SANDY BROWN

Consultants in Acoustics, Noise & Vibration

Memo:	M012-B	**Date:**	7 November 2023
Project:	22293	**Pages:**	13
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Tribeca Plot B and C

Planning noise report addendum

This memo is an addendum to the planning noise report titled '*Noise Assessment Report – Transformation of the Ugly Brown Building*' by Waterman Infrastructure & Environment Ltd, dated May 2021 (document reference WIE11701-102-R-9.2.1), and should be read in conjunction with this previous document.

The addendum has been prepared to accompany a Section 73 application in relation to the original planning application (reference 2021/2671/P) to address the proposed amendments to the scheme which comprise the following items:

- Increased building height and/or plant compounds and lab extract flues as required for the life science use to buildings B, C1, C2, C3 and minor adjustments to C4
- Revised residential numbers and mix to incorporate 2 escape stairs
- External landscape update to include integration of the canal bridge landing
- Affordable work space layout at Basement, Ground and additional Ground level Mezzanine floor above retail
- Various other minor external alterations to the building to suit detailed design and deliverability

With reference to the above changes, only the revised building heights are considered to have an impact on the planning requirements in terms of noise, affecting potential noise propagation.

This memo therefore contains a review of the updated proposals in terms of building services noise egress.

Plant noise limits

Planning permission for the building has previously been granted as part of the planning application for the wider scheme, for all six plots proposed to be constructed on the masterplan site (2017/5497/P). An additional planning application (2021/2671/P) for changes to the scheme, was also granted planning permission in November 2022. Planning conditions relating to noise egress have been attached to the decision notices for both applications.

Planning conditions 44 and 45 of planning application ref. 2021/2671/P ie, the most recent application, requires that the cumulative sound levels from external building services and fixed plant serving all plots are 10 dB or more below the lowest background sound level (15 dB below if tonal components are present) at the nearest sensitive receptor at any time in accordance with Policy A4 of the Camden Local Plan 2017.

Plant noise limits (measured at 1 m from the worst affected windows of the nearest Noise Sensitive Receiver (NSR)) for the cumulative noise level resulting from the operation of all new plant serving Plot B and C are summarised in Table 1.

The emergency plant noise limits have been set at 10 dB above the minimum background noise levels ie, 20 dB above the limits set out in Table 1. These are set in accordance with typical guidance from the London Borough of Camden Council for emergency plant. Confirmation has been provided by the Pollution Planning Officer that these limits are acceptable.

The limits are based on the noise levels reported in the environmental noise survey '*Noise Assessment Report – Transformation of the Ugly Brown Building'* by Waterman Infrastructure & Environment Ltd, dated May 2017.

The nearest noise sensitive receptors to the development are as follows:

- Unite Students, Beaumont Court, a student residential building northwest of the site
- Unite Students, St Pancras Way, a student residential building located west of the site
- Tribeca Plot C2 residential apartments, approximately southeast of Plot B
- Residential houses at Reapers Close, northeast of the site
- Urbanest, residential apartments on Camley Street, east of the site
- Proposed Oriel eye hospital, south of the site – up to Level 5

Table 1 Plant noise limits at 1 m from the nearest noise sensitive premises – Plot B and C combined

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)		
	Receptors on St Pancras Way (west)	Receptors across Regents Canal (east)	Receptors to the south and Plot C2
Daytime (07:00-23:00)	40	36	45
Night-time (23:00-07:00)	38	34	42

Proposed external plant

Technical specifications for the proposed plant, including noise data, have been provided by KJ Tait, the building services consultant for the development, these are discussed in the following sections. Plant data has been provided for the proposed externally located plant, as well as significant items of internally located plant.

Proposed plant layouts for Plot B and Plot C have also been provided by KJ Tait.

Plant noise data – Plot B

The octave band noise data for plant serving Plot B provided is summarised in Table 2.

