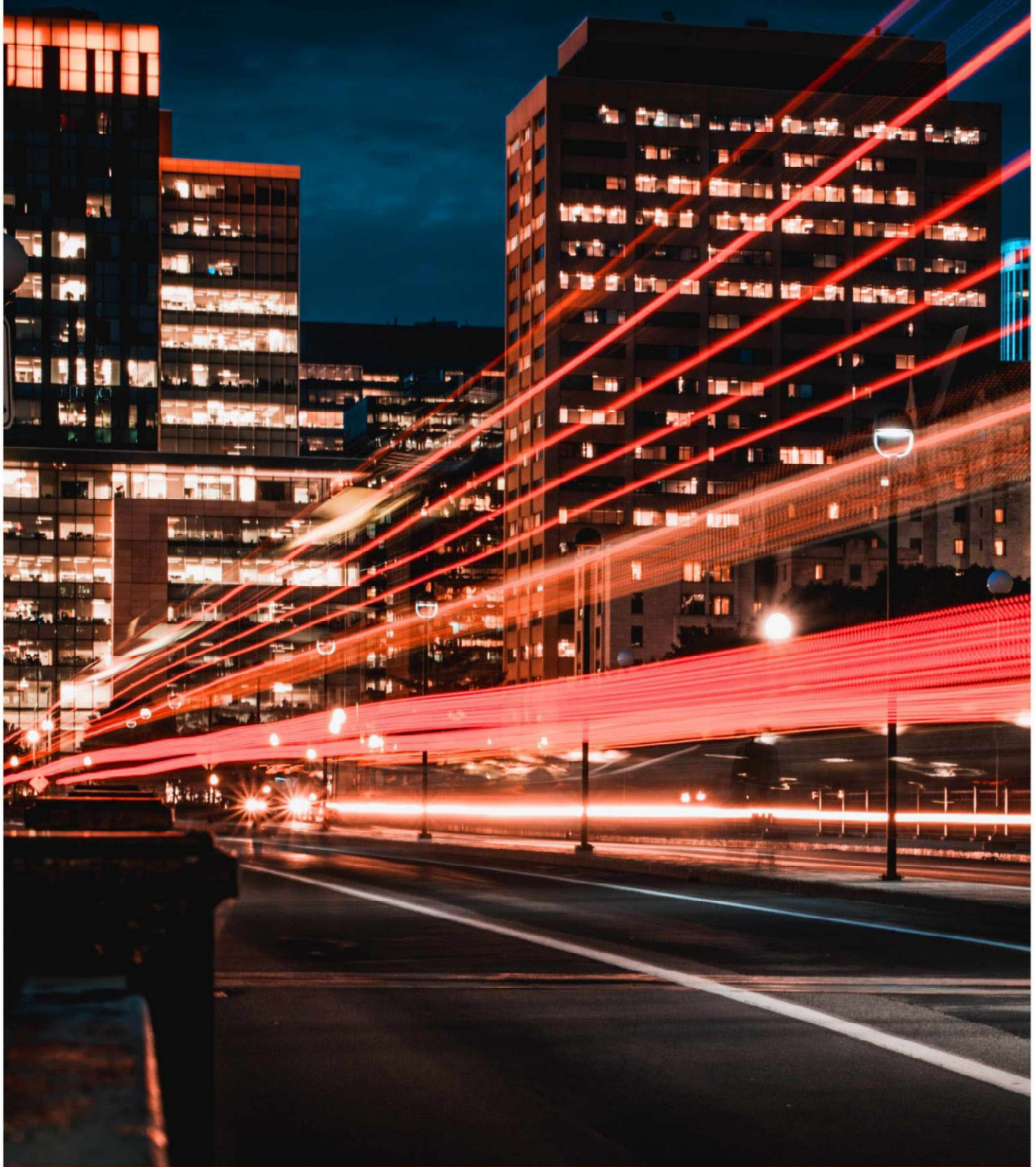




PREPARED: Friday, 30 August 2024

TFP WESSEX, SO30 2UN PLANNING CONDITION DISCHARGE REPORT

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LIST OF ATTACHMENTS

AS13698/SP1 Indicative Site Plan

APPENDIX A Acoustic Terminology

APPENDIX B Acoustic Calculations

Project Ref:	AS13698	Title:	TFP Wessex, SO30 2UN
Report Ref:	AS13698.240829.PCR	Title:	Planning Condition Discharge Report
Client Name:	The Construction Consultants		
Project Manager:	Ben Dymock		
Report Author:	Ben Dymock		
Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 INTRODUCTION

