

Proposed Apartment Development, Oldham Road, Manchester M4

Noise Impact Assessment

for GMI Construction, Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

Our Reference
21801R05PKSW

Your Reference
D464-ENV-ZZ-XX-RP-Y-1005

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Executive Summary

Environoise Consulting Limited has been commissioned by GMI to provide a review of noise from proposed services plant associated with the apartment development at Oldham Road New Cross, Manchester M4. The assessment has been done to address planning condition 14 of the decision notice.

Our findings are summarised below.

Planning Condition 14(a) - Predicted Plant Noise Impact

- A background noise survey was done on Tuesday 13th October 2020 detailed in Environoise report ref: 21461R02SWpak. This has informed a plant noise limit of 37dB L_{A_r,T_r} to meet the target requirements of Condition 14(a).
- A plant noise assessment indicates compliance with the plant noise limit at the nearest residential receptor (Broadside apartments) with no further mitigation measures required.

Planning Condition 14(b)

On-site testing will be done upon completion to demonstrate compliance with the Planning Condition (a) internal noise targets.

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1. Noise Assessment

1.1 Overview

- 1.1.1 Environoise Consulting Limited has been commissioned by GMI to assess plant noise from the proposed apartment development at Oldham Road New Cross, Manchester M4 to address planning condition 14 of the decision notice. This states as follows:

14(a)

Prior to the first occupation of the development hereby approved, details of externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

14(b)

Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met.

BS 4142+A1:2019

- 1.1.2 BS 4142:2014+A1:2019ⁱ provides a method of determining the 'impact of specific sound' on dwellings due to industrial and commercial noise sources through comparison between the measured background noise level (L_{A90}) and the noise source rating level ($L_{Ar,Tr}$) under consideration. The rating level is the specific noise level plus penalties of up to 18dB added for features to account for the character of the noise as follows:

- **Tonality:** +2dB penalty: Just perceptible; +4dB penalty: Clearly perceptible and +6dB penalty: Highly perceptible.
- **Impulsivity:** +3dB penalty: Just perceptible; +6dB penalty: Clearly perceptible and +9dB penalty: Highly perceptible.
- **Intermittency:** +3dB penalty: identifiable on/ off conditions.
- **Other:** +3dB penalty: where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent.

- 1.1.3 When comparing the rating plant noise level against the background noise level, BS 4142:2014 provides the following noise impact descriptors:

- +10dB(A) is likely to be an indicator of 'a significant impact, depending on the context'.

- +5dB(A) is likely to be an indicator of 'an adverse impact, depending on the context'.
- No excess of the background noise level is an indicator of 'a low impact, depending on the context'.

Plant Noise Limit

- 1.1.4 A comprehensive reporting of the night-time background noise survey is given in Environoise report ref: 21461R02SWpak (GMI ref: D464-ENV-ZZ-XX-RP-Y-1002). This has informed a plant noise limit of 37dB $L_{A_{r,Tr}}$ set for both the daytime (07.00 – 23.00hrs) and night-time (23.00 – 07.00) period to meet the Planning Condition criterion.

1.2 Proposed Plant

- 1.2.1 Details of the proposed internal and external (roof-top) plant are given in Table 1.1 together with associated sound power levels (L_{wA}) sourced from manufacturers noise data. Plant room, sub-station (opening on to Marshall Street) and roof-top plant locations are shown in Figures 1.1 and 1.2.

Table 1.1: Proposed external plant and sound power level data.

Item	Location	No. of units	L _{wA} (dB) per unit
Internal			
Minera 1000kVA WPD Tier 2 Unit Substation	Substation, ground floor	1	41
EC-Power XRG1 20 combined heat and power unit (CHP)	Plant Room, ground floor	1	63
Ideal Evomax 2 condensing boiler		4	62
External			
Smoke extract fan with silencer (emergency use only)	Roof-top	1	95
Residential Hub condenser			84

- 1.2.2 The smoke extract fan is for emergency use only. Therefore, it does not serve the daily operation of the building and thus is exempt from the assessment.

1.3 Assessment

- 1.3.1 Plant noise levels at the first and ninth floor level facades of the Broadside apartment building have been calculated using SoundPLAN® noise propagation software as per guidance given in ISO 9613-2 and BS 4142, see Figure A1, Appendix A. Table 1.2 summarises the plant noise impact assessment to the nearest NSRs with a comparison of the plant noise limits in section 1.1.4.
- 1.3.2 Spectral noise levels for the CHP and boilers are not available; therefore, we have considered the spectral criteria associated with a Noise Rating NR62 which is approximately equivalent to a combined reverberant noise level of 69dB(A).
- 1.3.3 All plant has been considered to be operating continuously and simultaneously.
- 1.3.4 We have considered non-acoustic louvred doors providing 5dB attenuation for the Plant Room and Substation.

Acoustic Features Correction

- 1.3.5 Acoustic feature corrections have been applied independently for the plant room, substation and roof-top plant noise due to the differing distances, source heights and character of the noise between the sources, see Table 1.2.

Table 1.2: BS 4142 acoustic feature corrections for plant sources.

