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OPERATIONAL NOISE MANAGEMENT PLAN & ACOUSTIC BARRIER DESIGN in respect of CONDITIONS 18 and 28 of PLANNING APPROVAL (AWDM/**0056/22**) – REVISION A

Project: Former EDF Car Park, Southdownview Road, Worthing West Sussex

Client: Shoreham Vehicle Auctions

Date: 26th February 2025

Author: Dr P Clark CEng MIMechE MIOA
Checked by: Samuel Monk MSc MIOA

Our reference: 90768

Revision: A

Notes: Local authority comments incorporated (26/2/25)

1. INTRODUCTION

1.1 Worthing Borough Council, under their reference AWDM/0056/22, granted planning permission in February 2023 for the *"Construction of 3no. buildings providing 11no. light industrial units (Class E(g)) with associated car parking, landscaping and acoustic fence to north side of access road"* at the *"Former Edf Car Park, Southdownview Road, Worthing, West Sussex"*. The planning consent was granted subject to conditions. Condition 18 requires that *"No development shall be occupied unless and until a Noise Management Plan identifying the main sources of noise and methods of controlling them has been submitted to and approved in writing by the Local Planning Authority. The Noise Management Plan should specifically include measures to restrict the size of delivery vehicles to 7.5 tonnes, restrict Forklift trucks used on the site to a low noise electric type, require reversing alarms on Forklift trucks to be a white / pink noise signal and a digital speed indicator sign on the access road. Thereafter the Noise Management Plan shall be adhered to at all times the light industrial units hereby permitted are in use"*.

1.2 The main noise sources for the consented development are: noise from vehicles arriving/departing the site, noise from loading/unloading operations (most notably fork-lift trucks), and noise from mechanical services that will serve the industrial units. The site location is given in Figure 1 below:

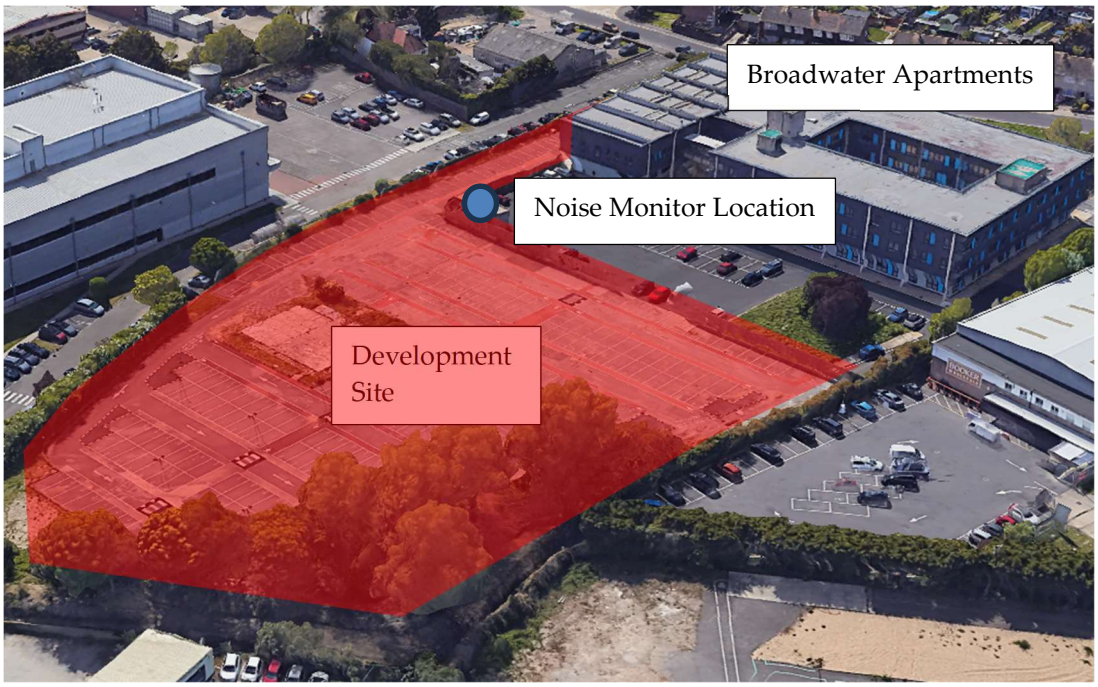


Figure 1: Site Location (© Google Earth™)

