REPORT TITLE:

The Mannings, Shoreham-By-Sea

Noise Impact Assessment, Planning Condition 16

CLIENT DETAILS:

Real Places Ltd

DATE:

19th November 2021

REPORT REFERENCE:

PC-21-0006-RP1

PREPARED BY:

Joan-Carles Blanco BSc.(Hons) MIOA

CHECKED/AUTHORISED BY:

Martin Jones BSc.(Hons) MIOA

Pace Consult Ltd, 652 The Crescent, Colchester Business Park, Colchester CO4 9YQ
t: 0845 241 0142 | **f:** 0845 241 2212 | **e:** info@paceconsult.co.uk | www.paceconsult.co.uk

Contents

1 SUMMARY 2

2 INTRODUCTION 3

3 CRITERIA 4

3.1 Nearest residential dwellings. 5

3.2 Acoustic criteria: BS 4142:2014+A1:2019 6

3.2 Planning Condition 16. 7

4 CALCULATION ASSUMPTIONS 8

4.1 Plant units location and noise levels. 8

4.2 Recommended noise mitigation. 9

4.3 Calculation results. 9

5 LIFT NOISE IMPACT. 11

6 FLOOR BETWEEN THE TANK ROOM AND RESIDENTIAL. 12

7 WALL BETWEEN THE TANK ROOM AND RESIDENTIAL. 12

8 CONCLUSIONS 13

Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date	Prepared by	Approved by
-	Checked and Authorised	19/11/21	JCB	MJ

1 Summary

Pace Consult Limited was commissioned by Real Places Ltd to undertake a noise impact assessment from the proposed plant units serving the proposed development named The Mannings located at Shoreham-By-Sea affecting the nearest noise sensitive receptors.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial units* and Planning Condition 16.

In order to meet the planning condition 16 noise mitigation measures have been recommended. The noise impact assessment based on these recommendations has anticipated that the specific sound levels (noise from plant units) is compliant with the acoustic criteria recommended by the Planning Condition 16.

2 Introduction

Pace Consult Limited was commissioned Real Places Ltd to undertake a noise impact assessment from the proposed Plant units serving the proposed development named the Mannings affecting the nearest noise sensitive receptors.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial units* and Planning Condition 16.

The background sound levels were measured by REC and documented the findings within the report reference AC107165-1R2 date 23rd November 2021. Representative background of the nearest noise sensitive receptors was assessed against current legislation.

The levels used in the calculations were extracted from the M&E technical submittals and plant manufacturer's data. To undertake the outdoor sound level calculations Part 2 of ISO 9613 Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation was used. This ISO standard is incorporated in the SoundPLAN v 8.2 noise propagation software. This software was used to generate outdoor sound levels from the Plant units to the nearest noise sensitive receptors and to produce noise contour maps.

The sound pressure levels from the proposed plant were assessed during the night time with all plant items operating continuously.

3 Criteria

The external noise emission criteria at the nearest noise sensitive receptors, as taken from REC report, are as follows:

Table 1. Summary of measured `at NMP4			
Day	Median measured sound pressure levels dB		
	Day $L_{Aeq,1hr}$	Day $L_{A90,1hr}$	Night $L_{A90,1hr}$
Friday/Monday	50	44	34
Saturday	50	43	35
Sunday	49	41	32

The measurement location NMP4 is included below.

