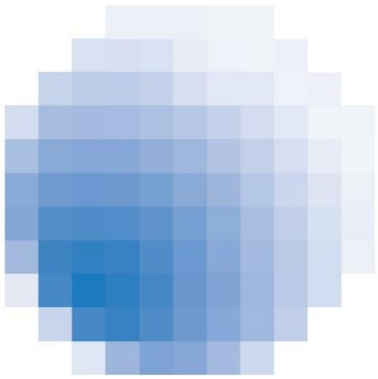


sol
acoustics

Unit 11, Brunel Court, Gadbrook Park, CW9 7LP

tel 01565 632 535
email info@solacoustics.co.uk
web www.solacoustics.co.uk

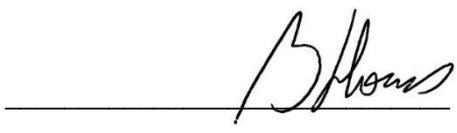
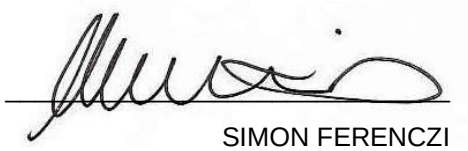
Newport EfW

Alexandra Docks, Newport

Environmental Noise Impact Assessment

P1889-REP01-REV B-BDH

19 January 2021

PROJECT:	Newport EfW Alexandra Docks, Newport Environmental Noise Impact Assessment
CLIENT:	Sol Environment Ltd 7 Greenway Farm Bath Road, Wick Bristol BS30 5RL
DOCUMENT REFERENCE:	P1889-REP01-REV B-BDH
SIGNED:	 BRIAN HORNER
CHECKED:	 SIMON FERENCZI
DATE:	19 January 2021

CONTENTS

1 EXECUTIVE SUMMARY

Sol Acoustics Ltd ("Sol") has been appointed to provide an environmental noise impact assessment for the proposed Energy from Waste (EfW) plant to be located at the Alexandra Docks in Newport, NP20 2WZ (the "Facility").

The purpose of this acoustic assessment is to determine appropriate maximum permissible environmental noise "Rating Level" limits and suggested corresponding "Specific Sound Level" limits to be achieved at all nearby noise sensitive residential housing, during daytime and night time periods, all in accordance with the methodology prescribed in relevant Standards and guidance (i.e. British Standard BS4142: 2014+A1:2019).

These adopted environmental noise limits have been derived from the results obtained from the benchmark environmental noise survey conducted by Sol, as carried out between c.10:15 hours during Thursday 20 August and c.12:00 hours during Tuesday 1 September 2020.

This acoustic assessment report also provides an acoustic assessment of the environmental noise impact that is expected to arise from the anticipated operation of key plant and processes associated with the proposed Facility at the nearest noise sensitive residential housing (i.e. receptors).

It is the conclusion of this environmental noise impact assessment that the total, aggregate environmental noise impact as arising from the proposed operation of the Facility, with duly implemented Noise Mitigation Plan (NMP), is capable of meeting the specified maximum permissible environmental noise Rating Level limits, resulting in a "low impact" at the worst affected noise sensitive receptor, as during both daytime and night time periods, all as assessed in accordance with British Standard BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

Please refer to the main report and appendices for further information.

2 INTRODUCTION

Sol Acoustics Ltd ("Sol") has been appointed to provide an environmental noise impact assessment for the proposed Energy from Waste (EfW) plant to be located at the Alexandra Docks in Newport, NP20 2WZ (the "Facility"). The purpose of this acoustic assessment is as follows:

- Identify the nearest pre-existing housing to the site, (i.e. noise sensitive receptors, NSRs), which is most likely to be affected by environmental noise arising from plant and/or processes associated with the operation of the Facility.
- Determine the prevailing, pre-existing daytime and night time background noise climate at the NSRs, through direct, environmental noise measurement.
- Suggest appropriate environmental noise level limits for the Facility, in the form of "Specific Sound Level" and "Rating Level" limits at the identified NSRs, all in accordance with the methodology prescribed in relevant Standards and guidance (i.e. British Standard 4142: 2014+A1:2019).
- Identify key noise sources which are likely to form part of the Facility, such as specific, fixed items of processing plant and machinery, as well as noise generated from HGVs and other mobile plant movements.
- Obtain indicative source noise level data for the various acoustically significant plant items identified (as based on Sol's experience and noise level data as obtained at similar facilities).
- Calculate the resultant environmental noise contribution and impact at the NSRs, as during daytime and night time periods, taking germane factors into account such as distance to receptors, acoustic screening and other environmental features.
- Specify, in outline terms, the likely requirements for any noise mitigation to be implemented such that the environmental noise levels arising from the Facility are capable of achieving the derived Rating Level limits.

This acoustic report is structured as follows:

- Section 3 provides a basic description of the Facility and key surrounding NSRs.
- Section 4 provides summary details of the benchmark environmental noise survey undertaken in order to determine the pre-existing environmental noise climate at the identified NSRs.
- Section 5 provides details of the results of the benchmark environmental noise survey.
- Section 6 provides a summary of the pertinent acoustic Standard, namely BS4142, for the assessment of the potential noise impact.
- Section 7 provides a summary of the proprietary 3D acoustic models constructed and acoustic calculations undertaken.
- Section 8 provides a BS4142 acoustic assessment, and a summary description of the environmental noise mitigation measures which will be required.
- Section 9 provides a conclusion statement.

3 DESCRIPTION OF SITE

3.1 General Overview and Noise Sensitive Receptors (NSRs)

The Facility is to be located off West Way Road at the existing Alexandra Docks in Newport, within an existing industrial estate. The site is situated in a predominantly industrial setting with agricultural and residential uses located further afield.

The nearest identified existing noise sensitive premises to the Facility are as follows:

A. Housing off Morgan Way, located c.1.1 kilometres to the west

B. Fair Orchard Farm, located c.1.3 kilometres to the south west

C. Housing on Heol Pont-y-Cwcw located c.900 metres to the south west

D. Housing on W Nash Road, located c. 2.6 kilometres to the south east

E. Housing off Watch House Parade, located c.1.4 kilometres to the north

Figure 1 indicates the location of the Facility in relation to the nearest pre-existing NSRs, and also the location of the noise monitoring positions that were used in order to inform the acoustic assessment (these are discussed in Section 4 of this report).

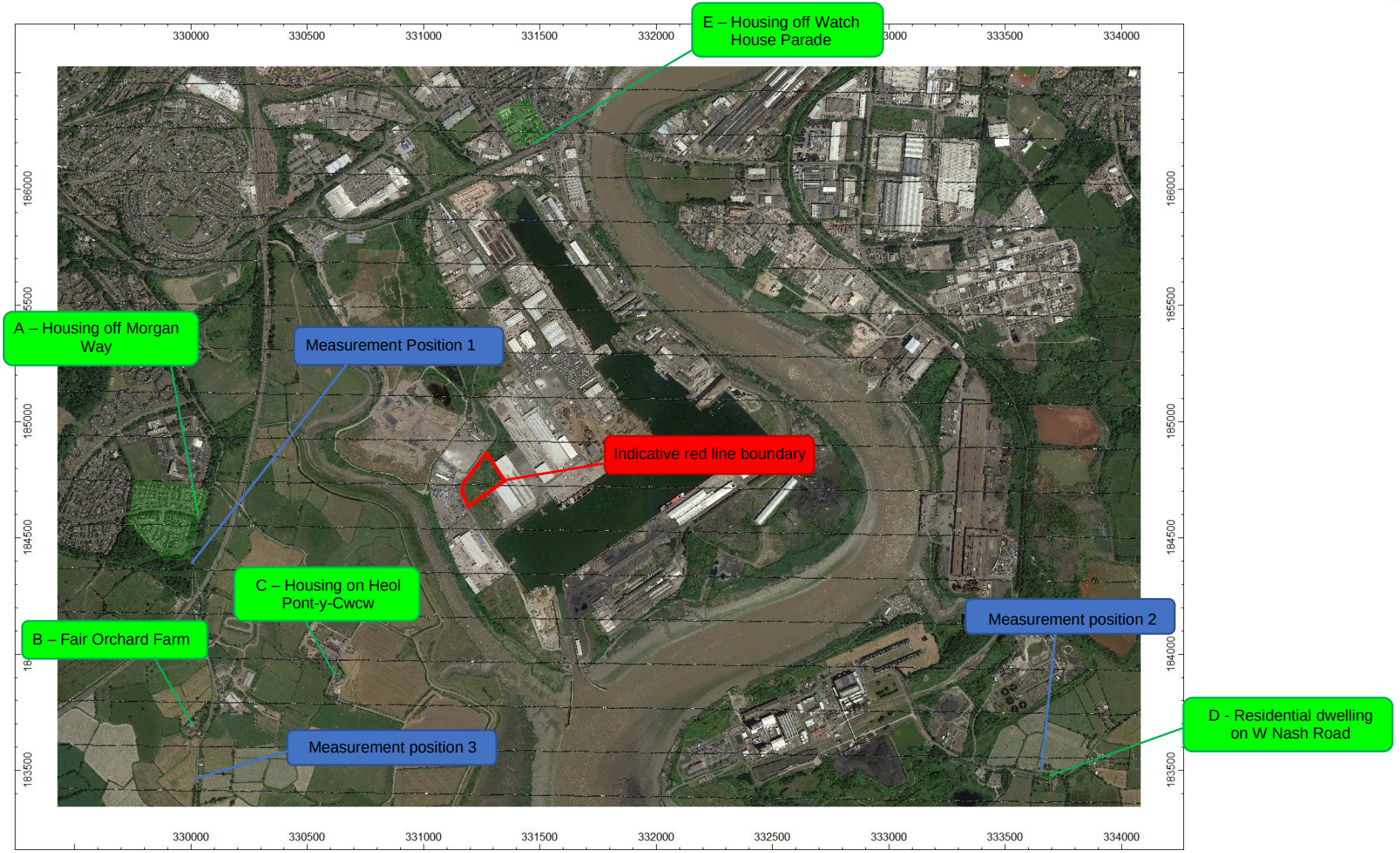


Figure 1: Development site and the surroundings

3.2 Characteristics of the Facility

3.2.1 Overview

The Facility accepts and processes up to 260,000 tonnes per annum of Refuse Derived Fuel (RDF) feedstocks and is capable of generating up to 20MWe of electrical power (Maximum Continuous Rating, MCR). The proposed Facility will include the following key elements:

- Fuel Reception Hall, including pre-treatment plant
- Gasification and boiler plant room
- Steam Turbine Generator room
- Air-Cooled Condenser (ACC)
- Silos
- Firewater tanks
- Office and admin areas

Figure 2 indicates the proposed site layout of the Facility. Figure 3 provides the proposed building elevations.

3.2.2 External Building Fabric

Sol is advised that the wall constructions to all proposed buildings shall comprise 80mm thick insulated Kingspan cladding panels. The roof shall comprise 100mm thick insulated Kingspan panels, with 10% of the total roof area to be translucent panels.

3.2.3 Mobile Plant

Two telescopic handlers / front loaders shall operate within the Fuel Reception Building.

3.2.4 Site Deliveries and Collections

The Client has confirmed that there could be up to 28 feedstock deliveries and up to 8 ash collections per day, as occurring during the following daytime and evening periods only:

- 07:00 – 19:00 hours Monday to Saturday
- 08:00 – 16:00 hours Sunday

3.2.5 Anticipated Noise Level Emissions

The Client has confirmed to Sol the anticipated noise level emissions as expected from key plant in processes in broadband A-weighted terms. This information is summarised in Appendix G of this report. The Client has not advised whether the stated sound levels are provided in sound power level or sound pressure level terms. For the purpose of this acoustic assessment, it has been assumed all stated noise level are in sound pressure level terms at one metre distance.

Appendix E provides a full inventory of all identified acoustically significant plant and processes which have the potential to create an environmental noise impact at nearby NSRs; this information has been used to inform this acoustic assessment.

