

<b>Project:</b>	Fyrex assessment	<b>Document No.:</b>	Da 001
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Further to recent discussion regarding the acoustic performance of wall system that incorporate a Fyrex penetration system we provide the following acoustic assessment.

## INTRODUCTION

The Fyrex system is essentially a hollow box with intumescent material on the inside. Building services such as cabling can be routed through the box rather than through individual penetrations in a ceiling baffle. We understand that this will simplify penetration work and allow for greater quality control with regards to ensuring penetrations through fire rated partitions meet the required fire treatment criteria.

## ACOUSTIC REQUIREMENT

Any penetration through an acoustically rated partition has the potential to degrade the overall partition rating. Our assessment reviews the impact a Fyrex has on a typical residential apartment/corridor fire rated partition.

The National Construction Code or Building Code of Australia requires that a wall between an apartment and adjacent spaces have a rating as stated below;

Description	Sound insulation	
	Laboratory	On-site
Wall separating an apartment from a stairway, public corridor, public lobby, etc	$R_w \geq 50$	$D_{nT,w} \geq 45$
Door separating an apartment from a public corridor, public lobby, etc	$R_w \geq 30$	$D_{nT,w} \geq 25$

The terms  $R_w$  and  $D_{nT,w}$  are very similar designations for acoustic performance. The  $R_w$  is usually used for laboratory or theoretical ratings and the  $D_{nT,w}$  is used for in situ or site ratings. The difference of 5dB is to allow for construction tolerances. It is important to note that during the design phase of a project, the relevant corridor partitions must be designed using the  $R_w50$  rating as the criterion. Once a partition is constructed, the  $D_{nT,w} 45$  rating must be achieved.

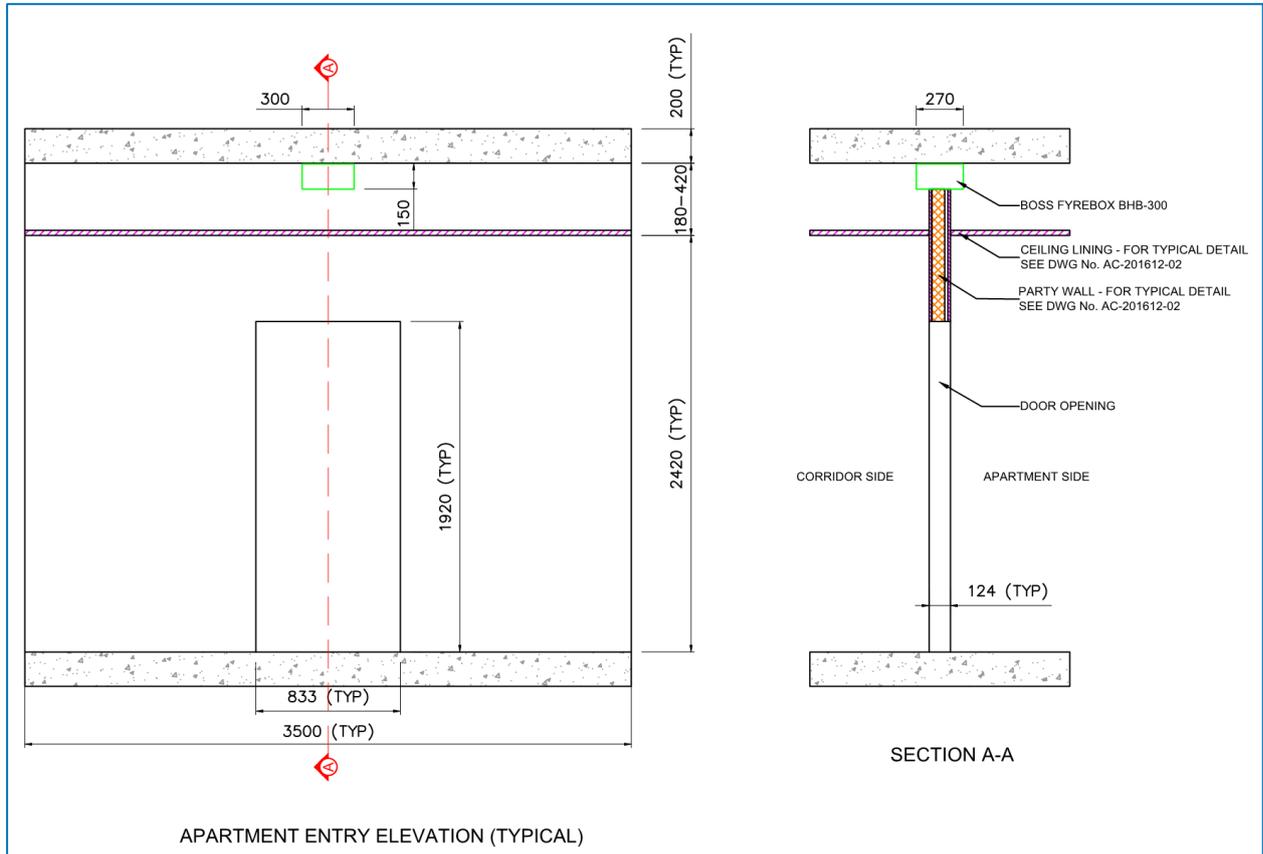
We have used the  $R_w 50$  criterion in our assessment as it is the most easily applicable to any apartment to corridor wall.

