SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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This City, Rodney Street, Ancoats

Plant noise egress assessment to discharge Planning Condition 18

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Summary

Sandy Brown have been appointed by Wates to provide acoustic advice in relation to the This City, Rodney Street development in Manchester.

This report presents an assessment of externally mounted plant associated with This City, Rodney Street to discharge the requirements of Planning Condition 18 for planning application ref 134154/VO/2022.

Two smoke extract fans and one life safety generator are proposed to the rooftop of Block A, and three smoke extract fans are proposed to Block B of the development. These life-safety plant items operate only in the event of an emergency and for occasional daytime routine testing. No other externally mounted noise generating plant is proposed.

Maximum emergency plant noise egress limits in line with the typical MCC requirements are set out below, which apply outside the nearby noise sensitive receptors:

- L_{Aeq} 51 dB daytime (0700-2300)
- L_{Aeq} 43 dB night-time (2300-0700).

The predicted emergency plant noise level (without further mitigation) at the facade of the nearest noise sensitive receptor (residential premises on Jersey Street and Mozart Close) is L_{Aeq} 77 dB, which significantly exceeds the proposed criteria.

It is recommended that any routing testing only be carried out during daytime hours (07:00-23:00). On this basis, it should be possible to agree a relaxation against the night-time limits on the basis that the plant would only operate at night during an actual life-safety emergency event.. This would need to be agreed with MCC but has been accepted on several other schemes in Manchester.

Recommended additional mitigation measures have been outlined.

Provided the additional mitigation measures outlined for the smoke extract fans are provided, it is expected that the emergency plant noise egress limits shall be met, therefore Planning Condition 18 can be discharged subject to the results of the post-completion acoustic testing.

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1 Introduction

This report presents an assessment of externally mounted plant associated with This City, Rodney Street to discharge the requirements of Planning Condition 18.

2 Site description

2.1 The site and its surroundings

The site location in relation to its surroundings is outlined in yellow in Figure 1.

The proposed development includes the erection of two residential apartment buildings (Use Class C3), one of 8 storeys (68 apartments) and one of 5 storeys (51 apartments), to form a total of 119 residential apartments; and the erection of 10, 3 storey townhouses (Use Class C3); together with car and cycle parking provision, hard and soft landscaping including public realm, access, substation and other associated works.

The site is bounded by Rodney Street to the east, Jersey Street to the south, Wadeford close to the west and a footpath to the north.

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

2.2 Adjacent premises

The site is located within a mixed residential, commercial and industrial area. A summary of the nearby premises is set out below with reference to Figure 1.

- Residential premises along Rodney Street (highlighted in royal blue)
- Residential premises on Jersey Street and Mozart Close (highlighted in orange)
- Residential tower building on Butler Street (highlighted in red)
- Proposed residential development on Butler Street, planning application reference 129187/FO/2021 (highlighted in purple)
- Commercial premises on Oldham Road (highlighted in green)
- Crown Industrial Estate on Poland Street (highlighted in light blue)
- Poland Street Industrial Estate (highlighted in pink).

There are other planned developments in the area on Jersey Street including Eliza Yard (planning application reference 130354/FO/2021) and Jersey Wharf which are located to the southwest of the site on Jersey Street. The Crown Industrial Estate on Poland Street is also due to be partly redeveloped for a Mobility Hub (planning application reference 130627/FO/2021).

3 Planning Condition 18

Planning Condition 18 for planning application ref 134154/VO/2022states the following:

> *(a) Prior to the first occupation of a building of the development, details of any 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 5 db (Laeq) below the typical background (La90) level at the nearest noise sensitive location.*
>
> *(b) Prior to the first occupation of each 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. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall not be agreed until such a time as the development complies with part (a) of this planning condition.*

3.1 Emergency plant criteria

MCC typically stipulate that noise egress associated with emergency/life-safety plant should not exceed a level 10 dB above the typical background noise level at the nearest noise

sensitive receptors. This is on the basis that it would normally be routinely tested during the daytime for brief periods.

4 Environmental noise survey and proposed limits

Attended day, evening and night-time sample measurements were performed by José M. González at 4 locations around the site on 28 and 29 June 2021.

