FORMER GAMECOCK PUBLIC HOUSE, BOOTH STREET WEST

Noise Impact Assessment

Curlew Alternatives Eighth Property LP

FORMER GAMECOCK PUBLIC HOUSE, BOOTH STREET WEST

Noise Impact Assessment

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EXECUTIVE SUMMARY

A noise impact assessment has been conducted where the following points have been concluded:

- The proposed development is likely to be subject to relatively high noise levels in the region of
  - 56 – 66 dB $L_{Aeq,16hr}$ during the day
  - 50 – 60 dB $L_{Aeq,8hr}$ during the night
  - 66 – 79 dB L_{amax} noise peaks during the night.
- A façade specification for the windows and solid façade has been provided such to comply with BS 8233 internal noise limits.
- Background noise levels have also been presented such to assess plant noise break out against.
- It is proposed that plant noise should not exceed 5dB below these background noise levels.
- Plant noise limits based on these have been put forward.

1.0 INTRODUCTION

This report outlines the results of a noise impact assessment both in terms of noise break out from the development and also noise break in. The assessment has been conducted following the environmental noise survey conducted on 25th – 26th February 2021.

2.0 PERFORMANCE STANDARDS

2.1 Internal Ambient Noise Limits – External Sources

The standard design guide for internal noise levels for residential developments is within BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'. BS8233 states that to achieve adequate sleeping and living conditions, the following targets should be met.

Activity	Location	Day (07:00-23:00)	Night (23:00-07:00)
Resting	Living Room	35 dB $L_{Aeq, 16\ Hour}$	-
Dining	Dining Room	40 dB $L_{Aeq, 16\ Hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq, 16\ Hour}$	30 dB $L_{Aeq, 8\ Hour}$

Table 2.1: BS 8233 Internal Noise Limits

Note 7 within BS8233 advises that these internal noise criteria may be relaxed by 5dB and reasonable internal conditions still achieved, where development is necessary or desirable,

BS 8233:2014 provides no definitive methodology for assessment of L_{Amax} levels. The WHO Community Noise Guidelines 1998 states that in order to avoid sleep disturbance within bedrooms during the night, the internal sound pressure level should not exceed 45 dB $L_{Amax.}$ It is widely accepted that noise events should not exceed 45 dB L_{Amax} more than 10-15 times during the night-time period (23:00 – 07:00).

These internal noise criteria are proposed to be achieved with windows closed and means of background ventilation enabled, provided by mechanical ventilation.

