

Chess Dynamics
Charwood House,
Oakwood Business Park,
Southwater, Horsham
RH13 9RT

Environmental Noise Survey and
Noise Impact Assessment Report

Date: 06 August 2026

Client: Chess Dynamics Ltd
Quadrant House
North Heath Lane Business Park
Horsham
RH12 5QE

Ref: QA26307/NIA

Document Control

Document History

Revision	Issue Date	Changes
0	28/07/2026	-
1	06/08/2026	Minor updates from client comments

Document Approvals

Role	Name	Signature	Date
Preparation and Approval	David Yates BSc (Hons), MIOA Associate		06/08/2026

For Information

Please Note

Quantum Acoustics Ltd have prepared this report with generally accepted acoustic consultancy principles, using all reasonable skill, care and diligence. This is as per the terms agreed between Quantum Acoustics Ltd and our Client. Information referred to herein which may have been provided by third parties should not be assumed to have been checked and verified by Quantum Acoustics Ltd, unless specifically confirmed to the contrary. Both confidential and commercially sensitive information is contained within this document, and as such it should not be disclosed to third parties. Any third party choosing to rely on this document does so at their own risk.

Contents

1.0	INTRODUCTION.....	4
2.0	SITE DESCRIPTION.....	5
3.0	PROPOSED DEVELOPMENT.....	7
4.0	PLANNING POLICY AND ASSESSMENT GUIDANCE	10
5.0	EXISTING NOISE ENVIRONMENT.....	18
6.0	ACTIVITY NOISE IMPACT ASSESSMENT.....	24
7.0	PLANT NOISE LEVELS	30
8.0	CUMULATIVE NOISE LEVELS	34
9.0	CONCLUSIONS.....	35

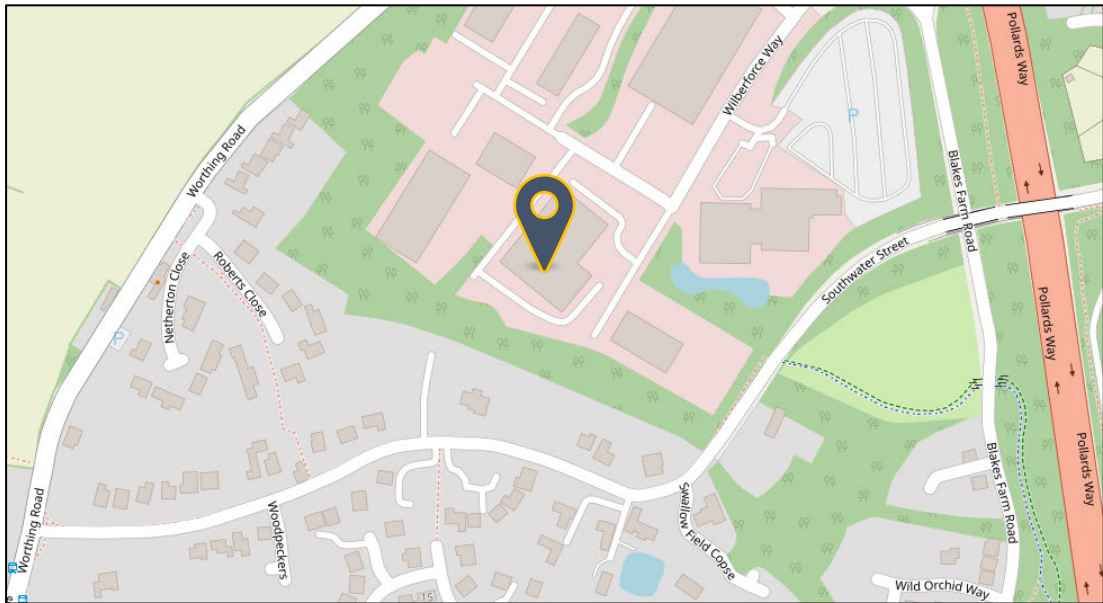
1.0 INTRODUCTION

- 1.1 Quantum Acoustics Limited has been instructed by Chess Dynamics Ltd to prepare this Noise Impact Assessment which accompanies a planning application for a new manufacturing facility at Charwood House, Oakwood Business Park, Southwater, Horsham RH13 9RT.
- 1.2 This report presents the results of an environmental noise survey undertaken in the environs of the site to determine existing ambient noise levels.
- 1.3 These noise levels have been used to determine noise emission criteria for proposed mechanical services, process plant and delivery noise supporting the use of the facility for the production of detection systems for military vehicles.
- 1.4 Compliance with these noise limits has then been assessed, based on available manufacturer's data and/or procurement specifications for the proposed plant.
- 1.5 This report is structured as follows:
 - **Section 2** outlined the location of site and proximity of existing noise sensitive receptors;
 - **Section 3** describes the proposed development (including existing process noise levels);
 - **Section 4** discusses relevant national and local planning policy and industry standard design guidance used as a basis for assessment;
 - **Section 5** presents the results of noise monitoring;
 - **Sections 6 to 8** assess future noise emissions;
 - Conclusions are set out in **Section 9**.

2.0 SITE DESCRIPTION

2.1 Charwood House is located within the Oakwood Business Park. The site is indicated below.

Figure 2.1: Site Location (Open Street Map, 2026)



- 2.2 The surrounding area immediately to the north, east and west is industrial estate.
- 2.3 To the south is a residential area, with the nearest noise sensitive receptors being located on Southwater Street.
- 2.4 The local planning authority is Horsham District Council.
- 2.5 The red line boundary for the site is provided in Figure 2.2 overleaf.

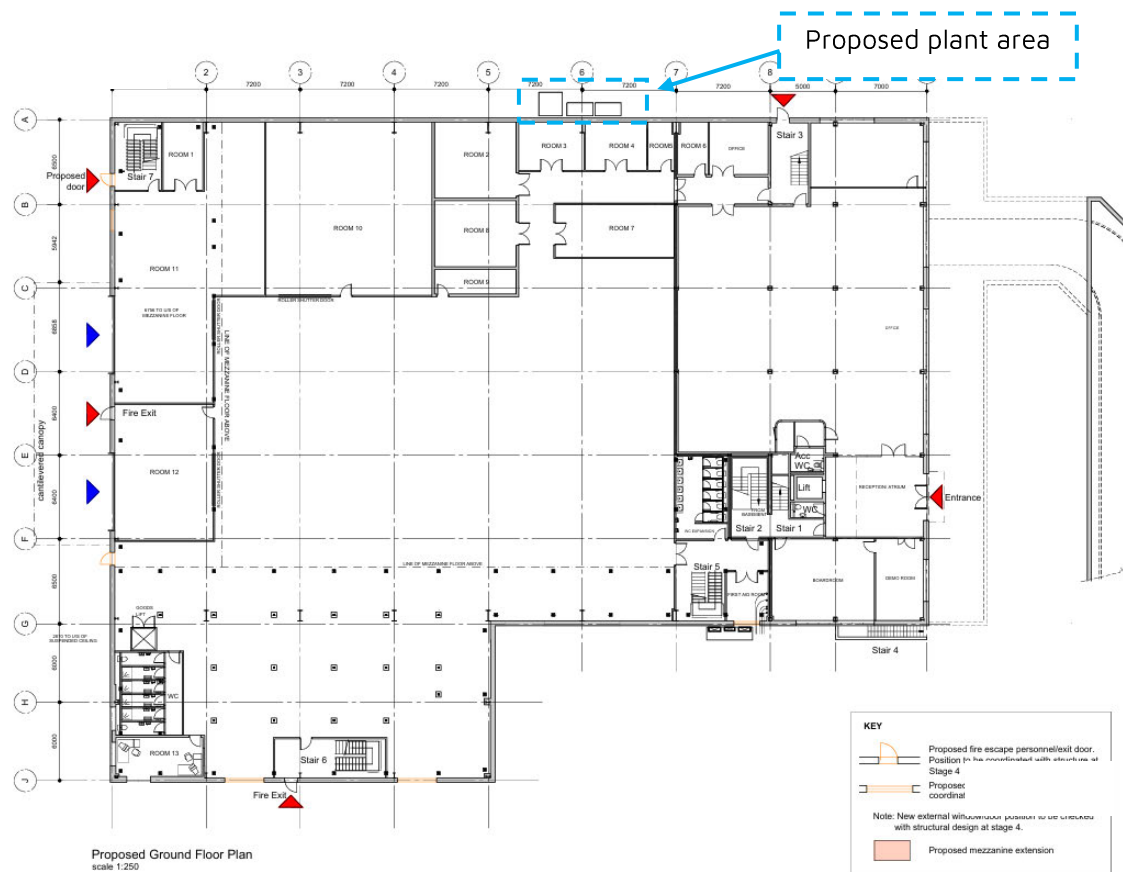
Figure 2.1: Proposed Site Plan (HNW Architects Document ref:26010-HNW-ZZ-ZZ-DR-A-2103 P04, March 2026)



