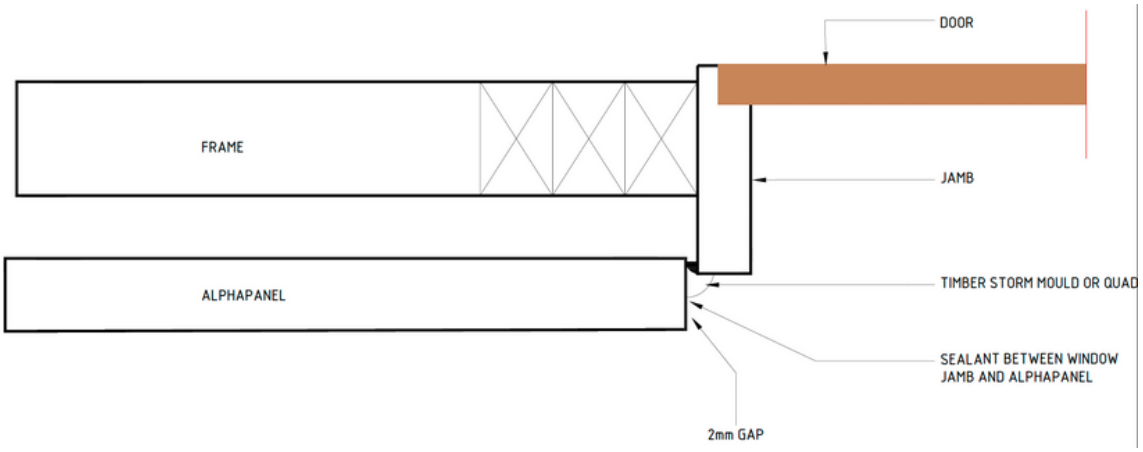
LX1.15 WINDOW HEAD (ALUMINIUM FRAME)