1.3 The Operational Noise Management Plan (ONMP) has been prepared (a) to provide a mechanism for noise control in respect of the site activities, and (b) to discharge Condition 18 of the planning approval. A part of the ONMP includes the specification of an Acoustic Barrier which is referred to in Condition 28 of the Planning Approval as "*Prior to the commencement of the development, details of the proposed boundary treatments with neighbouring sites/land, including details of the siting, design and construction of acoustic fencing and hedging along the northern side of the access road adjoining the site boundary with Broadwater Apartment, shall be submitted to and approved in writing by the Local planning Authority. No part of the development shall be first occupied unless and until the boundary treatments as agreed have been implemented and shall thereafter be retained*"

2. NOISE MEASUREMENTS

2.1 Environmental noise measurements were carried out from Thursday, 14th to Monday, 18th November 2024. Sound level measurement equipment was installed on the western perimeter fence (see Figure A1), close to the rear of Broadwater Apartments (see Figure 1 above). Whilst on site it was noted that the dominant noise source in the area is from surrounding industrial/commercial sites. The results of the noise survey are summarised in Table 1 below[1] and shown graphically in Figure A2:

Period	Average $L_{Aeq,12hour}$ (dB)	Typical L_{AmaxF} (dB)	Typical lowest $L_{A90,15min}$ (dB)
Day (07:00 to 19:00)	51	67[2]	42[2]

Table 1. Noise Measurement Survey Results

3. ASSESSMENT

3.1 The main sources of noise from the development site will be noise from vehicles arriving/departing the site, noise from loading/unloading operations (most notably fork-lift trucks), and noise from mechanical services that will serve the industrial units. The site layout is shown in Figure A4 at the end of this report which confirms that the orientation of the industrial units proposed is such that they shield Broadwater Apartments from noise on the site (Units 1 to 4 which are approximately 12m high form the western site boundary).

[1] Condition 20 of the planning approval limits working/trading/business hours: 7am to 7pm weekdays and 8am to 2pm Saturdays ONLY.

[2] See Maximum (L_{AFmax}) and Background ($L_{A90,15min}$) noise level histograms shown in Figure A3 at the end of this report

Vehicles arriving/departing

3.2 Vehicles arriving & departing the site will use the access road which lies immediately to the south of Broadwater Apartments. In a previous noise assessment[3], which was submitted in support of the planning application for the consented scheme, the calculations showed that noise levels from vehicles using the access road would be approximately 63 dB $L_{Aeq,1hour}$. This is a 12 dB increase over the existing daytime ambient (see Table 1 above). To reduce noise levels, an acoustic barrier is required (see Condition 28 of the Planning Approval). Given the proximity of the apartments' windows to the access road, the section of barrier immediately in front of the apartments themselves will need to be transparent[4]. The remainder of the barrier along the northern side of the access road is to be constructed from a solid close-boarded timber fence 2.5m minimum height[5].

Reversing Alarms

3.3 The potential impact of vehicle reversing alarms has been considered. Manufacturer's noise data for reversing alarms (see Figure A6) show that typical noise levels (for the most common type of vehicles that will use the site) are 82 to 87 dBA SPL at 1m. The closest residential windows (in Broadwater Apartments) are approximately 60m from Units 1-4 & 11 loading areas. Noise will be reduced by the barrier that is formed by Units 1-4 on the western perimeter of the site. The barrier attenuation is assumed to be a minimum of 15 dBA as these Units are 12m high. Noise levels at the

[3] See NoiseAir Ltd "NOISE IMPACT ASSESSMENT REPORT: FORMER EDF CAR PARK, SOUTHDOWNVIEW ROAD, WORTHING BN14 8NH REPORT" dated 19th December 2021 referenced P4547-R1-V2.