3.0 PROPOSED DEVELOPMENT

- 3.1 The proposed development is for the relocation of Chess Dynamics manufacturing facility from their current premises to Charwood House, Southwater. The manufacturing areas, which are currently spread across different buildings, will be located in the ground floor of Charwood House with external plant located to the west of the building on Wilberforce Way. The proposed arrangement of the site and noise generating plant is shown in Figure 3.1 below:

Figure 3.1: Proposed Internal Layout and Proposed Plant Area.



Noise Levels

- 3.2 Noise levels of specific items of plant and processes have been measured by Quantum Acoustics at the existing Chess Dynamics Facility. The noise measurements are summarised in Table 3.1 below.

Table 3.1: Plant and Activity Noise Levels

Plant or Activity	Distance (m)	Time (s)	Sound Pressure Level $L_{Aeq,T}$ dB
Thermal Chambers Exterior Plant	1 (above)	30	74
Thermal Chambers Exterior Plant	1 (in front)	30	71
Thermal Chambers (Internal – general noise levels)	<i>Internal</i>	30	71
Vibration Table and Generator (Internal – general noise levels)	<i>Internal</i>	30	81
Unit E (Internal – general air con noise levels)	<i>Internal</i>	30	68
Unit E crane (Internal)	1	30	71
Forklift (Internal)	5	30	70
Unit 3 (Internal – general air con noise levels)	<i>Internal</i>	30	64
Unit 2 (Internal – general air con noise levels)	<i>Internal</i>	30	59
Unit 2 Chain Crane (Internal)	1	5	83
Unit 2 Crane (Internal)	1	30	66
Unit 5 (Internal – general air con noise levels)	<i>Internal</i>	30	55
Unit 5 Crane (Internal)	1	30	67

Times of Operations

3.3 Current business operating hours are 08:30 hours – 17:30 hours Monday to Thursday and 08:30 hours – 13:00 hours on Fridays. The majority of deliveries and collections are scheduled within operating hours, with the current site restricted to deliveries and collections between 07:00 hours – 21:00 hours Monday to Friday and 09:00 hours – 13:00 hours on Saturdays.

3.4 The current operations at the Charwood House site are controlled by planning condition as follows:

"No heavy goods vehicles (HGVs), forklifts, plant or machinery shall be operated from the service yard area of the site outside the following times:

0700 hours and 1800 hours on Mondays to Fridays inclusive,

0700 hours and 1300 hours on Saturdays;

and not on Sundays, Bank and Public Holidays."

"Any process undertaken at the application site, except for the movement of cars and vans within the service yard area, shall only be undertaken within the building with the roller doors closed (with the exception of when cars or vans are entering or exiting the building), outside the following times:

0700 hours and 1800 hours on Mondays to Fridays inclusive,

0700 hours and 1300 hours on Saturdays;

and not on Sundays, Bank and Public Holidays."

3.5 Accordingly, proposed deliveries from HGV's are expected to be restricted as per the existing planning conditions, which roughly accord with the existing operating hours. Deliveries from vans are proposed to be unrestricted.

4.0 PLANNING POLICY AND ASSESSMENT GUIDANCE

Noise Policy Statement for England

- 4.1 The Noise Policy Statement for England (NPSE) was published in March 2010. The NPSE is the primary statement of noise policy for England and applies to all forms of noise other than occupational noise. The NPSE sets out the long-term vision of Government noise policy which is 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."

"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."*

- 4.2 The Explanatory Note to the NPSE introduces guidance to assist in defining the adverse impacts:

- **NOEL – No Observed Effect Level**

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

- **LOAEL – Lowest Observable Adverse Effect Level**

This is the level above which adverse effects on health and quality of life can be detected.

- **SOAEL – Significant Observed Adverse Effect Level**

This is the level above which significant adverse effects on health and quality of life occur.

- 4.3 These categories are further discussed in the Planning Practice Guidance section below.
- 4.4 The NPSE acknowledges that it is not possible to have a single objective noise level based measure that is mandatory and applicable to all sources of noise in all situations.

Planning Practice Guidance

- 4.5 The government's Planning Practice Guidance is a web based resource and provide advice on various issues, including noise (<https://www.gov.uk/guidance/noise--2>). The advice (March 2014, latest update July 2019) states in the context of considering when noise is relevant to planning, "noise needs to be considered when new development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)."
- 4.6 The Planning Practice Guidance pages also include more explanation of the effect level categories noted above, providing an explanatory Noise Exposure Hierarchy Table, which explores how actions such as a requirement for noise mitigation, or prevention of a development, might be assessed with respect to whether noise levels are considered above the category thresholds.

Planning Practice Guidance - Noise Exposure Hierarchy			
Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived 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 and/or attitude, 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.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, 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 and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

National Planning Policy Framework

- 4.7 The following paragraph is from the National Planning Policy Framework (NPPF). The NPPF was revised in December 2024.

"198. 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"

Local Authority Requirements

- 4.8 The site lies within the jurisdiction of Horsham District Council (HDC).
- 4.9 HDC's development plan for determining planning applications includes the "*Horsham District Planning Framework (excluding South Downs National Park)*" (adopted November 2015), which contains the following relevant policies:

"Policy 24

Strategic Policy: Environmental Protection

The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution and ensure that they:

- 1. Address land contamination by promoting the appropriate re-use of sites and requiring the delivery of appropriate remediation;*
- 2. Are appropriate to their location, taking account of ground conditions and land instability;*
- 3. Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevents contaminated run-off to surface water sewers;*
- 4. Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;*

5. Contribute to the implementation of local Air Quality Action Plans and do not conflict with its objectives;

6. Maintain or reduce the number of people exposed to poor air quality including odour. Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality; and

7. Ensure that the cumulative impact of all relevant committed developments is appropriately assessed."

"Policy 33

Development Principles

In order to conserve and enhance the natural and built environment developments shall be required to:

1. Make efficient use of land, and prioritise the use of previously developed land and buildings whilst respecting any constraints that exist;

2. Ensure that it is designed to avoid unacceptable harm to the amenity of occupiers/users of nearby property and land, for example through overlooking or noise, whilst having regard to the sensitivities of surrounding development;

..."

