



Noise Impact Assessment

C11048

Proposed Substation, Plas Coch, Wrexham

Prepared for
Osprey Charging Network Ltd,
3rd Floor,
Martin House,
5 Martin Lane,
London,
EC4R 0DP

February 2024

Omnia ref: C11048/NIA/1.0



ISO Accredited Certification (UKAS)



DOCUMENT VERSION	DOCUMENT DATE	OWNER
1	October 2021	Principal Acoustic Consultant

Quality Assurance

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft for comment			
Date	February 2024			
Prepared by	Martyn Parker MIOA			
Signature				
Position	Principal Consultant			
Checked by	John Goodwin MIOA			
Signature				
Position	Director			
Project number	C11048/NIA/1.0			

North

Office 4, No.3 Fulwood,
3 Caxton Road, Preston,
PR2 9ZZ
01772 963 024

Midlands

Office 203, St Nicholas House,
31 Park Row, Nottingham
NG1 6FQ
0115 7043 492

South

Suite 1, Pure Offices, One Port
Way, Port Solent,
Portsmouth, PO6 4TY
01489 808 088

We are a UK wide, truly joined up and fully collaborative multi-disciplinary engineering and environmental consultancy.



Ecology



Acoustics



Geotechnical



Geo-environmental



Air Quality

Executive Summary	
Site Address	Plas Coch, Wrexham
This Assessment has been undertaken to identify and assess any surrounding noise-generating activities which may have the potential to adversely impact the proposed noise-sensitive development. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance. In addition, various British Standard and guidance documents exist which are applicable to the assessment of noise impacts. This Assessment has shown that the that the rated level of noise from the development falls below the typical background sound level at the nearest receptor for both the daytime and night-time periods which affords the following outcome according to BS4142: <i>‘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.’</i> Additionally, the NANR45 criteria can be achieved across all frequencies at the receptors based on the daytime and night criteria. In summary, the predicted level of noise from the Development, following noise mitigation, is sufficiently low enough at the closest residential dwellings and accords with the requirements of BS4142:2014+A1:2019.	

Table of Contents

1	INTRODUCTION	6
1.1	Background	6
1.2	Site Location and Proposed Development	6
1.3	Acronyms	6
1.4	Limitations	6
1.5	Confidentiality	6
2	POLICY & GUIDANCE	8
2.1	Planning Guidance (Wales), Technical Advice Note 11, Noise	8
2.2	BS8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’	9
2.3	World Health Organisation’s (WHO) ‘Guidelines for Community Noise’	10
2.4	BS4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’	11
2.5	DEFRA NANR45: Procedure for Assessment of Low Frequency Noise	12
2.6	Wrexham County Borough Council’s Environmental Health Department	13
3	NOISE SURVEY	15
3.1	Background Sound Survey	15
3.2	Noise Survey Equipment	15
4	NOISE IMPACT ASSESSMENT	16
4.1	Assessment Information & Inputs	16
4.2	Calculation of Specific Noise Levels at Receptor	17
4.3	BS4142 Assessment	18
4.4	Low Frequency Noise Assessment	19
5	MITIGATION	21
5.1	Commercial Noise	21
6	CONCLUSION.....	22

APPENDICES

Appendix I	Limitations
Appendix II	Glossary of Acoustic Terminology
Appendix III	Figures
Appendix IV	Measured Background Sound Levels

1 INTRODUCTION

1.1 Background

Omnia was instructed by Osprey Charging Network Ltd to prepare a Noise Impact Assessment ('the Assessment') for a proposed electricity substation at a public house known as Plas Coch in Wrexham, LL11 2BW to be referred to hereafter as 'the Site'.

It is understood that a Noise Impact Assessment is required in order to discharge the following planning condition:

'3. Prior to the first use of any electricity substation installed in connection with the development hereby approved, an acoustic report assessing its impact upon amenity shall be submitted to, and approved in writing by, the Local Planning Authority. The report shall address the issue of noise (including low frequency noise) and vibration from the station to ensure that there is no loss of amenity to residential or commercial properties. The measures as are approved shall be fully implemented in strict accordance with the scheme prior to first use of the development and shall thereafter be retained as such.'

There a number of noise sensitive residential dwellings located to the east of the Site beyond Plas Coch Rd and as such, this Assessment considers potentially adverse noise impacts from operation of the substation upon the noise sensitive residential dwellings.

This Assessment has been undertaken to identify and assess any surrounding noise-generating activities which may have the potential to adversely impact the proposed noise-sensitive development. Accordingly, this Assessment has been completed with due regard to TAN 11 Noise. In addition, various British Standard and guidance documents exist which are applicable to the assessment of noise impacts and these are detailed in Section 2.

1.2 Site Location and Proposed Development

The proposed substation will be located to the north east of the public house, approximately 41m north west of the closest residential dwelling.

There a number of noise sensitive residential dwellings located to the east of the Site beyond Plas Coch Rd.

This assessment has been undertaken with due regard to the supplied planning layout shown on the following planning drawing:

- Site location plan, issued by Osprey.

The Site Layout is shown in Figure 1 of Appendix III.

1.3 Acronyms

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.4 Limitations

The limitations of this report are presented in Appendix I.

1.5 Confidentiality

This report has been prepared solely for the use of the Client. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Omnia; a charge may be levied against such approval.

2 POLICY & GUIDANCE

2.1 Planning Guidance (Wales), Technical Advice Note 11, Noise

Technical Advice Note 11 (Wales) (TAN 11) should be taken into account by local planning authorities in Wales in the preparation of development plans. They may be material to decisions on individual planning applications and will be taken into account by the Secretary of State and his Inspectors in the determination of called-in planning applications and appeals.

TAN 11 provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

TAN 11 adopts Noise Exposure Categories (NECs) which were used in the now revoked Planning Policy Guidance Note 24 (PPG 24) - the NECs were derived to assist local planning authorities in their consideration of planning applications for residential development near transport related noise sources. The NECs are detailed in Table 2.1.

Table 2.1 Noise Exposure Categories

Category	Advice
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

A recommended range of noise levels is given for each of the NECs for dwellings exposed to noise from road, rail, air and mixed sources as detailed in Table 2.2.

