

FUGRO TECHNICAL SERVICES (GUANGZHOU) LIMITED

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Client Ref : -
Report No: G13170AC130013

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Report on Laboratory Measurements of Airborne Sound Insulation of Building Elements

Information Supplied by Client

Client Intex International Pty Ltd

ABN/Local Business Number 95919466212

Head Office Address 115 McKellar Way
Epping, Victoria,
Australia, 3076

Sample Name Steel Sound Rated Access Panel

Client Sample I.D. SR1

Laboratory Information

Lab Sample I.D. AC130013

Date Received 21/04/2013

Date Test Started 27/04/2013

Date Test Completed 27/04/2013

Test Address Acoustic Reverberation Chambers, Jin Ke Ecological Park, Nancun, Panyu, Guangzhou, PRC

Test Standards BS EN ISO 140-3:1995 Incorporating Amendment No.1

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1. Reference Instrument

Name	Type	Serial Number
Hand-held analyzer	B & K 2270	2664200
1/2" Free-field microphone	B & K 4189	02662994 02663055
Omnipower omnidirectional sound source	B & K 4292	024010
Power amplifier	B & K 2716	2667548
Sound level calibrator	B & K 4231	02671619
Temperature & humidity data logger	testo 174H	36616834 36615789

2. Environment Condition

	Source Reverberation Room	Receiving Reverberation Room
Temperature	24.4°C	24.3°C
Relative humidity	72.4%	77.3%

3. Description of test specimen *(Information supplied by client)*

- 3.1 The test specimen is steel sound rated access panel of total thickness 30mm, which consists of 0.8mm thick galvanized steel frame and panel. The panel is made of 0.8mm thick galvanized steel face and 20mm thick sound insulation cotton infill.
- 3.2 Dimension used to calculate sound reduction index: 600mm x 600mm.
- 3.3 Sound insulated sealing strip is sealed around the gap between the frame and the panel. 3.4 Details of installation
- 3.4.1 In order to ensure that the flanking path transmitted sound as little as possible, 240mm thick brick with density of 1700 kg/m³, on both side which about 15mm thick plaster was plastered, was used as filler wall.
- 3.4.2 Then the panel was installed. In order to get better air-proof, sealant was caulked around the gap between the frame and filler wall after the panel installed. The details of the tested unit are referring to the drawings and photos given in Appendix.

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4. Principle and Procedure

4.1 Principle

The test specimen is placed in an opening between two adjacent reverberation rooms. Random noise is introduced into the source room and part of the sound energy is transmitted through the test specimen into the receiving room. In each one-third octave band of centre frequency 100 to 5000 Hz, the resulting average sound pressure levels in the source room and receiving room are L_1 and L_2 , respectively. The sound reduction index is evaluated from;

$$R = D + 10 \lg \frac{S}{A} = L_1 - L_2 + 10 \lg \frac{S}{A} \text{ dB}$$

where

- D** is the level difference, dB;
- S** is the area of the test specimen, m^2 ;
- A** is the equivalent sound absorption area in the receiving room, m^2 ;
- A** = $\frac{0.16V}{T}$ V is the receiving room volume, m^3 ;
T is the reverberation time in the receiving room, s.

The weighted sound reduction index R_w is determined from the value R in the 1/3 octave band with centre frequency 100 to 3150 Hz, following the procedure given in ISO 717-1 :1996/Amd.1 :2006.

4.2 Procedures

- 4.2.1** A calibration was checked on the frequency analyzer with reference calibrator before the measurement.
- 4.2.2** A high power steady sound source, with a continuous spectrum in the frequency bands of interest, was generated in the source room and to ensure the transmitted sound level in the receiving room was at least 6 dB above the background noise level at all frequencies. Loudspeaker and microphone positions were chosen according to standard requirements. Measurements were taken for two loudspeaker positions. For each loudspeaker position, at least five microphone positions were chosen in the source and receiving room. The level difference D as per defined in the standard was then calculated.
- 4.2.3** Then the loudspeaker was moved to receiving room to measure the reverberation time in accordance with ISO 354:2003. Two loudspeaker positions, for each loudspeaker position, three microphone positions with five readings in each were used.
- 4.2.4** A calibration was checked on the frequency analyzer with reference calibrator after the measurement. If the deviation of the calibration from before and after measurement was less than 0.5 dB, then the measured result was claimed valid.

