



WATERSIDE PLACES

ISLINGTON WHARF, PHASE 4

NOISE ASSESSMENT FOR PLANNING PURPOSES

1 April 2020

AEC REPORT: P3725/R1d/RDC

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DOCUMENT STATUS

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Revision	Date	Document Details	Author	Checked By
-	19/03/20	Original Document	RDC	AGB
a	23/03/20	Updated after discussions with Hannan	AGB	--
b	23/03/20	Updated after discussions with Hannan	AGB	--
c	26/03/20	Updated after discussions with Hannan	RDC	--
d	01/04/20	Updated after discussions with Hannan	RDC	--

1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Hannan Associates on behalf of Waterside Places to undertake a noise assessment for planning purposes in relation to the proposed residential development at Islington Wharf, Phase 4 in Manchester.
- 1.2 The proposed development is a multi-storey residential tower block consisting of 106, 1 and 2 bedroom apartments spread across a total of 16 stories, comprising a podium level for the first 11 floors. In addition on the ground floor, there is a residents foyer with the main entrance to the development, a 163m² commercial unit, bike storage and other facilities storage areas.
- 1.3 This report details the daytime and night-time noise levels measured on-site. Based on these noise levels, the impact that the external noise climate has on the design of the proposed new building is assessed, taking into account relevant planning guidance and the Local Authority's requirements. In addition, consideration has been given to the control of noise between the ground floor commercial and mixed use spaces and the residential units.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The proposed development is located on the junction where Great Ancoats Street meets Old Mill Street in the New Islington area of Manchester's city centre. The site location is identified on the attached Figure 1.
- 2.2 The south-western elevation of the development overlooks Great Ancoats Street which is a busy through road within the Ancoats suburb that connects Oldham Road to the north of the Manchester city centre, and the A57 to the south.
- 2.3 To the north-west of the development is Old Mill Street. Along Old Mill Street are a series of residential blocks, the New Islington Medical Practice and is where access to Bradford Road is gained.
- 2.4 The north-eastern elevation of the development is bound by Lockgate Mews, which is a small through road used to gain access to the parking areas associated with Islington Wharf Phase's 1 and 3.
- 2.5 The south-eastern elevation faces directly onto Islington Wharf Phase 1.
- 2.6 It is understood that the operator/tenant of the commercial unit is currently unknown, however, it could operate as any of the following use classes – A1, A2 or A3.

3.0 NOISE CLIMATE

- 3.1 Two sets of attended and unattended noise level surveys have been undertaken by AEC, in 2018 and 2020. These are discussed separately below.
- 3.2 All measurements during both surveys were undertaken in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'.
- 3.3 During both surveys, the prevailing noise climate was due to road traffic on the surrounding rounds. Full details of the measurements are presented in Appendix B and C, where further notes are also presented for each measurement location.

2018 Noise Survey

- 3.4 An attended noise level survey was undertaken by AEC on Monday 17 September 2018 between approximately 1600 and 1815h, and 2245 and 0000h. Measurements were undertaken at 5 locations around the development site identified as A to E on the attached Figure 1.
- 3.5 An extended unattended noise level survey was undertaken at a single location at the south-western site boundary of the development, directly overlooking Great Ancoats Street. The location is identified as L on Figure 1. Full logged data over 15-minute periods is held on file by AEC and is available on request.
- 3.6 A full measurement procedure is presented in Appendix B and the measured data is presented in Tables B1 and B2. The measured data for the extended noise level survey is presented in Graph B1, in Appendix B.

2020 Noise Survey

- 3.7 An attended noise level survey was undertaken by AEC on Thursday 5 March 2020, between approximately 1600 and 1830h. Measurements were undertaken at 4 locations around the development site identified as A, C, D and E, on the attached Figure 1.
- 3.8 An extended unattended noise level survey was undertaken at the same location as in 2018 (as presented in Section 3.5, above). The location is identified as L on Figure 1. Full logged data over 15-minute periods is held on file by AEC and is available on request.
- 3.9 A full measurement procedure is presented in Appendix C and the measured data is presented in Tables C1. The measured data for the extended noise level survey is presented in Graph C1, in Appendix C.
- 3.10 The summary of the daytime and night-time noise levels measured during each noise survey, is presented in Table 3.1, below. The tenth highest maximum noise levels at Location B & L are also presented in brackets.

Table 3.1 – Summarised Daytime & Night-time Noise levels

Elevation Facing (Measurement Location)	Period	Noise Level			
		2018		2020	
		dBL _{Aeq, T}	dBL _{Amax}	dBL _{Aeq, T}	dBL _{Amax}
South-West, (Location B & L)	Daytime	71	--	70	--
	Night-time	68	94 (80)	66	92 (80)
North-West (Location A)	Daytime	65 – 68	--	68	--
	Night-time	65	80	--	--
North-East (Location C, D, E)	Daytime	56 – 61	--	55 – 61	--
	Night-time	54	69	--	--
South-East (Location B & L)	Daytime	71	--	70	--
	Night-time	68	<90 (<80)	--	<90 (<80)

3.11 As the above demonstrates, the long-term measurements at Location L highlight that there has been a slight reduction in noise levels, which is believed to be due to their being a lane closure on Great Ancoats Street at the time of measurement. Therefore, the 2018 noise level data has been used.

3.12 At all other locations, the noise levels have remained consistent.

4.0 BASIS OF ASSESSMENT

National Planning Policy Framework

- 4.1 The latest Planning Policies are included in the National Planning Policy Framework published by the Department for Communities and Local Government and dated March 2012 and revised in February 2019.
- 4.2 This planning policies which relate specifically to noise are presented in paragraphs 170, 180 and 182 which are reproduced below:

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

€ preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise.

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

(5) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life ;

(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.

- 4.3 Further to the above, the Governments ‘Planning Practice Guidance’ published on 6 March 2014 and updated on 22 July 2019 states:

‘Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.’

- 4.4 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

Local Authority Requirements

- 4.5 Manchester City Council has produced 'Planning & Noise – Technical Guidance' (2015) (PNTG) in relation to their requirements for noise assessments to accompany planning applications.

Internal Noise Limits

- 4.6 Section 3.6.1.1 of this document states "*Manchester City Council has adopted the following internal limits for residential properties:*
- *Bedroom (night-time – 23.00 – 07.00) 30dB_{L_{Aeq}} (individual noise events should not normally exceed 45dB_{L_{Amax, F}} by more than 15 times);*
 - *Living Rooms (daytime – 07.00 – 23.00) 35dB_{L_{Aeq}}.*
- 4.7 These levels are based on guidance presented in BS8233:2014 'Guidance on sound insulation and noise reduction for buildings' (BS8233), and the World Health Organisation (WHO) document 'Guidelines for Community Noise' (1999).

