

ACOUSTIC PERFORMANCE ASSESSMENT

Product Name

Walsc AAC Panel Low-Rise Wall Systems

Company Name

Sipo Building Solutions Pty. Ltd.

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6 February 2020

Prepared For:

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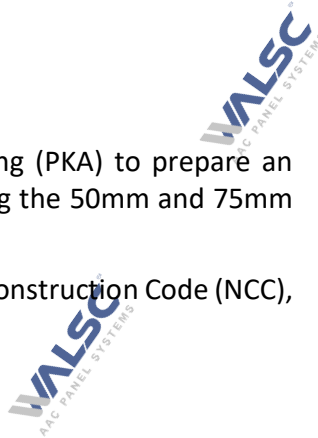
The work reported herein has been carried out in accordance with the terms of membership. We stress that the advice given herein is for acoustic purposes only, and that the relevant authorities should be consulted with regard to compliance with Regulations governing areas other than acoustics.

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1.0 INTRODUCTION

Sipo Building Solutions (Client) has commissioned PKA Acoustic Consulting (PKA) to prepare an acoustic assessment for various low-rise party wall configurations involving the 50mm and 75mm Walsc AAC Panel.

The relevant sound insulation requirements are contained in the National Construction Code (NCC), Building Code of Australia (BCA) Volume 2, separating Class 1 dwellings.



2.0 PRODUCTS FOR ASSESSMENT

Product Name	50mm Walsc AAC Panel	75mm Walsc AAC Panel
Dry Density	26kg/m ² (525kg/m ³)	39kg/m ² (525kg/m ³)
Ambient (Working) Density	30kg/m ² (600kg/m ³)	45kg/m ² (600kg/m ³)
Thickness	50mm	75mm
Width	600mm	600mm
Type	Non-load bearing tongue in groove autoclaved aerated concrete wall panel	
Graphics		



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3.0 ASSESSMENT INFORMATION

3.1 Acoustic Laboratory Test Data

This acoustic assessment is based on PKA’s extensive experience calculating the acoustic properties of wall systems as well as sound transmission loss test data undertaken at the Kilargo (now Resolute) Acoustic Laboratories in Banyo QLD in July 2015 [Ref: Ac-010-15/CT].

The relevant acoustic laboratory tests for this low-rise acoustic assessment have been presented below:

Kilargo Test	Partition Type	Full Description (From Source to Receive)	R _w	C _{tr}	R _w + C _{tr}
AC723WA7	Panel	75mm Walsc AAC Panel (45kg/m ²)	35	-3	32
AC731WA7	Separate Stud Panel Furring Channel	13mm Knauf standard plasterboard (8.5kg/m ²) 64mm Rondo Steel Studs 0.55BMT (cc 600mm) 75mm Knauf Earthwool (11kg/m ³) insulation in cavity 20mm gap 75mm Walsc AAC Panel (45kg/m ²) 50mm cavity consisting of: - 28mm Rondo Furring Channels 0.50BMT (cc 600mm) - 22mm Betafix Clip 50mm Knauf Earthwool (10kg/m ³) insulation in cavity 13mm Knauf standard plasterboard (8.5kg/m ²)	64	-14	50
AC732WA7	Separate Stud Panel Furring Channel	13mm Knauf fire-rated plasterboard (10.5kg/m ²) 64mm Rondo Steel Studs 0.55BMT (cc 600mm) 75mm Knauf Earthwool (11kg/m ³) insulation in cavity 20mm gap 75mm Walsc AAC Panel (45kg/m ²) 50mm cavity consisting of: - 28mm Rondo Furring Channels 0.50BMT (cc 600mm) - 22mm Betafix Clip 50mm Knauf Earthwool (10kg/m ³) insulation in cavity 13mm Knauf fire-rated plasterboard (10.5kg/m ²)	67	-12	55

Based on the available data we have calculated the 50mm Walsc AAC Panel to achieve the following airborne sound insulation performance:

Product	R _w	C _{tr}	R _w + C _{tr}
50mm Walsc AAC panel	33	-4	29

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4.0 ACOUSTIC CRITERIA REQUIREMENTS

4.1 BCA Sound Insulation Criteria

The BCA 2019 in Volume 2 Section P.2.4.6 “Sound Transmission and Insulation” requires walls separating dwellings to provide insulation against the transmission of airborne and impact generated sound sufficient to prevent illness or loss of amenity to the occupants.