[4] See example data sheet shown in Figure A5 and at CLEARSoundBlok-Full-Brochure.pdf.

[5] See example data sheet shown in Figure A6 and at Reflective Acoustic Barrier | Jacksons Security Fencing

nearest dwellings are then considered in terms (a) L_{AeqT} (i.e. BS4142), and (b) maximum (L_{AFMax}).

Reversing Alarm (BS4142 Assessment) Reversing Alarm (Units 1-4 & 11) with respect to Broadwater Apartments

Providence House	Daytime (7am to 7pm)	Relevant clause of BS4142:2014	Comments
Background Noise Level ($L_{A90,15min}$)	42	8.1, 8.2	Lowest background noise levels based on measured survey data
Noise level of reversing alarm	87 dB(A) SPL at 1m		Manufacturer's sound level data for "worst case" unit
Specific sound level with respect to reference time period (at source)	72.3 dB $L_{Aeq,15min}$	7.2	Reversing alarm is assumed to operate for 30 second period (maximum)
Barrier Attenuation	-15 dB		12m high units on west perimeter of site
No of Alarms (1 per unit)	+8		
Distance attenuation	-35.6 dB		Distance to nearest property 60m
Specific sound level at receiver	29.7 dB	7.3.6	
Acoustic Feature Correction	4 dB	9.2	Correction of +4 dB for impulsivity. Condition 18 of the planning consent specifies that only "broadband"

			alarms should be used
Rating Level	33.7 dB	11	
Excess of Rating Level over Background	- 8.3 dB	.	

3.4 Worthing Borough Council Noise Policy[6] states that *"… the rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019."*

Reversing Alarm L_{Amax} Assessment (Units 1-4 & 11) with respect to Broadwater Apartments

Maximum noise levels from reversing alarms are calculated using;

$$L_{Amax,\ receiver} = SPL_{1m} - \Delta_{barrier} - 20\log_{10}(d)$$

Where: $\Delta_{barrier}$ is the noise attenuation provided by the noise barrier and d is the distance to the receiver (60m)

Maximum noise level at Broadwater Apartments is therefore 36 dB(A). This is significantly lower than existing L_{AFmax} noise levels (see Figure A3). Noise from reversing alarms will be inaudible at the nearest properties in Broadwater Apartments.

[6] Worthing Borough Council refers to "Planning Noise Advisory Document: Sussex 2023" dated November 2023 paragraph 3.2.1

4. OPERATIONAL NOISE MANAGEMENT PLAN

The dominant noise emissions are likely to be due to vehicle activities (arriving/departing) and loading/unloading operations at the site.

- Vehicle Noise (engine, reversing alarms and horns)
- Personnel noise in loading/unloading bays

The following noise control measures are to be implemented -

Signage

Signage will be installed across the development site and at the entrance requiring that noise is kept to a minimum in the interest of surrounding neighbours. VEHICLES OVER 7.5 TONNES WILL NOT BE ALLOWED TO ACCESS THE SITE. Vehicle engines MUST be turned off when vehicles are not in use and that the use of vehicle horns is not permitted unless for a pending accident or emergency. The access road and site speed limit will be 15 MPH. *A digital vehicle speed indicator sign will be installed on the access road.*

Hours of Operation

No working, trade or business (including the arrival, reception or despatch of deliveries), shall take on any premises except between 0700 hrs and 1900 hrs Monday to Friday, and between 0800 hrs and 1400 hrs on Saturdays, with no working, trade or business, on Sundays or on Bank or Public Holidays

Acoustic Barriers

An acoustic barrier is to be installed to the north boundary of the access road of the development site. Alongside Broadwater Apartments themselves, the barrier is to be constructed from transparent panels. These panels will

typically have minimum surface density not less than 20 kg /m^2. The barrier should extend from ground floor to the underside of the 1st floor level above. The acoustic barrier should be extended to the north side of the access road which adjoins the car park at the rear of the apartments. This barrier should be 2.4m high (minimum) and constructed from close-boarded timber with minimum surface density not less than 20 kg /m^2. The acoustic barriers are to be regularly maintained to prevent degradation of their acoustic performance.

