

BRITISH MUSLIM HERITAGE CENTRE, COLLEGE ROAD, WHALLEY RANGE

NOISE IMPACT ASSESSMENT

Report **12416-NIA-01**

Prepared on 06 June 2017

Issued For:

British Muslim Heritage Centre

College Road

Whalley Range

M16 8BP

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List of Attachments

12416-SP1	Indicative Site Plan
12416-TH1	Environmental Noise Time History
Appendix A	Glossary of Acoustic Terminology
Appendix B	Acoustic Calculations

1.0 INTRODUCTION

Clement Acoustics Ltd has been commissioned by British Muslim Heritage Centre to investigate and assess the noise impact from amplified speech during proposed extended hours at The Marquee at The British Muslim Heritage Centre, College Road, Whalley Range on nearby residential properties.

This report presents the results of a background noise survey and break out assessment followed by an assessment of the anticipated noise emission levels and outlines any necessary mitigation measures.

2.0 SITE DESCRIPTION

Proposals are to extend operational hours of a venue at British Muslim Heritage Centre, College Road, Whalley Range. The venue is approximately 30m x 30m structure with a pitched roof consisting of 850g/m² Double Layer PCT Fabric, and walls consisting of 8/10/8mm double layer glass. It has been assumed the roof will provide no significant acoustic insulation.

The site is located in a large estate in a mostly residential environment and is bound by residential properties to the east and west, College Road to the north and Clarendon Road to the south.

The nearest residential receiver has been identified as a first floor residential window located at a minimum distance of 35m west of the venue.

The proposed hours of extension being sought are from 22:30 to 01:30 each night.

3.0 PROCEDURE

Measurements were undertaken at one position as shown on indicative site drawing 12416-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the site.

The microphone was mounted on a lamp post at the rear of the marquee. The position was considered to be free-field, and a correction for reflections has therefore not been applied. Noise levels at the monitoring location were dominated by traffic noise during the installation and collection of equipment.

Continuous automated monitoring was undertaken for the duration of the survey between 16:00 on 19 May and 09:00 on 22 May 2017.

Weather conditions were generally dry with light winds and occasional showers and therefore suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS 7445:1991: '*Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*'.

4.0 EQUIPMENT

4.1 Environmental Noise Survey

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 975 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

5.0 RESULTS

5.1 Environmental Noise Survey

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured at the location shown in site drawing 12416-SP1.

The measured sound pressure levels are shown as a time history in Figure 12416-TH1, with ambient and background noise levels summarised in Table 4.1.

	Average ambient noise level $L_{Aeq: 5min}$ dB(A)	Minimum background noise level $L_{A90: 5min}$ dB(A)
Daytime (07:00 - 23:00)	53	33
Night-time (23:00 - 07:00)	49	31
Proposed Extended Hours (22:30-01:00)	51	31

Table 5.1: Minimum background noise levels

6.0 NOISE EMISSIONS CRITERIA

6.1 External Noise Emissions

The Manchester City Council general criteria for noise emissions are as follows:

...“any externally mounted ancillary equipment, shall be acoustically insulated in accordance with a scheme designed so as to achieve a noise level of 10dB below the existing background (LA90) in each octave band at the nearest noise sensitive location”

“Music noise levels in the 63Hz and 125Hz octave frequency bands (Leq) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq), respectively”

As the site is proposed to be active during the hours of 22:30 – 01:00, we propose to set the noise criteria at 21 dB(A), the value 10 dB below the minimum measured background noise level during the proposed extended hours.

7.0 DISCUSSION

7.1 Existing Conditions

Measurements were taken of amplified speech played back at a similar event to that proposed, within the same venue. The noise levels measured are as shown in Table 7.1.

Source	Sound Pressure Level (dB) in each Frequency Band, at source								dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Amplified Speech	77	81	75	78	74	65	60	51	78

Table 7.1: Measured speech Noise Levels

These levels will be used to calculate the current noise breakout to nearby noise sensitive receivers and noise management criteria for proposed extended hours.

The closest receiver has been identified as the window on the east facade of a residential property opposite which is a minimum of 35m from the venue location.

