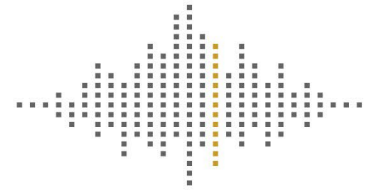


SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

412 Muswell Hill, London

Plant noise assessment

Prepared by

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Date 23 October 2023

Project No 2322036

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- B. Noise model input data
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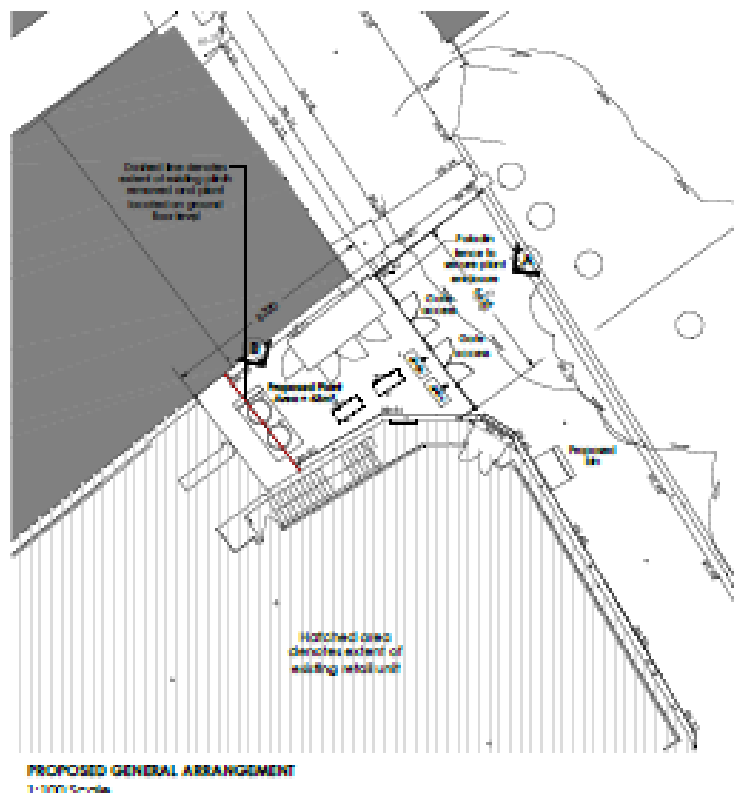
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This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

1.0 Introduction

- 1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment of the proposed plant to a retail store, at 412 Muswell Hill, London – see Appendix E for site layout drawing.
- 1.2 The proposal is to install refrigeration and air conditioning plant in an enclosed area at the rear of the store – see Figure 1 below:

Figure 1: Proposed plant layout



- 1.3 The available methods of assessment and assessment criteria are presented at section 2.
- 1.4 An assessment of predicted plant noise levels is contained at section 3.0
- 1.5 Details of the noise model methodology are presented in Section 4.0
- 1.6 The surrounding area is a combination of residential and other commercial properties. The nearest residential properties are located to the rear of the site in Wellfield Avenue, and a residential development adjacent to the store to the south east.

2.0 Assessment methodology and criteria

- 2.1 The National Planning Policy Framework (NPPF), 2023, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 185 of the NPPF states the following:

"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".*

- 2.2 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

Table 1: Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such	Observed Adverse Effect	Mitigate and reduce to a minimum

Response	Examples of Outcomes	Increasing Effect Level	Action
	that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

- 2.3 The NPPF and NPPG reinforces the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE), which states three policy aims, as follows:

“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; and*
- *where possible, contribute to the improvement of health and quality of life.”*

- 2.4 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

- 2.5 Taking an overview of national policy aims and guidance it is clear that when considering the impact of noise, the fact noise can be heard and causes impact, is not a reason to refuse an application as consideration should also be given to the significance of the impact and the mitigation measures available.

2.6 It is standard and good practice to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values, such as those contained in the World Health Organisation (WHO) *"Guidelines for Community Noise"*.
- ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
- iii) Another method is described within BS 4142:2014+A1:2019 which focuses on determining the significance of sound impact from sources of industrial and/or commercial nature. The sources that the newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

2.7 The assessment of fixed plant noise is principally undertaken in accordance with the methodology in BS 4142:2014+A1:2019. The scope of this standard states that it is suitable for the assessment of:

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

2.8 The significance of sound impact is to be determined according, in summary, to the following process:

- i) Determine the typical background sound levels, in terms of the index L_{A90} , at the receptor locations of interest.
- ii) Determine the specific sound level of the source being assessed, in terms of its L_{AeqT} level ($T = 1$ hour for day or 15 minutes for night), at the receptor location of interest.
- iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.