Table 2.2 Noise Levels Corresponding to Noise Exposure Categories for New Dwellings

Noise Source		Noise Exposure Category			
		A	B	C	D
Road Traffic	07:00 – 23:00	<55	55-63	63-72	>72
	23:00 - 07:00	<45	45-57	57-66	>66
Rail Traffic	07:00 – 23:00	<55	55-66	66-74	>74
	23:00 - 07:00	<45	45-59	59-66	>66

Air Traffic ³	07:00 – 23:00	<57	57-66	66-72	>72
	23:00 - 07:00	<48	48-57	57-66	>66
Mixed Sources ⁴	07:00 – 23:00	<55	55-63	63-72	>72
	23:00 - 07:00	<45	45-57	57-66	>66
Notes: (1) Noise levels: the noise level(s) (LAeq,T) used when deciding the NEC of a site should be representatives of typical conditions. (2) Night-time noise levels (2300-0700): sites where individual noise events regularly exceed 82dB LAmax (5 time weighting) several times in any hour should be treated as being in NEC C, regardless of the LAeq,8H (except where the LAeq,8H already puts the site in NEC D). (3) Aircraft noise: daytime values accord with the contour values adopted by the Department of Transport which relate to levels measured 1.2m above open ground. For the same amount of noise energy, contour values can be up to 2 dB(A) higher than those of other sources because of ground reflection effects. (4) Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant. To check if any individual noise source is dominant (for the purposes of this assessment) the noise level from the individual sources should be determined and then combined by decibel addition (remembering first to subtract 2 dB(A) from any aircraft noise contour values). If the level of any one source then lies within 2 dB(A) of the calculated combined value, that source should be taken as the dominant one and the site assessed against the appropriate NEC for that source, rather than using the "mixed source" NECs. If the dominant source is					

The NEC noise levels should not be used to assess the impact of industrial noise on proposed residential development because the nature of this type of noise, and local circumstances, may necessitate individual assessment and because there is insufficient information on people's response to industrial noise to allow detailed guidance to be given. However, at a mixed noise site where industrial noise is present but not dominant, its contribution should be included in the noise level used to establish the appropriate NEC.

Determining the NEC category for a given Site is useful for determining the likely level of noise mitigation that may be required in order to make a Site suitable for residential use. TAN 11 goes on to cite specific British Standards which should be used for the assessment of transportation noise and industrial/commercial noise. Indeed, TAN 11 references BS8233 and BS4142 which offer noise criteria for residential habitable areas with regards to transportation and industrial noise sources.

2.2 BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

Noise Criteria Limits

The scope of this standard is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within different types of buildings, including dwellings, as shown in Table 2.3.

Table 2.3 BS8233:2014 Internal Target Noise Levels

Criterion	Typical Situation	Design L _{Aeq,T} (dB)
Suitable resting / sleeping conditions	Living Room	35
	Bedroom*	30
*For a reasonable standard in bedrooms at night, individual noise events (measured with fast time weighting) should not exceed 45dB L _{max}		

BS8233 goes on to recommend noise levels for gardens as follows:

"It is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. 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 might be warranted".

BS8233 goes on to say:

"In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited".

Ventilation Requirements

Where a partially open window cannot be relied upon to provide an adequate level of sound insulation performance, it is necessary to consider alternative ventilation for habitable rooms. Section 8.4.5.4 within BS8233 states:

"The Building Regulations' supporting documents on ventilation [48, 49, 50] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

Alternatively, acoustic ventilation units (see 7.7.2 below) are available for insertion in external walls. These can provide sound reduction comparable with double glazed windows. However, ducted systems with intakes on the quiet side of the building might be required in very noisy situations, or where appearance rules out through-the-wall fans."

Section 7.7.2 states:

"NOTE 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level."

2.3 World Health Organisation's (WHO) 'Guidelines for Community Noise'

The WHO 'Guidelines for Community Noise' offers advice with regard to setting noise criteria applicable to sleep disturbance. Section 4.2.3 specifies:

'If the noise is not continuous, L_{Amax} or SEL are used to indicate the probability of noise-induced awakenings. Effects have been observed at individual L_{Amax} exposures of 45 dB or less. Consequently, it is important to limit the number of noise events with a L_{Amax} exceeding 45 dB.'

The guidelines go on to state:

'At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB L_{Aeq} and 60 dB L_{Amax} , so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.'

The sound insulation performance value of 15dB for a façade containing a partially open window accords with the guidance offered in BS8233:2014.

The guidelines reference a study by Vallet & Vernet, 1991, which concluded that:

'For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB $L_{AF,max}$ more than 10-15 times per night.'

Accordingly, this assessment has utilised the 10th highest measured maximum noise level from the night-time period and allows for an assessment of a typical maximum noise level in determining façade sound insulation performance.

2.4 BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- 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 processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is 'typical.'

The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00 - 23:00): 1 hour; and
- Night-time (23:00 - 07:00): 15 minutes.

There are a number of 'penalties' which can be attributed to the specific sound level, either subjectively or objectively, depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows (with regards to the subject method):

Tonality

- +2dB: where the tonality is just perceptible;
- +4dB: where the tonality is clearly perceptible; and
- +6dB: where the tonality is highly perceptible.

Impulsivity

- +3dB: where the impulsivity is just perceptible;
- +6dB: where the impulsivity is clearly perceptible; and
- +9dB: where the impulsivity is highly perceptible.

Intermittency

- +3dB: where the intermittency is readily distinctive against the acoustic environment.

Where the assessment is carried out using the objective method, the tonality penalty is either 0dB or 6dB and the impulsivity penalty can range from 0dB up to 9dB in increments of 1dB, depending on the level of impulsivity identified.

In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though is readily distinctive against the acoustic environment.

BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background noise level can yield the following commentary:

- Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
- 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; and
- 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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Whilst the amended 2019 Standard does make various references to it not being intended to assess noise impacts at indoor locations, section 1.1 does state 'The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident'. Example 6 in the Standard states 'In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance'.

With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts at the building façade do not give rise to internal noise level which causes sleep disturbance in bedrooms, this Assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

2.5 DEFRA NANR45: Procedure for Assessment of Low Frequency Noise

The following consultation was provided to Wrexham County Borough Council: A procedure for the assessment of low frequency noise, as set out under contract number NANR45 for the Department of Environment, Food and Rural Affairs (DEFRA), as detailed in the University of Salford document, has been used to inform the assessment. The procedure is intended for use where complaints have been received about an existing low frequency noise source, in order to identify whether the noise is present at a level that could reasonably give rise to disturbance.

The procedure has been adopted to determine the impact of the commercial units to the south on the proposed residences as requested by Wrexham County Borough Council, as guidance on assessing if the low frequency noise is likely to be an issue. However, it should be noted that the procedure cannot accurately predict the likelihood of complaints, as stated in the DEFRA document. We have therefore based advice on a cautious interpretation of the results.

