

Land North of Sefton Road & 80 Rose Green Road, Pagham

Condition 32 Noise Assessment

Report 16/0353/R2

Land North of Sefter Road & 80 Rose Green Road, Pagham

Condition 32 Noise Assessment

Report 16/0383/R2

Taylor Wimpey Southern Counties

Colverdene Court
Wessex Business Park
Wessex Way
Colden Common
Winchester
SO21 1WP

Revision	Description	Date	Prepared	Approved
0	1 st Issue	25 February 2020	Andy Emery	Tom Zarebski
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2	2 nd Revision	28 February 2022	Henry Stead	Andy Emery

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Glossary of Acoustic Terms

16/0383/R2/SP1

Site plan illustrating unattended noise measurement positions

16/0383/R2/SP2-2

Site plan showing noise assessment receiver positions

16/0383/TH01

Time history graph showing unattended measurement results

16/0383/SPC1

Acoustic barrier specification

16/0383/SPC2

External building fabric acoustic performance requirements specification



End of Section



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1 Introduction

- 1.1 Outline planning consent has been granted for development to provide up to 280 new dwellings. One of the planning conditions relates to noise as follows:

32 No occupation shall commence until a scheme for protecting the proposed dwellings from noise generated by the Osborne Refrigeration Site has been submitted to and approved in writing by the Local Planning Authority. This scheme shall include details and location of any acoustic wall and/or fencing designed to protect amenity spaces and also window specification and ventilation requirements in order to achieve a suitable acoustic environment in line with BS 8233:2014 and World Health Organisation guidelines 1999. Any works which form part of the scheme approved by the Authority shall be completed before any permitted dwelling is occupied, unless an alternative period is agreed in writing by the Authority.

Reason: In the interests of amenity in accordance with policy D DM1 and QE DM1 of the Arun Local Plan.

- 1.2 RSK Acoustics (formerly Cole Jarman) have been appointed to undertake assessment work in response to the above planning condition, based on the results of noise survey work undertaken at the site.

2 Site Description

- 2.1 The proposed site, currently under agricultural use, is located on the western outskirts of Bognor Regis, as shown on attached site plan 16/0383/R2/SP1. The site sits within the jurisdiction of Arun District Council.
- 2.2 The site is bounded to the east by existing residences on Lincoln Avenue, and to the south by existing residences on Rose Green Road and Osborne Way. Beyond the north and west site boundaries there are agricultural fields.
- 2.3 The site shares a portion of its southern boundary with an existing industrial premises at Racing Stables, which is occupied by an Osborne Refrigerators factory.
- 2.4 Noise sources affecting the site include the Osborne Refrigerators factory and distant road traffic.

3 Environmental Noise Survey

3.1 Methodology

- 3.1.1 A noise survey was undertaken at the site between 1600 hours on Wednesday 20th July and 1500 hours on Friday 22nd July 2016 inclusive.



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3.1.2 Unattended noise level measurements were taken from one position relevant to the Osborne Refrigerators Factory as illustrated in attached site plan 16/0383/R2/SP1 and described below:

- MP1 At the site boundary to the west of the existing Osborne Refrigerators factory, facing the service yard.

3.1.3 The microphones was at a height of 1.5m above local ground level. Measurements of the L_{Aeq} , L_{Amax} and L_{A90} indices were recorded over consecutive 15 minute periods for the duration of the survey using the equipment listed within table T1 (see attached Glossary of Acoustic Terms for an explanation of the noise units used).

Item	Manufacturer	Type
Sound Level Analyser	Rion	NL-52
Acoustic Calibrator	Rion	NC-74
Weatherproof windshield	Rion	WS-15

T1 Equipment used during unattended noise survey.

3.1.4 The microphone was fitted with a weatherproof enclosure, and the sound level meter was calibrated before and after the survey in order to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.

3.1.5 The weather conditions when setting up the noise monitoring equipment were hot and clear with a breeze. When collecting the equipment, the weather was clear, mild, dry and still.

3.1.6 A wind monitor was positioned adjacent to MP1 for the duration of the survey, the average wind speed did not exceed 5m/s at any point, the maximum wind speed only exceeded 5m/s briefly on a couple of occasions in the later afternoon and evening of 20th July.