Table 2 Proposed Plot B mechanical building services – Manufacturers' octave band noise data (dB)

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Air Handling Unit 1, 2 and 3									
Induct intake sound power levels (dB)	71	83	74	71	67	62	61	60	74
Induct exhaust sound power levels (dB)	78	89	81	83	80	76	73	68	85
Case radiated sound power levels (dB)	59	70	55	55	52	46	31	23	58
Air Handling Unit 4									
Induct intake sound power levels (dB)	68	73	69	60	55	54	57	45	44
Induct exhaust sound power levels (dB)	72	79	75	75	71	70	70	62	57
Case radiated sound power levels (dB)	73	70	65	55	44	37	34	17	39
Fume Extract Fan									
Induct Sound power levels (dB)	63	66	73	76	72	68	64	53	78
Breakout sound power levels (dB)[1]	55	58	65	68	64	60	56	45	69
Air Source Heat Pumps									
Sound power levels (dB)	-	90	87	89	85	78	77	70	90
Smoke extract fan									
Induct exhaust sound power levels (dB)	96	92	86	98	91	92	90	86	99
Breakout sound power levels (dB)[2]	73	70	71	72	73	74	71	60	78

[1] Case radiated noise levels have been derived from the stated broadband sound pressure level

[2] Case radiated noise levels have been derived from the induct sound power level data

Plant noise data – Plot C

The octave band noise data provided is summarised in Table 3 for Plot C1, Table 4 for Plot C2, and Table 5 for Plot C3.

Table 3 Proposed Plot C1 mechanical building services – Manufacturers' octave band noise data (dB)

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Air Handling Unit 1									
Induct intake sound power levels (dB)	76	76	71	67	64	59	57	59	70
Induct exhaust sound power levels (dB)	77	87	77	79	75	71	68	62	81
Case radiated sound power levels (dB)	71	75	64	64	60	55	42	35	66
Air Handling Unit 2									
Induct intake sound power levels (dB)	70	82	74	68	65	62	58	59	72
Induct exhaust sound power levels (dB)	78	86	79	82	78	75	71	67	83
Case radiated sound power levels (dB)	59	71	56	55	52	47	32	25	59
Air Handling Unit 3									
Induct intake sound power levels (dB)	57	65	69	66	63	64	67	62	72
Induct exhaust sound power levels (dB)	67	70	79	77	80	80	81	82	87
Case radiated sound power levels (dB)	56	59	61	57	60	58	49	46	64
Fume Extract Fan									
Sound power levels (dB)	63	66	73	76	72	68	64	53	78
Breakout sound power levels (dB)[1]	55	58	65	68	64	60	56	45	69
Smoke extract fan									
Induct exhaust sound power levels (dB)	96	92	86	98	91	92	90	86	99
Breakout sound power levels (dB)[2]	73	70	71	72	73	74	71	60	78

[1] Case radiated noise levels have been derived from the stated broadband sound pressure level

[2] Case radiated noise levels have been derived from the induct sound power level data

Table 4 Proposed Plot C2 mechanical building services – Manufacturers' octave band noise data (dB)

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Air Source Heat Pumps									
Sound power levels (dB)	-	90	87	89	85	78	77	70	90
Fume Extract Fan									
Sound power levels (dB)	63	66	73	76	72	68	64	53	78
Breakout sound power levels (dB)[1]	55	58	65	68	64	60	56	45	69
Smoke extract fan									
Induct exhaust sound power levels (dB)	96	92	86	98	91	92	90	86	99
Breakout sound power levels (dB)[2]	73	70	71	72	73	74	71	60	78

[1] Case radiated noise levels have been derived from the stated broadband sound pressure level

[2] Case radiated noise levels have been derived from the induct sound power level data

Table 5 Proposed Plot C3 mechanical building services – Manufacturers' octave band noise data (dB)

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Basement Air Handling Unit 10									
Induct intake sound power levels (dB)	78	81	76	73	69	65	63	65	75
Induct exhaust sound power levels (dB)	81	89	83	84	81	78	75	70	87
Case radiated sound power levels (dB)	64	70	58	58	55	50	35	28	61
Basement Air Handling Unit 11									
Induct intake sound power levels (dB)	79	80	75	70	65	62	59	61	73
Induct exhaust sound power levels (dB)	76	87	78	81	77	74	70	66	83
Case radiated sound power levels (dB)	64	71	59	58	56	52	36	30	61
Level 8 Air Handling Unit 1									
Induct intake sound power levels (dB)	81	79	75	71	67	62	60	63	73
Induct exhaust sound power levels (dB)	80	91	80	82	78	75	71	65	84
Case radiated sound power levels (dB)	67	71	60	59	56	51	35	29	61
Level 8 Air Handling Unit 2									
Induct intake sound power levels (dB)	82	85	83	78	73	70	67	69	81
Induct exhaust sound power levels (dB)	80	90	83	85	82	78	75	71	87

