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Project:

MARS Baglan Moor

Title:

Noise Impact Assessment



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1 INTRODUCTION

- 1.01 Environmental Equipment Corporation Limited has been commissioned by MBH Design Studio Ltd to undertake a noise assessment of HVAC plant proposed for a new food to go operator as part of changes and improvements to the existing service station that is part of the Morrisons store in Baglan Moor, Port Talbot. These will be introduced as part of a wider remodelling of the service station, replacing existing jet wash bays with four new jet wash bays. The existing sales building will be modified and extended for the new food to go provision.
- 1.02 This noise assessment has been conducted in accordance with local and national policies, British and International design standards and is based on a noise survey carried out at the site over a weekend period.
- 1.03 This assessment includes:
- The details of an ambient noise survey undertaken by this practice to measure the existing noise climate around the site; and
 - The prediction of noise impacts at the most affected noise sensitive receptors based on the possible operation of the plant across a typical 24 hour period and the opening hours of the facility.
- 1.04 This report is prepared solely for MBH Design Studio Ltd. Environmental Equipment Corporation Limited accepts no responsibility for its use by any third party. Note that the contents contained herein are produced for the purposes of review by relevant Planning Authority department.
- 1.05 Whilst every effort has been made to ensure that this report is easy to understand, it is necessarily technical in nature. To assist the reader, an explanation of the terminology used in this report is contained in Appendix A.

2 SITE

- 2.01 The Morrisons Supermarket site is located in a predominantly residential area in Baglan Moor on the outskirts of Port Talbot. The following Google Maps image has been annotated to identify the Morrisons petrol station, the sales building of the petrol filling station, the existing motorised car wash and separate jet wash bays and the nearest noise sensitive residential properties. The new food to go unit will be part of an extension and remodelling of the existing sales building along with the installation of new HVAC plant to serve the new provider. The measurement location used for the noise survey is also marked.



Figure 1: Site layout and nearest dwellings

- 2.02 The closest noise sensitive receptors to the site are the dwellings along Chalice Close to the north of the Petrol station.
- 2.03 All other noise sensitive receptors are at a greater distance from designated plant areas or are protected by more screening by intervening structures, and as such will be subject to lower levels of noise.
- 2.04 This application is for the extension of the existing sales building for a new food to go operator and the installation of new HVAC services. The site already has planning approval for the installation of 4 new jet wash bays and associated screening that will replace two existing jet wash bays. A large scale plan layout of the redeveloped site is presented in Appendix B. Figure 2 below overlays this plan onto a Google Maps image to put the proposed layout in context.



Figure 2: Proposed new site layout and existing surroundings.

3 GUIDANCE

- 3.01 Neath Port Talbot Council have requested that a noise impact assessment is undertaken of the HVAC plant, as part of the planning application for the proposed redevelopment.
- 3.02 We have reviewed the noise impact in line with the assessment methodology of 'BS4142:2014: 'Methods for rating and assessing industrial and commercial sound'' is the principle standard against which to assess potential impact in this context and that standard in turn requires that the assessment outcomes be judged and considered taking into account context and relevant guidance metrics.
- 3.03 Additional guidance has been taken from current British Standards and World Health Organisation Guidance. These documents provide useful reference for assessing acceptability against established absolute noise limits.

BS4142:2014 'Methods for rating and assessing industrial and commercial sound'

- 3.04 To assess the acceptability of the resultant noise levels we have consulted the relevant standards. BS 4142:2014 'Methods for rating and assessing industrial and commercial sound'. The scope of BS4142 includes that assessment of the following sources:
- Sound from industrial and manufacturing processes;
 - Sound from fixed installations which comprise mechanical and electrical plant and equipment;
 - Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
 - Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating
- 3.05 BS4142 gives guidance on assessing the likelihood of adverse impacts by calculating a 'rating level' of the new noise source and comparing its magnitude at noise sensitive locations to the existing or underlying background noise level. The background noise level is subtracted from the 'rating level' to assess the likelihood of complaints:
- The greater the difference the greater the likelihood of complaints.
 - A difference of around +10dB or more is an indication of a significant adverse impact, depending on the context.
 - A difference of +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 noise level, the less likely it is that the specific sound source will have an adverse impact or 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 sound impact, depending on the context.
- 3.06 This assessment is carried out over a one hour period for the daytime and a fifteen minute period for the night-time. For the purposes of the standard it states that daytime and night-time are typically 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

- 3.07 The 'rating level' of the noise source is obtained taking the following factors into consideration:
- The new plant noise (the specific noise) is measured or predicted in terms of L_{Aeq} .
 - An additional correction shall be included if the noise contains a distinguishable, discrete continuous note, if the noise contains distinct impulses or if the noise is irregular enough to attract attention. The value for any tonal noise can be an addition of up to 6dB and for impulsive noise of up to 9dB.

- 3.08 The background sound level should be established in terms of the L_{A90} noise index. The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. The standard states that *'a representative level ought to account for the range of background sound levels and ought not to automatically to be assumed to be either the minimum or modal value.'*

- 3.09 BS 4142 goes on to state 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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.'

- 3.10 BS4142 requires uncertainties in the assessment to be considered and, where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

BS8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

- 3.11 BS8233:2014, 'Guidance on sound insulation and noise reduction for buildings', section 7 gives guidance on acoustic criteria and noise levels appropriate for various internal spaces that have different functions. Section 7.7 relates specifically to buildings having a residential purpose and offers guidance on appropriate internal ambient noise levels for dwellings (when unoccupied) with specific consideration:

- for bedrooms, the acoustic effect on sleep; and
- for other rooms, the acoustic effect on resting, listening and communicating.

- 3.12 The guidance applies to external noise as it affects the internal acoustic environment from sources without a specific character.

- 3.13 Table 4 of section 7.7.2 recommends the following internal noise limits based on the presence of steady, external noise sources:

Table 4 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

- 3.14 The guidance criteria are based upon research and existing guidelines provided by the World Health Organisation.

- 3.15 It is generally considered that the sound insulation provided by a partially open window will be 15dB, dependent on window type, extent of opening and source frequency content.

- 3.16 It can be seen that in the worst case, with a partially open window reduction of 15dB, indoor ambient noise targets for bedrooms will be met where the external ambient noise level is below 45dB(A). This is based upon steady noise of an anonymous nature and is consistent with the World Health Organisations LOAEL.