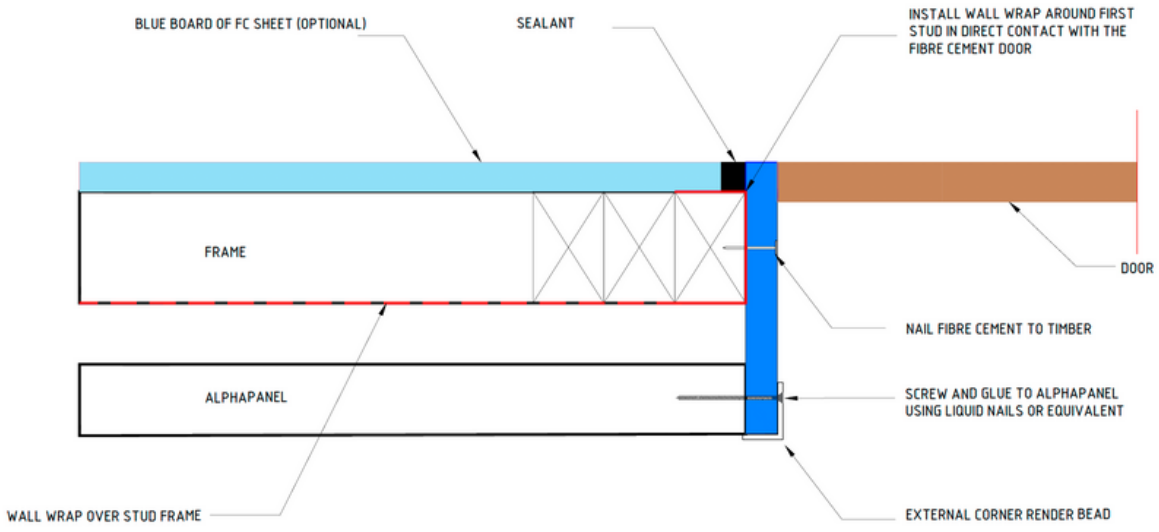
LX1.16 PARAPET CAPPING



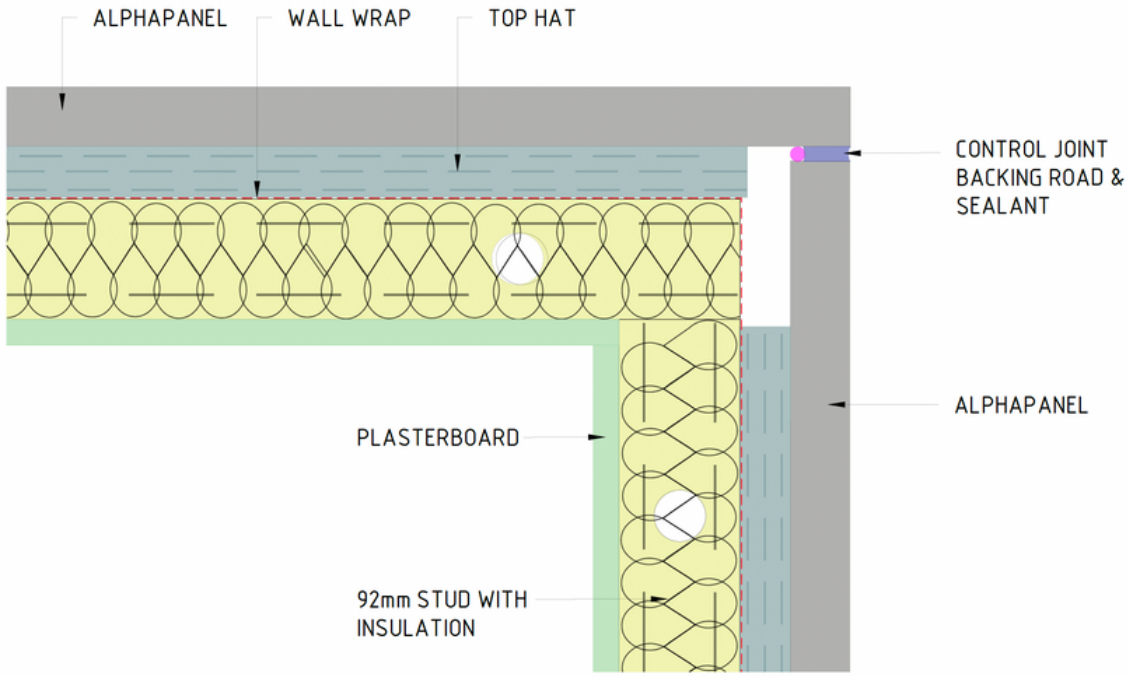
LX1.20 GARAGE DOOR JAMB OPTION 1



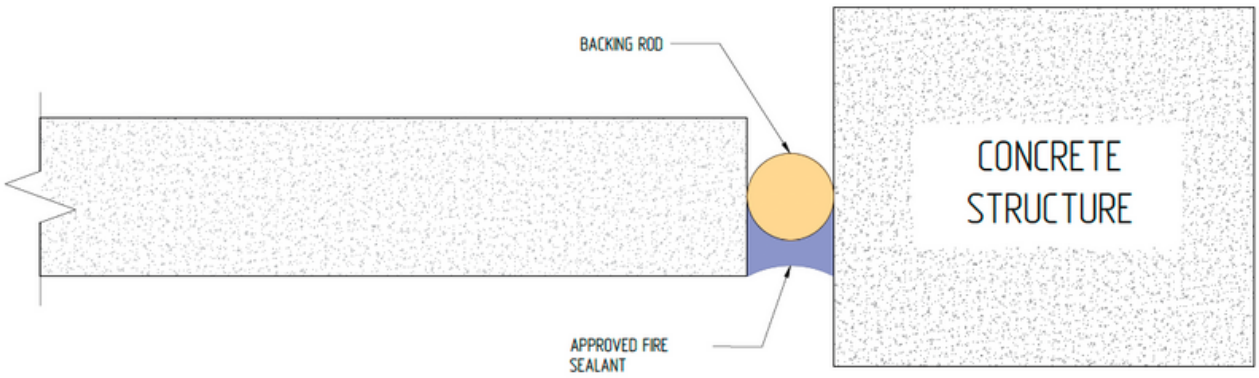
LX1.21 GARAGE DOOR JAMB OPTION 2



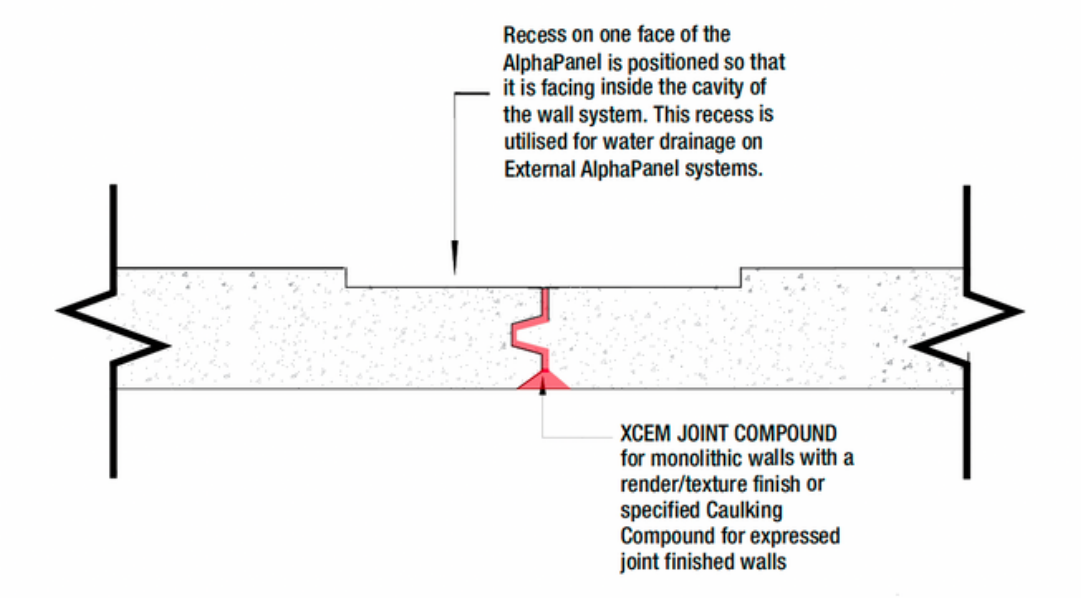
LXJ1.1 EXTERNAL CORNER DETAIL



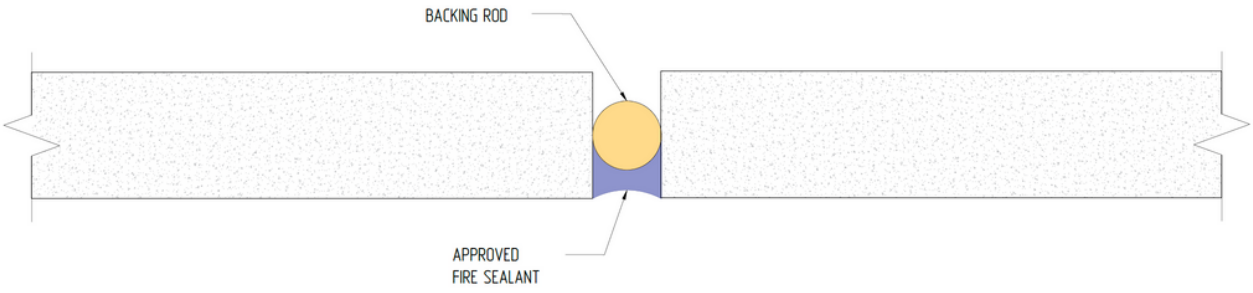
LXJ1.2 PANEL TO ALTERNATE SYSTEM MOVEMENT JOINT



LXJ1.3 EXTERNAL PANEL TO PANEL JOINT



LXJ1.4 PANEL TO PANEL CONTROL JOINT



CONSTRUCTION NOTES

The Installer shall refer to the project drawings and specifications and shall perform work to the quality standards agreed with the builder. The notes below are important from an engineering and compliance perspective. The details for construction are based generally on those in AS 5146.3 Section 4.

1. Framing shall be in accordance with the required standards for timber or cold-formed steel.
2. Framed heads to openings shall be designed to support the AlphaPanel® dead load.
3. Where any structural framing members are timber, the requirements of AS 3660.1 shall be followed to protect against termite attack. Refer to termite barrier system provider for base of wall detailing requirements suitable for the AlphaPanel® construction method.
4. AlphaPanel® shall be evenly supported by the slab edge or a shelf angle min. 4mm in thickness and galvanised to project requirements.
5. DPC shall be installed to the first top hat batten, or min. 150 mm above the finished slab level inside of the wall. DPC shall be expressed to the outside face of the wall.
6. Wall wrap/sarking shall overlap the DPC by min. 100 mm. Tape wall wrap to DPC, around the perimeter and at all laps.
7. AlphaPanel® can be bed in nom. 10 mm mortar at the base of the wall when constructed off a slab edge set-down to accommodate slab tolerances.
8. Base of panel shall be min. 50 mm below slab floor level or min. 100 mm below finished floor level if supported by an angle fixed to the floor framing. Refer also to any local authority requirements as applicable.
9. Set out top hats horizontally on the frame within the limits of the design specifications for the appropriate wind class and with the following considerations:
    - 9.1. Maximum end spacing at the top and bottom of the wall shall be 250 mm.
    - 9.2. Maximum spacing of top hats shall be 1350 mm.
10. AlphaPanel® shall be fixed to top hats in accordance with Table 7.1. Space screws 100 mm from each edge and then evenly distributed across the panel when more than 2 screws are specified.
11. Pre-drill panels dia. 4 mm if required. Tek screws do not need pre-drilling (countersink screw head as required). Type 17 screws require pre-drilling.
12. For monolithic/rendered walls AlphaPanel® joints are to be bonded using XCEM Joint Compound (2-part Epoxy Adhesive), or for expressed joint walls AlphaPanel® joints are to be bonded using a specified external caulking compound.
13. Provide vertical control joints (min. 10 mm wide) in walls at the following locations:
    - 13.1. Max. 2,400 mm ctrs.
    - 13.2. Where wall height changes by greater than 20%.
    - 13.3. A change in wall thickness.
    - 13.4. Locations corresponding to structure (slab) control joints.
    - 13.5. Generally at corners.
    - 13.6. At door and window openings.
    - 13.7. Junctions of different wall system types.
14. Top hats must be discontinuous behind control joints.
15. Seal control joints with backing rod and external grade sealant (fire-rated with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014 if required), min. 10 mm width x 5 mm depth.