Ventilation

- 4.8 The WHO guidelines assumes that attenuation of external to internal noise levels provided by a window partially open for ventilation is up to 15dB.
- 4.9 Therefore, for whole dwelling (background) ventilation to be provided via a partially open window, the external noise levels presented in Table 4.1 should not be exceeded.

**Table 4.1 – Allowable External Noise Levels for Background Ventilation
via a Partially Opened Window**

Activity	Location	Noise Limit, dB		
		Daytime 0700 – 2300h	Night-time 2300 – 0700h	
		L _{Aeq,16h}	L _{Aeq,8h}	L _{Amax}
Resting	Living Room	50	-	-
Dining	Dining Room/Area	55	-	-
Sleeping (daytime resting)	Bedroom	50	45	60

- 4.10 The ventilation specifications presented in this report are based on achieving the requirements of Approved Document F 'Ventilation' (2010) of the Building Regulations only.

- 4.11 ADF requires that continuous whole dwelling ventilation is provided to limit the accumulation of moisture and other pollutants originating within a building. This is typically achieved either via a partially opened window, or by a whole building ventilation system through the provision of trickle ventilators or mechanical ventilators. ADF states that '*The ventilation provisions will not necessarily meet cooling needs*'.
- 4.12 As purge ventilation is typically undertaken for short periods to disperse pollutants it is generally accepted that this can be done with opening windows.
- 4.13 In terms of allowable internal noise levels during periods when open windows are used for the control of overheating, AEC understands that MCC have no specific requirements.
- 4.14 However, discussions with Richard Knightley, a senior EHO with MCC has indicated that MCC is aware of this issue and that it should be considered. Furthermore, he indicated that how long opening windows would need to be relied upon (long and short term) to control overheating would form part of its consideration.
- 4.15 As MCC is still currently developing its guidance in relation to this issue, consideration could be given to guidance presented in the Association of Noise Consultants (ANC) document – '*Acoustic ventilation and Overheating (AVO)*', which is a residential design guide issued in January 2020.
- 4.16 Based on the noise levels presented in AVO, AEC would propose that where internal ambient noise levels are below 50dBL_{Aeq, 16h} during the daytime, 42dBL_{Aeq, 8h} during the night-time and when the typical maximum noise level does not exceed 65dBL_{Amax}, the control of overheating can be provided via an open window. These internal noise levels are the upper end of the medium risk category for adverse effects.
- 4.17 It should be noted that the limits are suggested only at this stage, and subject to confirmation with MCC, depending on how long windows would need to remain open for higher noise limits may be acceptable.

Atmospheric Plant Noise Emissions

- 4.18 Based on guidance presented in MCC's document PNTG, the following is stated in relation to noise level limits for industrial sources at noise sensitive premises:

"Externally mounted ancillary 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."

Noise Associated With Ground Floor Uses

- 4.19 The ground floor will include the following spaces that could potentially have a noise impact on the residential units above:

- plantrooms;
- commercial unit (A1, A2, A3 or facility management office space);
- refuse stores;

Plantrooms

- 4.20 In terms of the plant rooms, it is suggested that 'average' dB_{Leq} noise from these areas should be controlled to no greater than NR20 in the rooms above.

Ground Floor Commercial Unit

- 4.21 In relation to the ground floor commercial unit, in AEC's experience, it would be considered appropriate to control sound transfer from these space into adjacent habitable room to not exceed $NR30_{L_{max}}$ and $NR25_{L_{max}}$ during the daytime and night-time periods, respectively. This is likely to result in noise levels being just audible and it is unlikely to be deemed intrusive.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

External Noise Levels

- 5.1 With reference to AEC's on-site daytime and night-time measured noise levels as described in Section 3, the worst-case daytime & night-time ambient noise levels have been predicted at each façade using CadnaA®. The attached Figures D1 – D6, in Appendix D, show the prediction model that has been completed for each façade.
- 5.2 Using the noise levels presented above, the free-field daytime ambient and night-time ambient and the tenth highest maximum noise levels external to each elevation have been determined, taking into account distance attenuation. These determined noise levels are presented in Appendix B and C.

Assessment of Background Ventilation Requirements

- 5.3 A comparison of the external noise levels presented in Table 4.1 Appendix B and C, with the allowable limits for rooms to be naturally ventilated for background ventilation via a partially open window indicates that windows would need to be closed to achieve the internal noise level limits discussed above.
- 5.4 As such, alternative means of ventilation will be required in order that appropriate levels of background ventilation are achieved in line with the requirements of Approved Document F of the Building Regulations.

- 5.5 It is understood that the required background ventilation is being provided by a whole house system with atmospheric inlets and exhausts ducted to the external façade of each room. Opening windows will then be relied upon for purge ventilation and, where considered acceptable, for the control of overheating.

Assessment of Glazing Sound Insulation Requirements

- 5.6 In relation to the glazing requirements, calculations have been undertaken to determine the required sound insulation performance of the glazing to meet the internal noise level limits presented in BS8233 and WHO.
- 5.7 The calculations have been undertaken based on noise level spectrum data measured on-site, an assumed glazed percentage area in each room of 50%, and the proposed rooms sizes, which are based on the following drawings provided to AEC by Ryder Architecture:
- IW4-RYD-00-00-DR-A-3000-S2-P02-Level 00 GA Plan;
 - IW4-RYD-00-01-DR-A-3001-S2-P02-Level 01 GA Plans;
 - IW4-RYD-00-ZZ-DR-A-3002-S2-P01-Level 02-06 GA Plans;
 - IW4-RYD-00-ZZ-DR-A-3007-S2-P02-Levels 07-10 GA Plans;
 - IW4-RYD-00-ZZ-DR-A-3011-S2-P02-Level 11-15 GA Plan.
- 5.8 The required sound insulation performance for the glazing on Levels 1 – 10, is presented in Appendix B.
- 5.9 The required sound insulation performance for the glazing on Levels 11 – 15, is presented in Appendix C.
- 5.10 Full octave band sound insulation data relating to the overall required performances of each of the proposed glazing presented in Appendix B and C, are included in Table 5.1, below.

Table 5.1 – Octave Band Centre Frequency Sound Reduction Indexes

Overall Sound Insulation Performance	SRI, dB @ Octave Band Centre Frequency, Hz					
	125	250	500	1k	2k	4k
39dBR _w / 33dBR _w + C _{tr}	27	29	36	41	42	52
38dBR _w / 32dBR _w + C _{tr}	26	27	34	40	38	46
36dBR _w / 29dBR _w + C _{tr}	25	22	33	40	43	44
34dBR _w / 29dBR _w + C _{tr}	21	20	31	39	37	47
31dBR _w / 25dBR _w + C _{tr}	24	20	25	35	38	35

- 5.11 It should be noted that the overall sound insulation performances presented above can be achieved with glazing that has different octave band centre frequency values than those listed in Table 5.1, above. However, we would strongly recommended that any alternative glazing performance is first assessed by AEC.