4 MEASUREMENTS

- 4.01 Environmental noise measurements were carried out over a weekend period, between 0915 hours on Friday 5th September 2025 and concluded 0900hours Monday 8th September 2025, to establish the existing noise levels at the site. The survey methodology and results are set out below.
- 4.02 Noise measurements have been carried out at the following position, as shown in Figure 1 and described as:
- Position 1: located at a height of approximately 2.2 metres above ground level on the Northern boundary of the Morrisons store in close proximity to the dwellings of Chalice Court. The measurement was not located within 3.5 metres of any reflecting surfaces, other than the mounting surface.
- 4.03 This position is considered to be representative of the nearest dwellings to the Morrisons Petrol Station.

5 EQUIPMENT

- 5.01 The equipment used for the survey was as follows:-

- 01dB Fusion Integrating Sound Level Meter conforming to Class 1 BS EN 61672, Type 1 BS EN 60804 & BS EN 60651: 1994;
- GRAS 40CD Condenser Microphone, PRE22 S Pre-amp and Connecting Leads;
- Tripod.

- 5.02 The equipment holds current accreditation and serial numbers as follows:

Sound Level Meter 01dB Fusion	Serial No.	14014
	Calibration Date	7 th May 2025
	Cal Certificate No.	U50916
½" Condenser Mic. GRAS 40CD	Serial No.	383172
	Calibration Date	7 th May 2025
	Cal Certificate No.	50915
Calibrator CAL 31	Serial No.	94723
	Calibration Date	7 th May 2025
	Cal. Certificate No.	U50914

N.B. Copies of calibration certificates are available upon request.

- 5.03 The equipment was calibrated both before and after the survey with no difference noted in the levels.

6 RESULTS

- 6.01 The weather during the survey was suitable for noise measurement, it being dry with little wind for the duration of the survey.
- 6.02 Noise sources at the site include local and distant road traffic as well as activity on the garage forecourt, including usage of the existing jet wash bays and car wash. There were no other significant sources of noise during the survey.
- 6.03 A list of the levels measured is included in Appendix D and represented graphically in Appendix E.
- 6.04 A summary of the time averaged ambient levels and measured background levels over the measurement periods based on the survey data collected are shown in Table 6.1. The L_{A90} values reported for each period are based on the fifteen minute measurement in the specified period – it is proposed that the proposed HVAC plant serving the food to go operator will only operate 1100-2300hrs.

Period	Average $L_{Aeq,T}$ – dB	Minimum L_{A90} – dB	Maximum L_{A90} – dB	Modal L_{A90} – dB	Mean L_{A90} – dB
Day time (0700-1900 hrs)	62.1	46	59	56	53
Evening (1900-2300 hrs)	61.4	41	54	45	47
Night-time (2300-0700 hrs)	59.4	40	53	44	45
<i>Proposed Period (1100-2300 hrs)</i>	<i>62.3</i>	<i>41</i>	<i>59</i>	<i>56</i>	<i>52</i>

Table 6.1: Free-Field Measured Ambient and Background Noise Levels

7 PLANT ASSESSMENT

- 7.01 This application is for the extension of the existing petrol station sales building and the installation of new HVAC plant to serve a new food to go operator within.
- 7.02 The proposed HVAC plant serving the food to go operators have the following stated manufacturers noise levels. Copies of the manufacturer's plant data sheets are included in Appendix F. A layout of the proposed plant is presented in Appendix B

Operator	Plant Item	Model	Noise Data
Burger King	Kitchen Extract Fan	Systemair MUB/T 062 560EC	74 dB(A) SWL
	Kitchen Supply Fan	Systemair MUB 042 500EC	86 dB(A) SWL
	AC Condenser	Toshiba SM1104-AT8-E	54 dB(A) at 1m

Table 7.1: Summary details of HVAC manufacturer's published noise data for plant.

- 7.03 To suitably control noise emissions, duct-mounted attenuators will be installed on all ventilation fans. The attenuation will need to achieve the following minimum dynamic insertion losses:

Plant Item	Dynamic Insertion Loss - dB							
	63	125	250	500	1k	2k	4k	8k
BK Kitchen Extract Fan	7	13	24	31	35	40	40	38
BK Kitchen Supply Fan	4	10	11	21	23	23	24	22

Table 7.2: Summary details of manufacturer's published noise data for plant

- 7.04 The propagation of noise from the plant has been modelled using CadnaA software produce by Datakustik. Calculations are undertaken using the General Method of Calculation from ISO9613-2:2024. The propagation of noise from the proposed site due to the activities associated with the new installations has been modelled using CadnaA software produce by Datakustik. Calculations are undertaken using the General Method of Calculation from ISO9613-2:2024. The calculations include for the following:
- Downwind propagation at a speed of 3m/s, as a worst case;
 - LIDAR topographical digital terrain data has been imported into the model
 - A maximum order of the reflection of three;
 - A ground absorption factor of 0 to represent hard, reflective ground as a worst case, with a factor of 0.5 for mixed areas;
 - Receptor heights at a height of 2.5m per floor based on a starting height of 1.5m; and
 - Atmospheric sound absorption based in temperature of 10°C and a humidity level of 70%.
- 7.05 The service station is currently open 0600-2300hrs however the proposed HVAC plant is expected to generally only operate during the trading hours of the food to go retailer 1100-2300hrs.
- 7.06 The following illustrations show a graphical representation of the resulting noise model and calculated noise levels due to the operation of the HVAC plant serving the new food to go operator