- 1.1 Planning approval is sought for the installation of replacement building services plant and an emergency generator to serve Unit 9 Berrywood Business Village, Tollbar Way, Southampton, SO30 2UN.
- 1.2 Clarke Saunders Acoustics has been commissioned by The Construction Consultants to conduct a sound assessment of the plant in accordance with planning conditions set by Eastleigh Borough Council (EBC).
- 1.3 This report describes the assessment undertaken, including calculations, and its findings.
- 1.4 A glossary relevant to the terminology used in this report is presented in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 New building services plant will be installed externally within a rear service yard of the Business Village at ground floor level. Four condensing units, an air handling unit (AHU) and an emergency generator are intended to serve Unit 9 of the Business Village. The condensing units and AHU are proposed to operate during office hours only (08:00 to 18:00 hrs) whilst the emergency generator is proposed to only operate in the event of a total power failure. In this scenario, the generator will operate continuously until power is restored.
- 2.2 The Site is located in Berrywood Business Village, Tollbar Way, Southampton, SO30 2UN. The closest noise sensitive receptors have been identified as a Farmhouse approximately 100m to the north of the plant location and houses on the north side of Moorgreen Road, approximately 300m to the north-west of the plant location. While there are residential receptors to the east, these will benefit from significant building screening from the Business Village itself and have, therefore, not been considered within this assessment.
- 2.3 The areas discussed above are presented in the attached site plan ASI3698/SP1.

3.0 LOCAL AUTHORITY REQUIREMENTS

- 3.1 Planning Condition 4 of decision notice dated Thursday 1 February 2024 in reference to Application No. F/23/96317 states the following:
Any fixed plant or machinery used on site shall be provided with suitable acoustic attenuation, or sited at agreed locations, to mitigate the effects of noise as approved in writing by the local planning authority.
Reason: To protect the amenities from noise
- 3.2 Following correspondence with EBC, it is understood that to satisfy the requirements of the condition, noise emissions from the plant should comply with EBCs general requirements of less than $L_{Aeq,T}$ 35 dBA at night and $L_{Aeq,T}$ 45 dBA during the day.
- 3.3 EBC have indicated that no fixed criterion would be set for the emergency generator in light of its intermittent use i.e. in the event of a total power failure. A contextual discussion on the likelihood and regularity of impact has been discussed below.

4.0 PREDICTED SOUND IMPACT

4.1 PROPOSED PLANT

4.1.1 The proposed plant will be located at ground floor level to the rear of the Business Village as depicted on the attached site plan.

4.1.2 The selected plant to be installed has been confirmed as follows:

- 1no. Envistar Flex AHU;
- 1no. PURY-P400YNW-A2 condensing unit;
- 1no. PUZ-ZM60VHA2 condensing unit;
- 2no. PUZ-ZM250YKA condensing unit; and
- 1no. GRUPEL 30 GENSET 30 kVA generator.

4.1.3 Sound levels for each unit have been confirmed by the manufacturer and are presented in Table 1.

PLANT ITEM	Lp/Lw	63	125	250	500	1K	2K	4K	8K	dBA
Envistar AHU Breakout	L _w	69	79	61	53	47	45	42	32	63
Envistar AHU Intake	L _w	66	80	73	67	65	60	56	50	71
Envistar AHU exhaust	L _w	67	78	73	74	71	68	65	59	76
PURY-P400YNW-A2	L _p @ 1m	74	64	66	64	59	55	49	45	65
PUZ-ZM60VHA2	L _p @ 1m	53	52	53	44	43	39	34	27	49
PUZ-ZM250YKA	L _p @ 1m	72	62	61	60	56	53	49	43	62
GRUPEL Generator	L _p @ 1m	*	*	*	*	*	*	*	*	79

Table 1: Source plant sound data

*Sound spectra is not available for this unit.