Control of Overheating

- 5.12 Ideally, internal noise levels would not exceed around 50dBL_{Aeq, 16h} during the daytime, and 42dBL_{Aeq, 8h} & 65dBL_{Amax} in bedrooms at night when windows are open to control overheating. However, MCC has indicated that the allowable internal noise levels will depend upon the periods (short and long term) that the windows will need to be remain open for and as such, this element will require confirmation.

Plantrooms

- 5.13 Based on the proposed 225mm thick concrete slab between the ground floor plant rooms and first floor apartments, provided that noise levels are controlled to no greater than NR75 in the plant room (which is a realistic limit for the majority of plant areas) noise in the habitable rooms above would be limited to NR15-20 and as such, comply with the suggested limit.

Ground Floor Commercial Unit

- 5.14 Based on the proposed 225mm thick solid concrete slab (with an assumed density of 2400kg/m³) between the ground floor units and apartments, calculations indicate that the floor would achieve an airborne sound insulation performance of around 55dBD_w. This should be sufficient for most offices and shops.
- 5.15 However, if the ground floor unit was to have a noisier operator, such as a restaurant (class A3 use), a mass barrier ceiling could potentially be required.
- 5.16 Ambient and maximum noise levels can vary greatly in a restaurant depending on the operator, therefore, a more detailed assessment of the space would be required once the operator has been confirmed. If the operator wants to play amplified music, a noise level limit may need to be agreed in their tenancy agreement.
- 5.17 In terms of noise breaking out of the external envelope, if the tenant wanted to play amplified music, enhanced glazing may be required and doors may need to be lobbied. This would aspect would also need to be developed once the operator has been confirmed.
- 5.18 To adequately control potential noise breakout to the nearest resident properities, consideration must be given to the design of the external envelopes of the A3 units. This should be developed at the design stage.

Atmospheric Plant Noise Emissions

- 5.19 It is understood that any mechanical services plant will be located on the podium level and on the roof of the tower with the nearest affected windows would be those associated with Islington Wharf Phase 4.
- 5.20 As such, atmospheric plant noise should be controlled to the limits presented in Table 5.2, below, which are free-field and are approximately 5dB below the lowest measured background noise level.

Table 5.2 – Plant Noise Level Limits (At nearest residential window)

Period	Plant Noise Limit, dBL _{Aeq,T}
Daytime (0700h to 2300h)	45
Night-time (2300h to 0700h)	<40

- 5.21 The above noise limits assume that there is no acoustic character associated with the mechanical services plant (e.g. tonality or intermittency).
- 5.22 These overall noise limits would apply to the total plant noise from all plant associated with the building combined. Once further details relating to unit operation a noise limit can be determined for each to be included in any commercial unit tenancy agreement.

6.0 SUMMARY AND CONCLUSIONS

- 6.1 Acoustic & Engineering Consultants Ltd has undertaken a noise assessment in relation to the proposed residential development block at Islington Wharf, Phase 4.
- 6.2 Two separate noise surveys of the area surrounding the development were carried out by AEC in 2018 and 2020, and as presented in Appendices B & C, the noise climate in this area has remained broadly unchanged during this period. During the daytime and night-time noise surveys, it was demonstrated that the noise affecting the site is predominantly due to road traffic on Great Ancoats Street and Old Mill Street.
- 6.3 With reference to the above, the noise levels affecting the development have been predicted and are presented in Appendix B and C and in Figures 1 – 6, in Appendix D.
- 6.4 Based on the above, to achieve appropriate internal noise levels in line with the Local Authority's requirements of 30dBL_{Aeq} and 45dBL_{Amax} in bedrooms during the night-time and 35dBL_{Aeq} in living rooms during the daytime, windows must remain closed on all facades of the building.
- 6.5 The sound insulation performances required for the external windows, in order to comply with the above internal noise level limits, are identified on Appendix B and C. In general terms, this amounts to a very high performing double glazing to the windows with a view of Great Ancoats Street and a higher than standard on other facades.
- 6.6 In relation to ventilation, background ventilation in line with the requirements of Approved Document F will be provided within each apartment by means of a whole house system.
- 6.7 In terms of internal noise levels during times of enhanced ventilation provision to assist with control of overheating, this is discussed in Section 5, and requires final confirmation.
- 6.8 Calculations indicate that the proposed 225mm thick concrete slab would suitably control sound transfer from the ground floor commercial unit into the apartments above, provided that the operator is a café, shop or office. However, if a restaurant operated out of the

ground floor unit a mass barrier ceiling may be required and this would be assessed once the operator was confirmed.

- 6.9 An external mechanical services plant noise emission limit has been set at 5dB below the lowest measured background noise at the nearest noise sensitive receivers. This would be the Islington Wharf Phase 4 apartments nearest to the specific item of plant.
- 6.10 As shown above, although noise levels affecting some of the building facades are relatively high, appropriate mitigation measures can be implemented into the building design to minimise any potential impact from road traffic noise on future occupants. Based on this, it is considered that noise alone should not be considered a determining factor in relation to any planning permission being sought.

FIGURE 1 – Site Showing Monitoring Locations



Map data ©2020 Google United Kingdom

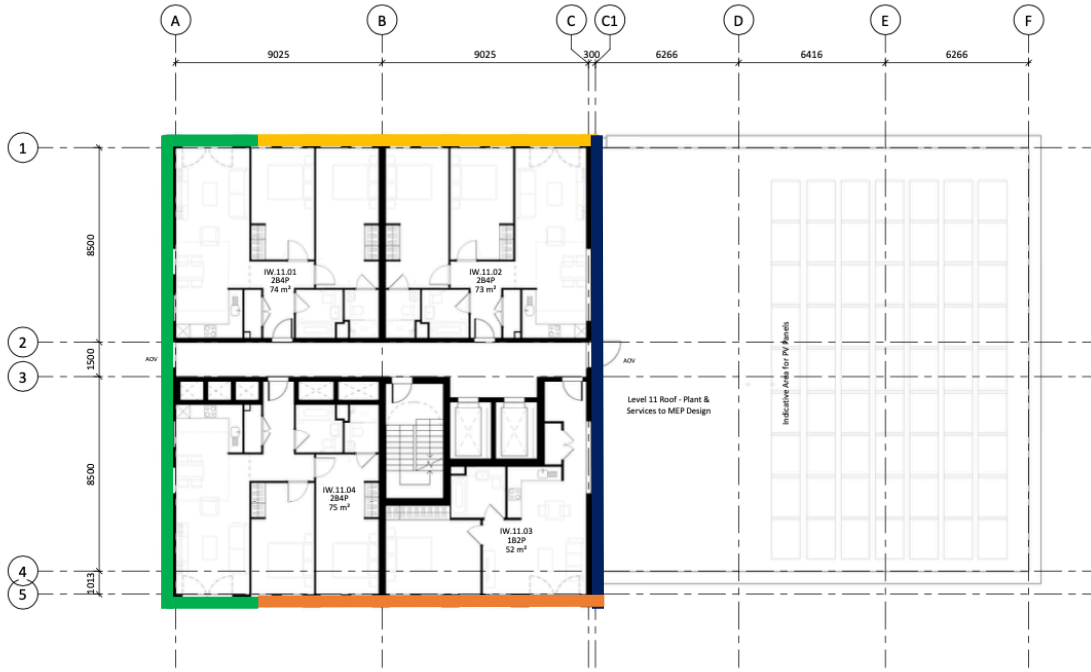
**FIGURE 2 – Daytime and Night-time External Noise Levels
& Glazing Sound Insulation Performance Requirements
Floors 1 – 10**