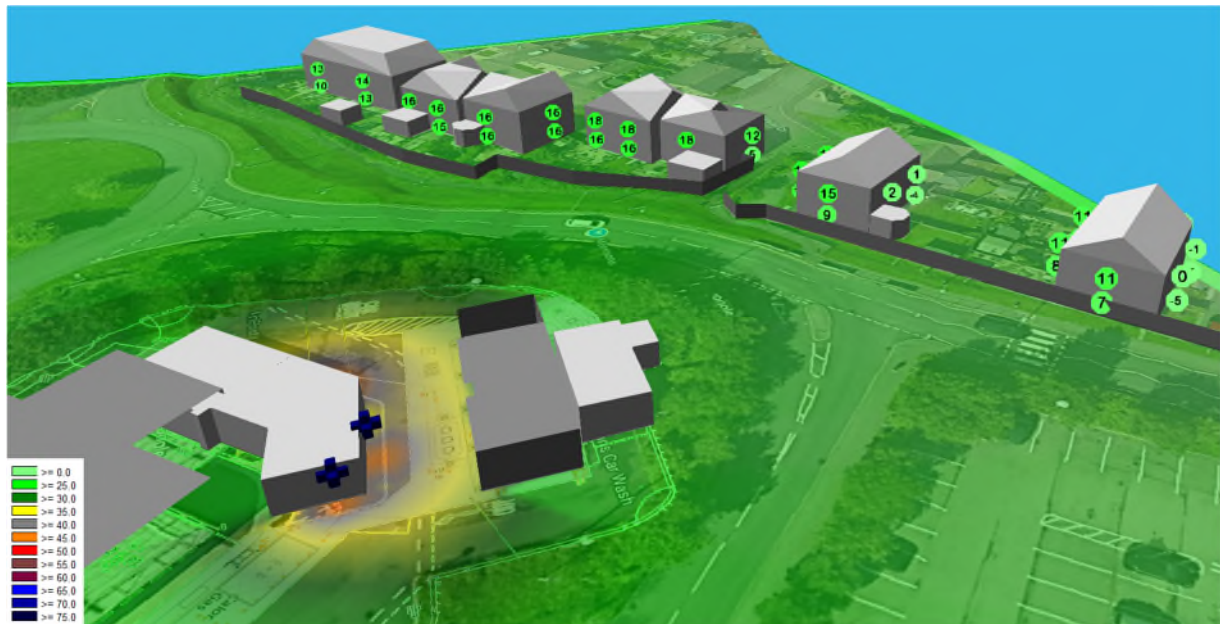


Figure 3: Specific Noise Levels as calculated for all HVAC plant serving the food to go operator– $L_{Aeq,T}$

7.07 The following image presents the results of the noise model when all plant is operating at its maximum capacity (typical of continuous operation).

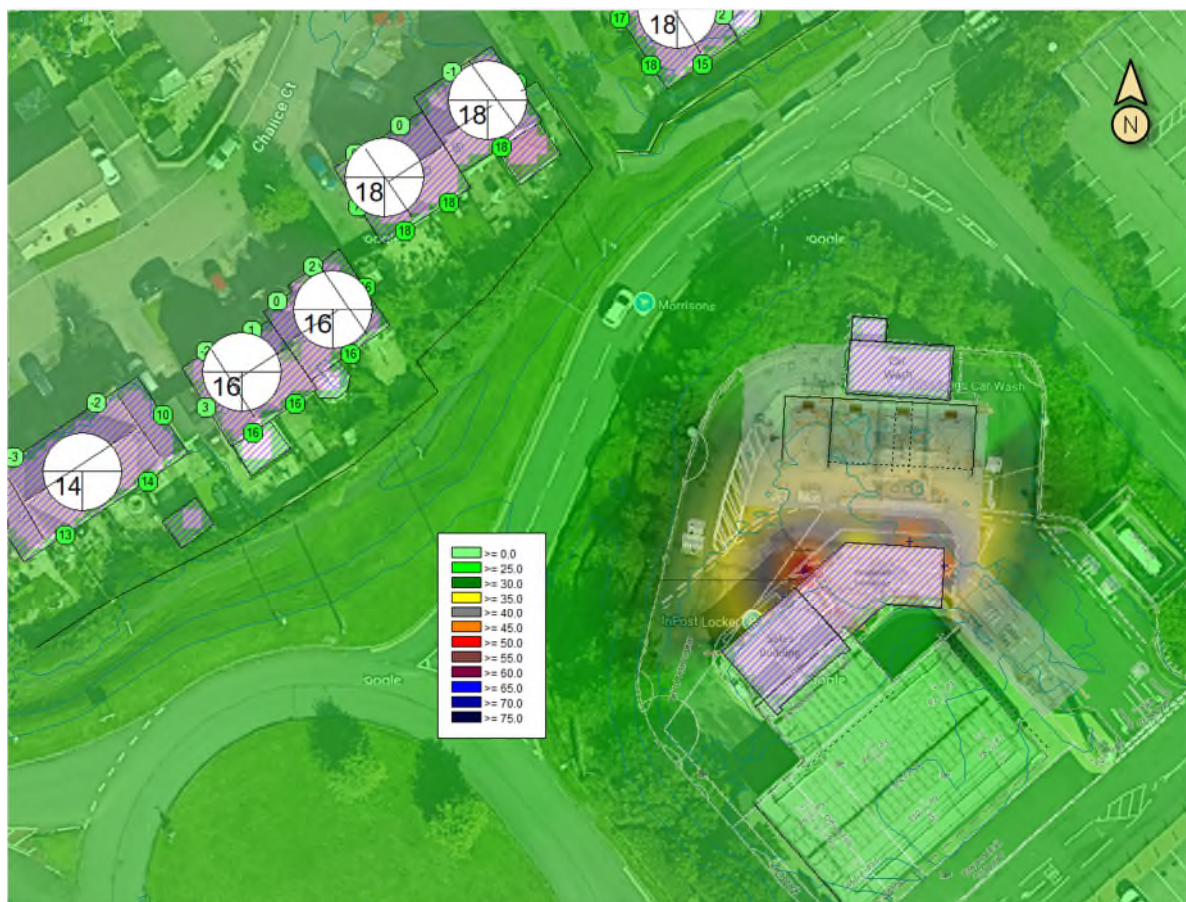


Figure 4: Worst case specific noise levels for relevant plant operating during the proposed periods

- 7.08 The results of the noise modelling show that the nearest and most affected dwelling of Chalice Court will be exposed to noise as summarised below:

Noise Source	Chalice Court
Food to go operator HVAC	18 dB(A)

Table 7.1: Worst case noise levels at most affected façade of nearest dwelling due to respective plant operation

- 7.09 Table 7.2 summarises the results of the noise modelling and calculated levels at the Chalice Court dwellings in the worst case along with minimum background noise level measured during the proposed operating period.