3.2 Results

3.2.1 The results of the noise measurements are presented in the attached time history figure 16/0383/TH01.

3.2.2 The noise climate across the site was generally quiet, with the main ambient components consisting of wildlife and distant traffic noise emanating from Seftor Road. Private light aircraft were noted to be flying near the site intermittently during the survey period. Industrial noise from the Osborne factory site can be heard intermittently while in its general vicinity.

3.2.3 Due to the generally low noise levels, wind blowing through the crops within the application site fields was noted to have an effect on the measured noise levels. The wind speeds measured at MP1 are also presented on the time history graphs for information.

3.2.4 A summary of the measured noise levels is set out below:



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Period	MP1 $L_{Aeq,T}$, dB
Wednesday 20 th July 1600h – 2300h	48
Wednesday 20 th July 2300h - Thursday 21 st July 0700h	47
Thursday 21 st July 0700h – 2300h	50
Thursday 21 st July 2300h - Friday 22 nd July 0700h	45
Friday 22 nd July 0700h – 1500h	51

T2 Daytime and night time noise levels

- 3.2.5 The sound level meter used during the survey has an audio recording function, which was triggered when the instantaneous sound pressure level exceeded a given threshold. This made it possible to identify which of the elevated noise levels at MP1 were attributed to different activities on the Osborne Refrigerators site, and which are from other noise sources e.g. birdsong, light aircraft.
- 3.2.6 The main noise events of interest on the Osborne Refrigeration site were within the yard to the west of the factory building. In this area HGVs were noted to be loaded/unloaded, arriving and departing the site via the entrance at the southern end. Materials and goods were noted to be moved around externally, noise from some banging against the ground was measured. Approximately halfway along the western façade of the factory a bell rang occasionally, each time for 10 seconds. On the east side of the building two small items of air handling plant were noted, short term attended noise measurements were taken of each of these.
- 3.2.7 Noise levels from activities of interest are tabulated below. All measurements were made at position MP1, with the exception of the Fan and Cowl to the east side of the factory building which were measured over a short duration in their vicinities. The measured noise levels over a suitable duration are presented ($L_{Aeq,T}$), and well as maximum noise levels (L_{Amax}) and single event level (SEL) at both the measurement position and a normalised distance of 10m for use in subsequent assessment work. Assumptions made of distances between the measurement position and noise source, and source height are also tabulated.



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Activity	Duration (seconds)	Assumed distance (m)	Assumed source height (m)	Measured noise levels from Osborne Refrigeration site, dB			
				$L_{Aeq,T}$	$L_{Amax(f)}$	SEL @ MP1	SEL @ 10m
Bell	10	50	4.4	73	77	83	97
Banging	48	20	1.0	53	73	70	76
Delivery	331	20	1.5	61	84	86	92
Delivery	706	20	1.5	58	82	86	92
Large Bangs	4	20	1.0	69	80	76	82
HGV Manoeuvre	81	20	1.5	54	62	73	79
Fan	-	10	4.5	50	51	-	-
Cowl	-	13	5.5	53	54	-	-

T3 Summary of measured industrial activity noise levels

4 Industrial Noise Assessment

4.1 Criteria

4.1.1 The following noise criteria were defined within the noise assessment report submitted with the outline planning application, taking into account the results of the site noise survey. The criteria are primarily based on guidance in BS8233, but as the only significant noise source at the site is industrial in nature, the targets are defined in terms of BS4142 rating levels, taking account of character corrections as appropriate.

- ✧ Daytime rating noise level in private external amenity area 50dB $L_{A,T}(T = 1 \text{ hour})$
- ✧ Daytime rating noise level inside living rooms 35dB $L_{A,T}(T = 1 \text{ hour})$
- ✧ Night time rating noise level inside bedrooms 30dB $L_{A,T}(T = 15 \text{ minutes})$



