

Appendix 3.4

NOISE AND VIBRATION IMPACT ASSESSMENT ADDENDUM

5 Kingdom Street

Noise and Vibration Impact Assessment Addendum

Introduction

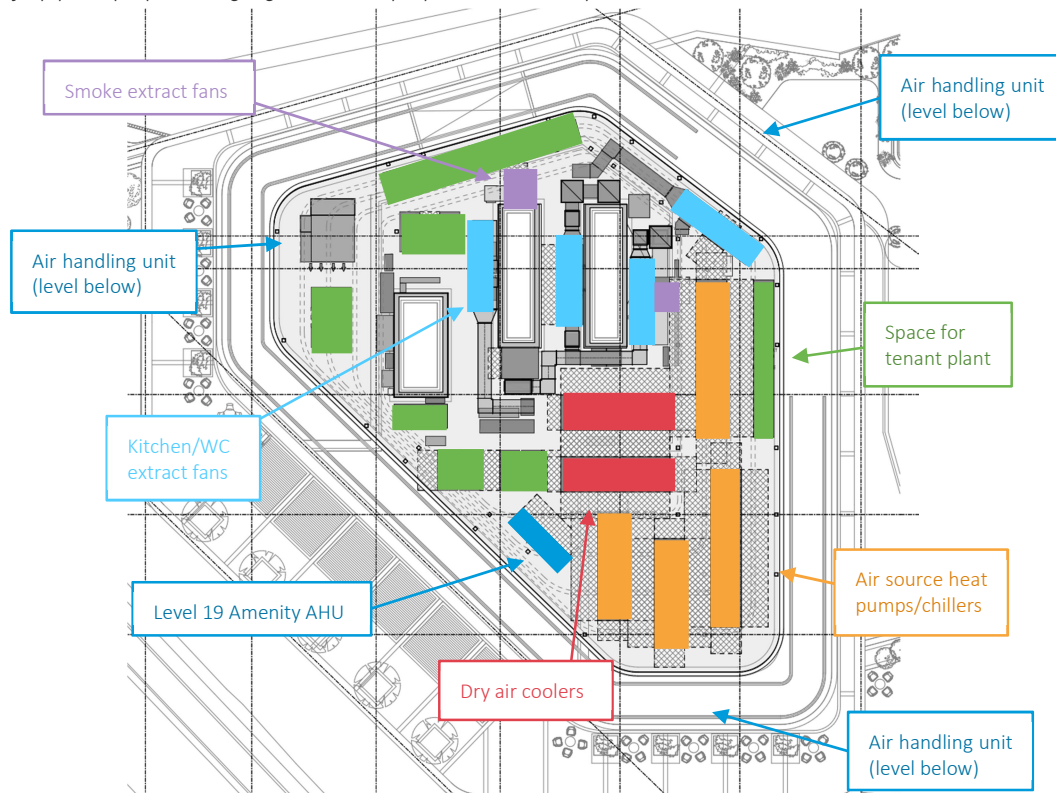
This technical note is provided as an addendum to the Noise & Vibration Impact Assessment (revision 03) for the 5 Kingdom Street development, written in April 2019. Since then some changes have been made to the design which may be expected to influence the results of the assessment; this addendum has been prepared to assess this influence.

Among the changes in the new scheme is alteration to the external rooftop plant proposals. These changes have been assessed by recalculating noise emission to the neighbouring properties. The other changes to the design are not expected to have a material effect on the outcomes presented in the original noise and vibration impact assessment, and so those outcomes are considered to remain valid.

New rooftop plant proposals

The new rooftop plant layout covers two floors at level 19 of the proposed building; this is shown in Figure 1:

Figure 1 Rooftop plant proposals highlighted on the proposed level 19M plan



As with the original application there are also several items of internally located plant proposed. These will have ventilation openings around the north and west façades of the building below podium level. It is not expected that the normal use plant proposed will exceed 65 dB L_{pA} at 1 metre from any termination.

Equipment selections will be made following detailed design. Assumptions have been made at this stage based on indicative plant selections; these are shown in Figure 2.

Figure 2 Noise levels of proposed rooftop building services equipment (normal-use plant)

Equipment	Qty	Expected noise level (per unit)
Air source heat pumps/chillers	4	2 units: 94 dB L_{WA} 2 units: 86 dB L_{WA}
Dry air coolers	2	86 dB L_{WA}
Air handling units	3	Up to 80 dB L_{pA} at 1 metre (from terminations as well as case)
Level 19 Amenity AHU	1	Up to 80 dB L_{pA} at 1 metre (from terminations as well as case)
Kitchen/WC extract fans	5	Up to 80 dB L_{pA} at 1 metre (from terminations as well as case)
Terminations below podium level	-	65 dB L_{pA} at 1 metre from termination
Tenant plant	Limit to be stipulated in tenant contract, so as to be well below noise from landlord plant	

Depending on the selection, it is likely that the Air Handling Units and the Kitchen/WC extract fans will require in-line attenuators/silencers to meet the limits given above.

Calculation methodology

The calculation of the *specific sound level* at the nearest noise sensitive receptors has been completed following the methodology and calculations presented in ISO 9613-2.

Attenuation due to geometric divergence has been calculated to the nearest part of the receiving buildings using estimated distances, and accounting for the change in plant height from the previous application. The nearest receivers north and south of the site are expected to benefit from around 40 dB attenuation due to geometric divergence.

The receivers will not have direct line of sight to the plant, so will benefit from the attenuative effect of acoustic screening. This will provide at least 5 dB further attenuation.

With the assumptions made in this assessment, it is expected that the *specific sound level* at the nearest receivers north and south of the site will be at or below 49 dB L_{pA} during office hours. This is around 1 dB quieter than was predicted in the previous assessment.

Emergency-use plant

In addition to the normal-use plant listed above, there will also be the following items of emergency-use plant:

- Life safety generators installed in some of the plantrooms below podium level, with ventilation terminations facing the north.
- 2 No. smoke extract fans installed at roof level

As with the previous assessment, these items of plant will only operate in the case of emergency or during occasional testing - which would be scheduled during the day to limit the risk of disturbance. The indicative noise limit of 80-85 dB L_{pA} at 1m for terminations leading to the life safety generators still applies

The smoke extract fans are estimated to be at least 40m from the nearest window of 4 Kingdom Street, and the line-of-sight will be occluded by the building - leading to a screening effect in the region of 5-10 dB. This leads to a limit of over 100 dB L_{pA} at 1m in order to meet the 70 dB L_{Aeq} target identified in the Noise and Vibration Impact Assessment for the previous scheme. It is likely that the proposed smoke extract fans will be far quieter than this to minimise disturbance to occupants of the balcony areas, and so it is expected that the limit will be readily achieved.

Conclusions

Noise from the updated normal-use plant proposals has been assessed, and predicted to be around 1 dB quieter at the neighbouring properties. This is still at least 10 dB below the *background sound level* that was established in the previous assessment during expected office hours. As with the previous assessment, it is expected that the noise levels from the proposed plant will considerably reduce outside of office hours, enabling the requirement to be met overnight as well.

Noise from the updated emergency-use plant proposals is expected to readily meet the requirements for this plant set out in the Noise and Vibration Impact Assessment submitted as part of the previous application.

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