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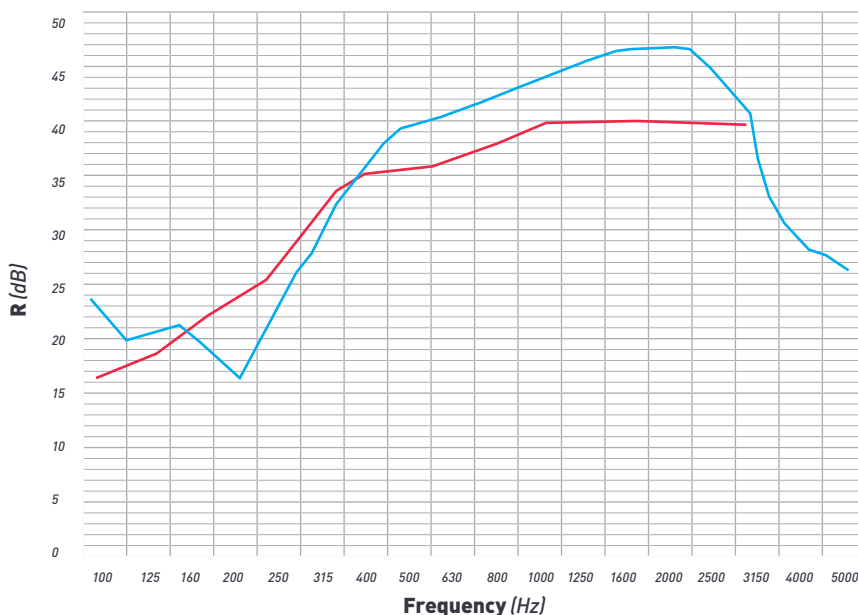
5. Results

Laboratory measurements of airborne sound insulation of building elements.

Area of test specimen: 0.36 m²
Source room volume: 272.5 m³
Receiving room volume: 151.3 m³

Key
R Sound reduction index, in dB
f frequency, in Hz
— Sound reduction index R
— Weighted sound reduction index, *R_w* = 36dB reference curve

Frequency f (Hz)	R (1/3 octave) (dB)
100	22.4
125	20.5
160	20.9
200	18.2
250	16.9
315	26.7
400	30.6
500	35.8
630	40.0
800	42.1
1000	42.4
1250	44.5
1600	45.9
2000	46.0
2500	44.7
3150	41.3
4000	34.0
5000	31.8

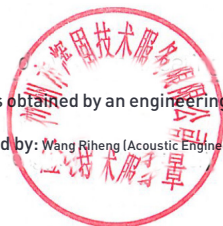


Rating according to ISO 717-1 :1996/Amd.1 :2006.

$R_w [C, C'] = 36 [-4, -8]dB$

Evaluation based on laboratory measurement results obtained by an engineering method.

Checked by: Jin Date: 01/05/2013 Certified by: Wang Riheng (Acoustic Engineer) Wang Riheng Date: 01/05/2013