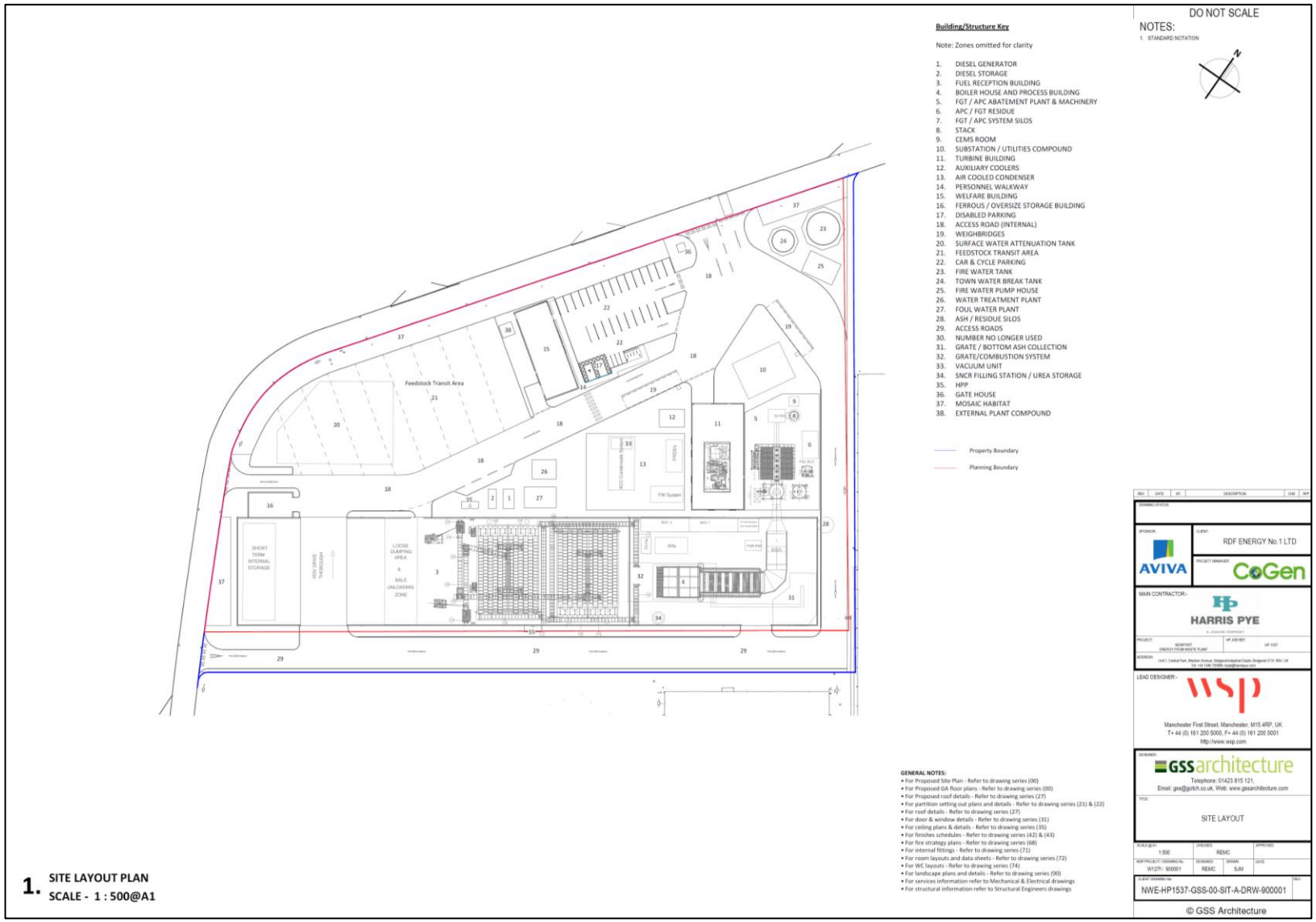


Figure 2: Proposed site layout

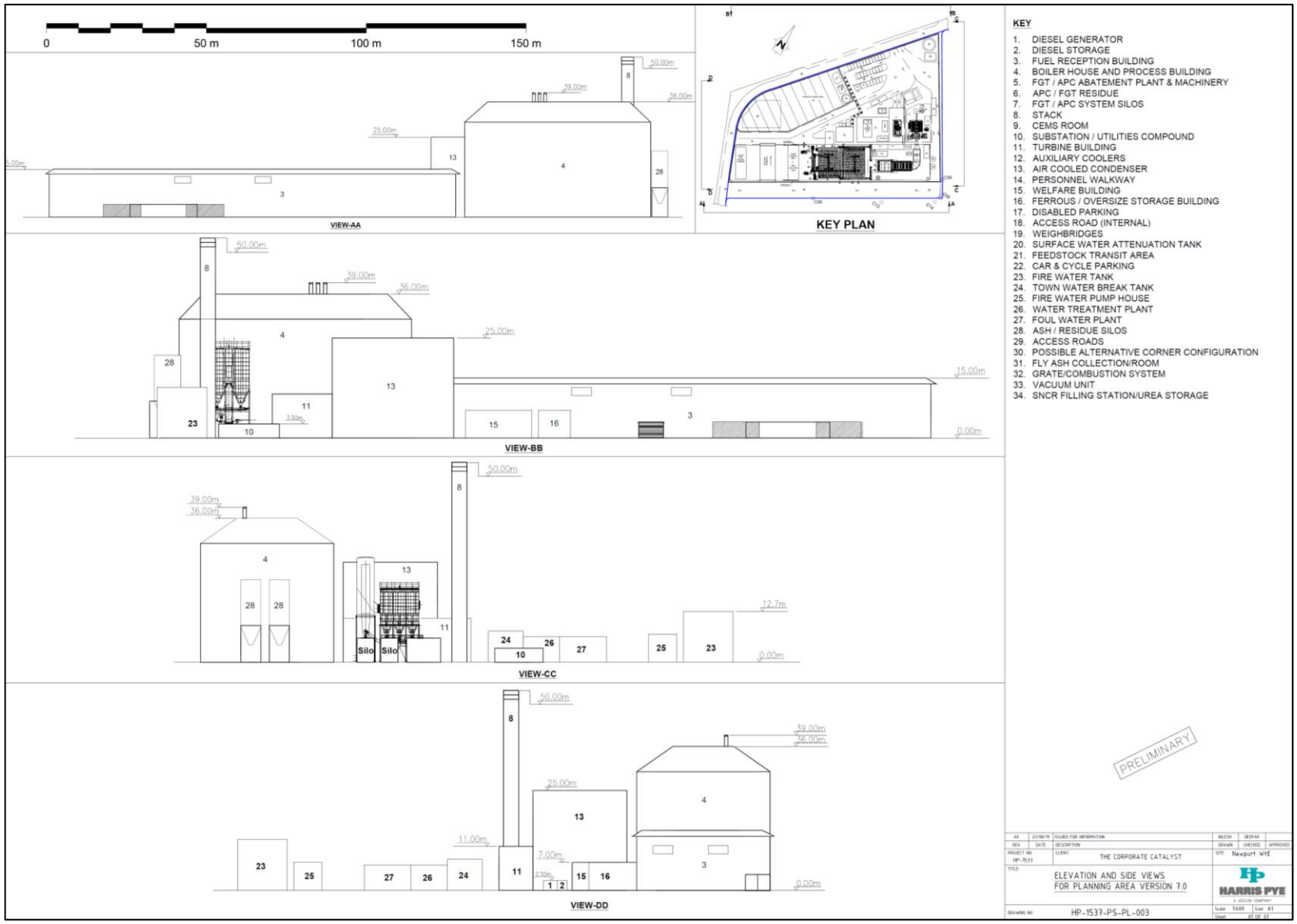


Figure 3: Proposed building elevations

4 DETAILS OF INVESTIGATION

4.1 Pre-existing Environmental Noise Climate

In order to inform the acoustic assessment, an environmental noise survey has been conducted by Sol between c.10:15 hours during Thursday 20 August and c.12:00 hours during Tuesday 1 September 2020. The purpose of this survey was to determine the prevailing pre-existing background sound levels at the nearest noise sensitive receptors (NSRs) to the Facility, as during typical weekend and weekday, daytime and night time periods, for environmental noise benchmarking and subsequent acoustic impact assessment purposes.

The environmental noise survey consisted of three unmanned environmental noise measurement positions:

- **Noise Monitoring Position 1**: Mast mounted microphone and weather station sited at c.1.8 metres above local ground level, c.40 metres to the south of the residential development on Morgan Way. Long term unattended environmental noise levels were recorded at this position between c.10:15 hours during Thursday 20 August and c.12:00 hours during 1 September 2020.

- **Noise Monitoring Position 2**: Mast mounted microphone sited at c.3.5 metres above local ground level, situated outside the front garden of a residential premises on West Nash Road. Long term unattended environmental noise levels were recorded at this position between c.14:15 hours during Thursday 20 August and c.12:00 hours during 1 September 2020.

- **Noise Monitoring Position 3**: Mast mounted microphone sited at c.6 metres above local ground level on Lighthouse Road (B4239). Long term unattended environmental noise levels were recorded at this position between c.14:15 hours during Thursday 20 August and c.12:00 hours during 1 September 2020.

The locations of the noise monitoring positions are shown in Figure 1. The full results are as presented in Appendix B.

The noise survey was carried out using Type 1 Precision Grade noise monitoring equipment, and the complete measuring systems were field calibrated immediately prior to and following the noise survey period. (Full details of the noise monitoring systems are retained on file by Sol, including traceable calibration records; these are available for review if needed).

Meteorological data was recorded at Noise Monitoring Position 1 for the duration of the noise survey, as using a Professional Grade Vaisala “WXT520” weather station. The prevailing weather conditions remained favourable for the majority of the survey period for the purposes of environmental noise assessment. Heavy rainfall was recorded during Monday 24 August, Thursday 27 August, and Friday 28 of August 2020; the corresponding noise data has been excluded from the dataset. Mean wind speeds remained below $5ms^{-1}$ for the duration of the survey. Notwithstanding the weather conditions recorded, the microphone systems were entirely weatherproofed and fitted with all-weather environmental windshields, each with bird spike.

5 ENVIRONMENTAL NOISE SURVEY RESULTS

5.1 Pre-Existing Environmental Noise Climate

Appendix B provides a detailed time history for the background noise levels as recorded at each of the measurement positions for the duration of the environmental noise survey and provides confirmation of the equipment used.

Tables 1 to 3 provides a basic summary of the typical overall, A-weighted noise levels measured at Measurement Positions 1 to 3 respectively, in $L_{Aeq,T}$ and $L_{A90,15min}$ terms. The specific, measured noise levels pertinent to the required BS4142 environmental noise assessment are highlighted in ***bold, italic*** text:

Date	Daytime (07:00 – 23:00 Hours)		Night Time (23:00 – 07:00 Hours)	
	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)
Thursday 20 August 2020	59[1]	46	56	43
Friday 21 August 2020	60	47	51	37
Saturday 22 August 2020	58	46	48	38
Sunday 23 August 2020	57	***42***	52	31
Monday 24 August 2020	59	41	55	37
Tuesday 25 August 2020	62	53	53	40
Wednesday 26 August 2020	59	43	51	32
Thursday 27 August 2020	60	***42***	55	37
Friday 28 August 2020	59	44	48	39
Saturday 29 August 2020	56	***42***	45	***33***
Sunday 30 August 2020	55	37	47	36
Monday 31 August 2020	57	35	49	28
Tuesday 1 September 2020	58[1]	39	-	-
[1] Measurement not conducted over the full 16-hour daytime assessment period				

Table 1: Summary of typical, measured broadband environmental noise levels at Measurement Position 1

Date	Daytime (07:00 – 23:00 Hours)		Night Time (23:00 – 07:00 Hours)	
	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)
Thursday 20 August 2020	58[1]	40	60	47
Friday 21 August 2020	62	44	56	44
Saturday 22 August 2020	60	44	49	***35***
Sunday 23 August 2020	60	39	50	36
Monday 24 August 2020	60	***33***	53	37
Tuesday 25 August 2020	67	55	54	42
Wednesday 26 August 2020	60	42	48	***35***
Thursday 27 August 2020	59	37	52	39
Friday 28 August 2020	61	46	51	45
Saturday 29 August 2020	60	43	51	39
Sunday 30 August 2020	60	39	49	38
Monday 31 August 2020	60	31	52	33
Tuesday 1 September 2020	61[1]	31	-	-
[1] Measurement not conducted over the full 16-hour daytime assessment period				

Table 2: Summary of typical, measured broadband environmental noise levels at Measurement Position 2

Date	Daytime (07:00 – 23:00 Hours)		Night Time (23:00 – 07:00 Hours)	
	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)
Thursday 20 August 2020	66[1]	44	58	40
Friday 21 August 2020	66	44	55	39
Saturday 22 August 2020	65	41	54	***30***
Sunday 23 August 2020	64	***35***	58	***30***
Monday 24 August 2020	66	***35***	61	32
Tuesday 25 August 2020	69	51	58	37
Wednesday 26 August 2020	66	38	58	***30***
Thursday 27 August 2020	67	***35***	61	33
Friday 28 August 2020	68	38	55	37
Saturday 29 August 2020	65	36	53	33
Sunday 30 August 2020	64	37	55	33
Monday 31 August 2020	66	***35***	57	32
Tuesday 1 September 2020	67[1]	36	-	-
[1] Measurement not conducted over the full 16-hour daytime assessment period				

Table 3: Summary of typical, measured broadband environmental noise levels at Measurement Position 3

6 ENVIRONMENTAL NOISE PERFORMANCE SPECIFICATION REQUIREMENTS

6.1 BS4142: 2014+A1: 2019 '*Method for rating and assessing industrial and commercial sound*'

British Standard BS4142: 2014+A1: 2019: '*Method for rating and assessing industrial and commercial sound*' (BS4142) is intended to be used to assess environmental noise of an industrial nature, which includes sound from fixed installations, which comprise mechanical and electrical plant and equipment.

The procedure contained in BS4142 for assessing the impact is to compare the measured or predicted noise level from the source in question, the 'Specific Sound Level' immediately outside the noise sensitive premises, with the "Background Sound Level". Where the noise contains attention attracting characteristics (i.e. acoustic features) such as tonal, impulsive, intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level to obtain the "Rating Level".

BS4142 states that the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level and the context in which the sound occurs:

- Typically, the greater this difference, the greater the magnitude of the 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.
- 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.

For the daytime, the assessment is carried out over a one-hour period, and over a 15-minute period at night. The daytime and night time periods are typically defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours respectively.

In full accordance with BS4142 methodology, the context in which the sound occurs must be taken into consideration when demining the magnitude of the noise impact. In this case, the Facility is located within an existing and operational industrial estate. Industrial noise from the proposed installation is expected to be within context of the site and the surroundings and as such, the context of the site is not expected to affect the magnitude of the noise impact generated.

On this basis, and based on the results of the environmental noise survey, Table 4 shows appropriate maximum permissible Rating Level limits which shall be applicable to Facility at each of the identified NSRs in order to achieve a BS4142 defined *Low Impact*, and should not be exceeded:

Noise Sensitive Receptors	**Representative Noise Measurement Position**	**Maximum Permissible Noise Rating Level Limit, dB $L_{Ar,Tr}$, for BS4142 defined *Low Impact***	
		Daytime (07:00 hours – 23:00 hours)	**Night Time (23:00 hours – 07:00 hours)**
A – Housing off Morgan Way (west of the Facility)	1	42	33
B – Fair Orchard Farm (south west of the Facility)	3	35	30
C – Housing on Heol Pont-y-Cwcw (south west of the Facility)	3	35	30
D – Housing on W Nash Road (south east of the Facility)	2	33	35

Table 4: Maximum permissible Rating Level limits, dB $L_{Ar,Tr}$, to achieve a BS4142 defined *low impact*

The above maximum permissible noise level limits are specified in terms of the BS4142 defined Rating Level. The acoustic character of the sound generated from the Facility must therefore be considered and where appropriate, an acoustic character correction (i.e. penalty) must be applied to the predicted Specific Sound Level when assessing compliance with the above specified receptor noise level limits.

At the time of reporting (January 2021), it was not possible to confirm the actual acoustic character that is expected to be present for noise specifically being emitted by the Facility, when perceived at the surrounding residential housing. However, environmental noise emissions from the Facility should be controlled such that the total aggregate noise level from all plant and processes does not include any discernible acoustic character (i.e. such as tonal, impulsive, intermittent features), for all Normal Operating Condition and also all Other Than Normal Operating Condition states (i.e. so-called “NOC” and “OTNOC” states respectively).

BS4142 states that ‘…*Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied*…’.