Forklift Truck / Loading & Unloading Activities

Forklift truck vehicles are to be of electric type only and fitted with "broadband" reversing alarms. The site has been designed such that the nearby residents are screened from activities in the loading bays. The industrial units at the site have been designed to ensure that noise breakout from internal activities is limited to acceptable levels. High noise generating activities should be avoided or kept to a minimum. Where high noise generating activities are to be undertaken regularly it is likely that specific, additional acoustic insulation measures will be required to ensure that noise breakout remains at acceptable levels. *Given the consented use is light industrial, the likelihood of excessive noise levels within buildings is low. However, individual tenants would be required to submit a detailed operational noise assessment prior to occupation."* All access and roller-shutter doors should generally be kept closed to minimise noise breakout. Individual building structures are to be maintained such that their integrity is not compromised.

Industrial Units

Additional fixed plant (mechanical services such as Air Conditioning, Heating, Ventilation etc) would need to be assessed in accordance with

BS4142:2014+A1+:2019 and that an acceptable rated noise level at the façade of the nearest noise sensitive receptor should not exceed the prevailing background sound level (in line with Worthing Borough Council noise policy).

Complaints Procedure

Any noise complaints in respect of operational noise from the proposed commercial development should be directed to the named contact on-site. If no response is received within 10 working days, then the complaint can be escalated to the Environmental Health Department at Worthing Borough Council.

Where a substantiated complaint is identified (e.g. using diary sheets etc) an appropriate level of noise investigation and assessment in line with BS4142 shall be carried out, to include the measurement of noise levels and site activities, in order to identify compliance or otherwise with this ONMP. The assessment must be carried out by a Suitably Qualified Acoustician. Any appropriate corrective measures should be identified, implemented and reported to Worthing Borough Council

5. CONCLUSION

5.1 Worthing Borough Council, under their reference AWDM/0056/22, granted planning permission in February 2023 for the development at the *"Former Edf Car Park, Southdownview Road, Worthing, West Sussex"*. The planning consent was granted subject to conditions. Condition 18 requires that an Operational Noise Management Plan be submitted, and Condition 28

requires the detailed specification of the acoustic barriers also be submitted. The requirements of both conditions are contained in this report.

