

Noise Impact Assessment Report for S73 Application

Achilles Therapeutics UK Limited, Hayes180

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Appendix A – Acoustic Terminology



1.0 Introduction

Hann Tucker have been commissioned by Achilles Therapeutics UK Ltd to prepare a Noise Impact Assessment to support a S73 application.

Planning permission was granted in November 2020 under application ref. 75918/APP/2020/3171 for the following:

“Installation of mezzanines, external plant compounds, external changes to elevations and associated works”.

Since securing planning permission, Achilles have been progressing the detailed design of Unit B and a number of design changes to the extant scheme are required for operational purposes. This includes the relocation of the electrical switch room inside the plant building and proposes relocating the approved generators and substations in the service yard.

This Noise Impact Assessment has been prepared to provide details of the proposed items of plant and assesses these against the requirements of the Local Authority based on the Environmental Noise Survey Report (ref. 28132/PNA1) that was approved under application ref. 75918/APP/2020/3171.

2.0 Objectives

To review the previous environmental noise survey report and plant assessment relative to the proposed plant (to include both cooling plant and generators).

To assess the noise emissions from the proposed plant and comment upon the acceptability.

To advise on noise control measures if required, with reference to the requirements of the Local Authority.

3.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

4.0 Criteria

In our Environmental Noise Survey and Plant Noise Assessment Report dated 23 October



2020, we proposed that the following noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential premises.

Noise Emission Limit (dBA)	
Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
41	36

The above criteria are to be achieved with all of the proposed plant operating simultaneously.

5.0 Plant Noise Impact Assessment

The following plant has been selected for this project: -

- 3No. Chillers (Aptus XL CGAF 180 SE SN). Fully hermetic-rotary scroll compressor. The XL reference is the Extra Low noise version of this chiller.
- 2No. Generators (F G Wilson, 1850kVA/400V/75DBA Emergency Standby Rated). Emergency back-up Only

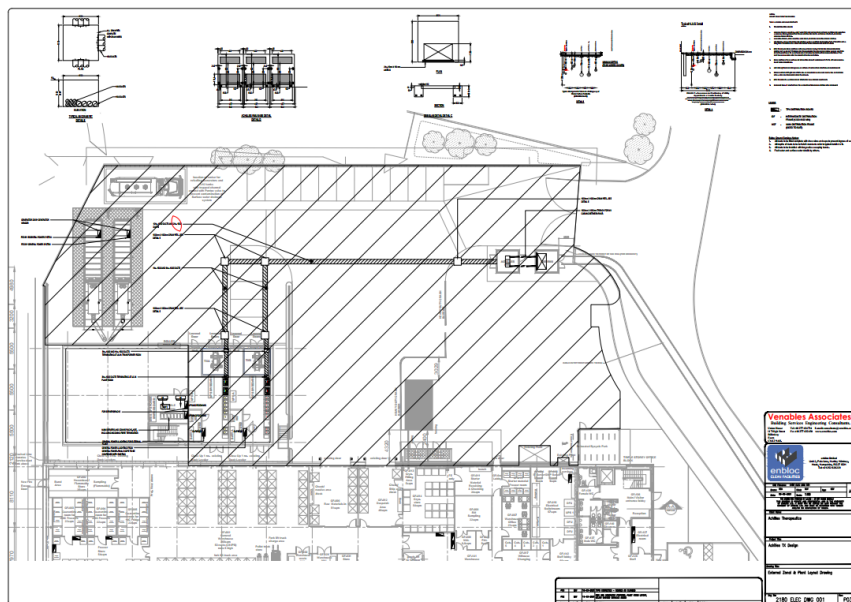
5.1 Plant Noise Data

The manufacturer's noise data for the equipment is as follows:

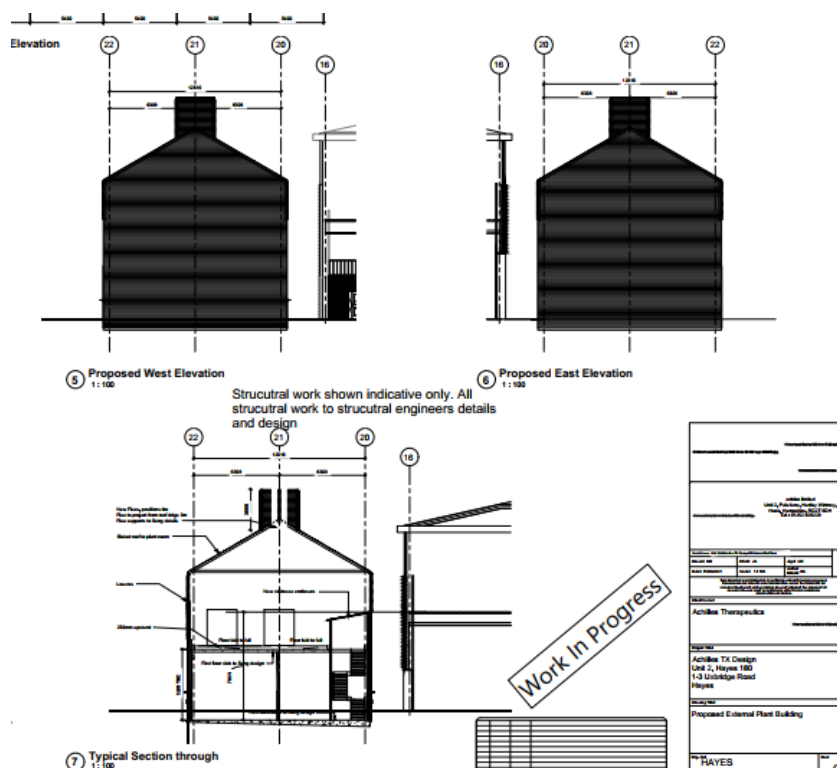
Plant Description	Sound pressure level
Each Chiller	65 dBA at 10m
Each Generator	75 dBA at 1 m

5.2 Location of Plant

The location of plant is indicated in the plan below. The chillers will be located in a louvered plant room and the generators will be located in front of this plant room.



Plan showing plant locations (screenshot of drawing No. 2180 ELEC DWG 001 by Enbloc Limited)



Elevation and Section of plant room (screenshot of drawing No. HAYES 180-HVAC-DWG-SKxx by Enbloc Limited)

5.3 Mitigation Measures

Caice SS300 Acoustic Louvre with the following transmission loss will be installed around the



chiller:

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Transmission Loss (dB)	5	6	9	14	20	20	20	20



Caice SS300 Acoustic Louvre data sheet

5.4 Plant Noise Impact Assessment

The proposed chillers will be operational during daytime and night-time hours. The following table summarises our predictions of atmospheric noise emissions from the plant to the nearest noise sensitive residential window located at Bankside.



	Sound Pressure Level (dB re 2x10 ⁻⁵ Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Sound Pressure Level at 10m*	67	66	65	63	61	55	47	41	
Correction for 3No.	+5	+5	+5	+5	+5	+5	+5	+5	
Acoustic Louvre Insertion Loss	-5	-6	-9	-14	-20	-20	-20	-20	
Distance Correction	-24	-24	-24	-24	-24	-24	-24	-24	
Façade Reflection	+3	+3	+3	+3	+3	+3	+3	+3	
Calculated Noise Level at Receptor	45	44	40	33	25	19	11	5	35

* only dBA data is available, the octave band data is estimated based on similar product

Our calculations indicate that the proposed plant, in conjunction with the proposed mitigation measures, will be capable of achieving the requirements of the Local Authority outlined in Section 4.0.

5.5 Emergency Generators

The generators will only run in the event of a mains power failure or when being tested 1 hour every week.

The following table summarises our predictions of atmospheric noise emissions from the generators to the nearest noise sensitive residential window.

	Sound Level (dBA)	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Cumulative Sound Pressure Level at 1m from 2No. Generators	78	78
Distance Correction	-45	-45
Façade Reflection	+3	+3
Calculated Noise Level at Receptor	36	36

Our calculations indicate that the proposed plant will be capable of achieving the requirements of the Local Authority.

When the generators are tested (only during daytime), the following table summarises our predictions of atmospheric noise emissions from the generators and the chillers.



	Sound Level (dBA)
	Daytime (07:00 – 23:00 hours)
Calculated Noise Level at Receptor from generators when testing	36
Calculated Noise Level at Receptor from chillers	35
Cumulative noise level at receptor	39

Our calculations indicate that the proposed plant will be capable of achieving the requirements of the Local Authority.

6.0 Conclusions

An environmental noise survey has been previously undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive window.

The assessment indicates that the proposed plant, in conjunction with the proposed attenuation will be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential window.

Appendix A

The acoustic terms used in this report are defined as follows:

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. $30\text{dB} + 30\text{dB} = 33\text{dB}$, not 60dB).
dBA	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.
$L_{90,T}$	L_{90} is the noise level exceeded for 90% of the period T (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.
$L_{eq,T}$	$L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, T .
L_{max}	L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.
L_p	Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).
L_w	Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).