Noise Impact Assessment of a Metal Shredding and Refining System

Client:	Mueller Europe Ltd.
Address:	Oxford Street, Bilston, West Midlands, WV14 7DS
Date:	19/03/2020

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Date	19/03/2020	--	--
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Executive Summary

An environmental noise survey and noise impact assessment have been undertaken to assess the noise emissions from a proposed copper refinery and shredder with associated fume extraction at Mueller Europe Ltd, Oxford Street, Bilston, WV14 7DS. The measured background sound levels have allowed a BS4142:2014 and IEMA noise assessment to be undertaken.

The specific noise emissions with a BS4142 rating applied are predicted to be 3 dB above the background noise level during the day time, and 2 dB below the background noise level during the night time. This shows a low level of adverse impact during the day and no impact during the night. This would be classed as a 'LOEL' (Lowest Observed Effect Level) and a NOEL (No Observed Effect Level) when assessed in conjunction with the NPSE. The City of Wolverhampton Council has indicated that an exceedance of up to 5 dB would be viewed as acceptable, and as such, the noise emissions associated with the Proposed Development are predicted to be within the criteria. As the client is also applying for an Environmental Permit for the development it is also assumed that the criteria outlined by the local authority will also suffice for the environment agency.

An IEMA 'Increase in Ambient Noise Level' assessment has also been undertaken. The results show that the ambient noise level at the most affected NSRs is predicted to rise by 0.5 dB during the day and 0.1 dB during the night. This increase is classed as 'Not Significant' which adds further context to the BS4142 assessment discussed above.

Recommendations and mitigation can be seen in the table below.

Recommendation and Mitigation Measure Overview
- The new structure should follow plans provided to NOVA Acoustics Ltd and should achieve a minimum of 40 dB R_w sound reduction. - All roller shutters should remain closed as much as practicable throughout the operation. - A noise management plan and Best Available Techniques for reducing noise should be implemented, as detailed in Section 4.4.

Further recommendations and mitigation measures can be found in the body of the report. Written approval of the findings of this report is required from the Local Authority and Environment Agency prior to works commencing.

1. Introduction

1.1 Overview

NOVA Acoustics Ltd has been commissioned to prepare a noise assessment of a Scrap Metal Refining System ('the Proposed Development') at Mueller Europe Ltd, Oxford Street, Bilston, WV14 7DS ('the Site').

The Applicant is preparing to submit a full planning application ('the Application') to the City of Wolverhampton Council.

The applicant has also submitted an application to the Environment Agency for a permit for the site's operation and has received pre-planning advice.

Accordingly, the following technical noise assessment has been produced to accompany the Application to the City of Wolverhampton Council and the Environment Agency.

This report details the existing background sound climate at the nearest receptors, as well as the sound emissions associated with the Proposed Development.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

1.2 Scope & Objectives

The scope of the noise assessment can be summarized as follows:

- Baseline sound monitoring survey to evaluate the prevailing sound levels at the nearest sensitive receptor ('NSR') to Site;
- Detailed sound modelling, acoustic calculation and analysis in accordance with ISO9613 – 1 prediction methodology to predict sound levels at the NSR.;
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the proposed sources; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Practice Guidance in England and Wales, BS4142:2014 and other relevant standards.

1.3 Legislation, Policy and Guidance

This report is to be primarily based on the following legislation, policy and guidance.

- National Planning Policy Framework (2019)
- Noise Policy Statement for England
- IEMA Guidelines on Noise Impact Assessments
- BS 4142:2014 'Methods for rating and assessing industrial and commercial sound'
- ISO 9613-2 Attenuation of sound during propagation outdoors
- BS EN 12354-4 Building Acoustics

2. Site Description & Background Information

2.1 Site & Surroundings

The proposed site is located at Mueller Europe Ltd, Oxford Street, Bilston, WV14 7DS. The immediate surrounding area is predominantly commercial and industrial in nature with a minority of residential dwellings. To the south of the site is Oxford Street (A41), which facilitates moderate to high levels of road traffic flow throughout the day and night time periods. Approximately 150m to the south-west of the site is a block of residential flats situated on the junction of Oxford Street and Chapel Street. Due to the proximity of this dwelling to the site, it will be considered the closest Noise Sensitive Receptor (NSR) in the subsequent assessment. The closest commercial and industrial premises to the site are 'Sailsbury Paulty (Midlands)' which operates between 06:00 -18:00, 'Ramsay Rubber' which operates between 08:30 – 17:00, 'Delta Plastics Ltd' which is assumed to operate between 08:00 – 18:00 and 'BNS Car Repairs Ltd' which operates between 09:00 – 18:00.

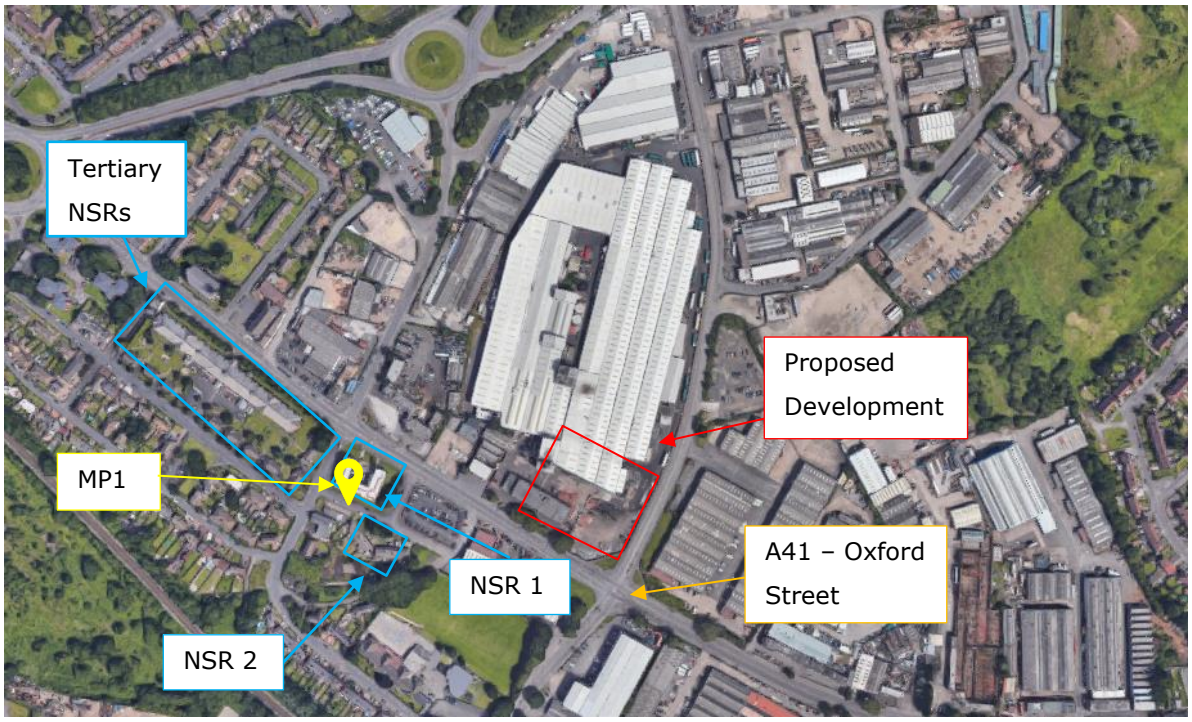


Figure 1.0 - Site and Surroundings

2.2 Background

The site is owned and operated by Mueller Europe Ltd and is used to manufacture and distribute copper tubing for plumbing, heating and industrial applications. The site operates 24 hours per day; however, the majority of noisy works associated with the Proposed Development will occur between the hours of 07:00 and 18:00.

It is proposed that a scrap copper shredding and refining system be installed at the existing site. The expected throughput of the refiner will be approximately 34000 tonnes annually, however not all of this will require shredding. Information provided by the client indicates that on average 50% of the scrap copper being refined may need shredding but this could range from 20-80% dependent on the type of scrap available.

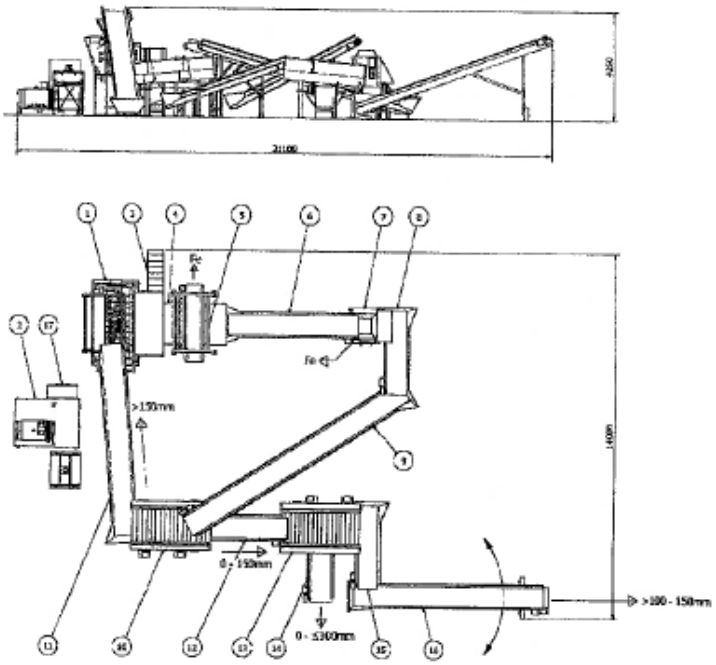
There are multiple operations that are proposed to occur on-site, a brief outline is as follows:

General site activities

HGVs carrying scrap copper will enter the site via a weighbridge then unload into bunkers in the southern section. The copper will then be sorted, and if needed the scrap copper will be shredded in a system designed by Continuous Properzi Scrap. If the copper does not need to be shredded it will be taken by wheeled loader inside the facility to an internal conveyor belt. The shredding system will be located externally and will include the following elements:

- 1 x Chopper with 2100mm rotor length, 18 flying and 10 static Knives with Rotor Speed 23RPM
- 1 x Service Platform for maintenance and servicing
- 1 x Vibratory Discharge Conveyor, 1600 x 5000mm, 3.0kW
- 1 x Electro Overband Magnet, 3.8kW
- 1 x Conveyor, 800 x5500mm, 2.2kW
- 1 x Nd Magnet, 0.55kW
- 3 x Conveyor, 800 x 3000mm, 1.5kW
- 1 x Conveyor, 800 x 10000, 2.2kW
- 2 x Disc Screener – Screening area 4.3m^2 & 2 x Electric motors, 5.5kw each
- 1 x Conveyor, 800 x 8000mm, 2.2kW

An example layout of the shredder provided by the manufacturer can be seen in Figure 2.0 below.



Picture 1 – A possible Shredding System layout

Figure 2.0 – Proposed Shredder

Once the material has been shredded (if needed) and sorted externally it will then be moved inside the building and loaded into a hopper. The material will then be inputted into the gas-fired vibratory

furnaces to allow melting of the scrap. The vibratory furnace will have a capacity for 150 tonnes based on 8 hours melting and 8 hours refining.