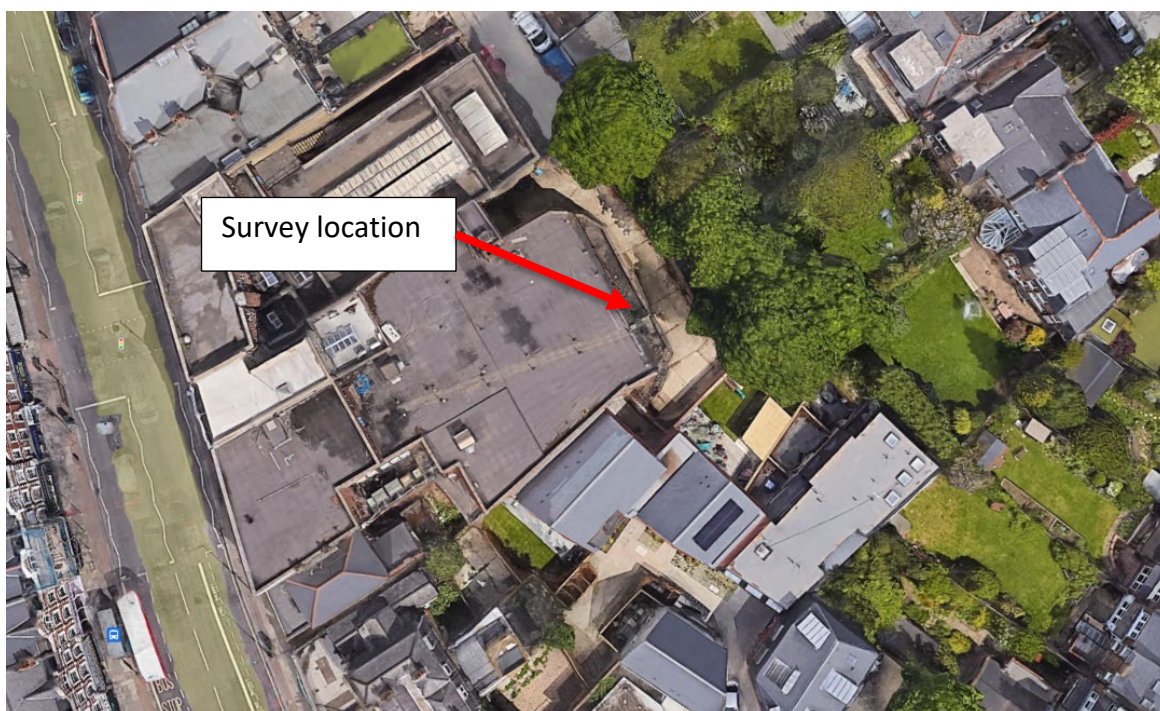
- v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.

2.9 Based on the guidance available, this assessment has been undertaken in accordance with BS 4142:2014+A1:2019.

3.0 Environmental noise survey details

- 3.1 It is usual in dealing with fixed sources of ventilation and refrigeration noise to use BS 4142:2014+A1:2019 “Method for rating and assessing industrial and commercial sound” as a means of establishing the potential impact from the new sources to the nearest residential properties.
- 3.2 A noise survey was undertaken at the site, between 9th and 10th October 2023. The sound level meter was set up to continually record noise levels at 15-minute intervals. Noise measurements were taken using Norsonic 140 type 1 sound level meter which was calibrated at the start and end of the survey and no variation in level was noted. All measurements were carried out in free-field conditions.
- 3.3 The sound level meter was set-up on an external staircase, 2nd floor height, at the rear of the building, in a location deemed to be representative of the noise climate at the nearest receptors identified.