16. Sealants shall be approved for the application by the manufacturer. The contractor must follow the manufacturer's specifications and ensure surfaces to be bonded are clean, free of dust and debris, and prepared and primed as required.
17. Flashing and sealing of windows and doors shall be in accordance with the specifications and detailing supplied by the manufacturer for a clad wall system. Principle is to seal to AlphaPanel® and for water to drain to the outside of the wall.
18. Coating of AlphaPanel® shall be in accordance with a specified system from coating supplier.

ALPHAPANEL® LOW-RISE INTERTENANCY WALLS

AlphaPanel® low-rise Intertenancy walls consist of a high-strength and highly durable fibre reinforced concrete panel separating tenancies. The system is fast to install and has a narrow footprint.

COMPONENT SPECIFICATIONS

AlphaPanel® low-rise intertenancy walls comprise a central core of vertical 35 mm and 50 mm AlphaPanel® fixed by aluminium brackets to structural timber or steel framing on both sides. The geometric limits of these walls are maximum 12.0 m overall height with max. 3,000 mm vertical spacing between lateral supports.

These walls are only for duplex and terrace style construction that separate sole-occupancies. They are not suitable for separating walls in buildings where there are sole-occupancies over different levels, e.g. manor home or multi-storey residential construction.

- Panel: 35 mm thick or 50 mm thick AlphaPanel®, 600, or 450 mm wide and max. 3,000 mm length.
- Framing: Timber framing in accordance with AS 1720 or AS 1684 series, or Cold-formed steel framing in accordance with NASH Standard.
- Aluminium Bracket: Min. 76 x 43 x 50 mm long – 1.6 mm thick, grade 5005.
- Screws: In accordance with AS 3566 Part 1 and Part 2
  - Coating Class 3 – generally acceptable for all environment zones in closed internal wall spaces.
- Flashings and DPC: In accordance with AS/NZS 2904.
- Sealants: Polyurethane fire-rated (with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014), prepared and installed in conjunction with a backing rod.
- Horizontal panel joint fire seal: Min. 110kg/m3 75 mm wide x 13 mm thick fire-resisting mineral fibre.
- Roof fire seal: Min. 60kg/m3 fire-resisting mineral fibre.
- XCEM Joint Compound: 2-Part Epoxy used for panel to panel fixed joints.

ALPHAPANEL® LOW-RISE INTERTENANCY WALLS COMPONENT LIST

ALPHAPANEL®

Product	Panel Width	Available Lengths (mm)	Weight
35mm AlphaPanel®	600mm	3000, 3300	45kg/m2
50mm AlphaPanel®	450mm	3000, 3300	65kg/m2

FRAMING

Timber framing in accordance with AS 1684 series, or Cold-formed steel framing in accordance with NASH Standard.

ALUMINIUM BRACKET

Min. 76 x 43 x 50 mm long – 1.6 mm thick, grade 5005.

XCEM JOINT COMPOUND (2-Part Epoxy)

XCEM's Joint Compound is a 2-Part Epoxy, used to bond AlphaPanel® joints together. XCEM Joint Compound is supplied in 10kg kits.

CAULKING COMPOUNDS

Use an Approved Fire-Rated Sealant to caulk all AlphaPanel movement joints, control joints, deflection gaps and penetrations. For walls which require a fire rating use Botsik FireBan One or another Polyurethane sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014.

EARTHWOOL INSULATION

AlphaPanel® wall systems incorporate Earthwool Insulation. Please contact insulation suppliers, and ensure specifications meet those specified in this Design Guide.

BACKING ROD

Backing rod is used to control the depth of sealant, please ensure the appropriate size backing rod is utilised for the gap required to be caulked. Please follow manufacturer's instructions.

PLASTERBOARD

AlphaPanel® Internal wall systems incorporate plasterboard lining. Use specified plasterboard in accordance with this Design Guide, or the project Fire/Acoustic Engineer's specifications.

FIXINGS

Aluminium Bracket to Timber frame: Ø2 x 25 mm gal nails, or No.12-11x35 Type 17 hex head screws.
Aluminium Bracket to Steel frame: No.10-16x16 mm Hex Head Tek screws.
Fixing of Capping Track Section: No.10 wafer head screws
Aluminium Bracket to 50mm AlphaPanel®: No.12-11x40 mm Hex Head Type 17 screws
Aluminium Bracket to 35mm AlphaPanel®: No.12-11x30 mm Hex Head Type 17 screws
Pre-drilling of AlphaPanel®: 4mm Masonry drill bit.

In accordance with AS 3566 Part 1 and Part 2

CONNECTION SPECIFICATIONS

- For AlphaPanel® 600 mm wide or less: one aluminium bracket per side per end of every panel (4 total per panel), fixed along the vertical center line of the panel, ± 50 mm.
- Aluminium bracket to frame:
  - Timber frame – 2 x Ø2 x 25 mm gal nails, or
    2 x No.12-11x35 mm Hex Head Type 17 screws
  - Steel frame – 2 x No.10-16x16 mm Hex Head Tek screws (note – install capping track section min. 200 mm long over the base track for fixing, 2xNo.10 wafer head screws each side).
- Aluminium bracket to 50 mm AlphaPanel®: 2 x No.12-11x40 mm Hex Head Type17 screws
- Aluminium bracket to 35 mm AlphaPanel®: 2 xNo.12-11x30 mm Hex Head Type 17 screws

The aluminium bracket fixing shall only be made at the periphery of the frames in order to maintain compliance with Deemed-to-Satisfy Provisions for discontinuous construction.

SLABS AND FOOTINGS

Slabs and footings supporting AlphaPanel® low-rise residential party walls shall be designed, specified, and constructed in accordance with AS 2870 for minimum construction category of “masonry veneer”. In the slab/footing system, there shall be a continuous beam (or adjacent beams in the case where the slab is discontinuous at the junction of the sole-occupancy units) directly under the AlphaPanel® low-rise residential party wall.

For stepped slabs at the intertenancy wall, the following detailing options can be considered:

1. One frame and the AlphaPanel® leaf are installed on the upper level, the other frame is installed on the lower level.
2. One frame is installed on the upper level, and the AlphaPanel® and other frame installed on the lower level.
3. The frames are installed on each respective level and the AlphaPanel® is installed off a shelf angle fixed to the edge of the slab set-down. For this option, the following shall be detailed:
   a. Min. 65x65x5 mm galvanised steel angle anchored to slab edge with M12 anchors with min. 100 mm embedment at 900 mm ctrs.
   b. Base of angle to be min. 150 mm below upper SSL.
   c. Coat base of angle with intumescent paint to supplier’s specification for 60 minutes fire resistance period.
   d. Seal between corner of angle and slab edge with backing rod and polyurethane fire-rated sealant (e.g. Bostik Fireban One).
   e. Seal butt joints in angle with polyurethane fire-rated sealant (e.g. Bostik Fireban One).

