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GLADMAN DEVELOPMENTS LTD (GLADMAN)

LAND OFF ST MARY'S ROAD, HAYLING ISLAND

NOISE ASSESSMENT REPORT

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LAND OFF ST MARY'S ROAD, HAYLING ISLAND

NOISE ASSESSMENT REPORT

DECEMBER 2021

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- Appendix A Legislation, Policy and Guidance
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DRAWINGS

LE13606 – Noise Monitoring Locations Plan

1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP was commissioned by Gladman Developments Ltd to undertake a noise assessment to accompany an outline planning application. The application is for a proposed residential development on land off St Mary's Road, Hayling Island. An application, which included a noise assessment, for residential development on this site was submitted in 2017, but it was subsequently withdrawn. This report is an update of the noise assessment which was submitted as part of the 2017 application. The proposed location for the site is shown on the location plan submitted to support this document.
- 1.1.2 The proposed development site is located to the west of St Mary's Road, Hayling Island; grid reference SZ719998; and currently comprises open land. To the north of the site lies open land beyond which lies Hayling Island Holiday Park. Adjacent to the north-east corner lies an electrical substation and Smith & Austin Engineering Products Ltd beyond which lies Church Road. To the east and south of the site lies housing, beyond which lies St Mary's Road. To the west of the site lies further open land.
- 1.1.3 The report comprises an assessment of potential noise impacts upon the proposed residential dwellings including noise from St Mary's Road, the electrical substation, Smith and Austin Engineering Products Ltd and Hayling Island Holiday Park. The report assesses the results of a noise survey carried out in accordance with current guidance and includes recommendations for noise mitigation as appropriate.

2 ASSESSMENT METHODOLOGY

2.1 Consultation and Scope of Works

2.1.1 Wardell Armstrong LLP was commissioned to undertake a noise assessment to accompany an outline planning application for a proposed residential development on land off St Mary's Road, Hayling Island.

2.1.2 Details of the proposed methodology adopted for this assessment were sent to the Environmental Health Department of Havant Borough Council on the 24th May 2021. No response has been received at the time of writing this report. The proposed methodology is considered suitable and robust and as no objection has been provided by the Council, it is assumed to be acceptable.

2.1.3 In 2016 a noise survey was undertaken at the site to determine noise levels associated with the surrounding noise sources. The survey included monitoring of the following noise sources.

- Noise from St Mary's Road and the surrounding local road network;
- Noise from the electrical substation adjacent to the north-eastern boundary of the development site;
- Noise from Smith and Austin Engineering Products adjacent to the north-eastern corner of the site;
- Noise from Hayling Island Holiday Park located to the north of the site.

The proposed methodology states that, although the data is now nearly 5 years old, it is considered unlikely that traffic on St Marys Road would have altered significantly in that time. Traffic data for the area has been assessed to confirm this.

2.1.4 Traffic data isn't available for St Marys Road, however, the data in Figure 1 below has been extracted from www.roadtraffic.dft.gov.uk website for the A3023. The A3023 is a different main road in Hayling Island which is of a similar size to St Marys Road and approximately 740m from it.

Figure 1 – Road Traffic Statistics Traffic Count

Annual Average daily flow

Year	Count method	Pedal cycles	Two wheeled motor vehicles	Cars and taxis	Buses and coaches	Light goods vehicles	Heavy goods vehicles	All motor vehicles
2020	Estimated using previous year's AADF on this link	59	23	3569	26	720	92	4431
2019	Estimated using previous year's AADF on this link	52	31	4698	42	816	105	5692
2018	Estimated using previous year's AADF on this link	47	33	4640	41	824	105	5643
2017	Estimated using previous year's AADF on this link	43	34	4692	46	808	105	5684
2016	Manual count	45	33	4726	49	768	104	5680

2.1.5 Data from 2020 is not suitable for assessment purposes due to reduced traffic during COVID lockdown restriction. The data shows that there was less than a 1% increase in road traffic between 2016 and 2019. A traffic increase of less than 1% would have a negligible and imperceptible impact on the associated noise levels. It is therefore considered that no adjustments need to be made to the 2016 noise survey data for use within this assessment. Details of the noise survey are provided within Section 3 of this report.

2.1.6 Additionally, due to the relatively small nature of the businesses assessed and types of associated noise, it is considered that noise from these sources will not have changed either.

2.1.7 Any noise from the electrical substation would also remain constant.

2.2 Assessment Methodology

2.3.1 Potential noise issues that are addressed as part of this assessment are as follows:

- Noise from St Mary's Road and the surrounding local road network;
- Noise from the electrical substation adjacent to the north-eastern boundary of the development site;
- Noise from Smith and Austin Engineering Products adjacent to the north-eastern corner of the site;
- Noise from Hayling Island Holiday Park located to the north of the site.

2.3.2 This noise assessment considers the suitability of the site for the proposed uses, and takes into account current guidance including:

- National Planning Policy Framework, 2021; (NPPF);
- Planning Practice Guidance (Noise), 2019;
- Noise Policy Statement for England 2010; (NPSE);
- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233);
- British Standard 4142: 2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142).
- Department of Transport's Memorandum: Calculation of Road Traffic Noise, 1988 (CRTN).