The procedure includes a criterion curve, and it is also suggested that if the noise is steady state, then a 5dB relaxation may be applied to all third octave bands. The noise is considered steady if either of the conditions below are met:

- $L_{10} - L_{90} < 5\text{dB}$; and/or
- The rate of change of sound pressure level (fast time weighting) is less than 10dB per second.

Table 2.4 below details the criterion curves for the NANR45 assessment.

Table 2.4 **NANR45 Criterion**

	Linear Noise Level (dB)												
Period	10Hz	12.5 Hz	16Hz	20Hz	25Hz	31.5 Hz	40Hz	50Hz	63Hz	80Hz	100 Hz	125 Hz	160 Hz
Daytime	97	92	88	79	69	61	54	48	47	45	43	41	39
Night-Time	92	87	83	74	64	56	49	43	42	40	38	36	34

2.6 Wrexham County Borough Council's Environmental Health Department

The following consultation was provided to Wrexham County Borough Council:

'We have been appointed by a client to undertake a Noise Impact Assessment support of a proposed electric substation at Plas Coch (pub), Wrexham, LL11 2BW.

It is understood that a Noise Impact Assessment is required in order to discharge the following planning condition:

'3. Prior to the first use of any electricity substation installed in connection with the development hereby approved, an acoustic report assessing its impact upon amenity shall be submitted to, and approved in writing by, the Local Planning Authority. The report shall address the issue of noise (including low frequency noise) and vibration from the station to ensure that there is no loss of amenity to residential or commercial properties. The measures as are approved shall be fully implemented in strict accordance with the scheme prior to first use of the development and shall thereafter be retained as such.'

Professional Consult will undertake a background sound survey over a full weekday and weekend period in a location considered to be representative of the background sound climate at the closest residential dwellings to the Site located to the east at the new housing development.

Professional Consult will complete the following assessment:

Noise Modelling of Proposed Plant: An assessment of all noise producing activities, including fixed mechanical and electrical plant, will be assessed against the noise criteria presented in BS4142:2014, as well as any low frequency noise criteria set NANR45 LFN Procedure.

Where exceedances of any noise criteria are identified, Professional Consult will recommend appropriate and reasonable noise mitigation measures to ensure that adopted noise level criteria is not exceeded at the closest residential dwellings.

If you have any comments, then please do advise at your earliest convenience.'

3 NOISE SURVEY

3.1 Background Sound Survey

Omnia has conducted a background sound survey in the absence of any commercial noise over the following period:

- 13:00, 12th January to 12:00, 15th January 2024.

The following location was chosen for the survey:

- Noise Measurement Position 1 (NMP1): Omnia undertook a background sound survey on the northern Site boundary in free-field conditions at a height of 1.5m above local ground level. The dominant noise source at this location was from road traffic using Plas Coch Rd and the distant A483 to the west.

A summary of the measured background sound levels are presented below for the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods.

Table 3.1 Summary of Measured Background Noise Levels

Period	Measured Range & (Mode Average) Noise Levels
	LA90,T
Daytime (07:00 – 23:00)	40 – 58 (53)
Night-time (23:00 – 07:00)	37 – 49 (43)

3.2 Noise Survey Equipment

The following equipment was used for the noise survey.

Table 3.2 Noise Measurement Equipment

Measurement Position	Equipment Description	Manufacturer & Type No	Serial No.	Calibration Due Date
NMP1	Sound Level Meter	01dB Fusion	15440	23 November 2025
	Pre-amplifier	01dB PRE22	2214039	
	Microphone	GRAS 40CD	585117	
	Calibrator	01dB CAL-31	87280	2 July 2024

The sound level meters were field calibrated prior to and following the noise surveys and there was no drift beyond the allowable limit of 1dB.

During the noise surveys the weather conditions were conducive to the measurement of environmental noise, i.e. wind speeds of no more than 5m/s and dry conditions.

4 NOISE IMPACT ASSESSMENT

4.1 Assessment Information & Inputs

The following noise sensitive residential dwelling has been identified and accounted for in this Assessment.

Table 4.1 Identified Residential Receptors

Identifier	Receptor	Type	Floor	Noise Model Receiver Location
R1	Dwelling on Plas Coch Rd	Residential	Ground (Daytime) / First-floor Night-time	At boundary of front garden area, 1.5m above ground for daytime and at 4.5m above ground level at dwelling façade for night-time

Omnia has recently undertaken source noise measurements at a charging station that is currently operational. See below for a summary of the measured noise levels, the make and model are similar to what is proposed for the development.

Table 4.2 Noise Level Data for Charging Station – Specific

Source	Specific Noise Level L_{AeqT} (dB)	Measured at (m)	Notes
Charging Station	64.3	1m	Fans in Auxiliary Unit, measurement 1m from fan outlet
Substation	47.8	1m	Low level sound from substation, only just audible at measurement location

In addition, the specific L_{Aeq} noise level the low frequency data have also been recorded as can be seen in Table 4.3 below.

Table 4.3 Noise Level Data for Charging Station – Low Frequency

	Linier Noise Level (dB)												
Source	10Hz	12.5 Hz	16Hz	20Hz	25Hz	31.5 Hz	40Hz	50Hz	63Hz	80Hz	100 Hz	125 Hz	160 Hz
Charging Station at 1m	46.6	47.7	49.9	50.8	53.8	54.1	50.4	52.4	53.7	50	49.9	49.7	49.9
Substation at 1m	44.4	45.7	47.9	47.5	49.3	46.9	50.8	52.4	55.9	49.7	49.6	42.7	44.8

4.2 Calculation of Specific Noise Levels at Receptor

Table 4.4 calculates the sound power levels for each plant item.

Table 4.4 Calculated Sound Power Levels

Event	Measured Sound Pressure level, $L_{Aeq,T}$ (dB)	Measurement Distance (m)	On-time/hr	Calculated Sound Power Level, LWA (dB)	Height above ground in Noise Model (m)
Charging Station	100.6	1	00:60:00	72.3	1.5
Substation	100.5	1	00:60:60	55.8	1.5

A noise model has been constructed in order to calculate noise levels at the building facades. The following inputs have been included in the model:

- Proposed Scheme Layout;
- Site elevations have been taken as existing using 1m LiDar data that has been converted into 1m contours;
- Existing buildings or features that provide screening at the Receptors have been included;
- A reflection order of 2 has been used in all calculations; and
- Noise levels generated using ISO 9613-1 and ISO 9613-2 “Acoustics – Attenuation of sound during propagation outdoors” as incorporated into CadnaA software.