- 4.10 HDC's emerging Local Plan covers the period 2023-2040 and is currently under examination by the Secretary of State prior to formal adoption. Whilst the full document could not be obtained in writing this report, a summary of changes document has been. Policy 33 as indicated above is due to be incorporated into another Policy with relevant parts of the new Policy reproduced below:

"Strategic Policy 19: Development Quality

High-quality and inclusive design for all development in the District will be required based on a clear understanding of the local, physical, economic, environmental and policy context. In order to conserve and enhance the natural and built environment, and deliver beautiful and sustainable buildings and places, where relevant, development should be designed in accordance with the following principles:

...

3. Provides and retains a good standard of amenity for existing and future occupants of the proposed site. Proposals should avoid unacceptable harm to the amenity of existing and future occupiers or users of nearby property and land, for example due to overlooking, overdominance or overshadowing, light pollution, noise, odour and / or vibration and having regard to the sensitivities / impacts of surrounding development.

..."

BS 4142:2014 + A1:2019

- 4.1 BS 4142:2014 + A1:2019: "*Methods for Rating and Assessing Commercial and Industrial Sound*". This standard provides a rating and assessment methodology for assessing the potential adverse impact of commercial and commercial noise sources on neighbouring dwellings and is referenced in documents supporting the Government's planning practice guidance on noise.
- 4.2 The assessment procedure initially compares the '**Rating Level**' of the source with the '**Background Noise Level**' when the source is not present.
- 4.3 The '**Rating Level**' (L_{Ar}) referred to is the specific noise level of the noise source under investigation (in terms of the L_{Aeq} noise index), to which corrections are applied if the noise has certain audible characteristics. The table below summarises the corrections to be applied based on a subjective assessment of noise source characteristics.

BS4142 Character Corrections

Character Correction				
Feature / Perception	Tonality	Impulsivity	Intermittency	Other Acoustic Characteristics
Just perceptible	+2dB	+3dB	+3dB	+3dB
Clearly perceptible	+4dB	+6dB	When the specific sound has identifiable on/off conditions that are readily distinctive	
Highly perceptible	+6dB	+9dB		

- 4.4 The '**Background Noise Level**' (L_{A90}) represents the noise level that is exceeded for 90% of the stated measurement period. For assessment purposes, the background noise level needs to be determined without the noise source under investigation operating.
- 4.5 The time of operation needs to be taken into account. During the day (normally taken to be 07.00 to 23.00 hours) a one-hour measurement period is considered appropriate. During

the night (normally taken to be 23.00 – 07.00 hours) a 15-minute time period is normally used.

4.6 The following guidance is then offered based on the outcome of this initial assessment:

- *A difference 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.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context*

4.7 Aligning the above guidance with national planning policy objectives suggest that:

- An *assessment* level 10 dB(A) above the background level might be considered to be a "*Significant Observed Adverse Effect Level*" (SOAEL).
- An *assessment* level that does not exceed the background level might be considered to be a "*Lowest Observed Adverse Effect Level*" (LOAEL).

4.8 Notwithstanding the above, BS 4142 importantly notes that any initial estimate of a noise impact should be modified to account for its "context". Such considerations include:

- The absolute level of the sound - the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.
- Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating

level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

- The *character* and level of the residual sound compared to the character and level of the specific sound.
- The *sensitivity* of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

5.0 EXISTING NOISE ENVIRONMENT

- 5.1 In order to establish existing ambient noise levels characterising the site, an environmental noise survey was undertaken using automated monitoring equipment.
- 5.2 An automated environmental noise survey was undertaken from Thursday 16 July 2026 to Tuesday 21 July 2026 to allow the subjective characteristics of the existing ambient and background noise climate to be assessed.

Measurement Locations

- 5.3 Noise measurements were made at one location, as identified in Figure 5.1 and Table 5.1 below and overleaf.

Figure 5.1: Noise Monitoring Locations

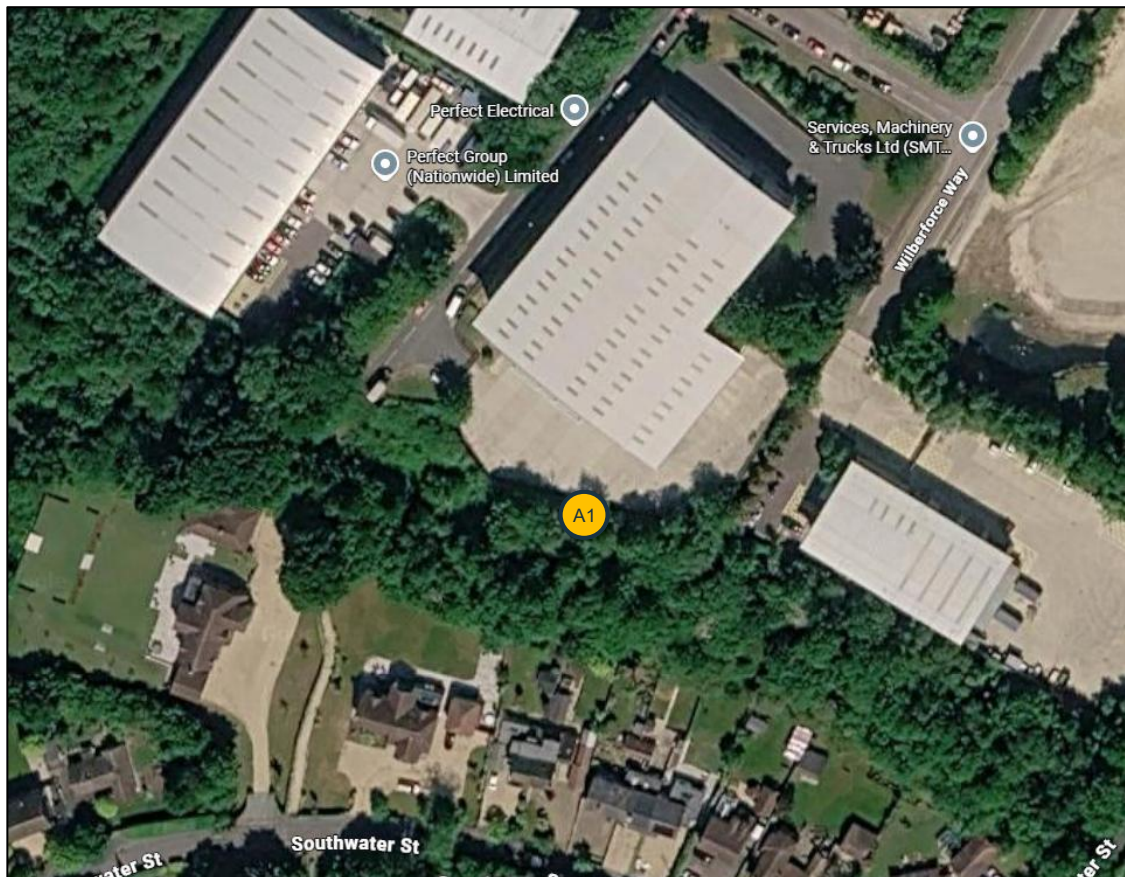


Table 5.1: Noise Monitoring Locations

Noise Monitoring Positions	
Position	Description
A1	Southern boundary of the site, approximately 0.5m above 2m high boundary fence.