For walls in garage areas where there will be a fall of 1:100 provided, the following options are available, with 1. being the preferred.

1. Provide a hob across the wall footprint so that the SSL is maintained under the wall.
2. Rake the wall frames and AlphaPanel® to follow the fall.

FIRE

IGNS-9074 I01, XCEM Pty Ltd AlphaPanel® Separating Wall Fire Resistance Level provides an assessment of fire separating walls in low-rise residential construction using min. 35 mm AlphaPanel® between separated plasterboard lined frames being suitable for FRL 60/60/60.

SOUND TRANSMISSION & INSULATION

PKA Acoustic Performance Assessment ID: PKA103XCM R01v1 provides confirmation of suitability of the 35 mm and 50 mm AlphaPanel® low-rise intertenancy wall system for separating walls. The NCC Volume Two Deemed-to-Satisfy Provisions are summarized in Table 8.1.

Table 8.1: NCC Volume 2 Requirements

Wall Type	NCC Sound Insulation Requirements	
	Airborne 3.8.6.2(a)(i)	Impact 3.8.6.2(a)(ii)
1. Separating sole-occupancy unit habitable areas	$R_w + C_{tr} \geq 50$	Not applicable
2. Separating sole occupancy unit wet areas to habitable areas	$R_w + C_{tr} \geq 50$	Discontinuous construction required

The following wall configuration meets the requirements in Table 8.1:

- 35 mm AlphaPanel® in the centre of the wall and fixed to the periphery of the wall framing with aluminium angle brackets.
- 90x45 mm timber or 90x0.75 mm BMT cold-formed steel studs at 450 or 600 mm ctrs. offset 20 mm from the 35 mm AlphaPanel® between.
- 90 mm thick glasswool of density 11kg/m3 in the stud cavities.
- 13 mm thick plasterboard of mass min. 8.4 kg/m2 each side.

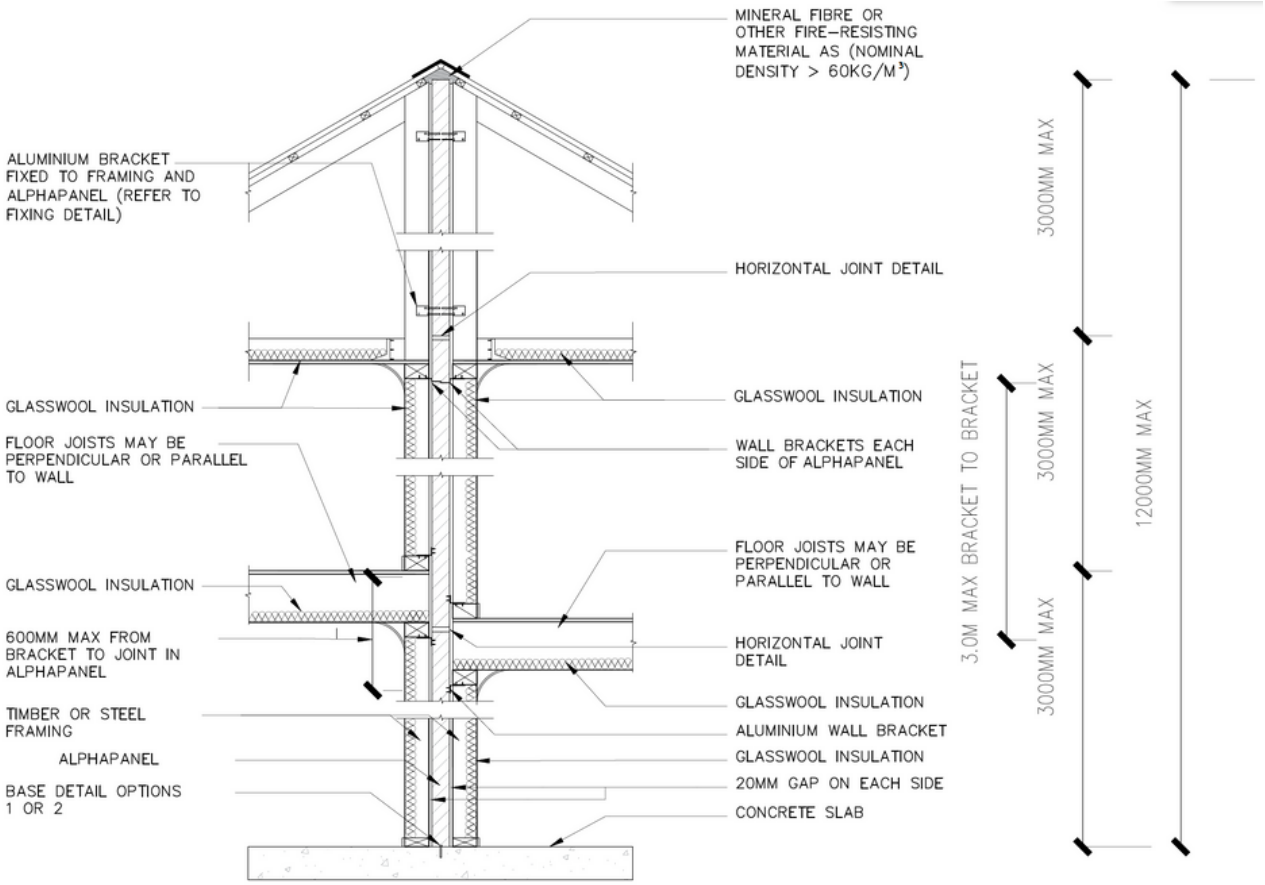
The total thickness of the wall is 296 mm.

For the case where 35 mm AlphaPanel® is in the roof space, provided the ceiling lining is 13 mm thick plasterboard of mass min. 8.4 kg/m2 and the insulation on the ceiling is at least 90 mm thick glasswool of density 11kg/m3, the requirements of Table 8.1 are met.