Figures 2 and 3 in Appendix 3 details the grid noise map and analysis of the grid noise maps for the daytime and night-time periods respectively. The grid noise maps indicate the following calculated specific sound pressure level at the closest receptor to the Site.

Table 4.5 Calculated Specific Sound Pressure Level at Receptor

Receptor	Period	Calculated Sound Pressure Level, $L_{Aeq,1hr}$ (dB)
R1	Daytime	33.2
	Night-time	32.6

4.3 BS4142 Assessment

The following has been considered in determining if any acoustic features exist in the predicted noise level at the closest residential receptors:

- Tonality: In determining if any tones exist in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- Impulsivity: In determining if any impulsiveness is evident in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- Intermittency: Whether or not the measured operations turn on or off during the assessment reference periods; and
- Other sound characteristics: Where no penalties are allocated for the above features, but there will be an audible noise at the closest receptor.

Table 4.6 allocates the character corrections.

Table 4.6 Application of Character Corrections

Noise Source	Tonality Correction (dB)	Impulsivity Correction (dB)	Intermittency Correction (dB)	Other Sound Characteristics Correction (dB)
Substation	2	0	0	0
Highest Overall Character	2	0	+3	0
Total Character Correction	+2			

Table 4.6 has included for 'just perceptible' tonality from the proposed mechanical and electrical plant.

Table 4.7 completes the BS4142 Assessment.

Table 4.7 BS4142 Assessment

Receptor	Period	Calculated Specific Noise Level at Receptor, $L_{Aeq,T}$ (dB)	Total Overall Character Correction (dB)	Calculated Rated Level, $L_{A,r}$ (dB)	Typical Background Sound Level ($L_{A90,15mins}$) (dB)	Difference +/- (dB)
R1	Daytime	33.2	2	35.1	53	-17.8

	Night-time	32.6	2	34.6	43	-8.4
--	------------	------	---	------	----	------

Table 4.7 indicates that the rated level of noise falls below the typical background sound level for Receptor R1 for the daytime period which affords the following outcome according to BS4142:

'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.'

4.4 Low Frequency Noise Assessment

The measured noise levels for the charging station have been calculated at the closet receptors across the low frequency spectrum in the below table. The predicted noise levels from both plant items have then been combined to give an overall specific noise level for each frequency.

Noise modelling has not been used for the low frequency assessment as the noise modelling inputs only go as low as 25Hz.

Table 4.8 Calculation of Sound Pressure Level at Closest Receptor – Low Frequency.

	Linear Noise Level (dB)												
	10Hz	12.5 Hz	16Hz	20Hz	25Hz	31.5 Hz	40Hz	50Hz	63Hz	80Hz	100 Hz	125 Hz	160 Hz
Charging Station (dB)	46.6	47.7	49.9	50.8	53.8	54.1	50.4	52.4	53.7	50	49.9	49.7	49.9
Measured at (m)	1	1	1	1	1	1	1	1	1	1	1	1	1
Distance to Receptor (m)	40	40	40	40	40	40	40	40	40	40	40	40	40
Calculated Specific Noise Level at Receptor (dB)	14.6	15.7	17.9	18.8	21.8	22.1	18.4	20.4	21.7	18.0	17.9	17.7	17.9
Substation (dB)	44.4	45.7	47.9	47.5	49.3	46.9	50.8	52.4	55.9	49.7	49.6	42.7	44.8
Measured at (m)	1	1	1	1	1	1	1	1	1	1	1	1	1
Distance to Receptor (m)	40	40	40	40	40	40	40	40	40	40	40	40	40
Calculated Specific Noise Level at Receptor (dB)	12.4	13.7	15.9	15.5	17.3	14.9	18.8	20.4	23.9	17.7	17.6	10.7	12.8

Combined Sound Pressure Level at Receptor (dB)	16.6	17.8	20.0	20.4	23.1	22.8	21.6	23.4	25.9	20.8	20.7	18.4	19.0
---	------	------	------	------	------	------	------	------	------	------	------	------	------

Tables 4.9 compares the predicted spectral noise level with the noise criteria stated within the NANR45 document for both the daytime and night-time periods for the closest receptor.

Table 4.9 Comparison of Predicted Sound Pressure Level at Receptor with the NANR45 Criteria

	Linier Noise Level (dB)												
	10Hz	12.5 Hz	16Hz	20Hz	25Hz	31.5 Hz	40Hz	50Hz	63Hz	80Hz	100 Hz	125 Hz	160 Hz
Combined Sound Pressure Level at Receptor (dB)	16.6	17.8	20.0	20.4	23.1	22.8	21.6	23.4	25.9	20.8	20.7	18.4	19.0
Daytime Criteria (dB)	97	92	88	79	69	61	54	48	47	45	43	41	39
Difference +/- (dB)	-80.4	-74.2	-68	-58.6	-45.9	-38.2	-32.4	-24.6	-21.1	-24.2	-22.3	-22.6	-20
Night-Time Criteria (dB)	92	87	83	74	64	56	49	43	42	40	38	36	34
Difference +/- (dB)	-75.4	-69.2	-63	-53.6	-40.9	-33.2	-27.4	-19.6	-16.1	-19.2	-17.3	-17.6	-15

The above table shows that the NANR45 criteria can be achieved across all frequencies at the receptors based on the daytime and night criteria. As such not mitigation measures are required.

5 MITIGATION

5.1 Commercial Noise

The previous section has shown that the that the rated level of noise from the development falls below the typical background sound level at the nearest receptor for both the daytime and night-time periods which affords the following outcome according to BS4142:

‘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.’

Additionally, the NNR45 criteria can be achieved across all frequencies at the receptors based on the daytime and night criteria. As such not mitigation measures are required.

6 CONCLUSION

Omnia was instructed by Osprey Charging Network Ltd to prepare a Noise Impact Assessment for a proposed electricity substation on at a public house known as Plas Coch in Wrexham, LL11 2BW.

It is understood that a Noise Impact Assessment is required in order to discharge the following planning condition:

‘3. Prior to the first use of any electricity substation installed in connection with the development hereby approved, an acoustic report assessing its impact upon amenity shall be submitted to, and approved in writing by, the Local Planning Authority. The report shall address the issue of noise (including low frequency noise) and vibration from the station to ensure that there is no loss of amenity to residential or commercial properties. The measures as are approved shall be fully implemented in strict accordance with the scheme prior to first use of the development and shall thereafter be retained as such.’