Elevation	Daytime Noise Levels, dBL _{Aeq} , 16h	Night-time Noise Levels, dBL _{Aeq} , 8h	Night-time Maximum Noise Levels, dBL _{Amax} , F
South-West (Great Ancoats Street)	70	<67	80
North-West (Old Mill Street)	68	65	75
North-East	62	59	69
South-East	65	62	75

Elevation Colour (Figure 2)	Glazing Sound Insulation Performance Requirements	
	Daytime	Night-Time
—	39dBR _w / 33dBR _w + C _{tr}	--
—	36dBR _w / 29dBR _w + C _{tr}	38dBR _w / 32dBR _w + C _{tr}
—	36dBR _w / 29dBR _w + C _{tr}	--
—	34dBR _w / 27dBR _w + C _{tr}	36dBR _w / 29dBR _w + C _{tr}

**FIGURE 3 – Daytime and Night-time External Noise Levels
& Glazing Sound Insulation Performance Requirements
Floors 11+**



Elevation	Daytime Noise Levels, dBL _{Aeq} , 16h	Night-time Noise Levels, dBL _{Aeq} , 8h	Night-time Maximum Noise Levels, dBL _{Amax} , F
South-West (Great Ancoats Street)	<67	<63	<70
North-West (Old Mill Street)	<65	<61	<70
North-East	<60	<55	<65
South-East	<63	<60	<70

Elevation Colour (Figure 3)	Glazing Sound Insulation Performance Requirements	
	Daytime	Night-Time
Green	36dBR _w / 29dBR _w + C _{tr}	--
Yellow	34dBR _w / 25dBR _w + C _{tr}	34dBR _w / 27dBR _w + C _{tr}
Blue	31dBR _w / 25dBR _w + C _{tr}	--
Orange	34dBR _w / 25dBR _w + C _{tr}	34dBR _w / 25dBR _w + C _{tr}

APPENDIX A – Acoustic Terminology in Brief

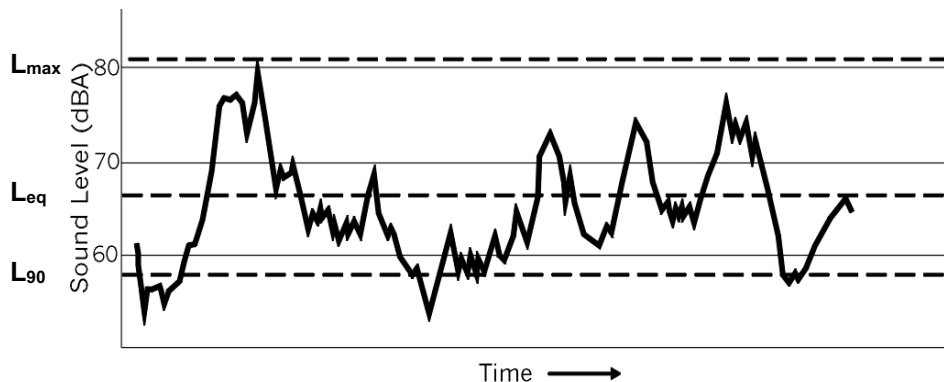
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most sound is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasises or reduces the importance of certain frequencies within the audible range.

Sound Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the sound.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of sound can be described by several different levels. The most common of these are described below. It should be noted that in many instances in the main body of text, the unit will be preceded by a *dB* descriptor in the report e.g. $L_{Aeq,T}$ could be written $dB L_{Aeq,T}$



Example of Sound Level Varying With Time

$L_{Aeq,T}$	The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, <i>T</i> . It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the "ambient" noise level.
$L_{A10,T}$	The (A-weighted) sound level exceeded for 10% of a measurement period. It is the value often used to describe traffic noise.
$L_{A90,T}$	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe background noise.

L_{Amax}	The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.
Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
Façade Level	This refers to the sound level measured outside, at 1m from a hard reflecting surface, typically 3dB greater than the free-field level.
NR	Noise Rating – a graphical method for assigning a single number rating to a noise spectrum and is often use to specify noise level limits for mechanical services.

APPENDIX B – 2018 Noise Survey Details

Date & Time of Survey:	Unattended: Monday 17 September 2018, 1600 – Tuesday 18 September 0900h					
	Attended: Monday 17 September 2018, 1600 – 1815h, & 2245 - 2400h					
Personnel:	Ross Chamberlain (AEC).					
Equipment Used:	Unattended: Cirrus CR:171B Real Time Analyser (AEC Kit 3)					
	Attended: Cirrus CR:171B Real Time Analyser (AEC Kit 5)					
Calibration:	The sound level analysers, which conforms to BS EN 61672-1: 2003 ' <i>Electro acoustics – sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, were in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Unattended:					
	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	Monday, 17th	Day	Dry	18°C	5m/s Easterly	45%
	Monday, 17 th – Tuesday 18th	Night	Dry	15°C	Negligible	65%
	Tuesday, 18th	Day	Dry	15°C	4m/s Easterly	70%
	Attended:					
	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	Monday, 17th	Day	Dry	18°C	5m/s Easterly	45%
	Monday, 17th	Night	Dry	15°C	Negligible	65%
Measurement Locations:	Unattended: The microphone was connected via an extension cable around 3m high and fixed externally at a location 2m from the site cabins at the Islington Wharf Phase 4 development. The elevation was facing Great Ancoats Street. The location is identified as L on Figure 1.					
	Attended: Measurements were undertaken at 5 locations around the development site. Identified as A to E on Figure 1 and described below. A – 1m from Old Mill Street. B – Spot check measurements representative of long-term measurements made at location L. Location B was 1m from the nearest Façade. C – Along Ashton Canal Tow Street D – Along Vesta Street. 1m from the Vesta Street road, and 1m from the nearest Façade. E – Located along the street of from Old Mill Street.					
Measurement Details:	Unattended: Measurements were logged continuously over 15 minute periods for post processing and assessment. This location was selected to represent the worst-case affected façade of the development that would be affected by road traffic noise along Great Ancoats Street.					
	Attended: Measurements were undertaken over various periods in terms of and L_{eq} , L_{90} , L_{10} and L_{max} .					
Façade / Free-Field:	Unattended: Façade level					
	Attended: A, C & E - free-field, B & D façade.					

