

TEST REPORT

Your Ref:

Date: 06 Oct 2006

Our Ref: 54S065688/A/EMK

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SUBJECT:

Laboratory measurement of airborne sound transmission loss of "SHERA" cellulose fiber partition panel system submitted by Mahaphant Fibre-Cement Public Co., Ltd on 22 Aug 2006.

TESTED FOR:

Mahaphant Fibre-Cement Public Co., Ltd
99 Moo 12 Saraburi-Lomsak Road
K.M. 16, Chongsarika,
Lopburi 15220 Thailand

Attn: Mr Ekarat Unkammuang

DATE OF TEST:

7 Sep 2006

DESCRIPTION OF SAMPLE:

A "SHERA" cellulose fiber partition panel system, STC 45 was installed onto the sample carrier by two sub-contractors, Lively House Interiors & Trading and Tarlic Engineering Construction.

Tarlic Engineering Construction was in-charge for the installation of the C-channel frame structure and "Shera Flexy" board. Lively House Interiors & Trading was in-charge of the spraying of the cellulose fiber material onto the sample after the board.

The "SHERA" cellulose fiber partition panel system consisted of the following layers. The 10mm thick "SHERA" Flexy board was used as outer layers in the construction. One layer of 74mm thick cellulose fiber materials were placed between the adjacent boards.

The mass of a randomly selected pitch area of 0.6m (width) x 0.59m (length) x 0.074m (thick) of cellulose fiber material was 2.8kg. The calculated density of the cellulose fiber material used for the test was 107kg/m³.

The technical specification of the system layout was shown in Appendix.



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METHOD OF TEST:

The test was conducted in accordance with ASTM E90 - 97 "Standard test method for laboratory measurement of airborne sound transmission loss of building partitions and elements"

Measured area of system opening : 3.19m (width) x 3.16m (height) = 10.08m²

Air temperature in both source room and receiving room : 25°C

Relative air humidity in both source room and receiving room : 55%

Source room volume : 73m³

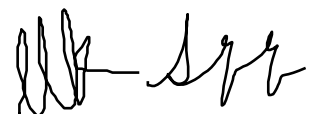
Receiving room volume : 86m³

Location of the test : Acoustics Lab of PSB Corporation Pte Ltd

TEST EQUIPMENT:

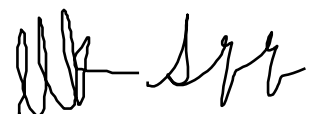
The following instruments were used for the test.

- 1) A dual-channel real-time frequency analyser (B&K Type 2133)
- 2) An Omni-loudspeaker (B&K Type 4296)
- 3) Two sets of ½" condenser microphones (B&K Type 4190)
- 4) Two sets of microphone preamplifiers (B&K Type 2669)
- 5) A sound pressure level calibrator (Norsonic Type 1251)
- 6) A sound source amplifier (Crown model CE 1000)
- 7) Two sets of rotating microphone booms (B&K Type 3923)



TEST PROCEDURES:

- 1) Instrumentation was set up according to ASTM E90-97
- 2) Measurement system was calibrated using a sound level calibrator Norsonic Type 1251.
- 3) Background noise level for both source room and receiving room were measured.
- 4) Sound source system was switched on and maintained at constant level. The sound pressure level in the receiving room was ensured to be 15dB higher than the background noise level.
- 5) Recording time for both rotating microphone booms was set to 64s which equals to the time taken by the booms to complete two revolutions.
- 6) Sound pressure level difference between the source room and the receiving room was measured with a dual – channel acoustic analyser (B&K 2133), and the measurement was repeated 3 times.
- 7) Step 6 was repeated after the loudspeaker was moved to new position.
- 8) Reverberation time (RT) of the receiving room was measured from two different loudspeaker positions. Each loudspeaker position was measured 2 times.
- 9) The mean values of the six readings for sound pressure level difference and four readings for RT values were calculated.
- 10) Values of sound transmission loss were determined for each 1/3 octave frequency band from 100Hz to 5kHz based on the mean values of step 9.
- 11) Sound transmission class was determined at the frequency of 500Hz of the shifted reference curve according to ASTM E 413.



RESULTS:

Values of sound transmission loss (TL) of the sample tested were tabulated in Table 1. Sound insulation rating was computed according to ASTM E413 - 87 (Reapproved 1999) "Classification for rating sound insulation".