2.3.3 Further details of Legislation, Policy and Guidance documents is found in Appendix A.

3 NOISE SURVEY

- 3.1.1 On 13th and 14th September 2016 Wardell Armstrong LLP carried out a noise survey to assess the ambient noise levels across the development site.
- 3.1.2 Attended noise measurements were taken at five monitoring locations, which are considered to be representative of proposed residential receptors. The monitoring locations are as follows, and are shown on Drawing Number LE13606-001:
- Monitoring Location 1: Adjacent to north-western corner of site boundary nearest to Hayling Island Holiday Park;
 - Monitoring Location 2: Adjacent to southern site boundary closest to St Mary's Road;
 - Monitoring Location 3: Adjacent to the north-eastern site boundary, adjacent to electrical substation and Smith and Austin Engineering Products Ltd;
 - Monitoring Location 4: Adjacent to western site boundary, distant from main noise sources;
 - Monitoring Location 5: Adjacent to eastern site boundary approximately 10m from St Mary's Road.
- 3.1.3 Attended noise monitoring was carried out at location 1 between 0737hrs and 0953hrs on 14th September 2016. Monitoring was carried out at location 1 to capture any potential noise from Hayling Island Holiday Park.
- 3.1.4 Monitoring was undertaken at location 2 between 0514 and 0917 on 14th September 2016 to capture any fluctuations in road noise, including busy periods during the busiest parts of the night and the daytime, within the development site.
- 3.1.5 Monitoring was undertaken at location 3 between 0451 and 0620, and between 1000 and 1200 on 14th September 2016 to capture noise associated with the electrical substation and Smith and Austin Engineering Products Ltd adjacent to the site. Two reference measurements were also taken at Location 3 in order to identify the specific noise from the electrical substation and the external plant at Smith and Austin Products Engineering Ltd.
- 3.1.6 At location 4 monitoring was undertaken from 1422 until 1522, and 2200 until 0000 on 13th September 2016 to capture the background noise during the quieter part of the day, away from the main noise sources at the development site.

- 3.1.7 At location 5 monitoring was undertaken from 0814 until 0845 and from 1202 until 1502 in order to capture any fluctuations in road traffic noise, including busy periods during the night-time and daytime, within the development site where the site entrance is likely to be and to allow the shortened CRTN procedure to be used.
- 3.1.8 The noise measurements were made using a Type 1, integrating sound level meter. The sound level meter was mounted vertically on a tripod 1.5m above the ground and more than 3.5 metres from any other reflecting surfaces.
- 3.1.9 All noise monitoring took place during dry and calm weather conditions. The sound level meter was calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in calibration was noted during the survey.
- 3.1.10 For the purpose of this assessment daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours.
- 3.1.11 A-weighted¹ L_{eq}^2 , L_{90}^3 and maximum noise levels were measured to comply with the requirements of BS8233 and BS4142. A-weighted and L_{10}^4 noise levels, together with the minimum sound pressure levels, were also measured to provide additional information. The measured noise levels are set out in full in Appendix B.
- 3.1.12 Attended noise monitoring allows observations and detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following:

Road Traffic Noise: Noise from road traffic on St Mary's Road and the surrounding road network was audible throughout the site.

Electrical substation: Noise from the electrical substation located close to the north-eastern corner of the site was audible throughout the monitoring at location 3.

Smith & Austin Engineering Products Ltd: Noise from the external plant at Smith and Austin Engineering Products which is located close to the north-eastern corner of the

¹ A' Weighting	An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions
² L_{eqs}	Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.
³ L_{90}	The noise level which is exceeded for 90% of the measurement period.
⁴ L_{10}	The noise level which is exceeded for 10% of the measurement period.

site was audible during the daytime monitoring at location 3. The plant is located on the rear of the premises approximately 2m off the ground.

Birdsong: Birdsong was audible during the daytime and night-time periods.

Other: Occasional aircraft noise was audible throughout the site. Some construction noise was also audible to the west of the site during the monitoring. No noise was audible from Hayling Island Holiday Park.

4 NOISE IMPACT ASSESSMENT

4.1 Existing Noise Levels

4.1.1 The measured noise levels for the monitoring locations have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours) categories. The individual levels have been arithmetically averaged and then rounded to give a single daytime and night-time level for each monitoring location.

4.1.2 In accordance with the shortened CRTN measurement procedures specified in CRTN, the measured daytime noise level at monitoring location 5 in the immediate vicinity of St Mary's Road, has been adjusted to predict the daytime level of road traffic noise at this location.