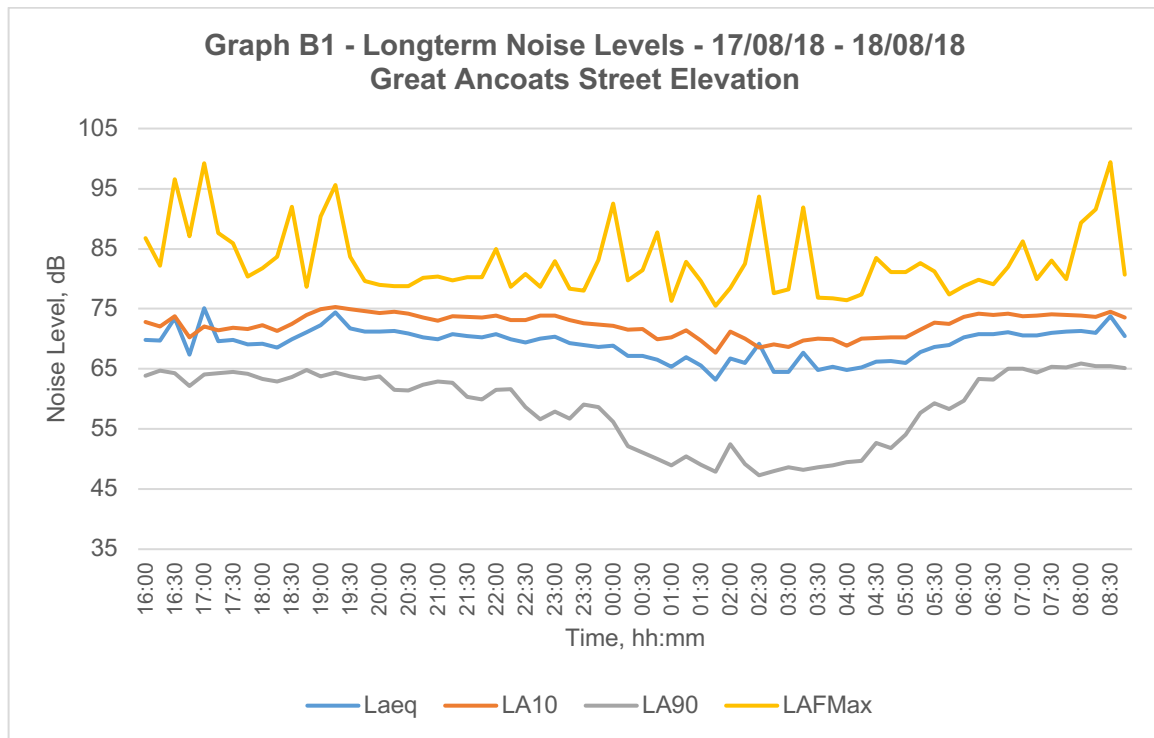
Measured Data:	Full octave band centre frequency data was obtained for all measurements. Full results for the attended measurements are given in Tables B1 and B2. The measured daytime and night-time periods for the unattended survey is presented on Graph B1.
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TABLE B1 – Attended Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L _{Aeq}	L _{A10}	L _{A90}	L _{Amax, F}	
A	1605 – 1620	67.1	69.9	60.5	80.4	Main noise source was road traffic along Old Mill Street. Maximum noise levels due to vehicles/HGV's along Old Mill Street.
	1641 – 1656	67.5	70.3	60.7	80.2	
	1700 – 1715	67.9	69.8	59.5	90.3	
	1800 - 1815	65.2	68.1	56.4	83.3	
B	1622 - 1637	71.0	73.6	65.0	84.8	Main noise source was distant road traffic along Great Ancoats Street. Maximum noise levels due to vehicles/HGV's along Great Ancoats Street.
C	1719 - 1729	56.0	57.8	53.4	66.5	Main noise source was distant road traffic along Great Ancoats Street. Maximum noise levels due to vehicles/HGV's along Great Ancoats Street.
D	1735 - 1745	60.9	62.4	58.7	71.1	Main noise source was road traffic along Old Mill Street. Maximum noise levels are due to loud vehicles/HGV's along Old Mill Street.

TABLE B2 – Attended Measured Night-Time Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L _{Aeq}	L _{A90}	L _{Amax, F}	
A	2247 - 2300	62.5	50.5	78.0	Main noise source was road traffic along Old Mill Street. Maximum noise levels are due to vehicles/HGV's along Old Mill Street.
	2300 - 2315	61.9	50.3	79.5	
	2344 - 2359	61.2	49.3	80.3	
B	2333 - 2335	69.3	63.6	75.8	Main noise source was road traffic along Great Ancoats Street. Maximum noise levels are due to vehicles/HGV's along Great Ancoats Street.
C	2337 - 2342	52.3	47.6	60.1	Main noise source was distant road traffic along Great Ancoats Street. Maximum noise levels are due to vehicles/HGV's along Great Ancoats Street.
E	2316 - 2331	53.5	45.4	64.8	Main noise source was road traffic along Old Mill Street. Maximum noise levels are due to vehicles/HGV's along Old Mill Street.