Table 1 : Measured values of TL and values of the shifted reference curve for STC = 52


1/3 Octave Band Frequency (Hz)	TL (dB)	STC = 52 (dB)	Deficiency
100	28	33	5
125	32	36	4
160	36	39	3
200	35	42	7
250	40	45	5
315	45	48	3
400	49	51	2
500	51	52	1
630	56	53	0
800	57	54	0
1000	57	55	0
1250	58	56	0
1600	62	56	0
2000	62	56	0
2500	57	56	0
3150	51	56	5
4000	55	56	1
5000	61	56	0
Total deficiency (125Hz – 4000Hz) :			30

The values in Table 1 were plotted as shown in Figure 1.

Remarks:

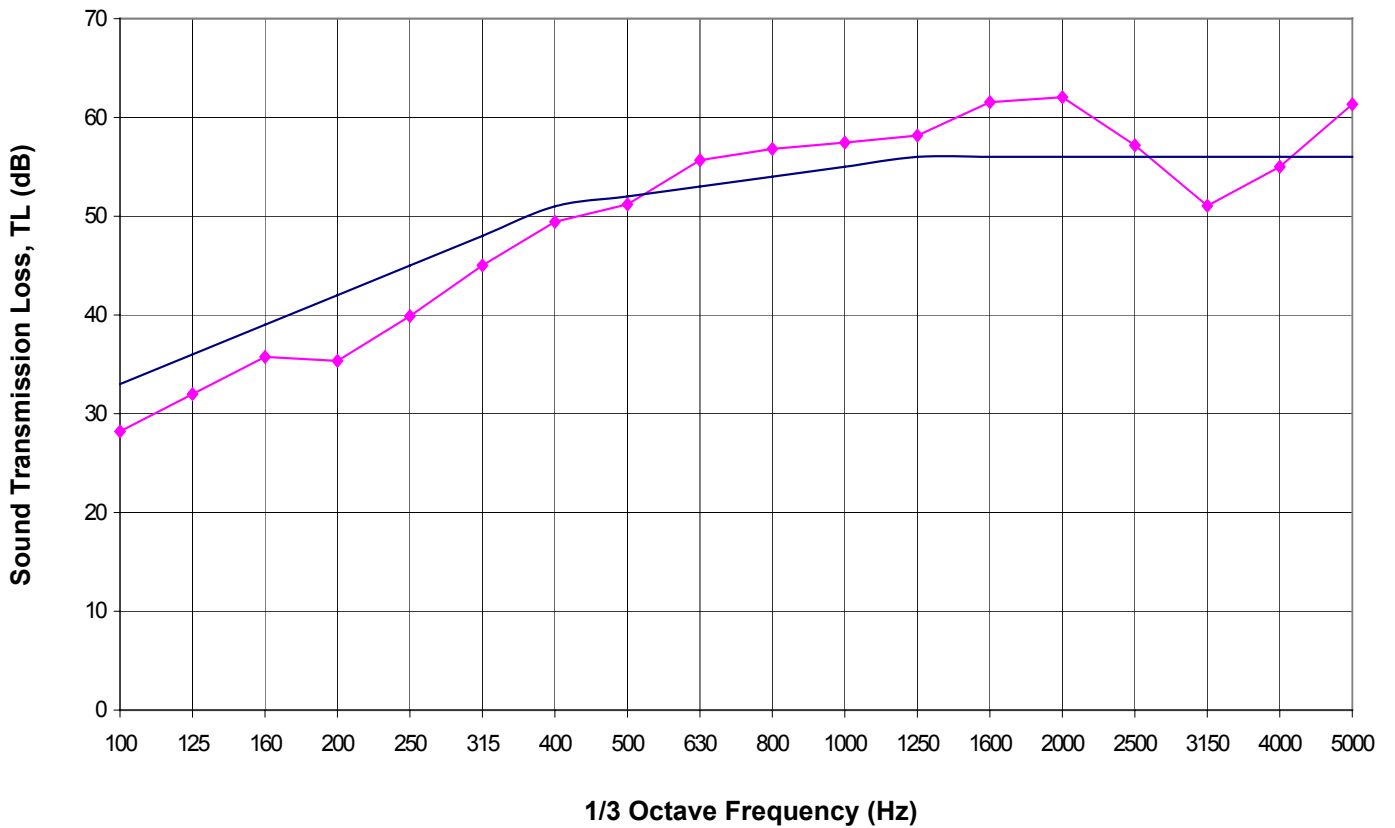
- 1) The cellulose fiber material had been cured for 8 days to ensure that it was sufficiently dry for test.
- 2) The tested sample has a sound transmission class, STC = 52