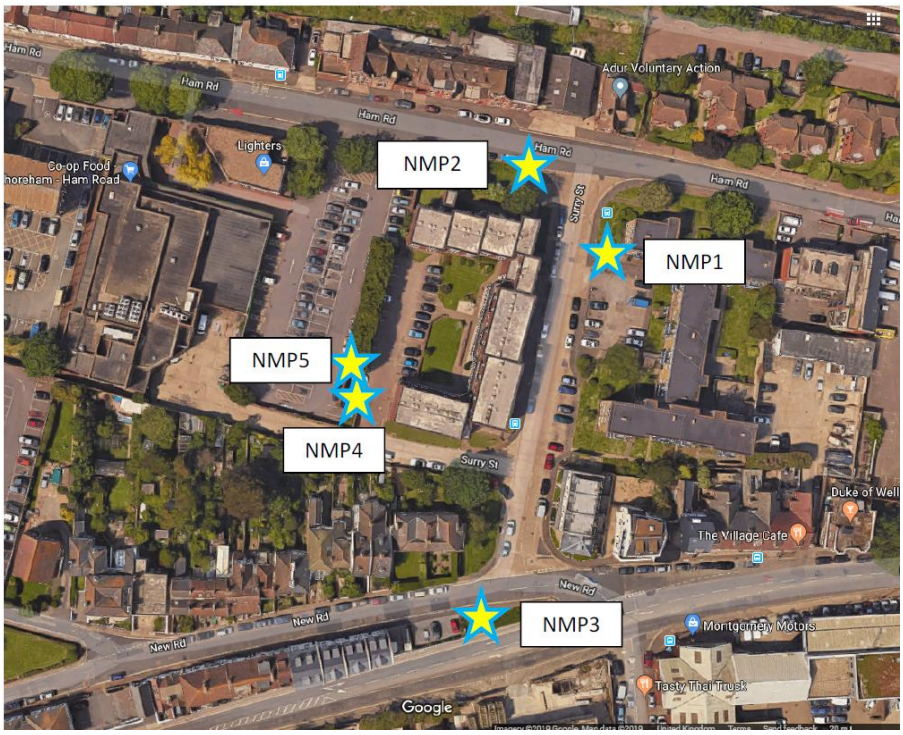


Figure 1. NMP4 location.

3.1 Nearest residential dwellings.

The nearest residential dwellings which have the potential to be affected by the noise emission from the proposed plant are included below.

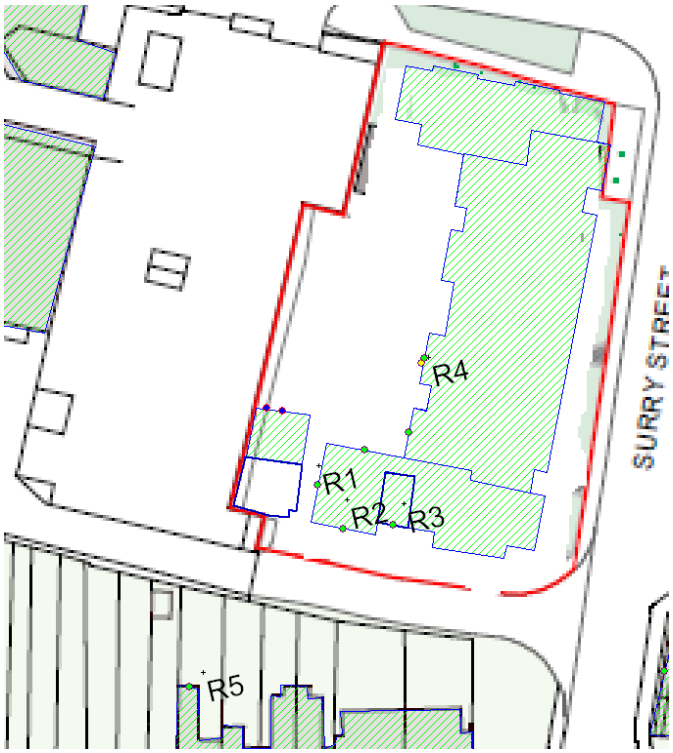


Figure 2. Nearest noise sensitive receptors.

R1, R2 and R4. First floor residential flat.

R3. Ground floor residential flat.

R5. House No 47 Surry St

3.2 Acoustic criteria: BS 4142:2014+A1:2019

This standard sets out a methodology for the assessment of noise from factories, industrial premises or fixed installations and sources of an industrial/commercial nature.

The procedure contained in BS4142 for assessing the impact is to compare the measured or predicted noise level from the source in question, the 'specific noise level', at the assessment position with the correct background noise level for the worst-case time of operation.