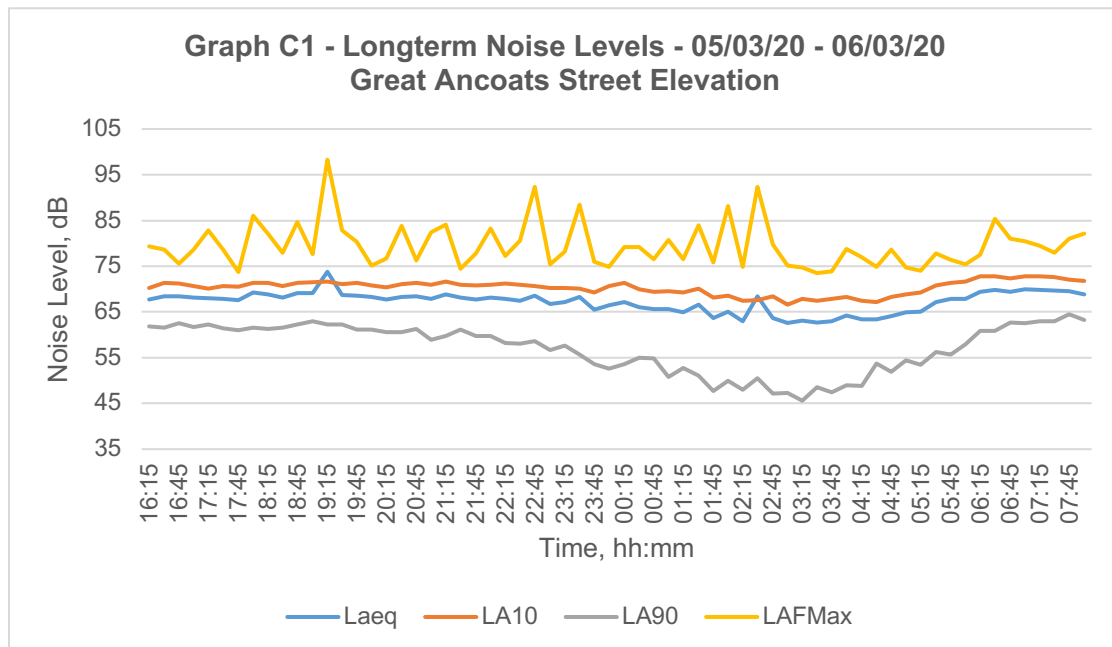
APPENDIX C – 2020 Noise Survey Details

Date & Time of Survey:	Unattended: Thursday 5 March 2020, 1615h to Friday 6 March 2020, 0800h					
	Attended: Thursday 5 March 2020, 1600h to 1830h					
Personnel:	Ross Chamberlain (AEC).					
Equipment Used:	Unattended: Cirrus CR:171B Real Time Analyser (AEC Kit 5)					
	Attended: B&K 2260 Real Time Analyser (AEC Kit 2)					
Calibration:	The sound level analysers, which conforms to BS EN 61672-1: 2003 ' <i>Electro acoustics – sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, were in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Unattended:					
	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	Thursday 5 th	Day	Dry	6°C	3m/s north-west	90%
	Thursday 5 th – Friday 6 th	Night	Dry	3°C	2m/s north	80%
	Friday 6 th	Day	Dry	4°C	Negligible wind speed & direction	45%
	Attended:					
	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	Thursday 5 th	Day	Dry	6°C	3m/s north-west	90%
Measurement Locations:	Unattended: The microphone was connected via an extension cable around 3m high and fixed externally above the site boundary fence at the Islington Wharf Phase 4 development. The elevation was facing Great Ancoats Street. The location is identified as L on Figure 1.					
	Attended: Measurements were undertaken at 5 locations around the development site. Identified as A to E on Figure 1 and described below. A – 1m from Old Mill Street. C – Along Ashton Canal Tow Street D – Along Vesta Street. 1m from the Vesta Street road, and 1m from the nearest Façade. E – Located along the street of from Old Mill Street.					
Measurement Details:	Unattended: Measurements were logged continuously over 15 minute periods for post processing and assessment. This location was selected to represent the worst-case affected façade of the development that would be affected by road traffic noise along Great Ancoats Street.					
	Attended: Measurements were undertaken over various periods in terms of and L_{eq} , L_{90} , L_{10} and L_{max} .					
Façade / Free-Field:	Unattended: Free-field level					
	Attended: A, C & E - free-field, B & D façade.					

Measured Data:	Full octave band centre frequency data was obtained for all measurements. Full results for the attended measurements are given in Table B1. The measured daytime and night-time periods for the unattended survey is presented on Graph B1.
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TABLE C1 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L _{Aeq}	L _{A10}	L _{A90}	L _{Amax, F}	
A	1600 - 1615	68.8	72.0	60.8	86.3	Main noise source was road traffic along Old Mill Street. Maximum noise levels due to vehicles/HGV's along Old Mill Street.
	1700 - 1715	68.3	71.8	59.6	79.8	
	1800 - 1815	67.9	71.2	59.8	78.9	
C	1646 - 1653	55.1	56.8	51.3	67.6	Main noise source was distant road traffic along Great Ancoats Street. Maximum noise levels due to vehicles/HGV's along Great Ancoats Street.
	1745 - 1750	55.2	55.6	51.4	70.8	
D	1640 - 1645	56.8	59.8	51.3	74.0	Main noise source was road traffic along Old Mill Street. Maximum noise levels due to vehicles/HGV's along Old Mill Street.
	1739 - 1744	55.2	58.2	49.7	65.3	
E	1618 - 1628	60.8	63.5	55.4	73.5	Main noise source was road traffic along Old Mill Street. Maximum noise levels due to vehicles/HGV's along Old Mill Street.
	1726 - 1736	59.9	62.7	53.9	75.3	



APPENDIX D – Predicted External Noise Levels

Figure D1 – Daytime Predicted External Noise Levels – North-West & South-West Facades