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4.2 Assessment Methodology

Existing Factory Use

- 4.2.1 Noise propagation from the existing use of the Osborne Refrigerators site has been assessed through the proposed application site housing layout.
- 4.2.2 The most recent planning application for the factory site (ref: P/1/12) was for an extension. The hours of operation indicated within the planning documents are between 0700 and 1900 hours on weekdays, and between 0700 and 1200 hours on Saturdays.
- 4.2.3 The planning consent (ref: P/118/07) for the change of use of the site to permit B2 general industrial includes a condition which states:
- “No vehicles shall enter or leave the premise between the hours of 2100 and 0700 the following day except for the company lorry making a nationwide or Euro-wide delivery.”*
- 4.2.4 While no noise from a vehicle leaving or arriving the site was measured during the night within the survey period, it has been included within the night time assessment to ensure a worst case.
- 4.2.5 During the noise survey, HGV movements and loading/unloading within the external yard was generally observed to be to the west of the factory building, near the northern end. However, for the purposes of the assessment the HGV and loading activity is assumed to take place anywhere on the yard to ensure a robust assessment methodology.
- 4.2.6 The factory noise is intermittent; therefore reasonable worst case assumptions must be made regarding activity in the assessment periods. The assumptions regarding the number of noise events utilised within the assessment are set out below. It should be noted these represent levels of activity on the site in excess of those measured during the survey, to ensure a robust assessment. These assumptions are as per those in the noise assessment report submitted with the outline planning application. BS4142 character corrections applied to each noise source are also indicated in the table.



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Noise Source	No. of occurrences / on time	BS 4142 character corrections		
		Tonality	Impulsivity	Intermittency
Daytime (1 hour assessment period)				
Bell	3 x 10 seconds	6		3
Banging	10 x 48 seconds		4	3
Delivery	2 x 331 seconds		6	3
Delivery	2 x 706 seconds		6	3
Large Bangs	4 x 4 seconds		6	3
HGV Manoeuvre	5 x 81 seconds			3
Fan	15 minutes			
Cowl	15 minutes			
Night time (15 minute assessment period)				
Bell	1 x 10 seconds	6		3
Delivery	1 x 706 seconds		6	3

T4 Noise assessment Osborne Refrigerators activity assumptions

Potential night time factory use

- 4.2.7 During the outline planning application determination period, Environmental Health at Arun District Council queried what the noise impact would be should another tenant move into the existing factory building and operate through the night time period, for example metal fabrication.
- 4.2.8 We have calculated noise levels at the new housing due to metal fabrication activity inside the existing building. It should be noted this assessment work is a hypothetical exercise only.
- 4.2.9 We have used data from our internal noise activity database as measured inside a metal workshop included periods of metal sawing, sanding, cutting and grinding. The data is set out in the table below:

	Sound Pressure Level (dB)							
	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Metal workshop noise $L_{Aeq,T}$	67.6	69.0	69.5	72.5	73.0	71.8	68.8	60.8

T5 Noise data utilised in assessment



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- 4.2.10 Within the assessment character corrections have been added to the $L_{Aeq,T}$ noise data above in order to give a $L_{Ar,Tr}$ rating level for comparison with the criteria. The corrections applied are 2dB to account for tonality and 6dB to account for impulsivity.
- 4.2.11 The existing factory building walls and roof are formed of profile metal cladding, the exact construction of which is not known. We have therefore made a pessimistic assumption over the sound reduction performance, based on data for a single layer of 0.45mm thick (26 gauge) profile steel with no insulation as set out below:

	Sound Reduction Index @							
	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
0.45mm thick (26 gauge) profile steel sheet	15	15	15	18	22	27	32	32

T6 Assumed sound reduction performance of existing factory building

- 4.2.12 Within the assessment area noise sources have been defined to represent the entire wall and roof areas of the factory building.

4.3 Mitigation

- 4.3.1 Noise mitigation measures have been specified as necessary for the agreed noise criteria to be achievable.
- 4.3.2 For control of noise to external amenity areas, acoustic barriers are proposed. The locations they are required as well as the relevant heights are indicated on attached figure 16/0383/R2/SP2-2. Barriers should meet the requirements of attached specification 16/0383/SPC1.
- 4.3.3 For control of noise to internal areas, acoustically enhanced glazing and ventilation openings are proposed. The locations they are required are indicated on attached figure 16/0383/R2/SP2-2. The glazing and ventilation should meet the acoustic performance requirements set out in attached specification 16/0383/SPC2.