Following on from the Vibratory Furnace the melted metal will then be processed in an ingot casting machine. As part of the development, there will also need to be a waste treatment plant installed and associated fume extraction fans which are to be located externally to the south-eastern corner of the building.

HGV Movements

The transport report provided by the client has shown that it is likely that there will be approximately 1 additional scrap metal HGV delivery per day. This equates to a maximum of 2 movements per hour (1 in and 1 out).

Site context

Given the location of the site and the industrial nature of the surroundings, as well as the fact that the site is already operating as a copper tube manufacturer, it is assumed that the location is suitable for development and that provided low impact can be achieved at the closest NSR it should be readily achievable at all the other surrounding NSRs.

3. Environmental Noise Survey

In order to characterise the sound profile of the area of the proposed development, a long-term environmental sound survey was carried out from the 17th of February 2020 to the 19th of February 2020.

3.1 Measurement Methodology

For the long-term sound monitoring, the sound level meter was placed on a lamppost in the vicinity of the closest NSR, approximately 3.5m above ground level with no nearby reflective surfaces. The monitoring position was chosen in order to collect representative sound levels of the area during the week day time and night time periods. This position was also representative of the sound levels at the NSR. The measurement position can be found in Figure 1.0.

3.2 Measurement Equipment

Piece of Equipment	Serial No	Calibration Deviation
CESVA SC420 Class 1 Sound Level Meter	T246458	≤0.5
CESVA CB006 Class 1 Calibrator	901927	

Table 1.0 – Measurement Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of ≤0.5 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

3.3 Weather Summary

As the long-term environmental noise survey was carried out over an un-manned period no localised records of weather conditions were taken, however, during the setup and collection of the equipment the weather was calm with wind speeds less than 5m/s and no precipitation. All measurements have been compared with met office weather data for the area, specifically the closest functioning weather station in Sutton Coldfield, approximately 16km to the east of the site. When reviewing the time history of the noise measurements, any time period that was thought to be affected by the local weather conditions has been omitted. The analysis of the noise data includes statistical and percentile values which aid in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each period during the entire measurement.

Weather Conditions 17/02/2020 – 19/02/2020 – Sutton Coldfield				
Time period	**Air temp (^{0}C)**	**Rainfall mm/h**	**Prevailing Wind Direction**	**Wind Speed (m/s)**
17/02/2020 - 00:00 – 23:59	3.6 – 10.9	0.0 – 6.0	SW	0.0 – 4.5
18/02/2020 - 00:00 – 23:59	2.8 – 9.5	0.0 – 4.8	SW	0.0 – 3.8
19/02/2020 - 00:00 – 23:59	2.5 – 9.1	0.0 – 1.8	SW	0.0 – 3.7

Table 2.0 - Meteorological Data

3.4 Results

3.4.1 Summary Results

The following table shows a summary of the sound survey results; L_{Aeq}, L_{Amax}, L_{A90} and the L_{A10} for the measurement period.

Measurement Position MP1				
Measurement Time Period ('t')	**$L_{Aeq,t}$**	**$L_{Amax,t}$**	**$L_{A90,t}$**	**$L_{A10,t}$**
Day 1 – 17/02/2020 - 11:45 - 23:00	60.0	94.0	55.0	63.0
Night 1 – 17/02/2020 – 23:00 – 07:00	54.0	81.0	50.0	56.0
Day 2 – 18/02/2019 - 07:00 – 23:00	60.0	87.0	56.0	62.0
Night 2 – 18/02/2019 – 23:00 – 07:00	54.0	79.0	50.0	57.0
Day 3 – 19/02/2019 - 07:00 – 10:30	60.0	87.0	59.0	61.0

Table 3.0 – Sound Survey Summary Results

3.4.2 Background Sound Level Summary Results

The following table shows a summary of the background sound levels during the day time and night time periods.

Measurement Position MP1				
Operational Hours ('t')	**$L_{A90,t}$**	**Statistically most Repeated $L_{A90,t}$**	**Min. $L_{A90,t}$**	**Max. $L_{A90,t}$**
Day 1 – 17/02/2020 - 11:45 - 23:00	55.0	56.0	50.0	59.0
Night 1 – 17/02/2020 – 23:00 – 07:00	50.0	45.0	45.0	55.0
Day 2 – 18/02/2019 - 07:00 – 23:00	56.0	56.0	49.0	59.0
Night 2 – 18/02/2019 – 23:00 – 07:00	50.0	46.0	45.0	55.0
Day 3 – 19/02/2019 - 07:00 – 10:30	59.0	56.0	54.0	61.0

Table 4.0 – Background Sound Survey Operational Hours Results

3.5 Subjective impression & Context

Whilst on the site, it was noted that the acoustic environment surrounding the NSRs was of a moderate level. The dominant noise source in the area was that of road traffic from the Oxford Street (A41). The noise emissions from the existing operations at the Mueller site were not audible at the NSR. This was primarily due to high levels of traffic present on the A41.

3.6 Assumptions

- It is assumed that the majority of noisy operations will happen during the day time hours, with only the fume extraction system running during the night.
- The proposed new building will be constructed of 1mm thick steel liner sheets, 140mm mineral wool insulation (min. density of 10 kg/m^3) and external steel cladding. providing a minimum sound reduction of 40 dB R_w.
- It is assumed there will be approximately 2 HGV movements per hour.

3.7 Uncertainty

BS4142:2014 section 10.0 states that uncertainty in the calculation of sound levels during the assessment process can arise from both the measured values and calculation methods.

To ensure the accuracy of the assessment consideration has been taken for the level of uncertainty in the measured data and associated calculations in the proposed methodology used to undertake the assessment. Where the level of uncertainty could affect the conclusion, reasonably practicable steps have been taken to minimise the level of uncertainty. Where the level of uncertainty is excessive, additional measurements and site visits have been conducted to increase the confidence in the results. In all instances the following steps have been taken to address the uncertainty;

1) Measured Values; A detailed understanding of the source of noise under investigation has been conducted including consideration for the complexity, variability over time and location, the character and effect of the residual sound level in comparison with the source, the measurement location, quantity of measurements and distance/intervening ground conditions, measurement time interval and the range of times measurement were taken, the suitability of weather conditions, the level of rounding and the classification of the instrumentation used to conduct the assessment.
2) Calculation Methods; Consideration has been taken for the accuracy of the measured sound levels, the character of the sound emissions in question, the calculation method and the simplification of the real situation to "fit" the modelled situation. Recognised standards and validated methods and processes have been used to establish accurate values during the calculation process.

For the avoidance of doubt, the level of uncertainty will not be quantified. If appropriate consideration is taken for points 1 and 2 during the collection of data and analysis thereof, then the influence of uncertainty in the final result is at its lowest practical value.

4. Noise Assessment

4.1 BS4142:2014 Noise Assessment

In the following section of the report, the noise emissions from the entire proposed operations are analysed in support of the environmental permit application and planning application. The assessment has been undertaken considering the operation of the site once the new copper shredding and refining system has been installed.

4.1.1 Specific Sound Level

The noise sources associated with the Proposed Development are defined below. The main sources of noise are as follows:

- Shredder (conveyors and shredder unit)
- HGV Movements
- HGV Unloading
- Plant Vehicle Movements
- Internal Refinery Noise
- Fume Extraction System

Shredder Noise Sources

Manufacturers noise measurements for the shredder unit show average noise levels of 72.0 dB at 1m (as shown in Appendix F), however, it is thought that this does not account for material running through the shredder. For this reason, and to provide a more robust analysis, noise levels for the shredder unit, conveyor belts, and material dropping from the shredder have been taken from previous reports compiled by NOVA Acoustics Ltd.

The table below shows the predicted noise levels from the shredding activities and the references for the reports that the noise levels have been taken from.

Description	NOVA Acoustics Report Ref.	Type of Noise Source	$L_{Aeq,t}$ (dB)	Calculated L_{wA} (dB)
Shredder Unit	3120RP	Point	93.0	101.0
Conveyor Belts	2661GA	Line	77.0	85.0
Material Dropping into Bin	3531SE	Point	83.0	91.0

Table 5.0 – Shredder Source Summary

HGV Movements

Conversations with the client have shown that the Proposed Development will increase the number of HGV vehicles carrying scrap metal on-site by 1 delivery/collection per day. The table below shows the noise level of an HGV entering and leaving the site, taken from BS5228:2009. Corrections have subsequently been applied to account for movement time per hour, considering a site speed limit of 10 mph (16 km/h) and a distance of approximately 250m from the entrance to the storage bunkers.

Description	L_w (dB)	No. of Movements Per Hour (in + out)	Distance (m)	Speed (km/h)	Total Maximum Movement Time (mins/hour)	Time Corrected L_w (dB)
HGV Moving Around Site	98.0	2	250	16	1	80.0

Table 6.0 – HGV Time Corrected Movement Noise Levels

The noise level of the HGVs unloading scrap copper into the storage bunkers has again been taken from a previous report compiled by NOVA Acoustics Ltd (ref: 3426TB). The measurement was taken approximately 5m from the rear of a similar-sized vehicle unloading scrap metal. The following table shows the noise level with a time correction applied to account for the unloading process taking approximately 10 minutes per hour.

Description	L_p @ 5m (dB)	L_p @ 1m (dB)	L_w (dB)	No. of Occurrences	Total On Time (mins/hour)	Corrected L_w (dB)
HGV Unloading	86.0	100.0	108.0	1	10	100.0

Table 7.0 – HGV Unloading Noise Levels

Plant Vehicle Movements

In order to transport the material from the storage bunkers to both the shredder and the main internal conveyor and furnace, plant vehicles will be used. The client has specified that a Hyundai 140-W7A Wheeled Excavator will be used to transport the scrap to the shredder, and a JCB 411-WHT Wheeled Loader will be used to transport the scrap to the main conveyor belt. Noise levels for the loader have been taken from manufacturers data, and noise levels for the excavator have been taken from BS5228 for a similar 90 kW vehicle. It is assumed that the excavator could run constantly for a 1-hour period, and the Loader is likely to run for a maximum of 30 minutes in an hour. The time corrected sound powers can be seen in the table below.

Model	Description	L_w (dB)	On Time (mins/hour)	Corrected L_w (dB)
Hyundai 140-W7A	Wheeled Excavator	94.0	60	94.0
JCB 411-WHT	Wheeled Loader	105.0	30	102.0

Table 8.0 – Plant Vehicle Noise

Fume Extraction System Noise

It is proposed that a fume extraction and purification system will be constructed in the south-eastern section of the site. It is specified that two fans will be installed, with two flue systems. The manufacturer has stated that the fans will not exceed 85 dB at 1.5m, which equates to a noise level of 89 dB at 1m. In order to calculate the noise emissions from the flues, the fan inlet and outlet

noise has been taken from a previous report (ref: 2516NU) for a similar ID fan system. The predicted noise levels can be seen in the table below and have been calculated considering each system has one 90-degree elbow. Full Calculations can be found in Appendix F.