Generator element	Acoustic feature correction
CHU & boilers	Impulsivity & intermittency: No correction due to the continuous, non-varying nature of plant equipment noise. Tonality: No correction due to noise expected to be broadband.
Sub-station	Impulsivity & intermittency: No correction due to the continuous, non-varying nature of plant equipment. Tonality: +4dB correction due to clearly identifiable noise at fundamental frequency of 50Hz and harmonics of 100Hz and 200Hz.
Roof-top plant	Impulsivity & tonal: No correction due to the continuous, non-varying and broadband nature of plant equipment noise. Intermittency: +4dB correction due to clearly identifiable on/off conditions of the condenser unit.

- 1.3.6 Table 1.3 summarises noise breakout assessments for both the Plant Room, Substation and Roof-top plant area to the nearest residential receptor against the noise limits.

Table 1.3: Plant noise impact assessment at the considered NSRs

NSR	Plant Room & Substation	Roof-top Plant
Broadside Apartment Building	Plant noise level (dBA) at NSR	33
	Acoustic features correction (dB)	+4
	Rating level [dB(A)]	36
	Plant noise limit [dB(A)]	37
	Level of excess (dB)	0 (-1)

1.4 Discussion

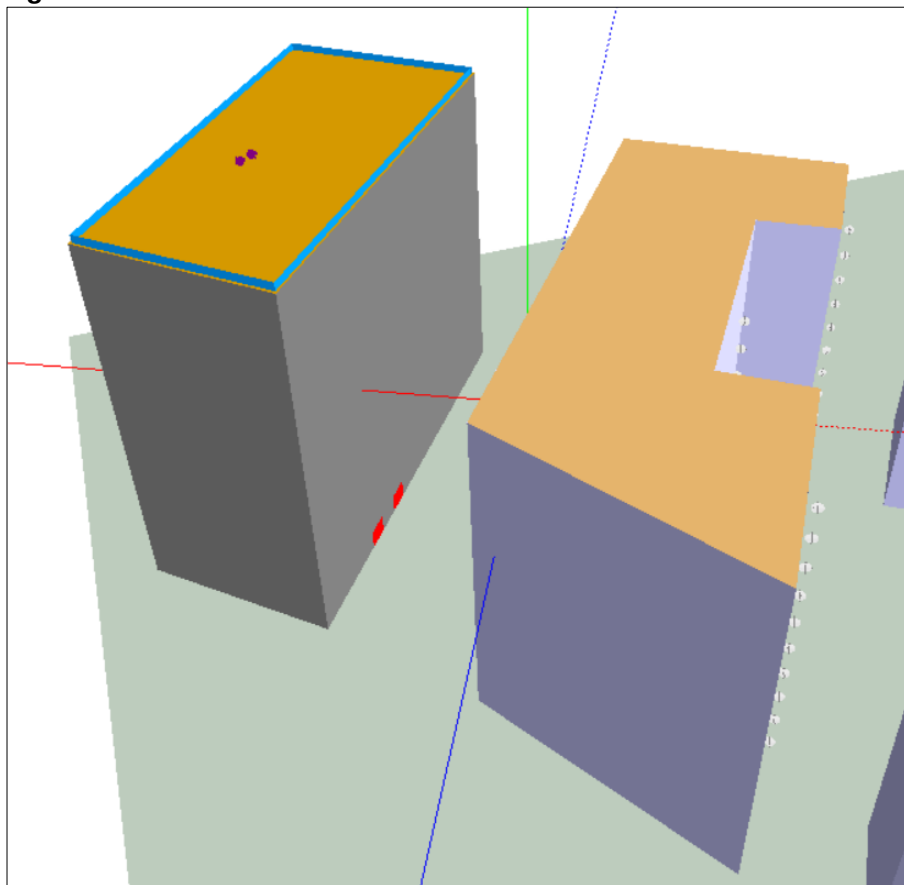
- 1.4.1 As shown in Table 1.3, plant noise levels at the Broadside apartments are predicted to meet the requirements of Planning Condition 14(a) with no further mitigation measures necessary. Compliance on-site testing will be done to address Condition 14(b).

General Recommendations

- 1.4.2 Plant should have suitable isolation to achieve 95% isolation of frequencies of concern to avoid structure borne noise transmission through any supporting structures (including the ground). Plant vibration isolators should be chosen such that the natural frequency of the item when mounted on the isolators is substantially below the forcing frequency of the item of plant and the natural frequency of the supported plant.
- 1.4.3 Please note, we cannot advise on the specification of vibration isolators. Manufactures of vibration isolation mounts have a technical service to advise on the correct mounts to use. They will need to know the weights and weight distribution of the plant over the slab, and the lowest forcing frequency likely to be encountered. An example company is [Total Vibration Solutions](#).
- 1.4.4 An inertia pouring base or paving slabs may be worth considering. Connections from plant must be flexible to reduce vibration transfer. Care must be taken in the orientation of the flue exhaust terminations so that sensitive spaces are not adversely affected.

Appendix A: SoundPLAN Model

Figure A1: 3D view of SoundPLAN model



References

ⁱ BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.