APPENDIX A: GRAPHS AND FIGURES



Figure A1: Noise measurement equipment at Broadwater Apartments

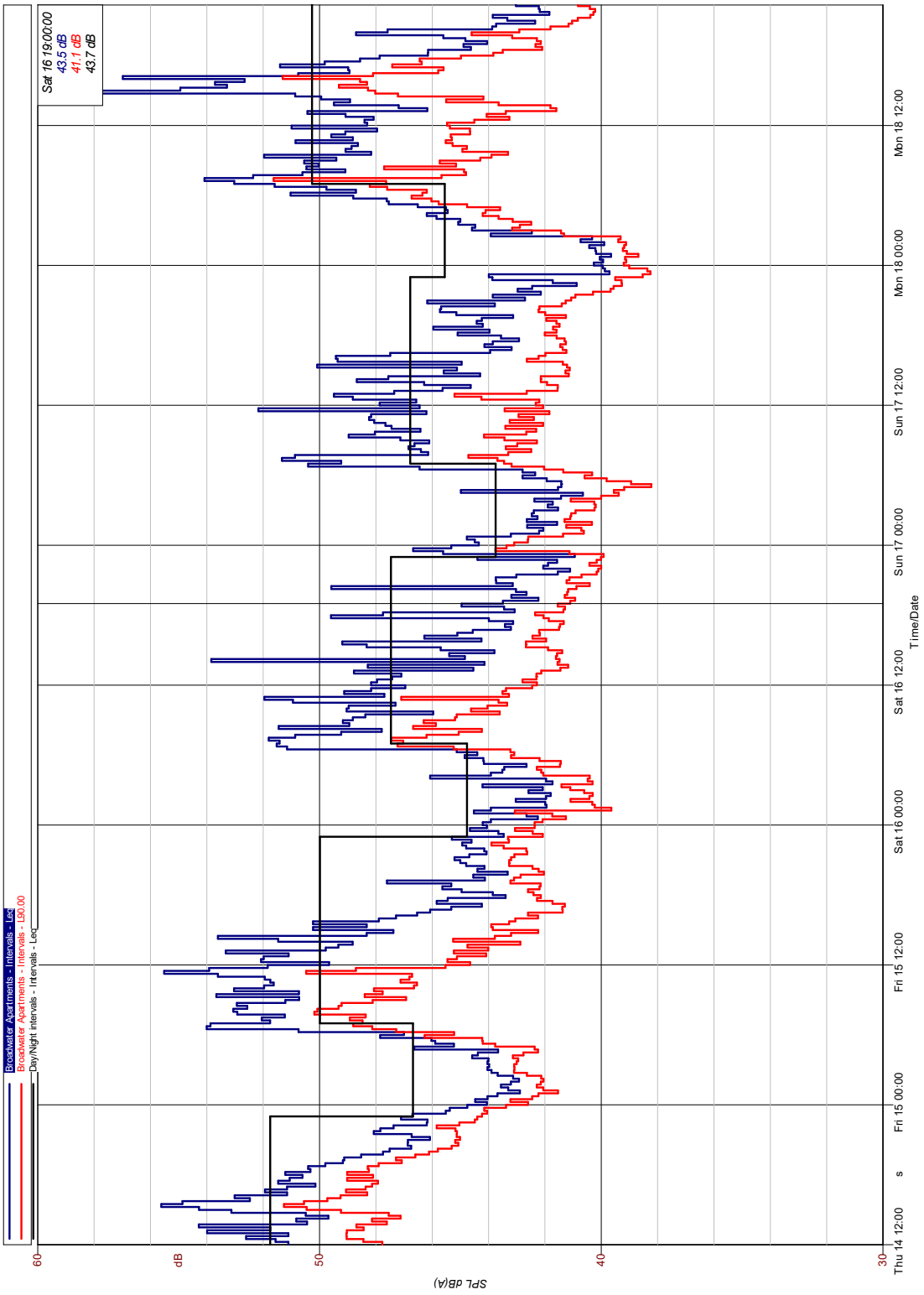
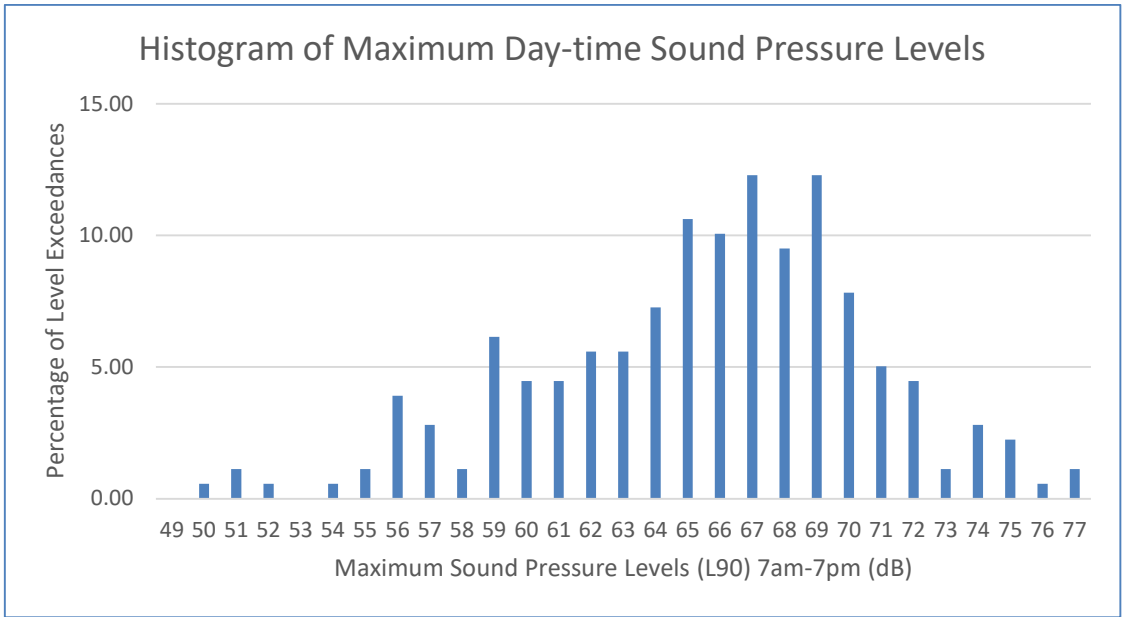