Description	L_p @ 1m (dB)	Calculated L_w (dB)
Case Breakout Noise	89.0	97.0
Flue Noise	76.0	84.0

Table 9.0 – Fume Extraction Noise Levels

Internal Noise Breakout

The noise breaking out of the building has been calculated considering the predicted internal noise level and the proposed construction of the building. Conversations with the client have shown that the building will be constructed of 1mm thick steel liner trays, 140mm of mineral wool insulation (min. density of 10 kg/m^3) and outer steel cladding. This construction has been modelled in INSUL software and is predicted to achieve a minimum of 40 dB R_w. This is in line with a similar Tata Steel build-up (MONTAWALL) shown in Appendix F.

The following table shows the predicted internal noise level. This has been calculated considering manufacturers assurances that internal noise levels will not exceed 85 dB at any worker position, and a predicted noise level for the furnace being charged, time corrected to approximately 10 minutes per hour. The furnace charging noise level is expected to be approximately the same as an HGV unloading metal waste (as shown above).

Description	L_p (dB)	Time Correction (mins/hour)	Corrected Value (dB)	Internal Noise Level (dB)
Normal Internal Noise Level	85.0	60	85.0	85.0
Furnace Charging Noise Level	100.0	10	92.0	98.0
Total				98.0

Table 10.0 – Predicted Internal Noise Level

The following table shows the predicted breakout noise from the structure. It is assumed the roller shutters to the south and east of the building will remain open for approximately 30 minutes per hour during day time operations.

Description	Internal L_p (dB)	R_w of Construction	Façade Noise Level (Int. – Rw – 6) (dB)	On Time (mins/hour)	Corrected L_p (dB)
Façade and Roof Breakout	98.0	40.0	52.0	60	52.0
Open Roller Shutter	98.0	0.0	92.0	30	89.0

Table 11.0 – Breakout Noise Level at Façade

The specific sound level at the NSR has been calculated using SoundPlan Essential 8.1, which undertakes its calculations in accordance with the guidance given in IS09613 – 1:1993 and ISO9613 – 2:1996.

The following assumptions have been made within the calculation software:

- To accurately model the land surrounding the development the topographical data has been taken from Google Maps, it is assumed this has an accuracy within the last 3 years.
- The ground between the source and receiver is mixed, 'soft' and 'hard', for the purpose of the assessment the ground has been considered as 'hard'.
- The sound levels presented above have been inputted into the software.
- The facades of the proposed building will behave as area noise sources. This is calculated in SoundPlan software assuming +10log(s).
- Two roller shutter doors to the south and east will remain open for a maximum of 30 minutes per hour during day time operational hours.
- There will be a maximum of 2 HGV movements per hour (1 in and 1 out) during day time operational hours.
- Only the fume extraction system will run during the night time.
- The Plant vehicle and HGV noise emissions have been modelled as line sources at heights of 1.5m.
- The walls surrounding the bunkers are approximately 2.5m tall.
- The flue noise emissions have been modelled as point source emitter approximately 22.5m above the ground.
- The grid height of the noise map is set to 1.5m.

The sound map showing the specific sound level emissions from the Proposed Development during the day time and the night time can be seen in the figures below.

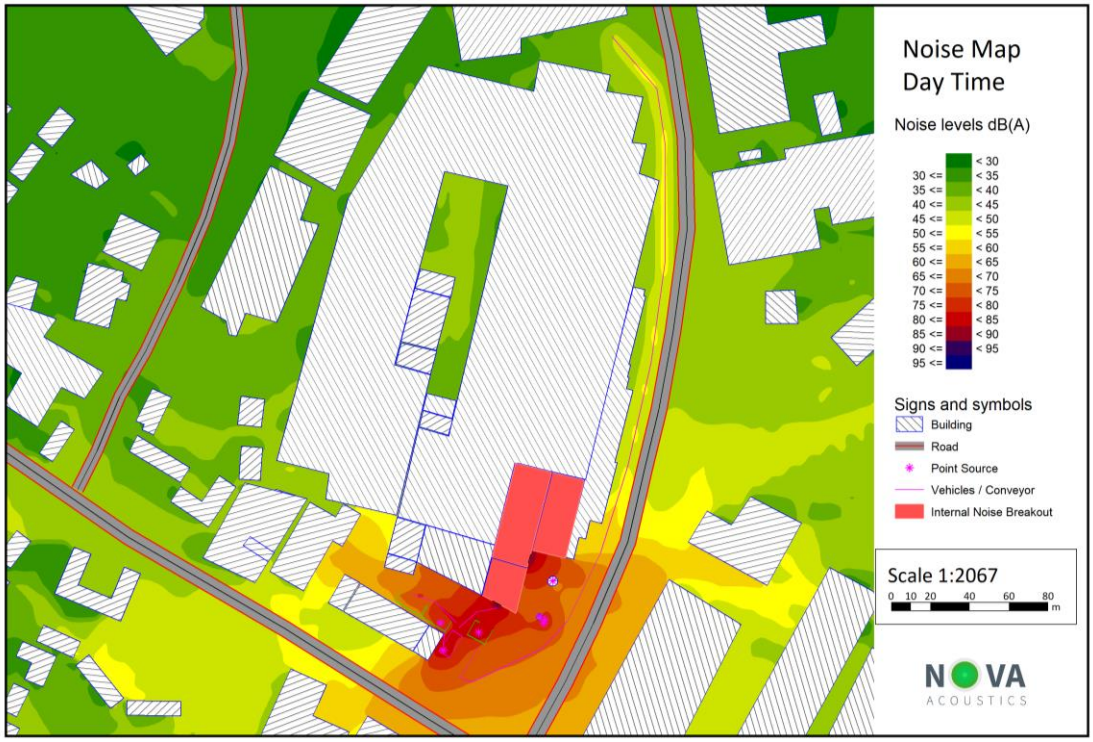


Figure 3.0 – Specific Sound Level Map – Day Time

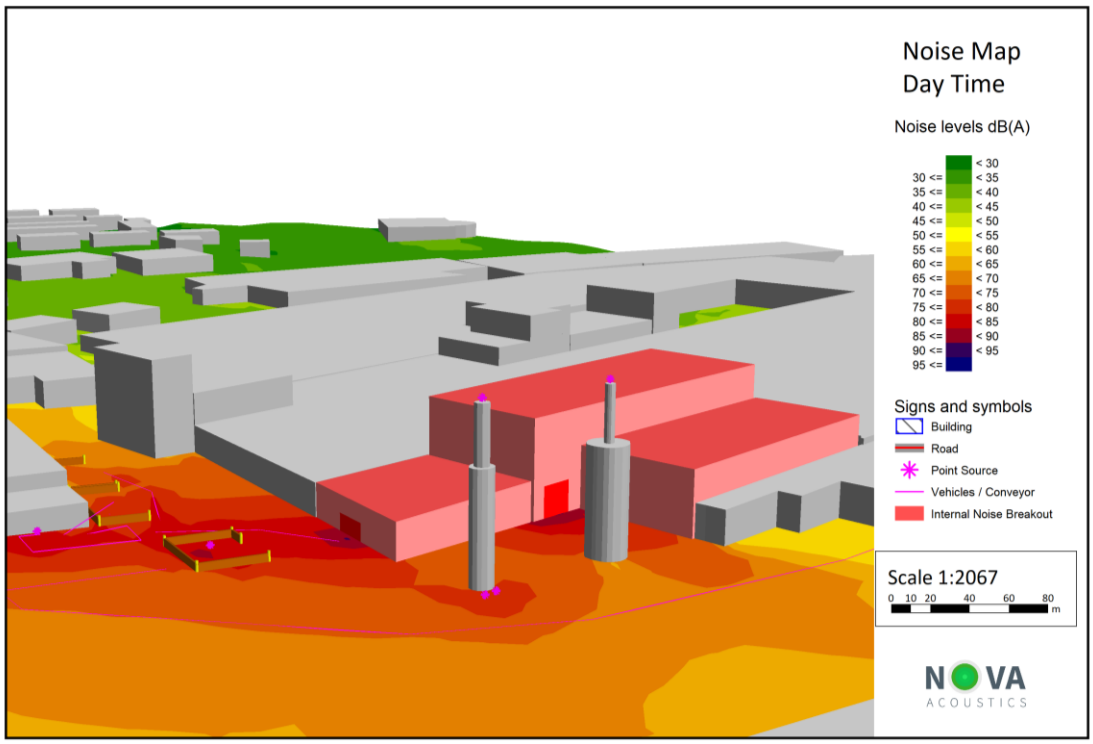


Figure 4.0 – Specific Sound Level Map – Day Time - 3D

Figure 5.0 – Specific Sound Level Map – Night Time

A summary of the specific sound levels at the NSRs based on the sound maps shown in in the figures above can be seen in the following table.

NSR	Day Time Specific Sound Level (dBA)	Night Time Specific Sound Level (dBA)
1	51.0	37.0
2	51.0	38.0

Table 12.0 - Specific Sound Level at NSR Summary

4.1.2 Rating Level

Rating Penalty

Section 9 of BS4142:2014 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142:2014 states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

a) subjective method;
b) objective method for tonality;
c) reference method."

Due to the nature of the development the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014, which states:

"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed. Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."

BS4142:2014 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

a) Tonality

A rating penalty of +2 dB is applicable for a tone which is "just perceptible", +4 dB where a tone is "clearly perceptible", and +6 dB where a tone is "highly perceptible".

b) Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is "just perceptible", +6 dB where it is "clearly perceptible", and +9 dB where it is "highly perceptible".

c) Other Sound Characteristics

BS4142:2014 states that where "the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinct against the residual acoustic environment, a penalty of +3 dB can be applied."

d) Intermittency

BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."

Rating Penalty Assessment

Considering the requirements of the rating penalty, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, and has been detailed in the following table.

Time Period	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
Day Time	+2	+3	+3	--	Impulsive and intermittent characteristics likely to be just audible at the NSRs. Possible tonal features to

					shredding and extract operations.
Night Time	+2	--	+3	--	Extract system may possibly contain tonal components and operate intermittently

Table 13.0 – Rating Penalty Assessment

Rating Level

Incorporating the rating penalties with the specific sound levels, the rating sound levels have been derived and have been detailed in the following table.

NSR	Day Time Rating Sound Level (dB)	Night Time Rating Sound Level (dB)
1	59.0	42.0
2	59.0	43.0

Table 14.0 – Summary of Rating Sound Levels

4.1.3 Background Sound Level

The background sound level is the underlying level of sound over a period, T, and is indicative of the relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

To ensure the background sound level values used within the assessment are reliable and suitably represent both the particular circumstance and periods of interest, efforts have been made to quantify a 'typical' background sound level for a given period. The purpose has not been to simply select the lowest measured value. Diurnal patterns have also been considered as they can have a major influence on background sound levels, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night time period for sleep purposes.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

The table below outlines a summary of the lowest daytime and night time background sound levels of the area measured during the entire environmental survey.