There a number of noise sensitive residential dwellings located to the east of the Site beyond Plas Coch Rd and as such, this Assessment considers potentially adverse noise impacts from operation of the substation upon the noise sensitive residential dwellings.

This Assessment has been undertaken to identify and assess any surrounding noise-generating activities which may have the potential to adversely impact the proposed noise-sensitive development. Accordingly, this Assessment has been completed with due regard to TAN 11 Noise. In addition, various British Standard and guidance documents exist which are applicable to the assessment of noise impacts and these are detailed in Section 2.

The proposed substation will be located to the north east of the public house, approximately 41m north west of the closest residential dwelling.

There a number of noise sensitive residential dwellings located to the east of the Site beyond Plas Coch Rd.

This Assessment has shown that the that the rated level of noise from the development falls below the typical background sound level at the nearest receptor for both the daytime and night-time periods which affords the following outcome according to BS4142:

‘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.’

Additionally, the NANR45 criteria can be achieved across all frequencies at the receptors based on the daytime and night criteria.

In summary, the predicted level of noise from the Development, following noise mitigation, is sufficiently low enough at the closest residential dwellings to accord with the ‘No Observed Adverse Effect Level’ as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Site.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Omnia and the Client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination, which are enforced, by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. Omnia cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by Omnia is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by OEC in this connection without their explicit written agreement there to by Omnia.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II

GLOSSARY OF ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid- frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'- weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A1: Typical Sound Pressure Levels

Sound Pressure Level (dB)	Location/Example
0	Threshold of hearing
20 - 30	Quiet bedroom at night
30 - 40	Living room during the day
40 - 50	Typical office
50 - 60	Inside a car
60 - 70	Typical high street
70 - 90	Inside factory
100 - 110	Burglar alarm at 1m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

Table A2: Terminology

Descriptor	Explanation
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean square pressure of the sound field and a reference pressure (2×10^{-5} Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq, T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A – weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} & L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Fast	A time weighting used in the root mean square section of a sound level meter with a 125millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000millisecond time constant.

