Date	13 June, 2023
Reference	PKA100FCA R01v2
Project	FireCrunch Acoustic Opinion
Contact	Ian Ritchie
Email	Ian.Ritchie@firecrunch.com.au
Company	FireCrunch Australia
File	*PKA100FCA R01v2 FireCrunch Corridor Wall Acoustic Opinion.docm*

Dear Ian,

Re: FireCrunch Corridor Wall Acoustic Opinion

The purpose of this letter is to provide an acoustic opinion for the FireCrunch corridor wall system, and compare to the airborne sound insulation requirements of the National Construction Code (NCC), Building Code of Australia (BCA), separating sole-occupancy units with corridors.

FireCrunch Board

The primary product for assessment is the 10mm FireCrunch (9.5kg/m^2, 950kg/m^3) board which is a magnesium oxide lining.

The FireCrunch Board was tested at the Kilargo Acoustic Laboratory (now Resolute Acoustic Laboratory) in Banyo, QLD [Ref: AC-011-15/CT dated March 2015].

Kilargo Acoustic Laboratory Test	Wall Description	Airborne	
		R_w	$R_w + C_{tr}$
AC739WA7/2015	10mm FireCrunch board (9.5kg/m^2) one side of 90mm Rondo steel studs 0.55BMT (cc 600mm)	29	27
AC738WA7/2015	10mm FireCrunch board (9.5kg/m^2) 90mm Rondo steel studs 0.55BMT (cc 600mm) 90mm Fletcher Pink Partition batts (25kg/m^3) 10mm FireCrunch board (9.5kg/m^2)	49	43

Sound Insulation Requirements

The National Construction Code (NCC), previously the Building Code of Australia (BCA), in Volume 1 Section F7 "Sound Transmission and Insulation" states that walls separating places of occupancy in Class 2 and 3 buildings must *"safeguard occupants from illness or loss of amenity as a result of undue sound being transmitted"*.

The following summarises the BCA sound insulation requirements, brevity necessitates detail in the BCA taking precedence over the tables below.

Wall Description	Airborne	BCA 2022	BCA 2019
Separating SOUs with corridor, stairway, lobby or different classification	$R_w \geq 50$	F7D6(1)(b)	F5.5(a)(ii)
Separating SOU habitable area with services from another SOU	$R_w + C_{tr} \geq 40$	F7D7(1)(a)	F5.6(a)(i)

Acoustic Assessment

This acoustic assessment is based on PKA's extensive experience calculating the acoustic properties of lightweight and masonry floor systems,

The acoustic predictions contained in this assessment are the expected values when tested in an acoustic laboratory and results are calculated in according with the relevant Australian Standards as per the National Construction Code (NCC):

- Airborne R_w and C_{tr} in accordance with AS/NZS ISO 717.1-2004 Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation

These acoustic predictions result in tolerances within R_w ±2 when validated against acoustic laboratory test results and other supporting information, which have their own inherent variability.

Reference	Wall Description	Airborne	
		R_w	$R_w + C_{tr}$
Kilargo Acoustic Laboratory AC738WA7/2015	10mm FireCrunch board (9.5kg/m^2) 90mm Rondo steel studs 0.55BMT (cc 600mm) 90mm Fletcher Pink Partition batts (25kg/m^3) 10mm FireCrunch board (9.5kg/m^2)	49	43
Acoustic Opinion PKA100FCA R01	2x10mm FireCrunch board (9.5kg/m^2) min. 90mm Rondo steel studs 0.55BMT (cc 600mm) min. 90mm glasswool insulation (20kg/m^3) 10mm FireCrunch board (9.5kg/m^2)	52	45

The acoustic opinion of the FireCrunch wall above, achieves R_w 52 which meets and exceeds the $R_w \geq 50$ requirements as per the NCC/BCA for corridor walls separating SOUs.

Yours faithfully,

Joel Parry-Jones, Principal

PKA Acoustic Consulting