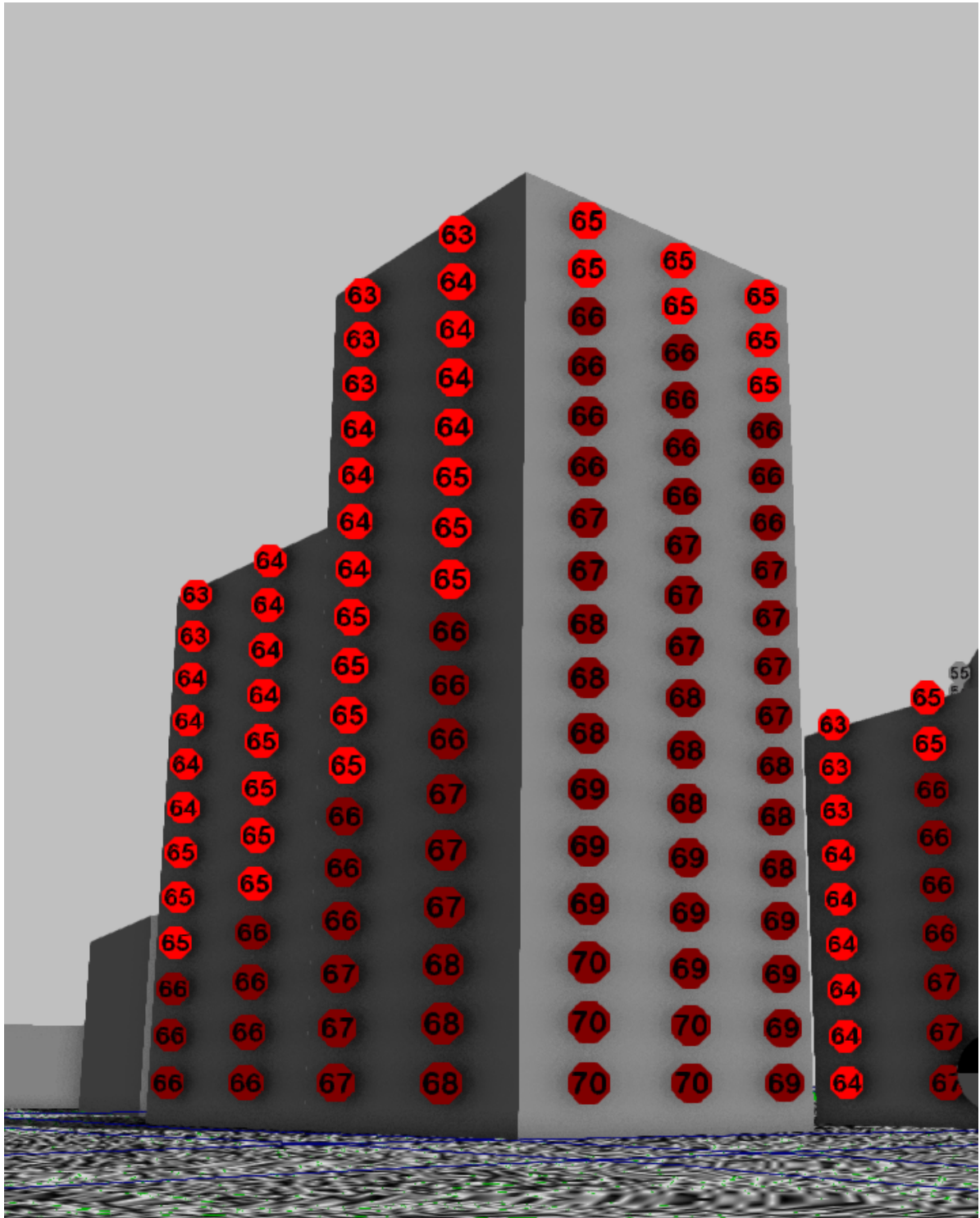


Figure D3 – Daytime Predicted External Noise Levels – North-East & North-West Facades

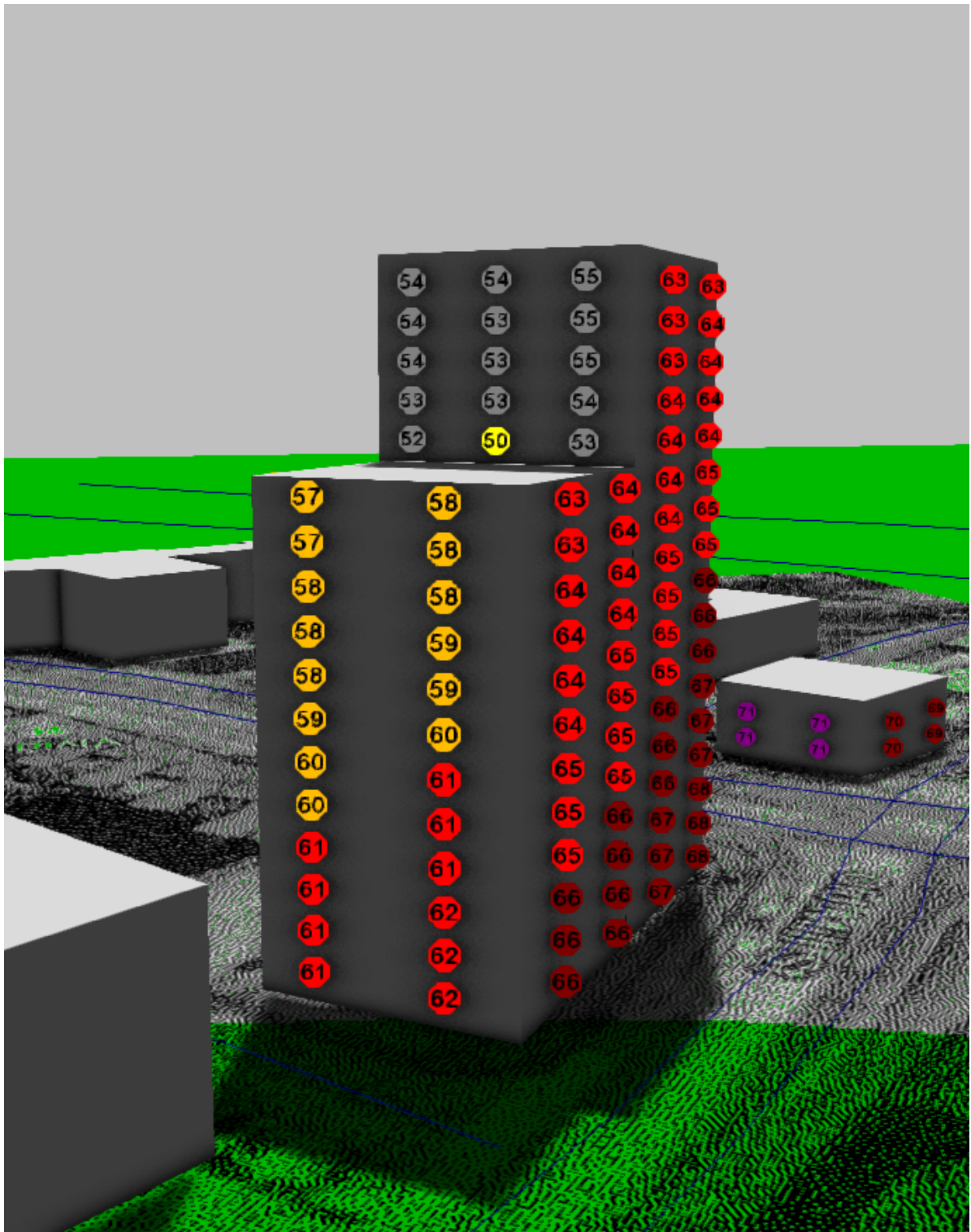


Figure D4 – Predicted Night-time External Noise Levels – North-West & South-West Facades