7.2 Proposed Noise Management Plan

In order to ensure the calculated noise emission levels are not exceeded, we would recommend following certain steps when operating the basement as a nightclub, as detailed below:

- In order for noise emissions to comply with British Standard recommendations, we would recommend limiting noise levels. We would recommend maximum noise levels as follows:

Source	Low Frequency Limits								Overall Limit
	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	
Amplified speech	60 dB	62 dB	64 dB	66 dB	64 dB	62 dB	62 dB	62 dB	70 dB

- Door staff should be instructed to ensure that entrance doors are kept closed where possible,
- When patrons are entering or existing the premises, the lobby area should be used to ensure at least one door stays closed at all times,
- Door staff should also remind patrons using the venue of the residential nature of surrounding premises and behaviour outside the premises should be monitored accordingly.

For all calculated levels shown above, full formulae used and spectral calculations are shown in the corresponding Appendices B1.

7.3 Noise Impact Assessment

Taking into account all necessary acoustic corrections, the resulting noise level at the identified residential windows would be as shown in Table 7.3. Detailed calculations are shown in Appendix B.

Receiver	Night Time Hours Criterion	Noise Level at Receiver (due to venue)
Nearest Residential Property	21 dB(A)	21 dB(A)

Table 7.3: Noise levels and criteria at noise sensitive receivers

As presented in Table 7.3 and Appendix B, the proposed amplified speech with noise limiter would be expected to meet the requirements of the proposed criteria.

7.4 Low Frequency Assessment

According to BS 8233:2014, a typical building facade with a partially open window offers 15 dB attenuation. Taking this into account, the resulting noise levels inside the identified residential windows at low frequency would be as shown in table 7.4.

Receiver	Frequency	Design Criteria	Noise Level at Receiver (due to venue)
Inside Residential Window	63 Hz	47dB(A)	6 dB(A)
	125 Hz	41dB(A)	6 dB(A)

Table 7.4: Noise levels and criteria inside nearest residential space

As presented in Table 7.4, the proposed amplified speech with noise limiter would be expected to meet the requirements of the proposed criteria.

7.5 British Standard Requirements

Further calculations have been undertaken to assess whether the noise emissions from the venue would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS 8233:2014 recommends 30dB(A) as being acceptable internal resting/sleeping conditions during night-time.

With loudest external levels of 21dB(A), acceptable internal conditions would be met without taking the attenuation of the window itself into consideration. According to BS 8233:2014, a typical building facade with a partially open window offers 15 dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of the set criteria, the emissions from the venue would be expected to meet the most stringent recommendations of the relevant British Standard, with neighbouring windows partially open. Predicted levels are shown in Table 7.5.

Receiver	Design Range – <i>For resting/sleeping conditions in a bedroom, in BS8233:2014</i>	Noise Level at Receiver (due to venue)
Inside Residential Window	30 dB(A)	6 dB(A)