Noise Source	Period	Chalice Court	Minimum Background Noise Level
HVAC plant	1100-2300hrs	18 dB(A)	41 dB(A)

Table 7.2: Worst case noise levels at most affected façade of nearest dwelling due to respective plant operation

- 7.10 As presented in the table above the worst case operating noise levels from all the new plant will be at least 23dB below the lowest background noise level that was measured.

8 BS4142 ASSESSMENT

- 8.01 The impact of noise due to the operation of the new facilities would typically be assessed in accordance with BS4142 for the daytime operating period; this expected to be 1100-2300hrs, seven days a week. The assessment has been undertaken against the lowest background noise level that occurred during this period of our weekend survey.
- 8.02 The AC Condenser plant can operate intermittently and the ventilation plant is operated at a fixed speed.
- 8.03 The following table shows the BS4142 assessment procedure for the daytime activities described above based upon the noise immissions modelled in CadnaA (Section 7 above). The assessments include commentary on context and reference to absolute noise standards found in BS8233:2014, 'Guidance on sound insulation and noise reduction for buildings' and WHO guidelines, summary details of which can be found in Appendix C.
- 8.04 The assessment refers only to worst-case site-wide noise impacts at the most affected properties of Chalice Court.
- 8.05 All other receptors are either further away or are subject to the same or less noise than those noted above.

Chalice Court – Daytime

Results		Relevant Clause	Commentary
Assessment made during the daytime, so reference time interval is 1 hour		7.2	
Calculated Specific Noise	18 dB $L_{Aeq,1 \text{ hour}}$	7.3.6	Noise modelled using CadnaA, assumes continuous operation of HVAC plant during peak periods
Acoustic Character Correction	+ 3 dB	9.2	Possible intermittent operation of Condenser plant
Rating Sound Level	(18+3) dB = 21 dB	9.2	Overall 1 hour level
Background Noise Level	41 dB $L_{A90,1 \text{ hour}}$	8	Lowest background during daytime period 1100-2300hrs
Difference	(21-41) dB = -20dB	11	
Assessment indicates the noise would be considered to be of negligible impact, depending on context		11	The site operates as a commercial business already and includes noise from activity on the forecourt.
Uncertainty of assessment	Not Significant	10	The noise model uses certified published source data and representative background noise levels are based extended survey including a weekend period.

Table 8.1: BS4142 Assessment for closest dwellings based on all HVAC plant operating

- 8.06 As indicated in the above BS4142 assessment, the levels of the operational noise from the site are not expected to have any significant adverse impact, depending on context.
- 8.07 The context in this instance is that the impact will in practice be effectively mitigated by a number of contributing factors:
- the assessment is based on a worst case of items operating at their maximum capacity.
 - The existing ambient noise level is consistently over 55 dB L_{Aeq} during the daytime which is significantly higher than the calculated noise of the proposed plant operation and therefore can be expected to provide some useful masking.
- 8.08 Additional reviews of the operational noise levels are presented below in the context of established and accepted absolute design targets and metrics for noise in dwellings as described in BS8233:2014, 'Guidance on sound insulation and noise reduction for buildings'.
- 8.09 The following review considers levels of noise that will result within the properties accounting for the noise reductions that will occur as sound passes across the building facades.

- 8.10 The sound insulation of the façade is very much governed by the type of glazing and whether the windows are open or not. Both cases are considered here assuming minimum levels of 20dB sound insulation likely from basic closed thermal double glazed windows. A typical loss of 15dB could be expected for noise passing through a partially open window.
- 8.11 The sound insulation of the façade is very much governed by the type of glazing and whether the windows are open or not. Both cases are considered here assuming minimum levels of 20dB sound insulation likely from basic closed thermal double glazed windows. A typical loss of 15dB could be expected for noise passing through a partially open window.
- 8.12 Table 8.2 presents the noise levels that could be expected within the dwellings against the relevant BS 8233 design criteria. We have presented the summary based on the most affected receptors. A minimal loss of 15dB could be expected for noise passing through a partially open window. Table 8.2 presents the noise levels that could be expected within the dwellings against the relevant BS 8233 design criteria.

Location	Condition	Calculated $L_{Aeq,1hour}$ external	Minimum sound reduction loss	Resultant internal ambient noise level	BS8233 Design Criterion
Chalice Court	Windows Closed	18 dB	20 dB	0 dB(A) $L_{eq,15minutes}$	35dB(A) $L_{eq,16 hour}$
	Windows Open	18 dB	15dB	3 dB(A) $L_{eq,15 minutes}$	35dB(A) $L_{eq,16 hour}$

**Table 8.5: Calculated Worst Case Internal Ambient Noise levels
within closest dwellings**

- 8.13 The assessment has shown that the noise from the operation of the plant will be of negligible impact during the proposed operating period during the daytime. The resultant noise levels within the dwellings will also satisfy current World Health Organisation and British Standard Guidance for daytime resting.

9 CONCLUSIONS

- 9.01 MBH Design Studio Ltd has appointed Environmental Equipment Corporation Limited to undertake a noise assessment for the new fit out for a new food to go operator as part of Morrisons Petrol station in Baglan Moor, Port Talbot.
- 9.02 The assessment has been carried out in accordance with national planning guidance and current British Standard guidance and is based on an environmental noise survey conducted at the site over a weekend period.
- 9.03 A noise assessment has been undertaken to evaluate the potential worst case noise impact of the proposed plant.
- 9.04 The assessment has shown that during the proposed daytime operating period the noise impact from the operation of the new plant is expected to be negligible at the nearest receptors when considered in the context of the existing activities around the site.
- 9.05 On the basis of this assessment it is considered that noise does not pose a material constraint to planning permission for the redevelopment of the site being granted.