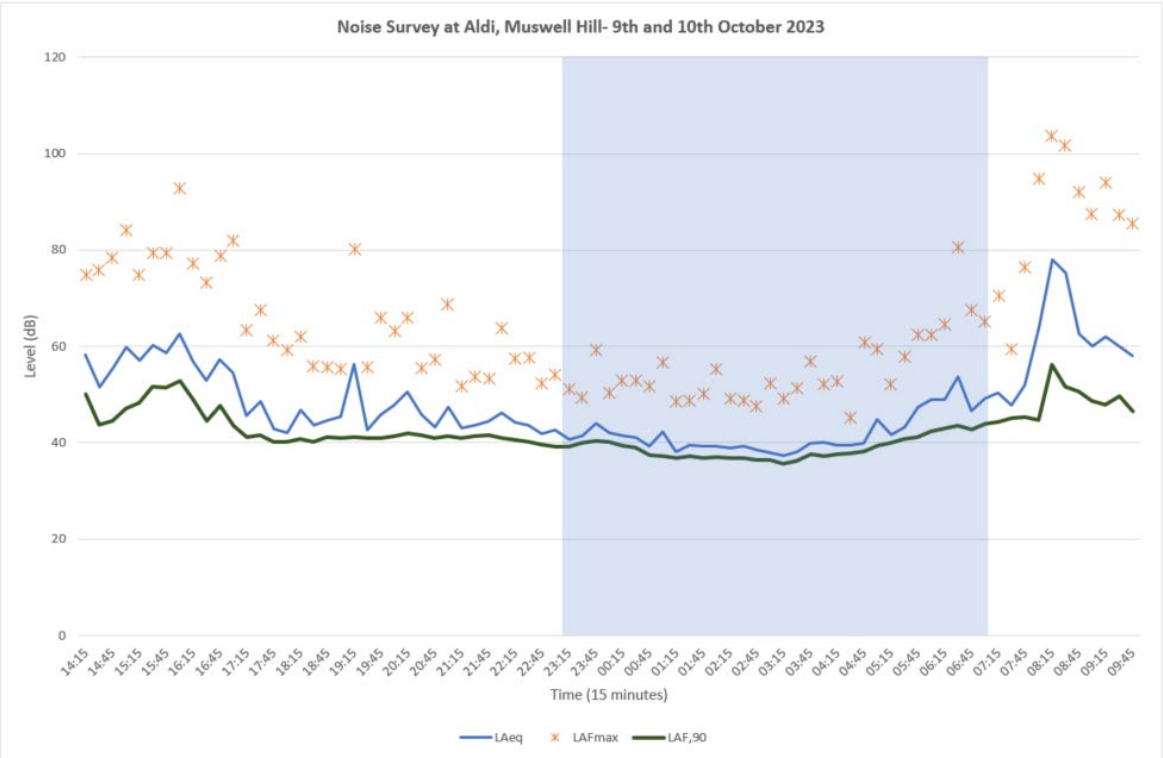
Figure 2: Monitoring Location



- 3.4 The weather was dry, with low wind speeds, as such would not have an adverse impact of the environmental noise survey.

3.5 A summary of the survey results are shown in Figure 3 below:

Figure 3: Environmental survey data



3.6 Based on the environmental noise surveys undertaken, the following background noise climate is considered to be typical:

Table 2: Typical background noise climate

Time	Typical background L_{A90} (dB)
Daytime 0700-2300	40 dB
Night 2300 - 0700	37 dB

4.0 The fixed plant noise control scheme – conclusions and recommendations

- 4.1 Based on the environmental noise model (see Section 5.0), the predicted noise levels without any additional mitigation are as follows:

Table 3: Predicted noise levels – no mitigation

Location	Daytime			Night		
	Predicted rating level L_{Aeq}	Background L_{A90}	Difference	Predicted rating level L_{Aeq}	Background L_{A90}	Difference
Wellfield Avenue	41 dB	40 dB	+1	41 dB	37 dB	+4
Wellfield Avenue garden	39 dB	40 dB	-1	N/A	N/A	N/A
Development to SE	28 dB	40 dB	-12	28 dB	37 dB	-9

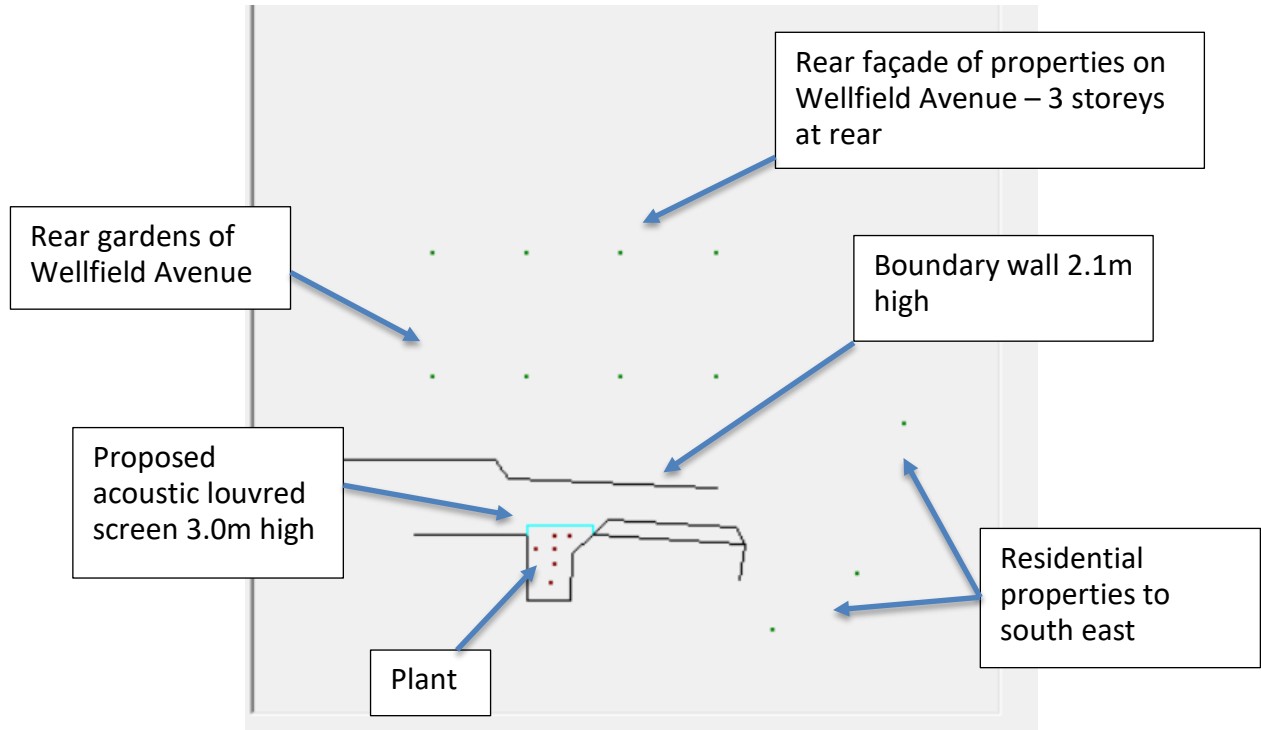
- 4.2 The comparison in Table 3 demonstrates that based on the proposed plant selections, the background noise climate is marginally exceeded during the day, and exceeded at night, and would be considered as an adverse impact at night.
- 4.3 A schedule of manufacturers noise data used for the proposed plant is shown in Appendix A. Based on our experience, the type of plant proposed is not impulsive or tonal in nature, however the refrigeration plant does tend to operate intermittently, therefore a +3 dB correction has been applied to the predicted noise levels presented in Table 3.
- 4.4 Based on the guidance in BS 4142:2014+A1:2019, where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.
- 4.5 To achieve noise levels not exceeding the typical background noise climate, additional mitigation in the form of screening is suggested. Based on the type of plant proposed, a solid screen is likely to create issues with airflow requirements, therefore the use of an acoustic louvred screen is suggested, for a typical 300mm deep louvre:

Table 4: Acoustic louvre performance

Screen	Transmission loss (dB)							
	63	125	250	500	1k	2k	4k	8k
Acoustic louvre	5	7	11	12	13	14	12	9

4.6 Detailed below is a sketch from the noise model.

Figure 4: Sketch from noise model



4.7 The predicted noise levels with the benefit of the acoustic louvred screen are as follows :

Table 5: Predicted noise levels with acoustic louvred screen

Location	Daytime			Night		
	Predicted rating level LAeq	Background LA90	Difference	Predicted rating level LAeq	Background LA90	Difference
Wellfield Avenue	37 dB	40 dB	-3	37 dB	37 dB	0
Wellfield Avenue garden	39 dB	40 dB	-1	N/A	N/A	N/A
Development to SE	28 dB	40 dB	-12	28 dB	37 dB	-9

4.8 The comparison in Table 5 demonstrates that based on the proposed plant selections, and a 3m high acoustic louvred screen, the predicted rating noise level does not exceed the typical background noise climate, and would be considered as a low impact.

5.0 The noise model and prediction methodology

5.1 The noise model employed has been written in-house to provide an accurate prediction method for assessing environmental noise from, in particular, plant and equipment items which can be perceived as being point sources. It has been mainly used for the prediction of noise emanating from superstores.

5.2 There are three input spreadsheets containing:

- noise sources data
- receiver data
- acoustic screening data

These are included in Appendix A.

5.3 The noise sources data include one of the following forms for each item of plant:

- either, octave band sound power levels in the range of 63 to 8000Hz – this being available from manufacturer of many of the supply and extract fans.
- or, octave band sound pressure levels in the range of 63 to 8000Hz – this is available usually for the small, externally mounted split units' condenser fans from the manufacturer's product catalogue when measured at one metre in anechoic conditions, thus allowing straight forward calculation of the equivalent sound power levels.
- or, single value sound pressure levels at a stated distance

5.4 The relative location of the plant using X and Y co-ordinates with an arbitrary datum point and a Z (height) co-ordinate based on supporting steel and screening heights from the main contractor and then the equipment heights based, in this case, on the mechanical services contractor drawings.

5.5 Where known, the area and orientation of the noise outlet is entered together with its location adjacent to either one, two or three reflective surfaces so that the calculation can establish the directivity pattern and outlet reflection losses.

5.6 The receiver data needed are the X, Y and Z co-ordinates so that the relative distance and angle can be calculated between the source and the receiver.

5.7 Finally, several types of acoustic screening may be entered. In this case, this is designated "F" meaning a finite barrier, used to indicate the parapet of the buildings and boundary wall.

5.8 The noise model carries out "text book" atmospheric side calculations at each receiver position from each source allowing for the attenuation from such as the calculated distance and screening. The calculations are performed in eight Octave bands from 63 to 8000Hz but can then be summarised as dBA, NR or NC for convenience. In this case, the overall summary levels are in dBA. Calculations for the plant are included in Appendix C and D. The computer maintains a logarithmic total of the noise +levels in Octave bands.

- 5.9 At the end of each program “run”, the overall day or night time noise level at each receiver position are calculated and ranked in descending order of noise level. Where this ranking shows that the receiver position’s noise level exceeds the noise criterion, each calculation can be interrogated to determine the plant items needing more detailed inspection to establish the attenuation needed. The process is repeated until either the noise level meets the noise criterion or the program demonstrates that other noise control methods are needed. This may take the form of restricting the offending plant’s period of operation or improving the screening or re-selection to give quieter plant.
- 5.10 Plant noise predictions are shown in summary form; full calculations of noise from each source to each receptor are available on request.

6.0 Assessment conclusions

- 6.1 This assessment has been undertaken in accordance with the guidelines in BS 4142:2014+A1:2019.
- 6.2 Based on the comparison presented in Table 5, the predicted rating noise levels comply are equal to or below the existing background noise climate, which based on the guidance in BS 4142:2014+A1:2019, is considered to be a low impact.
- 6.3 This assessment objectively demonstrates that noise arising from the fixed plant, complies with the requirement of paragraph 185 of the NPPF to avoid significant adverse impact.