APPENDIX III

FIGURES

Figure 1 – Site Layout

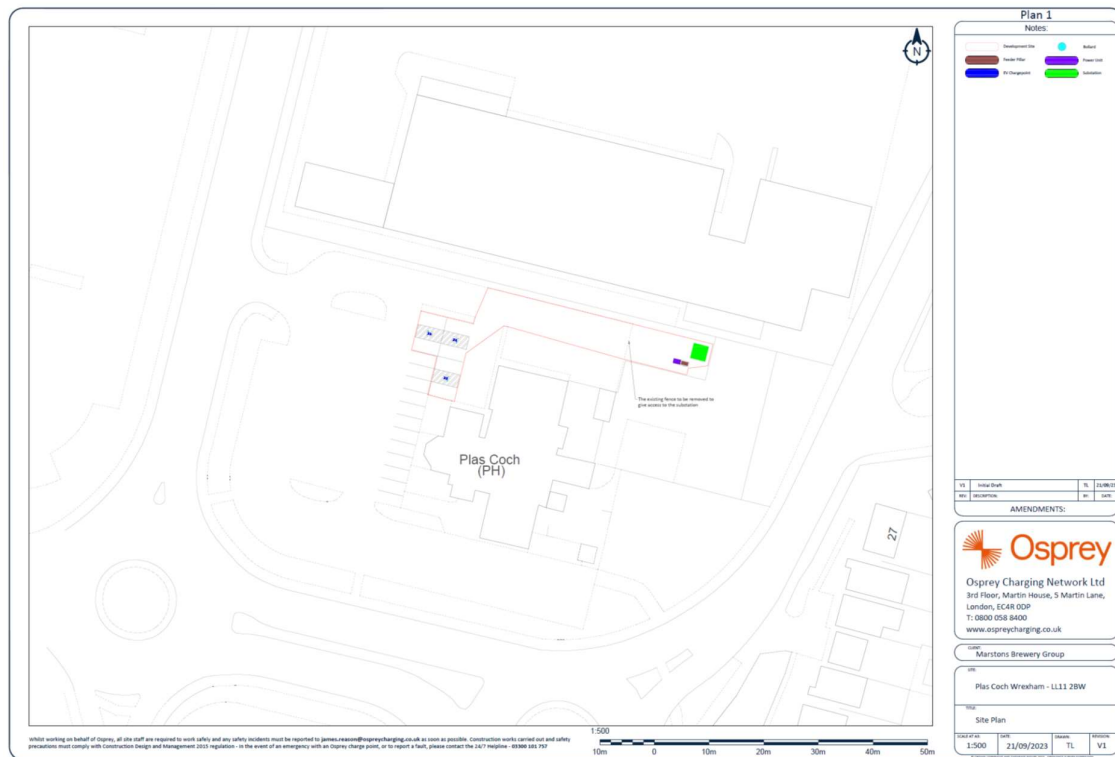


Figure 2 – Daytime Grid Noise Map

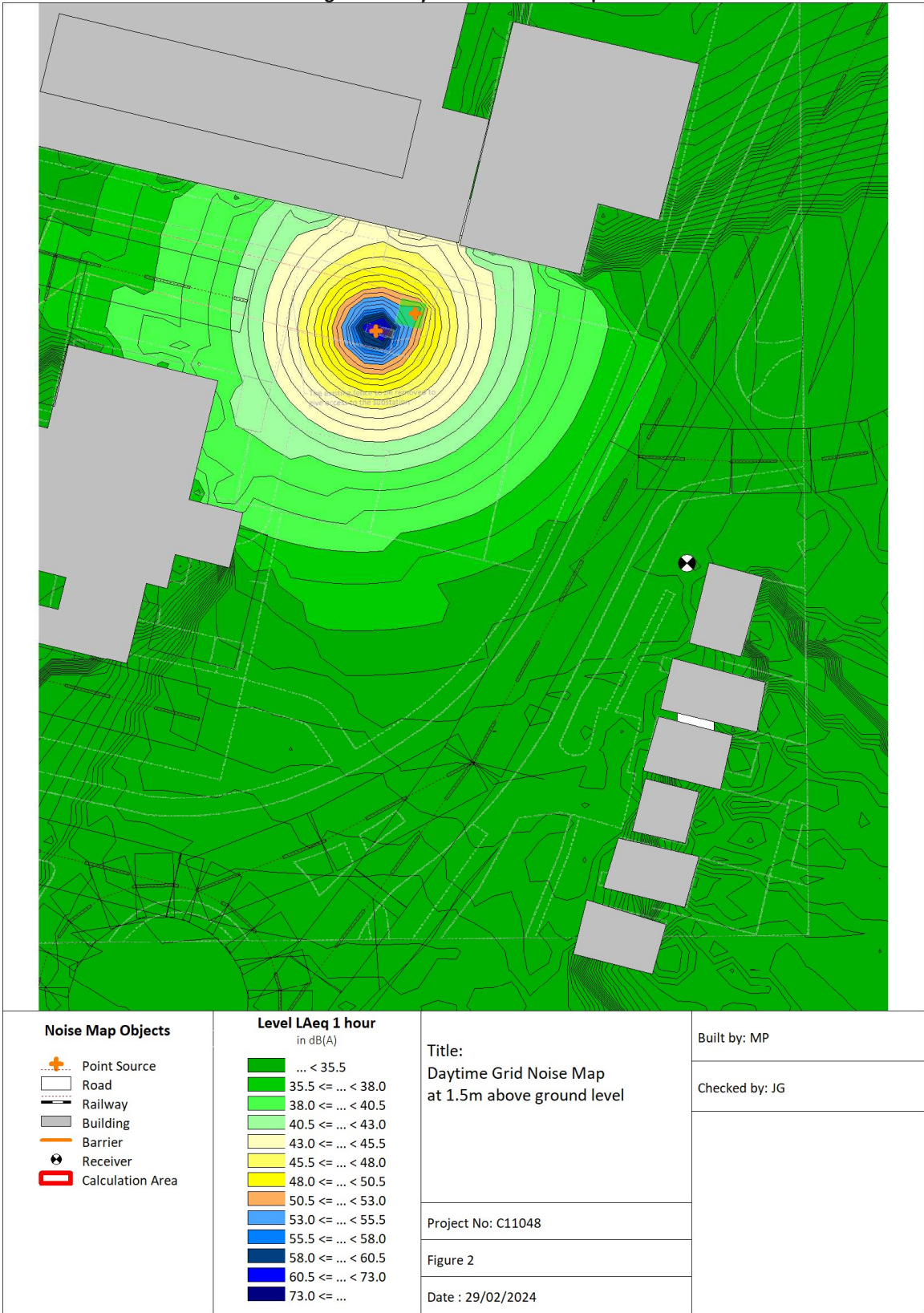
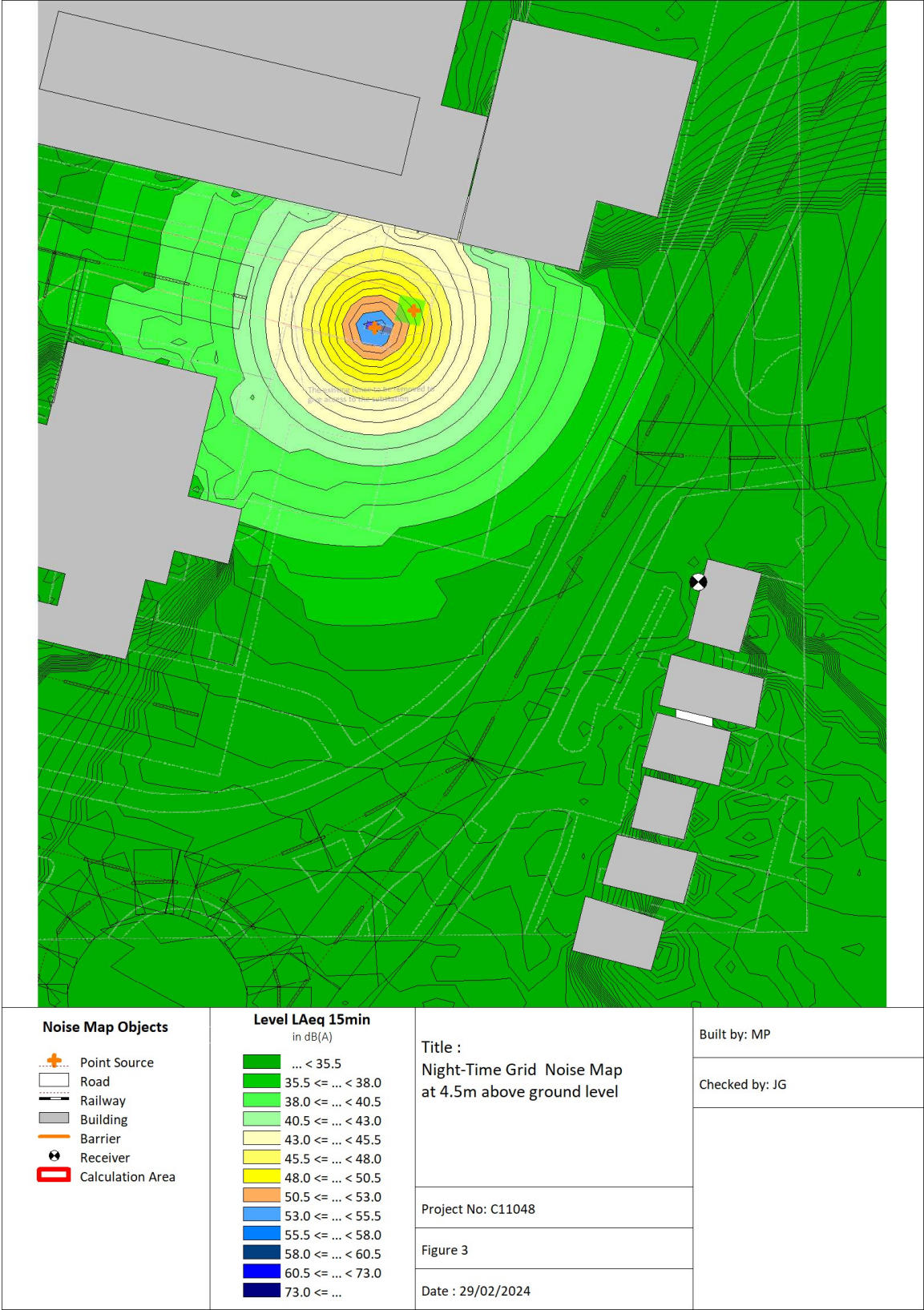