APPENDIX A

GLOSSARY OF TECHNICAL TERMS

ACOUSTIC TERMINOLOGY

Absorption Classes	The sound absorption of a material is rated from Class A to Class E, where Class A materials provide the highest level of sound absorption.
Ambient Noise Levels	Noise levels measured in the absence of noise requiring control, frequently measured to determine the situation prior to the additional of a new noise source.
dB	Decibel. The logarithmic unit of sound level.
dB(A)	A-weighted decibel. The A-weighting approximates the response of the human ear.
$D_{nT,w}$	Weighted standardized level difference. A single number quantity of the sound level difference between two rooms. $D_{nT,w}$ is typically used to measure the on-site sound insulation performance of a building element such as a wall, floor or ceiling. Measured in accordance with BS EN ISO 16283-1 and weighted in accordance with BS EN ISO 717-1.
$D_{n,e,w}$	The weighted element-normalized level difference. A single number rating of the sound reduction provided by a sound passing through an individual element. $D_{n,e,w}$ is typically used to define the sound insulation provided by ventilators. Measured in accordance with BS EN ISO 10140-2:2010 and rated in accordance with BS EN ISO 717-1.
Flanking	Transmission of sound energy through paths adjacent to the building element being considered. For example, sound may be transmitted around a wall by travelling up into the ceiling space and then down into the adjacent room.
Frequency	Sound can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. Sound is generally described over the frequency range from 63Hz to 4kHz, roughly equal to the range of frequencies on a piano.
Impact Sound	Sound produced by an object impacting directly on a building structure, such as footfall noise or chairs scrapping on a floor.
$L_{Aeq,t}$	The equivalent continuous sound level measured in dBA. This is commonly referred to as the average noise level. 't' is the interval time for the measurement. Typically 't' of 16hrs and 8hrs is used for day and night time ambient noise respectively or 't' is defined by the period of interest in BS4142 assessments.
$L_{A90,t}$	The noise level exceeded for 90% of the measurement period, measured in dBA. This is commonly referred to as the background noise level.
$L'_{nT,w}$	Weighted, standardized impact sound pressure level. A single number rating of the impact sound insulation of a floor/ceiling when impacted on by a standard "tapper" machine. The lower the $L'_{nT,w}$, the better the acoustic performance. Measured in accordance with BBS EN ISO 140-7 and rated in accordance with BS EN ISO 717-2.
NR	Noise Rating. A single number rating which is based on the sound level in the octave bands 31.5Hz – 8kHz inclusive, generally used to assess noise from mechanical services in buildings.
Octave Band	Frequencies are often grouped together into octaves for analysis. Octave bands are labelled by their centre frequency which are: 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz and 4kHz.
Reverberation Time (T_{mf})	Reverberation time is used for assessing the acoustic qualities of a space. It is defined as the time it takes for an impulse to decay by 60dB. T_{mf} is the arithmetic average of the reverberation time in the mid frequency bands (500Hz, 1kHz and 2kHz).
R_w	Weighted sound reduction index. A single number rating of the sound insulation performance of a specific building element. R_w is measured in a laboratory. R_w is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete. Measured in accordance with BS EN ISO 10140-2:2010 and rated in accordance with BS EN ISO 717-1.
Sound Absorption	When sound hits a surface, some of the sound energy is absorbed by the surface material. Sound absorption refers to the ability of a material to absorb sound, rated from 0, complete reflection, to 1, complete absorption.
Sound Insulation	When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to the ability of a material to prevent the travel of sound.
Structure-borne transmission	Transmission of sound energy as vibrations via the structure of a building.

APPENDIX B

**PROPOSED
SITE PLAN
&
PLANT LAYOUT**

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APPENDIX C

PLANNING POLICY AND GUIDANCE

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PLANNING GUIDANCE

British Standard 4142

To assess the acceptability of the resultant noise levels we have consulted the relevant standards. BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' has been used to assess the likelihood any adverse impacts based on the resultant noise level from the new plant item, including any corrections for the character of the noise against the existing background noise level.

BS4142 gives guidance on assessing the likelihood of adverse impacts by calculating a 'rating level' of the new noise source and comparing its magnitude at noise sensitive locations to the existing or underlying background noise level. The background noise level is subtracted from the 'rating level' to assess the likelihood of complaints:

- The greater the difference the greater the likelihood of complaints.
- A difference of around +10dB or more is an indication of a significant adverse impact, depending on the context.
- A difference of +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 noise level, the less likely it is that the specific sound source will have an adverse impact or 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 sound impact, depending on the context.

This assessment is carried out over a one hour period for the daytime and a fifteen minute period for the night-time. For the purposes of the standard it states that daytime and night-time are typically 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

The 'rating level' of the noise source is obtained taking the following factors into consideration:

- The new plant noise (the specific noise) is measured or predicted in terms of L_{Aeq} .
- An additional correction shall be included if the noise contains a distinguishable, discrete continuous note, if the noise contains distinct impulses or if the noise is irregular enough to attract attention. The value for any tonal noise can be an addition of up to 6dB and for impulsive noise of up to 9dB.

BS 4142 goes onto state 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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.'

BS4142 has been referenced in setting noise limits for any fixed plant proposed as part of the proposed development.

APPENDIX D

SURVEY RESULTS
(TABULAR)

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EC 21526 - MARS Baglan Moor

MBH Design Studio

Tabulated Noise data

Sheet 1 of 3

Time	L _{Aeq}	L _{AMax}	L _{A90}
09:15	60.0	74.3	50.5
09:30	60.6	74.1	51.9
09:45	60.3	71.2	52.7
10:00	62.2	80.6	51.7
10:15	60.8	74.9	52.0
10:30	60.9	72.9	52.6
10:45	64.3	80.2	55.6
11:00	63.2	73.1	55.1
11:15	62.6	87.3	51.6
11:30	64.1	88.1	52.5
11:45	60.8	77.2	52.3
12:00	60.4	72.5	53.8
12:15	62.1	78.3	54.7
12:30	62.7	76.0	55.6
12:45	62.3	78.3	53.7
13:00	61.1	77.9	51.8
13:15	61.5	76.1	53.3
13:30	60.3	72.0	52.9
13:45	60.6	73.7	53.2
14:00	60.7	72.7	53.2
14:15	63.6	76.0	57.4
14:30	62.3	73.7	55.2
14:45	60.7	75.0	51.8
15:00	60.4	77.2	52.2
15:15	60.9	83.6	52.2
15:30	59.3	69.4	51.1
15:45	61.1	74.9	53.5
16:00	63.2	88.1	53.1
16:15	61.6	72.8	54.0
16:30	60.0	71.1	52.5
16:45	60.2	71.0	52.7
17:00	61.2	73.4	55.8
17:15	61.4	80.5	52.1
17:30	60.0	73.0	51.2
17:45	60.6	74.0	52.7
18:00	60.1	72.9	51.4
18:15	59.5	70.7	50.8
18:30	60.3	84.9	48.7
18:45	59.1	75.2	49.2
19:00	59.6	81.7	48.3
19:15	57.9	74.8	46.7
19:30	58.0	74.0	47.5
19:45	57.9	70.4	47.2
20:00	58.0	80.1	45.1
20:15	55.7	71.8	45.7
20:30	55.3	71.6	46.2
20:45	56.1	73.1	45.7
21:00	55.7	74.3	45.8