APPENDIX A

NOISE SOURCE DATA

CLIENT :				A Sht: 1 of 1							
PROJECT :Muswell Hill				PROJECT No:2322036							
CONSULTANT:MT				DATE :20 October 2023							
SOUND POWER LEVELS (Lw) & SOUND PRESSURE LEVELS (Lp) FOR FANS AND OTHER EQUIPMENT											
EQUIPMENT NAME/REFERENCE	Lw/Lp	DIST. (m)	OP. TIME DNA	MID FREQUENCY OCTAVE BANDS (HZ)							
				63	125	250	500	1k	2k	4k	8k
Gas cooler	Lp	10	A	Maximum 43dBA at 10 metres							
Compressor Pack	Lp	10	A	Maximum 35dBA at 10 metres							
HT CU	Lp	10	A	Maximum 33dBA at 10 metres							
LT CU	Lp	10	A	Maximum 36dBA at 10 metres							
ASHP	Lp	1	A	Maximum 52dBA at 1 metres							
ASHP	Lp	1	A	Maximum 52dBA at 1 metres							
NOTES: 1. Lw/Lp: Lw means sound power level (dB) Lp means sound pressure level at stated distance (dB/m) 2. Operational time (OP.TIME D/N/A): D (Day) - could operate at any time between 0700 & 2300 N (Night) - could operate at any time between 2300 & 0700 A (All) - could operate at any time during the day and night											

APPENDIX B

NOISE MODEL INPUT DATA

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Filename : P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date : 20 October 2023
Entries by : MT
Project number : 2322036
Project title : Muswell Hill
Client's name : Aldi

Map/plot details :

Length :3200
Width :3200
Height :250

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Source data - description, coordinates, outlet size, percentage to atmosphere, directivity,
sound levels and running period.

Filename : P:\23 - Projects\2322036\11-11 Muswell Hill- GJK\Noysplot\201023_1 screened

Source Description	Coordinates			Outlet details			Run Lp/ dBA Dist.			Mid frequency octave bands									
	X(m)	Y(m)	Z(m)	A(mm)	B(mm)	Ang. %	Q	DNA	Lw	Y/N	(m)	63	125	250	500	1k	2k	4k	8k
Gas cooler	202.5	195.0	1.4	0	0	0	100	3	A	P	Y	10.0	43	0	0	0	0	0	0
Compressor Pack	201.0	198.5	2.0	0	0	0	100	2	A	P	Y	10.0	35	0	0	0	0	0	0
HT CU	203.0	197.0	1.0	0	0	0	100	2	A	P	Y	10.0	33	0	0	0	0	0	0
LT CU	203.0	198.5	1.0	0	0	0	100	2	A	P	Y	10.0	36	0	0	0	0	0	0
ASHP	203.0	200.0	1.0	0	0	0	100	2	A	P	Y	1.0	52	0	0	0	0	0	0
ASHP	204.5	200.0	1.0	0	0	0	100	2	A	P	Y	1.0	52	0	0	0	0	0	0

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The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Receptor data - description and coordinates

Filename : P:\23 - Projects\2322036 ., Muswell Hill- GJK\Noysplot\201023_1 screened

Receptor Description	Coordinates			DNA
	X (m)	Y (m)	Z (m)	
Wellfield Avenue	190.0	230.0	7.5	A
Wellfield Avenue	200.0	230.0	7.5	A
Wellfield Avenue	210.0	230.0	7.5	A
Wellfield Avenue	220.0	230.0	7.5	A
Wellfield Avenue - garden	190.0	217.0	1.5	D
Wellfield Avenue - garden	200.0	217.0	1.5	D
Wellfield Avenue - garden	210.0	217.0	1.5	D
Wellfield Avenue - garden	220.0	217.0	1.5	D
Development to south east	240.0	212.0	4.0	A
Development to south east	226.0	190.0	4.0	A
Development to south east	235.0	196.0	4.0	A

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Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Barrier data - description and coordinates

Filename : P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Barrier type	Coordinates					
	X(m)	Start Y(m)	Z(m)	X(m)	Finish Y(m)	Z(m)
F	188.0	200.0	3.9	200.0	200.0	3.9
F	200.0	200.0	3.9	200.0	193.0	3.9
F	200.0	193.0	9.9	204.5	193.0	9.9
F	204.5	193.0	7.0	204.8	198.0	6.9
F	204.8	198.0	6.9	207.0	200.0	9.9
F	207.0	200.0	7.0	223.0	199.0	7.0
F	223.0	199.0	7.0	222.5	195.0	7.0
F	207.0	200.0	3.9	208.5	201.5	3.9
F	208.5	201.5	3.9	222.0	200.8	3.9
F	222.0	200.8	3.9	223.0	199.0	3.9
F	220.0	205.0	2.1	198.0	206.0	2.1
F	198.0	206.0	2.1	196.5	208.0	2.1
F	196.5	208.0	2.1	180.0	208.0	2.1
F1	200.0	200.0	3.0	200.0	201.0	3.0
F1	200.0	201.0	3.0	207.0	201.0	3.0
F1	207.0	201.0	3.0	207.0	200.0	3.0

APPENDIX C

PREDICTED NOISE LEVELS – SUMMARY DAYTIME

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The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time overall receptor listings

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Wellfield Avenue - garden	58	46	36	28	23	21	22	27	36
Wellfield Avenue - garden	58	46	36	28	24	21	22	26	36
Wellfield Avenue	55	43	35	28	23	21	20	23	34
Wellfield Avenue	54	43	34	28	23	21	20	23	34
Wellfield Avenue	54	43	34	27	23	20	19	22	34
Wellfield Avenue	53	42	33	27	22	20	19	22	33
Wellfield Avenue - garden	53	41	31	23	18	16	16	21	31
Wellfield Avenue - garden	52	40	30	22	18	15	16	20	30
Development to south east	47	34	24	16	13	11	11	14	25
Development to south east	46	33	23	15	10	9	9	11	24
Development to south east	45	33	23	15	11	8	8	11	23