Figure 3 – Night-time Grid Noise Map



APPENDIX IV

Measured Background Sound Levels

Period Start Time	Measured Sound Pressure Level	
	L _{Aeq,15mins}	L _{A90,15mins}
12/01/2024 13:00	54	51
12/01/2024 13:15	53.7	51.3
12/01/2024 13:30	53.2	51.2
12/01/2024 13:45	53.5	51.3
12/01/2024 14:00	55.5	52
12/01/2024 14:15	53.7	51.8
12/01/2024 14:30	53.7	51.9
12/01/2024 14:45	54.8	53.2
12/01/2024 15:00	54.9	52.4
12/01/2024 15:15	54.2	52.5
12/01/2024 15:30	53.8	52.1
12/01/2024 15:45	54.2	52.2
12/01/2024 16:00	53.3	51.7
12/01/2024 16:15	53.3	51.9
12/01/2024 16:30	53.9	52
12/01/2024 16:45	53.4	51.4
12/01/2024 17:00	53.3	51.7
12/01/2024 17:15	54.5	52.7
12/01/2024 17:30	55.1	53.1
12/01/2024 17:45	54.7	52.8
12/01/2024 18:00	54.3	52.1
12/01/2024 18:15	53.5	51.4
12/01/2024 18:30	53.6	51.9
12/01/2024 18:45	53.8	52
12/01/2024 19:00	53.5	51.4
12/01/2024 19:15	53.4	51
12/01/2024 19:30	54.2	50.5
12/01/2024 19:45	53.7	51
12/01/2024 20:00	52.8	49.8
12/01/2024 20:15	51.7	49.9
12/01/2024 20:30	50.7	47.8
12/01/2024 20:45	50.8	48.3
12/01/2024 21:00	52.8	49.9
12/01/2024 21:15	52	49.2
12/01/2024 21:30	52.5	48.8
12/01/2024 21:45	50.9	48
12/01/2024 22:00	50.6	47.1
12/01/2024 22:15	51	45.5
12/01/2024 22:30	50	44.9
12/01/2024 22:45	48.6	45.4
12/01/2024 23:00	48.8	44.3
12/01/2024 23:15	46.8	43.5
12/01/2024 23:30	46.8	43.2

12/01/2024 23:45	47.3	43.8
13/01/2024 00:00	49.2	43
13/01/2024 00:15	46.8	43.4
13/01/2024 00:30	45.1	40.2
13/01/2024 00:45	44.5	40.2
13/01/2024 01:00	45.3	41.4
13/01/2024 01:15	44.4	40.3
13/01/2024 01:30	43.3	41.1
13/01/2024 01:45	44.3	40.6
13/01/2024 02:00	44.5	40
13/01/2024 02:15	44.5	39.9
13/01/2024 02:30	44.2	40.7
13/01/2024 02:45	46.1	42.5
13/01/2024 03:00	45.4	41
13/01/2024 03:15	43.8	41
13/01/2024 03:30	45.5	42.5
13/01/2024 03:45	45.2	41.8
13/01/2024 04:00	45.5	41.9
13/01/2024 04:15	45.2	41.3
13/01/2024 04:30	45.6	41.7
13/01/2024 04:45	45.9	43.2
13/01/2024 05:00	48	43.3
13/01/2024 05:15	50.6	47.6
13/01/2024 05:30	49.6	46
13/01/2024 05:45	50	46.3
13/01/2024 06:00	50.5	47.2
13/01/2024 06:15	48	45.8
13/01/2024 06:30	49.2	46.7
13/01/2024 06:45	50.4	47.7
13/01/2024 07:00	50.9	47.7
13/01/2024 07:15	50.9	48.2
13/01/2024 07:30	50.8	48.2
13/01/2024 07:45	53.2	49.9
13/01/2024 08:00	51.3	48.9
13/01/2024 08:15	52.4	50
13/01/2024 08:30	52.6	49.8
13/01/2024 08:45	54.3	51.3
13/01/2024 09:00	54.8	51.8
13/01/2024 09:15	54.9	51.8
13/01/2024 09:30	54.3	52.1
13/01/2024 09:45	54.6	52.6
13/01/2024 10:00	54.3	52
13/01/2024 10:15	61.4	53.2
13/01/2024 10:30	58.7	53.6
13/01/2024 10:45	55.1	53.4
13/01/2024 11:00	56.6	54

13/01/2024 11:15	55.2	53.5
13/01/2024 11:30	57.1	54.5
13/01/2024 11:45	56.5	54.3
13/01/2024 12:00	55	53.4
13/01/2024 12:15	54.4	53
13/01/2024 12:30	54.2	52.6
13/01/2024 12:45	54.5	53
13/01/2024 13:00	55	53
13/01/2024 13:15	55.7	53.8
13/01/2024 13:30	56.1	53.8
13/01/2024 13:45	54.9	53.3
13/01/2024 14:00	57.8	54.4
13/01/2024 14:15	56.2	53.1
13/01/2024 14:30	56	53.7
13/01/2024 14:45	53.4	51.4
13/01/2024 15:00	53.7	52
13/01/2024 15:15	53.7	51.7
13/01/2024 15:30	54.6	52.9
13/01/2024 15:45	53.4	52
13/01/2024 16:00	54.8	52.4
13/01/2024 16:15	53.5	52
13/01/2024 16:30	53.3	51.7
13/01/2024 16:45	53.5	51
13/01/2024 17:00	53.4	51.9
13/01/2024 17:15	54.9	52.7
13/01/2024 17:30	54.6	53.1
13/01/2024 17:45	55.2	53.3
13/01/2024 18:00	55.5	53.7
13/01/2024 18:15	55.3	52.7
13/01/2024 18:30	55.3	53.1
13/01/2024 18:45	53.5	51.4
13/01/2024 19:00	54.6	50.8
13/01/2024 19:15	53.8	51.3
13/01/2024 19:30	54.6	51.8
13/01/2024 19:45	53	50.5
13/01/2024 20:00	52.6	49.9
13/01/2024 20:15	52.4	49.8
13/01/2024 20:30	52.2	49.6
13/01/2024 20:45	52.6	49.9
13/01/2024 21:00	52.9	48.9
13/01/2024 21:15	53.3	48.8
13/01/2024 21:30	61.3	49.3
13/01/2024 21:45	51.7	48.7
13/01/2024 22:00	50.9	45.6
13/01/2024 22:15	53.6	45.2
13/01/2024 22:30	51.3	46