Figure A2: Environmental Noise Levels – Broadwater Apartments

Figure A3: Environmental Noise Level Histograms



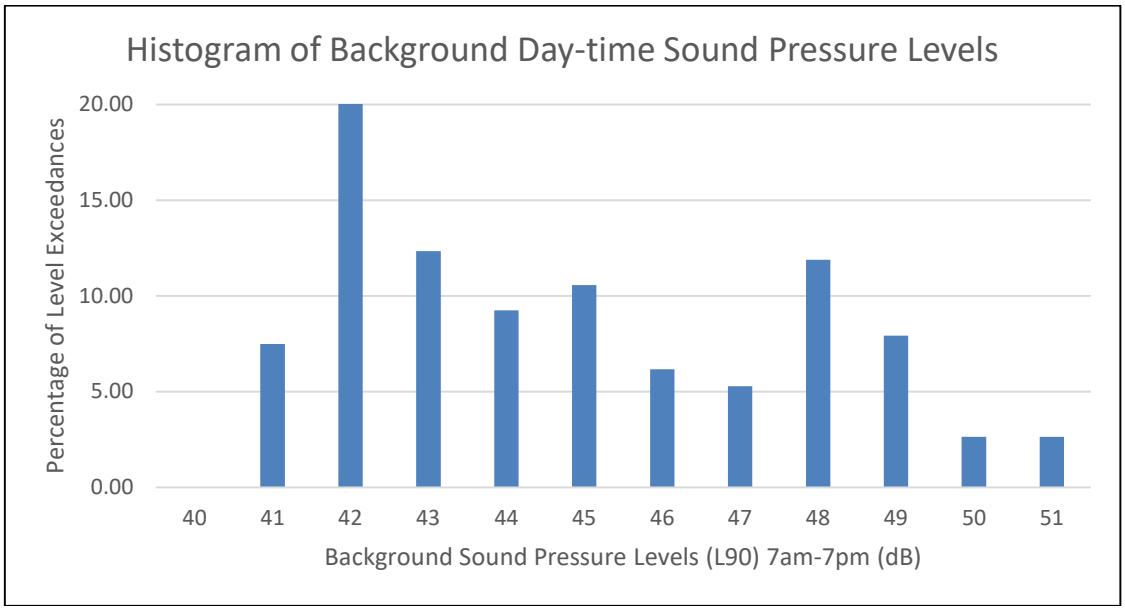


Figure A4: Consented Scheme Layout

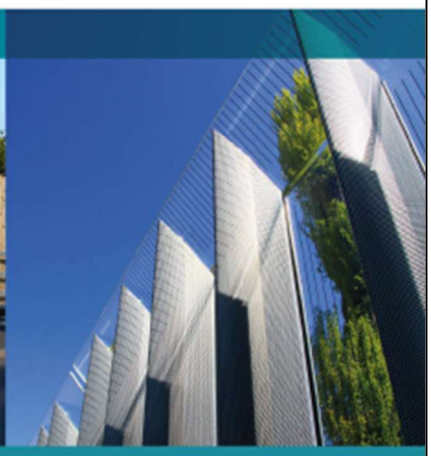


Figure A5: Transparent Acoustic Barrier Data Sheet

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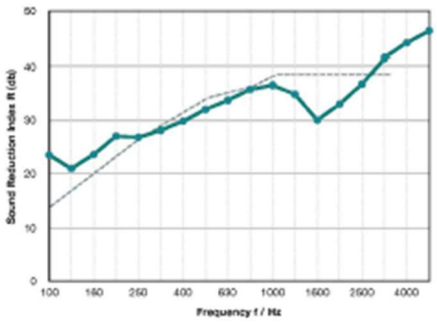