4.1.3 The results for the monitoring locations are presented in Table 1.

Table 1: Average Daytime and Night-time Noise Levels (Figures in dB)				
Time	Monitoring Location	Average Measured Noise Level L _{Aeq}		Lowest Measured Background Noise L _{A90}
0700-2300	1	46.0		39.9
2300-0700		-		-
0700-2300	2	46.7		39.0
2300-0700		41.6		31.1
0700-2300	3	48.0		42.8
2300-0700		45.2		36.7
0700-2300	4	44.1		35.2
2300-0700		40.6		35.3
0700-2300	5	CRTN	Measured	42.7
		50.1	52.8	
2300-0700		-		-

4.1.4 Based on the results obtained, a robust assessment can be made of the noise levels at the site and of the mitigation measures necessary to achieve the required internal daytime and night-time noise levels, and external daytime noise levels at the development.

- 4.1.5 The maximum noise levels at the measurement locations, measured during the night-time period of the survey, are shown in Table 2.

Table 2: Summary of the Maximum Night-time Noise Levels (Figures in dB L _{Amax})	
Monitoring Location	Maximum Measured Noise Level
2	59.7
3	69.4
4	63.4

4.2 Consideration of Noise and Overheating

- 4.2.1 The potential for overheating within dwellings has been assessed in accordance with the Acoustics Ventilation & Overheating: Residential Design Guide (AVO).
- 4.2.2 The stage 1 assessment has shown that the risk of overheating throughout the site will be low or negligible during the daytime and night-time. Therefore, no further assessment of the risk of overheating is required and no mitigation is proposed.

4.3 BS8233 Assessment of Daytime Noise Levels in Outdoor Living Areas

- 4.3.1 Table 1 shows that during the daytime, noise levels affecting the development site would be between 44.1dB and 52.8dB L_{Aeq}. The BS8233 guidance level of 55dB L_{Aeq} will not be exceeded in outdoor living areas anywhere on the site, including the part of the site closest to St Mary's Road.

4.4 BS8233 Assessment of Daytime Noise Levels in Living Rooms

- 4.4.1 The measured daytime noise levels, as detailed in Table 1, have been used to determine the noise levels likely at the façades of properties in the vicinity of the monitoring locations during the daytime period.
- 4.4.2 Before internal noise levels can be calculated 3dB(A) must be added to the freefield measured levels to allow for the reflection of noise from the proposed housing façades when the buildings are in place.
- 4.4.3 The calculated noise levels at the facades of the properties, together with the level of attenuation required to achieve 35dB L_{Aeq} in the living room areas, are summarised in Table 3.

Table 3: Facade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Daytime Noise Guideline Level (Figures in dB(A))		
Residential Properties	Noise Level at the Façade of the Property	Level of Attenuation Needed to Achieve Noise Guideline Level in Living Room Areas
Proposed dwellings in the northern part of the site, nearest to Hayling Island Holiday Park (monitoring location 1)	49.0	14.0
Proposed dwellings in the eastern and southern part of the site, nearest to St Mary's Road (monitoring location 2)	49.7	14.7
Proposed dwellings in the north-eastern part of the site, nearest to the electrical substation & Smith and Austin Engineering products (monitoring location 3)	51.0	16.0

4.5 The facades of the buildings further into the site will be protected by the buildings themselves and/or screened by other buildings. It is considered that the noise levels at these facades, and therefore the level of attenuation the facades would need to provide will be less than those detailed in Table 3.

4.6 Assessment of Night-time Noise Levels in Bedrooms

4.6.1 The measured night-time noise levels, as detailed in Tables 1 and 2, have been used to determine the noise levels likely at the façades of properties in the vicinity of the monitoring locations, during the night-time period.

4.6.2 To be robust, the noise levels at these facades are based on the highest maximum noise levels measured during the night-time survey. Before internal noise levels can be calculated 3dB(A) must be added to the free field measured levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

4.6.3 The calculated noise levels at the façades of properties, together with the level of attenuation required to achieve 30dB L_{Aeq} and 45dB $L_{Af,max}$ in the bedrooms, are summarised in Table 4.

Table 4: Facade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Night-time Noise Guideline Levels (Figures in dB(A))			
Residential Properties	Noise Level at the Façade of the Property (L_{Aeq})	Maximum Noise Level at the Façade of the Property (L_{Amax})	Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms
Proposed dwellings in the eastern and southern part of the site, nearest to St Mary's Road (monitoring location 2)	44.6	62.7	17.7
Proposed dwellings in the north eastern part of the site, nearest to the electrical substation & Smith and Austin Engineering products (monitoring location 3)	48.2	72.4	27.4

4.6.4 The facades of the buildings further into the site will be protected by the buildings themselves and/or screened by other buildings. It is considered that the noise levels at these facades, and therefore the level of attenuation the facades would need to provide will be less than those detailed in Table 4.

4.7 BS4142 Assessment of Electrical Substation and Smith & Austin Engineering Products Ltd

4.7.1 Observations made during the noise survey indicate that noise from the electrical substation and the external plant at Smith & Austin Engineering Products Ltd may affect proposed residential dwellings in the north-eastern parts of the site closest to them.

Electrical Substation

4.7.2 The substation appeared to be active throughout the day and night. It was audible at the site boundary throughout the monitoring during the day and night. The sound level produced by the substation was constant.