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Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036
Date: 20/10/2023

Muswell Hill- GJK\Noysplot\201023_1 screened

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	52	41	32	26	21	19	18	21	32
Compressor Pack	42	31	22	14	10	7	7	11	21
LT CU	42	30	20	12	8	5	6	11	20
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	26	16	8	4	2	3	8	17
ASHP	38	26	15	7	3	1	2	7	16
Total Free field Lp and dBA	53	42	33	27	22	20	19	22	33

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The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 A\ , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	53	42	33	27	22	20	19	22	33
Compressor Pack	43	32	23	15	11	8	8	12	22
LT CU	43	31	21	13	9	6	7	12	21
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	27	16	8	4	2	3	8	17
ASHP	39	26	16	8	4	2	3	8	17
Total Free field Lp and dBA	54	43	34	28	23	21	20	23	34

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Day time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	54	42	34	27	22	20	19	22	33
Compressor Pack	43	32	23	15	11	8	8	12	22
LT CU	43	31	21	13	9	6	7	12	21
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	27	16	9	4	2	3	8	17
ASHP	39	27	16	8	4	2	3	8	17
Total Free field Lp and dBA	55	43	35	28	23	21	20	23	34

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 - i, Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	53	42	33	26	22	19	18	21	33
Compressor Pack	42	31	22	15	10	7	7	11	21
LT CU	43	31	21	13	8	5	7	11	21
HT CU	39	28	18	10	5	2	3	7	18
ASHP	38	26	15	8	3	1	2	7	16
ASHP	38	26	15	8	3	1	2	7	16
Total Free field Lp and dBA	54	43	34	27	23	20	19	22	34

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue - garden

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	49	37	28	19	13	11	11	13	27
LT CU	46	34	23	16	11	9	10	15	24
Compressor Pack	45	33	23	16	11	8	9	14	24
HT CU	42	30	20	12	7	5	6	11	20
ASHP	41	29	19	11	7	5	6	11	20
ASHP	41	29	19	11	7	4	6	11	20
Total Free field Lp and dBA	53	41	31	23	18	16	16	21	31

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue - garden

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	57	45	35	27	22	19	21	25	35
LT CU	48	36	25	18	13	11	12	17	26
Compressor Pack	47	36	26	18	13	11	12	16	26
HT CU	44	32	22	14	9	7	8	13	22
ASHP	43	31	21	13	9	6	8	13	22
ASHP	43	31	20	13	9	6	8	13	22
Total Free field Lp and dBA	58	46	36	28	23	21	22	27	36

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP9 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at Receptor: Wellfield Avenue - garden

Filename: P:\23 - Projects\2322036 - Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	57	45	35	27	23	20	21	25	35
Compressor Pack	47	35	25	17	12	10	11	15	25
LT CU	47	35	24	17	12	10	11	16	25
ASHP	44	31	21	13	9	7	8	13	22
ASHP	43	31	21	13	9	7	8	13	22
HT CU	43	31	21	13	9	6	7	12	21
Total Free field Lp and dBA	58	46	36	28	24	21	22	26	36

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Wellfield Avenue - garden

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
LT CU	46	34	24	16	11	8	9	14	24
Compressor Pack	45	33	24	16	11	8	9	13	24
Gas cooler	44	31	21	14	11	10	10	12	22
HT CU	44	32	22	15	10	7	7	11	22
ASHP	42	30	20	12	7	5	6	11	20
ASHP	41	29	18	11	6	4	5	10	19
Total Free field Lp and dBA	52	40	30	22	18	15	16	20	30

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH
 Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Development to south east

Filename: P:\23 - Projects\2322036 Muswell Hill- GJK\Noysplot\201023_1 screened
 Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	42	29	19	11	8	7	7	9	20
ASHP	38	27	17	9	4	1	2	6	17
Compressor Pack	37	26	17	9	4	0	0	0	16
ASHP	31	19	9	1	0	0	0	0	8
LT CU	30	17	7	1	0	0	0	0	7
HT CU	28	15	5	0	0	0	0	0	4
Total Free field Lp and dBA	45	33	23	15	11	8	8	11	23

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Day time source sound pressure levels at receptor: Development to south east

Filename: P:\23 - Projects\2322036 Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	46	33	23	15	12	11	11	13	24
LT CU	35	22	12	5	2	1	1	3	14
Compressor Pack	36	23	13	4	1	0	0	2	13
HT CU	32	19	9	2	0	0	0	0	8
ASHP	32	19	9	1	0	0	0	0	8
ASHP	31	18	8	1	0	0	0	0	8
Total Free field Lp and dBA	47	34	24	16	13	11	11	14	25

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Day time source sound pressure levels at receptor: Development to south east

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	44	31	21	13	10	9	9	11	22
ASHP	36	24	15	6	0	0	0	0	14
ASHP	36	24	14	6	0	0	0	0	14
LT CU	33	20	10	3	0	0	0	1	10
Compressor Pack	32	20	10	1	0	0	0	0	9
HT CU	30	17	7	0	0	0	0	0	7
Total Free field Lp and dBA	46	33	23	15	10	9	9	11	24