Condition 32 Noise Assessment

5 Conclusions

- 5.1 Outline planning consent has been granted for development to provide up to 280 new dwellings. One of the planning conditions relates to noise as follows:

32 No occupation shall commence until a scheme for protecting the proposed dwellings from noise generated by the Osborne Refrigeration Site has been submitted to and approved in writing by the Local Planning Authority. This scheme shall include details and location of any acoustic wall and/or fencing designed to protect amenity spaces and also window specification and ventilation requirements in order to achieve a suitable acoustic environment in line with BS 8233:2014 and World Health Organisation guidelines 1999. Any works which form part of the scheme approved by the Authority shall be completed before any permitted dwelling is occupied, unless an alternative period is agreed in writing by the Authority.

Reason: In the interests of amenity in accordance with policy D DM1 and QE DM1 of the Arun Local Plan.

- 5.2 Assessment work has been undertaken in response to the above planning condition. The assessment is based on the results of noise survey work undertaken at the site and has been undertaken against acoustic criteria defined within the noise assessment report submitted with the outline planning application.
- 5.3 A scheme of noise control measures has been developed as necessary to enable the noise criteria to be achievable. The scheme includes acoustic barriers to protect external amenity areas, and acoustically enhanced glazing and ventilation systems where necessary. Detailed requirements for the mitigation are presented.

 End of Section



Condition 32 Noise Assessment

Glossary of Acoustic Terms

L_{Aeq} :

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq} .

L_{Amax} :

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the “fast” sound level meter response.

L_{A10} & L_{A90} :

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly, L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n .

L_{AX} , L_{AE} or SEL:

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

■ End of Section



Title: Site plan illustrating unattended noise measurement position

Figure 16/0383/R2/SP1

Project: Land North of Sefter Road, Pagham, Bognor Regis

Date: 28 February 2022

Revision: 2

Scale: Not to scale

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e info@colejaman.com w www.colejaman.com

Figure 16/0383/R2/SP2

Title:

Proposed site layout indicating acoustic requirements

Key

-  Acoustic screen
-  Facades where acoustically rated glazing and ventilation openings are required
-  Properties where mechanical ventilation is required

N.B To be read in conjunction with acoustic performance specifications 16/0383/SPC1 and 16/0383/SPC2

Project:

Sefter Road, Bognor Regis

Date:

February 2022

Revision:

2

Scale:

Not to scale

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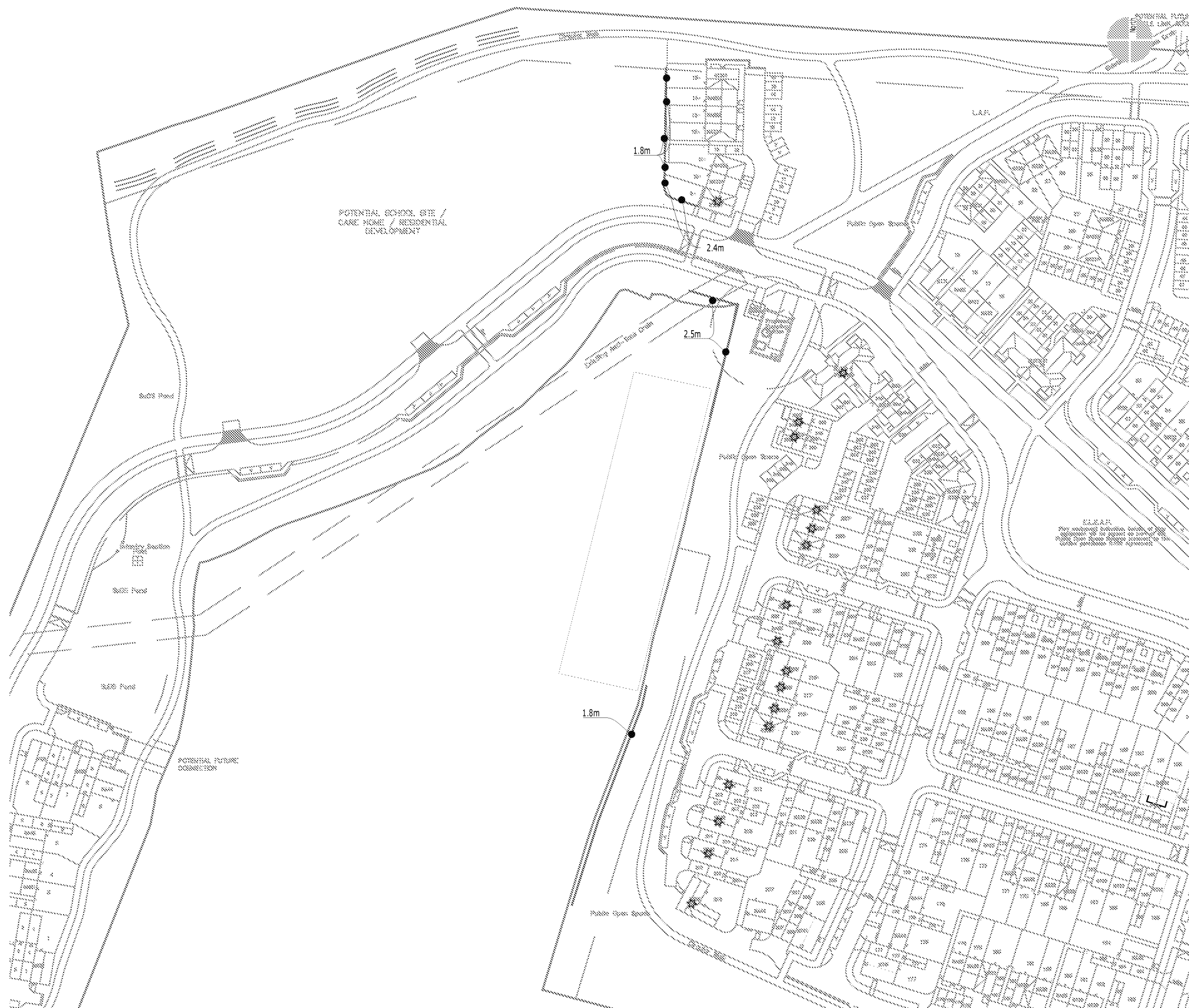
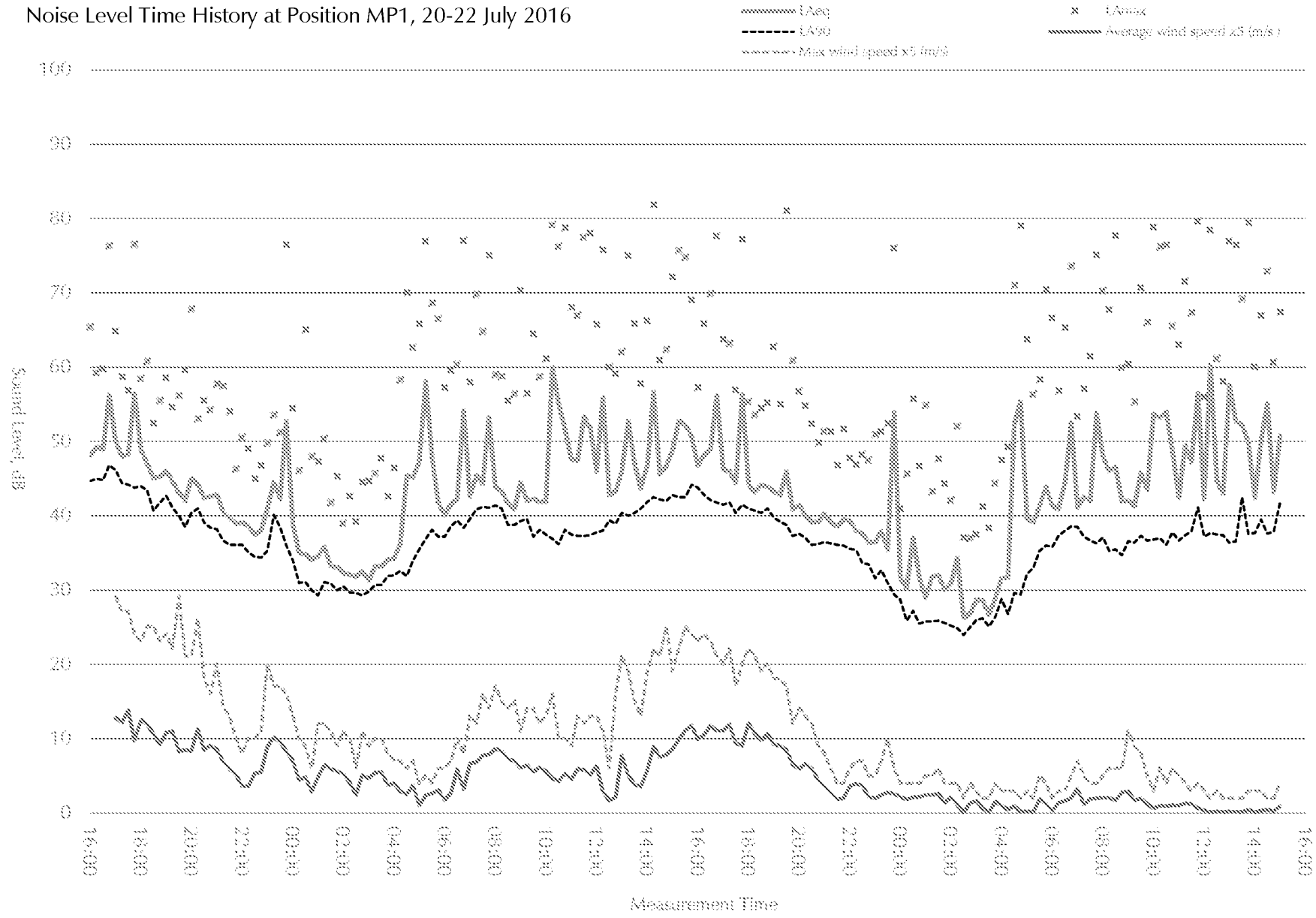




