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UNIT 1, STRATEGIC PARK, HEDGE END
NOISE ASSESSMENT

Technical Report: R10262-1 Rev 3

Date: 24th January 2024

For: Columbia Threadneedle Real Estate Partners LLP
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24 Acoustics Document Control Sheet**Project Title:** Unit 1, Strategic Park, Hedge End – Noise Assessment**Report Ref:** R10262-1 Rev 3**Date:** 24th January 2024

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1.0 INTRODUCTION AND SITE DESCRIPTION

- 1.1 24 Acoustics Ltd has been instructed by Columbia Threadneedle Real Estate Partners LLP to undertake a noise assessment for a proposed change of use of a warehouse at Unit 1, Strategic Park, Hedge End. The unit will comprise flexible commercial, business and service use classes E (g) (i - iii) and B2 general industrial / B8 storage or distribution use classes.
- 1.2 Strategic Park is located in an existing industrial estate and employment area. There are residential properties beyond the tree lined bund to the south, the Ageas Bowl golf course to the north/west and the M27 to the east with retail and commercial buildings further east. The site contains two large warehouse units (Unit 2 to the north, Unit 1 to the south), previously containing research and development operations and a storage and distribution warehouse.
- 1.3 Proposals comprise refurbishment of the Unit 1 warehouse building and include installation of replacement plant, most of which is catering for a specific occupier. The future occupier is a manufacturer of carbon fibre race yachts and associated components, Sail GP. The facility will be used to accelerate its research and development programme, which previously operated overseas, and used to help maintain the cutting-edge F50 catamarans used in a global racing series.
- 1.4 Existing extended HGV loading bays will be removed and replaced with quiet closing sectional doors (as is the case for Unit 2) and an existing loading door is proposed to be widened. A Noise Management Plan accompanies the proposals (reference R10262-2 Rev 3) and includes noise mitigation measures to be implemented. A solid acoustic barrier / gate, of height 3 m, has been installed as shown in Figure 1 under planning consent F/22/93417 which applies to a change of use for the adjacent Unit 2.
- 1.5 The normal hours of operation for the site are anticipated to be 07:00 – 20:00 with very infrequent later working by the intended new B2 occupier. The majority of plant will not operate during the night-time period. Access is required 24 hours a day 7 days a week. It is anticipated that access and deliveries outside of standard working hours will be very infrequent, but it is noted that the site currently benefits from unencumbered 24-hour use.
- 1.6 This report reviews noise emissions from the proposed external plant as well as HGV and container movements within the service yard.
- 1.7 An explanation of acoustical terms used in this report is provided in Appendix A. All sound pressure levels in this report are given in dB re: 20 μ Pa.

2.0 CRITERIA

NPPF

- 2.1 The National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely 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:
- 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 quality of life;
 - Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- 2.2 The NPPF refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term 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' which is supported by the following aims.
- Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life.
- 2.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:
- 2.4 "It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

- 2.5 In 2014 the Planning Practice Guidance (PPG) was finalised [Reference 3]. This is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.
- 2.6 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.

Plant Noise

- 2.7 BS 4142:2014 [Reference 4] provides a method for rating and assessing industrial and commercial sound in relation to residential properties. The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered.
- 2.8 For rating purposes if the noise source is tonal, impulsive or otherwise distinctive in character, a rating correction may be applied depending on the severity of the character. The standard states that a difference between the rating level and the background level of around +10 dB or more is likely to be an indication of a significant adverse impact depending on the context, a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context, and where the rating level does not exceed the background level it is an indication of a low impact, depending on the context.
- 2.9 In line with the consent granted for change of use at Unit 2, replacement plant should be designed to achieve a rating noise level no greater than 5 dB below the existing background noise level surrounding residential properties to the south.
- 2.10 The following planning condition is recommended:

"Noise from internal activities and fixed plant serving the premises shall be controlled at all times to a level 5 dB below the prevailing typical background noise level, as assessed at the nearest residential property. The assessment shall be undertaken in accordance with BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'."