APPENDIX D

PREDICTED NOISE LEVELS – SUMMARY NIGHT

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time overall receptor listings

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Wellfield Avenue	55	43	35	28	23	21	20	23	34
Wellfield Avenue	54	43	34	28	23	21	20	23	34
Wellfield Avenue	54	43	34	27	23	20	19	22	34
Wellfield Avenue	53	42	33	27	22	20	19	22	33
Development to south east	47	34	24	16	13	11	11	14	25
Development to south east	46	33	23	15	10	9	9	11	24
Development to south east	45	33	23	15	11	8	8	11	23

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 - , Muswell Hill- GJK\Noysplot\201023_1 screened
Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	52	41	32	26	21	19	18	21	32
Compressor Pack	42	31	22	14	10	7	7	11	21
LT CU	42	30	20	12	8	5	6	11	20
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	26	16	8	4	2	3	8	17
ASHP	38	26	15	7	3	1	2	7	16
Total Free field Lp and dBA	53	42	33	27	22	20	19	22	33

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH
 Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened
 Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	53	42	33	27	22	20	19	22	33
Compressor Pack	43	32	23	15	11	8	8	12	22
LT CU	43	31	21	13	9	6	7	12	21
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	27	16	8	4	2	3	8	17
ASHP	39	26	16	8	4	2	3	8	17
Total Free field Lp and dBA	54	43	34	28	23	21	20	23	34

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	54	42	34	27	22	20	19	22	33
Compressor Pack	43	32	23	15	11	8	8	12	22
LT CU	43	31	21	13	9	6	7	12	21
HT CU	40	28	18	11	6	3	4	8	19
ASHP	39	27	16	9	4	2	3	8	17
ASHP	39	27	16	8	4	2	3	8	17
Total Free field Lp and dBA	55	43	35	28	23	21	20	23	34

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Wellfield Avenue

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	53	42	33	26	22	19	18	21	33
Compressor Pack	42	31	22	15	10	7	7	11	21
LT CU	43	31	21	13	8	5	7	11	21
HT CU	39	28	18	10	5	2	3	7	18
ASHP	38	26	15	8	3	1	2	7	16
ASHP	38	26	15	8	3	1	2	7	16
Total Free field Lp and dBA	54	43	34	27	23	20	19	22	34

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Development to south east

Filename: P:\23 - Projects\2322036 , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	42	29	19	11	8	7	7	9	20
ASHP	38	27	17	9	4	1	2	6	17
Compressor Pack	37	26	17	9	4	0	0	0	16
ASHP	31	19	9	1	0	0	0	0	8
LT CU	30	17	7	1	0	0	0	0	7
HT CU	28	15	5	0	0	0	0	0	4
Total Free field Lp and dBA	45	33	23	15	11	8	8	11	23

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Development to south east

Filename: P:\23 - Projects\2322036 . . . , Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	46	33	23	15	12	11	11	13	24
LT CU	35	22	12	5	2	1	1	3	14
Compressor Pack	36	23	13	4	1	0	0	2	13
HT CU	32	19	9	2	0	0	0	0	8
ASHP	32	19	9	1	0	0	0	0	8
ASHP	31	18	8	1	0	0	0	0	8
Total Free field Lp and dBA	47	34	24	16	13	11	11	14	25

SHARPS REDMORE PARTNERSHIP

The White House, London Road, Copdock, Ipswich, IP8 3JH

Tel: 44 (0) 1473 730073 Fax: 44 (0) 1473 730030 Email: srp@sharpsredmore.co.uk

Night-time source sound pressure levels at receptor: Development to south east

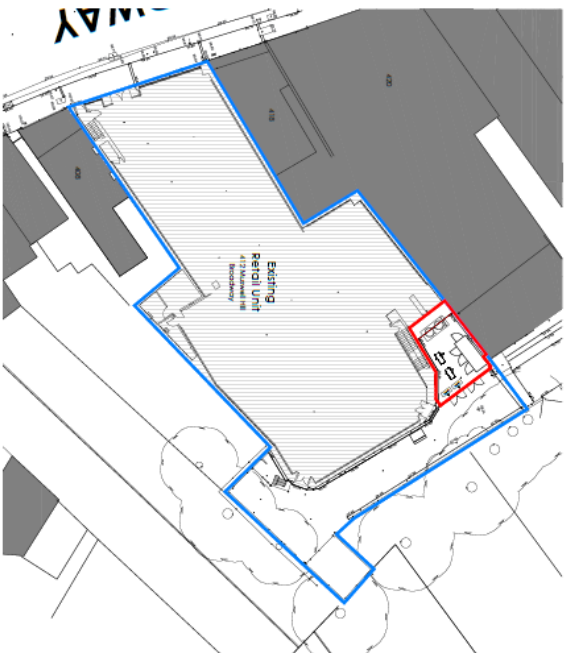
Filename: P:\23 - Projects\2322036 Alder, Muswell Hill- GJK\Noysplot\201023_1 screened