Time	L _{Aeq}	L _{AMax}	L _{A90}
21:15	53.0	67.6	45.1
21:30	55.4	74.1	45.0
21:45	52.8	73.1	44.6
22:00	54.2	68.8	47.3
22:15	54.9	82.7	45.2
22:30	49.9	70.0	43.9
22:45	47.5	65.9	44.3
23:00	47.5	68.0	44.1
23:15	49.5	71.0	44.0
23:30	47.8	68.9	44.0
23:45	46.2	63.2	44.1
00:00	47.2	65.6	43.8
00:15	46.3	61.8	43.8
00:30	46.1	66.6	43.6
00:45	44.6	54.0	42.8
01:00	43.5	57.1	40.7
01:15	44.4	65.9	41.3
01:30	45.4	65.8	42.3
01:45	44.5	53.4	43.1
02:00	45.4	54.4	43.7
02:15	46.0	61.6	43.9
02:30	45.7	58.6	43.9
02:45	45.3	62.1	43.3
03:00	44.2	50.2	43.0
03:15	44.3	51.2	42.6
03:30	45.8	62.8	42.2
03:45	46.5	64.0	42.4
04:00	46.3	70.8	42.6
04:15	51.2	74.6	43.1
04:30	46.7	59.1	44.1
04:45	48.6	65.0	44.1
05:00	50.6	70.8	45.1
05:15	48.1	57.9	45.2
05:30	48.5	68.7	45.1
05:45	52.0	75.5	45.3
06:00	58.8	82.1	46.0
06:15	51.2	65.5	47.1
06:30	54.7	74.9	48.3
06:45	53.2	72.8	48.3
07:00	54.3	71.6	48.0
07:15	54.6	70.7	48.5
07:30	56.9	73.0	49.7
07:45	61.0	78.0	50.2
08:00	57.4	71.3	49.4
08:15	61.8	76.2	51.2
08:30	57.8	73.4	50.5
08:45	62.1	76.7	52.4
09:00	58.8	79.9	51.6

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MBH Design Studio

Tabulated Noise data

Sheet 2 of 3

Time	L _{Aeq}	L _{AMax}	L _{A90}
09:15	60.7	84.8	52.2
09:30	60.3	76.7	53.0
09:45	61.3	85.9	53.9
10:00	60.9	85.3	53.6
10:15	66.9	91.0	56.5
10:30	61.9	74.9	55.0
10:45	62.4	74.5	55.6
11:00	62.9	75.0	56.3
11:15	61.8	78.2	55.7
11:30	60.5	71.7	54.7
11:45	60.4	77.5	54.4
12:00	61.6	74.3	55.9
12:15	62.8	77.7	56.6
12:30	62.5	76.4	56.6
12:45	63.0	80.9	56.1
13:00	63.3	81.6	56.9
13:15	63.0	81.0	57.1
13:30	62.1	70.7	55.9
13:45	62.5	79.8	56.9
14:00	63.1	72.7	57.8
14:15	63.4	81.2	54.7
14:30	61.5	78.1	55.5
14:45	63.0	74.1	57.5
15:00	62.4	79.2	56.4
15:15	62.1	75.6	55.6
15:30	64.1	87.2	55.1
15:45	60.9	73.1	54.8
16:00	62.5	81.2	55.1
16:15	62.4	80.3	55.1
16:30	62.1	73.4	55.1
16:45	65.1	82.1	59.0
17:00	62.8	84.8	54.5
17:15	63.6	83.6	55.6
17:30	68.3	96.8	54.0
17:45	61.5	82.3	54.3
18:00	62.9	81.8	55.1
18:15	60.7	75.6	53.5
18:30	61.6	80.8	53.8
18:45	63.7	84.6	55.7
19:00	61.7	81.4	53.0
19:15	60.7	82.1	52.2
19:30	61.7	85.3	52.5
19:45	63.6	81.2	54.0
20:00	61.7	85.9	51.7
20:15	62.6	85.0	51.1
20:30	63.6	86.4	51.3
20:45	62.8	89.7	51.5
21:00	61.6	84.6	49.6

Time	L _{Aeq}	L _{AMax}	L _{A90}
21:15	55.7	73.8	48.5
21:30	56.4	77.8	48.7
21:45	62.3	90.0	49.9
22:00	67.9	93.7	50.3
22:15	62.6	87.8	50.4
22:30	64.5	83.1	50.3
22:45	74.1	97.4	52.9
23:00	72.3	92.9	53.1
23:15	70.9	88.6	52.2
23:30	68.5	91.3	51.1
23:45	69.9	91.6	51.2
00:00	64.5	85.7	48.5
00:15	67.8	85.9	50.3
00:30	59.8	88.0	48.4
00:45	59.0	80.1	46.7
01:00	56.9	76.5	47.3
01:15	60.0	82.6	47.4
01:30	70.0	90.8	52.3
01:45	63.9	88.1	50.0
02:00	61.7	85.6	46.4
02:15	55.9	80.0	44.7
02:30	49.2	73.9	43.6
02:45	49.3	73.3	44.7
03:00	53.9	80.1	45.3
03:15	56.7	79.7	45.4
03:30	59.1	79.8	45.3
03:45	49.7	67.0	44.0
04:00	48.4	67.3	44.3
04:15	46.3	67.7	43.5
04:30	46.8	58.2	44.3
04:45	49.5	69.9	44.6
05:00	46.7	62.3	44.0
05:15	49.5	67.9	44.9
05:30	48.8	65.0	44.9
05:45	47.8	68.6	44.0
06:00	51.0	77.9	43.5
06:15	50.0	73.5	43.7
06:30	50.1	69.4	45.2
06:45	51.7	71.8	45.9
07:00	52.3	73.2	45.7
07:15	51.8	69.1	45.5
07:30	52.8	71.0	46.9
07:45	57.1	70.0	45.9
08:00	56.5	69.6	46.5
08:15	53.8	71.8	46.8
08:30	52.4	69.1	47.2
08:45	52.4	68.4	47.2
09:00	58.9	71.8	48.4