Figure 16/0383/TH01



Specification 16/0383/SPC1

Project: Land North of Sefter Road & 80 Rose Green Road, Pagham
Subject: Acoustic Barrier
Date: 28 February 2022

1 General

- 1.1 This specification defines the applicable requirements for acoustic barriers. The suppliers of the materials shall provide the necessary information and data to verify the required performance.
- 1.2 The supplier shall be responsible for ensuring that all the performance criteria set out herein are met by the product being offered.

2 Barrier Specification

- 2.1 Barrier heights shall be as shown on figure 16/0383/R2/SP2. It is important to note that the barrier height is specified relative to the height of the nearest point on the adjacent service yard or garden area.
- 2.2 Barrier alignments shall be within $\pm 1.0\text{m}$ of that as shown on figure 16/0383/R2/SP2.
- 2.3 Minimum extents of the barrier shall be as shown on attached figure 16/0383/R2/SP2.
- 2.4 Barriers shall achieve a minimum of 10 kg/m^2 uniform mass per unit area over the full area of the barrier and for the duration of its design life.
- 2.5 Barriers shall be of imperforate construction over their full areas and remain so for the design life of the barrier. It is essential, especially for barriers with butting or overlapping components, that the joints are well sealed to prevent leakage. This should be achieved without compromising the overall density requirement. Gravel boards of equivalent density are to be used to prevent gaps between screen structure and ground if necessary.
- 2.6 The barrier structure is to be suitably designed and engineered with appropriate consideration for wind loading and aerodynamic forces.
- 2.7 No major maintenance should be required for the barriers for 20 years and each barrier should remain serviceable for at least 40 years.



3 Acoustic Barrier Suppliers

3.1 Jacksons Fencing

✧ Address

Stowting Common
Ashford
Kent
TN25 6BN



3.2 Newton and Frost Fencing Ltd

✧ Address

Downsview Yard
North Corner
Horam
East Sussex
TN21 0UH



3.3 Gramm Barrier Systems Ltd

✧ Address

Venture Wales Offices
Merthyr Tydfil Industrial Park
Pentrebach
Merthyr Tydfil
CF48 4DR



Specification 16/0383/SPC2

Subject:	External Façade Element Sound Reduction Performance Requirements		
Project:	Land North of Sefton Road & 80 Rose Green Road, Pagham		
Date:	28 February 2022	Prepared:	HS
Revision:	1	Approved:	AE

This specification covers the acoustic performance requirements for the different elements of the external building fabric, in order to control external noise intrusion to the residential properties and meet the specific internal noise criteria. The specific elements of the external building fabric covered by this specification are as follows:

1. Glazing
2. Ventilation

The locations where each of the requirements apply are identified on figure 16/0383/R2/SP2.