Table 7.5: Noise levels and criteria inside nearest residential space

8.0 CONCLUSION

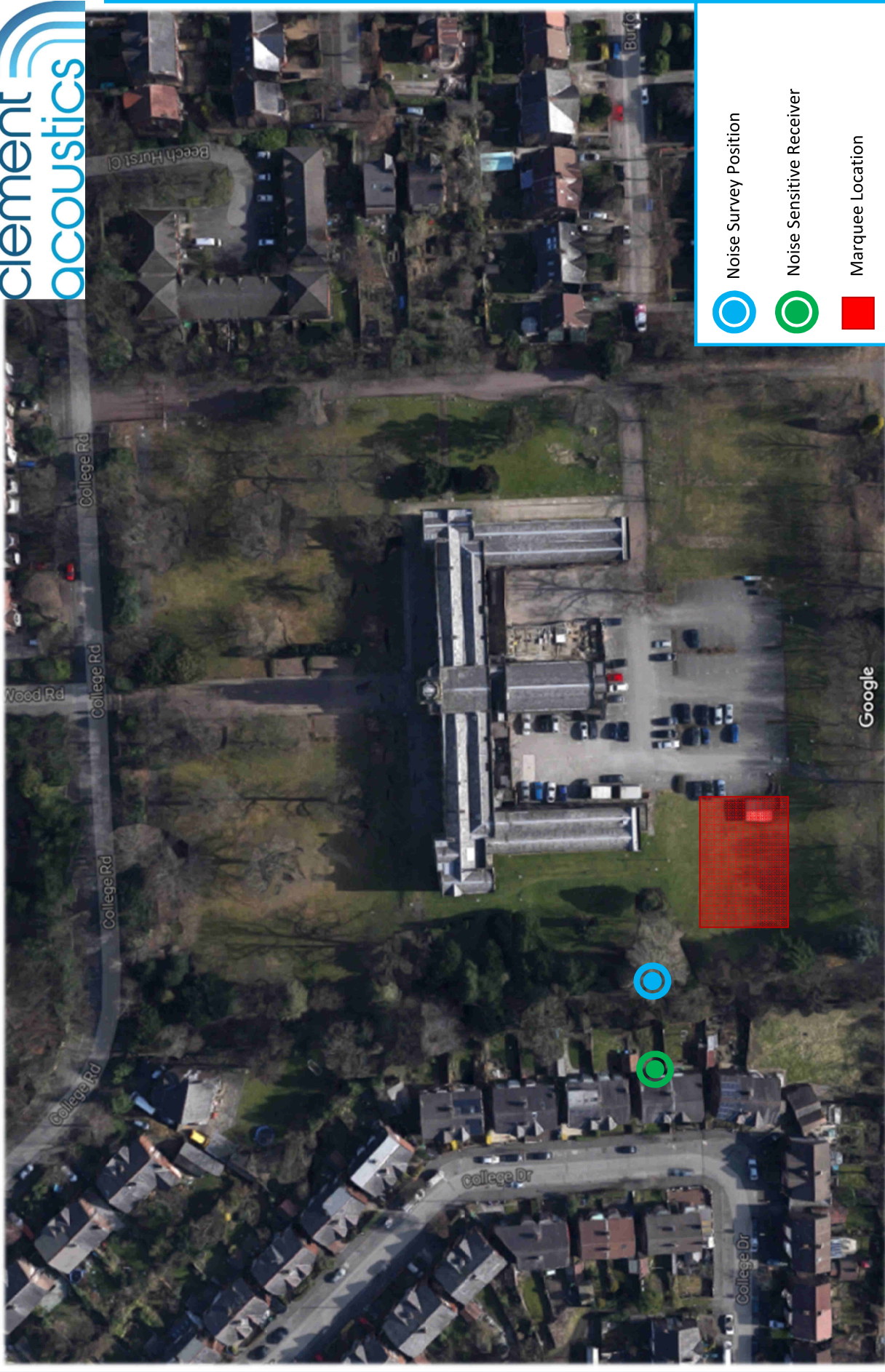
A noise survey has been undertaken at The Marquee at The British Muslim Heritage Centre, College Road, Whalley Range. The results of the survey, combined with noise breakout measurements, have enabled the assessment of noise propagation of amplified speech playback within the venue to surrounding receivers.

Calculations have shown that the noise from amplified speech playback within the venue should meet the set noise criteria during proposed extended operational hours with the use of a noise limiter. Further calculations have shown that the recommendations of the relevant British Standard would also be met.

An outline noise management plan has been recommended, in order to minimise noise transmission.