On this basis, Table 5 provides the corresponding maximum permissible Specific Sound Level limits which are applicable to the aggregate noise level emissions from all plant and processes associated with the Facility at the identified NSRs and should also not be exceeded:

Noise Sensitive Receptors	**Representative Noise Measurement Position**	**Maximum Permissible Specific Sound Level Limit, dB $L_{Aeq,T}$, for BS4142 defined *low Impact***	
		Daytime (07:00 hours – 23:00 hours)	**Night Time (23:00 hours – 07:00 hours)**
A – Housing off Morgan Way (west of the Facility)	1	39	30
B – Fair Orchard Farm (south west of the Facility)	3	32	27
C – Housing on Heol Pont-y-Cwcw (south west of the Facility)	3	32	27
D – Housing on W Nash Road (south east of the Facility)	2	30	32

Table 5: Maximum permissible Specific Sound Level limits, dB $L_{Aeq,T}$, (no discernible acoustically tonal, impulsive and/or intermittent features present)

7 ENVIRONMENTAL NOISE MODEL

7.1 Methodology and Basis of 3D Environmental Noise Models

In order to predict the likely noise levels impinging on the surrounding noise sensitive receptors, proprietary 3D computer noise models were created using the DataKustik "CadnaA" Noise Mapping software. The following assumptions have been made when building all the noise models:

(a) The noise model was set up to apply the noise prediction methodology set out in ISO 9613-2: '*Acoustics – Attenuation of Sound propagation outdoors – Part 2: General Method of Calculation'*.

(b) The model was set to include second order reflected noise from solid structures.

(c) Ground absorption, as defined in ISO 9613-2, has been taken into consideration in the construction of the model. The base ground absorption for the model has been set to G=1.0 (soft ground). The ground absorption for large tarmacked areas have been modelled as G=0.0 (hard ground).

(d) The existing land topography of the plant and surrounding area up to and including the nearest NSR has been taken into consideration in the assessment. Third party topographical information has been obtained from emapsite.com.

(e) The noise impact as expected at the worst affected NSRs during both the daytime and night time periods has been determined at a receptor grid height of 4 metres above local ground level to approximate first floor (bedroom) height.

(f) Sol is advised that the proposed building shall be of a steel frame construction and the wall constructions to all proposed buildings shall comprise 80mm thick insulated Kingspan cladding panels. The roof shall comprise 100mm thick insulated Kingspan panels. The location and construction details of other building elements, such as building rollershutters, personnel doors and building ventilation louvres are not shown on the proposed building elevations (as presented in Figure 3).

In the absence of full details at the time of reporting (January 2021), this acoustic assessment has been based on the sound insulation performance of a basic doorset and acoustic rated roller shutter (as well as acoustic rated ventilation louvres), all as summarised in Table 6. This stated minimum building element acoustic performance is required in all cases, and this forms part of the required Noise Management Plan appertaining to the Facility.

Building Element	Construction	Nominal Area of Coverage	Sound Reduction Index (SRI, dB) @ Octave Band Centre Frequency (Hz)							dB R_w
			63	125	250	500	1k	2k	4k	
Cladding	Kingspan KS1000 Rw	Façade:80% Roof: 90%	20	18	20	24	20	29	39	25
Roller shutter	Ascot Doors Roller Shutter	Façade: 10%	14	14	17	18	15	19	19	18
Personnel doors	Booths 29H 45mm Metal Door	Façade: 5%	18	24	25	28	30	29	34	30
Ventilation louvres	Allaway Acoustics AL3015 single banked acoustic louvre or similar *(note c.30% free area)*	Façade: 5%	5	6	8	11	18	25	20	17
Rooflights	Kingspan KS1000 DLTR	Roof: 10%	13	9	12	17	22	24	19	21

Table 6: Minimum required acoustic performance of external building fabric elements

The composite sound insulation performance of the façade and roof for all buildings modelled is presented in Table 7:

Building Element	Composite Sound Reduction Index (SRI, dB) @ Octave Band Centre Frequency (Hz)							dB R_w
	63	125	250	500	1k	2k	4k	
Facade	15	15	17	21	19	26	27	23
Roof	19	16	18	23	20	28	29	24

Table 7: Predicted composite sound insulation performance of external façade and roof

(g) The noise contribution from the identified plant proposed to be installed within the buildings has been predicted from the derived sound power level of each identified noise source (refer to Appendix E). This data has been used to determine the resultant reverberant sound pressure level within the building. Specifically, a reverberation time of 2.0 seconds has been assumed within all buildings.

(h) Environmental noise breakout from internal plant has been modelled by determining the level of noise radiated from the external building fabric of the building based upon the assessment methodology provided within British Standard *BS12354-4:2000: 'Building Acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 4: Transmission of indoor sound to the outside'*. The sound power level per unit area for each external building element has been determined from the predicted resultant reverberant sound pressure level calculations for each building and by applying a "diffusivity term", as defined in BS12354-4 and subtracting the calculated composite sound insulation performance of each building face. Specifically, a diffusivity term of -5dB have been assumed.

(i) The noise model assumes that all identified noise sources for all site operating modes (NOC, sootblowing, start-up and bypass) are operating simultaneously. Noise sources associated with emergency operation are not considered at this stage.

(j) The noise model assumes that on average up to five HGVs could arrive at and depart from the Facility during a typical 1-hour daytime assessment period. No HGVs are expected to arrive at, nor depart from the Facility during any night-time period.

(k) The introduction of noise mitigation to an existing noise source is likely to affect the noise frequency spectrum generated. At this early stage, where noise mitigation has been specified for a noise source, the predicted noise impact has been determined by assuming the noise contribution is dominated by low frequency noise (i.e. assumes a single sound pressure level in the 250Hz octave band equivalent to the stated A-weighted sound pressure level). This assumption has been adopted for the following reasons:

a. Noise emitted from mechanical plant, such as motors and fans etc. is typically higher and of most significance at low to mid frequency, most especially the 250Hz centre frequency octave band.

b. Low frequency noise is more difficult to attenuate when compared to the mid and high frequencies. The acoustic performance of an acoustic enclosure, attenuator or acoustic lagging tends to be lower at low frequencies, as compared to mid and high frequencies.

c. Any acoustic screening effects afforded by any intervening buildings and barriers is reduced at low frequency.

d. Attenuation due to atmospheric/environmental factors (such as air and ground absorption), is reduced at low frequency.

Figure 4 provides a three-dimensional visualisation of the noise model used to inform the noise impact assessment.

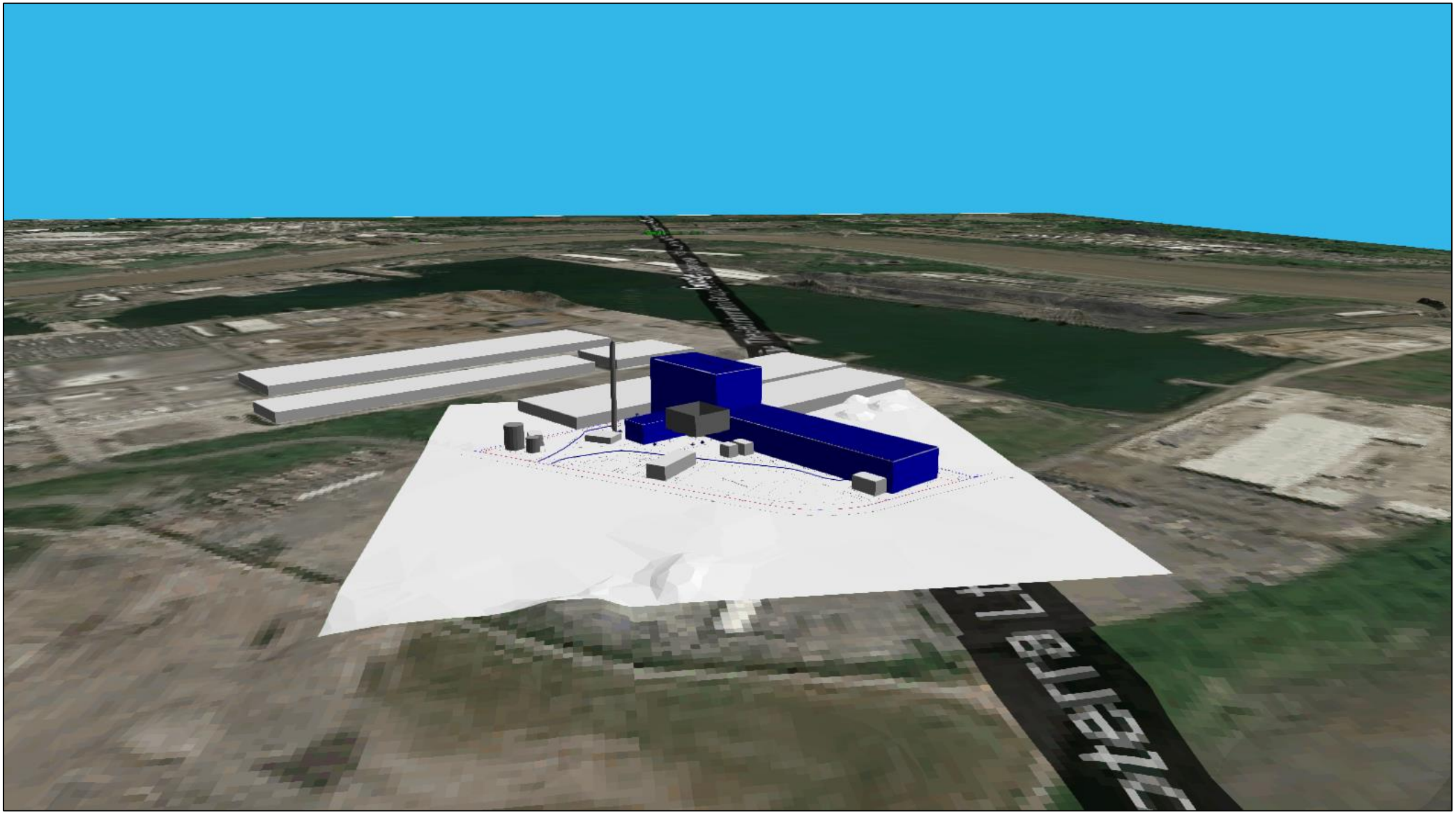


Figure 4: 3D view of the noise model of the plant

8 ENVIRONMENTAL NOISE IMPACT ASSESSMENT

8.1 BS4142 Assessment

Table 8 overleaf presents the predicted overall A-weighted, BS4142-defined Rating Level at the identified NSRs with the Noise Management Plan, as presented in Section 8.2, having been duly and fully implemented.

Appendix D provides full details of CadnaA noise maps which present the daytime and night-time Specific Sound Levels expected.

It shall be noted from the at-receptor noise level tables presented within Appendix D that the noise contribution from all individual noise sources are below the existing Background Sound Level at each receptor. As a result, any acoustic character associated with individual noise sources is not expected to be clearly discernible at the nearest noise sensitive receptor above the pre-existing environmental noise climate.

Furthermore, whilst individual noise sources associated with the Facility may generate noise with a particular acoustic character (i.e. such as tonal, impulsive, intermittent features), it is considered that such features would not be as prominent when observed when the remainder of the plant is running. For example, the tonal character of any individual noise source is likely to be less prominent when observed whilst other noise sources of similar magnitude, each with its own distinctive acoustic features, are running.

On this basis, and in accordance with BS4142, a conservative correction of +3dB has been applied to the calculated Specific Sound Level, as arising at the noise sensitive receptors from the Facility, in order to allow for any residual “readily distinctive” acoustic features, in order to determine the BS4142 defined Rating Level for acoustic assessment purposes.

Noise Sensitive Receptor	Assessment Period	Predicted Specific Level, dB $L_{Aeq,T}$	Predicted Rating Level, dB $L_{Ar,Tr}$	Maximum Permissible Noise Rating Level Limit, dB $L_{Ar,Tr}$, for BS4142 Defined *Low Impact*	Exceedance, dB
A – Housing off Morgan Way (west of the Facility)	Daytime (07:00hrs – 23:00hrs) T = 1 hour	30	33	42	-9
	Night Time (23:00hrs – 07:00hrs) T = 15 minutes	30	33	33	0
B – Fair Orchard Farm (south west of the Facility)	Daytime (07:00hrs – 23:00hrs) T = 1 hour	27	30	35	-5
	Night Time (23:00hrs – 07:00hrs) T = 15 minutes	27	30	30	0
C – Housing on Heol Pont-y-Cwcw (south west of the Facility)	Daytime (07:00hrs – 23:00hrs) T = 1 hour	29	32	35	-3
	Night Time (23:00hrs – 07:00hrs) T = 15 minutes	27	30	30	0
D – Housing on W Nash Road (south east of the Facility)	Daytime (07:00hrs – 23:00hrs) T = 1 hour	16	19	33	-14
	Night Time (23:00hrs – 07:00hrs) T = 15 minutes	15	18	35	-17

Table 8: BS4142 summary assessment (NMP fully implemented)

Thus, the total, aggregate environmental noise impact as arising from the proposed operation of the Facility, with fully and satisfactorily implemented Noise Mitigation Plan (NMP), is capable of meeting the specified maximum permissible environmental noise Rating Level limits, resulting in a “low impact” at the identified NSRs, as during both daytime and night time periods, and all as assessed in accordance with BS4142.

8.2 Preliminary Noise Management Plan (NMP)

Appendix E provides a preliminary Noise Management Plan, this being an itemised list of noise source mitigation measures which form the basis of the calculations and acoustic modelling underpinning the findings of this acoustic report. The finalised, actual noise mitigation strategies to be implemented must be reviewed, further developed, refined and approved by the Acoustic Consultant.

The provisional, outline noise mitigation measures that are assumed to be in place and are specifically required by this acoustic assessment report are as summarised below.

Please note that the noise impact from any plant which is not listed in Appendix E must be duly assessed. (Sol is to be advised by the Client if this list is not fully exhaustive and inclusive please). The actual/anticipated noise level emissions as expected from the plant must be confirmed and reviewed once available. This acoustic assessment must be reviewed and updated once this information becomes available:

(a) **Mobile plant**: All HGVs, telehandlers etc. under the direct control of the Operator shall only use non-intrusive broadband noise type vehicle reversing alarms and/or reversing cameras. There shall be no use of pulsed and/or tonal reversing alarms (e.g. reversing bleepers).