1 Glazing

The table T1 on page 2 of this specification sets out the sound reduction performance requirements for the glazed façade elements on the building.

The indicative R_w values and indicative glazing configurations quoted in the table on page 2 overleaf are for guidance only; alternative configurations may be utilised.

The octave band sound reduction performances quoted in the table on page 2 overleaf must be achieved by the glazing system taken as a whole in its installed condition. The specification therefore applies to the glazing, the frames and all seals on any openable parts of the systems and any required ventilation or condensation control mechanisms. This list is not exhaustive: no part of the glazing system shall cause the above figures not to be achieved.

The supplier should be expected to prove by means of certified test results that the above sound reduction figures can be achieved by the system being proposed. The tests shall be conducted in accordance with BS EN ISO 10140 2010 Parts 1 to 5 or BS EN ISO 140 Part 5 1998.



External Façade Element Sound Reduction Performance Requirements

Location	Glazing Sound Reduction Index (SRI dB) @ Octave Band Centre Frequency (Hz)						Indicative R_w ($R_w + C_{tr}$)
	125	250	500	1k	2k	4k	
Façades where acoustically rated glazing is required (refer to figure 16/0383/R2/SP2)							
Indicative glazing type: 6mm glass / 12-24mm airspace / 6mm glass	20	21	30	35	32	37	32 (28)
All other façades							
Indicative glazing type: 4mm glass / 12-24mm airspace / 4mm glass	20	18	26	33	33	37	30 (28)

T1 Glazing sound reduction performance requirements

2 Ventilation

The table T2 on page 3 of this specification sets out the octave band and single figure sound reduction performance requirements for any passive ventilators forming part of ventilation systems. Specific details of the ventilation requirements are as follows:

Properties where mechanical ventilation is required (refer to figure 16/0383/R2/SP2)

A partial or full mechanical ventilation system will be required to remove the need to rely upon openable windows to provide background ventilation in these locations. The systems supplied should utilise continuously operating fans - with a user operated setting, where possible, to allow an increased ventilation rate when desired. It is anticipated systems complying with the requirements of System 3 or System 4 as defined within Building Regulations Approved Document F 2010 would be suitable.

All other properties

It is anticipated systems complying with the requirements of System 1, System 3 or System 4 as defined within Building Regulations Approved Document F 2010 would be suitable in these locations.



External Façade Element Sound Reduction Performance Requirements

Mechanical Ventilation Noise

All mechanical ventilation systems should be designed to achieve noise levels inside of no more than NR25 in bedrooms and NR30 in all other habitable rooms under background ventilation mode, with a 5dB relaxation at any temporary boost increased ventilation rate under the occupiers control.

Trickle Vents

Where ventilation systems incorporate passive air intakes (trickle vents) in the façades, the vents should have an installed element-normalized level difference ($D_{n,e}$) when tested in accordance with BS EN 10140 2010 Parts 1 to 5 of not less than that indicated in the following table:

Location	Trickle Vent Installed Element Normalized Level Difference (dB $D_{n,e}$) @ Octave Band Centre Frequency (Hz)						Indicative $D_{n,e,w}$
	125	250	500	1k	2k	4k	
Façades where acoustically rated ventilation openings are required (refer to figure 16/0383/R2/SP2) <i>Indicative vent type:</i> <i>Rytons TAL9H&M</i>	36	29	31	39	44	45	38
All other façades <i>Indicative vent type:</i> <i>Unattended trickle vent</i>							30

T2 Ventilator sound reduction performance requirements

Typical vents which would achieve the performance requirements are also identified within table T2.

The indicative $D_{n,e,w}$ values and indicative vent types quoted above are for guidance only, alternatives may be utilised provided the **octave band** sound reduction performance quoted are achieved.

 End of Section