Operational Hours ('t')	$L_{A90,t}$	Statistical $L_{A90,t}$	Min. $L_{A90,t}$	Max. $L_{A90,t}$
Day 1 – 17/02/2020 - 11:40 - 23:00	55.0	56.0	50.0	59.0
Night 1 – 17/02/2020 – 23:00 – 07:00	50.0	45.0	45.0	55.0

Table 15.0 – Summary of Background Sound Levels

Discussion:

According to the statistical analysis the lowest most repeated $L_{A90,t}$ value during the day time operational period was 56.0 dBA and the night time was 45.0 dBA. As can be seen, the range of $L_{A90,t}$ during this periods is relatively low, and the statistical values sit towards the middle and lower ends of the range respectively, thus the statistical values are deemed to be 'typical'. As such, these values will be used in the following assessment.

4.1.4 BS4142 Assessment

The rating sound level has been assessed in accordance with BS4142:2014 at the most exposed NSR. The BS4142:2014 assessment at the NSR, during the day time and night time periods can be seen in the table below.

Results	Day Time (dB)	Night Time (dB)	Notes
Rating Sound Level	59.0	43.0	As shown in Table 14.0
Operational Period Background Sound Level	56.0	45.0	As shown in Table 15.0
Excess of Rating over Background Sound Level	+3.0	-2.0	Assessment Indicates a possibility of 'Adverse Impact' during the day, and 'No Impact' during the night.

Table 16.0 – BS4142:2014 Assessment

Discussion

As can be seen in the assessment above the rating level at the NSR exceeds the background sound level by 3 dB during the day time and is 2 dB below the background during the night time. This indicates a low level of potential adverse impact during the day and no impact during the night. It is important to note that the client has stated that the local authority has indicated they would accept a rating level of +5dB above background, and as such, the day time exceedance is deemed to be acceptable.

Also, BS4142:2014 states that when assessing the impact of any noise source it is essential that the context of the assessment and wider area is taken into account. The site is situated in an industrial/commercial area and is bordered by a major transport route, thus the local residents will

likely have a higher tolerance to commercial and industrial noise and for significant periods throughout the day, the noise from the site will be masked by the road traffic.

4.2 Increase in Ambient Noise Level Assessment

To provide further context to the BS4142 assessment above, in the following section the expected increase in ambient noise levels is analysed. The specific sound levels associated with the proposed development are logarithmically added to the lowest measured residual sound level at the NSR. The higher the increase in noise levels the higher the impact.

Increase in Ambient Noise Level Assessment		
Description	**Day Time (dB)**	**Night Time (dB)**
Lowest Measured Ambient Noise Level	60.0	54.0
Specific Noise Level	51.0	37.0
Resulting Noise Level	60.5	54.1
Increase in Noise Level	+0.5	+0.1
Expected impact	None/Not Significant	None/Not Significant

Table 17.0 – Increase in Ambient Noise Level Assessment

Discussion

As can be seen in the assessment above the increase in ambient noise levels at the NSR due to the operations at the site is predicted to be 0.5 dB during the day, and 0.1 dB during the night. According to the IEMA Guidelines on Noise Impact, this level of increase is 'Not Significant' and indicates a low impact.

4.3 Recommendations and Mitigation

It is thought that the noise emissions from the Proposed Development will be within the criteria, and as such, no further fencing is required. However, to ensure noise levels are kept as low as possible the following points should be followed.

- The new structure should follow plans provided to NOVA Acoustics and should provide a minimum of 40 dB R_w sound reduction.
- All roller shutters should remain closed as much as practicable.
- The Noise Management Plan in the following section should be implemented.

4.4 Noise Management Plan

4.4.1 Introduction

This noise management plan outlines the methods by which the site operator will systematically assess and minimise the potential impacts of noise generated by the site. The noise management plan is a working document with the specific aim to ensure that:

- Noise impact is considered as part of routine inspections.

- Noise is primarily controlled at source by good operational practices, including physical and management control measures.
- All appropriate measures are taken to prevent or, where that is not reasonably practical, to reduce noise emissions from the site.

The noise management plan addresses the impact of noise and the control measures employed to mitigate the risk. These are supported through monitoring procedures to identify elevated levels and review complaints should they arise. The complaints management procedure including the management responsibilities are also addressed.

4.5 Noise Control Measures

The management measures are outlined below. The table in Appendix G outlines the demonstration that Best Available Techniques will be adopted to ensure that noise emission levels during the operation of the site meet the relevant criteria. The table also includes any additional actions that could be used to help BAT.

4.5.1 Site Management Responsibility

The Site Manager (or designated responsible person) will have responsibility for ensuring that nuisances and hazards arising from the facility due to noise are minimised. Regular meetings will be instigated to discuss current and planned site operations that have the potential to generate elevated noise emissions.

4.5.2 Management Control Measures

a) The following range of management control methods will be implemented at the site

Including:

- All plant equipment will be regularly maintained to ensure that no item will produce excessive noise.
- Traffic movements from HGVs will take place during daytime operational hours.
- A speed limit of 10 mph or lower will be in place onsite.
- Site staff will be made aware that they are working in the vicinity of noise-sensitive receptors and avoid all unnecessary noise due to misuse of tools and equipment, and unnecessary shouting and radios. To further enhance this; staff will be trained to operate the equipment and plant without causing excess noise including measures such as not dropping metal from height, where avoidable.

b) If at any time it is necessary to carry out temporary actions that are likely to cause elevated noise levels, the site manager will contact the Environmental Agency and any other interested parties before such actions are taken to inform them of the operations being undertaken and that the elevated levels of noise will be a temporary nature.

c) All operational staff will be responsible for reporting any noise problems immediately to the site manager.

d) No annual quantitative noise monitoring is proposed, however qualitative monitoring of noise levels will be included as a factor to be considered by the site manager as part of daily work on site.

e) Routine maintenance of all plant and equipment, including vehicles, will also identify equipment operating at elevated noise levels and work will be undertaken to repair the defect.

4.5.3 Noise Contingency Measures

Elevated levels of noise may be identified either by receipt of a noise complaint from a third party suggesting that there is excessive noise from the site or by detection of noise as a result of the routine monitoring by site personnel. This section details the contingency measures in place to identify the source of elevated noise levels, bring noise levels back under control and minimise their impact.

4.5.4 Noise Complaint Investigation

An issue management system (IMS) will be implemented and completed by the site manager, this will include a site diary, plus forms and records of complaints. Further to this a customer care and complaints procedure will be implemented, this procedure will allow for all complaints, feedback and requests made by third parties regarding the site's operational activities, health and safety performance or quality of service/product.

All complaints received from third parties including external customers, potential customers, statutory authorities, statutory consultees, members of the general public and internal clients will be forwarded to the site manager to action as below and record into the incident database within 72 hours.

The site manager will ensure that:

- The complaint is investigated to identify the cause, if necessary this may involve direct communication with the complainant.
- In the event of elevated noise being detected, the presence of 'abnormal' onsite activity is assessed and if necessary preventive action is taken that will prevent a reoccurrence of the same problem. These actions must be documented.
- The complainant will be contacted and given information on the investigations conducted and actions taken as appropriate.
- Where a complaint or query is likely to involve a statutory authority, the emergency services, an insurance company, or the media, the external affairs manager will be informed.
- Complaints involving a location with Local Authority Contracts will be reported in line with specific Contract requirements and timescales. Local procedures may need to be in place to ensure these are adhered to.
- All complaints are reported to regional directors and discussed at site meetings.
- Details of other complaints are sent to the other company personnel as appropriate.
- If the investigation indicates that the complaint has not been justified this will be clearly recorded on the incident report. All complaints will be logged.

4.5.5 Elevated Noise Levels

Any elevated levels of noise identified by the qualitative monitoring procedure the customer care and complaints procedure will be mitigated as follows:

- The site manager will investigate the source of the noise and carry out a range of checks at the identified source of the elevated levels if it is found to be operating within the site. As part of these checks, the site manager will consider the need for quantitative monitoring.
- Any noise monitoring will be completed in accordance with the relevant British Standard, including BS4142:2014. Monitoring locations will be agreed with the Environmental Agency and/or Local Planning Authority prior to undertaking monitoring.
- The results of any noise monitoring will determine whether the site is causing an unacceptable impact at the receptor in question.
- The site manager will then ensure the plant is being operated to the manufacturer's specification, and within the requirements of section 4.5.2 of this management plan and ensure that any improvements required to minimise the noise levels are made.

To further mitigate the elevated noise levels, the following actions shall be considered:

- The replacement of equipment identified as generating excess noise.
- Once the improvement identified by the site manager have been completed, the manager will commission a further set of noise monitoring to ensure that the improvements have met the required standard. If the noise levels are still not being met, then the manager will repeat the request for improvements and subsequent monitoring until the limits are met.

If operational failings are identified, the retraining of employees will take place to ensure that all employees operate to the required standards. If the failings are identified as part of the operating techniques, then the problem will be raised as part of the review of control measures.

The site manager will ensure a close liaison with the Environment Agency throughout all stages of the process following an identified elevated noise level.

4.5.6 Reporting Measures

In the event of elevated levels of noise being identified, the event will be reported into an issue management system (IMS) by a member of operational staff. Upon notification of an environmental incident, the site manager will complete an incident reporting form. The completed form is then distributed throughout the company for review at operational, management and health and safety meetings.

All performance failures will be categorised for input into the IMS as follows:

- Minor event; quick fix possible, locally resolved.
- Medium event; brief disruption into service, management intervention required.
- Major event; significant disruption to service.

Each non-conformance category must have a given deadline for rectification.

The IMS will record any actions taken to rectify the issue, ensure that any necessary actions or review are recorded onto the IMS and ensure that the person reporting the incident is notified. The site manager will investigate the performance failure within 2 hours and, if necessary, will report the event to the Environment Agency. Once the issue has been resolved, the corrective action will be entered onto the system and the issue will be closed.

4.6 Emergency Plans

4.6.1 General

This section considers the potential for accidents or incidents which would result in the loss of control of noise emissions and could have an unacceptable short term impact on the local community. The measures in place to mitigate any emergency situations will generally be the same as the contingency measures identified in section 4.5.2. If the situation is considered to be an emergency by the site manager then the mitigation measures will be immediately implemented and the manager will consider limiting the hours of operation or immediately suspending the site operations creating the unacceptable levels of noise. These measures will be considered on a case by case basis.

4.6.2 Breakdown of Equipment and Plant

Elevated levels of noise may escape from the site due to the breakdown of plant onsite. Machines not operating to manufacturer's specification may create unacceptable levels of noise and the failure of control equipment such as acoustic cladding or acoustic barriers may allow unacceptable levels of noise to escape from the site. In the event of the equipment or abatement breakdown the mitigation measures to be undertaken are the same as the contingency measures.