4.7.3 BS4142 includes a section on identifying acoustic features which can increase the significance of impact over that expected from the basic comparison of the specific sound level and the background sound level. No acoustic features were identified for the substation and therefore no penalties have been added to the specific sound level.

4.7.4 The following measured noise from the substation has been used for the specific noise level in the BS4142 assessment. Due to the constant nature of the noise produced by

the substation, the lowest level recorded at location 3 has been used to best represent the noise produced solely by the substation.

- 4.7.5 Monitoring Location 3: The measured noise level over the period 0457 to 0458 hours (14/09/2016) is considered to be representative of the noise from the substation. For the purpose of the assessment the daytime and night-time noise level (L_{Aeq}), of 36.8dB, has been used and is shown in Table 5.
- 4.7.6 The noise levels measured during the following periods are considered to be representative of the background noise level in the western part of the site, (i.e. in the absence of any noise from the substation):
- 4.7.7 Daytime Period: Over the period 2200 to 2300 hours (13/09/2016) at Monitoring Location 4. For the purpose of the assessment the daytime background noise level (L_{A90}), of 35.2dB, has been used. This is considered representative of the daytime background noise level at location 3 without noise from the substation.
- 4.7.8 Night-time period: Over the period 2345 to 0000 hours (13/09/2016) at Monitoring Location 4. For the purpose of the assessment the night-time background noise level (L_{A90}), of 35.3dB, has been used. This is considered to be representative of the night-time background noise level at location 3 without noise from the substation.
- 4.7.9 In accordance with BS4142 the specific noise level in the vicinity of the proposed dwellings within the site has been compared with the corresponding measured background noise level, as shown in Table 5.

Table 5: BS4142 Assessment of the Electrical Substation at Proposed Dwellings in the north-eastern Part of the Site– (Figures in dB(A))		
	Daytime	Night-time
Specific Noise i.e. noise level of the operational activities (including distance correction)	36.8	36.8
Acoustic Feature Correction	0	0
Rating Level	36.8	36.8
Background Noise Level	35.2	35.3
Excess of rating over background level	+1.6	+1.5

4.7.10 The result of the BS4142 assessment in Table 5 suggests that with no mitigation in place, an adverse impact due to noise from the substation station is unlikely.

4.7.11 No mitigation has therefore been recommended to attenuate noise from the electrical substation.

Smith & Austin Engineering Products Ltd

4.7.12 The only noise audible from Smith and Austin Engineering Products during the survey was the external plant located to the rear of the premises. The plant appeared to be active throughout the opening hours of the premises. It was audible at the site boundary throughout the monitoring during the premises' opening hours. As the plant was active only during daytime hours, the noise impact of the plant during the night-time will not be considered. The sound level produced by the plant was constant.

Application of Acoustic Feature

4.7.13 BS4142 includes a section on identifying acoustic features which can increase the significance of impact over that expected from the basic comparison of the specific sound level and the background sound level. No acoustic features were identified for the plant and therefore no penalties have been added to the specific sound level.

4.7.14 The following measured noise from the plant has been used for the specific noise level in the BS4142 assessment.

Identification of the Specific Noise

4.7.15 Monitoring Location 3: The measured noise level over the period 1200 and 1201 hours (14/09/2016) is considered representative of the noise from the plant. For the purpose of the assessment the daytime noise level (L_{Aeq}), of 51.2dB, has been used and is shown in Table 6.

Identification of Background Noise

4.7.16 The noise levels measured during the following periods are considered to be representative of the background noise levels during the opening hours of the premises in the north-eastern part of the site, in the absence of any noise from the plant:

4.7.17 Daytime Period: Over the period 0846 to 0917 hours (14/09/2016) at Monitoring Location 2. For the purpose of the assessment the daytime background noise level (L_{A90}), of 39.0dB, has been used. This is considered representative of the background

noise levels during the opening hours of the premises at location 3 without noise from the plant.

4.7.18 In accordance with BS4142 the specific noise level in the vicinity of the proposed dwellings within the site has been compared with the corresponding measured background noise level, as shown in Table 6.

Table 6: BS4142 Assessment of the Extraction fan at Proposed Dwellings in the North-eastern Part of the Site– (Figures in dB(A))	
	Daytime
Specific Noise i.e. noise level of the operational activities (including distance correction)	51.2
Acoustic Feature Correction	0
Rating Level	51.2
Background Noise Level	39.0
Excess of rating over background level	+12.2

4.7.19 The result of the BS4142 assessment in Table 6 suggests that with no mitigation in place, a significant adverse impact due to noise from the plant may be likely during the daytime.