Equipment

5.4 Details of the equipment use for the survey are summarised below:

Table 5.2: Measurement Instrumentation

Survey Equipment				
Location ID	Description	Manufacturer	Type	Serial Number
A1	Type 1 Sound Level Meter	Svante	971	133608
A1	Acoustic Calibrator	Svante	33B	125699

5.5 A calibration check on the sound level analyser was carried out prior to and on completion of the survey, with no significant calibration drift observed. Calibration certificates for the equipment are available upon request.

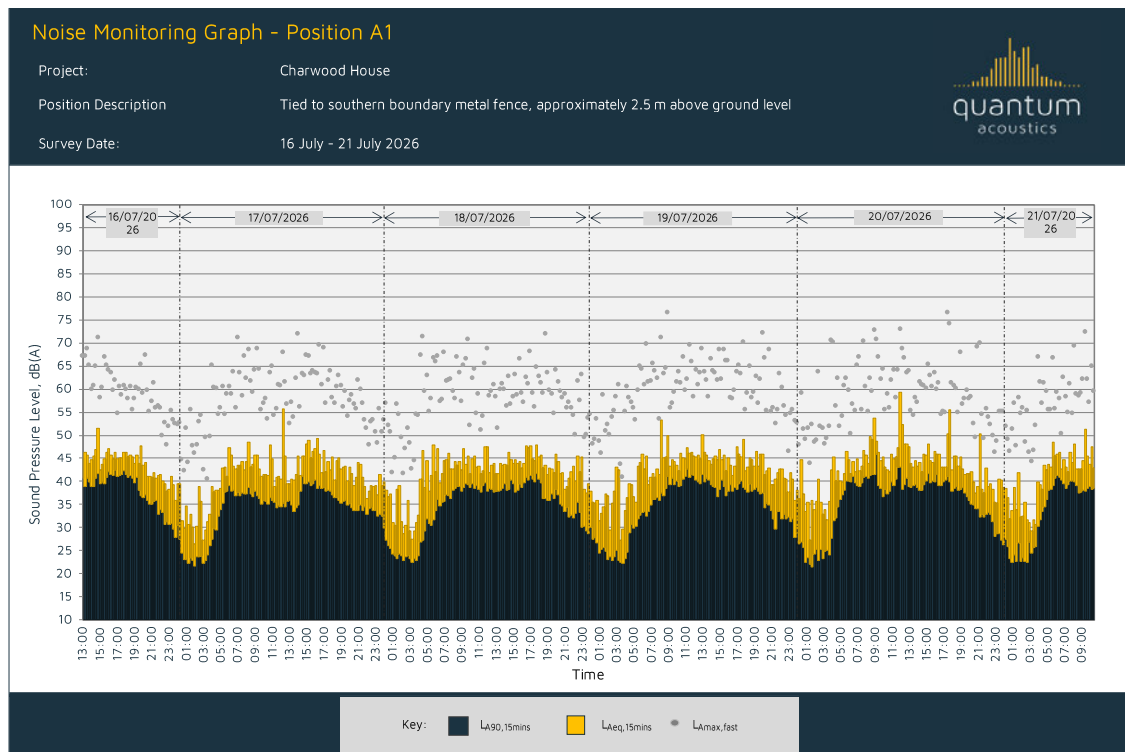
Measurement Procedure

5.6 The noise monitoring equipment was configured to record the $L_{A90,T}$, $L_{Aeq,T}$, and $L_{Amax,fast}$ sound pressure levels over consecutive 15-minute periods to provide a detailed time history profile showing fluctuations in noise levels. The equipment was also configured to undertake higher resolution logging (100ms) to assist with the identification of noise events.

Results

5.7 The results of the survey work are presented in Figure 5.2 overleaf.

Figure 5.2: Noise Monitoring Results: Position A1



Observations

- 5.8 During site attendance it was noted that noise levels across the site were dominated by wind through foliage, distant road traffic noise and occasional noise from passing aircraft.

Weather Conditions

- 5.9 Whilst weather conditions during the survey were not actively measured, weather conditions at the time of equipment installation / removal were dry with very light winds and no cloud cover. Publicly available historic weather data for the survey period indicated the following typical conditions.

16 July 2026	17 July 2026
Temperature: 16 to 28°C Pressure: 1018 – 1022 hPa Humidity range: 40 – 82% Average wind speed: 2.5 m/s Average wind direction: NE Precipitation: 0 mm	Temperature: 15 to 29°C Pressure: 1016 – 1017 hPa Humidity range: 40 – 84% Average wind speed: 1.0 m/s Average wind direction: N Precipitation: 0 mm
18 July 2026	19 July 2026
Temperature: 16 to 24°C Pressure: 1018 – 1021 hPa Humidity range: 42 – 91% Average wind speed: 1.5 m/s Average wind direction: NE Precipitation: 0 mm	Temperature: 13 to 23°C Pressure: 1023 – 1025 hPa Humidity range: 35 – 72% Average wind speed: 2.5 m/s Average wind direction: NE Precipitation: 0 mm
20 July 2026	21 July 2026
Temperature: 10 to 26°C Pressure: 1026 – 1027 hPa Humidity range: 34 – 74% Average wind speed: 1.5 m/s Average wind direction: N Precipitation: 0 mm	Temperature: 12 to 21°C Pressure: 1028 – 1029 hPa Humidity range: 58 – 83% Average wind speed: 1.5 m/s Average wind direction: NE Precipitation: 0 mm

Data Analysis

- 5.10 The following typical background noise levels have been determined from the measured dataset for the daytime (07.00 to 19.00 hours), evening (19.00 to 23.00 hours) and night-time (23.00 to 07.00 hours) periods.