If there is a door present in the corridor wall as there often is, the performance need only be  $R_w 30$  during design or  $D_{nT,w} 25$  in situ.

## ASSESSMENT

The following typical configuration has been assessed and presents a typical layout with regards to an apartment/corridor interface.

Figure 1: Typical apartment to corridor interface



### Construction assumptions.

We have assumed the following for the purposes of this assessment

- That the partition by itself achieves  $R_w$  50.
- That the door and partition in combination achieve  $R_w$  30 (where relevant)
- That there are no flanking paths

Table 1: Assessment

#	Targeting	Construction	Ceiling and baffle	Fyrebox	Estimated performance
1	<b>R<sub>w</sub> 50</b> no door in the partition	Assumptions listed	-Plasterboard ceiling of: <i>16mm fire rated (&gt;12kg/m<sup>2</sup>) or 13mm fire rated (&gt;10kg/m<sup>2</sup>) or 13mm normal (&gt;9kg/m<sup>2</sup>)</i> in the apartment and in the corridor <sup>2</sup> no untreated penetrations in the ceilings within 2m of the Fyrebox Ceiling baffle presumed to be same as the wall construction	Fyrebox presumed completely open no seals of any kind	≥ <b>R<sub>w</sub> 50</b>  Complies with BCA
2	<b>R<sub>w</sub> 50</b> no door in the partition	Assumptions listed	-Plasterboard ceiling of: <i>10mm normal (&gt;6.1kg/m<sup>2</sup>) or 10mm ceiling grade (&gt;5.8kg/m<sup>2</sup>)</i> in the apartment and in the corridor <sup>2</sup> no untreated penetrations in the ceilings within 2m of the Fyrebox Ceiling baffle presumed to be same as the wall construction	Fyrebox must be filled with at least expanding <u>fire rated</u> polyurethane foam or <u>packed</u> with glasswool or rockwool insulation (any density)	≥ <b>R<sub>w</sub> 50</b>  Complies with BCA
3	<b>R<sub>w</sub> 30</b> door is present in the partition	Assumptions listed	-Plasterboard ceiling of: <i>16mm fire rated (&gt;12kg/m<sup>2</sup>) or 13mm fire rated (&gt;10kg/m<sup>2</sup>) or 13mm normal (&gt;9kg/m<sup>2</sup>) or 10mm normal (&gt;6.1kg/m<sup>2</sup>) or 10mm ceiling grade (&gt;5.8kg/m<sup>2</sup>)</i> in the apartment and in the corridor <sup>2</sup> no untreated penetrations in the ceilings within 2m of the Fyrebox The Fyrebox must be located within 2m of the door for this treatment option to be valid Ceiling baffle presumed to be same as the wall construction	Fyrebox presumed completely open no seals of any kind	≥ <b>R<sub>w</sub> 30</b>  Complies with BCA

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2 Any return air grilles or other penetrations in the ceiling within 2m of the entry door must be treated such that they do not degrade the performance of the plasterboard ceiling or alternatively they must be reviewed by an acoustic consultant who must ensure the treatment detailed above remains valid.