Noise from HGV and Container Movements

- 2.11 The NPPF currently provides no technical guidance on planning noise values. Therefore, in relation to HGV movements, it is appropriate to refer to methodologies used in planning appeals which have considered similar scenarios.
- 2.12 The assessment of noise from HGV movements is usually best assessed (ie, achieve a better correlation with subjective response) by a comparison with prevailing ambient (L_{eq}) noise levels. This approach has been used and accepted at several Planning Inquiries (further details are available).
- 2.13 The movement of containers has been assessed using the methodology of BS4142:2014+A1:2019.

3.0 ENVIRONMENTAL NOISE MEASUREMENTS

- 3.1 An environmental noise survey was undertaken between 14th and 20th October 2022 to determine the ambient noise levels at the site. Noise monitoring equipment was set up on the southern site boundary at approximately 1.5 metres above local ground level. The measurement location can be seen in Figure 1.
- 3.2 Background noise levels were measured using the following equipment:
- Rion precision sound level meter Type NL-52;
 - Norsonic acoustic calibrator Type 1252.
- 3.3 Noise measurements were undertaken in samples of 5 minutes in terms of the overall free-field A-weighted L_{eq} , L_{90} and $L_{max,f}$ noise levels. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 3].
- 3.4 The instrumentation's calibration was checked before and after the survey in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards. All instruments were fitted with environmental weather shields during the surveys.
- 3.5 Weather conditions during the survey were variable but were not found to have significantly affected the measured noise levels.

- 3.6 It is relevant to note that measurements were carried out after the existing plant had been de-commissioned and when the site was vacant. Therefore, the measured noise levels are likely to be lower than when the site and existing plant was in operation.
- 3.7 Measurement results are shown graphically in Appendix B. Typical background noise levels during daytime (07:00 to 19:00 hours), evening (19:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) periods are shown in Table 1 below.

Measured Typical Background Noise Level		
Daytime (07:00 to 19:00 hours) dB LA90 1 hour	Evening (19:00 to 23:00 hours) dB LA90 1 hour	Night-Time (23:00 to 07:00 hours) dB LA90 15 min
52	50	40

Table 1 - Measured Background Noise Levels

- 3.8 24 Acoustics determines the typical background noise level to be the average minus one standard deviation over the relevant period.
- 3.9 Measured ambient noise levels were 56 dB LAeq 1 hour during daytime periods (07:00 to 19:00 hours), 55 dB LAeq 1 hour during evening periods (19:00 to 23:00 hours) and 51 dB LAeq 15 min during night-time periods.
- 3.10 Noise levels on site are dominated by road traffic on M27 and surrounding road network.

4.0 NOISE ASSESSMENT

External Plant & Ducted Building Openings

- 4.1 Careful consideration has been given to noise in developing the site layout ensuring that the majority of external plant is located to the north of the building which will maximise screening from the building itself and hence minimise noise levels at the nearest residential receptors. During selection of external plant items, consideration has been given to sourcing low noise options along with screening and acoustic enclosures as required.
- 4.2 Air conditioning plant previously located to the south of Unit 1 has been decommissioned and removed. Replacement plant will include five air conditioning condenser units located to the north of the building.