An additional noise survey was carried out on 7 September 2021 and performed by Thomas Dent to verify the noise levels to the north-west of the site and close to the A62.

Details of the survey method, procedure and levels measured are detailed in Sandy brown report 22013-R01-C *Acoustic planning report.*

Maximum emergency plant noise egress limits in line with the typical MCC requirements are set out below, which apply outside the nearby noise sensitive receptors:

- L_{Aeq} 51 dB daytime (0700-2300)
- L_{Aeq} 43 dB night-time (2300-0700).

The proposed emergency plant limits would need to be agreed with MCC.

5 Proposed plant

Two smoke extract fans and one life safety generator are proposed to the rooftop of Block A, and three smoke extract fans are proposed to the rooftop of Block B of the development. These are life-safety plant items that operate only in the event of an emergency and for occasional daytime routine testing. No other externally mounted noise generating plant is proposed.

A mark-up showing the proposed plant item locations is shown in Figure 3. The generator location is marked in green, and the smoke extract fan locations are marked in red.

Figure 2 Mark-up showing location of proposed plant items

5.1 Proposed mitigation measures

An acoustic screen is proposed surrounding the generator (understood to extend 1 m above the generator height) to mitigate noise egress, as indicated in Figure 3.

For the screening to be acoustically effective, it will need to provide the following:

- A minimum mass of 15 kg/m^2
- Solid – no gaps, sealed joints etc.

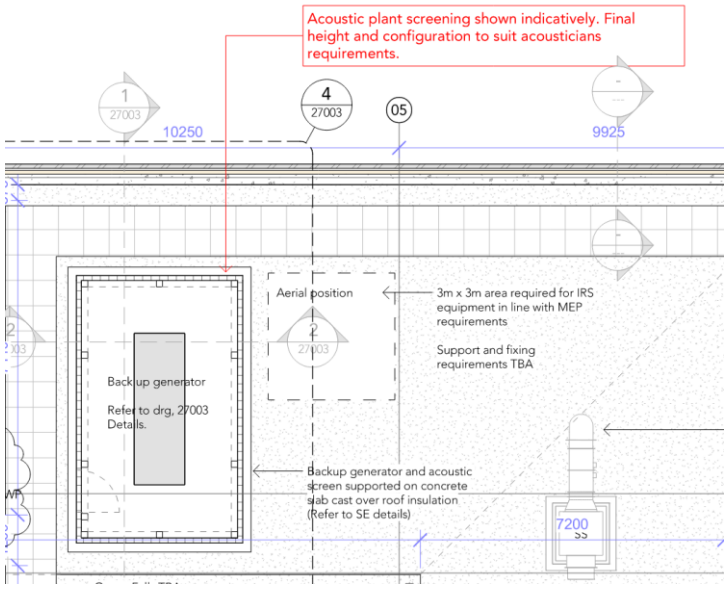

Figure 3 Location of backup generator and proposed screening

5.2 Plant noise data

Based on the manufacturer information, the proposed generator has a sound pressure level of L_{Aeq} 70 dB at 7 m and L_{Aeq} 79 dB at 1 m inclusive of an acoustic enclosure. In addition, secondary exhaust attenuation is proposed to the generator which is expected to achieve a broadband insertion loss of 5-10 dB based on discussion with the supplier.

The acoustic data for the smoke fan is summarised in Table 1. No attenuation is noted for the smoke fan.

Table 1 Smoke fan acoustic data

	Sound power level, L_w (dB) Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Block A								
Outlet	102	100	102	105	106	106	102	100
Breakout	89	94	78	78	78	76	64	68
Block B								
Outlet	98	108	106	110	110	102	97	95
Breakout	97	100	91	91	88	77	65	65

5.3 Operating conditions

It is understood that the proposed generator will only operate during a life-safety emergency and during routine daytime testing.

6 Assessment

Calculations have been undertaken to predict the noise egress level from emergency plant items at nearest noise sensitive receptors.

The screening and distance conditions of nearby noise sensitive receptors to the proposed plant items are summarised in Table 2 in reference to the noise sensitive premises outlined in Figure 1. The calculations undertaken include attenuation from the proposed screening discussed in Section 5.1.

