The Building Test Centre

Fire Acoustics Structures

The Building Test Centre
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VERTICAL TEST SUITE

This test chamber can be used to test floor, ceiling etc. It consists of two transmission rooms on top of each other and has been designed to satisfy the British, European and international standard recommendations for measurement of sound transmission and impact sound insulation. The rooms are similar in shape, size and volume.

Test Method and Conditions

An omnidirectional loudspeaker rotating at 1 rpm is used in the source room satisfying Annex C of BS EN ISO 140-3: 1995. The average sound pressure level in each 1/3 octave band is measured using a rotating microphone boom, positioned such that the minimum distance between the microphone and sound source is 1m and between microphone and room boundaries is 0.7m.

The rotating microphone has a sweep radius of at least 1m and is inclined in relation to the boundaries at an angle of at least 30° to the horizontal. The microphone has a traverse time of 32 seconds, and the sound pressure levels are averaged over 64 seconds, which is equivalent to two complete sweeps of the microphone boom. The equivalent absorption area of each room is determined by producing the arithmetic average of twelve reverberation times and applying this to the Sabine formula.

The laboratory limit for airborne sound insulation measurement due to flanking on a lightweight construction is:

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R'max	26	31	31	37	49	53	55	61	67	70	73	75	76	82	85	86	86	87	87	89	89

The laboratory limit for airborne sound insulation measurement due to flanking on a concrete based construction is:

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R'max	32	39	38	42	52	52	55	60	65	69	74	76	78	80	83	87	88	88	89	90	90

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The figures below show flanking and isolation treatments in the test chamber.

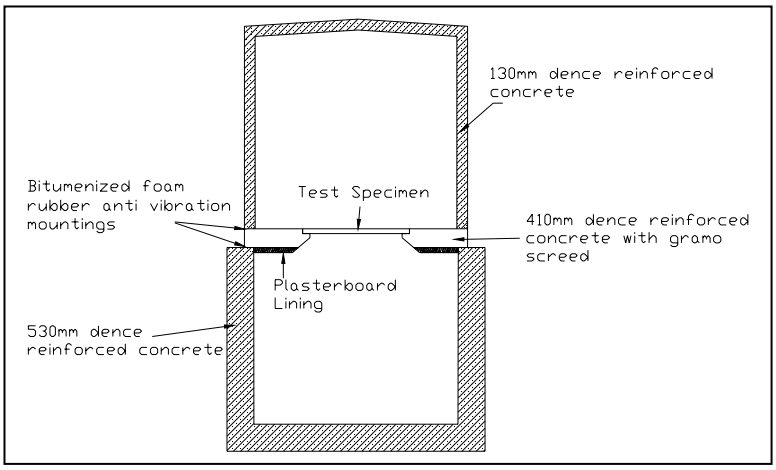

Figure 1. Chamber layout

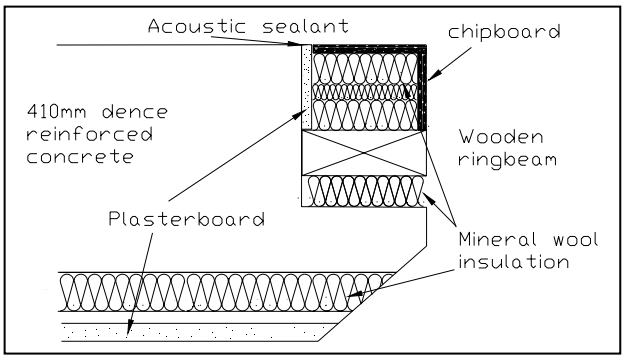

Figure 2. Ringbeam construction around test aperture.

Technical Data

Room **Dimensions** - 4.5m x 5.7m x 4m **Volumes** - 100m^3

Both rooms have non parallel walls and ceilings.

Walls and ceiling

Lower Room - 530mm thick dense reinforced concrete.
Upper Room - 410mm thick dense reinforced concrete.

Floor

Lower Room - 300mm thick dense reinforced concrete with grano screed.
Upper Room - 130mm thick dense reinforced concrete with grano screed.

Vibration mountings – three concrete pillars and rubber studded mats. Upper room and floor platen separated, vibration mounted on bitumenized foam rubber.

Test aperture – contained in floor of upper room – 3.16m x 3.16m

Access size - Lower Room – 2.11m x 0.92m.
Upper Room - 2.11m x 1.53m.

There is a ½ ton weight restriction on the crane for getting materials onto the second level.

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