4.7 Management Review

Noise control measures will be reviewed through internal audits as part of the monitoring and reporting systems. With reference to noise, the internal audits will include but not limited to the following:

- Monthly spot check inspections of the paper trail of forms and the IMS to ensure that all data is entered correctly.
- Spot checks on the higher risk sources of noise to check monitoring and maintenance procedures are being carried out in accordance with this management plan.
- Checks to ensure that any issues entered into the IMS have been resolved correctly.

NOVA ACOUSTICS

Appendix A – Acoustic Terminology

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa (20x10-6 Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L10 can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided. The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

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

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source. A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the

time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound. To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS4142:2014 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125ms.

Appendix B – Legislation, Policy and Guidance

This report is to be primarily based on the following legislation, policy and guidance.

National Planning Policy Framework (2019)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2019. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 170e, it states:

Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

Paragraph 180 states:

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

a) *Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
b) *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
c) *Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

Noise Policy Statement for England

Paragraph 180 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision to:

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

To achieve this vision the Statement identifies the following three aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life;*
- *Where possible, contribute to the improvement of health and quality of life.*

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that "significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development".

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: "all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. This can be related to the third aim above, which seeks: "where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

IEMA Guidelines on Noise Impact Assessments

The IEMA Guidelines for Environmental Noise Assessment address the key principles of noise impact assessment and are applicable to all development proposals where noise effects may occur. The guidelines set out key principles for noise impact assessment relevant to all types of project regardless of size. The guidance provides advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed. The guidance recognizes that the effect associated with a noise impact will be dependent on a number of factors including but not limited to the sensitivity of the receptor, frequency and duration of the noise source and time of day. The Guidelines accept that a simple change in noise levels using a single noise indicator may fail to adequately reveal the actual noise impact of the proposal. The character of the noise must be considered and the Guidelines suggest comparing several noise indicators such as the LAeq, LAmax and LA90 as a more rigorous approach.

Absolute levels such as those set out in WHO Guidelines are also considered and the Guidelines suggest that a change in noise levels in an area where the existing levels are above WHO Guidelines should be considered as having more of an adverse effect than a change in noise levels in an area where existing levels are well below.

The Guidelines stop short of providing specific assessment criteria which developments should achieve but instead suggests that the methodology adopted should be selected on a site by site basis regarding relevant national and local standards.

The Guidelines contain effect descriptors for changes in noise levels and for noise effect levels. These are summarized below:

Effect Descriptors	
Very substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise sensitive receptor, or a 5 to 9.9 dB LAeq change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5dB LAeq change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
None/Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

Table 18.0 – IEMA Guidelines Effect Descriptors

Noise Effect Level		
Time	Lowest Observed Adverse Effect Level	Significant Observed Adverse Effect Level
07:00 - 23:00	50 dB $L_{Aeq,16\ hour}$	60 dB $L_{Aeq,16\ hour}$
23:00 - 07:00	40 dB $L_{Aeq,8\ hour}$	55 dB $L_{Aeq,8\ hour}$
	60 dB L_{AFMax} (at the facade)	80 dB L_{AFMax} (at the facade)

Table 19.0 – IEMA Guidelines Noise Effect Level

The Guidelines are not prescriptive as to how a noise impact assessment should be carried out, and allow assessors to consider factors such as frequency spectra, days and times of operation, frequency of operation and any other factor which allows the noise to be assessed in context.

BS 4142:2014 'Methods for rating and assessing industrial and commercial sound'

BS4142:2014 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014 states: "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". An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- "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 negligible impact, depending on the context."

Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level;
- The lower the rating sound 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 sound level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact, and would therefore classified as a No Observed Adverse Effect Level.

During the daytime, the assessment is carried out over a reference time period of 1-hour. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

ISO 9613-2 Attenuation of sound during propagation outdoors

The ISO 1996 series of standards specifies methods for the description of noise outdoors in community environments. Part 2 of ISO 9613 is intended to enable noise levels in the community to be predicted from sources of known sound emission. The method is general in the sense that it may be applied to a wide variety of noise sources, and cover most of the major mechanisms of attenuation.

This standard provides guidance on the outdoor propagation of sound. It is widely used to establish the different attenuations that occur during the transmission of the sound from the sources to the receivers. The total attenuation is the sum of the following: geometrical divergence, atmospheric absorption, ground effect, barriers, and miscellaneous other effects.

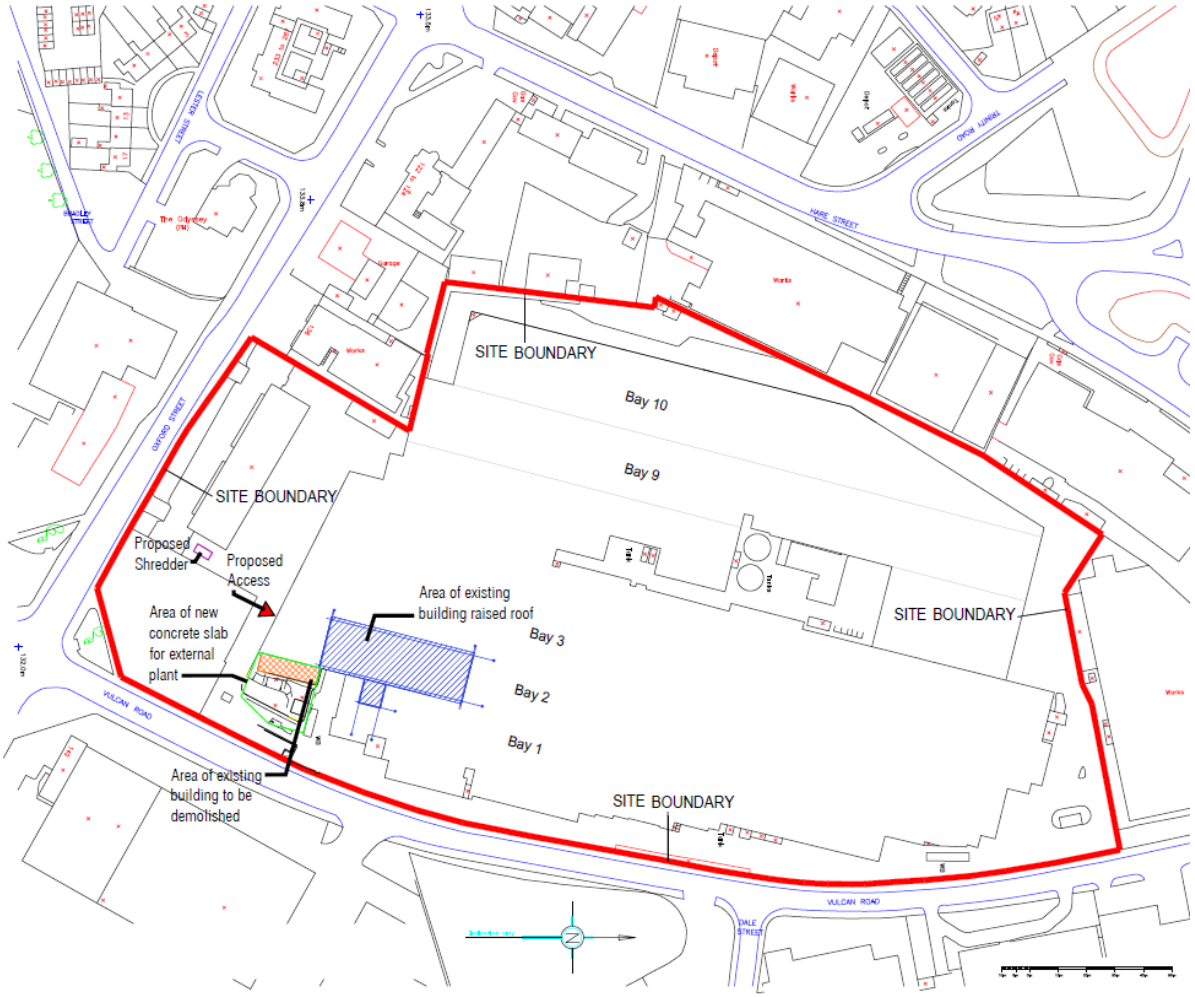
BS EN 12354-4 Building Acoustics

Estimation of acoustic performance of buildings from the performance of elements – Transmission of indoor sound to the outside

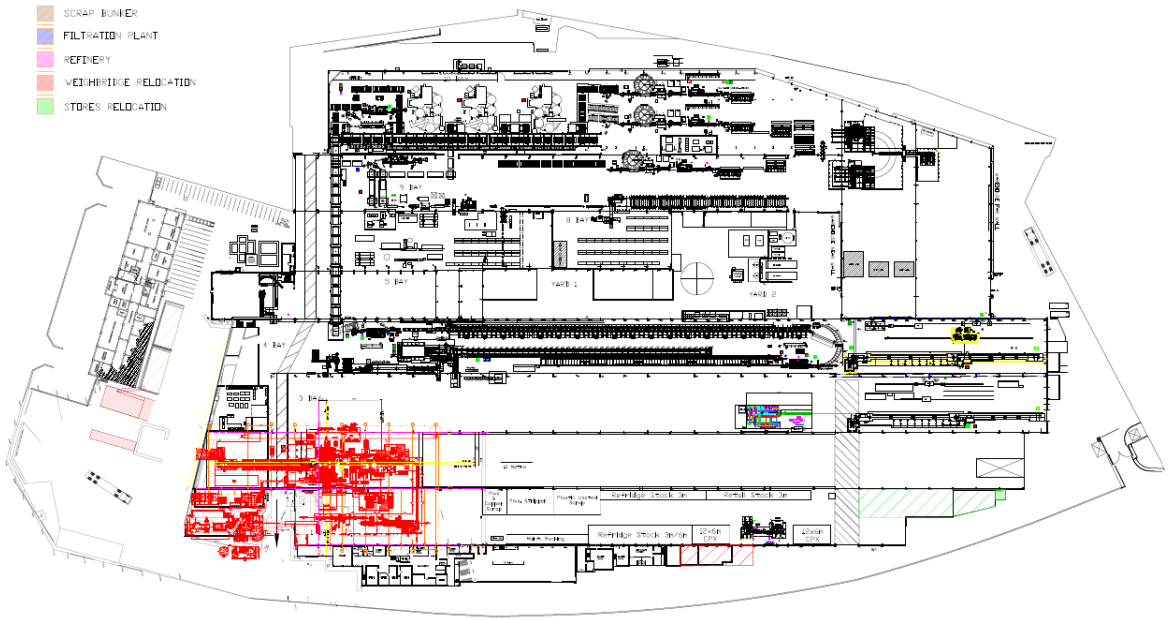
This European Standard describes a calculation model for the sound power level radiated by the envelope of a building due to airborne sound inside that building, primarily by means of measured sound pressure levels inside the building and measured data which characterize the sound transmission by the relevant elements and openings in the building envelope. These sound power levels, together with those of other sound sources in or in front of the building envelope, form the basis for the calculation of the sound pressure level at a chosen distance from a building as a measure for the acoustic performance of buildings.