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MBH Design Studio

Tabulated Noise data

Sheet 3 of 3

Time	L _{Aeq}	L _{AMax}	L _{A90}
09:15	59.7	76.6	49.4
09:30	58.6	78.2	50.3
09:45	57.2	69.8	51.1
10:00	59.0	73.3	51.8
10:15	60.9	77.2	54.2
10:30	60.3	75.1	53.1
10:45	60.2	76.5	53.8
11:00	60.5	79.6	53.5
11:15	61.1	79.0	55.4
11:30	60.5	74.7	54.6
11:45	60.7	78.5	55.6
12:00	62.5	72.4	56.8
12:15	63.3	76.2	56.0
12:30	60.4	71.4	54.5
12:45	63.0	73.8	56.7
13:00	62.8	73.5	55.8
13:15	64.6	75.6	56.0
13:30	68.7	78.1	57.8
13:45	69.3	77.7	58.3
14:00	66.8	77.1	56.7
14:15	65.0	80.9	55.7
14:30	63.1	75.8	54.9
14:45	62.9	73.3	54.4
15:00	67.9	81.1	57.4
15:15	66.3	76.6	55.7
15:30	65.9	75.3	54.3
15:45	63.7	74.0	50.9
16:00	61.4	73.9	48.4
16:15	57.3	73.9	47.7
16:30	56.8	73.8	47.2
16:45	56.5	78.4	48.1
17:00	60.3	87.4	47.3
17:15	54.7	70.8	46.9
17:30	56.7	71.9	47.1
17:45	62.5	86.5	48.4
18:00	60.9	83.0	47.2
18:15	58.0	74.6	47.7
18:30	55.1	68.9	47.0
18:45	53.6	70.7	45.7
19:00	55.2	70.9	47.2
19:15	55.6	72.9	46.0
19:30	54.9	71.4	44.9
19:45	54.7	72.8	48.3
20:00	52.4	69.4	44.6
20:15	52.7	70.0	43.0
20:30	50.6	71.5	41.6
20:45	52.4	70.5	42.6
21:00	50.5	73.7	41.9

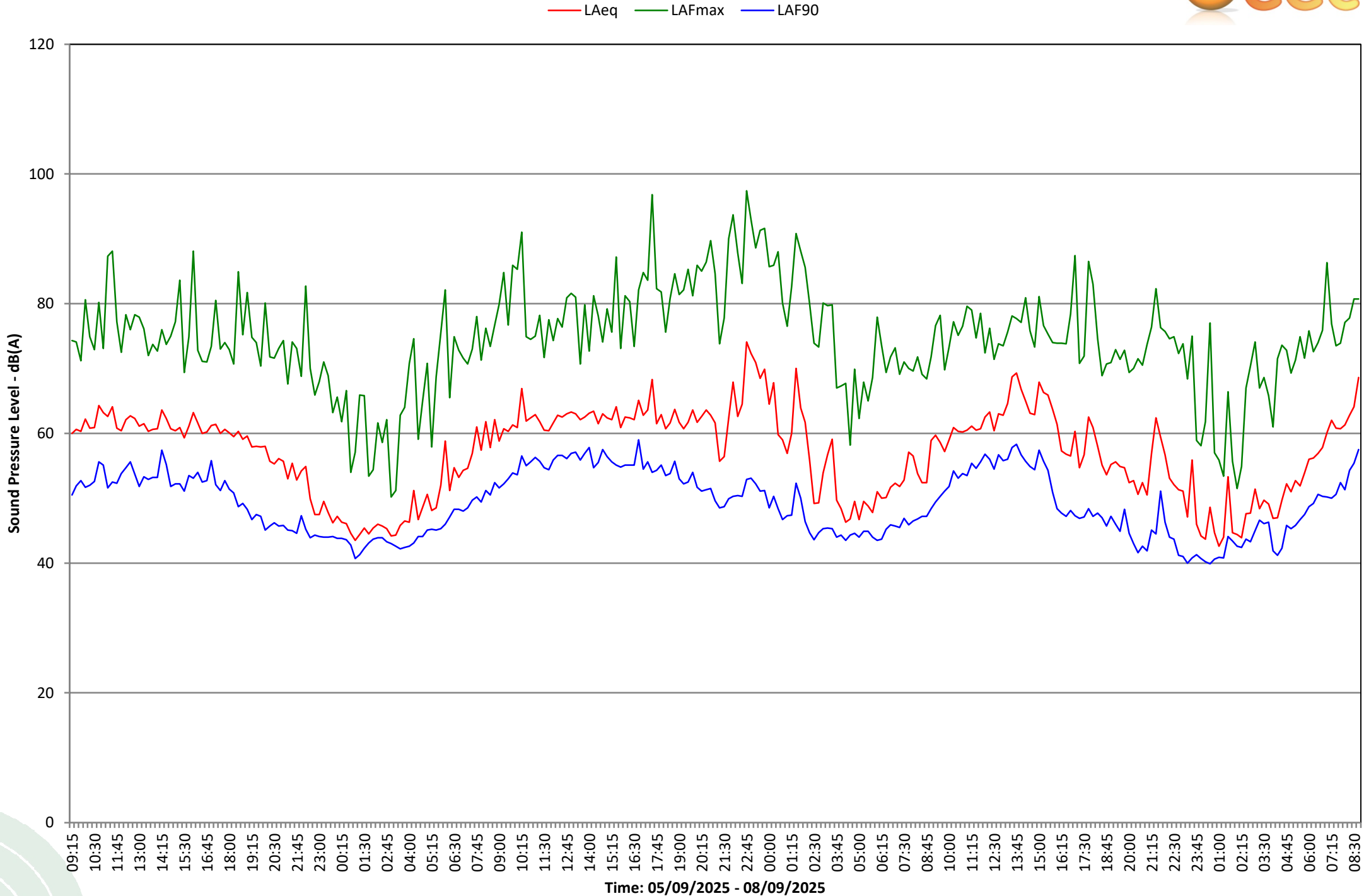
Time	L _{Aeq}	L _{AMax}	L _{A90}
21:15	56.9	76.4	45.1
21:30	62.4	82.3	44.5
21:45	59.4	76.3	51.1
22:00	56.7	75.7	46.3
22:15	53.1	74.6	44.0
22:30	52.1	74.9	43.7
22:45	51.3	72.3	41.2
23:00	51.1	73.8	41.0
23:15	47.1	68.4	40.0
23:30	55.9	75.0	40.8
23:45	46.0	58.9	41.3
00:00	44.2	58.1	40.7
00:15	43.7	61.8	40.2
00:30	48.6	77.0	39.9
00:45	44.7	57.0	40.6
01:00	42.6	55.9	40.9
01:15	44.0	53.4	40.8
01:30	53.3	66.4	44.1
01:45	44.7	55.7	43.4
02:00	44.4	51.5	42.6
02:15	43.9	54.9	42.4
02:30	47.6	67.0	43.7
02:45	47.7	70.4	43.3
03:00	51.4	74.1	45.0
03:15	48.4	67.0	46.6
03:30	49.7	68.6	46.1
03:45	49.1	65.8	46.3
04:00	46.9	61.0	41.9
04:15	47.0	71.5	41.2
04:30	49.7	73.6	42.3
04:45	52.2	72.8	45.8
05:00	51.0	69.3	45.3
05:15	52.7	71.3	45.8
05:30	51.9	74.9	46.7
05:45	53.9	71.6	47.5
06:00	56.0	75.8	48.7
06:15	56.2	72.6	49.2
06:30	56.9	74.0	50.6
06:45	57.8	75.9	50.3
07:00	60.1	86.3	50.2
07:15	62.0	76.9	50.0
07:30	60.8	73.5	50.6
07:45	60.7	73.9	52.4
08:00	61.3	77.1	51.3
08:15	62.8	77.8	54.3
08:30	64.1	80.7	55.4
08:45	68.6	80.7	57.5