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Case radiated sound power levels (dB)	68	78	65	65	61	57	41	35	67
Level 8 Air Handling Unit 3									
Induct intake sound power levels (dB)	65	71	68	65	67	65	66	58	72
Induct exhaust sound power levels (dB)	69	81	77	80	92	81	82	73	93
Case radiated sound power levels (dB)	58	70	59	60	72	59	50	37	72
Roof level Air Handling Unit 1									
Induct intake sound power levels (dB)	79	81	75	72	68	63	62	63	74
Induct exhaust sound power levels (dB)	79	92	81	83	79	76	72	67	85
Case radiated sound power levels (dB)	66	72	60	60	57	52	36	30	62
Roof level Air Handling Unit 2									
Induct intake sound power levels (dB)	76	84	78	75	72	68	66	67	78
Induct exhaust sound power levels (dB)	85	92	86	88	84	80	77	75	89
Case radiated sound power levels (dB)	63	73	61	61	58	54	38	31	63
Roof level Air Handling Unit 3									
Induct intake sound power levels (dB)	66	68	66	63	65	62	60	54	69
Induct exhaust sound power levels (dB)	68	77	74	80	82	76	76	67	85
Case radiated sound power levels (dB)	57	66	56	60	62	54	44	31	64
Fume Extract Fan									
Sound power levels (dB)	63	66	73	76	72	68	64	53	78
Breakout sound power levels (dB)[1]	55	58	65	68	64	60	56	45	69
Air Source Heat Pumps									
Sound power levels (dB)	-	90	87	89	85	78	77	70	90
Smoke extract fan									
Induct exhaust sound power levels (dB)	96	92	86	98	91	92	90	86	99
Breakout sound power levels (dB)[2]	73	70	71	72	73	74	71	60	78

[1] Case radiated noise levels have been derived from the stated broadband sound pressure level

[2] Case radiated noise levels have been derived from the induct sound power level data

Noise data for the proposed unpackaged generators to be provided on the rooftops of Plot B, C2 and C3 are provided in Table 6.

Table 6 Maximum sound pressure levels for landlord generators

	Octave band centre frequency (Hz)								
Item	63	125	250	500	1k	2k	4k	8k	dBA
Generators									
Average sound pressure level at 1 m (dB)	106	102	109	105	106	102	98	90	110

It is understood that the generators are to be housed within acoustic enclosures. The manufacturer has confirmed the generators will achieve a sound pressure level of 65 dBA at 1 m, and the assessment is based on this being achievable. The manufacturer is required to provide evidence this can be achieved.

Noise egress assessment

Plant operation assumptions

It is understood that all generators will be used for emergency use for landlord plant, and mains back-up for essential tenant plant (such as refrigeration). On this basis, the generators are not considered to fall under any relaxation for emergency use. It is, however, understood that the ASHPs and AHUs will not be in operation when the generators are in use, though fume extracts will be in operation. This has formed the basis of our assessment of generator noise.

It is understood that the smoke extracts will operate during an emergency only and will be tested fortnightly or monthly for a short period during the daytime only. Therefore this plant is to be assessed against the emergency plant criteria.

For all other items of plant ie, heat rejection and ventilation plant, it has been assumed that this plant will have the potential to operate at design duty 24 hours a day. It should be noted, however, that in practice, heat rejection plant is unlikely to be running at full duty at night. Nosie levels are therefore expected to be lower during the night time period, than those predicted.

CadnaA acoustic model

A 3D acoustic model of the proposed development and the surrounding noise sensitive receptors has been created using CadnaA to assess the impact of external plant from mechanical building services of Plot B and C to the nearest receptors.

The CadnaA acoustic model considers screening by building mass, reflections from building facades, geometrical divergence of noise sources to account for distance attenuation, and air absorption of sound as specified in ISO 9613-2.

Results

The initial results of the acoustic modelling resulted in exceedances of the plant noise criteria at the nearest residential receptors.

Therefore, enhanced mitigation measures have been incorporated into the design to reduce the plant noise egress levels at the nearest sensitive receptors. With the mitigation measures outlined in the following sections the day-time and night-time criteria can be met.

