

GUIDE TO MASONRY INTER-TENANCY WALL CONSTRUCTION AND STC VALUES



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INTRODUCTION

With the ongoing reduction of land availability and associated costs multi-unit dwellings are becoming a more common solution. Such adjoining dwellings present design consideration relative to transmission of sound between units and protection from fire.

Adjoining dwellings achieve protection with the construction of a compliant inter-tenancy wall between. Various options are available to achieve comfortable living conditions.

PERFORMANCE

Both airborne sound transmission and fire protection must meet compliance within the New Zealand Building Code. [NZBC] Firth concrete masonry due to its inherent high mass is an ideal solution for minimising transmission of airborne sound and protection of fire transmission between multi-unit dwellings.

COMPLIANCE

NZBC Clause G6 provides for protection from airborne and impact sound impacting on an adjoining dwelling and stipulates a Sound Transmission Classification [STC] wall of not less than 55 when tested within Laboratory conditions.

NZBC Clause C/AS1 requires an inter-tenancy wall to have a Fire Resistance Rating minimum of 30 minutes. Fire rating is determined by laboratory testing and includes the following components - Insulation, Structural and integrity. Typically stated as 30/30/30 minimum.

Masonry offers greater protection up to 240/240/240.

DESIGN CONSIDERATIONS

Choosing a design option which suits the needs of the customer which may vary from STC 55 or a higher level of sound suppression. Masonry solutions with acoustic insulation can offer much higher values. Noises associated with plumbing and waste water can result in unexpected noise transmission.

Wall construction must exclude gaps or penetrations and avoid back to back locations of wall sockets. Specific engineering is required if any structural components continue through an inter-tenancy wall. Strapping and lining of a masonry wall does provide access for electrical services and thermal insulation. Flanking sound can transmit around an inter-tenancy wall and its impact can be varied subject to location and degree of soundproofing of windows.

Masonry structural design must comply with NZS 4229 or NZS 4230.

SOLUTIONS

Refer Table 1

STC values are derived from laboratory testing and modelling by Marshall Day Acoustics.

SITE TOLERANCES

Although the NZBC specifies a laboratory STC rating of 55 its verification method allows an on site tolerance of 5dB which results in a field minimum of 50 when site tested.

CONSTRUCTION

Masonry construction must comply with NZS 4210.

Firth recommend flushing of mortar joints after tooling.

Block fill must be compacted during filling to avoid any air pockets.

Any mortar joints between solid end masonry units must have a full width of mortar.

Firth recommend 2016 units be laid open end to closed end to minimise any air gap at mortar joints.

Table 1

SOUND TRANSMISSION CLASSIFICATION

MASONRY WALL THICKNESS - SOLID FILLED

MASONRY ONLY	140mm	190mm	Overall width	
Solid fill	51	55	140mm	190mm
10mm Standard Plasterboard 1 side	na	55	-	200mm
LINING OPTIONS				
Direct fix to masonry wall				
13mm Standard Plasterboard both sides	51	54	166mm	216mm
13mm Fyreline both sides	51	54	166mm	216mm
13mm Noiseline both sides	51	54	166mm	216mm
25mm Barrierline both sides	51	55	190mm	240mm
Strap & Line - min 25mm cavity with acoustic insulation				
13mm Standard Plasterboard both sides	56	57	216mm	266mm
13mm Fyreline both sides	56	57	216mm	266mm
13mm Noiseline both sides	58	60	216mm	266mm
Strap & Line - min 40mm cavity with acoustic insulation				
10mm Standard Plasterboard 1 side	57	59	246mm	296mm
13mm Standard Plasterboard both sides	61	65	246mm	296mm
13mm Fyreline both sides	63	66	246mm	296mm
20mm solid plaster -				
1 side	na	55	-	210mm
both sides	na	55	-	210mm
Strap & Line - min 40mm cavity with no acoustic insulation				
10mm Standard Plasterboard 1 side	52	54	190mm	240mm
13mm Noiseline both sides	53	54	203mm	296mm
Strap & Line - min 90mm cavity with no acoustic insulation				
10mm Standard Plasterboard 1 side	55	58	243mm	293mm
13mm Standard Plasterboard both sides	58	59	346mm	396mm
13mm Fyreline both sides	62	64	346mm	396mm
13mm Noiseline both sides	61	65	346mm	396mm

Notes

Direct fixing to have close contact with masonry wall to minimise any air gap

Strapping at min of 600mm centres

Acoustic insulation options -			
AUTEX	20mm	R0.5 Masonry Wall Blanket	
	45mm	R1.0 Masonry Wall Blanket	
	25mm	AAB 35-25	
	50mm	AAB 35-50	
TASMAN	50mm	BIB R1.2	
	40mm	Pink Batts Masonry R1.0	

System attributes with Firth masonry construction

Effective sound insulation meets or exceeds STC 55

Excellent Fire Resistance Rating - 20 series 240/240/240, 15 series 180/180/180

Thermal insulation achieved with strapping & lining options

Excellent bracing characteristics - NZS 4229