Date: 20/10/2023

	Mid frequency Octave bands (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Gas cooler	44	31	21	13	10	9	9	11	22
ASHP	36	24	15	6	0	0	0	0	14
ASHP	36	24	14	6	0	0	0	0	14
LT CU	33	20	10	3	0	0	0	1	10
Compressor Pack	32	20	10	1	0	0	0	0	9
HT CU	30	17	7	0	0	0	0	0	7
Total Free field Lp and dBA	46	33	23	15	10	9	9	11	24

APPENDIX E

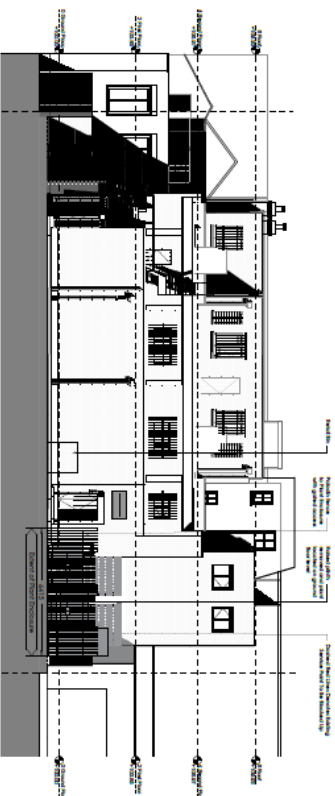
PLANT AND SITE LAYOUT DRAWING



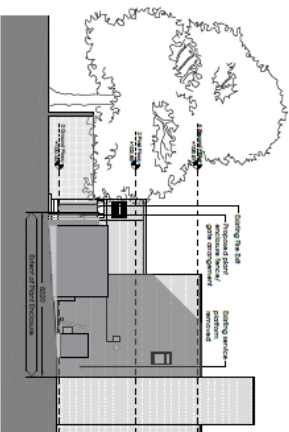
PROPOSED SITE PLAN
1:200 SCALE



PROPOSED GENERAL ARRANGEMENT
1:100 SCALE



VIEW A - PROPOSED REAR ELEVATION
1:100 SCALE



VIEW B - PROPOSED SIDE ELEVATION / SECTION
1:100 SCALE

PROPOSED SITE PLAN, GA PLAN AND ELEVATIONS
SCALE 1:200 / 1:100 @ A1

SCALE 1:200

SCALE 1:100

LEGEND
Proposed
Existing

NO.	REVISION	DATE
1	ISSUED FOR PERMIT	10/10/2023
2	ISSUED FOR PERMIT	10/10/2023

HAZEL'S
ARCHITECTS
100-102, 104-106, 108-110, 112-114, 116-118, 120-122, 124-126, 128-130, 132-134, 136-138, 140-142, 144-146, 148-150, 152-154, 156-158, 160-162, 164-166, 168-170, 172-174, 176-178, 180-182, 184-186, 188-190, 192-194, 196-198, 200-202, 204-206, 208-210, 212-214, 216-218, 220-222, 224-226, 228-230, 232-234, 236-238, 240-242, 244-246, 248-250, 252-254, 256-258, 260-262, 264-266, 268-270, 272-274, 276-278, 280-282, 284-286, 288-290, 292-294, 296-298, 300-302, 304-306, 308-310, 312-314, 316-318, 320-322, 324-326, 328-330, 332-334, 336-338, 340-342, 344-346, 348-350, 352-354, 356-358, 360-362, 364-366, 368-370, 372-374, 376-378, 380-382, 384-386, 388-390, 392-394, 396-398, 400-402, 404-406, 408-410, 412-414, 416-418, 420-422, 424-426, 428-430, 432-434, 436-438, 440-442, 444-446, 448-450, 452-454, 456-458, 460-462, 464-466, 468-470, 472-474, 476-478, 480-482, 484-486, 488-490, 492-494, 496-498, 500-502, 504-506, 508-510, 512-514, 516-518, 520-522, 524-526, 528-530, 532-534, 536-538, 540-542, 544-546, 548-550, 552-554, 556-558, 560-562, 564-566, 568-570, 572-574, 576-578, 580-582, 584-586, 588-590, 592-594, 596-598, 600-602, 604-606, 608-610, 612-614, 616-618, 620-622, 624-626, 628-630, 632-634, 636-638, 640-642, 644-646, 648-650, 652-654, 656-658, 660-662, 664-666, 668-670, 672-674, 676-678, 680-682, 684-686, 688-690, 692-694, 696-698, 700-702, 704-706, 708-710, 712-714, 716-718, 720-722, 724-726, 728-730, 732-734, 736-738, 740-742, 744-746, 748-750, 752-754, 756-758, 760-762, 764-766, 768-770, 772-774, 776-778, 780-782, 784-786, 788-790, 792-794, 796-798, 800-802, 804-806, 808-810, 812-814, 816-818, 820-822, 824-826, 828-830, 832-834, 836-838, 840-842, 844-846, 848-850, 852-854, 856-858, 860-862, 864-866, 868-870, 872-874, 876-878, 880-882, 884-886, 888-890, 892-894, 896-898, 900-902, 904-906, 908-910, 912-914, 916-918, 920-922, 924-926, 928-930, 932-934, 936-938, 940-942, 944-946, 948-950, 952-954, 956-958, 960-962, 964-966, 968-970, 972-974, 976-978, 980-982, 984-986, 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