Mitigation measures

Barriers

The assessment has been based on the provision of the proposed barrier heights to the perimeter of each rooftop plant compound, as summarised below:

- Plot B, level 9 – 3.8 m
- Plot C1, roof – 5 m (with acoustic lid)
- Plot C2, roof – 4.3 m
- Plot C3, level 8 – 4.2 m
- Plot C3, level 9 – 2.7 m
- Plot C3, roof – 4.3 m

With the proposed barrier heights set out above, the plant noise limits should be achieved subject to the provision of the following mitigation measures.

Louvres

Areas of acoustic louvres are required to be provided adjacent to the ASHPs to assist with airflow.

Minimum insertion losses are provided in Table 7. These can be achieved with circa 600 mm acoustic louvres, such as the 600 mm IAC Noiseshield 2LP.

Table 7 Example acoustic louvres– minimum insertion losses

Item	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Acoustic louvre - Minimum insertion loss	5	8	12	16	22	18	15

Roof to Plot C1 compound

An acoustic 'lid' is to be provided to the Plot C1 rooftop plant compound, forming an enclosed rooftop plant zone.

A build-up rated at R_w 25 dB is to be provided, the design of which is to be developed as the design progresses, however, this could be achieved through the provision of a lightweight construction comprising insulated panels, or through a built-up rainscreen cladding system with a single layer of marine ply.

Air source heat pump mitigation

Proposals are to provide ASHPs with acoustic attenuation packages, based on the insertion losses from Allaway Acoustic AA303S package, the insertion losses for which are shown in Table 8

Table 8 Allaway AA303S – ASHP attenuation package insertion losses

Item	Octave band centre frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Minimum insertion loss, *R* (dB)	4	8	13	22	24	21	18	14

Air handling unit mitigation

Attenuators are required to be provided to the intake and exhaust ductwork of all air handling units.

The minimum required performances for the attenuators are set out in Table 9. The attenuators will need to be suitably sized and selected to provide sufficient control of regenerated noise.

Table 9 Minimum attenuator insertion losses - AHUs

	Octave-band centre frequency (Hz)								Typical length (mm)
	63	125	250	500	1k	2k	4k	8k	
Plot B – AHU 1, 2, 3, 4									
Intake minimum insertion loss (dB)	5	10	19	36	43	31	19	10	1500
Exhaust minimum insertion loss (dB)	4	9	17	34	42	33	22	14	1500
Plot C1 – AHU 1									
Intake minimum insertion loss (dB)	5	10	19	36	43	31	19	10	1500
Exhaust minimum insertion loss (dB)	7	17	23	42	46	46	40	25	1500
Plot C1 – AHU 2, 3									
Intake minimum insertion loss (dB)	10	19	26	44	47	45	38	22	1500
Exhaust minimum insertion loss (dB)	7	17	23	42	46	46	40	25	1500
Plot C3 level 8 – AHU 1, 2, 3									

	Octave-band centre frequency (Hz)								Typical length (mm)
	63	125	250	500	1k	2k	4k	8k	
Intake minimum insertion loss (dB)	5	10	19	36	43	31	19	10	1500
Exhaust minimum insertion loss (dB)	4	9	17	34	42	33	22	14	1500
Plot C3 roof – AHU 1, 2, 3									
Intake minimum insertion loss (dB)	5	10	19	36	43	31	19	10	1500
Exhaust minimum insertion loss (dB)	4	9	17	34	42	33	22	14	1500
Plot C3 basement – AHU 10, 11									
Intake minimum insertion loss (dB)	10	19	26	44	47	45	38	22	1500
Exhaust minimum insertion loss (dB)	7	17	23	42	46	46	40	25	1500

Fume exhaust fans

Attenuators are required to be provided to the exhaust ductwork of all FEFs.

The minimum required performances for the attenuators are set out in Table 10. The attenuators will need to be suitably sized and selected to provide sufficient control of regenerated noise.

Table 10 Minimum attenuator insertion losses

	Octave-band centre frequency (Hz)								Typical length (mm)
	63	125	250	500	1k	2k	4k	8k	
Exhaust minimum insertion loss (dB)	4	6	12	21	24	21	16	11	900

Smoke extract fans

Attenuators are required to be provided to the exhaust ductwork of all smoke extract fans.

The minimum required performances for the attenuators are set out in Table 11. The attenuators will need to be suitably sized and selected to provide sufficient control of regenerated noise.