BS4142 Context Assessment

Absolute Level of Sound

4.7.20 The impact of a given difference between the rating level of the industrial/commercial noise and background noise level will depend upon whether the residual sound level is low or high. The magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

4.7.21 As the residual sound level is low it is likely that the noise from industrial buildings would have a lower impact on the site, than is suggested by Table 6

Character and Level of Residual Sound

- 4.7.22 The proposed development is in the centre of a residential area where the dominant noise source is distant traffic and pedestrians and the residual sound level is low.
- 4.7.23 The specific noise level of the industrial buildings is higher than the residual noise. This would suggest that there may be an adverse impact with no mitigation in place.
- 4.7.24 The noise from the industrial buildings is of a different character to the noise at the proposed development site and is therefore noticeable. This would suggest that there may be an adverse impact with no mitigation in place.

Sensitivity of Receptor & Existing Acoustic Conditions

The proposed development is residential in nature and therefore the sensitivity of the receptors is high. However, in accordance with BS4142, the sensitivity of the receptors will depend on whether or not they incorporate design measures to secure good acoustic conditions, such as façade insulation, ventilation to allow windows to remain closed and acoustic screening. In this case the proposed dwellings close to the industrial buildings will be provided with façade insulation, an alternative means of ventilation and acoustic screening. This mitigation will secure good internal and external acoustic conditions.

BS4142 Assessment Summary

- 4.7.25 Mitigation measures should be implemented to reduce noise from the plant at Smith & Austin Engineering Products Ltd by at least 7.2dB at proposed dwellings in the north-eastern part of the site, nearest to the proposed residential premises, to reduce the specific noise levels to no more than 5dB above background. It is considered that this would reduce the likelihood of an adverse impact to low. The mitigation measures are discussed in section 5 of this report.

5 NOISE ATTENUATION SCHEME

5.1 Introduction

5.1.1 The results of the noise assessment, for the proposed residential areas of the development, indicate that noise mitigation measures are required to reduce the noise impact from St Mary's Road and the external plant at Smith & Austin Engineering Products Ltd to an acceptable level at the proposed dwellings in the parts of the site closest to them.

5.1.2 No mitigation is considered necessary to attenuate noise from the electrical substation and Hayling Island Holiday Park.

5.2 Daytime Noise Levels in Outdoor Living Areas

5.2.1 The measured noise levels, as detailed in Table 1 of the report indicate that outdoor living areas throughout the site will achieve outdoor daytime noise guideline levels of less than 55dB L_{Aeq} . However, the BS4142 assessment shows that a significant adverse impact is likely in parts of the site closest to the external plant at Smith & Austin Engineering products Ltd without mitigation in place.

5.2.2 To mitigate noise levels in outdoor living areas located closest to, and with a direct line of sight of the plant, at Smith & Austin Engineering products Ltd, gardens can be located on the screened sides of dwellings, i.e., not located with a direct line of sight to the plant. Alternatively, if gardens are positioned facing the plant the required noise levels could be achieved with close boarded fencing (or fence and bund combinations) of approximately the following heights:

- North-eastern part of the site adjacent to Smith & Austin Engineering products Ltd – 1.8m.

5.2.3 The final height of the required fence would depend on the final location of the outdoor living areas the location of the barrier relative to the plant and proposed receptors.

5.2.4 Properties further into the site will be screened by the proposed residential buildings themselves and would therefore be likely to achieve the required daytime noise levels without further mitigation.

5.3 Glazing Requirements of Proposed Development

5.3.1 In the absence of design details for the building facades, it has been assumed that the glazing to noise sensitive rooms would comprise about 25% of the facade area. To

calculate the overall attenuation provided by this percentage of glazing in a brick or block facade, a non-uniform partition calculation can be used.

- 5.3.2 The calculation combines the different degrees of attenuation of the wall element and the window element. A facade element comprising solid brick or blockwork, will attenuate by 45-50dB (British Standard 8233: "Sound insulation and noise reduction for buildings – Code of practice" 1999) whereas standard double glazing will attenuate road traffic noise by 26-29dB(A) (BRE Digest 379 "Double glazing for heat and sound insulation"). The overall noise attenuation provided by this combination is, therefore, between 31.9dB(A) and 34.9dB(A).

Noise Sensitive Rooms during the Daytime

- 5.3.3 The noise attenuation requirements during the daytime for proposed noise sensitive rooms nearest to existing noise sources are summarised in Table 3 and 6. The requirements indicate that standard thermal double glazing should ensure that internal noise levels are met with the windows closed.
- 5.3.4 With windows open, the attenuation provided by the façade will be approximately 15dB(A). This would potentially allow the recommended internal noise limit to be exceeded in some noise sensitive rooms during the daytime in the north-eastern parts of the site nearest to the electrical substation and Smith & Austin Engineering Products Ltd.
- 5.3.5 Some form of acoustic ventilation would therefore need to be installed in some of the noise sensitive rooms. Alternatively, to meet the required noise levels, noise sensitive rooms could be located on the screened side of the proposed buildings, away from the noise source.
- 5.3.6 It is considered that proposed dwellings further into the site will be protected by the buildings themselves and/or screened by other buildings, from the main sources of noise. These façades are likely to achieve the recommended noise guidance levels, even with windows open.
- 5.3.7 Glazing and ventilation requirements can be confirmed, on a plot-by-plot basis, at the reserved matters stage.