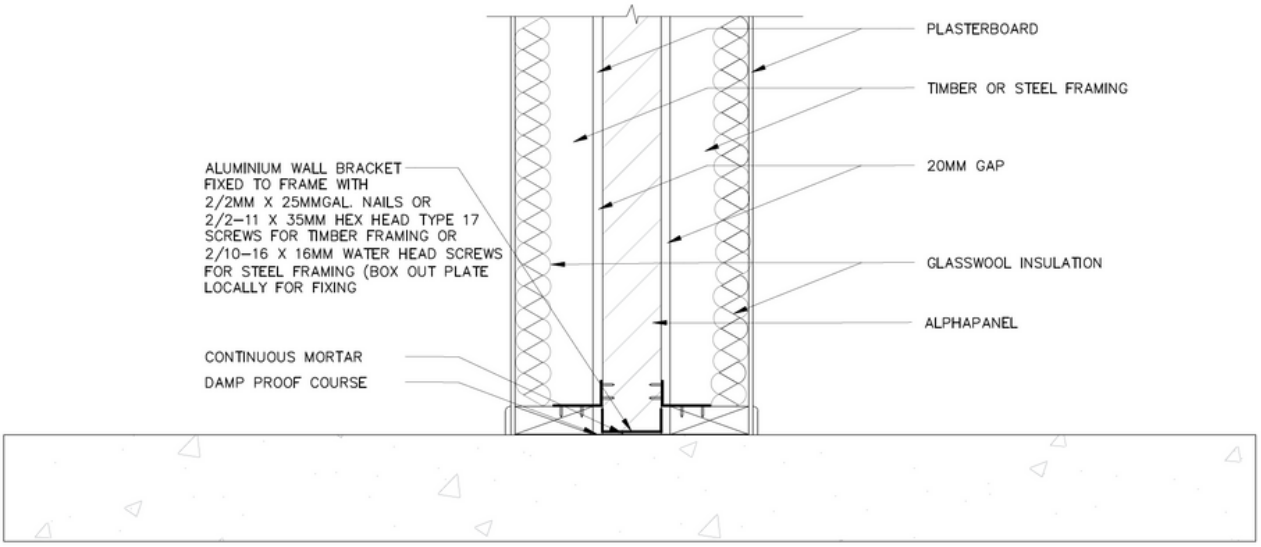
STANDARD CONSTRUCTION DETAILS

Detailing of the AlphaPanel® low-rise residential party wall system follows the principles of the standard details in AS 5146 Part 3 – Section 5, Figures 5.4.1(A) to 5.4.1(N).