13/01/2024 22:45	49.7	46
13/01/2024 23:00	49.1	46
13/01/2024 23:15	48	44
13/01/2024 23:30	49.4	44.7
13/01/2024 23:45	48.1	45.2
14/01/2024 00:00	48.9	45.4
14/01/2024 00:15	50.4	44.8
14/01/2024 00:30	46.2	41.2
14/01/2024 00:45	46.4	42.7
14/01/2024 01:00	48	42.4
14/01/2024 01:15	46.4	41.9
14/01/2024 01:30	46.9	42.5
14/01/2024 01:45	46.8	43
14/01/2024 02:00	47.9	40.8
14/01/2024 02:15	45.8	42.3
14/01/2024 02:30	45.6	43
14/01/2024 02:45	45.1	42.8
14/01/2024 03:00	46	42.6
14/01/2024 03:15	45.1	41
14/01/2024 03:30	45.5	41.6
14/01/2024 03:45	45.8	42.1
14/01/2024 04:00	46.9	42.7
14/01/2024 04:15	47.2	43
14/01/2024 04:30	45	40.3
14/01/2024 04:45	45.6	42.7
14/01/2024 05:00	47.1	43.9
14/01/2024 05:15	48.8	45.3
14/01/2024 05:30	50.8	46.6
14/01/2024 05:45	49.8	45.9
14/01/2024 06:00	51	45.1
14/01/2024 06:15	48.9	46.5
14/01/2024 06:30	50.4	47.3
14/01/2024 06:45	51.2	48.4
14/01/2024 07:00	52.3	48.4
14/01/2024 07:15	51.4	49.3
14/01/2024 07:30	51.9	49.6
14/01/2024 07:45	53.1	50.5
14/01/2024 08:00	51.7	49.5
14/01/2024 08:15	52	50.1
14/01/2024 08:30	51.3	49.3
14/01/2024 08:45	52.6	49.8
14/01/2024 09:00	51.8	49.6
14/01/2024 09:15	55.4	52.3
14/01/2024 09:30	54.4	51.6
14/01/2024 09:45	55	53.1
14/01/2024 10:00	55.9	53.3

14/01/2024 10:15	56.5	54.5
14/01/2024 10:30	56.5	54.5
14/01/2024 10:45	55.6	53.3
14/01/2024 11:00	55.2	53.5
14/01/2024 11:15	55.7	54.4
14/01/2024 11:30	55.9	54
14/01/2024 11:45	57.3	55.4
14/01/2024 12:00	56.9	55.6
14/01/2024 12:15	56.1	55.1
14/01/2024 12:30	55.1	53.8
14/01/2024 12:45	56.5	54.7
14/01/2024 13:00	57.5	55.9
14/01/2024 13:15	56.8	54.5
14/01/2024 13:30	56.7	54
14/01/2024 13:45	56.7	54.9
14/01/2024 14:00	56.2	54.5
14/01/2024 14:15	56.8	55.2
14/01/2024 14:30	56.7	55.2
14/01/2024 14:45	55.5	53.6
14/01/2024 15:00	55.1	53.3
14/01/2024 15:15	56.2	54.5
14/01/2024 15:30	56.1	54
14/01/2024 15:45	56.5	53.3
14/01/2024 16:00	55.1	53.2
14/01/2024 16:15	54.4	52.4
14/01/2024 16:30	55	51.3
14/01/2024 16:45	55.3	52.1
14/01/2024 17:00	55.1	50.2
14/01/2024 17:15	52.3	50.1
14/01/2024 17:30	51.9	49.1
14/01/2024 17:45	51.1	48.1
14/01/2024 18:00	51.7	49.8
14/01/2024 18:15	51.9	49.5
14/01/2024 18:30	54.4	48.7
14/01/2024 18:45	50.4	47.5
14/01/2024 19:00	51.3	47
14/01/2024 19:15	50.4	46.9
14/01/2024 19:30	52	47.5
14/01/2024 19:45	55.8	47.4
14/01/2024 20:00	49.7	46.7
14/01/2024 20:15	50.5	46.5
14/01/2024 20:30	51	47.1
14/01/2024 20:45	49.3	45.9
14/01/2024 21:00	49.3	45.4
14/01/2024 21:15	48.4	44.2
14/01/2024 21:30	49.3	43

14/01/2024 21:45	47.5	42.5
14/01/2024 22:00	52.3	40.2
14/01/2024 22:15	45.9	40
14/01/2024 22:30	47.4	40.9
14/01/2024 22:45	46.7	41.1
14/01/2024 23:00	46	41.9
14/01/2024 23:15	47.5	44.2
14/01/2024 23:30	49.5	42.4
14/01/2024 23:45	46.3	40.1
15/01/2024 00:00	45.9	40.7
15/01/2024 00:15	44.8	39
15/01/2024 00:30	44.7	39.7
15/01/2024 00:45	44.9	39.9
15/01/2024 01:00	44	38.7
15/01/2024 01:15	44	41
15/01/2024 01:30	43.5	39.1
15/01/2024 01:45	44.2	40.2
15/01/2024 02:00	43.5	37.2
15/01/2024 02:15	43.1	37.7
15/01/2024 02:30	43.2	38
15/01/2024 02:45	44.2	40.4
15/01/2024 03:00	43.8	39.4
15/01/2024 03:15	44.2	40.5
15/01/2024 03:30	45.5	41.5
15/01/2024 03:45	45.2	41.8
15/01/2024 04:00	45.2	41.6
15/01/2024 04:15	46	41.2
15/01/2024 04:30	46.5	42.5
15/01/2024 04:45	47.2	43.9
15/01/2024 05:00	51.5	46
15/01/2024 05:15	50.9	48.1
15/01/2024 05:30	50.8	47.7
15/01/2024 05:45	50.8	47.7
15/01/2024 06:00	49.9	46.7
15/01/2024 06:15	49.4	46.3
15/01/2024 06:30	50.9	47.1
15/01/2024 06:45	51.6	48.6
15/01/2024 07:00	58.3	49.1
15/01/2024 07:15	58.4	51.6
15/01/2024 07:30	54.4	51.8
15/01/2024 07:45	54.9	52.8
15/01/2024 08:00	55.2	53.1
15/01/2024 08:15	58.9	55
15/01/2024 08:30	60.9	57.8
15/01/2024 08:45	57.2	53.8
15/01/2024 09:00	55.2	53.5

15/01/2024 09:15	55.3	53.5
15/01/2024 09:30	62.4	52.5
15/01/2024 09:45	54.8	52.2
15/01/2024 10:00	55.7	53.1
15/01/2024 10:15	56.3	52
15/01/2024 10:30	55	52.1
15/01/2024 10:45	59.9	53.7
15/01/2024 11:00	56	52.6
15/01/2024 11:15	56	52.8
15/01/2024 11:30	55.1	52.5
15/01/2024 11:45	56	53