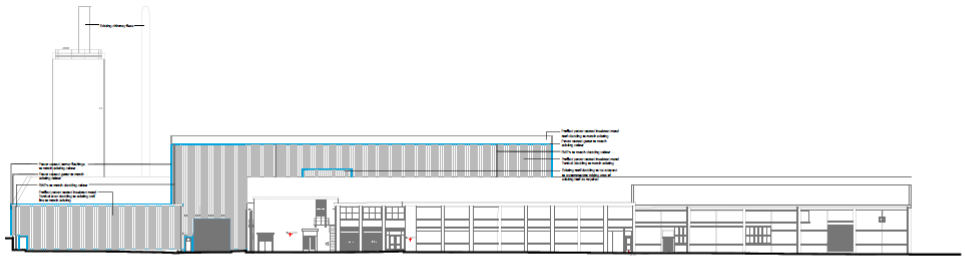
NOVA ACOUSTICS

Appendix C - Location Plan

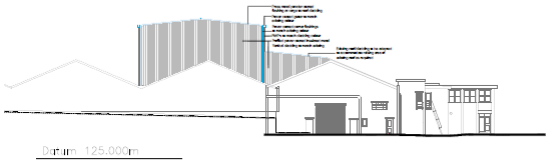


Appendix D – Site Plans

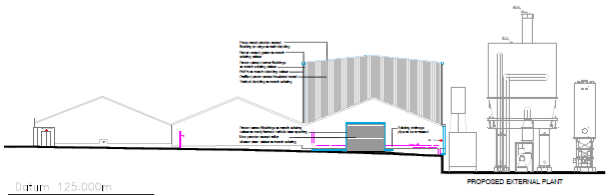




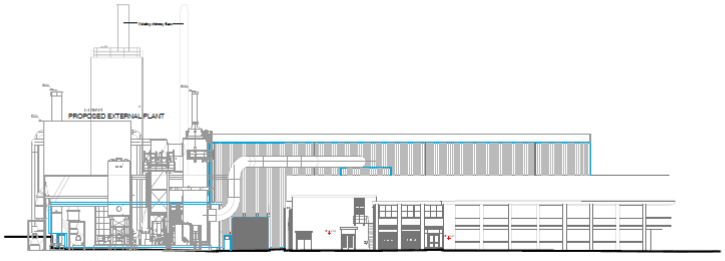
ELEVATION 1 (EAST VIEW - Vulcan Road) Scale 1:200 @ A1



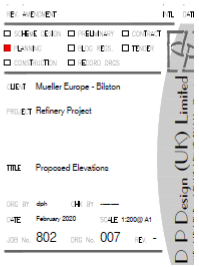
ELEVATION 2 (SW VIEW) Scale 1:200 @ A1



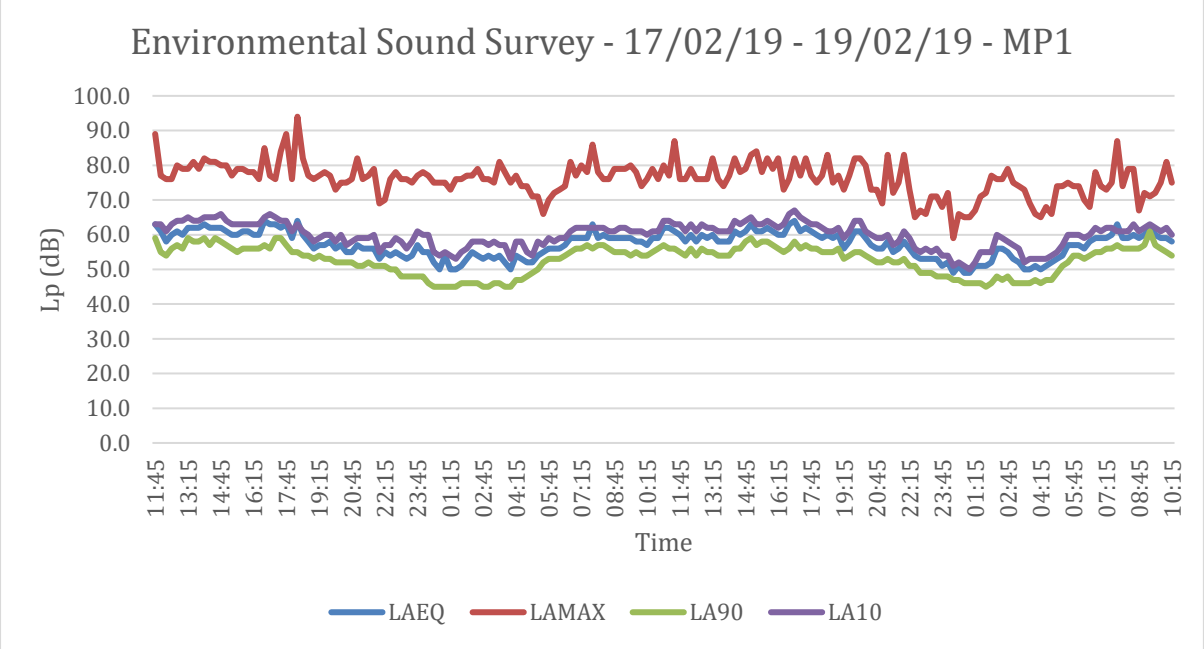
ELEVATION 3 (SW VIEW) Scale 1:200 @ A1



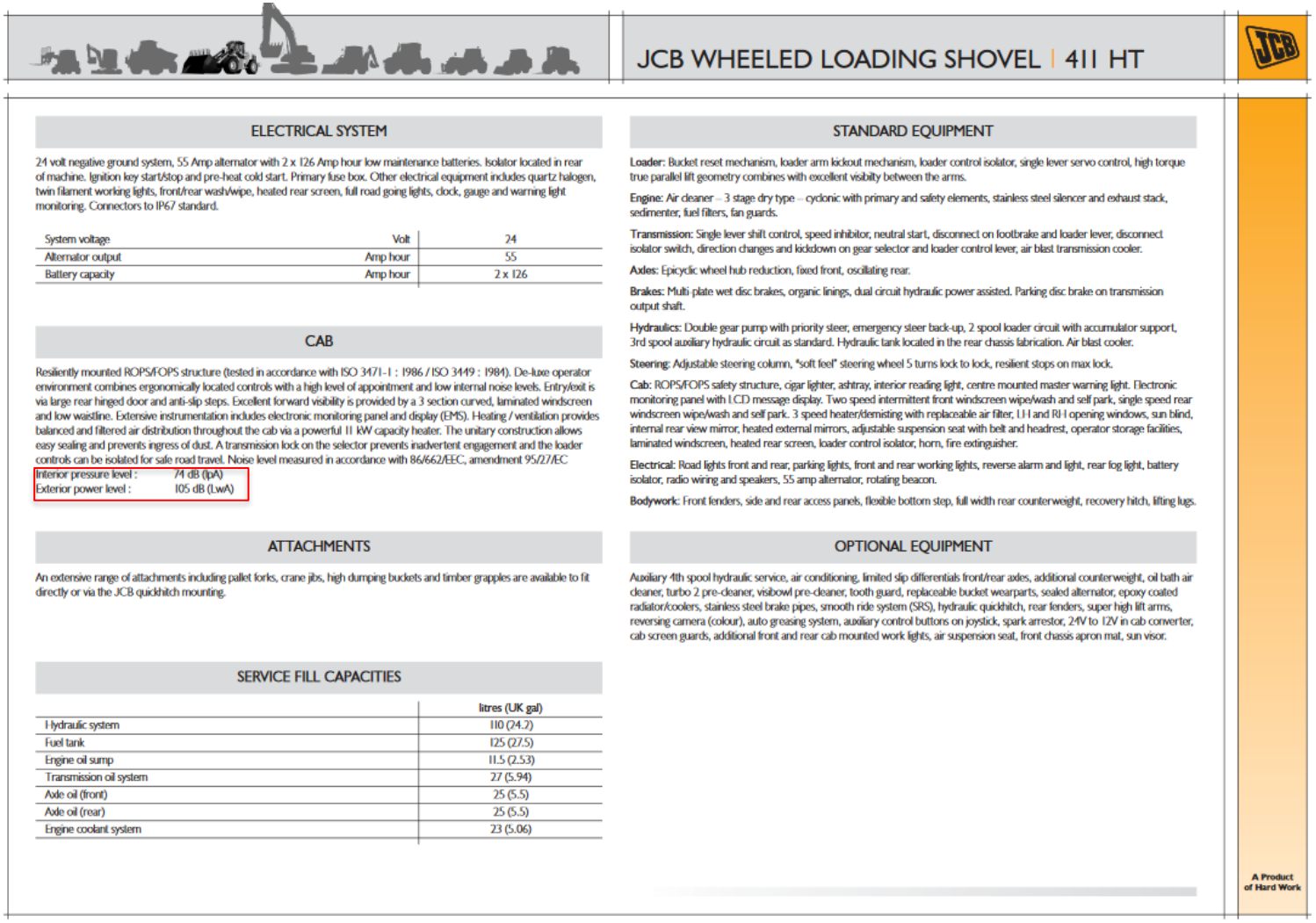
ELEVATION 1 (EAST VIEW - Vulcan Road (with external plant indicated)) Scale 1:200 @ A1



Appendix E – Environmental Sound Survey



Appendix F – Manufacturers Data, Calculations and Grid References



JCB WHEELED LOADING SHOVEL | 411 HT

ELECTRICAL SYSTEM

24 volt negative ground system, 55 Amp alternator with 2 x 126 Amp hour low maintenance batteries. Isolator located in rear of machine. Ignition key start/stop and pre-heat cold start. Primary fuse box. Other electrical equipment includes quartz halogen, twin filament working lights, front/rear wash/wipe, heated rear screen, full road going lights, clock, gauge and warning light monitoring. Connectors to IP67 standard.

System voltage	Volt	24
Alternator output	Amp hour	55
Battery capacity	Amp hour	2 x 126

CAB

Resiliently mounted ROPS/FOPS structure (tested in accordance with ISO 3471-1 : 1986 / ISO 3449 : 1984). De-luxe operator environment combines ergonomically located controls with a high level of appointment and low internal noise levels. Entry/exit is via large rear hinged door and anti-slip steps. Excellent forward visibility is provided by a 3 section curved, laminated windscreen and low waistline. Extensive instrumentation includes electronic monitoring panel and display (EMS). Heating / ventilation provides balanced and filtered air distribution throughout the cab via a powerful 11 kW capacity heater. The unitary construction allows easy sealing and prevents ingress of dust. A transmission lock on the selector prevents inadvertent engagement and the loader controls can be isolated for safe road travel. Noise level measured in accordance with 86/662/EEC, amendment 95/27/EC

Interior pressure level :	74 dB (lpA)
Exterior power level :	105 dB (LwA)

ATTACHMENTS

An extensive range of attachments including pallet forks, crane jibs, high dumping buckets and timber grapples are available to fit directly or via the JCB quickhitch mounting.