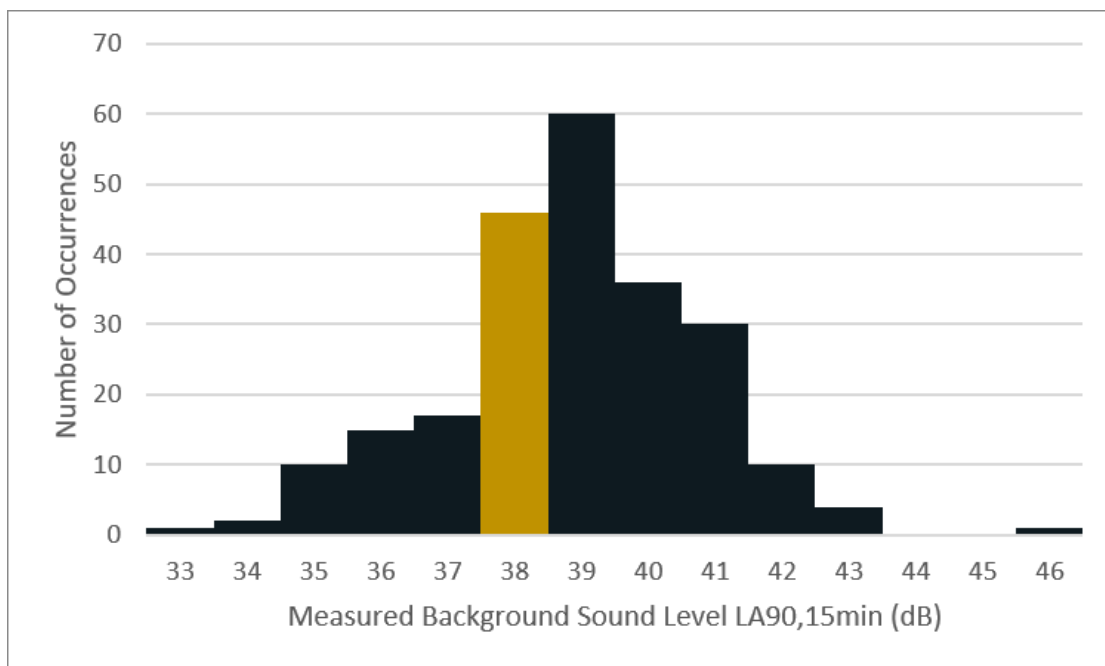
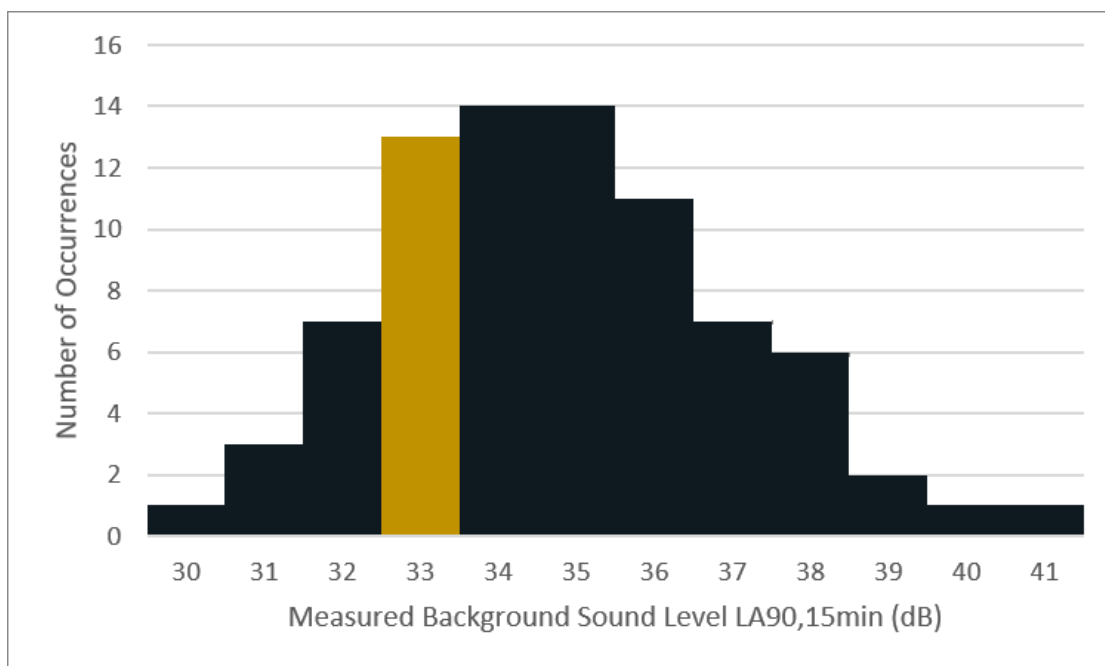
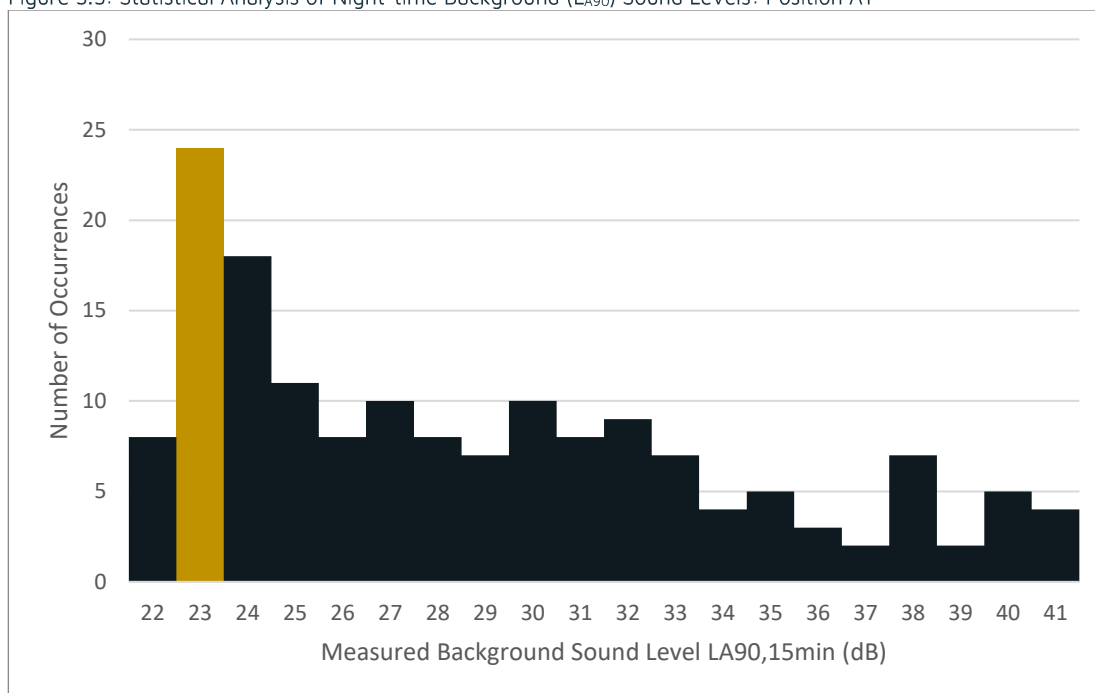
Figure 5.3: Statistical Analysis of Daytime Background (L_{A90}) Sound Levels: Position A1Figure 5.4: Statistical Analysis of Evening Background (L_{A90}) Sound Levels: Position A1

Figure 5.5: Statistical Analysis of Night-time Background (L_{A90}) Sound Levels: Position A1

Ambient and Background Sound Levels

- 5.11 The ambient and background sound levels obtained from the survey are presented in Table 5.3 below.