(b) **External Building Fabric**: The construction of the external building fabric shall achieve the minimum sound insulation performance as set out in Table 9: *(NB: the requirement for acoustic louvres, including louvred doors where applicable, should be particularly noted. The specified acoustic louvres have a depth of 300mm and a free area of c.30%. Others must advise whether this will provide the minimum required ventilation to the building. Further details of the proposed ventilation louvres are provided in Appendix F*)

Building Element	Construction	Assumed Nominal Area of Coverage	Minimum Sound Reduction Index (SRI, dB) @ Octave Band Centre Frequency (Hz)							dB R_w
			63	125	250	500	1k	2k	4k	
Cladding	Kingspan KS1000 Rw	Façade:80% Roof: 90%	20	18	20	24	20	29	39	25
Roller shutter	Ascot Doors Roller Shutter	Façade: 10%	14	14	17	18	15	19	19	18
Personnel doors	Booths 29H 45mm Metal Door	Façade: 5%	18	24	25	28	30	29	34	30
Ventilation louvres	Allaway Acoustics AL3015 single banked acoustic louvre or similar *(note c.30% free area)*	Façade: 5%	5	6	8	11	18	25	20	17
Rooflights	Kingspan KS1000 DLTR	Roof: 10%	13	9	12	17	22	24	19	21

Table 9: Minimum required sound insulation performance to be achieved by external building fabric

(c) **Roller shutter and personnel doors**: Roller shutters and personnel doors must always be kept closed when not in use for immediate, momentary vehicle ingress/egress. They must not be used for ventilation or heat dissipation purposes etc. Induction loop automatic open/close operation is recommended.

(d) **Internal reverberant sound pressure levels**: based upon the list of anticipated internal noise sources and the assumed noise level emissions (as listed in Appendix E), as well as the anticipated sound insulation performance to be provided by the external building fabric, Table 10 sets out the predicted maximum permissible reverberant sound pressure levels to be achieved within the Fuel Reception Building, Boiler House and Turbine Hall:

Location	Maximum Permissible Reverberant Sound Pressure Level (dB $L_{eq,T}$) @ Octave Band Centre Frequency (Hz)								dB $L_{Aeq,T}$
	63	125	250	500	1k	2k	4k	8k	
Fuel Reception Building	87	84	82	79	79	76	73	65	84
Boiler House	85	83	82	79	79	77	75	71	84
Turbine Hall	79	79	80	81	82	82	83	81	89

Table 10: Maximum permissible reverberant sound pressure levels within buildings

(e) **Shredders**: Make provisions for acoustic enclosures to be fitted to the shredders in order to ensure that the noise levels produced do not exceed 85dB $L_{Aeq,T}$ at one metre from any enclosure surface. Where required, due consideration should be made for ventilation of the enclosure, for the control of dust, ventilation and/or heat gain dissipation. Any ventilation openings shall require acoustic attenuation such that the noise levels as specified in Appendix E can be achieved including at grilles, cowls and ventilation louvres; it is likely that any ventilation fans and other auxiliary electrical equipment will require an electrical spark arrestance rating (others must advise here, including in respect of any required explosion release panels etc. also).

(f) **FD fans (Primary and Secondary) case and motor:** An acoustic enclosure is required to both the primary and secondary FD fans to encapsulate the fan case, motor and any exposed flexible connectors within the adjoining ductwork, to achieve a sound pressure level of 75dB $L_{Aeq,T}$ at one metre from any surface. Attenuated forced draught ventilation to the enclosure will be needed, complete with run and standby fans (resilience).

(g) **FD fans (Primary and Secondary) air intake:** Noise from the air intake to the FD fan, shall not exceed 80dB $L_{Aeq,T}$ at 1m (maximum, when on full load and as measured on-axis). Make provisions for an attenuator to be fitted to the atmosphere side of the fan.

(h) **ID fan casing and motor**: An acoustic enclosure is required to the ID fan casing and motor, encapsulating any exposed flexible connectors within the adjoining ductwork also, in order to achieve a maximum sound pressure level of 75dB $L_{Aeq,T}$ at one metre from any surface. Attenuated forced draught ventilation to the enclosure will be needed, complete with run and standby fans (resilience).

(i) **ID fan stack outlet**: Noise from the ID fan stack outlet shall not exceed 80dB $L_{Aeq,T}$ at one metre from stack outlet edge, 90º off longitudinal axis of the stack at any design speed/mode. Make provisions for duct attenuator(s) to be fitted to the discharge side of the ID fan (including an allowance for the ensuing attenuator static pressure loss can be accommodated at maximum required gas flowrates).

(j) **External blowers**: Make provisions for acoustic enclosures to be fitted to ensure that the noise levels produced do not exceed 80dB $L_{Aeq,T}$ at one metre from any surface in each case. Attenuated forced draught ventilation to the enclosure will be needed, complete with run and standby fans (resilience).

(k) **Steam blow-offs (various)**: An attenuator is to be fitted to the duct of each steam blow-off, in order to achieve a sound pressure level of 85dB $L_{Aeq,T}$ at one metre (90º off longitudinal axis), for all possible modes of operation, including worst case.

(l) **Sootblowing**: Sootblowing to occur during the daytime period (i.e. between 07:00 – 23:00 hours) only.

(m) **Pneumatic blow-offs**: All pneumatic blow-offs and solenoids et al, such as those associated with the bag filter (Baghouse), must be fitted with high performance 'Silvent' pneumatic silencers or similar:

http://www.silvent.com/en-uk/products/?group=1702-air-nozzles

8.3 Uncertainty

Section 10 of BS4142: 2014 states the following with regards to uncertainty:

> '… *Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty*…'

In accordance with the requirements of BS4142, Sol have undertaken the following steps to limit the level of uncertainty in the acoustic assessment:

1. All noise measurements have been carried out using Type 1 Precision Grade noise mounting equipment. All noise measuring instruments have traceable laboratory calibration certification.

2. The environmental noise survey was conducted over a twelve-day period at three separate measurement positions.

3. All noise measurements were accompanied by continuous meteorological measurements as conducted at, or close to, the measurement position in order to ensure that the measurement data was not adversely affected by unfavourable weather conditions. Periods of adverse weather conditions have been excluded from the assessment.

4. Calculations have been conducted in line with appropriate and nationally recognised acoustic standards (ISO 9613-2, BS12354: 2000), and using proprietary 3D noise modelling software, CadnaA.

5. The assessment assumes downwind propagation in all cases as this represents the worst case.

Once the Noise Management Plan has been agreed, implemented and installed on site, Sol advises that comprehensive, post-completion acoustic testing be carried out to ensure that the noise impact has been suitably controlled.

9 CONCLUSION

Sol has been appointed to provide an environmental noise impact assessment for the proposed Energy from Waste (EfW) plant to be located at the Alexandra Docks in Newport, NP20 2WZ (the "Facility").

The purpose of this acoustic assessment is to determine appropriate maximum permissible environmental noise "Rating Level" limits and suggested corresponding Specific Sound Level limits for the Facility to be achieved at all nearby noise sensitive residential housing, during daytime and night time periods, all in accordance with the methodology prescribed in relevant Standards and guidance (i.e. British Standard BS4142: 2014+A1:2019).

These adopted environmental noise limits have been derived from the results obtained from the benchmark environmental noise survey conducted by Sol, as carried out between c.10:15 hours during Thursday 20 August and c.12:00 hours during Tuesday 1 September 2020.

This acoustic assessment report also provides an acoustic assessment of the environmental noise impact that is expected to arise from the anticipated operation of key plant and processes associated with the proposed Facility at the nearest noise sensitive residential housing.

It is the conclusion of this environmental noise impact assessment that the total, aggregate environmental noise impact as arising from the proposed operation of the Facility, with duly implemented Noise Mitigation Plan (NMP), is capable of meeting the specified maximum permissible environmental noise Rating Level limits, resulting in a "low impact" at the worst affected NSR as during both daytime and night time periods, all as assessed in accordance with British Standard BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMS

Term	Abbreviation	Description
Sound Pressure Level	L_{pA}	A measure of the (usually instantaneous) A-weighted sound pressure level. Typically expressed in dB(A) referenced to 2 x 10^{-5} Pascals.
Equivalent Continuous Sound Level	$L_{Aeq,T}$	The steady level of sound over a prescribed time period (*T*) which would contain the same total sound energy as the actual fluctuating noise under consideration as during the same time period (time-averaged noise level).
Statistical Sound Levels	L_{A10} and L_{A90}	The A-weighted sound pressure level that is statistically exceeded for a percentage of the time period being sampled, either 10% or 90% respectively.
Background Sound Level	$L_{A90,T}$	The A-weighted sound pressure level of the residual noise at an assessment position (e.g. receptor) that is statistically exceeded for 90% of a given time period (*T*).
Maximum Sound Level	L_{Amax}	The maximum sound or noise level recorded during a defined measurement time interval, with sound measuring instrumentation set to either a fast time weighting, L_{Afmax}, or a slow time weighting, L_{Asmax}.
Sound Power Level	L_{wA}	A measure of the total A-weighted sound energy radiated from a source (e.g. item of plant). Like sound pressure levels this is also expressed in dB(A), albeit referenced to 1 x 10^{-12} W.
Broadband		Noise data comprising of a wide frequency range (e.g. $L_{Aeq,T}$), as opposed to octave, one-third octave or narrow frequency band noise data.
Narrow-band		Acoustic Energy over a restricted range of frequencies. Used to identify the frequency of audible tones, and to assist in identifying sources of noise in a complex sound environment (e.g. via prominent, tell-tale narrow frequency spectrum).
Ambient Sound		Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
Specific Sound Level	$L_{eq,Tr}$	The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given referred time interval, *Tr*
Rating Level	$L_{Ar,Tr}$	The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.)
Residual Noise	$L_{Aeq,T}$	The ambient sound remaining at given position in a given situation when the specific sound source is suppressed to a degree such that it no longer contributes to the ambient sound.
Sound Reduction Index	*SRI*	The reduction in sound energy when transmitted through a panel or similar planar element, used typically in relation to single octave or one-third octave frequency band values.
Weighted Sound Reduction Index	R_w	The Sound Reduction Index expressed as a single figure.
Dynamic Insertion Loss	*DIL*	Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator).
NOC		Normal Operating Conditions
OTNOC		Other Than Normal Operating Conditions

APPENDIX B

NOISE SURVEY DETAILS AND SUMMARY RESULTS

LOCATION

Newport, Wales

DATES, TIMES AND WEATHER CONDITIONS

Date	Daytime (07:00 hours – 23:00 Hours)				Night Time (23:00 hours – 07:00 hours)			
	Temp, °C	Rain, mm/h	Wind Direction	Average Wind Speed, m/s	Temp, °C	Rain, mm	Wind Direction	Average Wind Speed, m/s
20/08/2020	19	-	NE	0.6	18	0.1	NE	0.7
21/08/2020	18	0.1	N	0.6	16	-	NW	0.5
22/08/2020	17	-	W	0.5	15	0.1	SW	0.2
23/08/2020	17	-	SW	0.4	14	-	SW	0.1
24/08/2020	18	-	SW	0.3	16	1.6	NE	0.5
25/08/2020	17	-	SW	0.8	16	-	SW	0.6
26/08/2020	17	-	SW	0.4	12	-	SW	0.1
27/08/2020	14	1.6	NE	0.2	13	0.8	SW	0.1
28/08/2020	14	0.1	W	0.4	11	-	W	0.4
29/08/2020	15	-	W	0.5	12	-	W	0.5
30/08/2020	14	-	NW	0.5	10	-	SW	0.2
31/08/2020	15	-	NE	0.2	11	-	SW	0.3
01/09/2020	13	-	SW	0.3	-	-	-	-

PERSONNEL

Josh McLelland – Sol Acoustics

INSTRUMENTATION

Measurement Position 1

01dB Cube Sound level meter (serial no. 11117)

01dB Pre22 Microphone preamplifier (serial no. 1610404)

GRAS 40CD Microphone capsule (serial no. 260827)

CAL 21 Acoustic Calibrator (serial no. 34675320)

Vaisala WXT520 Weather Station (serial no. M3640013)

Measurement Position 2
01dB Cube Sound level meter (serial no. 11228)
01dB Pre22 Microphone preamplifier (serial no. 1610782)
GRAS 40CD Microphone capsule (serial no. 287832)
CAL 21 Acoustic Calibrator (serial no. 34675320)