The following summarises the acoustic laboratory design requirements, brevity necessitates detail in the BCA taking precedence over the tables below.

Wall Description	BCA Reference	BCA Sound Insulation Requirements	
	Volume 2 Class 1	Airborne	Impact
Separating sole-occupancy units (SOUs) habitable areas	3.8.6.2(a)(i)	$R_w + C_{tr} \geq 50$	
Separating SOUs wet to habitable areas	3.8.6.2(a)(i) 3.8.6.2(a)(ii)	$R_w + C_{tr} \geq 50$	Discontinuous Construction

Regarding kitchens, the BCA in Section 3.8.6.2(a)(ii) excludes a kitchen as being a habitable room, however this refers to a fully enclosed kitchen which is typically not found in modern low-rise apartments. PKA, along with the majority of acoustic consultants, deem it necessary to provide discontinuous construction for open plan configurations such as kitchen to kitchen, bathroom to kitchen etc.

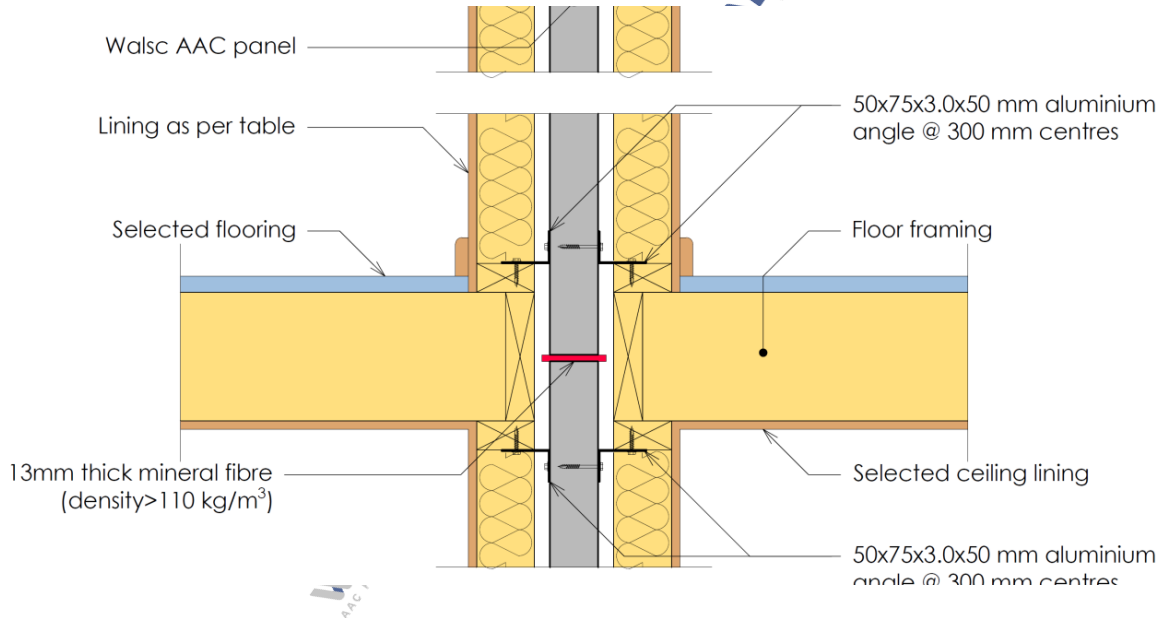
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4.2 BCA Discontinuous Construction Configuration

The BCA denotes “Discontinuous Construction” as follows:

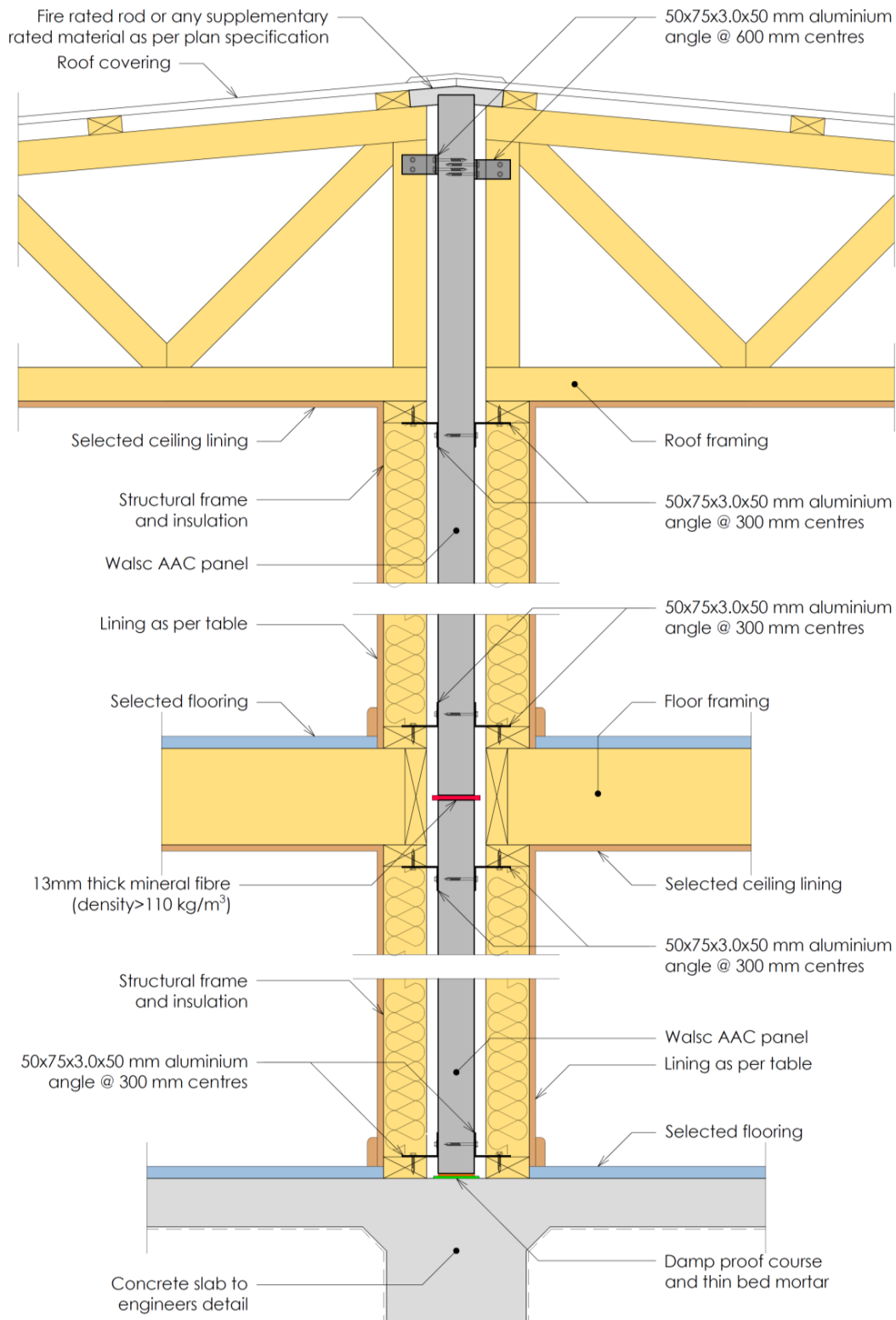
Wall Type	BCA Reference	Discontinuous Construction Requirement
	Volume 2 Class 1	
Masonry	3.8.6.2(b)(ii)	Wall having a minimum 20mm cavity between the 2 separate leaves, with resilient wall ties if necessary
Other than masonry	3.8.6.2(b)(iii)	Wall having a minimum 20mm cavity with no mechanical linkage except at the periphery

For low-rise partywall configurations, the Walsc AAC Panel is located in the core of the wall with studwork either side. As the Walsc AAC Panel is non-loadbearing, the panel requires connection to the load-bearing studwork by way of aluminium brackets as shown in the diagram below:



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To achieve discontinuous construction, the bracket connections must be located at the periphery such as the base plates and underside of floor/ceiling joists as shown in the following diagram displayed in the Walsc Technical Manual:

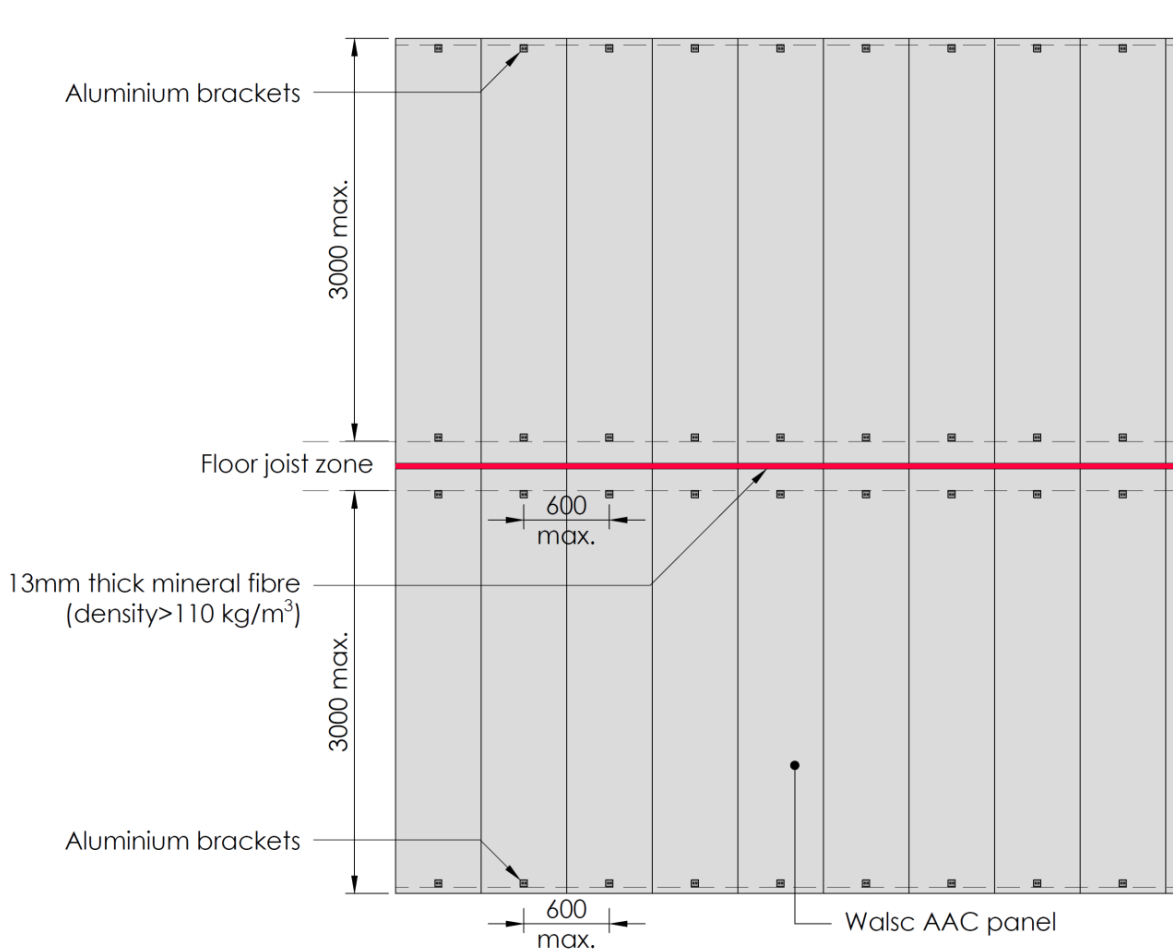


Walsc low-rise partywalls have two configurations that achieve discontinuous construction.

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4.2.1 Vertically Aligned – Discontinuous Construction