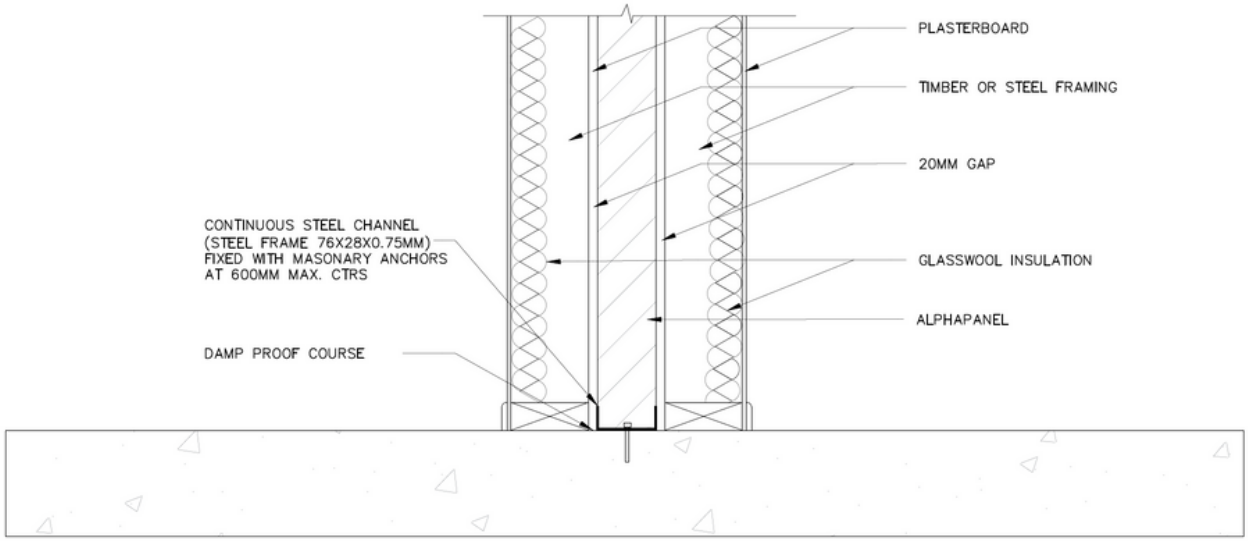
LI1.1 ALPHAPANEL LOW RISE RESIDENTIAL INTERTENANCY WALL



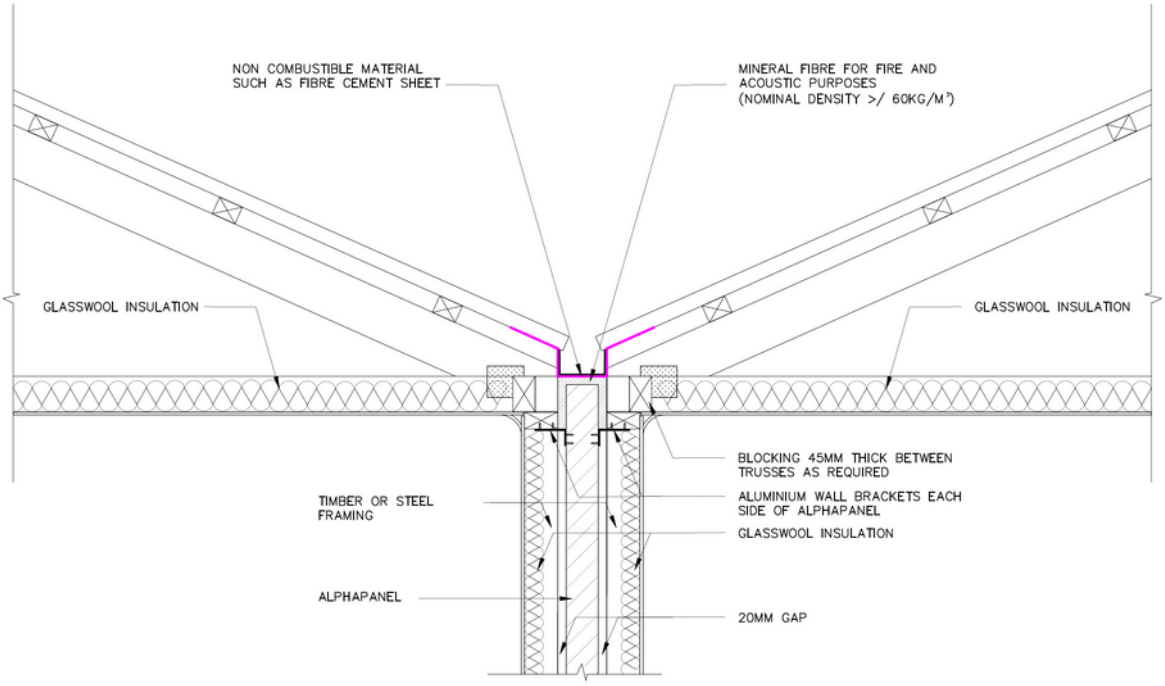
LI1.2 BASE CONNECTION OPTION 1



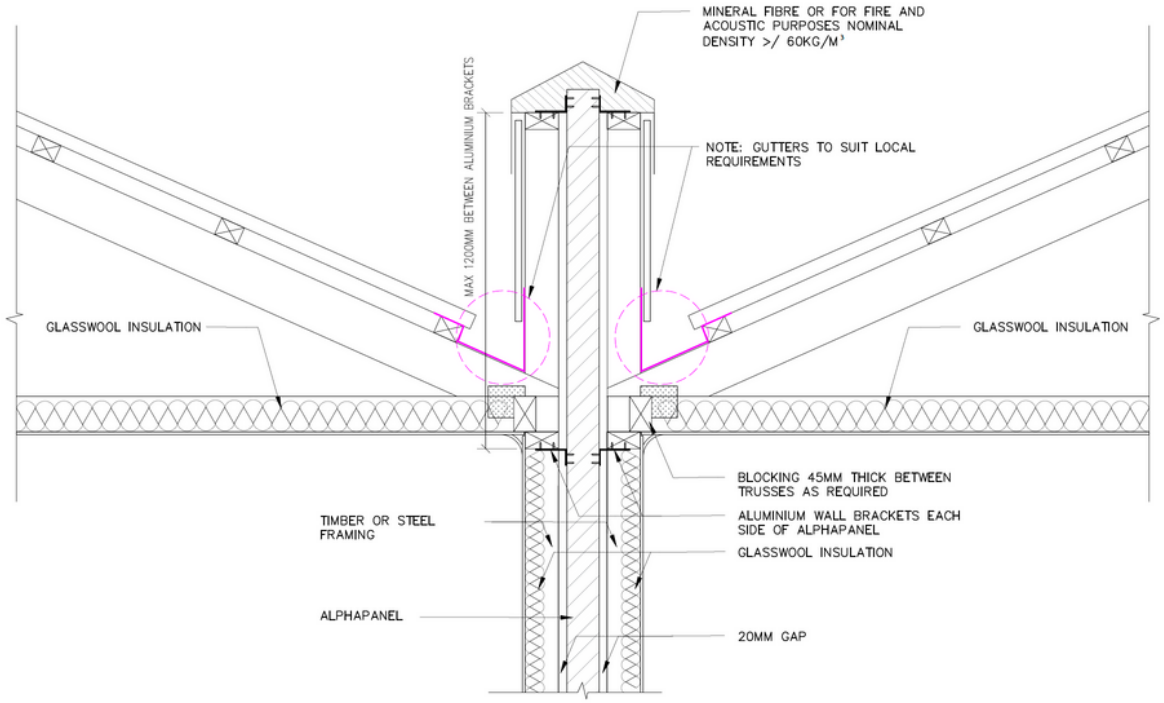
LI1.3 BASE CONNECTION OPTION 2



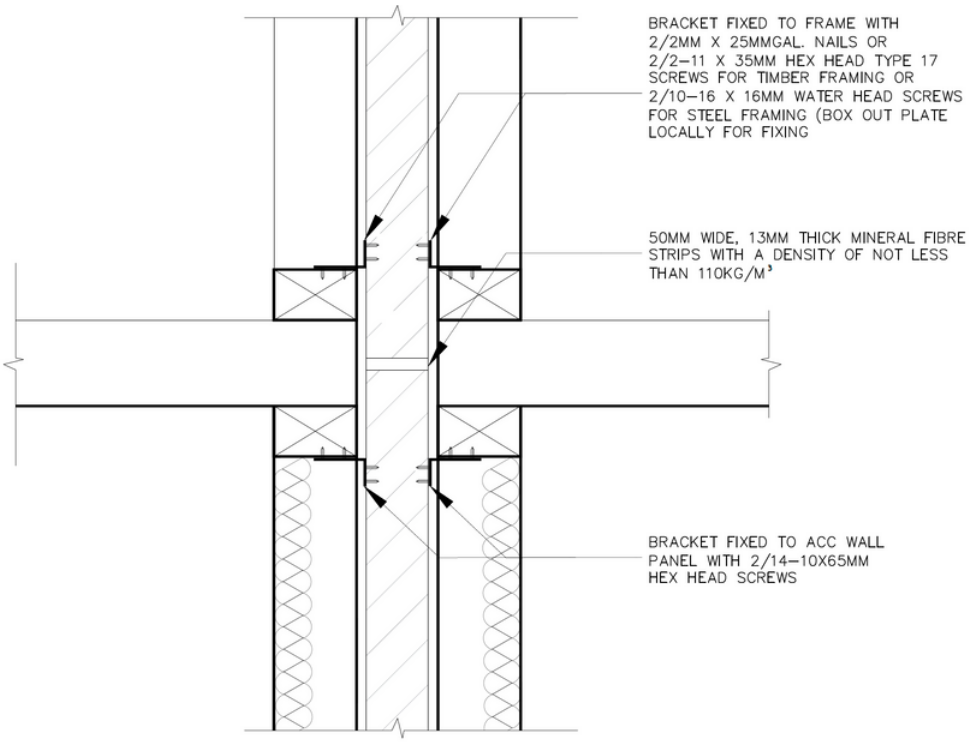
LI1.4 ROOF VALLEY