- 4.3 Other plant external to the north of the building will comprise an air source heat pump unit, a dust extract unit, and a cooling tower (which serves an autoclave located inside the building). A compressor unit will be housed within a GRP enclosure, as will a vacuum unit and plant associated with the ASHP system also to the north of the building.
- 4.4 To the south-west of the building, external plant will comprise a freezer condenser and a second vacuum unit within a GRP enclosure.
- 4.5 Close board fences (minimum surface density 12 kg/m^3) are proposed around some items of plant. Figure 2 shows the site layout and items of external plant are identified therein.
- 4.6 Ducted openings within the north façade of the building include the air intake for the CNC machine, and the air scrubber intake and exhaust for the spray booth. There will be no other openings in the building facades. Figure 3 shows the elevations of the building with the locations of these openings identified.
- 4.7 The air conditioning units to the north of the building and the freezer condenser to the west of the building are likely to operate at night (23:00 – 07:00). All other plant will operate during the day / evening periods only (07:00 – 23:00).
- 4.8 Noise data has been obtained for the plant items and where necessary, this has been used to derive sound power level data for each external noise source and building opening using standard acoustic theory. A schedule of sound power levels used in the calculations are shown in Appendix C.
- 4.9 The nearest receptors are located in West Road to the south-west (No. 27) and Windmill Cottage off Upper Northam Road to the south-east. Based on the above, calculations have been undertaken to determine noise levels from external plant and building openings at the nearest residential properties and include corrections for distance and screening provided by the intervening building where appropriate. The resultant noise level for the day, evening and night-time periods is given in Table 2.

Receiver Location	Resultant Noise Level dB $L_{Aeq, T}$
Day and Evening (07:00 – 23:00)	
No.27 West Road	32
Windmill Cottage	31
Nighttime (23:00 – 07:00)	
No.27 West Road	28
Windmill Cottage	19

Table 2: Predicted Noise Levels from External Plant & Building Openings

- 4.10 Table 3 below shows the BS 4142 assessment for the selected receiver locations considered. This plant is not considered to contain any tonal or otherwise distinctive noise characteristics, therefore, character corrections are not applicable.

Period	Specific Source Noise Level dB $L_{Aeq, T}$	Rating Level	Background Noise Level dB $L_{A90, T}$	BS 4142 Assessment Level
No.27 West Road				
Daytime (07:00 – 19:00)	32	32	52	-20
Evening (19:00 – 23:00)	32	32	50	-18
Night-time (23:00 – 07:00)	28	28	40	-12
Windmill Cottage off Upper Northam Drive				
Daytime (07:00 – 19:00)	31	31	52	-21
Evening (19:00 – 23:00)	31	31	50	-19
Night-time (23:00 – 07:00)	19	19	40	-21

Table 3: Assessment, All External Plant and Building Openings

- 4.11 The rating values in Table 3 are significantly lower than the prevailing background noise level and therefore this is less than a 'low' impact when assessed in accordance with the standard. Furthermore, the predicted rating levels meet the requirements of the proposed planning condition.

Internal Plant

- 4.12 The warehouse will be used to store equipment associated with events and will house some plant and machinery associated with research and development of the fleet. The internal design for the building is such that processes which may generate noise, will be enclosed within dedicated spaces as shown in Figure 4 eg, woodworking room and grinding room. These rooms will be designed to reduce noise break-out into the main warehouse space and hence minimise noise break-out from the building. Levels will be controlled to 5 dB below prevailing background at all times.
- 4.13 External fire escape doors to the south and east of the building will remain closed at all times other than in an emergency.

HGV Movements

- 4.14 The Highways and Transport Statement by I-Transport (technical note reference: SJ/GT/ITB19404-001) provides predicted maximum HGV movements of 4 per hour based on 24-hour Class B2 operations. I-Transport has further predicted 5 HGV movements per hour during evening (19:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) periods.
- 4.15 Based on the above, the following number of HGV movements have been used in the assessment:
- 4 HGV movements per hour during daytime periods (07:00 to 19:00 hours);
 - 5 HGV movements per hour during evening periods (19:00 to 23:00 hours);
 - 5 HGV movements per 15 mins during night-time periods (23:00 to 07:00 hours).
- 4.16 Calculations have been undertaken to predict the level of HGV movement noise associated with the proposed development (using a worse case scenario) and include corrections for distance and screening provided by the intervening warehouse buildings and the proposed 3 m high acoustic barrier.
- 4.17 Calculations have been undertaken to habitable windows in properties on West Road, closest to the yard, using a source noise level of 72 dB L_{Aeq} at 5 m from a slow-moving HGV (taken from 24 Acoustics' library database).
- 4.18 Table 4 below shows the assessment of noise arising from HGV movements.