Report by
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Checked by
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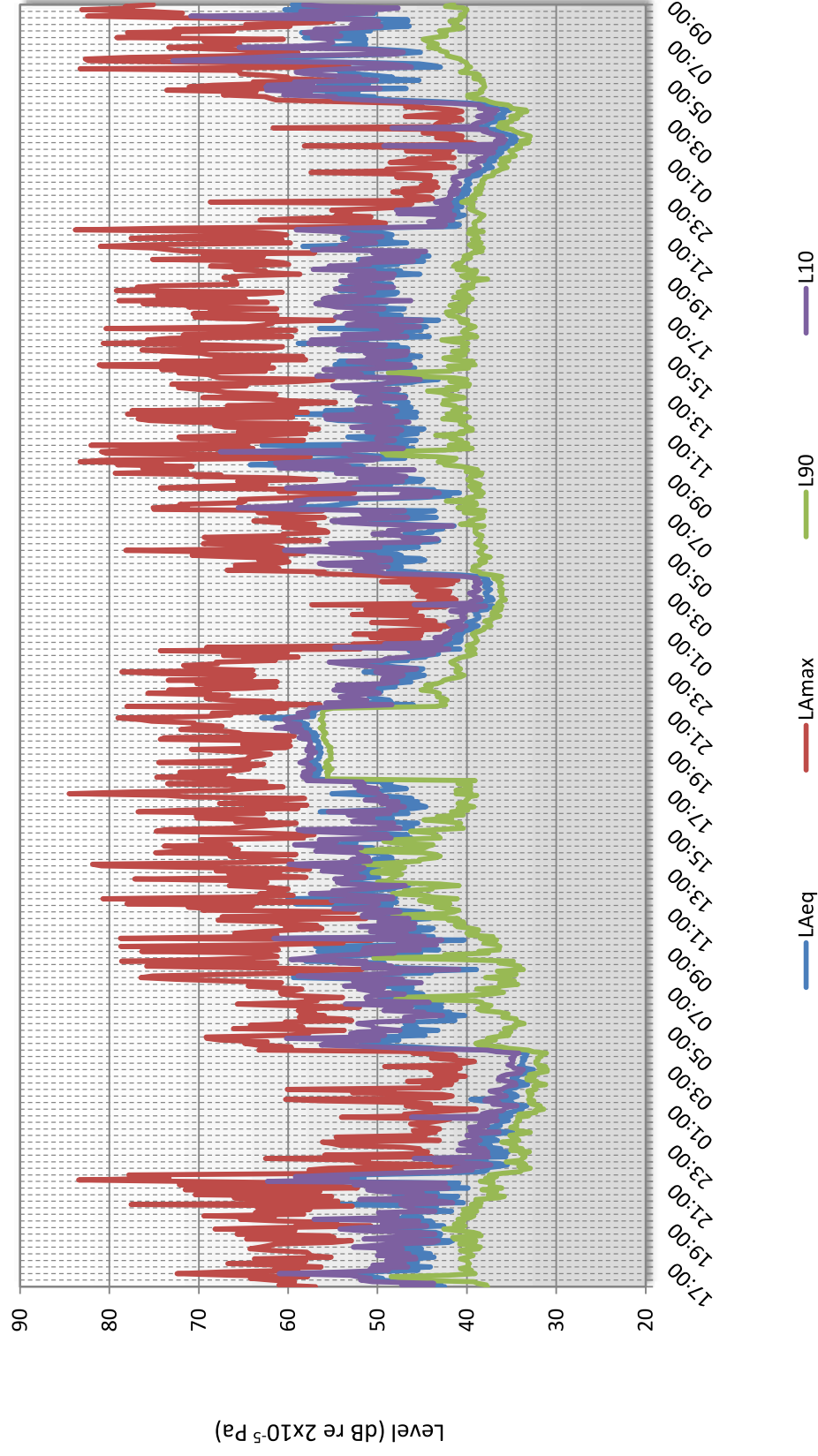
Indicative site plan indicating noise monitoring position and nearest noise sensitive receiver

Date: 25 May 2017

The British Muslim Heritage Centre, College Road, Whalley Range

Environmental Noise Time History

19/05/2017 to 22/05/2017



GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

APPENDIX B

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The British Muslim Heritage Centre, College Road, Whalley Range

NOISE EMISSIONS CALCULATION

Receiver: Nearest Residential Receiver Source: Proposed Activity Noise		Frequency, Hz								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Limited Source Noise		60	62	64	66	64	62	62	62	70
Correction due to Building Envelope		-8	-9	-12	-14	-17	-20	-23	-26	
Distance correction to receiver, dB (35m)		-31	-31	-31	-31	-31	-31	-31	-31	
Sound pressure level at receiver		21	21	21	20	16	11	8	5	21

Design Criterion	21
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BS 8233 ASSESSMENT CALCULATION

Receiver: Inside Nearest Residential Window Source: Proposed Activity Noise		Frequency, Hz								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Sound pressure level outside window		21	21	21	20	16	11	8	5	21
Minimum attenuation from partially open window, dB		-15	-15	-15	-15	-15	-15	-15	-15	
Sound pressure level inside nearest noise sensitive premises		6	6	6	5	1	-4	-7	-10	6

Design Criterion	30
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