Table 5.3: Ambient and Background Sound Levels Determined from Noise Monitoring

Location	Time Period	Ambient Noise Level $L_{Aeq,T}$ (dB)	Background Sound Level $L_{A90,T}$ (dB)
A1	Daytime (07.00 – 19.00 hours)	46	38
	Evening (19.00 – 23.00 hours)	43	33
	Night-time (23.00 – 19.00 hours)	40	23

6.0 ACTIVITY NOISE IMPACT ASSESSMENT

Activity Noise Level (Internal)

- 6.1 Operational noise levels within the future building will be similar to the existing operations of Chess Dynamics. Quantum Acoustics have measured noise levels at the existing premises and it is clear that noise levels will be significantly below the lower exposure limit of 80 dB $L_{AEP,d}$ as prescribed in the 'The Control of Noise at Work Regulations 2005' to protect employees working within the building from the risk of noise induced hearing loss. The highest noise levels came from the vibration table and associated generator, at between 80 dB and 85 dB L_{Aeq} , however as long as these are well positioned and in an enclosed room then this is not expected to significantly contribute to the overall noise levels within the premises, which were generally approximately 65 dB L_{Aeq} to 75 dB L_{Aeq} .
- 6.2 The external envelope of the proposed units comprises insulated cladding and roller shutter doors located on façades facing the residential properties. The storage areas, which open onto the delivery yard, are located separately from the main assembly areas, with additional partitions and roller doors in between. As such, noise breakout from internal activities is not considered to be an issue.

Activity Noise Level (External)

- 6.3 The external activities associated with the unit will be dominated by Heavy Goods Vehicles (HGVs) and Lights Goods Vehicles (LGVs) arriving and departing and the loading/unloading of the vehicles.
- 6.4 Source noise levels for the HGV and LGV movements and unloading has been extracted from "in- house" database for typical loading activities at approximately 5m, as summarised in the table below:

Table 6.1: Typical Loading Activities Noise Data

Activity	Approximate Duration of Activity (seconds)	Measured Noise Level $L_{Aeq,T}$ @ approximately 5m
HGV Operations		
HGV entering service yard	15s	71
Lorry reversing to within 3m of loading bay + air brake	30s	70
Driver exiting cab, opening trailer doors	60s	66
Driver returning to cab, reversing onto loading dock, air brake, engine off	30s	70
Operation of dock leveller	15s	59
Loading/unloading activity	2400s	66
Driver returning to cab, engine starting, HGV pulling forward, air brake, closing doors	60s	70
HGV departing service yard	20s	70
LGV/Van Operations		
LGV entering service yard	15s	70
Van reversing to loading bay	20s	69
Driver exiting cab, opening doors	60s	66
Loading/unloading activity (handballing)	1200s	60
Driver returning to cab, engine starting, LGV pulling forward, brake, closing doors	60s	69
LGV departing service yard	20s	69

- 6.5 The fork lift in use at the current Chess Dynamics facility is an electric powered forklift. As identified in Table 3.1 above, Quantum Acoustics have measured the noise level from the forklift to be 70 dB L_{Aeq} at approximately 5m. It is noted that the forklift measured by Quantum Acoustics was in an internal location and therefore it can be safely assumed that externally this will approximately match the loading/unloading activity noise level presented of 66 dB L_{Aeq} at 5m in Table 6.1 above.
- 6.6 The data provided by Chess Dynamics indicate a total of 15 vans and up to 3 HGVs per day.

6.7 The BS 4142 assessment methodology utilises a 1-hour assessment period for the daytime.

- Worst-case of 2 LGV movements and 1 HGV movement per hour during the daytime (07:00 hours – 19:00 hours) and it is assumed that the lorries would be loaded or unloaded again within the hour.
 - Accordingly, this would be a total of approximately 4 minutes manoeuvring and 40 minutes loading of LGVs per hour.
 - Additionally, there would be 2 minutes of manoeuvring and 40 minutes loading of HGVs per hour.
- During the evening period (19:00 hours – 23:00 hours), there would be a worst-case of 1 LGV movement within an hour.
 - Accordingly, this would be a total of 2 minutes of manoeuvring and 20 minutes loading of LGVs per hour.

6.8 At night, no HGV's or LGV's would be expected in accordance with current operating procedures and the existing Planning Condition at Charwood House as detailed at Paragraph 3.4 of this report.

6.9 Using the above information, the receptor noise levels have been predicted to the nearest receptor on Southwater Steet at approximately 60m, in general accordance with ISO 9613-2: 1996 "Acoustics. Attenuation of Sound During Propagation Outdoors – General Method of Calculation". The assessment noise levels from each activity are identified in Tables 6.2 and 6.3 below for the daytime and evening periods respectively.

Table 6.2: Predicted Receptor Loading Activities Noise Level – Daytime

Receptor	Activity	Measured Noise Level @ 5m (dB)	Daytime 07:00 – 19:00	
			% on-time	Predicted Receptor Noise Level $L_{Aeq,1hr}$ (dB)
Southwater Street	HGV Manoeuvring	70	3%	31
	HGV Loading/ Unloading Activities	66	67%	41
	LGV Manoeuvring	69	7%	34
	LGV Loading/ Unloading Activities	60	67%	35
	Total	-	-	43

Table 6.3: Predicted Receptor Loading Activities Noise Level – Evening

Receptor	Activity	Measured Noise Level @ 5m (dB)	Evening 19:00 – 23:00	
			% on-time	Predicted Receptor Noise Level $L_{Aeq,1hr}$ (dB)
Southwater Street	HGV Manoeuvring	70	-	-
	HGV Loading/ Unloading Activities	66	-	-
	LGV Manoeuvring	69	7%	34
	LGV Loading/ Unloading Activities	60	33%	32
	Total	-	-	36

6.10 The activity noise level predictions have been assessed in accordance with BS4142:2014+A1:2019, and this is presented in the table below.

Table 6.4: Activity Noise Impact Assessment

Parameter	Daytime (07:00-19:00)	Evening (19:00-23:00)
Ambient Noise Level, $L_{Aeq,15min}$ dB	46	43
Predicted Specific Noise Level, $L_{Aeq,T}$ dB	43	36
Character Correction, dB	+3	+3
Predicted Rating Noise Level, $L_{Ar,1hour}$ dB	46	39
Typical Background Noise Level, $L_{A90,15mins}$ dB	38	33
Excess of Rating Level Over Background Level	+8	+6
Initial Assessment Conclusion	Between an <i>adverse impact</i> and a <i>significant adverse impact</i>	Potential <i>adverse impact</i>

- 6.11 Table 6.4 above indicates that the activity noise from the proposed activities are significantly above the prevailing background noise level at the nearest noise sensitive receptors during the proposed operational hours.
- 6.12 In addition to the above and as noted in BS 4142, it is important to note any initial assessment of the impact of plant noise should be modified for context.
- 6.13 The proposed activities will take place on the edge of an industrial area facing towards a quiet residential area with limited screening between the activities and receptors. The wooded area between the activities and the receptors would not be expected to give significant reduction and cannot be relied upon. Additionally, the activity area is raised from the level of the residential area and therefore the existing boundary fences cannot be relied upon to provide any significant mitigation.
- 6.14 It is noted that the predicted noise levels are around the prevailing ambient sound level during the daytime and below the ambient sound level during the evening.
- 6.15 Despite there not being any proposed activities involving large vehicles at night, there is the potential for deliveries around 07:00 hours and into the evening when people are trying to relax.