Table 2 Summary of distances and screening from plant items

Noise sensitive receptor	Distance from generator	Distance from smoke extract fans (Block A) [1]	Distance from smoke extract fans (Block B) [1]	Screening from plant
Residential premises along Rodney Street	56 m	45 m / 80 m	38 m / 70 m / 73 m	Fully screened by building massing

Noise sensitive receptor	Distance from generator	Distance from smoke extract fans (Block A) [1]	Distance from smoke extract fans (Block B) [1]	Screening from plant
Residential premises on Jersey Street and Mozart Close	49 m	49 m	45 m / 54 m / 57 m	Fully screened by building massing
Residential tower building on Butler Street	45 m	35 m / 52 m	62 m / 68 m / 71 m	Generator partially screened by proposed screening
Proposed residential development on Butler Street	45 m	36 m / 70 m	47 m / 73 m / 80 m	Fully screened by building massing
Commercial premises on Oldham Road	150 m	140 m / 160 m	152 m / 157 m / 170 m	Fully screened by building massing
Crown Industrial Estate on Poland Street	105 m	95 m / 115 m	101 m / 110 m / 136 m	Fully screened by building massing
Poland Street Industrial Estate	105 m	95 m / 115 m	95 m / 100 m / 130 m	Fully screened by building massing

[1] Where more than one distance have been provided, it refers to distances from multiple separate extract fans.

From the information outlined above, the worst affected noise sensitive premises are expected to be the residential tower building proposed on Butler Street.

The predicted noise level at the facades of the nearest noise sensitive receptors are L_{Aeq} 77 dB at the residential tower on Butler Street, and L_{Aeq} 71 dB at residential premises on Rodney Street.

The predicted plant noise egress levels without additional mitigation significantly exceed the proposed criteria outlined in Section 3. This is dominated by contributions from the smoke extract fan (both exhaust and breakout).

6.1 Potential relaxation to limits

It is recommended that all routing testing of emergency plant be limited to daytime hours (07:00-23:00) only, and can therefore be assessed against the daytime plant noise egress limits.

On this basis, it should be possible to agree a relaxation against the night-time limits on the basis that the generator and smoke fans would only operate at night during an actual life-safety emergency event.

This approach has been agreed for other schemes in Manchester but would need to be approved by MCC.

6.2 Additional smoke fan mitigation measures

To ensure that the daytime emergency plant noise limits are not exceeded, a sound power level limit of L_{wA} 88 dB is required to be achieved for the smoke extract fans proposed to Block A, and a limit of L_{wA} 98 dB is required to be achieved for the smoke extract fans proposed to Block B (cumulative of both breakout and exhaust).

Currently this can be achieved through in-duct attenuation to the smoke extract fan to control exhaust contributions, and acoustic lagging to control contributions from breakout.

Minimum insertion losses for the smoke extract exhaust attenuators are provided in Table 3.

Table 3 Minimum insertion losses for in-duct attenuators

	Minimum insertion loss, IL (dB) Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Smoke extract fan – exhaust								
Block A [1]	7	14	16	30	38	38	35	20
Block B [2]	6	12	21	21	21	21	20	20

[1] Insertion losses can typically be provided with 1200 mm long attenuators

[2] Insertion losses can typically be provided with 900 mm long attenuators

Mass barrier acoustic lagging should be provided to the smoke extract fan casing and ductwork and this should have a minimum outer surface weight of 10 kg/m^2, and incorporate at least 25 mm mineral wool insulation to the inside face. Example products for the mass barrier lagging material are:

- Rockwool Techwrap2
- Muftilag R31.

7 Acoustic testing

Planning Condition 18 states that post-completion testing and assessment to ensure that the plant noise egress limits have been met.

8 Conclusion

Sandy Brown have been appointed by Wates to provide acoustic advice in relation to the This City, Rodney Street development in Manchester.

An assessment of plant noise egress from the proposed items of plant has been undertaken.

Provided the additional mitigation measures outlined for the smoke extract fans are provided, it is expected that the emergency plant noise egress limits shall be met, therefore Planning Condition 18 can be discharged subject to the results of the post-completion acoustic testing.