Table 11 Minimum attenuator insertion losses

	Octave-band centre frequency (Hz)								Typical length (mm)
	63	125	250	500	1k	2k	4k	8k	
Exhaust minimum insertion loss (dB)	7	17	23	42	46	46	40	25	1500

It is understood that the smoke extract fan serving Plot C1 is to be located on the roof of a stairwell. The fan will need to be housed inside an enclosure with acoustic louvre to control case radiated noise if it is located outside of the currently proposed enclosure with lid.

Discussion

Predicted sound pressure levels are shown in the following sections for the nearest noise sensitive receptors. The outputs are based on normal operational plant ie, heat rejection and ventilation plant. As shown in the figures, with the provision of mitigation measures outlined above, the normally operational plant (ie without the generators or smoke extract fans) is considered to be compatible with the plant noise limits during the daytime and night-time.

Generator discussion

Provided the generators are mitigated to achieve a sound pressure level of 65 dBA at 1 m, and AHUs and ASHPs are not operational during mains back-up conditions, the plant noise limits are expected to be achieved.

Emergency / life safety plant

The emergency plant criteria are expected to be met with the mitigation measures outlined in this document.

On the basis of the above, with the specified mitigation measures, the proposed plant is predicted to comply with the noise egress limits set in relation to the previous planning applications. The impact of the changes in building height are therefore not expected to result in any implications from a noise perspective.

Results / plots

Outputs from the 3D model of the site are presented below. These are representative of typical operational noise levels and are based on the assessment with the amended barrier heights as set out above.

Receivers across Regents Canal (east)

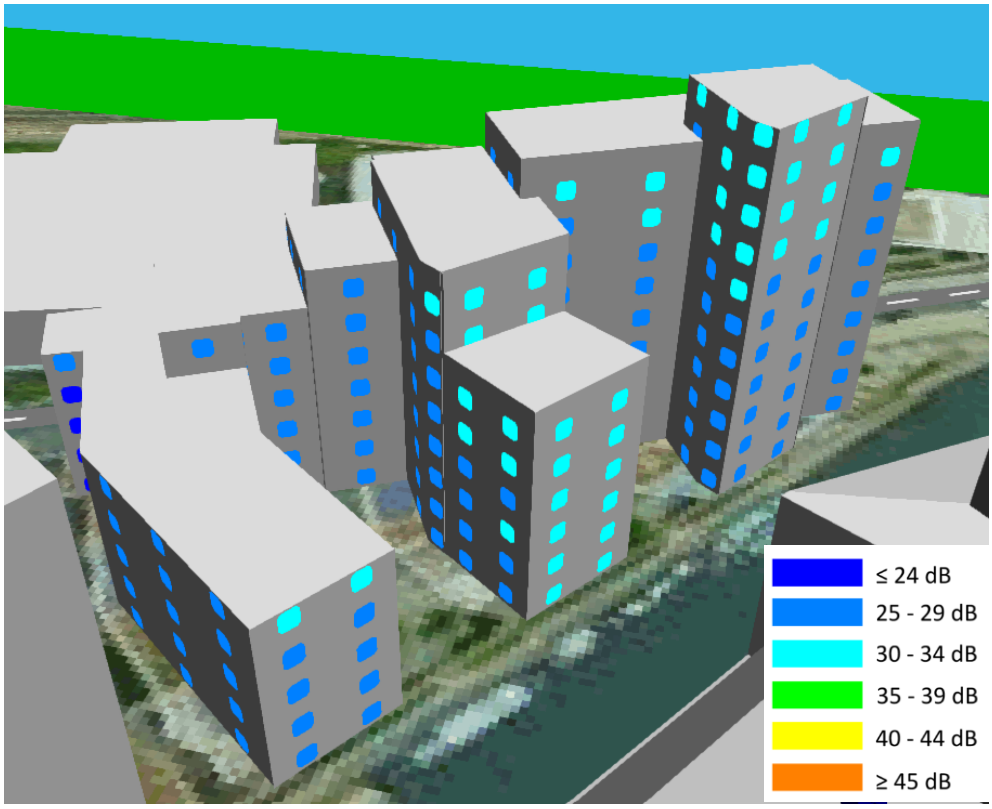

Figure 1 predicted noise levels for receivers across Regents Canal

Receivers on St Pancras Way (west)