Period	Number of HGV Movements	HGV Movement Noise Level	Existing Ambient Noise Level	Increase in Noise Level
Daytime (07:00 – 19:00)	4	16 dB $L_{Aeq, 1 \text{ hour}}$	56 dB $L_{Aeq, 1 \text{ hour}}$	0.0 dB
Evening (19:00 – 23:00)	5	17 dB $L_{Aeq, 1 \text{ hour}}$	55 dB $L_{Aeq, 1 \text{ hour}}$	0.0 dB
Night-time (23:00 – 07:00)	5	23 dB $L_{Aeq, 15 \text{ min}}$	51 dB $L_{Aeq, 15 \text{ min}}$	0.0 dB

Table 4: Assessment, HGV Movement Change in Noise Level – Properties on West Road

- 4.19 As shown in Table 4, noise levels from the HGV movements associated with the use of the service yard will be significantly lower than the prevailing ambient noise levels and, therefore, no increase in noise level will arise.
- 4.20 It is understood that Sail GP will generate significantly less movements than described above. This is due to the number of staff employed at the site, with only one HGV delivery expected each day outside of the maintenance period, with other deliveries carried out in light goods vehicles. Please see the accompanying Transport and supporting Planning Statement for further details.

Container Movements

- 4.21 When a new boat is ready for delivery, four containers will be required to transport it from the site. In this instance, four empty containers will be transported to site during a single day. They will remain on site for 1 – 2 weeks for loading. They will not be moved around while on site. The containers will then be removed from site over the course of a single day. This will occur approximately once per year.
- 4.22 Maintenance periods will take place every 3 – 4 years over a period of 8 weeks when boats will be transported to the site for maintenance and repair. This will involve no more than 4 container arrivals per day over a period of 3 – 4 days during Week 1 of the maintenance period. The containers will then remain on site until Week 8, when they will be removed at a rate of no more than 4 per day. Again, containers will not be moved around while on site.
- 4.23 Based on the information above, container delivery / collection movements are unlikely to take place on more than 10 days per year. Delivery / collection of containers will take place during the hours of 08:00 and 17:00. The average measured background noise level representative of the receptors during this period is 53 dB $L_{A90, 1 \text{ hr}}$.

- 4.24 Calculations have been undertaken assuming all four container movements take place during a single hour using 24 Acoustics data for container movements by forklift truck with a sound power level of 98 dBA L_w . These take into account screening due to the building between the yard and the receptor locations. A BS 4142 assessment has been undertaken with a + 6 dB rating correction applied due to the potentially impulsive nature of container movement noise and this can be seen in Table 5 below.

Receptor	Specific Source Noise Level, dB $L_{Aeq, 1 \text{ hour}}$	Rating Level, dB L_{Ar}	Representative Background Sound Level, dB $L_{A90, 1 \text{ hour}}$	BS 4142 Assessment Level
Mon to Fri: 08:00 – 17:00 Hours				
Receiver 1 - West Road	31	37	53	-16
Receiver 2 - Upper Northam Drive	29	35	53	-18