Where the noise contains a 'distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks or clatters), or if the noise is irregular enough to attract attention' then a range of correction factors can be added to the specific noise level as appropriate to obtain the 'rating level'.

As this is a prescriptive report prior to plant installation, overall rating noise levels will be specified for the new installation. Compliance with the rating value will be necessary to provide evidence that significant adverse impact has been avoided as required by the NPSE.

To assess the impact, the measured background noise level is subtracted from the rating noise level. BS4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (See Clause 8) from the rating level (see Clause 9) and consider the following.

a) Typically, the greater the difference, the greater the magnitude of the impact.
b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.
d) 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.

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) The absolute level of sound. For a given difference between the rating level and the background sound level, 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.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

3) 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, such as;

i) Façade sound insulation treatment

ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and Acoustic screening.

3.2 Planning Condition 16.

The planning condition 16 states the following:

Noise	
16	With the exception of any demolition works, no development shall take place until details of a sound insulation scheme for protecting the proposed residential flats and neighbouring dwellings from noise or vibration from any plant or tank rooms or lift mechanism have been submitted to and approved by the Local Planning Authority. The objective of the sound insulation scheme shall be to ensure that noise from these facilities is inaudible in any of the new flats and in any of the existing neighbouring properties. **Reason**: To protect future and existing occupiers from noise disturbance in accordance with Policies 15 & 34 of the Adur Local Plan 2017.

4 Calculation assumptions

4.1 Plant units location and noise levels.

The proposed plant items included within the noise impact assessment are as follows:

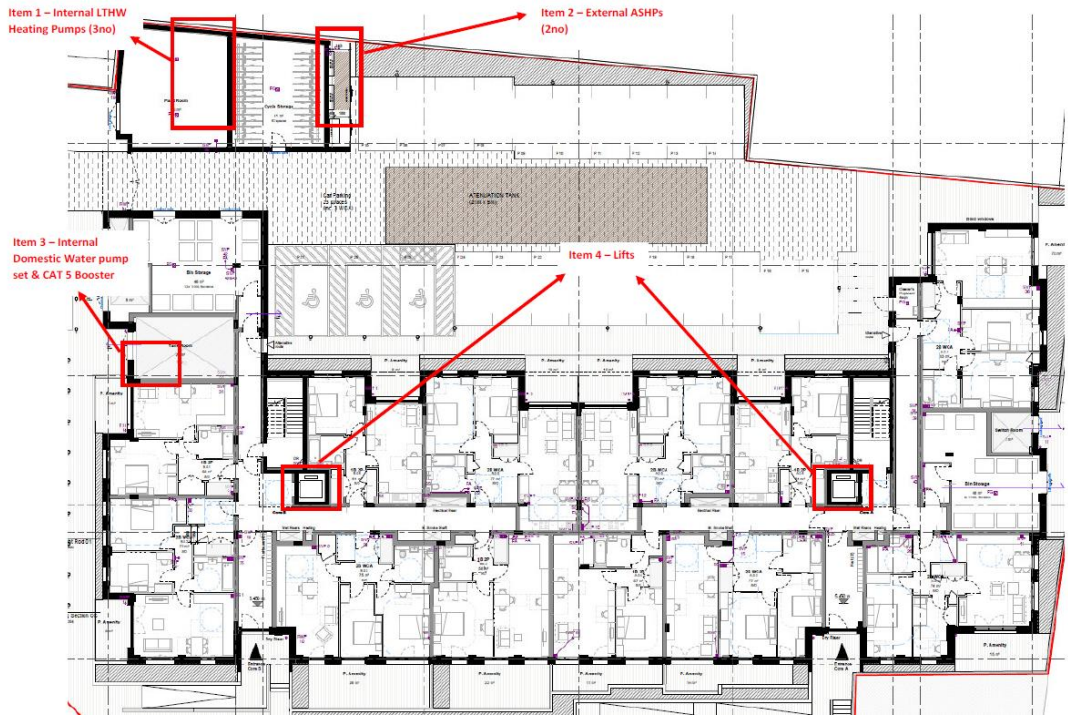


Figure 3. Plant items location.