Discussion

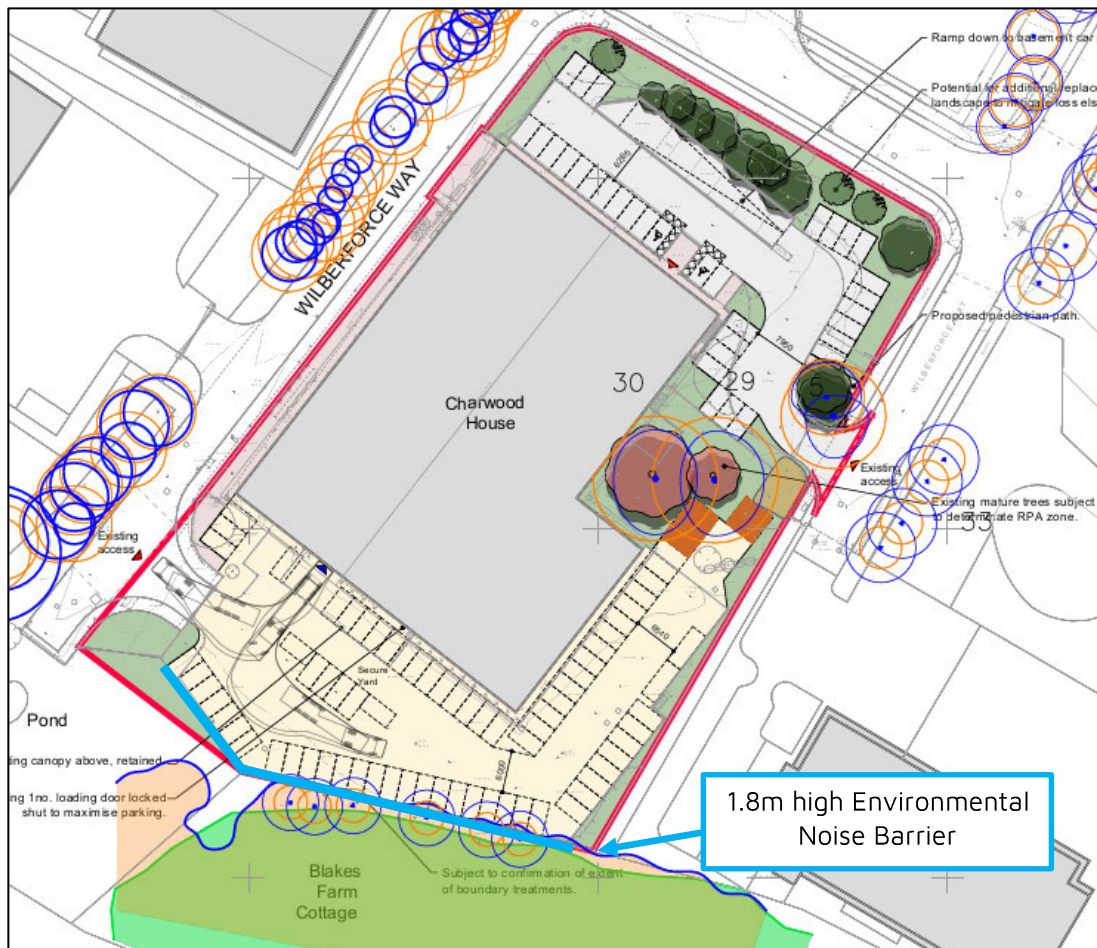
- 6.16 In consideration of the context of the noise source, the proposed activities have the potential to cause adverse impacts on the health or quality of life of the nearest noise sensitive receptors, potentially verging towards a significant adverse impact for the worst-affected receptors during busier times.

Mitigation

- 6.17 In order to protect the residents to the south of the site, it is proposed to install a 1.8m high environmental noise barrier to the southern boundary of the rear yard of the activity area. This can be in place of, or in addition to, the existing metal palisade fence along that boundary. The environmental noise barrier must:
- Be of a solid construction, with no gaps.
 - Be reasonably thick and solid with a very minimum density of 10 kg/m².

6.18 The proposed location and extent of the barrier is shown in Figure 6.1 overleaf:

Figure 6.1: Location and Extent of Proposed Noise Barrier



6.19 The installation of the proposed noise barrier would reduce activity noise levels by approximately 10 dB – 15 dB, which will reduce activity noise levels to below the background sound level and therefore to below a *low impact* at the nearest noise sensitive receptor.

6.20 Accordingly, the introduction of the noise barrier would reduce noise levels sufficiently that residents of neighbouring properties would be protected from adverse impacts from activity noise in accordance with existing and emerging national and local policy.

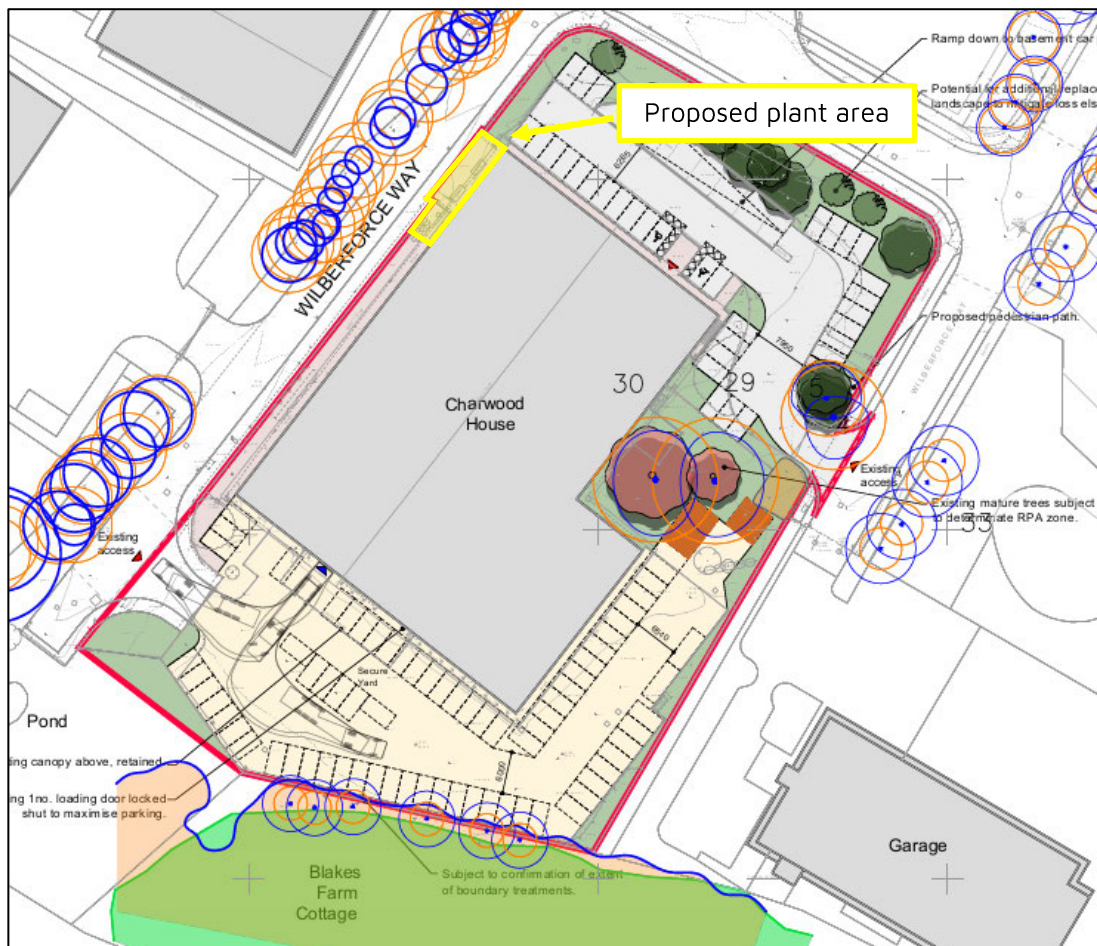
7.0 PLANT NOISE LEVELS

7.1 The proposed fixed plant at the site are noted on the site layout plan as:

- 1No. Air Compressor;
- 1No. Condenser Unit; and
- 1No. Vibration Cooler.