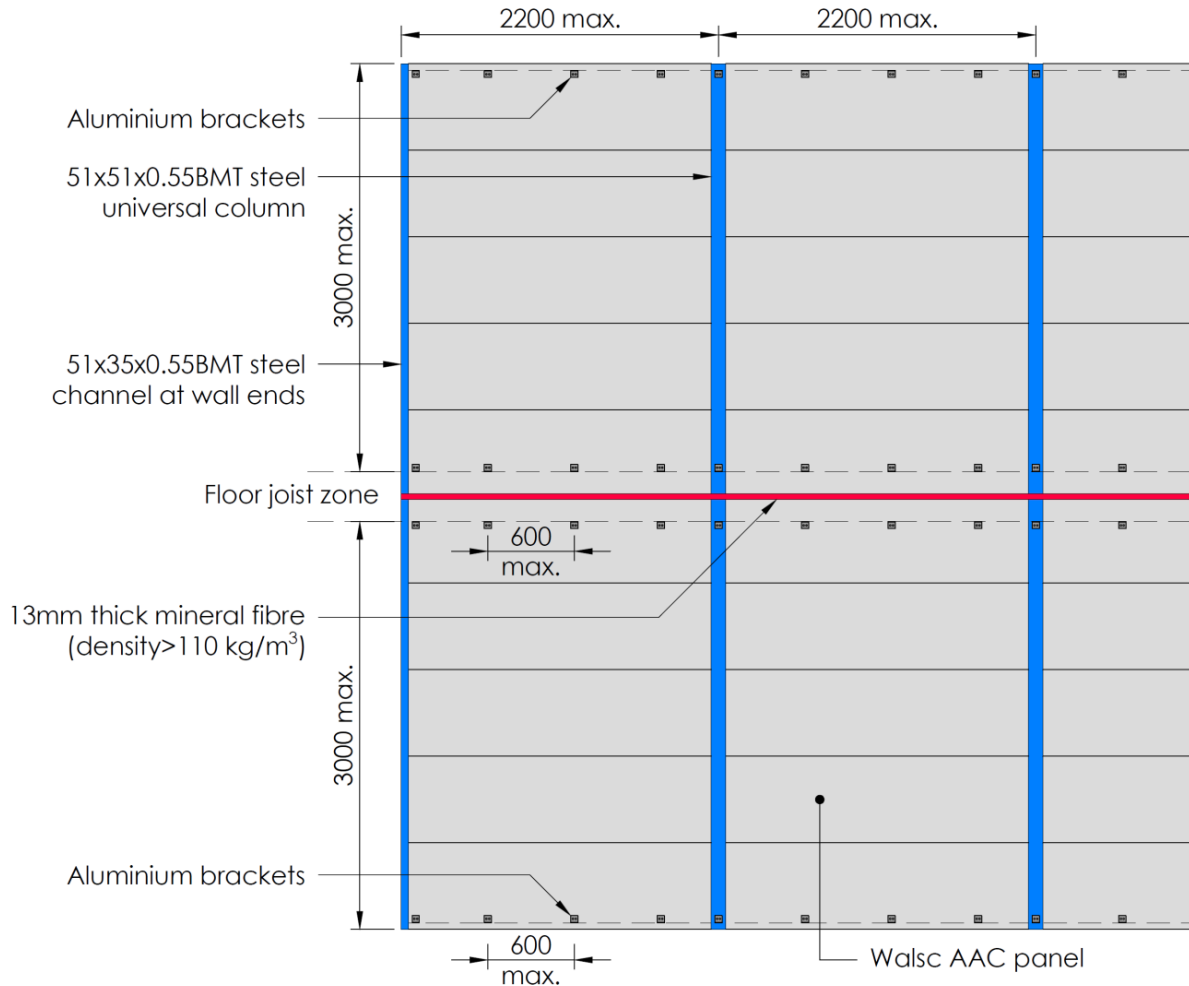
Vertically aligned configuration allows for Walsc AAC panels to extend full height between floors. The aluminium brackets are located at the periphery therefore achieving discontinuous construction.



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4.2.2 Horizontally Aligned – Discontinuous Construction