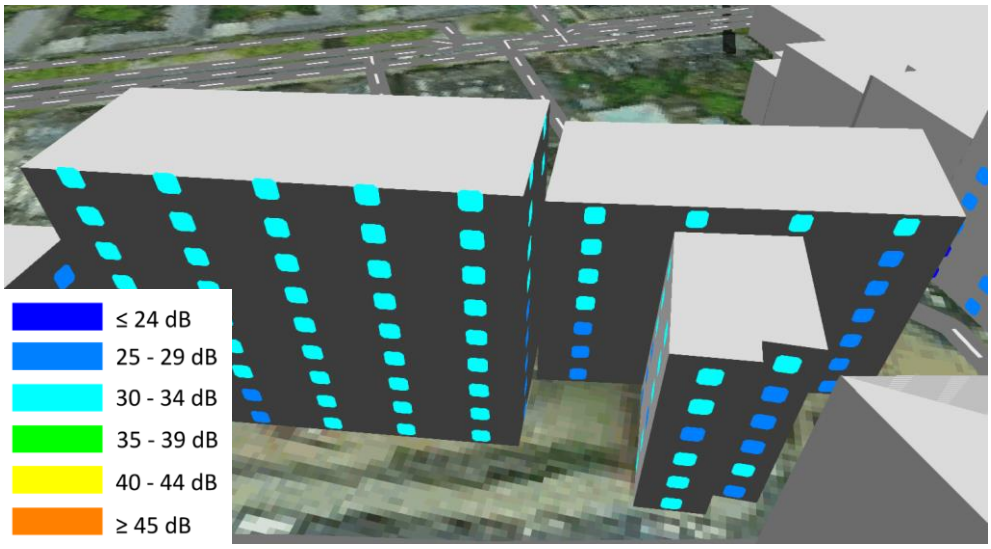

Figure 2 predicted noise levels for receivers on St Pancras Way

Receivers on Granary Street (South)

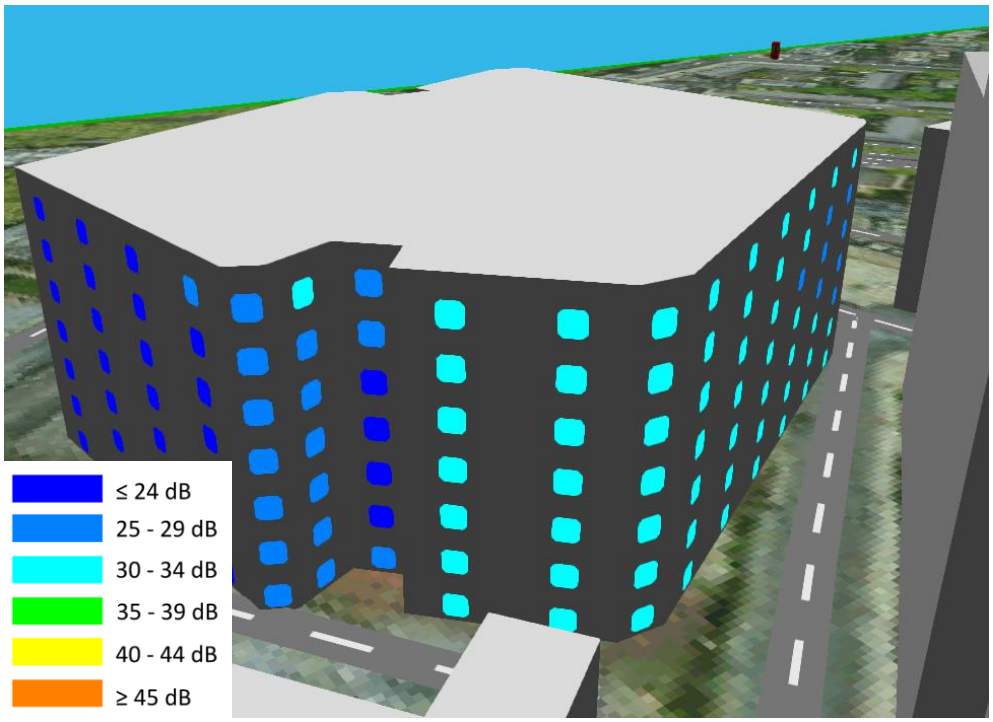

Figure 3 predicted noise levels for receivers on Granary Street