Table 5: BS 4142 Assessment, Container Movements

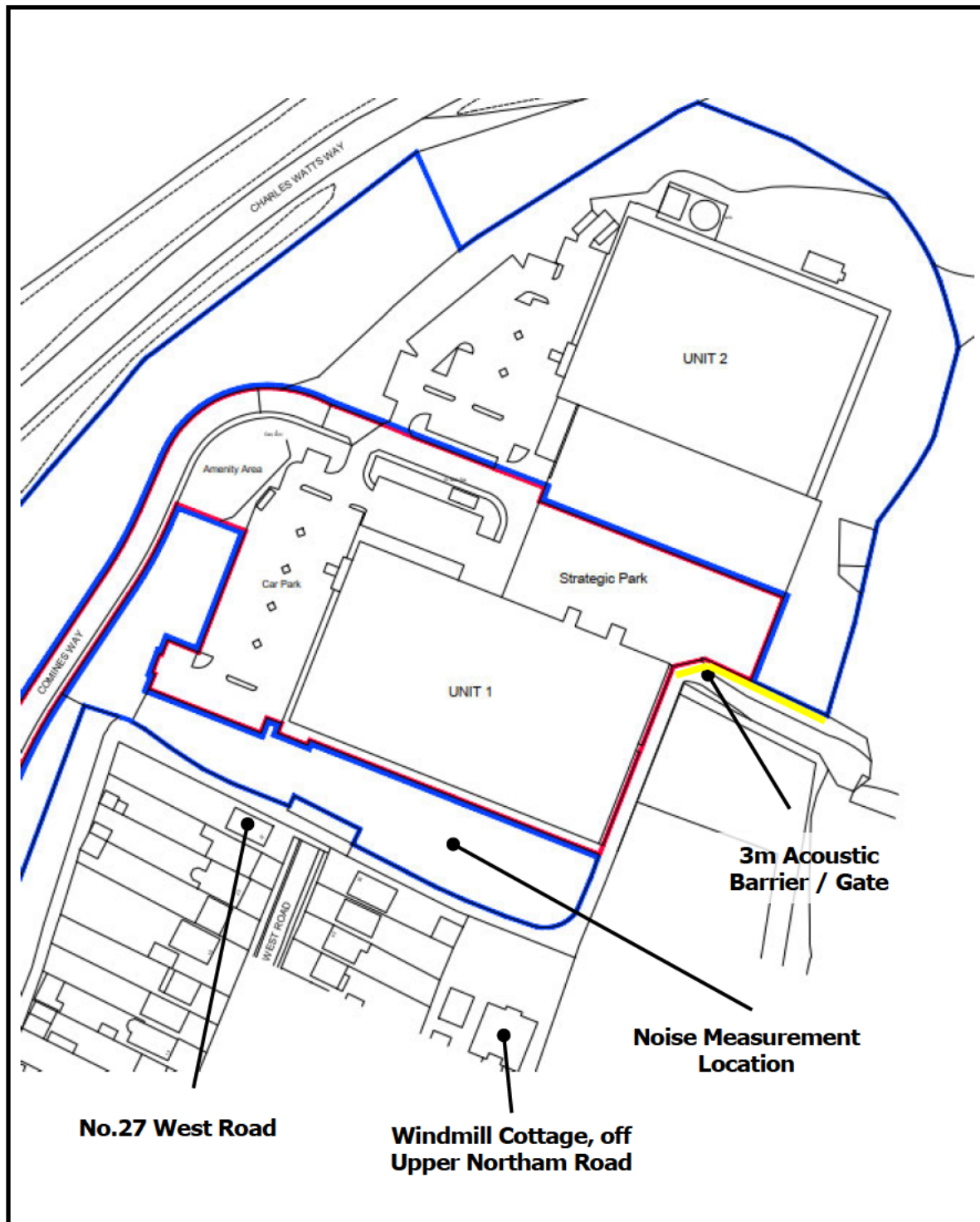
- 4.25 It can be seen that the rating noise level due to container movements is significantly lower than the representative background noise level and therefore this is less than a 'low' impact when assessed in accordance with the standard.
- 4.26 BS 4142 requires uncertainty to be considered as part of the assessment. At this site an extended background noise survey has been undertaken and the data analysed to ensure that background noise data influenced by meteorological conditions has not affected the assessment. The sound level meters were calibrated before and after the survey and no significant drift in calibration was recorded. Standard acoustic theory has been used in the calculations. It is therefore considered that the uncertainty associated with the assessment has been kept to a minimum.