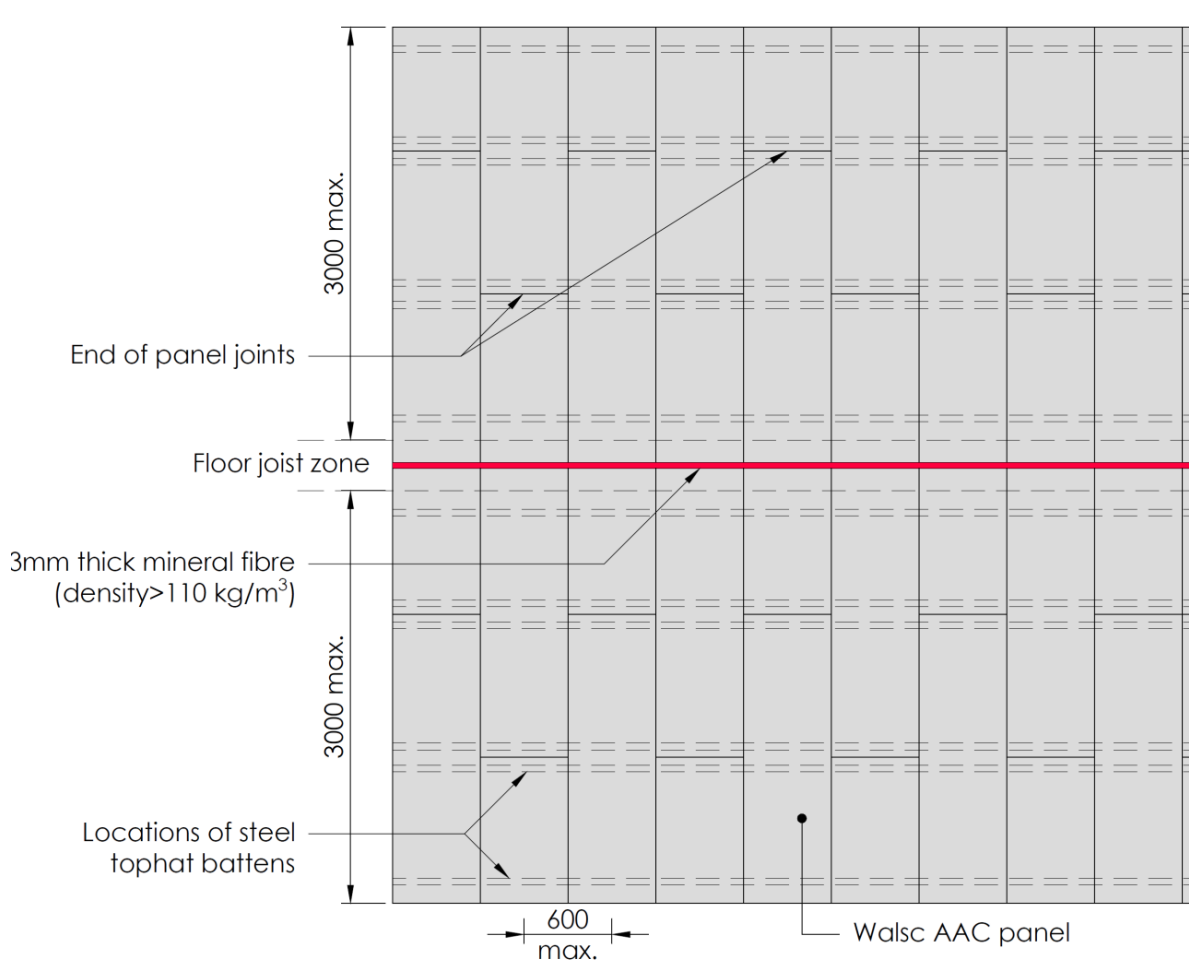
Horizontally aligned configuration allows for shorter Walsc AAC panels to be installed using steel universal columns to support the Walsc panels. The aluminium brackets are located at the periphery therefore achieving discontinuous construction.



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4.3.1 Vertically Staggered – Continuous Construction

Vertically staggered configuration allows for shorter Walsc AAC panels to have their panel joints offset. This requires top hats and/or brackets to be located outside of the periphery and therefore does not achieve discontinuous construction.



5.0 ASSESSMENT OF ACOUSTIC PERFORMANCE



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5.1 Discontinuous Construction – 75mm Walsc Partywall

Both Sides	Lining Options	min. 13mm standard plasterboard (min. 8.4kg/m ²)
	Stud Options	min. 70mm x 35mm timber studs (cc 450mm or 600mm) min. 90mm x 45mm timber studs (cc 450mm or 600mm)
	Insulation Options	min. 75mm glasswool 11kg (min. 11kg/m ³)
	Fixing	Aluminium L brackets at the periphery to achieve discontinuous construction
	Gap	min. 20mm gap between Panel and Studwork
Panel Installation		75mm Walsc AAC Panel (45kg/m ²)
Panel Configuration		Horizontally aligned or vertically aligned as per Section 4.2

Studs Both Sides	Insulation Both Sides	Lining Both Sides	R _w	R _w + C _{tr}
70mm timber	75mm glasswool 11kg	13mm standard plasterboard	62	50
90mm timber	75mm glasswool 11kg	13mm standard plasterboard	63	52

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5.2 Discontinuous Construction – 50mm Walsc Partywall