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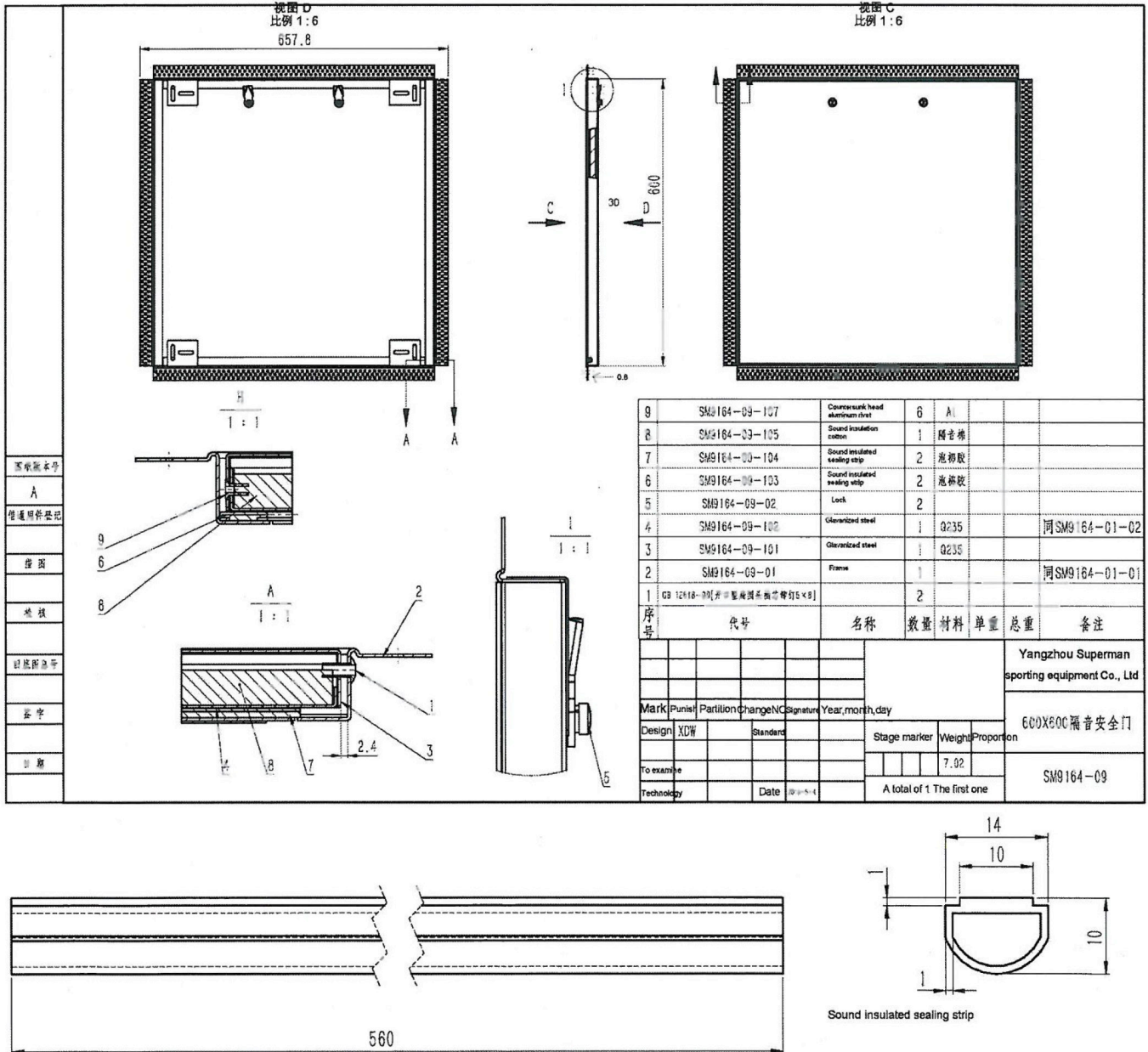


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Appendix 1: Details of test specimen (Information supplied by client)



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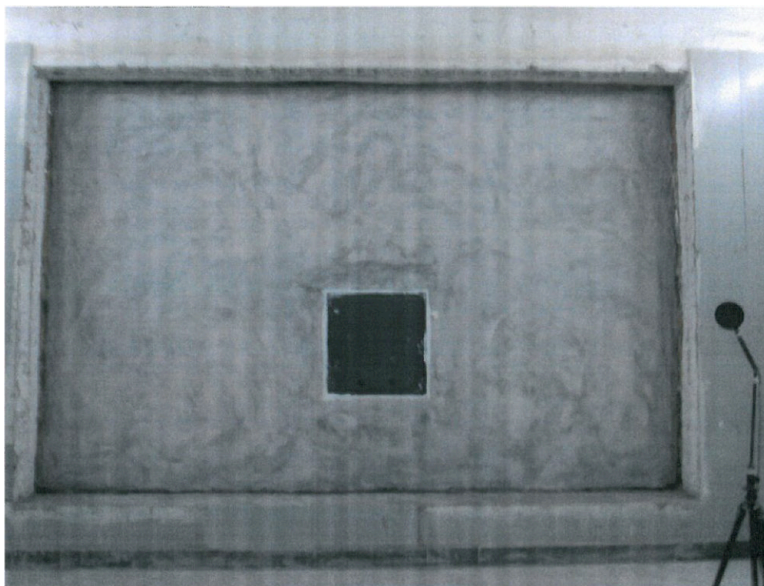
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Appendix 2: Photographic records