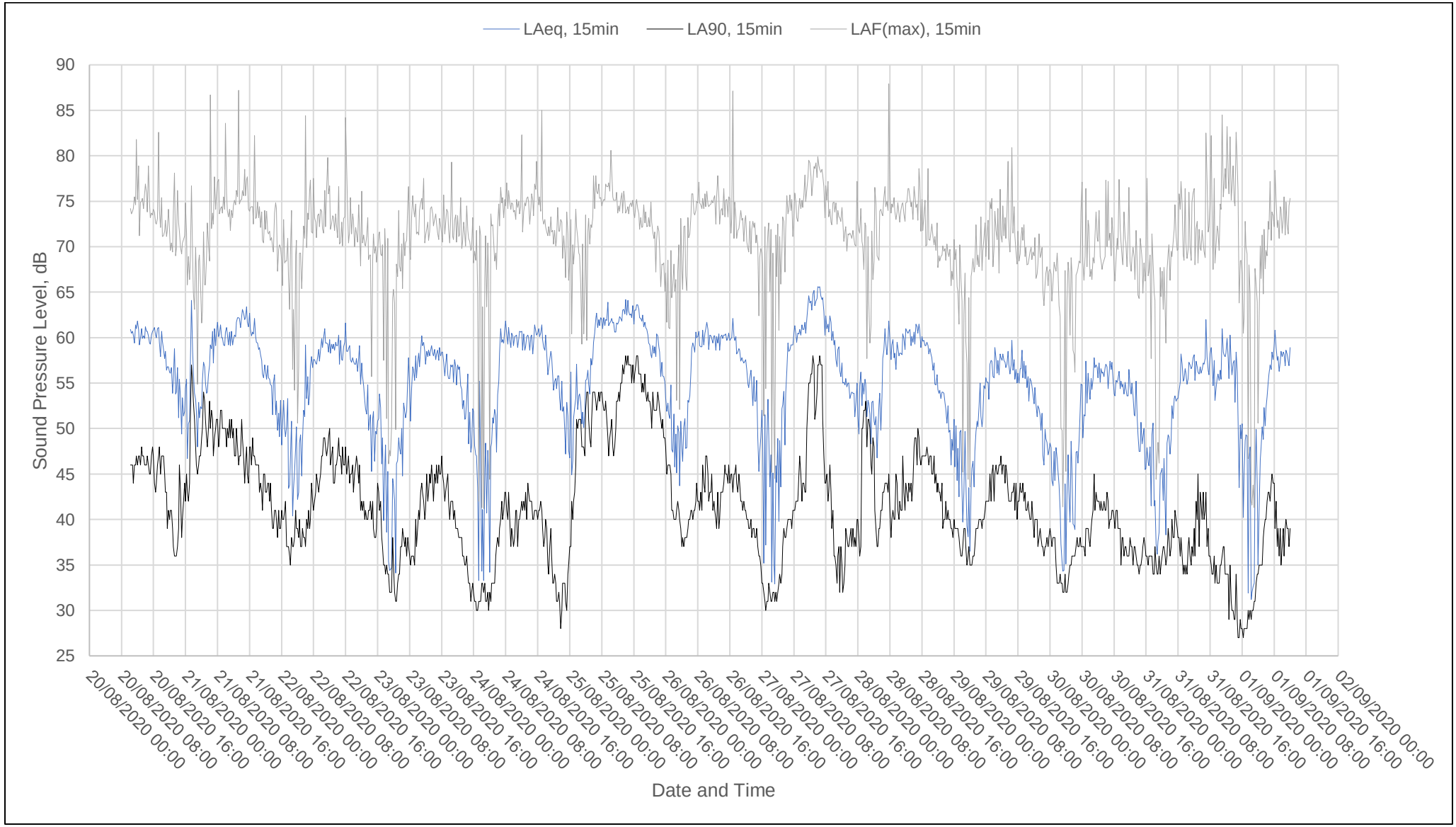
Measurement Position 3
01dB Cube Sound level meter (serial no. 11114)
01dB Pre22 Microphone preamplifier (serial no. 1610399)
GRAS 40CD Microphone capsule (serial no. 260807)
CAL 21 Acoustic Calibrator (serial no. 34675320)

METHODOLOGY

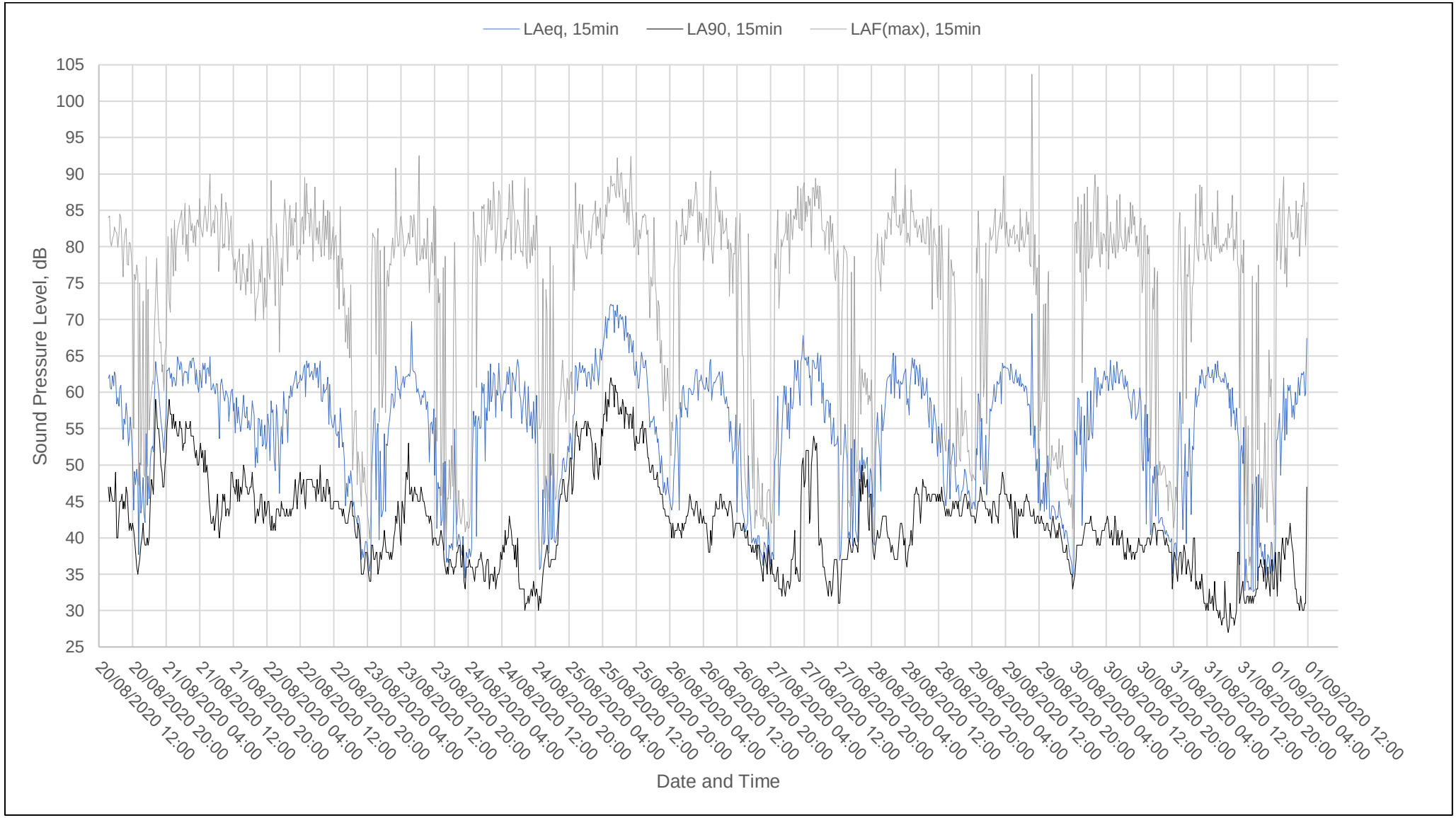
Before and after the measurements the noise monitoring equipment was calibrated to an accuracy of ±0.3dB using the Cal 21 Calibrator. The calibrator produces a sound pressure level of 94dB re 2 x 10^{-5} Pa @ 1kHz.

MEASUREMENT RESULTS

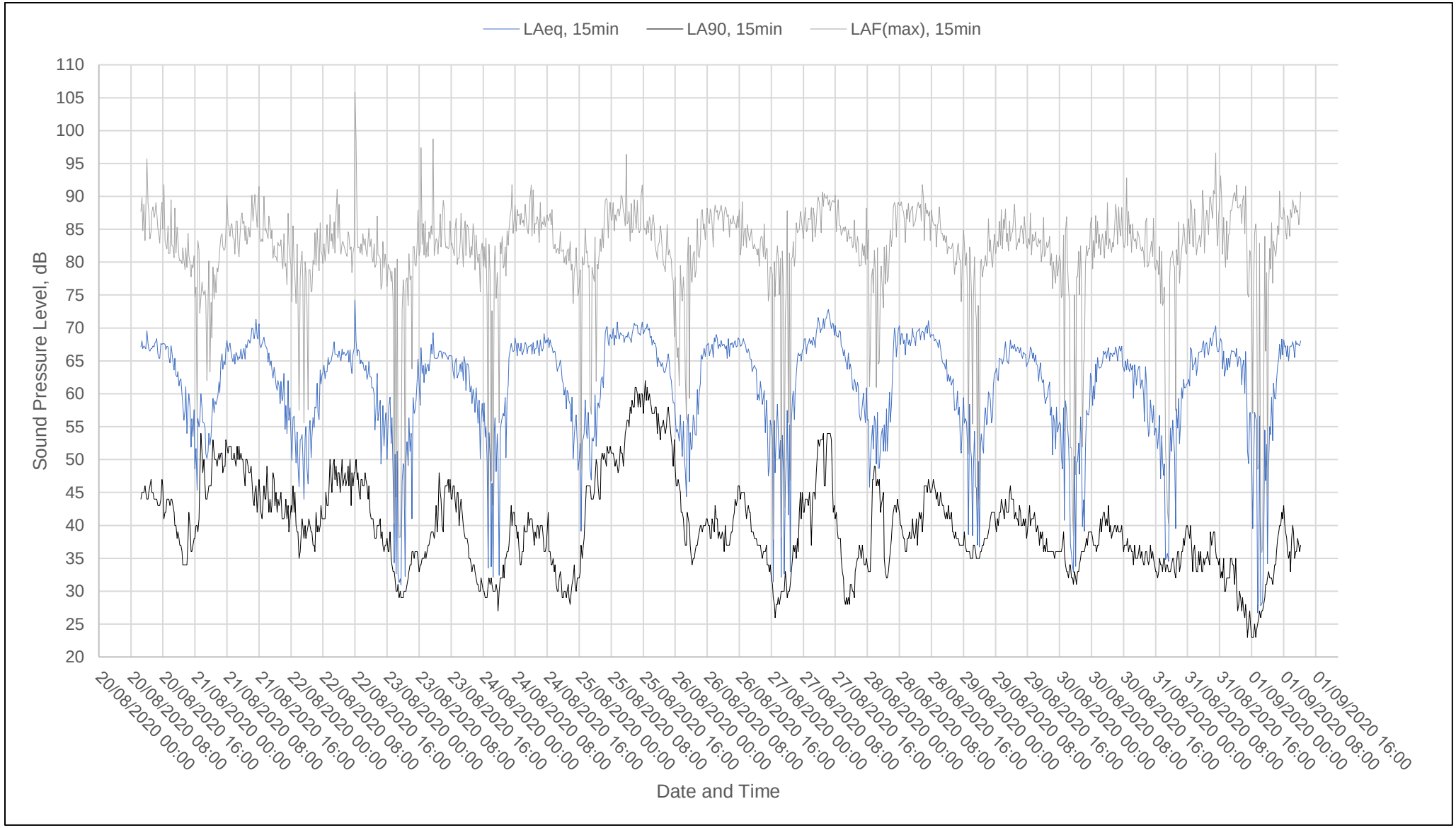
Graphs B1, B2 and B3 summarises the broadband A-weighted results obtained at Monitoring Positions 1, 2 and 3.



Graph B1: Measurement Position 1, 20 August to 1 September 2020



Graph B2: Measurement Position 2, 20 August to 1 September 2020



Graph B3: Measurement Position 3, 20 August to 1 September 2020

APPENDIX C

SITE PLAN INDICATING LOCATION OF NOISE SOURCES

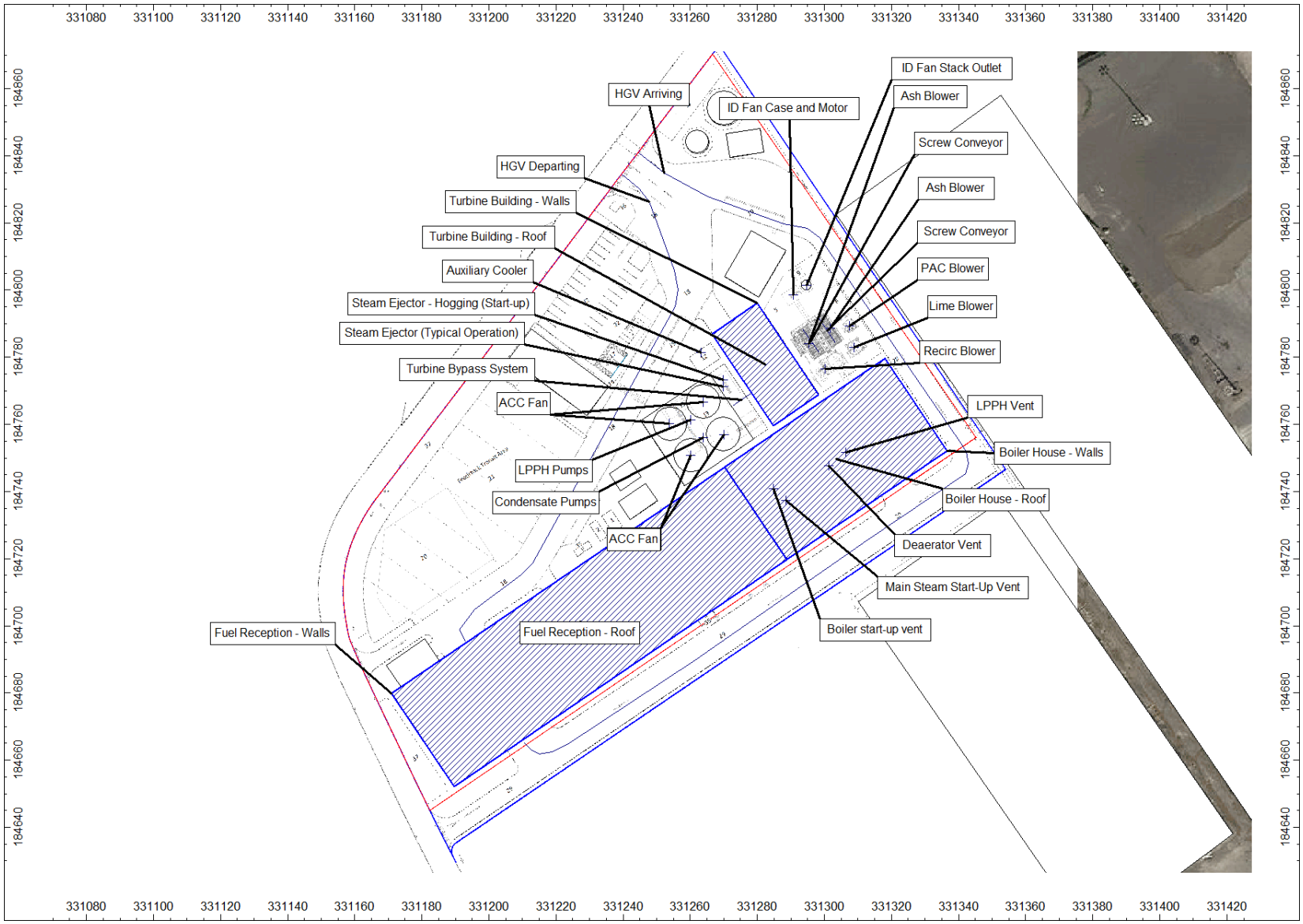


Figure C1: Site plan indicating grid coordinate references x, y coordinates for all external modelled noise sources