5.0 CONCLUSIONS

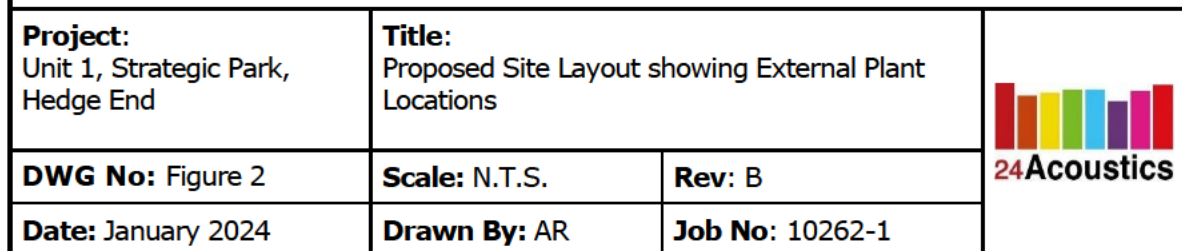
- 5.1 Columbia Threadneedle Real Estate Partners LLP has instructed 24 Acoustics to undertake a noise assessment for external noise sources, along with HGV and container movement operations associated with the proposed change of use at Unit 1, Strategic Park, Hedge End.
- 5.2 A noise limit has been proposed for the development and a noise impact assessment has been undertaken to determine the noise level from all external noise sources and movement of containers. The assessment demonstrates that noise levels will be more than 5 dB lower than the representative background noise level at all times and as such this indicates an impact that is less than 'low' at nearby residential properties.
- 5.3 Calculations have been undertaken to determine the increase in noise levels due to HGV movements associated with the proposals. Results demonstrate that noise from HGV movements within the service yard will be very low at nearby residential properties and will not cause disturbance.
- 5.4 On the above basis, the proposed operations will not cause a significant adverse impact at nearby existing residential properties and are acceptable.

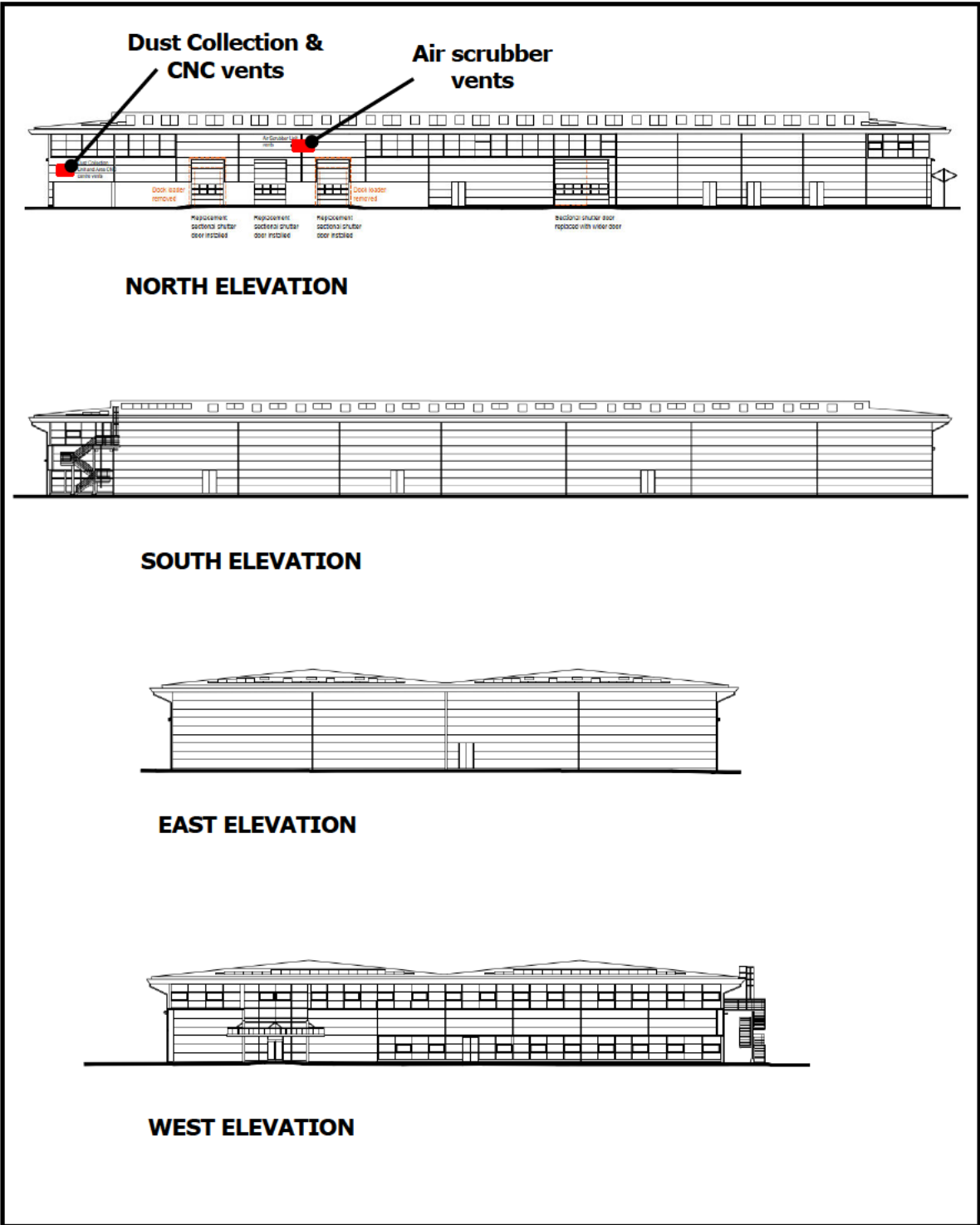
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1. National Planning Policy Framework, Department for Communities and Local Government, September 2023.
2. Noise Policy Statement for England (NPSE), Department for Environment, Food and Rural Affairs, 2010.
3. Planning Practice Guidance, Department of Communities and Local Government March 2014.
4. British Standards Institution. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
5. British Standards Institution. BS 7445: 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use' 1991.