SERVICE FILL CAPACITIES

	litres (UK gal)
Hydraulic system	110 (24.2)
Fuel tank	125 (27.5)
Engine oil sump	11.5 (2.53)
Transmission oil system	27 (5.94)
Axle oil (front)	25 (5.5)
Axle oil (rear)	25 (5.5)
Engine coolant system	23 (5.06)

STANDARD EQUIPMENT

Loader: Bucket reset mechanism, loader arm kickout mechanism, loader control isolator, single lever servo control, high torque true parallel lift geometry combines with excellent visibility between the arms.

Engine: Air cleaner – 3 stage dry type – cyclonic with primary and safety elements, stainless steel silencer and exhaust stack, sedimenter, fuel filters, fan guards.

Transmission: Single lever shift control, speed inhibitor, neutral start, disconnect on footbrake and loader lever, disconnect isolator switch, direction changes and kickdown on gear selector and loader control lever, air blast transmission cooler.

Axles: Epicyclic wheel hub reduction, fixed front, oscillating rear.

Brakes: Multi-plate wet disc brakes, organic linings, dual circuit hydraulic power assisted. Parking disc brake on transmission output shaft.

Hydraulics: Double gear pump with priority steer, emergency steer back-up, 2 spool loader circuit with accumulator support, 3rd spool auxiliary hydraulic circuit as standard. Hydraulic tank located in the rear chassis fabrication. Air blast cooler.

Steering: Adjustable steering column, "soft feel" steering wheel 5 turns lock to lock, resilient stops on max lock.

Cab: ROPS/FOPS safety structure, cigar lighter, ashtray, interior reading light, centre mounted master warning light. Electronic monitoring panel with LCD message display. Two speed intermittent front windscreen wipe/wash and self park, single speed rear windscreen wipe/wash and self park. 3 speed heater/demisting with replaceable air filter, LH and RH opening windows, sun blind, internal rear view mirror, heated external mirrors, adjustable suspension seat with belt and headrest, operator storage facilities, laminated windscreen, heated rear screen, loader control isolator, horn, fire extinguisher.

Electrical: Road lights front and rear, parking lights, front and rear working lights, reverse alarm and light, rear fog light, battery isolator, radio wiring and speakers, 55 amp alternator, rotating beacon.

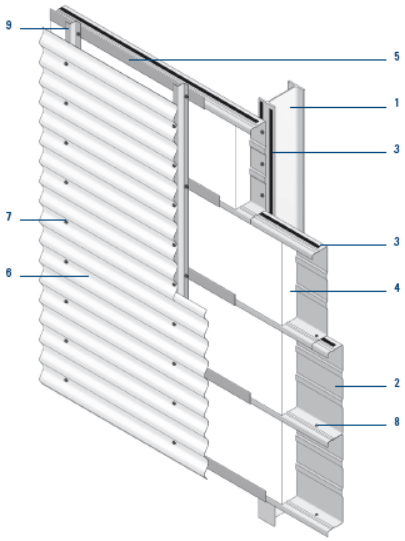
Bodywork: Front fenders, side and rear access panels, flexible bottom step, full width rear counterweight, recovery hitch, lifting lugs.

OPTIONAL EQUIPMENT

Auxiliary 4th spool hydraulic service, air conditioning, limited slip differentials front/rear axles, additional counterweight, oil bath air cleaner, turbo 2 pre-cleaner, visibowl pre-cleaner, tooth guard, replaceable bucket wearparts, sealed alternator, epoxy coated radiator/coolers, stainless steel brake pipes, smooth ride system (SRS), hydraulic quickhitch, rear fenders, super high lift arms, reversing camera (colour), auto greasing system, auxiliary control buttons on joystick, spark arrestor, 24V to 12V in cab converter, cab screen guards, additional front and rear cab mounted work lights, air suspension seat, front chassis apron mat, sun visor.

A Product of Hard Work

KONSTRUKTIONSBESCHRIEB der hinterlüfteten Fassade	DESCRIPTIF de la façade ventilée	DESCRIZIONE della facciata ventilata	DESCRIPTION OF THE STRUCTURE of the rear-ventilated façade



Kassette Cassette Cassetta Liner tray	Wandstärke bis Fassadenhaut Épaisseur de la paroi Spessore Wall thickness ca. mm	Dämmstärke Ép. isolation Spessore isolante Insulation thickness mm	U-Wert Valeur U Valore U Valore U W/m²k°	Schalldämmung Isolation acous-tique Isol. fonico Sound insulation R'w[dB]
80/333	30	80	0.940	42
80/500	130	80	0.760	41
100/333	150	100	0.870	45
100/500	150	100	0.690	44
100/600	150	100	0.630	43
120/333	170	120	0.820	46
120/500	170	120	0.640	45
120/600	170	120	0.580	44
140/500	190	140	0.600	46
140/600	190	140	0.540	45
160/500	210	160	0.570	47
160/600	210	160	0.510	46

MONTAWALL® mit eingelegter Dämmung, Aufstackprofil und Distanzprofil. SWISS PANEL® horizontal verlegt.

1 Stahlstütze
2 MONTAWALL®-Kassette MK
3 Dichtband
4 Wärmedämmung
5 Montana Aufsteckprofil
6 Wellband horizontal SWISS PANEL®
7 Bohrschraube rostfrei
8 Verbindungsmittel im Längsstoss
9 Z-Profil

MONTAWALL® avec isolation, profil à emboîter et profil d'écartement. SWISS PANEL® posé horizontalement.

1 Pilier métallique
2 Cassette MONTAWALL®-MK
3 Bande d'étanchéité
4 Isolation thermique
5 Profil coupe-froid Montana
6 Profil ondulé horizontal SWISS PANEL®
7 Vis autoperceuse en inox
8 Fixation du joint latéral
9 Profil Z

MONTAWALL® con isolante integrato, profilo a innesto, profilo distanziatore e SWISS PANEL® posato in senso orizzontale.

1 Pilastro in acciaio
2 Cassetta MONTAWALL® MK
3 Nastro isolante
4 Isolante termico
5 Profilo ad innesto Montana
6 Profilo ondulato SWISS PANEL® posato in senso orizzontale
7 Vite autoperforante in acciaio inossidabile
8 Cucitura giunto longitudinale
9 Profilo Z

MONTAWALL® with inlaid insulation, push-on profile and spacing profile. SWISS PANEL® laid horizontally.

1 Steel support
2 MONTAWALL® liner tray MK
3 Sealing tape
4 Heat insulation
5 Montana push-on profile
6 SWISS PANEL® horizontal corrugated profile
7 Stainless steel drilling screw
8 Longitudinal joint connector
9 Z-profile

NOVA ACOUSTICS

Continuus Properzi

Noise emission test on CR2A645 Chopper

The phonometric surveys were carried out by applying the measurement strategy for tasks, according to the metrological practice provided by UNI EN 150 9612:2011					
Survey	**measurement time (min)**	**Noise type**	**Typical level**	**L_{peak} [dB(A)]**	**U (L_{peak})**
From cutting chamber at 1 m	1	Constant	76,10	90,80	1,56
From hydraulic unit at 1 m	1	Constant	75,70	89,20	1,56
From drive side at 1 m	1	Constant	74,30	88,50	1,56
From Electrical panel front at 1 m	1	Constant	72,40	93,20	1,56
From Electrical panel front at 5 m	1	Constant	61,40	75,30	1,56

Maximum peak pressure value	
L_{peak} [dB(C)]	93,20
U (L_{peak})	1,56

Average sound pressure measured: **71,98 dB(A)**

Instantaneous sound pressure peak: **95,78 dB(C)**

The noise emission levels can be affected by the material processed, the type of installation and the positions of the operator

	63 Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
1. L_w of fan	77	82	82	79	79	77	74	72
2. Uncertainties	3	3	3	3	3	3	3	3
3. Room and Terminal effect	0	0	0	0	0	0	0	0
4. Allowance for end reflection	-4	-1	0	0	0	0	0	0
5. Ductwork attenuation	0	0	0	0	0	0	0	0
6. Elbow attenuation		-5	-8	-4	-3	-3	-3	-3
7. Silencers								
8. Weighting (A)	-26	-16	-9	-3	0	1	1	1
9. Resulting L_w	50	63	68	75	79	78	75	73
10. Spherical Propagation (10logQ/4πr^2)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
11. L_{Aeq} at N.S.R	42.0	55.0	60.0	67.0	71.0	70.0	67.0	65.0
12. Gobal L_{Aeq} @ N.S.R	75.7							

Noise Source Grid References				
Name	**Source Type**	**X**	**Y**	**Z**
HGV Movement	Line	395878.24	296349.54	1.5 (Rel.)
		395901.14	296322.85	1.5 (Rel.)
		395905.55	296293.33	1.5 (Rel.)
		395905.26	296234.11	1.5 (Rel.)
		395898.16	296183.78	1.5 (Rel.)
		395886.36	296130.89	1.5 (Rel.)
		395872.31	296086.37	1.5 (Rel.)
		395855.49	296051.92	1.5 (Rel.)
		395842.25	296037.79	1.5 (Rel.)
		395806.76	296020.85	1.5 (Rel.)
		395800.98	296023.35	1.5 (Rel.)
		395810.06	296039.05	1.5 (Rel.)
Excavator	Line	395776.41	296065.50	1.5 (Rel.)
		395787.91	296062.05	1.5 (Rel.)
		395798.83	296051.26	1.5 (Rel.)
Shredder Conveyor	Line	395793.47	296048.96	4.0 (Rel.)
		395792.15	296040.06	1.0 (Rel.)

		395796.84	296047.41	2.0 (Rel.)
		395801.95	296044.17	2.0 (Rel.)
		395795.36	296033.69	2.0 (Rel.)
		395789.94	296036.82	2.0 (Rel.)
		395791.25	296038.90	2.0 (Rel.)
Loader	Line	395800.21	296048.64	1.5 (Rel.)
		395809.34	296056.79	1.5 (Rel.)
		395819.84	296058.59	1.5 (Rel.)
HGV Unloading	Point Source	395810.44	296046.23	2.5 (Rel.)
Shredder	Point Source	395792.43	296037.31	3.0 (Rel.)
Material Dropping into Bunker	Point Source	395790.73	296051.06	1.0 (Rel.)
Flue 1	Point Source	395848.11	296072.39	2.5 (Rel.)
Flue 2	Point Source	395841.29	296054.25	2.5 (Rel.)
Fan 1 Case Breakout	Point Source	395843.50	296051.02	2.0 (Rel.)
Fan 2 Case Breakout	Point Source	395843.90	296052.77	2.0 (Rel.)
Regal Motors Building (6m Height)	No Noise Emissions	395714.43	296027.68	135.88
		395732.79	296019.48	135.88
		395728.79	296010.58	135.88
		395725.80	296003.92	135.88

		395744.19	295995.70	135.88
		395742.20	295991.27	135.88
		395739.67	295985.63	135.88
		395746.00	295982.80	135.88
		395740.46	295970.49	135.88
		395697.38	295989.77	135.88
Existing Site Building (Height 8m)	No Noise Emissions	395818.50	296090.89	-1.74 (Rel.)
		395828.82	296132.45	-0.87 (Rel.)
		395864.75	296124.10	-0.49 (Rel.)
		395902.30	296276.07	0.54 (Rel.)
		395892.10	296279.80	0.57 (Rel.)
		395895.84	296294.63	0.69 (Rel.)
		395888.43	296295.57	0.73 (Rel.)
		395894.04	296318.74	1.10 (Rel.)
		395875.50	296321.56	1.05 (Rel.)
		395877.37	296329.91	1.15 (Rel.)
		395841.22	296337.40	0.81 (Rel.)
		395838.40	296321.64	0.67 (Rel.)
		395784.65	296334.73	0.19 (Rel.)