7.2 The units will be located to the west of Charwood House in a ground floor level external plant area adjacent to Wilberforce Way. The location of the units is shown in Figure 7.1 below.

Figure 7.1: External Plant Area



7.3 The nearest noise sensitive receptor is on Southwater Street at a distance of approximately 125m.

- 7.4 One of the units is an existing item of plant which will be relocated from the current facility to the new facility and serves the thermal chambers. Quantum Acoustics have measurement the noise level from this unit to be 71 dB $L_{Aeq,30s}$ at 1m from the front of the unit.
- 7.5 The other two plant items will be new are presently unselected and therefore Quantum Acoustics will determine maximum allowable noise levels from these units based on the assessment of the air compressor in isolation.

Thermal Chambers Plant Noise Calculated Sound Levels

- 7.6 Noise emissions to all receptor locations previously identified have been calculated based on the noise data set out in section 3, in general accordance with ISO 9613-2: 2023 "Acoustics Attenuation of Sound During Propagation Outdoor – General Method of Calculation". Summary calculations are shown in Table 7.1 below.

Table 7.1: Thermal Chambers Plant Noise Summary Calculations

Calculation Step	Southwater Street
Source Noise Level, $L_{Aeq,15min}$ @1m	71
Measurement Distance from Plant (m)	1
On-time Correction	0
Directivity Correction, D_c	0
Receptor Distance from Plant (m)	125
Geometric Divergence, A_{div} dB	-42
Ground Attenuation, A_{gr}	0
Barrier Attenuation, A_{bar} (proposed mitigation for activity noise)	-10
Miscellaneous Attenuation, A_{misc}	0
Reflections	0
L_p @ Receptor	19
Calculated Sound Level at Receptor	19 dB(A)

BS 4142 Assessment

- 7.7 As noted earlier, BS 4142 requires the application of a "Penalty Correction" to account for any characteristics exhibited by the plant which may serve to attract attention (e.g. tonality, impulsivity, intermittency, etc.). Such corrections need to be judged based on the likely prominence of any characteristics, as experienced at the receptor location.
- 7.8 In this instance, the noise from the plant unit does not contain any tonal features but has a potentially low frequency "hum". In line with Section 9.2 of BS 4142, this would attract a character correction of +3 dB.
- 7.9 The initial assessment of impact in accordance with BS 4142 is set out in Table 7.2 below during the proposed opening hours, which Quantum Acoustics has expanded to include the entire daytime period (07:00 hours – 19:00 hours) for the purposes of assessment.

Table 7.2: Assessment Summary Results – Thermal Chambers Plant Unit

Results at Receptor Location	Southwater Street
Calculated Plant Noise Level	19
Acoustic Character correction	+3
Rating level	22
Background sound level	38
Excess of rating level over background sound level	-16

- 7.10 The above tables indicates that noise levels from the existing plant would be more than 10 dB below the background sound level during the daytime and therefore would not be audible at the nearest noise sensitive receptor.
- 7.11 Accordingly, the installation of the existing thermal chambers plant will be sufficiently low that residents of neighbouring properties would be protected from adverse impacts from activity noise in accordance with existing and emerging national and local policy.

Maximum Plant Noise Levels

- 7.12 For the remaining items of plant, the maximum noise level has been derived taking into account the BS 4142:2014 + A1:2019 methodologies and is presented in Table 7.3 below. The assumed criteria for plant items is to be inaudible at the nearest noise sensitive receptor and therefore at least 10 dB below the prevailing background sound level.

Table 7.3: Maximum Plant Noise Levels

Results at Receptor Location	Southwater Street
Background Sound Level	38
Required difference between background sound level and rating level	-10
Maximum Rating Level (all three plant units)	28
Rating Level (Thermal Chamber Plant)	22
Maximum Rating Level (remaining two plant units)	27

- 7.13 It is important to note that the maximum rating level of 27 dB L_{Ar} is for the combined level of the two additional units.
- 7.14 The simplest way to achieve the criterion is for each plant unit could produce a rating level of 24 dB L_{Ar} , with other combinations acceptable to ensure that the maximum rating level from both units does not exceed the 27 dB L_{Ar} criterion at the nearest noise sensitive receptor.
- 7.15 24 dB L_{Ar} at the nearest noise sensitive receptor is equal to a sound power level of 74 dB L_{Aw} from the plant item.
- 7.16 A planning condition to achieve the derived criteria in Table 7.3 can be attached to any planning permission with a requirement for the Council to review any plant selections or plant noise assessment following final selection of plant equipment. This would ensure that the Council retains full control of noise emanating from the facility.

8.0 CUMULATIVE NOISE LEVELS

- 8.1 There will be no significant cumulative noise impact from fixed plant and delivery operations due the fact that noise levels have been set for the fixed plant to be inaudible and therefore 10 dB or more below the background noise level.
- 8.2 Whilst delivery noise may be just audible on occasion having been predicted to be just below the background noise level, it would be intermittent and at a low level and therefore have no effect on the overall ambient noise climate.

9.0 CONCLUSIONS

- 9.1 Quantum Acoustics has undertaken an environmental noise survey to establish the prevailing baseline noise climate around the site.
- 9.2 Additionally, Quantum Acoustics have carried out noise measurements of existing operations and fixed plant.
- 9.3 Operational noise would be dominated by delivery noise and an assessment has been carried out of this using the on-site noise measurements and our library data of similar delivery operations. The assessment has concluded that adverse impacts should be avoided at the nearest noise sensitive receptor, subject to the installation of a 1.8m high environmental noise barrier along the southern boundary of the site.
- 9.4 An assessment of fixed plant noise from the plant that will be transferred to the new operations site has been carried out and no noise impact would be expected at the nearest noise sensitive receptor.
- 9.5 The results of the plant noise assessment have enabled maximum plant noise levels to be determined for new plant which will be installed as part of the transfer of operations but has not yet been selected.
- 9.6 The assessment demonstrates that the predicted operational noise levels associated with the proposed activities and plant comply with the derived noise emission criteria and are therefore not expected to give rise to any significant adverse noise effects.
- 9.7 On the basis of the findings of this assessment, the proposed plant is considered acoustically acceptable in respect of existing and emerging national and local planning policy. Accordingly, in terms of noise impact, there are no acoustic reasons why planning permission should be refused.



www.quantumacoustics.co.uk

+44 (0)203 376 7000

hello@quantumacoustics.co.uk

London Office: 141 Lower Marsh, London SE1 7AE

Southern Office: Ash House, Tanshire Park, Elstead, Surrey GU8 6LB

Northern Office: Peter House, Oxford Street, Manchester M1 5AN