Source room side



Receiving room side



End of Report

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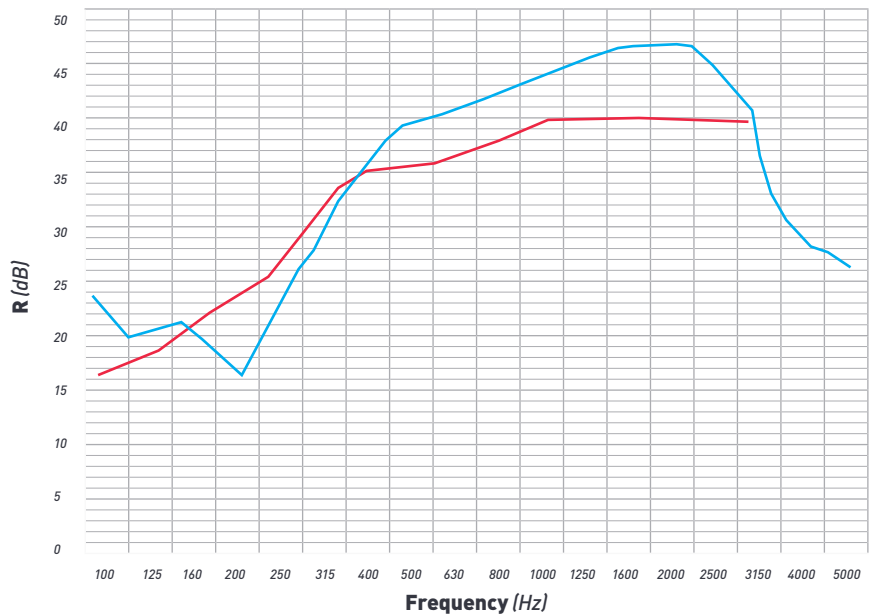
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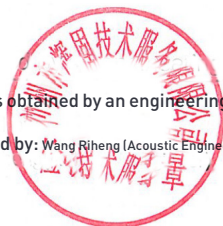