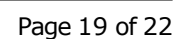


Project: Unit 1, Strategic Park, Hedge End	Title: Site location and noise measurement location		 24Acoustics
DWG No: Figure 1	Scale: N.T.S.	Rev: A	
Date: January 2024	Drawn By: AR	Job No: 10262-1	





Project: Unit 1, Strategic Park, Hedge End	Title: Façade Elevations showing Ducted Building Openinings		 24Acoustics
DWG No: Figure 3	Scale: N.T.S.	Rev: B	
Date: January 2024	Drawn By: AR	Job No: 10262-1	



APPENDIX A: ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB(A) is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB(A). The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB(A) corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

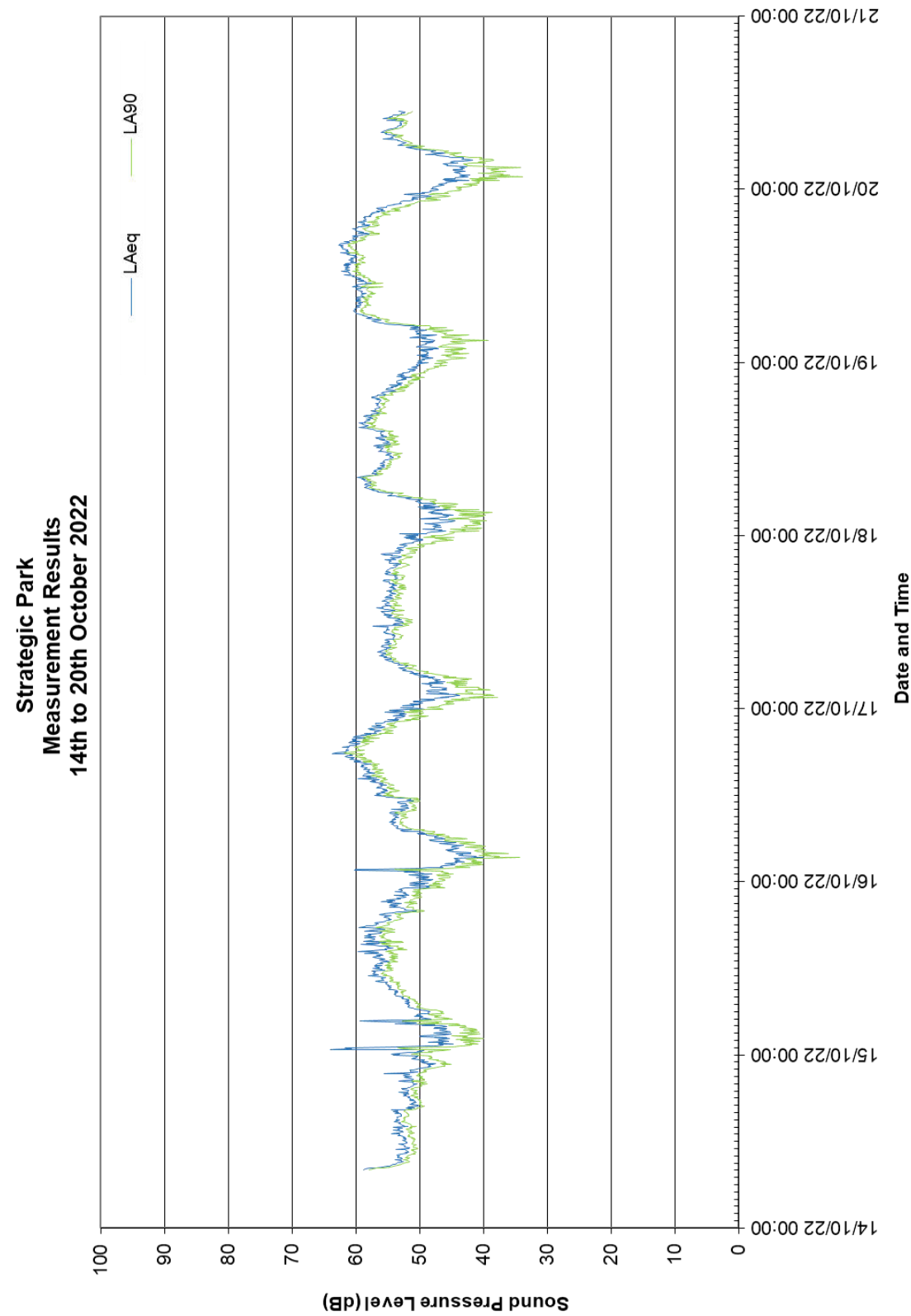
This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T , has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

APPENDIX B: MEASUREMENT RESULTS



APPENDIX C: SOUND POWER LEVEL SCHEDULE