APPENDIX E

SURVEY RESULTS
(GRAPHICAL)

quietly moving forward

Noise Level Time History at MARS Baglan Moor



APPENDIX F

PUBLISHED PLANT NOISE DATA

Burger King AC Condenser

CODE		100	100	125	125
Outdoor Unit	RAV-	SM1104ATP-E	SM1104AT8P-E	SM1404ATP-E	SM1404AT8P-E
Cooling Range (Min. - Max.)	kW	3.0 - 11.2	3.0 - 11.2	3.0 - 13.2	3.0 - 13.2
Heating Range (Min. - Max.)	kW	3.0 - 13.0	3.0 - 13.0	3.0 - 16.0	3.0 - 16.0
Ambient Operating Range Cooling/Heating	°C	46 to -15/15 to -15	46 to -15/15 to -15	46 to -15/15 to -15	46 to -15/15 to -15
Fan(s)	Motor Power	W	100	100	100
	Standard Air Flow	l/s	1133	1133	1167
	Standard Air Flow	m³/min	68	68	70
	Standard Air Flow	m³/h	4080	4080	4200
Sound	Pressure Level C/H	dB(A)	53/54	53/54	54/55
	Power Level C/H	dB(A)	70/71	70/71	70/71
Unit	Appearance	Silky Shade (Muncel 1Y 8.5/0.5)	Silky Shade (Muncel 1Y 8.5/0.5)	Silky Shade (Muncel 1Y 8.5/0.5)	Silky Shade (Muncel 1Y 8.5/0.5)
	Heat Exchanger	Finned tube	Finned tube	Finned tube	Finned tube
	Compressor Type	Hermetic Twin Rotary	Hermetic Twin Rotary	Hermetic Twin Rotary	Hermetic Twin Rotary
	Compressor Power	kW	2.5	3.0	3.0
	Height x Width x Depth	mm	890 x 900 x 320	890 x 900 x 320	890 x 900 x 320
	Total Weight	kg	68	68	68
Refrigerant	Control	Pulse motor valve	Pulse motor valve	Pulse motor valve	Pulse motor valve
	Gas Type	R410A	R410A	R410A	R410A
	Base Charge/Chargeless To	kg/m	2.8/30	3.1/30	2.8/30
	Additional Charge Main Liquid Side	g/m	40	40	40
	Replacement Technology	Yes	R22, R407C, R417A, R134a, R12	R22, R407C, R417A, R134a, R12	R22, R407C, R417A, R134a, R12
Pipe Connections	Min.-Max. Length	m	5-50	5-50	5-50
	Height Difference Outdoor To AHU	m	±30	±30	±30
	Gas Side	inch	5/8	5/8	5/8
	Liquid Side	inch	3/8	3/8	3/8
	Drain Port Connector Hose Inner Diameter	mm	16	16	16
Electrical	Power Supply	V/ph/Hz	220-240/1/50	380-415/3/50	220-240/1/50
	Maximum Run Current	A	15.18	3.67	21.37
	Suggested Fused Supply	A	20	10	32

Burker King Kitchen Supply Fan



MUB 042 500EC Multibox

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	46	65	62	68	68	65	62	54	74
Outlet	dB(A)	47	67	64	70	70	67	63	55	75
Surrounding	dB(A)	25	47	38	38	39	39	30	19	49
Sound pressure level at 3m (20m² Sabine)	dB(A)	-	-	-	-	-	-	-	-	42
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	28

Supply Fan Silencer

Acoustic

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Insertion Loss dBW	4	10	11	21	23	23	24	22

N.B. Above figures only apply when silencer is bolted direct to the fan flange.

Burger King Kitchen Extract Fan



MUB/T 062 560EC

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	47	64	79	80	80	78	74	69	86
Outlet	dB(A)	48	65	80	81	82	79	76	70	87
Surrounding	dB(A)	27	47	51	48	50	49	42	33	57
Sound pressure level at 3m (20m² Sabine)	dB(A)	-	-	-	-	-	-	-	-	50
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	36

Extract Fan Silencer

Acoustic

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Insertion Loss dBW	7	13	24	31	35	40	40	38

N.B. Above figures only apply when silencer is bolted direct to the fan flange.

quietly moving forward