Noise Sensitive Bedrooms during the Night-Time

- 5.3.8 The noise attenuation requirements during the night-time for proposed noise sensitive bedrooms nearest to existing noise sources are summarised in Table 4 and

5. The requirements indicate that standard thermal double glazing should ensure that internal noise levels are met with the windows closed.

5.3.9 With windows open, the attenuation provided by the façade will be approximately 15dB(A). This would potentially allow the recommended internal noise limit to be exceeded in some bedrooms during the night-time in the eastern parts of the site nearest to St Mary's Road and Smith & Austin Engineering Products Ltd.

5.3.10 Some form of acoustic ventilation would therefore need to be installed in some of the bedrooms. Alternatively, to meet the required noise levels, bedrooms could be located on the screened side of the proposed buildings, facing away from the noise source.

5.3.11 It is considered that proposed dwellings further into the site will be protected by the buildings themselves and/or screened by other buildings, from the main sources of noise. These façades are likely to achieve the recommended noise guidance levels, even with windows open.

5.3.12 Glazing and ventilation requirements can be confirmed, on a plot-by-plot basis, at the reserved matters stage.

5.4 Acoustic Ventilation Requirements

5.4.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2000 Approved Document F1 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation". Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living rooms.

5.4.2 The implementation of the recommended glazing together with appropriate acoustic ventilation should ensure that the required internal daytime and night-time noise limits are achieved.

5.4.3 The façades of some of the properties further into the site will be protected by the buildings themselves and/or screened by other buildings. Therefore, acoustic ventilation may not be required for these plots. The requirement for acoustic ventilation can be confirmed on a plot-by-plot basis before commencement of the development.

6 CONCLUSIONS

- 6.1.1 The dominant noise sources at the proposed development are road traffic on St Mary's Road and the surrounding road network and noise from the external plant at Smith & Austin Engineering Products Ltd. Due to the very low noise levels observed from the electrical substation and Hayling Island Holiday Park, these are not considered to be a problem for the proposed development.
- 6.1.2 The noise levels have been assessed using guideline values suggested by BS8233. It should be noted that the internal guideline values are health-based and are therefore relatively inflexible; however adequate noise mitigation is relatively straightforward to engineer.
- 6.1.3 The results of the noise survey and assessment indicate that to achieve the guideline value of 55dBLAeq (16 Hour) in outdoor living areas, acoustic mitigation will be required for those areas located nearest to, and with a direct line of sight to the external plant at Smith & Austin Engineering Products Ltd.
- 6.1.4 This mitigation could include locating gardens on the screened sides of dwellings, i.e. facing away from the plant. Alternatively, if gardens are positioned facing the plant, noise guideline levels could be achieved with close boarded fencing (or a bund and fence combination) of approximately 1.8m in height in the north-eastern part of the site.
- 6.1.5 The final height of the required fence would depend on its chosen position relative to the noise source.
- 6.1.6 Properties further into the site will be screened by the proposed residential buildings themselves and would therefore be likely to achieve the required outdoor daytime noise levels.
- 6.1.7 In living rooms and bedrooms in all dwellings across the site, standard thermal double glazing should ensure that required internal noise levels are met with the windows closed.
- 6.1.8 With windows open there is potential for recommended internal noise limits to be exceeded in some living rooms in the northeast of the site during the daytime and bedrooms in the eastern parts of the site due to noise from St Marys' Road and the external plant at Smith & Austin Engineering Products Ltd. Some form of acoustic ventilation would therefore need to be installed in some of the rooms. Alternatively,

to meet the required noise levels, these rooms could be located on the screened side of the proposed buildings, facing away from the road noise.

- 6.1.9 The implementation of the recommended glazing together with appropriate acoustic ventilation should ensure that the required internal daytime and night-time noise limits are achieved at those proposed dwelling closest to the noise sources.
- 6.1.10 The large majority of the proposed dwellings further into the site will be able to open windows for ventilation at all times.
- 6.1.11 Noise mitigation measures, including glazing requirements for bedroom and living room areas will be confirmed, on a plot-by-plot basis, at the reserved matters stage. Requirements for acoustic ventilation will also be confirmed.

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APPENDICES

Appendix A
Legislation, Policy and Guidance

Policy, Standards and Guidance

Appendix A

A.1 National Planning Policy Framework

In February 2021 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England.

Paragraph 185 of the NPPF states:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking in account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impact that could arise from the development. In doing so they should:

- a. Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impact on health and the quality of life;
- b. Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'...

Paragraph 187 of the NPPF states:

'Planning policies and decisions should ensure that new development can be integrated with existing business and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

A.2 Noise Policy Statement for England

With regard to 'significant adverse impacts on health and the quality of life' the NPPF refers to the 'Noise Policy Statement for England' (NPSE).

The Noise Policy Statement for England refers to the World Health Organisation when discussing noise impacts and introduces observed effect levels which are based on

established concepts from toxicology that are applied to noise impacts by WHO.