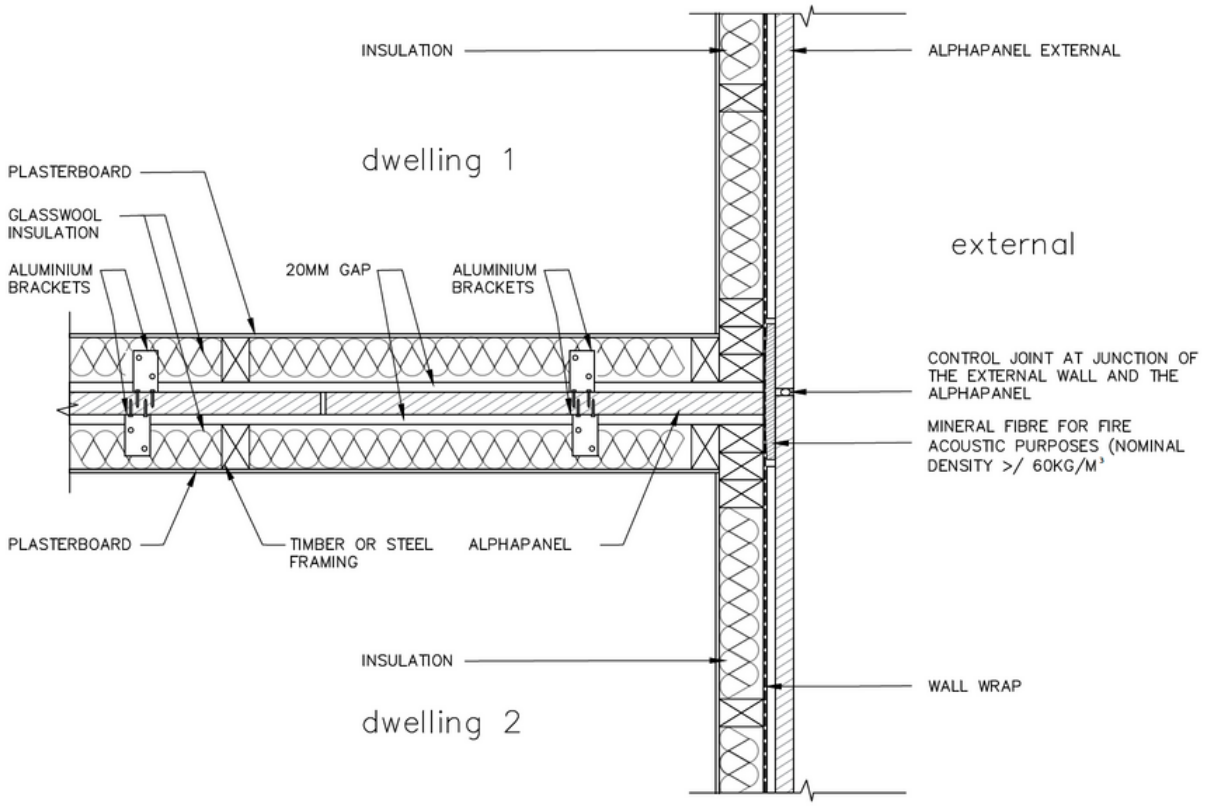
LI1.5 ROOF PARAPET



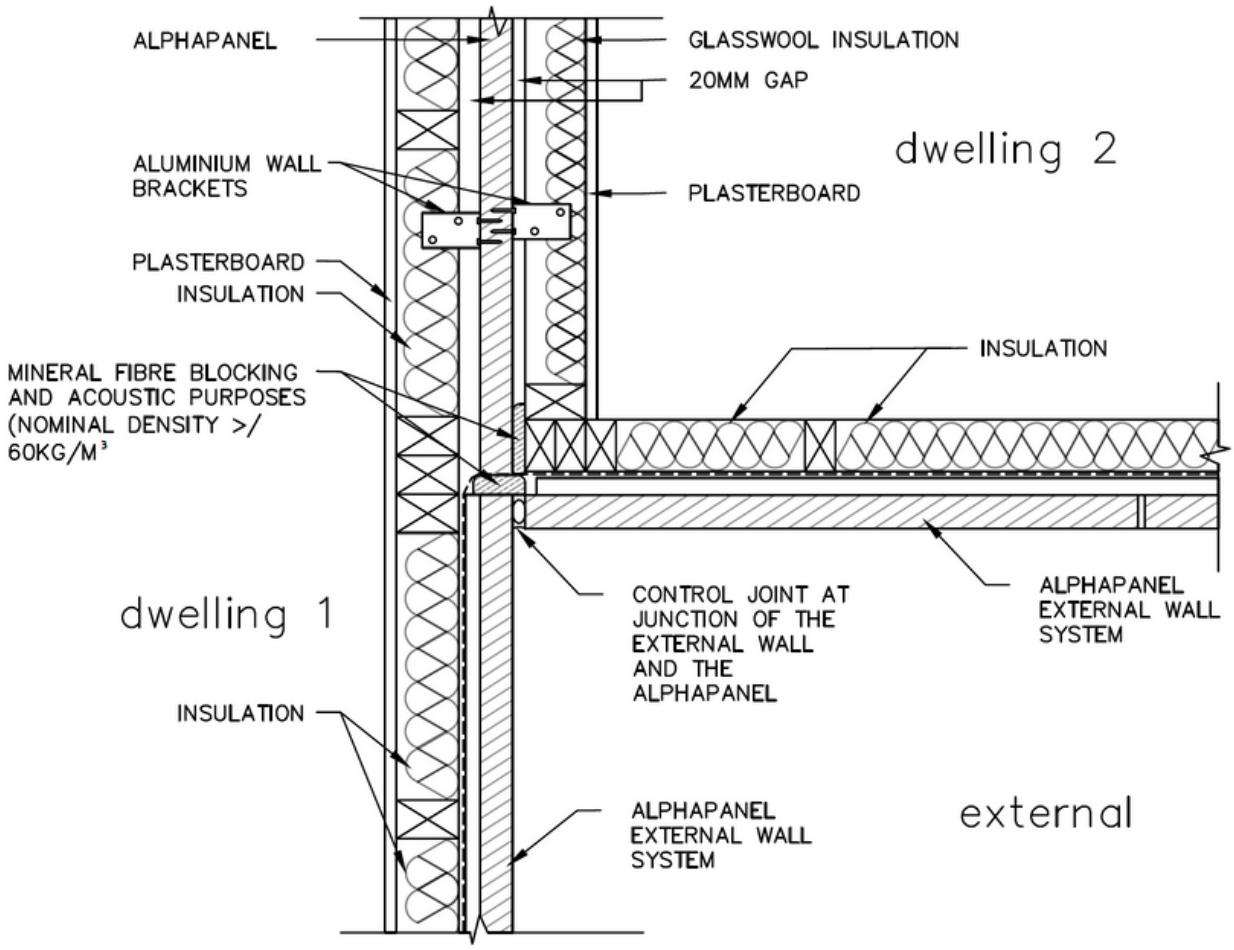
LI1.6 HORIZONTAL JOINT



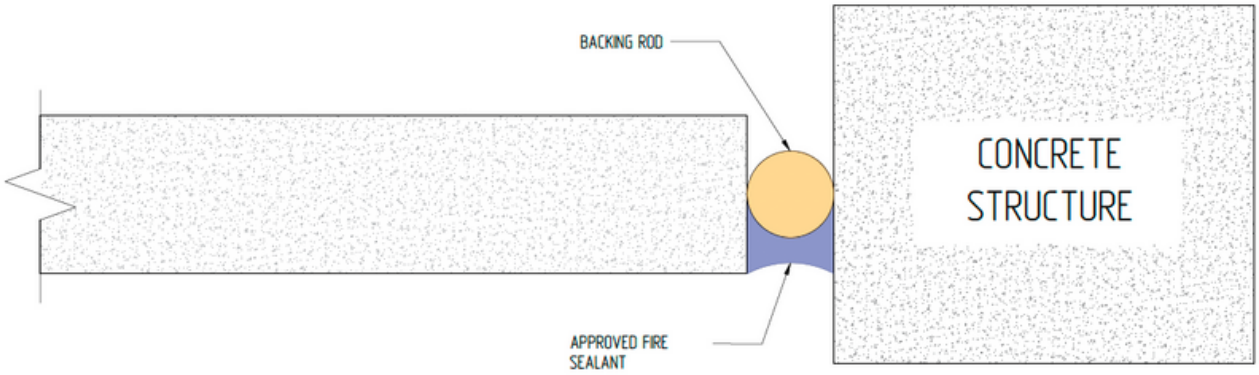
LI1.7 EXTERNAL & INTERTENANCY JUNCTION



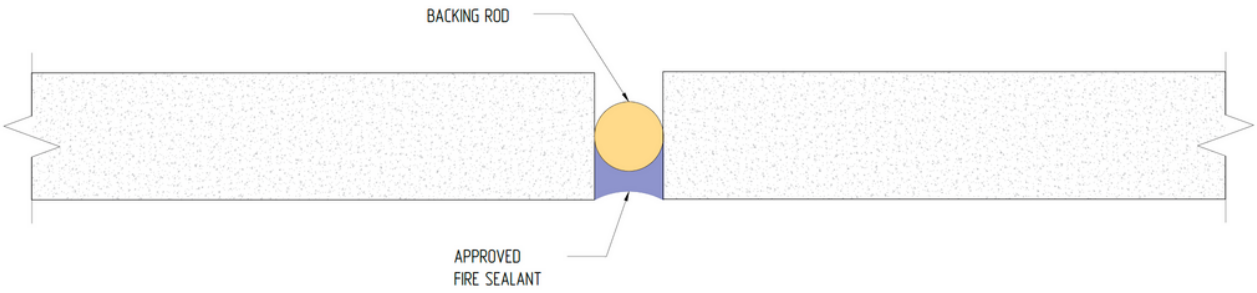
LI1.8 EXTERNAL CORNER & INTERTENANCY JUNCTION