 Ee Min Kuen
 Testing Officer

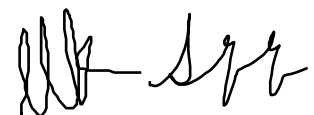

 Dr Sun Qiqing
 Assistant Vice President
 Acoustic & Vibration/Packaging

RESULTS: (cont'd)

Figure 1: Sound insulation performance of "SHERA" cellulose partition panel system, STC 52



 Measured sound transmission loss, TL
 Shifted curve, STC = 52



RESULTS: (cont'd)



Figure 2 : Test set up of sample in the source room

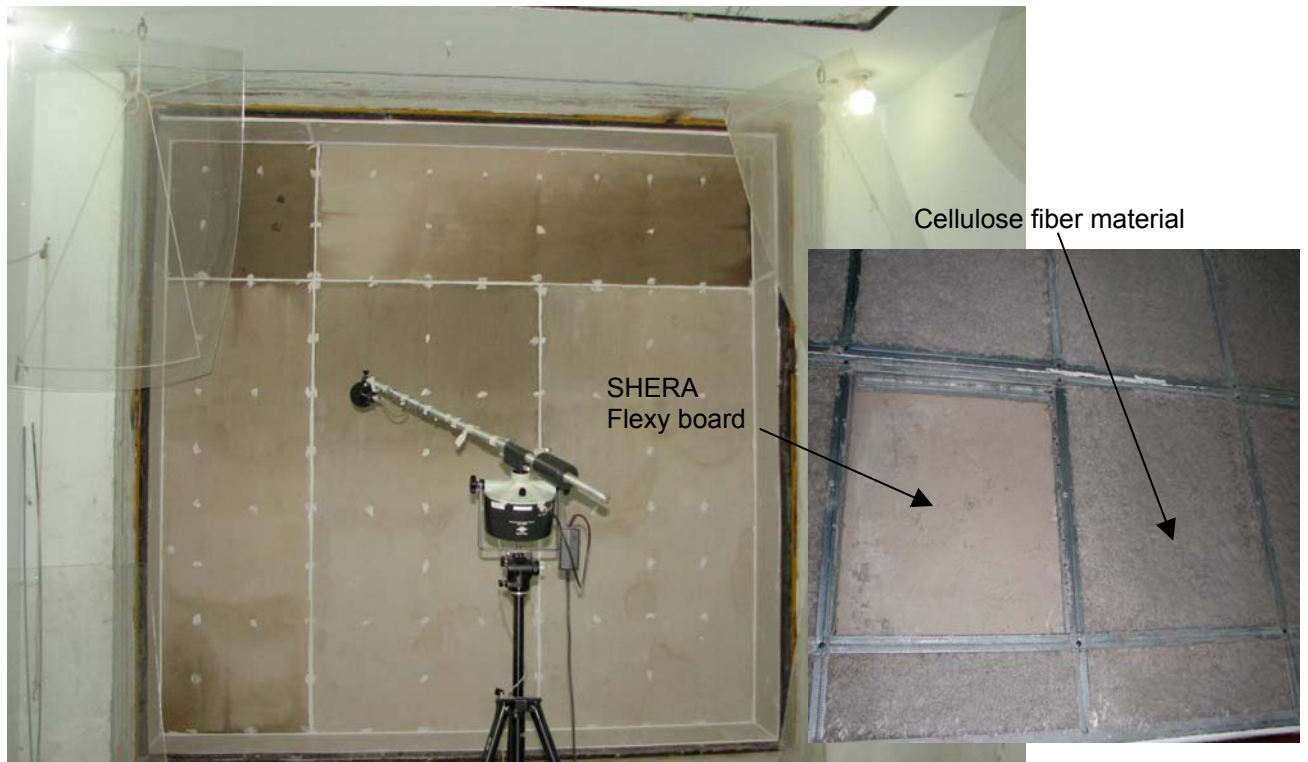
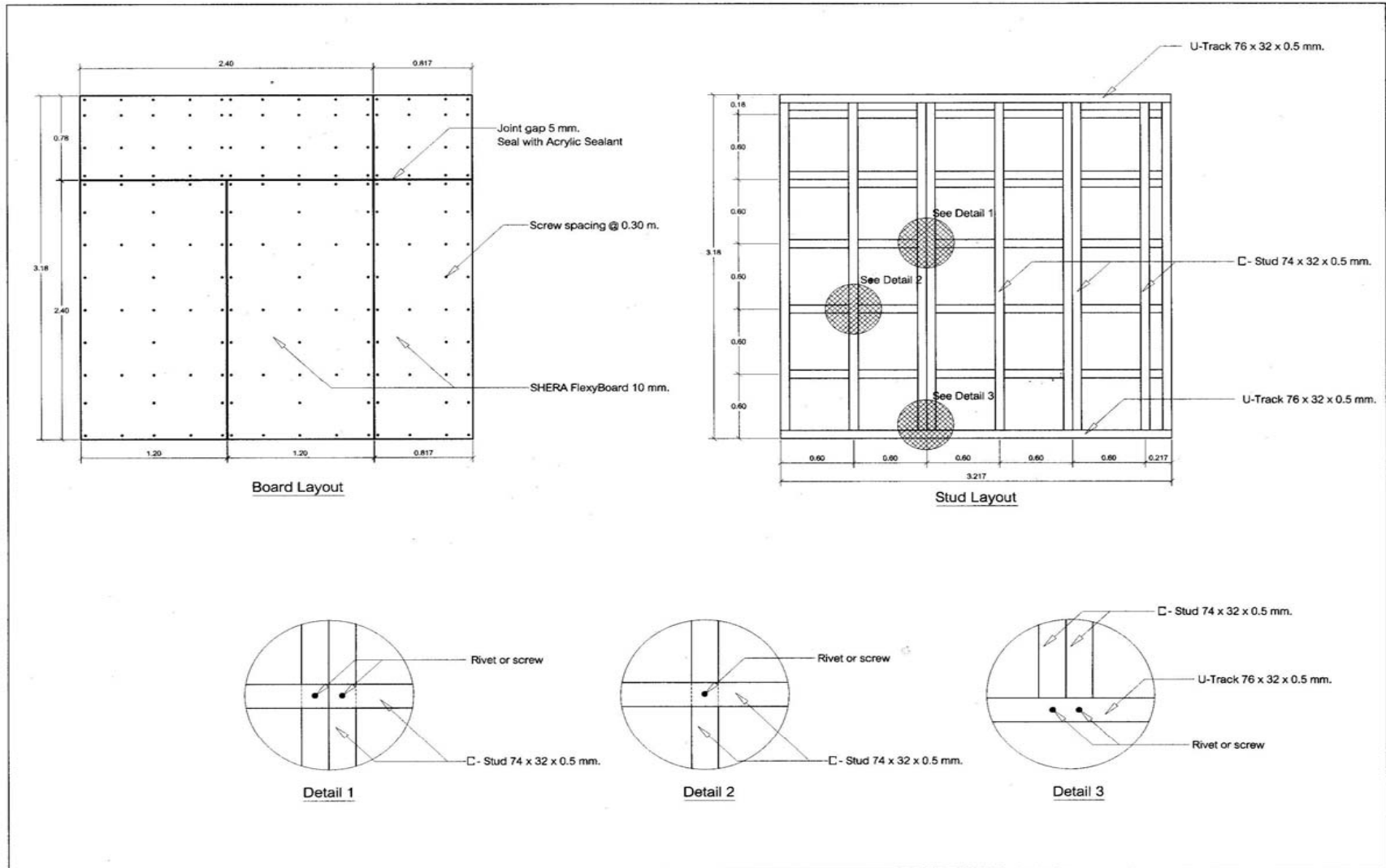
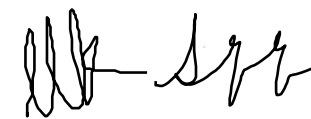


Figure 3 : Test set up of sample in the receiving room

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June 2006