4.2 PREDICTED SOUND LEVELS AT RESIDENTIAL RECEPTORS

4.2.1 The overall prediction to the nearest residential premises is presented in Table 2.

PLANT	RECEPTOR	PREDICTED SOUND PRESSURE LEVEL	CRITERION
AHU & Condensing plant items	Farmhouse	32 dBA	Day: 45 dBA Night: 35 dBA
Generator		40 dBA	

Table 2: Predicted sound levels at the nearest receptor

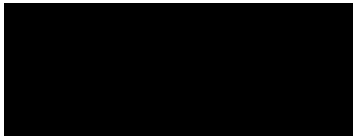
4.2.2 Calculations indicate that EBC requirements can be met by AHU and condensing unit plant during both day and night-time periods when assessed with only the acoustic losses associated with distance propagation applied.

4.2.3 Noise from the generator is expected to exceed the night-time requirement for fixed plant, however, as this plant will only operate in the event of a total power failure, any temporary impact on nearby residential receptors would be expected to be low.

4.2.4 A summary of the calculations is presented in Appendix B.

5.0 CONCLUSIONS

- 5.1 A sound assessment has been undertaken by Clarke Saunders Acoustics for the installation of new building services plant to serve Unit 9 Berrywood Business Village, Tollbar Way, Southampton, SO30 2UN.
- 5.2 Data for the proposed units has been used to predict the sound impact of the new plant on nearby sensitive receptors.
- 5.3 Compliance with the requirements of Eastleigh Borough Council have been demonstrated and no further mitigation is required on this basis.
- 5.4 Impact during emergency operation has been considered. The results of the calculations indicate a low impact for residential receptors.



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Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

APPENDIX A

ACOUSTIC TERMINOLOGY AND HUMAN RESPONSE TO BROADBAND SOUND

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

APPENDIX B
AS13698 TFP Wessex, SO30 2UN
PLANT SOUND CALCULATIONS

Plant sound to Farm House		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
<u>AHU</u>										
Envistar Flex AHU Break Out	LwA	69	79	61	53	47	45	42	32	64
Lw to Lp @ 1m	Q = 2	-8	-8	-8	-8	-8	-8	-8	-8	
Attenuation Loss	none	0	0	0	0	0	0	0	0	
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	
Subtotal		22	32	14	6	0	-2	-5	-15	17
Exhaust	LwA	67	78	73	74	71	68	65	59	76
Lw to Lp @ 1m	Q = 2	-8	-8	-8	-8	-8	-8	-8	-8	-8
Attenuation Loss	none	0	0	0	0	0	0	0	0	
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	-39
Subtotal		20	31	26	27	24	21	18	12	29
Intake	LwA	66	80	73	67	65	60	56	50	71
Lw to Lp @ 1m	Q = 2	-8	-8	-8	-8	-8	-8	-8	-8	-8
Attenuation Loss	none	0	0	0	0	0	0	0	0	
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	-39
Subtotal		19	33	26	20	18	13	9	3	24
<u>Condensers</u>										
PURY-P400YNW-A2	Lp @ 1m	74	64	66	64	59	55	49	45	65
Number of	1no	0	0	0	0	0	0	0	0	0
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	-39
Subtotal		35	25	27	25	20	16	10	6	26
PUZ-ZM60VHA2	Lp @ 1m	53	52	53	44	43	39	34	27	49
Number of	1no	0	0	0	0	0	0	0	0	0
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	-39
Subtotal		14	13	14	5	4	0	-5	-12	10
PUZ-ZM250YKA	Lp @ 1m	72	62	61	60	56	53	49	43	62
Number of	2no	3	3	3	3	3	3	3	3	3
Distance Loss	90m	-39	-39	-39	-39	-39	-39	-39	-39	-39
Subtotal		36	26	25	24	20	17	13	7	26
Specific sound level at recep	L_{eq} 1hr	39	37	32	31	27	24	20	14	33

Plant sound to Farm House		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
<u>Generator</u>										
GRUPEL 30 GENSET 30 kVA	Lp @ 1m									79
Distance Loss	90m									-39
Specific sound level at recep	L_{eq} 1hr									40

Conditioned Day Time Target
Conditioned Night Time Target

L_{Aeq,T} **45**
L_{Aeq,T} **35**