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TECHNICAL BULLETIN No : **17**

ISSUED : **November 2004**

Sound Resistance Constructions for BCI® Joist Intermediate Floors.

Introduction

The 2003 edition of Approved Document E set new improved sound insulation standards for floors within dwellings (intermediate floors) and floors between dwellings (separating floors). This technical bulletin gives guidance on the construction of intermediate floors using BCI® Joists to meet the Part E requirements. It also gives a brief overview of the sound insulation requirements for separating floors but does not provide any details of floor constructions to meet the requirements for separating floors as these are provided in a comprehensive technical bulletin dealing specifically with such floors.

Sound resistance requirements for floors

The sound insulation performance that floors must achieve is shown in Table 1 below.

Sound Resistance Requirements for Floors				
Floor Type	**Sound Resistance Required**		**Pre-completion Testing Required?**	**Boise Solution**
	Airborne dB min.	Impact $L'_{nT,w}$ dB max.		
Intermediate	$R_w \geq 40$[B]	-	No	See below for intermediate BCI® Joist floors that meet the requirement of Building Regulation E2
Separating	$D_{nT,w} + C_{tr} \geq 45$[C]	≤ 62[C]	No – if floor constructed in accordance with Robust details[A]. Yes – if floor not constructed in accordance with Robust details	Refer to Boise technical bulletin entitled 'BCI® Joists and Robust details separating floor construction' and Robust details Ltd publication entitled 'Robust details Part – E Resistance to the passage of sound', May 2004

[A] The use of Robust details by builders for separating floor constructions is subject to the terms and conditions set out by Robust Details Limited.
[B] The requirement is for a laboratory sound reduction of 40dB.
[C] The requirement is for on site sound reduction, met by either complying with Robust details or pre-completion testing.

Table 1. Sound Resistance Requirements for Floors

It can be seen from the table above that intermediate floors do not require pre-completion testing, and that the sound reduction requirement is met by undertaking laboratory tests on the proposed floor construction to see if it passes

the 40dB criteria. Additionally, Section 5 of Approved Document E gives a 'deemed to satisfy' construction for an intermediate floor that may be used without the need for a laboratory test.

BCI® Joist floor constructions that meet the sound requirements for intermediate floors

Boise have undertaken a number of tests on various intermediate floor constructions to establish their compliance with the 40dB airborne sound reduction requirement of Part E. The testing was undertaken by Sound Research Laboratories Ltd in accordance with BSEN ISO 140-3: 1995. The following tables show the BCI® Joist floor constructions that meet the requirement. Table 2 contains details of floors the BCI® Joists at 600mm centres and 241mm deep or deeper and Table 3 contains details of floors the BCI® Joists at 400mm centres and 241mm deep or deeper. Table 4 contains details of floors the BCI® Joists at 400mm centres and 302mm deep or deeper.

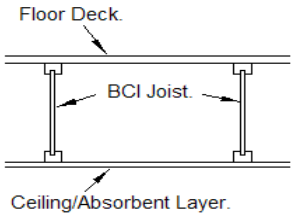
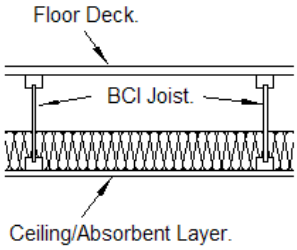
BCI® Joist floor constructions at 600mm centres, 241mm deep or deeper			
	Section Through Floor	**Layer and Material**	**Justification**
In-1		Floor Deck: 22mm P5 Chipboard Joist: Any BCI® Joist 241mm or deeper at 600mm centres Ceiling/Absorbent Layer: 15mm Type 1 plasterboard[1] 12.5mm Type 1 plasterboard[1] +3mm skim 12.5mm Type 5 fire resisting plasterboard (all inclusive 1 downlighter per 1.5m^{2}- floor area	Sound:- Lab tests in accordance with BS EN ISO 140-3:1995, and expert sound consultant assessment of results. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
In-2		Floor Deck: 22mm P5 Chipboard or 22mm cement bonded particle board, or any board with a surface mass of 15kg/m^{2} Joist: Any BCI® Joist Ceiling/Absorbent Layer: 15mm Type 1 plasterboard[1] 12.5mm Type 1 plasterboard[1] +3mm skim 12.5mm Type 5 fire resisting plasterboard[1] plus 100mm mineral wool insulation min density 10kg/m^{3}	Sound:- Approved Document E clause 5.23 deemed to satisfy construction. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
[1] Plasterboard to have a minimum surface mass of 10kg/m^{2}.			