APPENDIX D

ENVIRONMENTAL NOISE MODELLING RESULTS

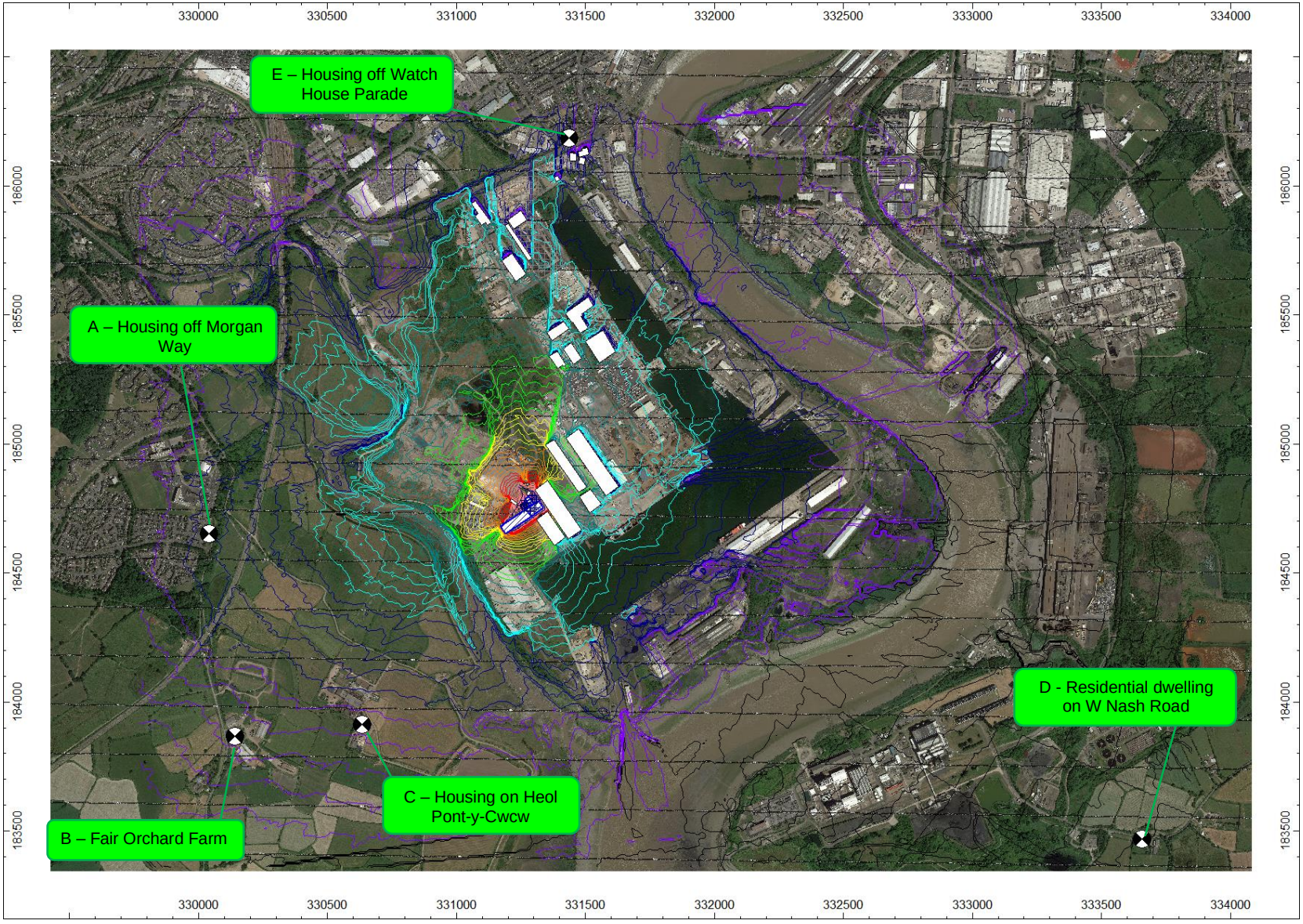


Figure D1: Predicted daytime $L_{Aeq,1hour}$ Specific Sound Level from the installation, at 4 metres grid height

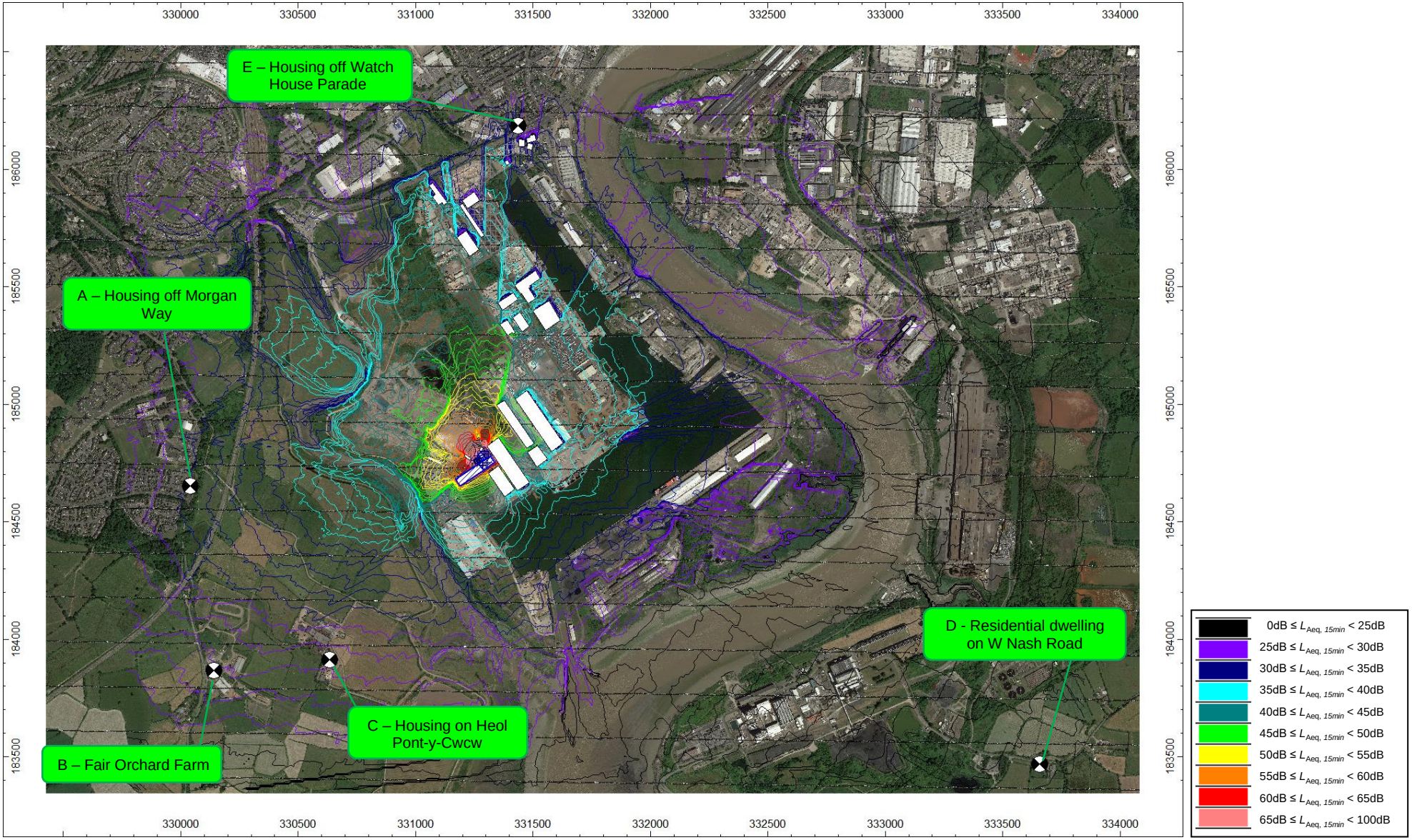


Figure D2: Predicted night time $L_{Aeq,15min}$ Specific Sound Level from the installation, at 4 metres grid height

A – Morgan Way NMP Duly Implemented Predicted Specific Sound Levels Daytime (07:00 – 23:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Auxiliary Cooler	20.6
Screw Conveyor	20.4
Screw Conveyor	20.2
LPPH Pumps	19.3
Turbine Bypass System	19.3
HGV Departing	18.0
ID Fan Case and Motor	17.9
ACC Fan	17.0
ID Fan Stack Outlet	16.6
ACC Fan	16.6
Condensate Pumps	16.6
Boiler House - Walls	15.2
Ash Blower	14.4
HGV Arriving	14.4
Fuel Reception - Walls	14.1
Lime Blower	13.3
ACC Fan	12.6
ACC Fan	12.4
Fuel Reception - Roof	12.4
Recirc Blower	11.9
Boiler start-up vent	11.9
Main Steam Start-Up Vent	11.3
Deaerator Vent	9.8
LPPH Vent	9.7
Turbine Building - Walls	9.4
Ash Blower	8.8
Boiler House - Roof	7.3
PAC Blower	5.5
Steam Ejector (Typical Operation)	3.8
Turbine Building - Roof	1.4
Steam Ejector - Hogging (Start-up)	0.5
Total	**30.4**

Table D1: A – Morgan Way NMP duly implemented Specific Sound Levels, daytime

A – Morgan Way NMP Duly Implemented Predicted Specific Sound Levels Night time (23:00 – 07:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Auxiliary Cooler	20.6
Screw Conveyor	20.4
Screw Conveyor	20.2
LPPH Pumps	19.3
Turbine Bypass System	19.3
ID Fan Case and Motor	17.9
ACC Fan	17.0
ID Fan Stack Outlet	16.6
ACC Fan	16.6
Condensate Pumps	16.6
Boiler House - Walls	15.2
Ash Blower	14.4
Fuel Reception - Walls	14.1
Lime Blower	13.3
ACC Fan	12.6
ACC Fan	12.4
Fuel Reception - Roof	12.4
Recirc Blower	11.9
Boiler start-up vent	11.9
Main Steam Start-Up Vent	11.3
Deaerator Vent	9.8
LPPH Vent	9.7
Turbine Building - Walls	9.4
Ash Blower	8.8
Boiler House - Roof	7.3
PAC Blower	5.5
Steam Ejector (Typical Operation)	3.8
Turbine Building - Roof	1.4
Steam Ejector - Hogging (Start-up)	0.5
HGV Arriving	n/a
HGV Departing	n/a
Total	**30.0**

Table D2: A – Morgan Way NMP duly implemented Specific Sound Levels, night time

B – Fair Orchard Farm NMP Duly Implemented Predicted Specific Sound Levels Daytime (07:00 – 23:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Auxiliary Cooler	18.0
Screw Conveyor	16.2
Screw Conveyor	15.4
HGV Arriving	15.3
ID Fan Stack Outlet	15.1
LPPH Pumps	15.1
Turbine Bypass System	14.9
HGV Departing	14.1
Boiler House - Walls	14.0
ACC Fan	13.7
ACC Fan	13.7
Condensate Pumps	13.2
ACC Fan	13.0
ACC Fan	13.0
Fuel Reception - Walls	12.7
Fuel Reception - Roof	11.4
Boiler start-up vent	10.9
Main Steam Start-Up Vent	10.3
Ash Blower	10.0
Recirc Blower	9.2
PAC Blower	8.7
Lime Blower	8.4
Deaerator Vent	8.2
LPPH Vent	8.1
Boiler House - Roof	5.4
Ash Blower	4.6
ID Fan Case and Motor	3.8
Turbine Building - Walls	2.5
Steam Ejector (Typical Operation)	1.4
Steam Ejector - Hogging (Start-up)	-3.4
Turbine Building - Roof	-5.1
Total	**27.3**

Table D3: B – Fair Orchard Farm NMP duly implemented Specific Sound Levels, daytime

B – Fair Orchard Farm NMP Duly Implemented Predicted Specific Sound Levels Night time (23:00 – 07:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Auxiliary Cooler	18.0
Screw Conveyor	16.2
Screw Conveyor	15.4
ID Fan Stack Outlet	15.1
LPPH Pumps	15.1
Turbine Bypass System	14.9
Boiler House - Walls	14.0
ACC Fan	13.7
ACC Fan	13.7
Condensate Pumps	13.2
ACC Fan	13.0
ACC Fan	13.0
Fuel Reception - Walls	12.7
Fuel Reception - Roof	11.4
Boiler start-up vent	10.9
Main Steam Start-Up Vent	10.3
Ash Blower	10.0
Recirc Blower	9.2
PAC Blower	8.7
Lime Blower	8.4
Deaerator Vent	8.2
LPPH Vent	8.1
Boiler House - Roof	5.4
Ash Blower	4.6
ID Fan Case and Motor	3.8
Turbine Building - Walls	2.5
Steam Ejector (Typical Operation)	1.4
Steam Ejector - Hogging (Start-up)	-3.4
Turbine Building - Roof	-5.1
HGV Arriving	n/a
HGV Departing	n/a
Total	**26.8**

Table D4: B – Fair Orchard Farm NMP duly implemented Specific Sound Levels, night time

C – Heol Pont-y-Cwcw NMP Duly Implemented Predicted Specific Sound Levels Daytime (07:00 – 23:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
HGV Arriving	21.0
Boiler House - Walls	19.8
Auxiliary Cooler	18.1
ID Fan Stack Outlet	17.7
ACC Fan	17.4
ACC Fan	16.6
Fuel Reception - Walls	16.4
Fuel Reception - Roof	14.2
Boiler start-up vent	14.0
HGV Departing	13.7
ACC Fan	13.6
Main Steam Start-Up Vent	13.5
Turbine Bypass System	11.9
Deaerator Vent	11.7
LPPH Vent	11.6
LPPH Pumps	9.8
Boiler House - Roof	8.9
Ash Blower	8.7
Screw Conveyor	6.6
ACC Fan	5.4
Steam Ejector (Typical Operation)	4.9
Ash Blower	4.7
ID Fan Case and Motor	4.4
Screw Conveyor	4.0
Condensate Pumps	1.9
Turbine Building - Walls	-0.4
Steam Ejector - Hogging (Start-up)	-0.8
PAC Blower	-1.8
Recirc Blower	-2.3
Lime Blower	-2.4
Turbine Building - Roof	-6.3
Total	**28.5**

Table D5: C – Heol Pont-y-Cwcw NMP duly implemented Specific Sound Levels, daytime