Both Sides	Lining Options	min. 13mm standard plasterboard (min. 8.4kg/m ²)
	Stud Options	min. 70mm x 35mm timber studs (cc 450mm or 600mm) min. 90mm x 45mm timber studs (cc 450mm or 600mm)
	Insulation Options	min. 90mm glasswool 11kg (min. 11kg/m ³) min. 90mm glasswool 14kg (min. 14kg/m ³)
	Fixing	Aluminium L brackets at the periphery to achieve discontinuous construction
	Gap	min. 20mm gap between Panel and Studwork
Panel Installation		50mm Walsc AAC Panel (30kg/m ²)
Panel Configuration		Horizontally aligned or vertically aligned as per Section 4.2

Studs Both Sides	Insulation Both Sides	Lining Both Sides	R _w	R _w + C _{tr}
70mm timber	90mm glasswool 14kg	13mm standard plasterboard	62	50
90mm timber	90mm glasswool 11kg	13mm standard plasterboard	62	51



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5.3 Continuous Construction – 75mm Walsc Partywall

Both Sides	Lining Options	min. 13mm high-density plasterboard (min 10.4kg/m ²)
	Stud Options	min. 70mm x 35mm timber studs (cc 450mm or 600mm) min. 90mm x 45mm timber studs (cc 450mm or 600mm)
	Insulation Options	min. 90mm glasswool 11kg (min. 11kg/m ³) min. 90mm glasswool 14kg (min. 14kg/m ³)
	Fixing	Top hats and/or brackets outside the periphery zone where required for structural stability. Does not achieve discontinuous construction
	Gap	min. 20mm gap between Panel and Studwork
Panel Installation		75mm Walsc AAC Panel (45kg/m ²)
Panel Configuration		Vertically staggered as per Section 4.3

Studs Both Sides	Insulation Both Sides	Lining Both Sides	R _w	R _w + C _{tr}
70mm timber	90mm glasswool 14kg	13mm high-density plasterboard	61	50
90mm timber	90mm glasswool 11kg	13mm high-density plasterboard	61	51



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5.4 Continuous Construction – 50mm Walsc Partywall

Both Sides	Lining Options	min. 16mm high-density plasterboard (min 12.4kg/m ²)
	Stud Options	min. 70mm x 35mm timber studs (cc 450mm or 600mm) min. 90mm x 45mm timber studs (cc 450mm or 600mm)
	Insulation Options	min. 90mm glasswool 11kg (min. 11kg/m ³) min. 90mm glasswool 14kg (min. 14kg/m ³)
	Fixing	Top hats and/or brackets outside the periphery zone where required for structural stability. Does not achieve discontinuous construction
	Gap	min. 20mm gap between Panel and Studwork
Panel Installation		50mm Walsc AAC Panel (30kg/m ²)
Panel Configuration		Vertically staggered as per Section 4.3

Studs Both Sides	Insulation Both Sides	Lining Both Sides	R _w	R _w + C _{tr}
70mm timber	90mm glasswool 14kg	16mm high-density plasterboard	61	50
90mm timber	90mm glasswool 11kg	16mm high-density plasterboard	61	51



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5.5 Penetrations

To maintain the acoustic performance of the Walsc AAC Panel low-rise wall systems and therefore compliance with the BCA's sound insulation requirements, the following conditions must be met regarding penetrations:

- General Purpose Outlets (GPOs) can penetrate the studwork linings on both sides but must be offset by a minimum 300mm from each other. Cables may come in contact with the studwork frame and/or Walsc AAC Panel but must not be fixed to or penetrate the Walsc AAC Panel.
- Hydraulic services can penetrate the studwork linings on both sides in close-cut holes (max 6mm clearance) and must be sealed with non-hardening sealant. Fire-rated or acoustic-rated sealant is optional. Services must not be in contact or penetrate Walsc AAC Panel.

6.0 CONDITIONS OF ASSESSMENT

- This assessment refers to the expected acoustic laboratory performance of the wall system
- The wall system must be constructed and installed according to the manufacturer's instruction for acoustic-rated construction and be installed with good workmanship
- During installation care must be taken to ensure that the wall system is filled so that no air gaps exist at the periphery
- This assessment is based on the stated densities of the Walsc AAC Panel product. Reducing these densities will reduce the acoustic performance of the wall system
- Any changes to the wall construction or materials used can invalidate this assessment. If changes are made, then they should be checked by a qualified acoustic consultant for compliance
- This assessment is for the acoustic performance only. Other relevant authorities should be consulted in regards to aspects of structural, fire, etc.
- This assessment is only valid for a period of 5 years from the date of issue

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