Table 2. BCI® Joist Intermediate Floor Constructions at 600mm Centres, 241mm deep or deeper

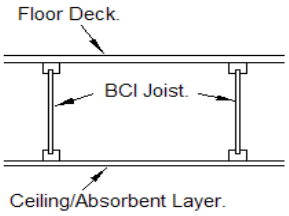
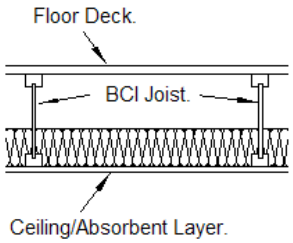
BCI® Joist floor constructions at 400mm centres, 241mm deep or deeper			
	Section Through Floor	**Layer and Material**	**Justification**
In-3		Floor Deck: 22mm P5 Chipboard Joist: Any BCI® Joist 241mm or deeper at 400mm centres or greater Ceiling/Absorbent Layer: 15mm Type 1 plasterboard[1] +1mm skim 12.5mm Type 1 plasterboard[1] +4mm skim 12.5mm Type 5 fire resisting plasterboard[1] +1mm skim (all inclusive 1 downlighter per 1.5m^{2-} floor area	Sound:- Lab tests in accordance with BS EN ISO 140-3:1995, and expert sound consultant assessment of results. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
In-2		Floor Deck: 22mm P5 Chipboard or 22mm cement bonded particle board, or any board with a surface mass of 15kg/m^2 Joist: Any BCI® Joist Ceiling/Absorbent Layer: 15mm Type 1 plasterboard[1] 12.5mm Type 1 plasterboard[1] +3mm skim 12.5mm Type 5 fire resisting plasterboard[1] plus 100mm mineral wool insulation min density 10kg/m^3	Sound:- Approved Document E clause 5.23 deemed to satisfy construction. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
[1] Plasterboard to have a minimum surface mass of 10kg/m^2.			

Table 3. BCI® Joist Intermediate Floor Constructions at 400mm Centres, 241mm deep or deeper

Issued by Boise Engineering Services
Provided under exclusive arrangement by TimberSolve, 4 Lenten Street, Alton, Hampshire, GU34 1HG
Tel: 01420 590078 Fax: 01420 590073 E-mail: solutions@timbersolve.co.uk

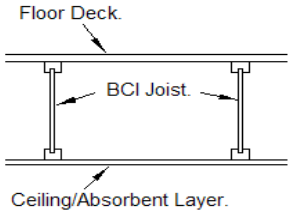
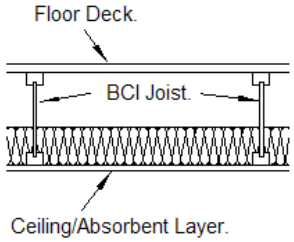
BCI® Joist floor constructions at 400mm centres, 302mm deep or deeper			
	Section Through Floor	**Layer and Material**	**Justification**
In-4		Floor Deck: 18mm minimum P5 Chipboard Joist: Any BCI® Joist 302mm or deeper at 400mm centres or greater Ceiling/Absorbent Layer: 15mm Type 1 plasterboard +1mm skim 12.5mm Type 1 plasterboard[1] +3mm skim (all inclusive 1 downlighter per 1.5m^{2} floor area	Sound:- Lab tests in accordance with BS EN ISO 140-3:1995, and expert sound consultant assessment of results. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
In-2		Floor Deck: 22mm P5 Chipboard or 22mm cement bonded particle board, or any board with a surface mass of 15kg/m^{2} Joist: Any BCI® Joist Ceiling/Absorbent Layer: 15mm Type 1 plasterboard[1] 12.5mm Type 1 plasterboard[1] +3mm skim 12.5mm Type 5 fire resisting plasterboard[1] plus 100mm mineral wool insulation min density 10kg/m^{3}	Sound:- Approved Document E clause 5.23 deemed to satisfy construction. Fire:- ½ hour structural fire test in accordance with BS 476-21:1987 and expert fire consultant assessment of results.
[1] Plasterboard to have a minimum surface mass of 10kg/m^{2}.			

Table 4. BCI® Joist Intermediate Floor Constructions at 400mm Centres, 302mm deep or deeper

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