C – Heol Pont-y-Cwcw NMP Duly Implemented Predicted Specific Sound Levels Night time (23:00 – 07:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Boiler House - Walls	19.8
Auxiliary Cooler	18.1
ID Fan Stack Outlet	17.7
ACC Fan	17.4
ACC Fan	16.6
Fuel Reception - Walls	16.4
Fuel Reception - Roof	14.2
Boiler start-up vent	14.0
ACC Fan	13.6
Main Steam Start-Up Vent	13.5
Turbine Bypass System	11.9
Deaerator Vent	11.7
LPPH Vent	11.6
LPPH Pumps	9.8
Boiler House - Roof	8.9
Ash Blower	8.7
Screw Conveyor	6.6
ACC Fan	5.4
Steam Ejector (Typical Operation)	4.9
Ash Blower	4.7
ID Fan Case and Motor	4.4
Screw Conveyor	4.0
Condensate Pumps	1.9
Turbine Building - Walls	-0.4
Steam Ejector - Hogging (Start-up)	-0.8
PAC Blower	-1.8
Recirc Blower	-2.3
Lime Blower	-2.4
Turbine Building - Roof	-6.3
HGV Arriving	n/a
HGV Departing	n/a
Total	**27.4**

Table D6: C – Heol Pont-y-Cwcw NMP duly implemented Specific Sound Levels, night time

D – W Nash Road NMP Duly Implemented Predicted Specific Sound Levels Daytime (07:00 – 23:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
ID Fan Case and Motor	9.5
ID Fan Stack Outlet	9.3
Boiler House - Walls	6.6
HGV Arriving	6.5
PAC Blower	3.5
Main Steam Start-Up Vent	1.3
Deaerator Vent	1.2
LPPH Vent	1.2
Fuel Reception - Roof	1.2
Boiler start-up vent	1.0
Fuel Reception - Walls	-0.5
Boiler House - Roof	-1.9
Turbine Bypass System	-4.6
Steam Ejector (Typical Operation)	-5.5
HGV Departing	-6.9
ACC Fan	-7.8
ACC Fan	-7.9
Auxiliary Cooler	-8.4
Steam Ejector - Hogging (Start-up)	-8.4
Screw Conveyor	-9.1
ACC Fan	-9.8
Screw Conveyor	-10.3
Ash Blower	-10.8
ACC Fan	-10.9
LPPH Pumps	-13.4
Ash Blower	-15.1
Lime Blower	-15.4
Recirc Blower	-16.6
Condensate Pumps	-16.8
Turbine Building - Walls	-20.6
Turbine Building - Roof	-24.1
Total	**15.9**

Table D7: D – W Nash Road NMP duly implemented Specific Sound Levels, daytime

D – W Nash Road NMP Duly Implemented Predicted Specific Sound Levels Night time (23:00 – 07:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
ID Fan Case and Motor	9.5
ID Fan Stack Outlet	9.3
Boiler House - Walls	6.6
PAC Blower	3.5
Main Steam Start-Up Vent	1.3
Deaerator Vent	1.2
LPPH Vent	1.2
Fuel Reception - Roof	1.2
Boiler start-up vent	1.0
Fuel Reception - Walls	-0.5
Boiler House - Roof	-1.9
Turbine Bypass System	-4.6
Steam Ejector (Typical Operation)	-5.5
ACC Fan	-7.8
ACC Fan	-7.9
Auxiliary Cooler	-8.4
Steam Ejector - Hogging (Start-up)	-8.4
Screw Conveyor	-9.1
ACC Fan	-9.8
Screw Conveyor	-10.3
Ash Blower	-10.8
ACC Fan	-10.9
LPPH Pumps	-13.4
Ash Blower	-15.1
Lime Blower	-15.4
Recirc Blower	-16.6
Condensate Pumps	-16.8
Turbine Building - Walls	-20.6
Turbine Building - Roof	-24.1
HGV Arriving	n/a
HGV Departing	n/a
Total	**15.3**

Table D8: D – W Nash Road NMP duly implemented Specific Sound Levels, night time

E – Watch House Parade NMP Duly Implemented Predicted Specific Sound Levels Daytime (07:00 – 23:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Screw Conveyor	23.1
Steam Ejector (Typical Operation)	22.7
Turbine Bypass System	22.3
Screw Conveyor	21.6
HGV Departing	20.2
ID Fan Case and Motor	18.8
Steam Ejector - Hogging (Start-up)	18.8
Ash Blower	17.3
ACC Fan	16.5
ACC Fan	16.1
ID Fan Stack Outlet	15.7
Ash Blower	14.7
Auxiliary Cooler	14.3
Recirc Blower	14.2
Boiler House - Walls	13.8
Lime Blower	13.4
LPPH Pumps	13.0
ACC Fan	12.7
PAC Blower	12.4
HGV Arriving	11.7
Condensate Pumps	11.5
ACC Fan	9.5
Boiler start-up vent	8.7
LPPH Vent	8.6
Deaerator Vent	8.5
Turbine Building - Walls	8.2
Fuel Reception - Roof	7.6
Fuel Reception - Walls	7.5
Boiler House - Roof	5.6
Main Steam Start-Up Vent	5.3
Turbine Building - Roof	4.5
Total	**31.5**

Table D9: E – Watch House Parade NMP duly implemented Specific Sound Levels, daytime

E – Watch House Parade NMP Duly Implemented Predicted Specific Sound Levels Night time (23:00 – 07:00 Hours)	
Source Description	**Specific Sound Level, dB $L_{Aeq,T}$**
Screw Conveyor	23.1
Steam Ejector (Typical Operation)	22.7
Turbine Bypass System	22.3
Screw Conveyor	21.6
ID Fan Case and Motor	18.8
Steam Ejector - Hogging (Start-up)	18.8
Ash Blower	17.3
ACC Fan	16.5
ACC Fan	16.1
ID Fan Stack Outlet	15.7
Ash Blower	14.7
Auxiliary Cooler	14.3
Recirc Blower	14.2
Boiler House - Walls	13.8
Lime Blower	13.4
LPPH Pumps	13.0
ACC Fan	12.7
PAC Blower	12.4
Condensate Pumps	11.5
ACC Fan	9.5
Boiler start-up vent	8.7
LPPH Vent	8.6
Deaerator Vent	8.5
Turbine Building - Walls	8.2
Fuel Reception - Roof	7.6
Fuel Reception - Walls	7.5
Boiler House - Roof	5.6
Main Steam Start-Up Vent	5.3
Turbine Building - Roof	4.5
HGV Arriving	n/a
HGV Departing	n/a
Total	**31.1**

Table D10: E – Watch House Parade NMP duly implemented Specific Sound Levels, night time

APPENDIX E
NOISE SOURCE SCHEDULE AND OUTLINE REQUIRED BAT NOISE CONTROL MEASURES

Equipment Name	Data Source / Specification	Number of Sources	Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz									Average Sound Pressure Level on Measurement Surface, L_{pA}	Measurement Distance, m	Measurement Surface area at Measurement Position, m²	Overall Sound Power Level, dB L_{wA}	Utilisation		Source: Area (A) Line (L) Point (P) or Internal (I)	Operating Mode	Outline Noise Mitigation Design
			31.5	63	125	250	500	1k	2k	4k	8k					Daytime	Night time			
Internal																				
Reception Building																				
HGV unloading	Noise spectrum taken from BS5228 Table C.8 reference 20 ("Tipper Lorry").	1		88	82	74	74	74	73	70	67	80	10	628	107	20%	0%	I	NOC	Non-intrusive broadband noise type vehicle reversing alarms and/or reversing cameras. There shall be no use of pulsed and/or tonal reversing alarms (e.g. reversing bleepers).
Mobile Telehandler	Noise spectrum taken from BS5228 Table C.2 reference 35 ("Wheeled loader": 60kW 10t).	2		85	79	69	67	64	62	56	47	71	10	628	98	100%	100%	I	NOC	Non-intrusive broadband noise type vehicle reversing alarms and/or reversing cameras. There shall be no use of pulsed and/or tonal reversing alarms (e.g. reversing bleepers).
Shredders	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2	81	84	84	84	83	79	76	76	68	85	1	161	107	100%	100%	I	NOC	Make provision for an acoustic enclosure to achieve 85dB $L_{Aeq,T}$ at 1m from any surface. See Section 8.2 for further details.
Conveying system	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Ferrous Reject	Client confirmed sound pressure level of 90dB(A) at 1m. Typical noise spectrum assumed.	1		89	88	87	83	86	83	77	60	90	1	33	105	100%	100%	I	NOC	
Push Floor	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	4 (2 in stand by)		84	83	82	78	81	78	72	55	85	1	64	103	100%	100%	I	NOC	
Push Floor Power Pack	Client confirmed sound pressure level of 84dB(A) at 1m. Typical noise spectrum assumed.	4 (2 in stand by)	67	67	82	82	79	79	77	74	72	84		64	102	100%	100%	I	NOC	
Conveying system to feed chute / hopper	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Boiler House																				
Feed Chute	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	33	100	100%	100%	I	NOC	
MHPS fin-fan cooler	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	90	90	86	82	80	77	77	79	74	85	1	48	102	100%	100%	I	NOC	
Boiler Feed Pumps	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	2 (1 in stand by)	80	75	72	73	70	68	72	76	72	80	1	40	96	100%	100%	I	NOC	
Grate Cooling system pumps	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2 (1 in strand by)	85	80	77	78	75	73	77	81	77	85	1	40	101	100%	100%	I	NOC	
Boiler	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	87	86	82	78	83	79	78	75	69	85	1	189	108	100%	100%	I	NOC	
Gasifier	No data provided. Assumed unattenuated sound pressure level of 75dB(A) at 1m. Typical noise spectrum assumed.	1	77	76	72	68	73	69	68	65	59	75	1	189	98	100%	100%	I	NOC	
FD Fan, Primary, Case and Motor	Client confirmed sound pressure level of 85dB(A) at 1m. Noise mitigation required.	1				84						75	1	105	95	100%	100%	I	NOC	An acoustic enclosure is required to the FD fan case and motor, encapsulating any exposed flexible connectors within the adjoining ductwork, to achieve a sound pressure level of 75dB $L_{Aeq,T}$ at 1m from any surface. Force draught attenuated ventilation to the enclosure will be needed with run and standby fans (resilience).
FD Fan, Primary, Intake	No data provided.	1				89						80	1	4	86	100%	100%	I	NOC	Noise from the air intake to the FD fan, shall not exceed 80dB $L_{Aeq,T}$ at 1m (maximum, when on full load and as measured on-axis). Make provisions for an attenuator.

Equipment Name	Data Source / Specification	Number of Sources	Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz									Average Sound Pressure Level on Measurement Surface, L_{pA}	Measurement Distance, m	Measurement Surface area at Measurement Position, m²	Overall Sound Power Level, dB L_{wA}	Utilisation		Source: Area (A) Line (L) Point (P) or Internal (I)	Operating Mode	Outline Noise Mitigation Design
			31.5	63	125	250	500	1k	2k	4k	8k					Daytime	Night time			
FD Fan, Secondary, Case and Motor	Client confirmed sound pressure level of 85dB(A) at 1m. Noise mitigation required.	1				84						75	1	105	95	100%	100%	I	NOC	An acoustic enclosure is required to the FD fan case and motor, encapsulating any exposed flexible connectors within the adjoining ductwork, to achieve a sound pressure level of 75dB $L_{Aeq,T}$ at 1m from any surface. Force draught attenuated ventilation to the enclosure will be needed with run and standby fans (resilience).
FD Fan, Secondary, Intake	No data provided.					89						80	1	4	86	100%	100%	I	NOC	Noise from the air intake to the FD fan, shall not exceed 80dB $L_{Aeq,T}$ at 1m (maximum, when on full load and as measured on-axis). Make provisions for an attenuator.
FD Fan Burner	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	89	87	83	85	82	80	78	72	68	85	1	54	102	100%	100%	I	NOC	
Spray attemperators / Spray Control Valves	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2	90	90	86	82	80	77	77	79	74	85	1	12	96	100%	100%	I	NOC	
Bottom Ash / Slag Conveyor	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Boiler Fly Ash Conveyor	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Economiser Ash Conveyor	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Bottom Ash Bucket Loader	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1		84	83	82	78	81	78	72	55	85	1	107	105	100%	100%	I	NOC	
Sootblowers	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	1	70	63	59	59	60	64	74	70	79	80	1	44	97	<1%	<0%	I	NOC	Sootblowing shall not take place during the night time period (23:00 – 07:00 hours)
Knocking / Rapping System	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	90	90	86	82	80	77	77	79	74	85	1	33	100	100%	100%	I	NOC	
Vibratory Screen	No data provided. Noise data taken from similar project	1	86	85	87	84	84	83	81	79	75	88	1	125	109	100%	100%	I	NOC	
Compressor	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	83	86	83	83	83	79	77	74	71	85	1	33	100	100%	100%	I	NOC	
Turbine Building																				
Steam Turbine and Generator	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	71	73	75	76	77	78	78	79	77	85	1	250	109	100%	100%	I	NOC	
Turbine Pumps	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	85	80	77	78	75	73	77	81	77	85	1	40	101	100%	100%	I	NOC	
External																				
Flue Gas Treatment System																				
ID Fan Case and Motor	Client confirmed sound pressure level of 97dB $L_{Aeq,T}$ at 1m. Acoustic enclosure shall be required.	1				84						75	1	150	97	100%	100%	P	NOC	An acoustic enclosure is required to the ID fan case and motor, encapsulating any exposed flexible connectors within the adjoining ductwork, to achieve a sound pressure level of 75dB $L_{Aeq,T}$ at 1m from any surface. Forced draught attenuated ventilation to the enclosure will be needed with run and standby fans (resilience).
ID Fan Stack Outlet	Client confirmed sound pressure level of 123dB $L_{Aeq,T}$ from the top of the ID Fan Stack Outlet. Outlet attenuator shall be required. Sound Spectrum taken for a similar project, post attenuator.	1	101	101	91	83	65	46	55	38	34	80	1	28	95	100%	100%	P	NOC	Noise from the ID fan stack outlet shall not exceed 80dB $L_{Aeq,T}$ at 1 metre from stack outlet edge, 90º off longitudinal axis of the stack at any speed. Make provisions for duct attenuators fitted to the discharge side of the fan.