Sound Power Level, dB re 10 ⁻¹²	Octave Band Centre Frequency, Hz								dBA
	63	125	250	500	1k	2k	4k	8k	
Plant to NE corner of building									
Dust extract fan and motor	107	94	91	75	64	59	59	50	86
Dust extract filter casing	110	96	93	78	66	61	61	52	88
Autoclave Cooling tower top									74
Compressor GRP enclosure	99	84	75	70	64	59	53	59	76
Northern façade	63	125	250	500	1k	2k	4k	8k	dBA
Air Scrubber intake	79	81	81	87	83	81	77	70	88
Air Scrubber exhaust	91	86	84	86	84	80	76	67	88
CNC air intake	64	66	66	72	68	66	62	55	73
To north of building	63	125	250	500	1k	2k	4k	8k	dBA
Vacuum Unit GRP enclosure	94	76	74	66	63	57	51	67	73
Condensor Unit x 3 (PURY P1100YSNW)	99	88	88	84	78	76	71	67	86
Condensor Unit x 2 (PUZ-ZM100VKA2)	82	72	72	68	62	59	55	51	69
ASHP	98	88	88	84	78	75	71	67	85
ASHP plant enclosure	110	90	87	78	76	69	63	79	87
To SW of building	63	125	250	500	1k	2k	4k	8k	dBA
Vacuum Unit GRP enclosure	97	79	77	69	66	60	54	70	76
Danfoss freezer condenser	86	80	75	71	75	73	60	52	79