Three levels are defined as follows:

‘NOEL – No Observed Effect Level

- This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

- This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur’.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

A.3 Planning Practice Guidance – Noise

The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable, however it has no adverse effect as it does not cause any change in behaviour or attitude. Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused. At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. Table 1 summarises the noise exposure hierarchy.

Table 1 - National Planning Practice Guidance noise exposure hierarchy			
Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

“Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separate from the economic, social and other

environmental dimensions of proposed development”

A.4 *ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise*

ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

The guidance reflects the Government’s overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

A.5 *British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings*

British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB L_{Aeq} (16 hour) during the day time in noise sensitive rooms
- 30 dB L_{Aeq} (8 hour) during the night time in bedrooms
- 45 dB $L_{Amax,F}$ during the night time in bedrooms
- 50 dB L_{Aeq} (16 hour) desirable external noise levels for amenity space such as gardens and patios
- 55 dB L_{Aeq} (16 hour) upper guideline value which would be acceptable in noisier environments.

In addition, for internal noise levels it states;

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

Furthermore, with regard to external noise, the Standard states;

“However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a

compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited”.

A.6 *British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound (BS4142):*

BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:

1) Investigating complaints;

2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

3) Assessing sound at proposed new dwellings or premises used for residential purposes.

The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.

BS4142 refers to noise from the industrial source as the ‘specific noise’ and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with industrial noise. The ‘specific noise’ sources, of the existing industrial

premises that have been observed are detailed in Section 3 of this report.

BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). Section 3 of this report provides details of the background noise survey undertaken.

Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular, BS4142 identifies that the absolute level of sound, the character, and the residual sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.

The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.

Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and,

- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

A.7 AVO: Acoustics, Ventilation and Overheating Residential Design Guide

The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

Appendix B
Noise Monitoring Results

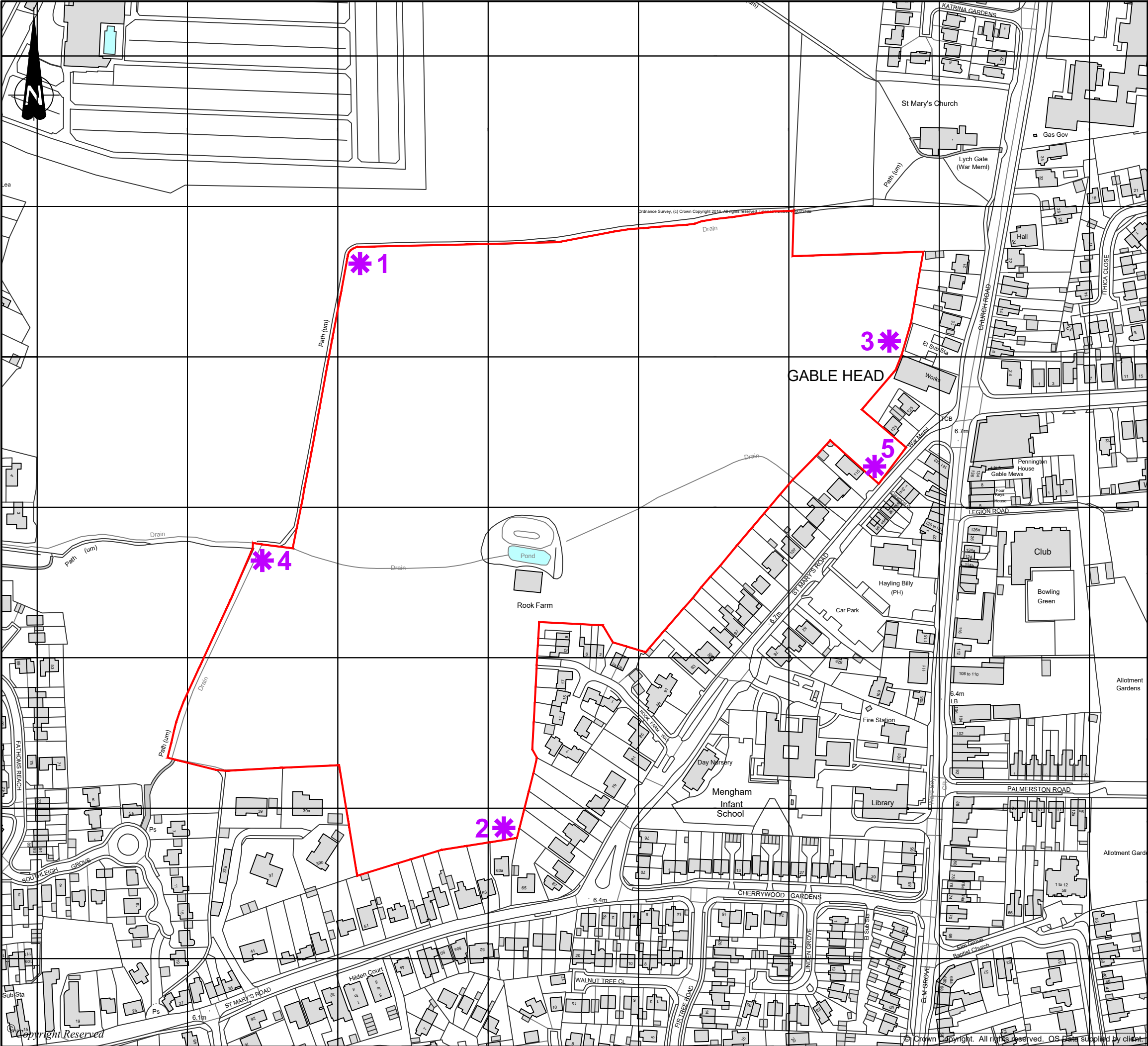
Appendix B

Noise Monitoring Results

Monitoring Location 1 – Adjacent to north western corner of site boundary nearest to Hayling Island Holiday Park						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
14/09/2016 - Daytime						
0737-0808	43.2	38.3	58.6	39.9	44.1	Constant distant traffic noise. Occasional aircraft. Birdsong. Pedestrians and dogs passing near to meter. 0823 – motorbikes on St Mary’s Road
0922-0953	48.7	38.5	69.8	41.0	48.5	Constant distant traffic noise. Occasional aircraft. Birdsong. Pedestrians and dogs passing near to meter. 0925-0927 – dog barking near to meter 0930 onwards – Construction noise west of site
Monitoring Location 2 –Adjacent to southern site boundary nearest to St Mary’s Road						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
14/09/2016 – Night-time						
0514-0529	35.8	29.0	47.4	31.1	38.3	Occasional vehicle on St Mary’s Road
0529-0544	38.1	28.1	49.0	31.8	40.8	
0630-0645	45.7	38.7	59.7	41.5	48.3	Intermittent traffic on St Mary’s Road.
0645-0700	46.6	40.0	55.5	42.9	48.8	Occasional aircraft. Birdsong.
14/09/2016 – Daytime						
0700-0730	46.9	40.7	58.8	43.6	48.6	Constant traffic noise on St Mary’s Road. Occasional aircraft. Birdsong 0914-police siren
0846-0917	46.5	35.5	62.3	39.0	49.2	
Monitoring Location 3 – Adjacent to eastern site boundary, adjacent to electrical substation and Smith and Austin Engineering Products Ltd						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
14/09/2016 – Night-time						
0451-0507	41.1	36.3	56.1	36.7	43.6	Occasional vehicle on St Mary’s Road. Noise from electrical substation.
0550-0605	45.8	37.5	62.1	39.4	48.3	
0605-0620	48.7	38.5	69.4	40.5	48.9	
14/09/2016 - Daytime						
1000-1100	49.1	41.1	67.1	44.1	50.2	Intermittent traffic on St Mary’s Road. Constant noise from electrical substation. Occasional aircraft. Birdsong.
1100-1200	47.0	39.3	65.2	42.8	49.0	
Monitoring Location 4 – Adjacent to western site boundary, distant from main noise sources (background noise)						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
13/09/2016 - Daytime						
1422-1522	50.4	41.2	67.3	45.2	52.1	Intermittent distant traffic noise. Occasional aircraft noise. Birdsong. 1456-dog bark
2200-2300	37.8	32.0	44.3	35.2	39.6	Occasional distant traffic noise. Occasional aircraft noise. Birdsong

13/09/2016 – Night-time						
2300-2315	45.1	34.8	63.4	36.4	44.9	Occasional distant traffic noise. Occasional aircraft noise. Birdsong 2305 - motorbikes
2315-2330	40.1	36.1	44.2	38.1	41.5	
2330-2345	39.4	35.7	42.9	37.3	40.9	
2345-0000	37.7	33.1	42.0	35.3	39.3	
Monitoring Location 5 – Adjacent to eastern site boundary, approximately 10m from St Mary’s Road						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
20/07/2016 - Daytime						
0814-0845	55.2	36.7	82.3	43.3	55.6	Constant traffic noise. Occasional aircraft. Birdsong. 0818-motorbike
1202-1302	54.3	34.6	83.8	42.8	54.5	Constant traffic noise. Occasional aircraft. Birdsong. 1206-motorbike 1246-motorbike 1349-dog bark 1417-shouting 1421-motorbike
1302-1402	50.5	35.8	71.8	42.7	53.4	
1402-1502	51.2	39.0	71.8	44.4	54.0	

DRAWINGS



DO NOT SCALE FROM THIS DRAWING

REFERENCE

Site boundary_____

Noise monitoring location_____ *1

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
CLIENT					
GLADMAN DEVELOPMENTS Ltd.					
PROJECT					
St. MARY'S ROAD, HAYLING ISLAND					
DRAWING TITLE					
NOISE MONITORING LOCATION POINTS					
DRG No.		LE13606-001		REV	
DRG SIZE		A3		SCALE	
				1:2500	
DRAWN BY		RJH		DATE	
				15/09/16	
CHECKED BY		RP		APPROVED BY	
				JLH	
■ CARDIFF TEL 029 2072 9191 WEB: WWW.WARDELL-ARMSTRONG.COM					
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