The sound power Lw dB of each plant unit is included below.

Table 2. Sound power Lw dB	
Plant Room	
Unit	Lw dB
LTHW	85
Tank Room	
Water Pump	76
CAT 5 Booster	84
Outdoor units	
ASHP	67

Note. The sound power Lw dB is calculated based on the sound pressure dBA measured at 1 m distance from the unit provided by the manufacturer.

4.2 Recommended noise mitigation.

Plant Room.

The plant room doors should be acoustic louvre doors with the following sound reduction.

Rw [dB]	C	Ctr	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
25.0	-1.0	-6.0	7.0	8.0	13.0	23.0	37.0	33.0	29.0	29.0

Tank Room

The tank room door should be solid with the following sound reduction.

Rw [dB]	C	Ctr	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
41.0	-1.0	-2.0	28.0	32.0	37.0	41.0	39.0	40.0	49.0

In order to provide the required air recirculation within the tank room, an acoustic louvre with the following sound reduction is recommended. It is assumed that the area of the acoustic louvre is 1 m^2.

Rw [dB]	C	Ctr	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
25.0	-1.0	-6.0	7.0	8.0	13.0	23.0	37.0	33.0	29.0	29.0

4.3 Calculation results.

In order to assess that the noise emission from the plant is not audible at the nearest receptors as per the planning condition acoustic requirements. The calculated plant noise is compared against the lowest measured background sound levels.

Table 3. Calculated Sound Pressure Level dBA			
ID	Calculated Sound Pressure Level dBA	Lowest measured background levels	Exceedance over the measured background
R1	29	32	-3
R2	32		0
R3	31		-1
R4	31		-1
R5	30		-2

As can be seen from the above table, the calculated noise levels are equal to and below the lowest measured noise levels, which is a clear indication that the noise emission from plant will be inaudible within the nearest receptors.

The table below shows an example of the calculated sound propagation at R2, the highest calculated sound levels during daytime.

Table 5. Noise propagation calculation

Source	Source type	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	Kl dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	dLrefl dB	Lr dB(A)
Tank Room Door	Area	78	41	33.6	39.7	4	0	0	0	6.64	-27.4	3	-10.3	0.4	5
Tank Room Louvre	Area	78	25	54.7	54.7	1	0	0	3	7.99	-29	3	-7.4	0.2	25
Plan Room door	Area	83	25	59.9	65.4	3.6	0	0	0	8.83	-29.9	3	-2.4	0	31
ASHP (1 of 2)	Point			60.1	60.1		0	0	0	19.2	-36.7	3	-22.5	0	4
ASHP (2 of 2)	Point			60.1	60.1		0	0	0	17.9	-36	3	-23.2	0	4

The figure below includes the legend of the acoustic parameters used to calculate the sound pressure level at receivers.

Legend

Source		Source name
Source type		Type of source (point, line, area)
Li	dB(A)	Level inside
R'w	dB	Rated transmission loss
L'w	dB(A)	Sound power level per m, m²
Lw	dB(A)	Sound power level per unit
l or A	m,m²	Size of source (length or area)
Kl	dB	Correction for source impulsiveness
KT	dB	Correction for source tonality
Ko	dB	Correction for propagation in limited spacial angle
S	m	Distance source - receiver
Adiv	dB	Mean attenuation due to geometrical spreading
Agr	dB	Mean attenuation due to ground effect
Abar	dB	Mean attenuation due to screening
dLrefl	dB	Level increase due to reflections
Lr	dB(A)	Assessed level of time slice

Note. The plantroom external walls are cavity walls, and the plant room roof is concrete. The sound reduction offered by these elements is in excess of R_w 60 dB, which is considered sufficient to mitigate the sound transfer to the exterior.

5 Lift noise impact.

The maximum recommended noise levels within the living accommodation due to lift operation should not exceed the values given in table 5 of BS8233:2014. This table is included below for reference.