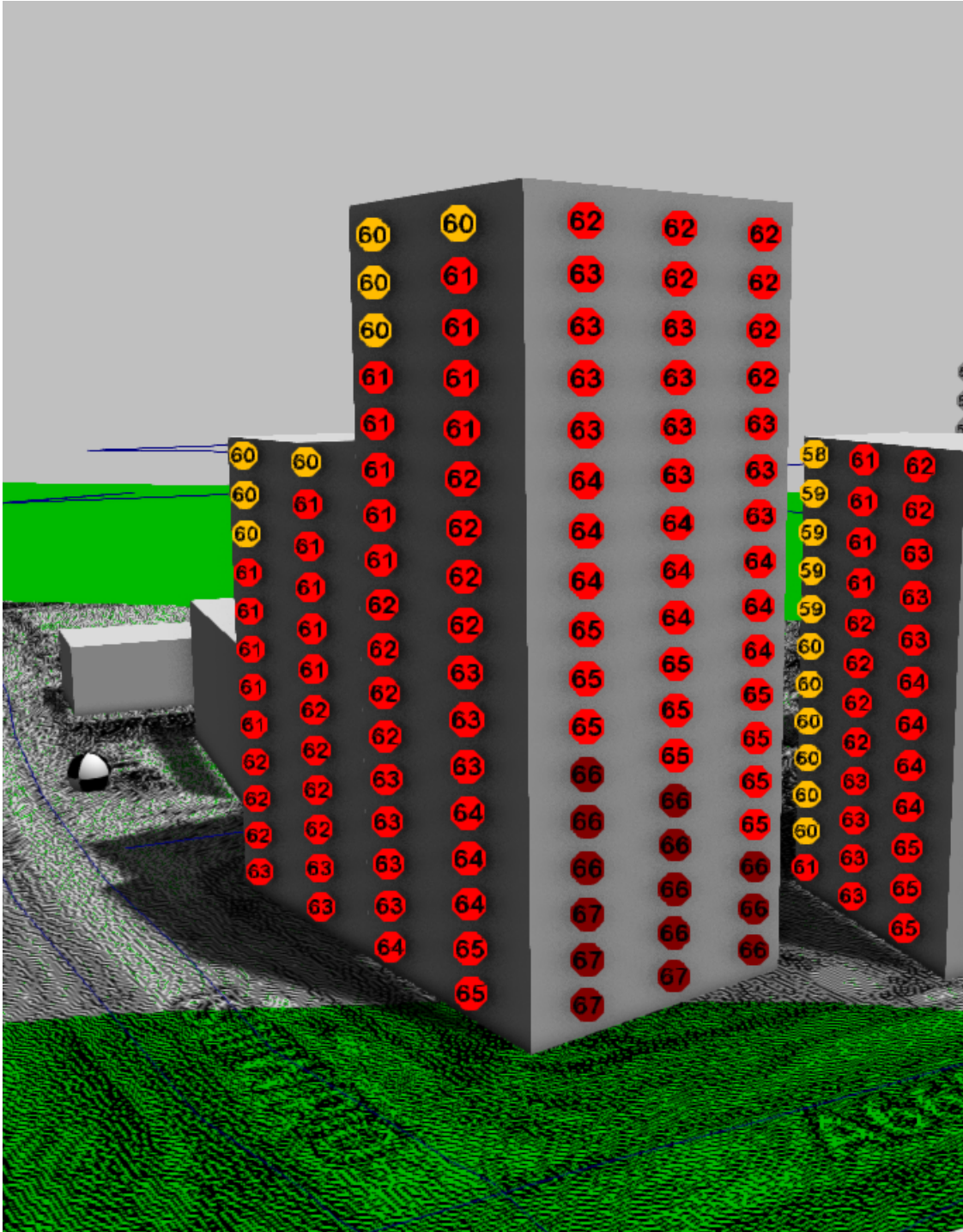


Figure D5 – Night-time Predicted External Noise Levels – South-West & South-East Facades

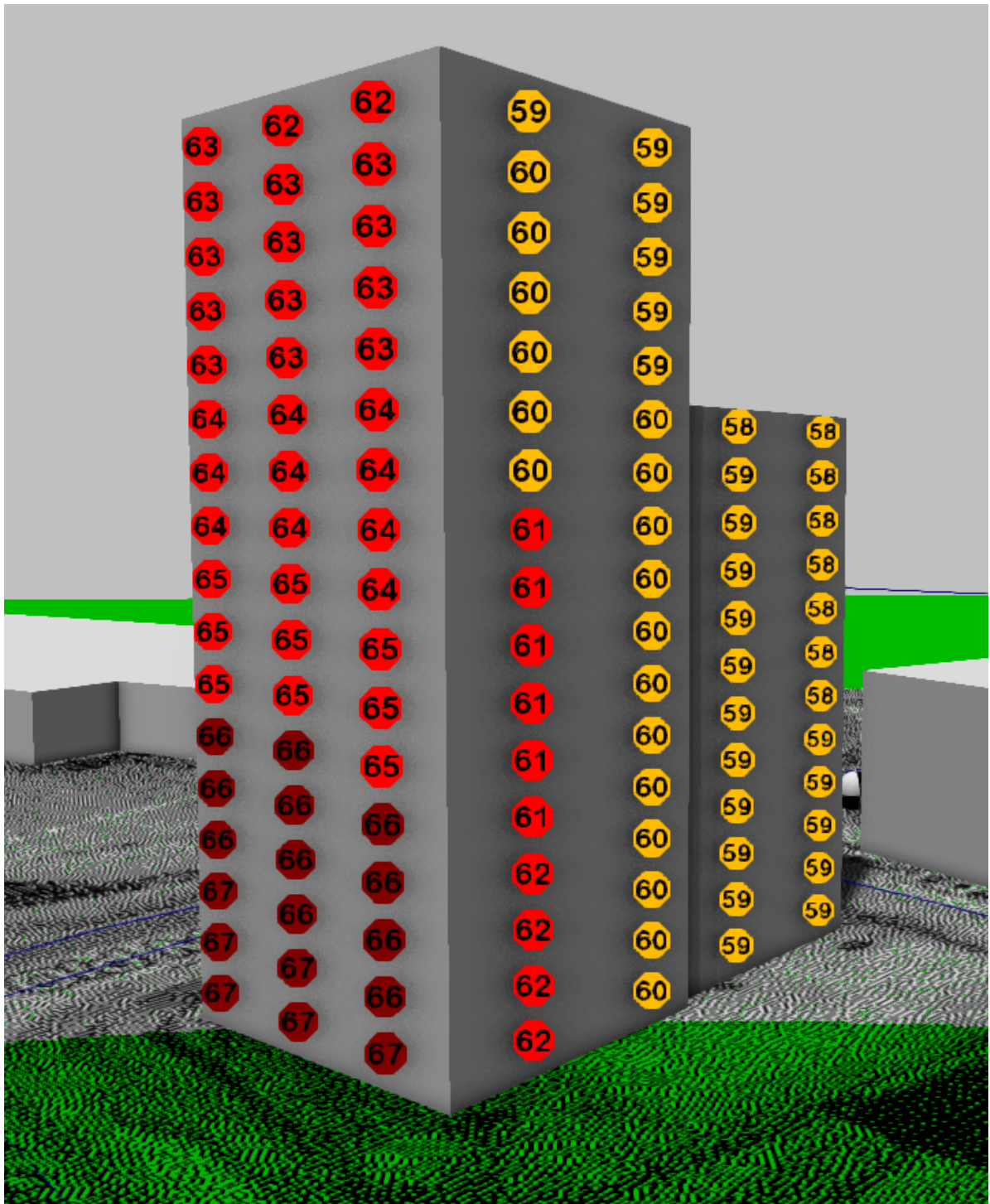


Figure D6 – Night-time Predicted External Noise Levels – North-West & South-West Facades

