TEST REPORT

Your Ref:

Date: 06 Oct 2006

Our Ref: 54S065688/B/EMK

DID: + 65-6885 1438

Fax: + 65-6779 3903

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:

2 Oct 2006

DESCRIPTION OF SAMPLE:

A “SHERA” Cellulose fiber partition panel system, STC 60 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 two outer layers and one inner layer in the construction. Two layers 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/m^3.

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

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) = 10.08m^2
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 : 72m^3
Receiving room volume : 86m^3
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 preamplifers (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.

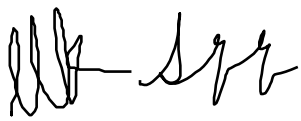
7) Step 6 was repeated after the loudspeaker was moved to new position.

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 = 64

1/3 Octave Band Frequency (Hz)	TL (dB)	STC = 64 (dB)	Deficiency
100	31	45	14
125	40	48	8
160	46	51	5
200	49	54	5
250	55	57	2
315	58	60	2
400	65	63	0
500	68	**64**	0
630	69	65	0
800	70	66	0
1000	72	67	0
1250	73	68	0
1600	73	68	0
2000	73	68	0
2500	67	68	1
3150	63	68	5
4000	68	68	0
5000	73	68	0
Total deficiency (125Hz – 4000Hz) :			28

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

Remarks:

1) Each layer of cellulose fiber material was cured for 8 days, and a total of 16 days were used to ensure that it was sufficiently dry for test.

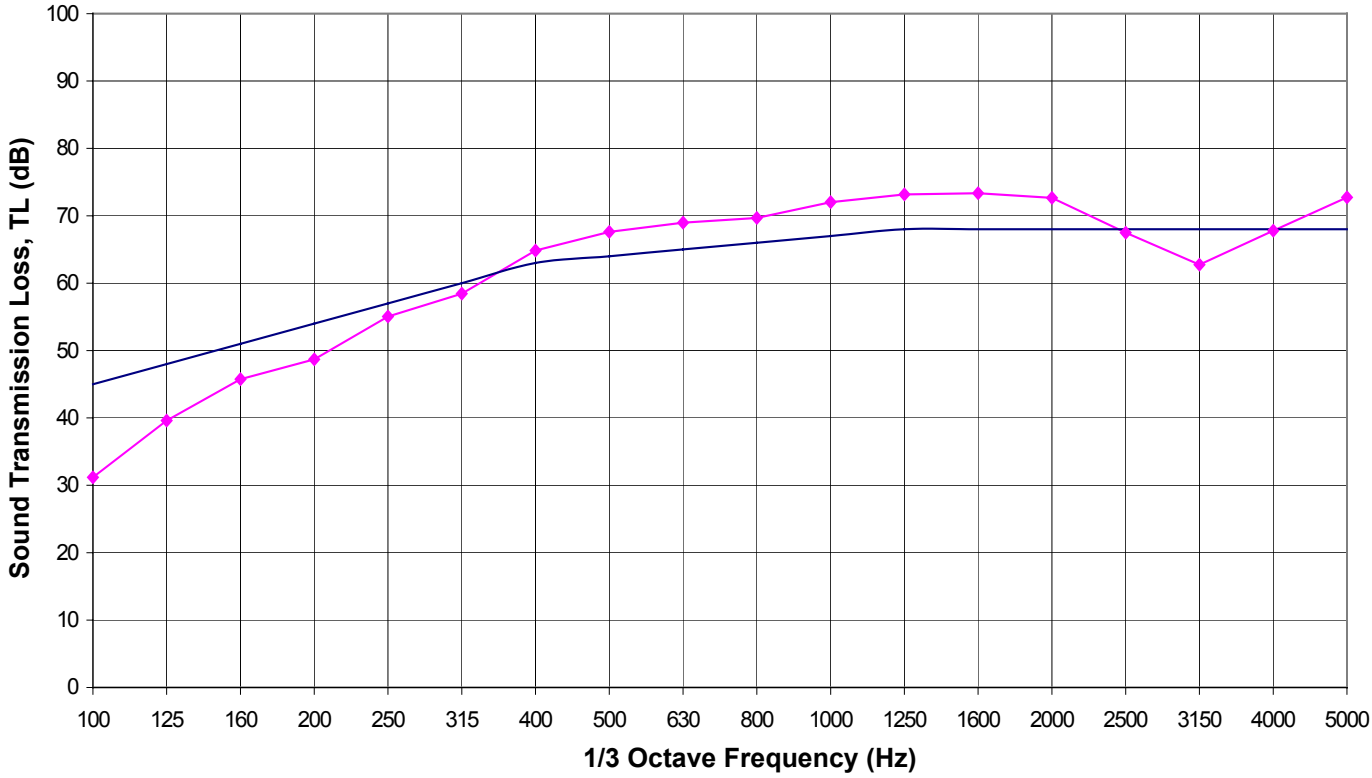
2) The tested sample has a sound transmission class, STC = 64