Equipment Name	Data Source / Specification	Number of Sources	Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz									Average Sound Pressure Level on Measurement Surface, L_{pA}	Measurement Distance, m	Measurement Surface area at Measurement Position, m²	Overall Sound Power Level, dB L_{wA}	Utilisation		Source: Area (A) Line (L) Point (P) or Internal (I)	Operating Mode	Outline Noise Mitigation Design
			31.5	63	125	250	500	1k	2k	4k	8k					Daytime	Night time			
Lime Blower	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	1	77	69	71	79	77	76	70	68	59	80	1	34	95	100%	100%	P	NOC	Make provision for an acoustic enclosure to achieve 80dB $L_{Aeq,T}$ at 1m from any surface
PAC Blower	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	1	77	69	71	79	77	76	70	68	59	80	1	34	95	100%	100%	P	NOC	Make provision for an acoustic enclosure to achieve 80dB $L_{Aeq,T}$ at 1m from any surface
Recirc Blower	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	1	77	69	71	79	77	76	70	68	59	80	1	34	95	100%	100%	P	NOC	Make provision for an acoustic enclosure to achieve 80dB $L_{Aeq,T}$ at 1m from any surface
Ash Blowers	Client confirmed sound pressure level of 80dB(A) at 1m. Typical noise spectrum assumed.	2	77	69	71	79	77	76	70	68	59	80	1	34	95	100%	100%	P	NOC	Make provision for an acoustic enclosure to achieve 80dB $L_{Aeq,T}$ at 1m from any surface
Screw Conveyors	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2	76	78	78	77	78	83	76	73	70	85	1	63	103	100%	100%	L	NOC	
ACCs																				
ACC Fans	Client confirmed each fan is rated to achieve a sound power level of 97dB L_{wA}	4	78	80	80	76	73	70	62	58	54	75	1	157	97	100%	100%	P	NOC	
Condensate Pumps	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2 (1 in strand by)	85	80	77	78	75	73	77	81	77	85	1	40	101	100%	100%	P	NOC	
LPPH Pumps	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	2 (1 in strand by)	88	85	86	81	78	78	80	73	67	85	1	23	98	100%	100%	P	NOC	
Steam Ejector (Typical Operation)	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	94	92	85	81	78	77	79	77	70	85	1	40	101	100%	100%	P	NOC	
Steam Ejector - Hogging (Start-up)	Client confirmed sound pressure level of 85dB(A) at 1m. Typical noise spectrum assumed.	1	72	82	88	87	78	70	74	70	82	85	1	13	96	100%	100%	P	Start-up	
Auxiliary Cooler	Noise data taken from manufacturer confirmed data for an unattenuated unit 100dB L_{wA}	2 (1 in strand by)		78	79	80	76	73	70	65	59	79	1	144	100	100%	100%	P	NOC	
Turbine Bypass System	Client confirmed sound pressure level of 85dB $L_{Aeq,T}$ at 1m	1	94	92	85	81	78	77	79	77	70	85	1	4.7 (per m)	91 (per m)	100%	100%	L	Bypass	
Steam Blowoffs																				
Deaerator vent	No data provided. Noise data taken from similar project	1	83	88	89	82	81	78	78	77	72	85	1	6	93	100%	100%	P	NOC	Attenuator to be fitted to the duct to achieve a sound pressure level of 85dB $L_{Aeq,T}$ at 1m (90º off longitudinal axis), for all possible modes of operation including worst case blowoff.
LPPH vent	No data provided. Noise data taken from similar project	1	83	88	89	82	81	78	78	77	72	85	1	6	93	100%	100%	P	NOC	Attenuator to be fitted to the duct to achieve a sound pressure level of 85dB $L_{Aeq,T}$ at 1m (90º off longitudinal axis), for all possible modes of operation including worst case blowoff.
Boiler start-up vent	No data provided. Noise data taken from similar project	1	83	88	89	82	81	78	78	77	72	85	1	6	93	100%	100%	P	Start-up	Attenuator to be fitted to the duct to achieve a sound pressure level of 85dB $L_{Aeq,T}$ at 1m (90º off longitudinal axis), for all possible modes of operation including worst case blowoff.
Main steam start-up vent	No data provided. Noise data taken from similar project	1	83	88	89	82	81	78	78	77	72	85	1	6	93	100%	100%	P	Start-up	Attenuator to be fitted to the duct to achieve a sound pressure level of 85dB $L_{Aeq,T}$ at 1m (90º off longitudinal axis), for all possible modes of operation including worst case blowoff.
Mobile Plant																				
HGV	Noise spectrum taken from BS5228 Table C.2 reference 34 ("Lorry": 4-axle wagon).	1		73	78	78	78	74	73	68	66	80	10	628	108	2/hour	0	Moving P	NOC	

Table E1: Noise source schedule and outline BAT noise control measures

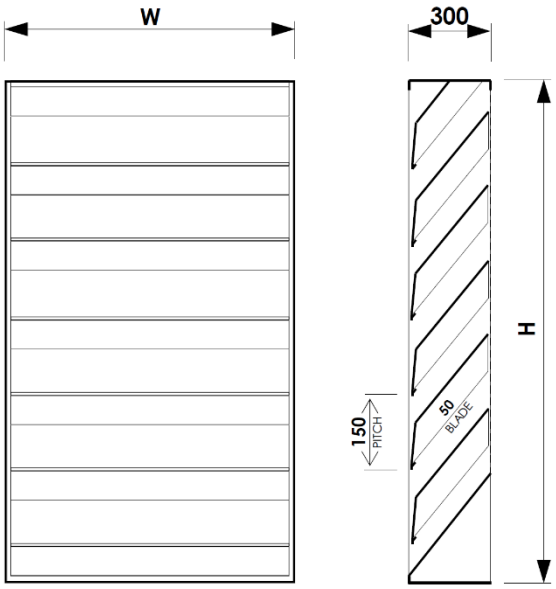
APPENDIX F

DETAILS OF ACOUSTIC LOUVRES USED TO INFORM THE ASSESSMENT

DATA SHEET **L70E**
ACOUSTIC LOUVRE
MODEL **AL3015**

THIS IS NOT A STAND ALONE DOCUMENT AND UNLESS REFERRED TO IN A DATED EQUIPMENT SCHEDULE IS SUBJECT TO REVISION WITHOUT NOTICE.

DIMENSIONS



SPECIFICATION

LOUVRES ARE CONSTRUCTED FROM FOLDED SHEET METAL AND HAVE A SERIES OF HORIZONTAL BLADES CONTAINED WITHIN A FOUR SIDED EXTERNAL FRAME.

THE MATERIAL OF CONSTRUCTION MAY BE PRE-GALVANISED STEEL (SUFFIX G) OR ALUMINIUM (SUFFIX A).

GALVANISED BIRD SCREENS ARE FITTED AS STANDARD.

CASING SIDES ARE PROVIDED WITH 10mm DIA HOLES FOR FIXING ADJACENT SECTIONS TOGETHER, OR FIXING THE LOUVRE INTO THE BUILDERSWORK OPENING.

LOUVRES ARE SUPPLIED SELF FINISH AS STANDARD OR WITH AN OPTIONAL POLYESTER POWDER FINISH (SUFFIX P).

NOTES

THIS DATA SHEET IS TO BE READ IN CONJUNCTION WITH THE EQUIPMENT SCHEDULE.

WIDTH **(W)** AND HEIGHT **(H)** DIMENSIONS GIVEN ON THE EQUIPMENT SCHEDULE ARE AS MANUFACTURED. ADEQUATE CLEARANCE MUST BE ALLOWED WHEN CONSTRUCTING THE BUILDERSWORK OPENING, A MINIMUM OF 10 mm IS RECOMMENDED.

LOUVRES WILL BE SUPPLIED WITHOUT SUPPORT STEELWORK, CLEATS, BRACKETS, FIXINGS, FLASHING, MASTIC, OR OTHER SUCH ITEMS, UNLESS OTHERWISE STATED.

EXCESSIVELY LARGE OR HEAVY LOUVRES MAY BE MANUFACTURED IN MATING SECTIONS FOR EASE OF HANDLING.

LOUVRES ARE MANUFACTURED TO STANDARD SHEET METAL TOLERANCES OF +/- 3 mm.

SUFFIX

THE SUFFIX DEFINES ADDITIONAL FEATURES OR SPECIAL CONSTRUCTIONAL DETAILS

G GALVANISED STEEL CONSTRUCTION.

A ALUMINIUM CONSTRUCTION.

P POLYESTER POWDER COAT.

X SPECIAL CONSTRUCTION - REFER TO EQUIPMENT SCHEDULE FOR DETAILS.

WEIGHT

LOUVRE WEIGHTS ARE GIVEN ON THE EQUIPMENT SCHEDULE. APPROXIMATELY:

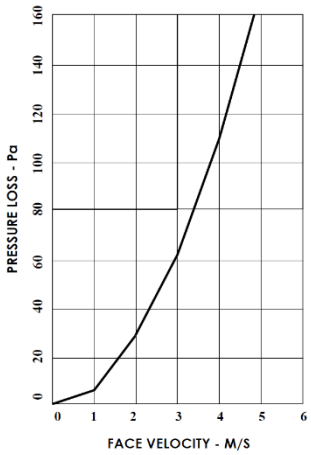
52kg/M² GALVANISED CONSTRUCTION
37kg/M² ALUMINIUM CONSTRUCTION

ACOUSTIC PERFORMANCE

SOUND REDUCTION INDEX: BS EN ISO 10140 - 2

63	125	250	500	1000	2000	4000	8000	HZ
5	**6**	**8**	**11**	**18**	**25**	**20**	**16**	**dB**

PRESSURE LOSS



STANDARD SIZES

THERE ARE NO STANDARD SIZES. ALL LOUVRES ARE MADE TO ORDER.

ALLAWAY ACOUSTICS LIMITED Old Police Station, 1 Queens Road, Hertford SG14 1EN
T | 01992 550825 E | enquiries@allawayacoustics.co.uk W | allawayacoustics.co.uk

Figure F2: Details of the proposed AL3015 single banked acoustic louvre

APPENDIX G

CLIENT CONFIRMED NOISE DATA

Noise Source	Noise Level, dB*
The Feedstock Hall	
Vehicles unloading bales of RDF and/or walking floor loose deliveries	85
Mobile telehandlers (x2)	73
Shredders (x2) including drive motors and hydraulic drives	85
Conveying System including all drive motors	85
Ferrous reject magnets dropping metal into bins below	90
Hydraulic Power Pack associated with Push Floors (x2 working, 2 standby)	84
Push Floors (x2 working, 2 standby)	85
Conveying system to feed chute / hopper	85
The main Process (Boiler) Hall	
Feed chute / fuel delivery to boiler	85
MHPS fin-fan cooler (intermittent	85
Boiler Feed pumps	80
Grate cooling system pumps	85
Radiant noise from boiler	85
43a. Forced Draft Fan (Primary)	85
43b. Forced Draft Fan (Secondary)	85
43c. Forced Draft Fan (Burner) Start-Up & Intermittent + Diesel System)	85
43d. Forced Draft Fan (Burner)	85
Pressure control valves and piping	85
Spray attemperators	85
Bottom ash / slag conveyor	85
Boiler fly ash conveyor	85
Economiser ash conveyor	85
Bottom Ash bucket loader	85
Sootblowers	80
Knocking / Rapping system	85
Flue Gas Treatment System	
Pumps	85
Screw conveyors	85
Blowers (lime, PAC, recirc)	80
ID Fan	85
The Turbine House	
Steam Turbine and Generator	85
Various pumps	85
Auxiliary Cooling system including pumps and fans	85
ACC system	85
Fans (4 of)	85
Steam Ejector (hogging at start-up to atmosphere)	85
Steam Ejector (holding - continued operation)	85
Condensate pump (D&S)	85
Dump extraction pump	85
Other Equipment	
Compressors	85
Drainage system and pumps	85
Waste water treatment system and pumps	85
Water treatment system and pumps	85
** For the purposes of the assessment, it is assumed all stated noise levels are sound pressure levels at one metre distance, dB $L_{Aeq,T}$*	

Table G1: Client confirmed noise data

Steam Blow-off	Location	Operation	Noise Level, dB*
Deaerator PSV	Zone 1	Emergency	85
Deaerator PRDS PSV	Zone 1	Emergency	85
Deaerator vent	Zone 1	Normal Operating conditions	85
Flash tank PSV	Zone 1	Emergency	85
LPPH PSV	Zone 1	Emergency	85
LPPH PRDS PSV	Zone 1	Emergency	85
LPPH vent	Zone 1	Normal Operating condition	85
ECO 1 PSV	Zone 1	Emergency	85
Drum #1 PSV	Zone 1	Emergency	85
Drum #2 PSV	Zone 1	Emergency	85
Superheater PSV	Zone 1	Emergency	85
Boiler start-up vent	Zone 1	Start-up	85
Main steam start-up vent	Zone 1	Start-up	85
Steam blow connection	Zone 4	Commissioning activity	85
Gland Steam Condenser PSV	Zone 4	Emergency	85
Ejector condenser PSV	Zone 5	Emergency	85
ACC PSV	Zone 5	Emergency	85
** For the purposes of the assessment, it is assumed all stated noise levels are sound pressure levels at one metre distance, dB $L_{Aeq,T}$*			

Table G2: Client confirmed noise data for steam blow-off valves

APPENDIX H

DETAILS AND PROFESSIONAL QUALIFICATIONS OF CONTRIBUTING SOL STAFF

Company Details

Name of Organisation: Sol Acoustics Limited

Status: Private Limited Company

Address: Unit 11, Brunel Court,
Gadbrook Park
CW9 7LP

Telephone Number: 01565 632535

E-Mail: info@solacoustics.co.uk

Nature of Business: Acoustic Consultancy

Directors: Simon Ferenczi

Company Registration Number: 4218702

Key Technical Personnel & Qualifications

Simon Ferenczi	Institute of Acoustics Diploma (with additional modules), MIOA
Brian Horner	BSc (Hons), MIOA
Josh McLelland	Ba (Hons), Institute of Acoustics Diploma (with additional modules), AMIOA

Company Accreditations

Sol Acoustics is a member of The Association of Noise Consultants (ANC) and is qualified to perform sound insulation testing under the ANC's accredited testing scheme to demonstrate compliance with the requirements of Approved Document E of the Building Regulations.