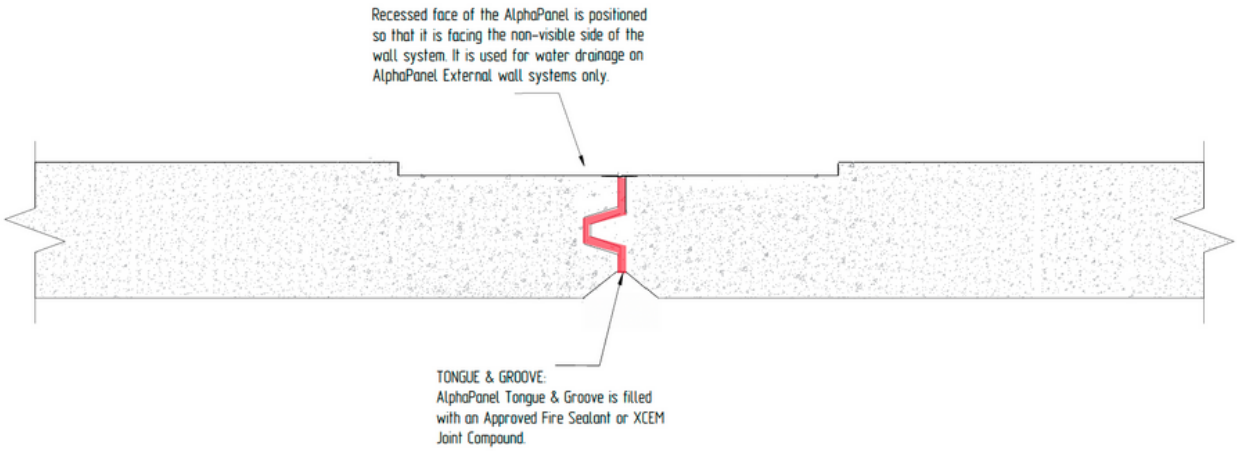
LIJ1.1 PANEL TO ALTERNATE SYSTEM MOVEMENT JOINT



LIJ1.2 PANEL TO PANEL CONTROL JOINT



LJ1.3 LOW-RISE PARTY WALL PANEL TO PANEL JOINT



CONSTRUCTION NOTES

The Installer is to refer to the project drawings and specifications and shall perform work to the quality standards agreed with the builder. The notes below are important from an engineering and compliance perspective. The intertenancy wall must be completed prior to installation of the AlphaPanel® external cladding to ensure access for fire and acoustic sealing.

1. Framing shall be in accordance with the required standards for timber of cold-formed steel as per Component Specifications in Section 8 of this Design Guide.
2. AlphaPanel® shall be evenly supported at the base. Options as follows:
    2.1. Provide a nom. 10 mm mortar bead at the base of the wall to address any gaps and variations in slab level.
    2.2. Install J-track to slab, bedding in fire-rated sealant.
3. AlphaPanel® shall be fixed to the frames as specified in Section 6.2, with edge distance min. 100 mm.
4. AlphaPanel® joints are to be bonded using XCEM Joint Compound (2-part Epoxy Adhesive).
5. Provide vertical control joints (min. 10 mm wide) in walls at the following locations:
    5.1. Max. 6,000 mm ctrs.
    5.2. Where wall height changes by greater than 20%.
    5.3. At steps in slab.
    5.4. Locations corresponding to structure (slab) control joints.
6. Seal control joints on both sides with backing rod and fire-rated sealant, min. 10 mm width x 5 mm depth.
7. Sealants shall be approved for the application by the manufacturer. The contractor must follow the manufacturer's specifications and ensure surfaces to be bonded are clean, free of dust and debris, and prepared and primed as required.
8. Horizontal joints shall be filled with min. 110kg/m3 50 mm wide x 13 mm thick fire-resisting mineral fibre.
9. Fire protection shall be provided at the roof junction by packing the gap between the top of the AlphaPanel® and the roofing material with min. 60kg/m3 fire-resisting mineral fibre.
10. The junction to external walls requires the following treatment for fire and acoustic separation:
    10.1. AlphaPanel® in the intertenancy wall to be run through to the back of the external AlphaPanel® cladding.
    10.2. Polyurethane fire-rated sealant (e.g. Botsik FireBan One or another sealant with an established FRL of at least -/120/120 in accordance with AS 1530.4:2014.) to seal on both sides to the back of the external AlphaPanel® cladding.
    10.3. Blocking under the AlphaPanel® over the slab edge rebate, either by:
        10.3.1. locally filling in slab edge rebate with grout or concrete; or,
        10.3.2. packing with a durable non-combustible mineral fibre.
    10.4. Vertical DPC to ensure moisture does not transport to the AlphaPanel® in the intertenancy wall or on the top of the slab.
    10.5. AlphaPanel® in the intertenancy wall to be carried through the eaves. This can be achieved by cantilevering a raked horizontal panel and providing fixing to the rafters/trusses with the aluminmium brackets and fixings.

WORKERS HEALTH & SAFETY

Please contact XCEM for AlphaPanel® Material safety data sheet (MSDS) and for MSDS on Joint & Setting Compounds.

CUTTING OF ALPHAPANEL®

AlphaPanel® can be very easily cut on-site using a diamond tipped masonry vacuum saw. AlphaPanel® products have been analysed and assessed by HIBBS & Associates (certified occupational hygienists) for traces of crystalline silica. The AlphaPanel® samples examined did not contain measurable levels of crystalline silica, therefore worker exposure to that risk when handling and processing is unlikely to occur. Crystalline silica is categorised as a health hazard when it's in a respirable form, such as occurs when cutting, grinding, and drilling. Refer to HIBBS report S11606-L1 for full details and limitations.

MANUAL & TROLLEY ASSISTED HANDLING

AlphaPanels® are to be handled and worked on-site as per similar generally accepted cladding, masonry and panel units, with installation contractors providing relevant safe work method statements.

XCEM recommends using a panel trolley and any other mechanical apparatus to assist with movement of the panels. Physical & manual movement of AlphaPanels® should be kept to a minimum. Contractors must provide adequate support to the panels when lifting off the horizontal or tilting.

PERSONAL PROTECTION

Eye/Face: For dust generating work, wear safety glasses with side shields or dust-proof goggles.
Hand: For dry handling/work, use any work-compatible protective gloves.
Body: Wear long sleeve shirt and full-length pants, or full coveralls. Where a body part is likely to be in contact with wet product.
Respiratory: For dust generating work (e.g. cutting, drilling, crushing, cleaning, etc.), use Class P1 (Particulate) respirator at minimum. Respiratory protective equipment should be selected based on an assessment of the working conditions (conducted by a competent person and should be informed by occupational hygiene exposure assessment results). Refer to AS/NZS 1715.

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