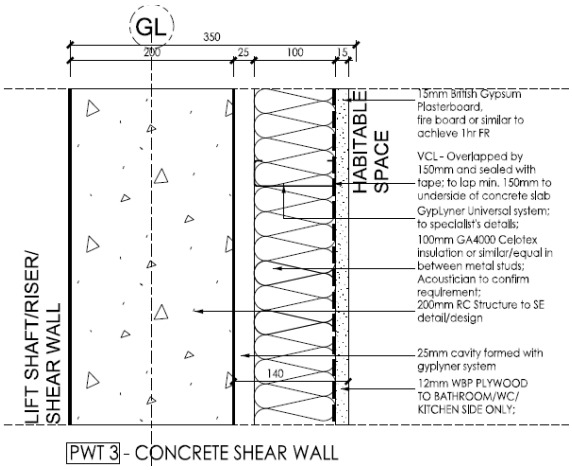
Noise levels from lifts in living accommodation

Room	Maximum noise level (dB $L_{Amax,F}$)
Bedroom	25
Living room	30
Other areas	35

NOTE These figures relate solely to lift noise levels and do not account for any other noise sources. These values include noise from the lifts irrespective of the transmission mechanism, i.e. they include both airborne and structure-borne noise.

It is understood that the lift motor and associated equipment will be installed on suitable anti-vibration mountings to prevent the transmission of excessive vibration and/or structure-borne noise to any parts of the living accommodation.

The proposed wall between the lift core and residential dwelling is the PWT3.

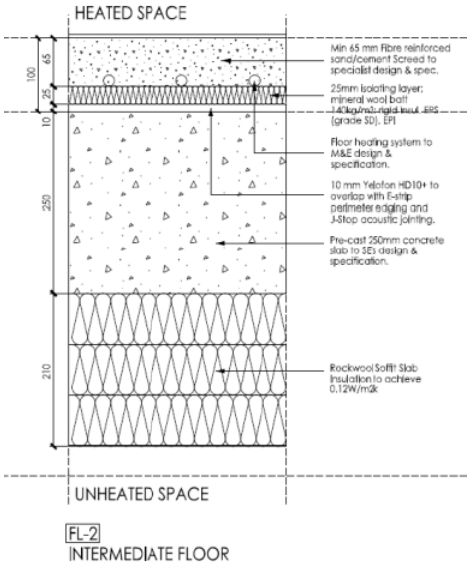


PWT 3 - CONCRETE SHEAR WALL

The sound reduction provided by the above wall is R_w + C_{tr} 72 dB, which is considered sufficient to mitigate any sound transfer during the lift operation into the residential accommodation. Therefore, the indoor noise levels recommended by the relevant acoustic guideline (BS8233:2014) it is expected to be met.

6 Floor between the Tank Room and residential.

The floor between the tank room and residential is included below.



The above floor should be acoustically upgraded by using 1 x 15 mm soundBloc plasterboard supported on acoustic hangers. As shown below;



Gypframe Acoustic Hangers

Resilient hangers used in conjunction with the CasoLine mf ceiling system and timber joist ceilings and floors for increased sound insulation.

Conforms to EN 14195.

The plant items should be installed on antivibration mounts in order to mitigate the structural vibration.

7 Wall between the Tank Room and residential.

It is recommended that the wall between the tank room and the residential will be similar to the PWT3 but adding one additional layer of 15 mm soundbloc plasterboard.

8 Conclusions

The acoustic recommendations included in this report are based on meeting the planning condition 16 which requires a scheme of sound insulation measures to be detailed for the plant and tank rooms.

The calculated plant noise assessment, based on the noise mitigation measures recommended in this report, is equal to and below the lowest pre-existing background sound levels, which is an indication that the noise from plant will be adequately controlled at the nearest receptors.

Additional mitigation measures have been recommended in order to avoid that noise from the operation of the lift and plant items being be audible within the nearest residential dwellings.