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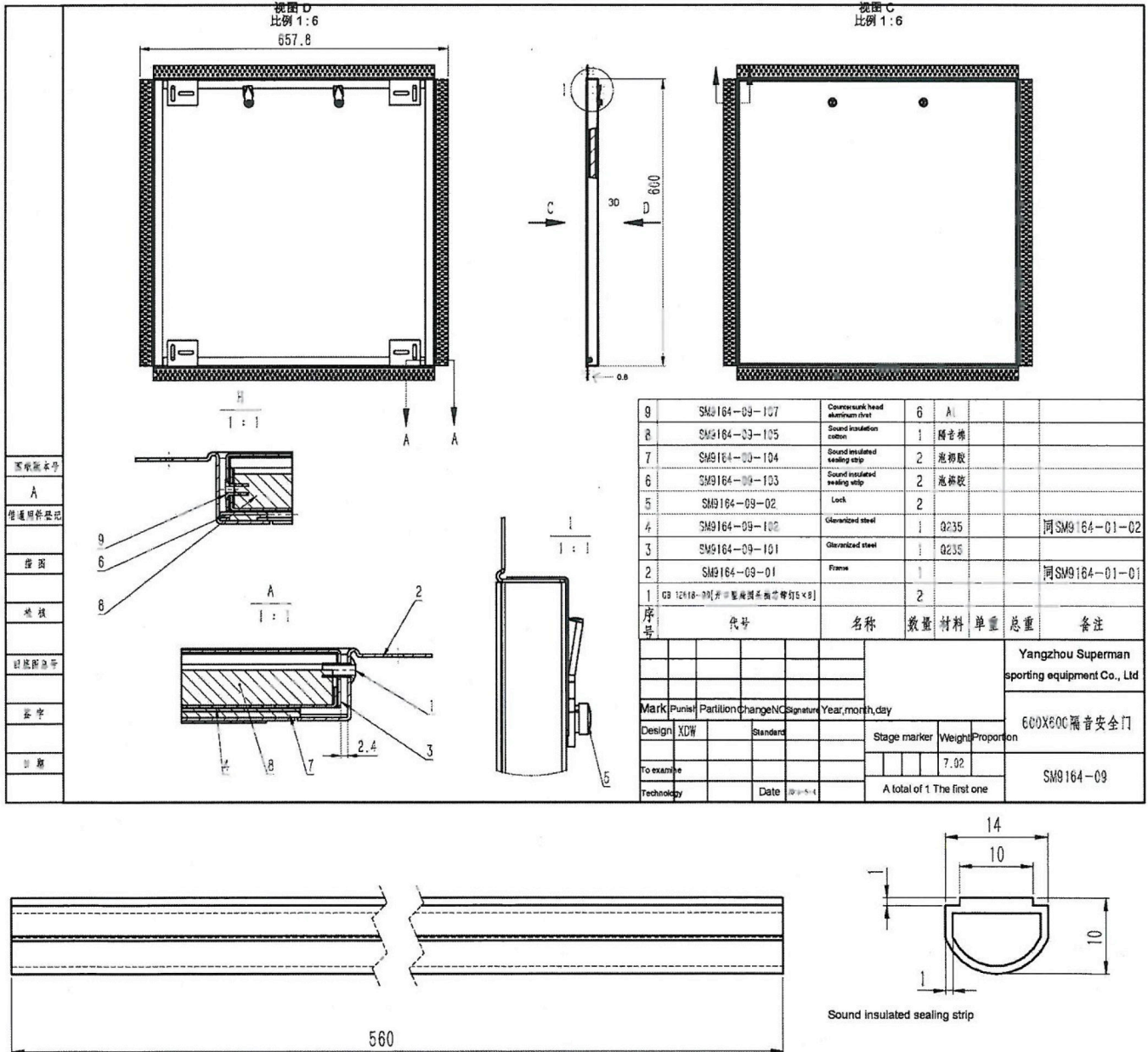


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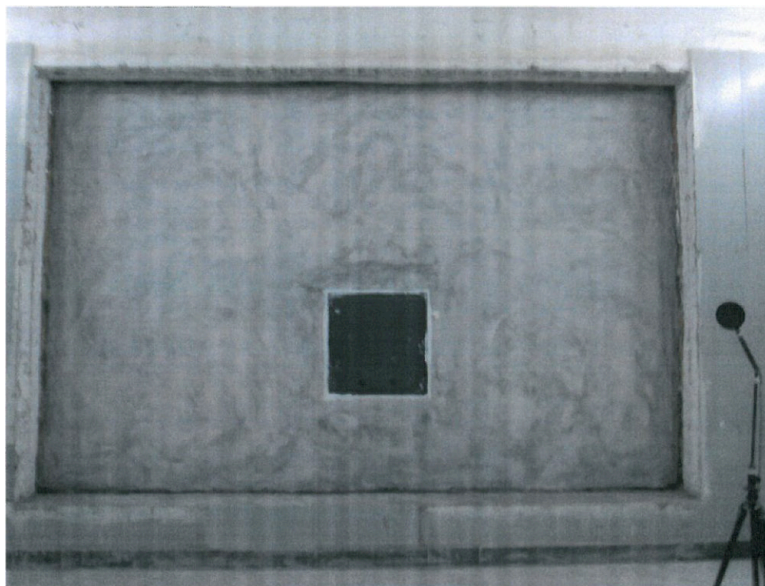
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