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 64



RESULTS: (cont'd)

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

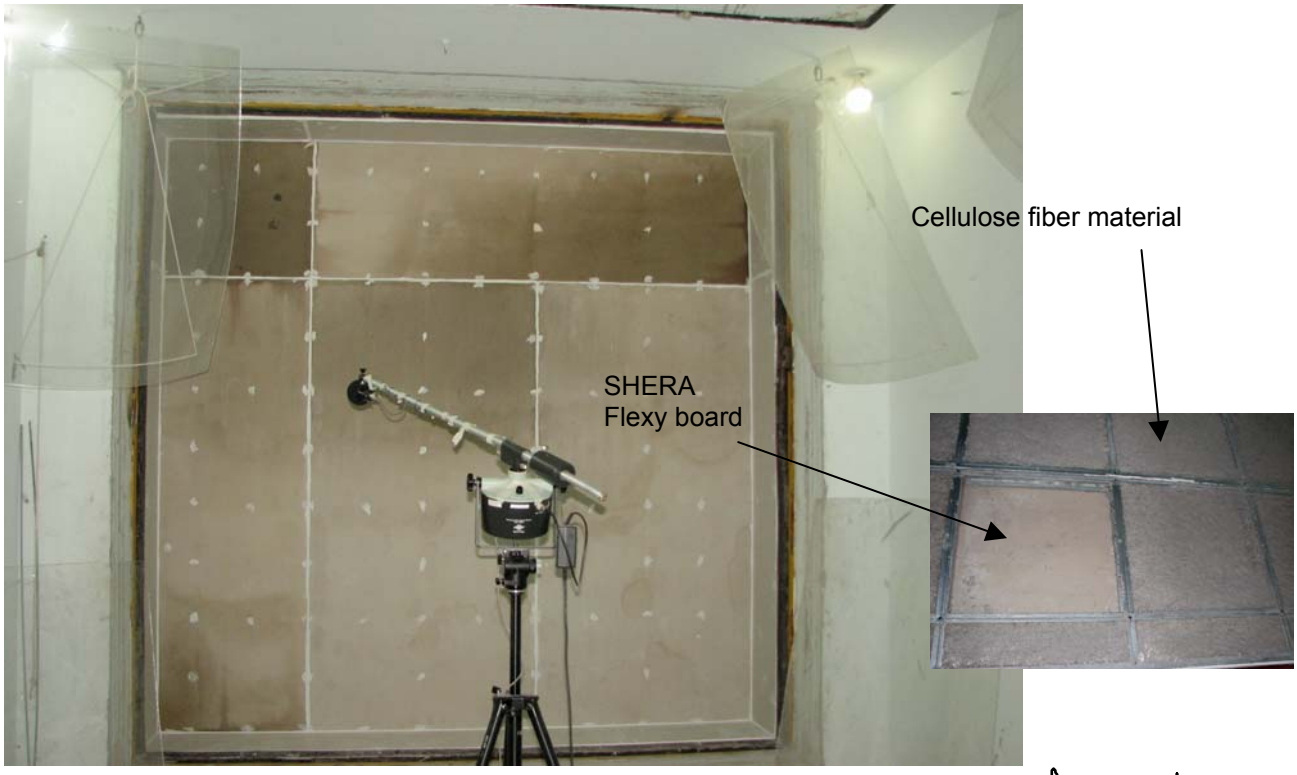
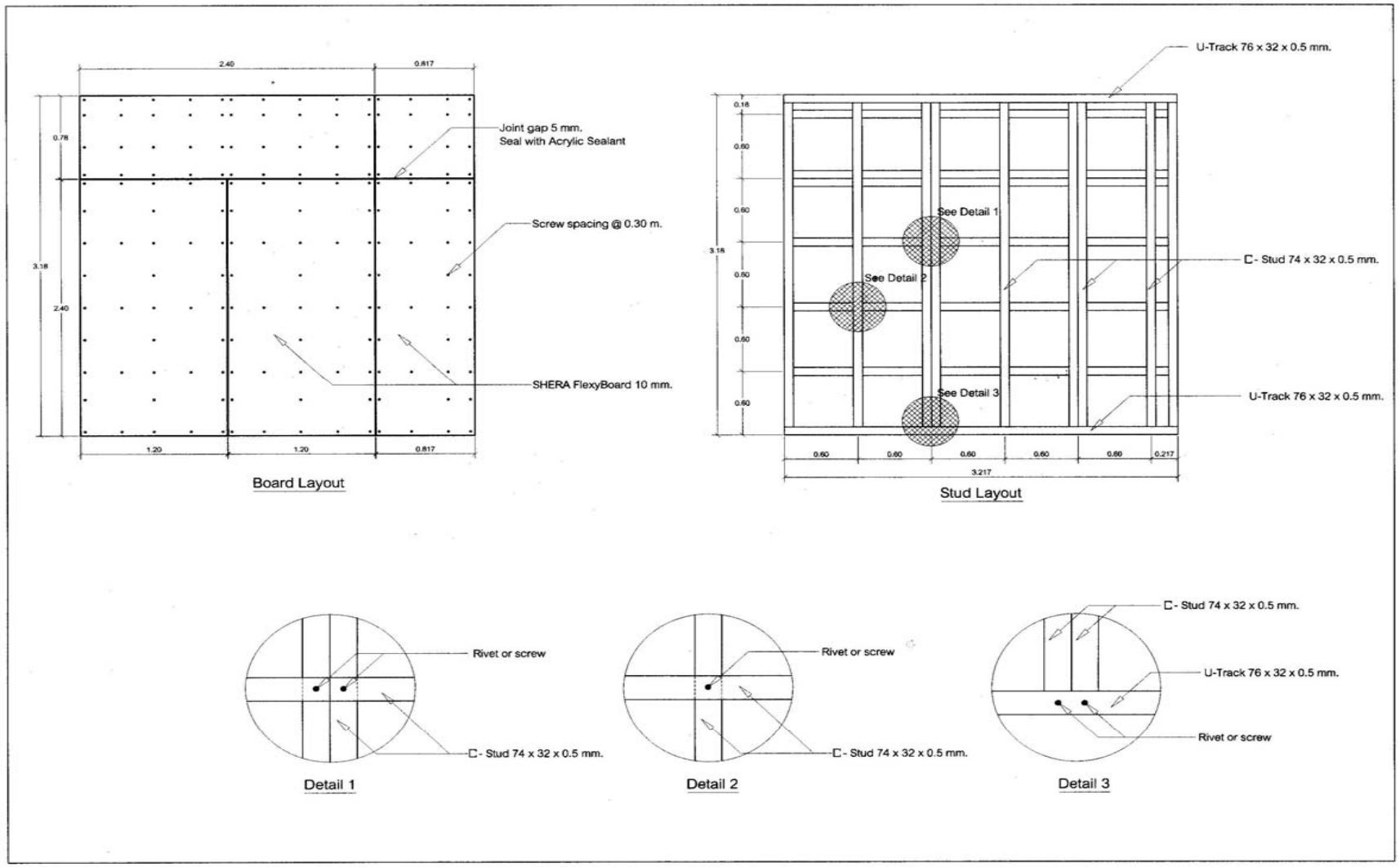


Figure 3 : Test set up of sample in the receiving room


2.40
0.817
0.78
3.18
2.40
Joint gap 5 mm.
Seal with Acrylic Sealant
Screw spacing @ 0.30 m.
SHERA FlexyBoard 10 mm.
1.20
1.20
0.817
Board Layout
U-Track 76 x 32 x 0.5 mm.
0.18
0.60
0.60
0.60
0.60
0.60
3.18
See Detail 1
See Detail 2
See Detail 3
C- Stud 74 x 32 x 0.5 mm.
U-Track 76 x 32 x 0.5 mm.
0.60
0.60
0.60
0.60
0.60
0.217
3.217
Stud Layout
Rivet or screw
C- Stud 74 x 32 x 0.5 mm.
Detail 1
Rivet or screw
C- Stud 74 x 32 x 0.5 mm.
Detail 2
C- Stud 74 x 32 x 0.5 mm.
U-Track 76 x 32 x 0.5 mm.
Rivet or screw
Detail 3

Appendix

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June 2006