		395743.71	296267.12	-0.90 (Rel.)
		395707.28	296133.66	-3.21 (Rel.)
		395734.16	296127.11	-2.75 (Rel.)
		395732.28	296114.13	-3.10 (Rel.)
		395768.42	296105.85	-2.48 (Rel.)
		395785.80	296177.35	-0.91 (Rel.)
		395767.39	296182.38	-1.20 (Rel.)
		395792.89	296280.93	-0.03 (Rel.)
		395825.33	296273.44	0.28 (Rel.)
		395795.01	296146.07	1.22 (Rel.)
		395779.76	296150.56	1.41 (Rel.)
		395769.10	296105.14	2.48 (Rel.)
Existing Site Building (Height 6m)	No Noise Emissions	395855.97	296084.12	0.00 (Rel.)
		395858.69	296083.43	0.04 (Rel.)
		395861.53	296094.69	0.22 (Rel.)
		395864.77	296093.87	0.27 (Rel.)
		395867.12	296103.19	0.41 (Rel.)
		395873.08	296101.69	0.50 (Rel.)
		395880.89	296132.62	0.93 (Rel.)

		395879.72	296132.92	0.92 (Rel.)
		395888.94	296169.42	1.44 (Rel.)
		395885.58	296170.27	1.39 (Rel.)
		395887.02	296175.96	1.45 (Rel.)
		395886.11	296176.19	1.43 (Rel.)
		395887.68	296182.40	1.49 (Rel.)
		395886.77	296182.63	1.48 (Rel.)
		395895.49	296217.14	1.67 (Rel.)
		395894.30	296217.44	1.65 (Rel.)
		395895.11	296220.62	1.64 (Rel.)
		395889.08	296222.12	1.54 (Rel.)
		395854.55	296084.40	-0.02 (Rel.)
Existing Site Building (Height 10m)	No Noise Emissions	395764.05	296086.61	0.00 (Rel.)
		395778.71	296082.30	0.22 (Rel.)
		395783.09	296100.56	0.73 (Rel.)
		395768.78	296104.82	0.54 (Rel.)
Existing Site Building (Height 16m)	No Noise Emissions	395778.69	296082.13	0.00 (Rel.)
		395763.90	296086.34	-0.23 (Rel.)
		395762.32	296079.48	-0.45 (Rel.)

		395776.82	296075.65	-0.21 (Rel.)
Existing Site Building (Height 10m)	No Noise Emissions	395782.01	296159.11	0.00 (Rel.)
		395797.03	296154.78	0.19 (Rel.)
		395794.83	296146.57	0.03 (Rel.)
		395779.92	296150.96	-0.16 (Rel.)
Existing Site Building (Height 15m)	No Noise Emissions	395798.89	296164.17	0.00 (Rel.)
		395796.70	296155.29	-0.16 (Rel.)
		395781.95	296159.51	-0.35 (Rel.)
		395783.98	296167.89	-0.19 (Rel.)
Existing Site Building (Height 12m)	No Noise Emissions	395770.88	296193.64	0.00 (Rel.)
		395788.85	296189.27	0.23 (Rel.)
		395785.80	296177.57	0.07 (Rel.)
		395768.04	296182.81	-0.21 (Rel.)
Existing Site Building (Height 6m)	No Noise Emissions	395777.65	296221.36	0.00 (Rel.)
		395795.84	296216.56	0.20 (Rel.)
		395788.64	296189.92	-0.15 (Rel.)
		395770.66	296194.50	-0.37 (Rel.)
Existing Site Building (Height 12m)		395780.70	296231.11	0.00 (Rel.)

	No Noise Emissions	395798.25	296226.74	0.19 (Rel.)
		395796.06	296216.77	0.09 (Rel.)
		395777.87	296221.58	-0.10 (Rel.)
Existing Site Building (Height 6m)	No Noise Emissions	395811.84	296065.19	0.00 (Rel.)
		395818.46	296090.72	0.63 (Rel.)
		395783.49	296100.76	0.08 (Rel.)
		395778.81	296082.01	-0.44 (Rel.)
Existing Site Building – Offices (Height 4m)	No Noise Emissions	395776.96	296036.77	0.00 (Rel.)
		395785.18	296049.75	0.54 (Rel.)
		395792.58	296045.54	0.61 (Rel.)
		395784.35	296031.96	-0.00 (Rel.)
Existing Site Building – Offices (Height 4m)	No Noise Emissions	395742.04	296075.84	0.00 (Rel.)
		395749.63	296071.63	0.07 (Rel.)
		395741.00	296057.24	-0.57 (Rel.)
		395733.61	296061.26	-0.64 (Rel.)
Chimney 1 Base (Height 15m)	No Noise Emissions	395845.55	296072.29	0.00 (Rel.)
		395845.65	296071.72	-0.00 (Rel.)

		395845.77	296071.27	-0.01 (Rel.)
		395846.01	296070.79	-0.01 (Rel.)
		395846.36	296070.28	-0.01 (Rel.)
		395847.29	296069.92	0.01 (Rel.)
		395847.82	296069.85	0.02 (Rel.)
		395848.65	296069.82	0.03 (Rel.)
		395849.23	296069.97	0.05 (Rel.)
		395849.74	296070.33	0.06 (Rel.)
		395850.01	296070.68	0.07 (Rel.)
		395850.36	296071.13	0.08 (Rel.)
		395850.54	296071.81	0.09 (Rel.)
		395850.59	296072.28	0.10 (Rel.)
		395850.54	296073.01	0.10 (Rel.)
		395850.26	296073.56	0.10 (Rel.)
		395849.95	296074.24	0.11 (Rel.)
		395849.37	296074.57	0.10 (Rel.)
		395848.71	296074.80	0.09 (Rel.)
		395848.11	296074.83	0.08 (Rel.)
		395847.62	296074.77	0.07 (Rel.)

		395847.22	296074.63	0.06 (Rel.)
		395846.84	296074.31	0.05 (Rel.)
		395846.41	296074.05	0.04 (Rel.)
		395846.00	296073.62	0.02 (Rel.)
		395845.69	296073.09	0.01 (Rel.)
Chimney 1 Top (Height 7m)	No Noise Emissions	395847.54	296072.41	15.00 (Rel.)
		395847.58	296072.17	15.00 (Rel.)
		395847.73	296071.95	15.00 (Rel.)
		395847.88	296071.86	15.00 (Rel.)
		395848.11	296071.77	15.00 (Rel.)
		395848.32	296071.80	15.01 (Rel.)
		395848.54	296071.89	15.01 (Rel.)
		395848.65	296072.07	15.02 (Rel.)
		395848.72	296072.29	15.02 (Rel.)
		395848.73	296072.59	15.02 (Rel.)
		395848.64	296072.80	5.03 (Rel.)
		395848.42	296072.92	5.02 (Rel.)
		395848.22	296072.97	5.02 (Rel.)
		395848.01	296072.97	15.02 (Rel.)

		395847.80	296072.91	15.01 (Rel.)
		395847.65	296072.74	15.01 (Rel.)
		395847.57	296072.59	15.00 (Rel.)
Chimney 2 Base (Height 15m)	No Noise Emissions	395841.53	296052.81	0.00 (Rel.)
		395840.98	296052.76	-0.01 (Rel.)
		395840.33	296053.05	-0.03 (Rel.)
		395840.05	296053.60	-0.02 (Rel.)
		395839.86	296054.07	-0.02 (Rel.)
		395839.89	296054.66	-0.01 (Rel.)
		395840.39	296055.20	0.01 (Rel.)
		395840.91	296055.61	0.03 (Rel.)
		395841.59	296055.67	0.05 (Rel.)
		395842.03	296055.50	0.06 (Rel.)
		395842.42	296055.16	0.06 (Rel.)
		395842.62	296054.75	0.06 (Rel.)
		395842.66	296054.20	0.05 (Rel.)
		395842.42	296053.48	0.03 (Rel.)
		395841.95	296053.06	0.02 (Rel.)
Chimney 2 Top (Height 7m)		395840.51	296053.78	15.00 (Rel.)

	No Noise Emissions	395840.40	296054.29	15.01 (Rel.)
		395840.66	296054.83	15.02 (Rel.)
		395841.10	296055.14	15.04 (Rel.)
		395841.67	296055.05	15.05 (Rel.)
		395842.06	296054.66	15.06 (Rel.)
		395842.10	296054.10	15.05 (Rel.)
		395841.67	296053.61	15.03 (Rel.)
		395841.09	296053.46	15.01 (Rel.)
Proposed Site Building	Façade Area Sources	395817.10	296084.27	131.97
		395835.11	296079.47	131.97
		395847.43	296127.70	131.97
		395829.16	296132.36	131.97
Proposed Site Building	Façade Area Sources	395811.92	296065.28	131.99
		395829.32	296056.01	131.99
		395834.88	296079.12	131.99
		395817.00	296084.18	131.99
Proposed Site Building	Façade Area Sources	395837.56	296088.08	131.01
		395854.41	296083.96	131.01

		395864.06	296123.79	131.01

NSR No.	NSR Grid References		
	X	Y	Z
NSR1	395629.27	296053.12	137.44
NSR2	395628.23	296015.68	138.56

APPENDIX G – Demonstration of Operational BAT

Source Reference	Details of BAT actions/abatement in use	Actions/abatement to meet BAT	Timescale
Lorry Movements	Speed limits implemented to minimise noise from lorry movements.	Ensure ALL drivers are complying with limits and enforce penalties if not.	Ongoing
Lorry Horns	Used as a health and safety measure to warn drivers and plant operators of potentially dangerous situations	None required	Not applicable
Site Operations	Building acoustically treated to minimise noise emissions, doors remain closed as much as practicable.	Ensure ALL site operators comply with minimising the time the doors are open on site.	Ongoing
Mobile Plant	Reverse warning systems.	Any mobile plant on site, including internal, are to be equipped with a multi frequency broadband alarm.	Prior to commencement
General Site Operations			
	Training	Site induction and site rules to include details of good working practices to minimise noise emissions from plant. Information sheet for contractors outlining the requirements for good site practice and good neighbour practice.	Prior to commencement
	Plant Maintenance	Plant will be maintained and in a good state of repair.	Ongoing