Technical Information

- Barrier Rating: A0, B3
- Absorption: 0 Dla
- Reflection: 32 DLr
- Height: From 0.3m - 10m (Bespoke Heights available on request)
- Lengths: 1m - 3.0m (Bespoke Lengths available on request)
- Material: PMMA
- Weight: 23.7kg/m2
- Finish: Clear or colored screens, Aluminium frame can be PPC to any RAL colour
- Design Life: 30 years





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Figure A6: Timber Acoustic Barrier Data Sheet

JSW 30 Issue 02

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- Unique tuning fork design posts
- Attractive timber structure with a planed finish throughout
- Anti climb design and scale design
- High privacy barrier
- Special fixings clamp the acoustic boards between posts
- Can accommodate changes in level or profile
- Complete with capping and counter rail
- Up to 28 dB reduction in noise*
- Category B3 rating
- 34mm thick "V" boards
- Matching pedestrian, swing and tracked sliding gates
- **25-year Jakcure® guarantee**

*Jakoustic® barrier certified laboratory results:

Rating according to BS EN 1793-2:1998
Category = B3
Laboratory sound reduction 28 dB
Superficial mass 25kg/m²

APPENDIX B: GLOSSARY OF NOISE TERMS AND UNITS.

1.0 Noise

1.1 The sounds that we hear are as a result of successive air pressure changes. These air pressure changes are generated by vibrating sources, such as train engines or wheels, and they travel to a receiver, i.e. the human ear, as air pressure waves.

1.2. The human ear is capable of detecting a vast range of air pressures, from the lowest sound intensity that the normal ear can detect (about 10^{-12} watts/m^2) to the highest that can be withstood without physical pain (about 10 watts/m^2). If we were to use a linear scale to represent this range of human sensitivity it would encompass more than a billion units. Clearly this would be an unmanageable scale yielding unwieldy numbers.

1.3. The scale can be compressed by converting it to a logarithmic or Bel scale, the number of Bels being the logarithm to the base 10 of one value to another (as applied by Alexander Graham Bell to measure the intensity of electric currents). The Bel scale gives a compressed range of 0 to 12 units which in practice is a little too compressed. A more practical operating range of 0 to 120 is obtained by multiplying by 10, ie. 10 x Bel, which produces the scale units known as decibels or dB.

1.4. Examples of typical sound intensity levels within the decibel range of 0 to 120 dB are listed below:

Commercial four-engine jet aircraft at 100m	120dB
Riveting of steel plate at 10m	105dB
Pneumatic drill at 10m	90dB
Circular wood saw at 10m	80dB

Heavy road traffic at 10m	75dB
Male speech, average, at 10m	50dB
Whisper at 10m	25dB
Threshold of hearing, 100Hz	0dB

1.5. Due to this logarithmic scale noise levels have to be combined logarithmically rather than arithmetically. For example, two equal sound sources of 70 dB each, when operated simultaneously, do not produce a combined level of 140 dB but instead result in a level of 73 dB, ie. A rise of 3dB for each doubling of sound intensity. Subjectively, a 3dB change does not represent a doubling or halving of loudness; to make a sound appear twice as loud requires an increase in sound pressure level of about 10dB.

1.6. The subjective loudness of noise can be measured by applying a filter or weighting which equates to the frequency response of the human ear. This is referred to as an A-weighting and when applied results in noise levels expressed as dB(A).

1.7. dB(A) noise levels can be measured using a variety of noise indices. The index which correlates best with human response due to machinery noise is the L_{Aeq} this is the A-weighted L_{eq} which is referred to as the 'equivalent continuous noise level' and is a measure of the total sound energy generated by a fluctuating sound signal within a given time period.