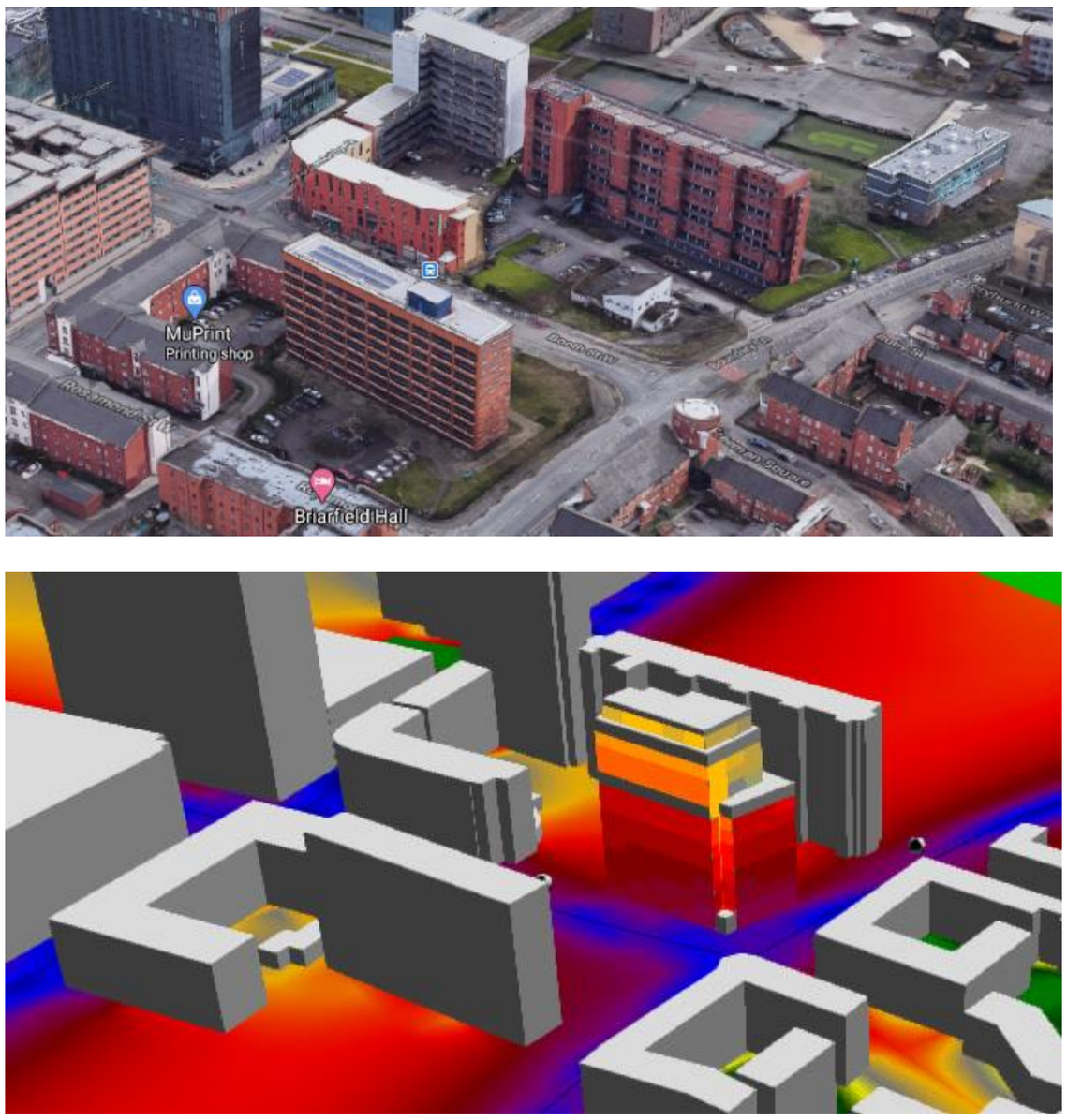


Figure 2.1: Google Maps View (Top) & Noise Map Overview (Bottom) of The Site

3.0 NOISE CLIMATE

Appendix A provides the noise assessment for this development. The table below presents a summary of the daytime L_{Aeq}, night time L_{Aeq} and night time L_{Amax} noise levels measured at the fixed position.

Period, T	Start	End	Typical $L_{Aeq,T}$ (dB)	10th Highest L_{Amax} (dB)
Daytime (16hour)	07:00	23:00	61	-
Night Time (8hour)	23:00	07:00	54	72

Table 3.1: Noise Survey Measured Noise Levels (Fixed Position)

Full results of the noise survey are presented in Appendix A.

3.1 Predicted Façade Noise Levels

Such to better understand how noise levels are likely to vary at each of the façades of the development a noise mapping model has been produced. The model has been produced in CadnaA where the noise levels have been calibrated based on the fixed and spot measurement data.

These predicted noise levels are shown on the following pages.

3.1.1 Day Time – L_{Aeq}

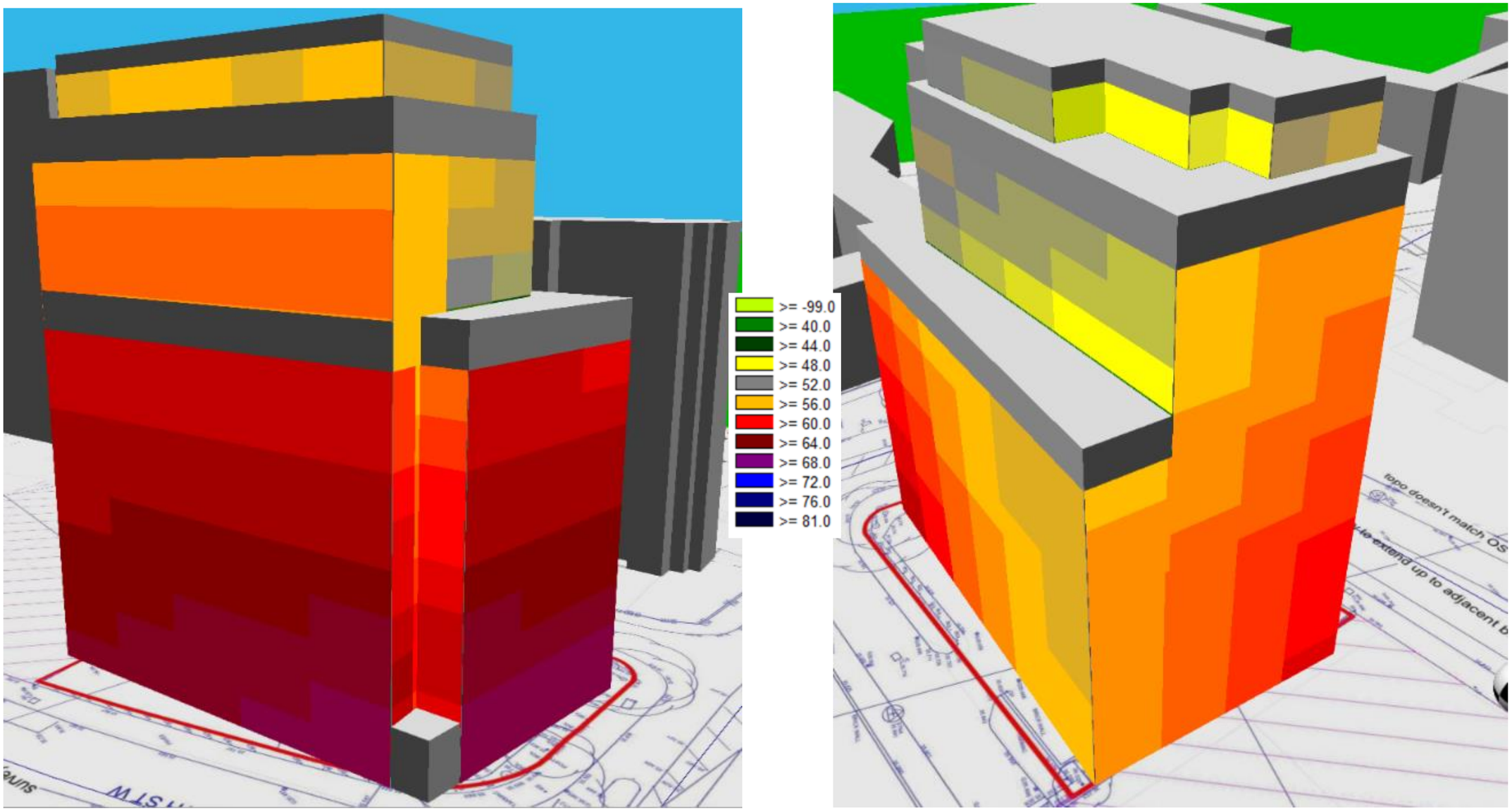


Figure 3.1: Northern & Western Elevations (Day)

Figure 3.2: Southern & Eastern Elevations (Day)

3.1.2 Night Time – L_{Aeq}

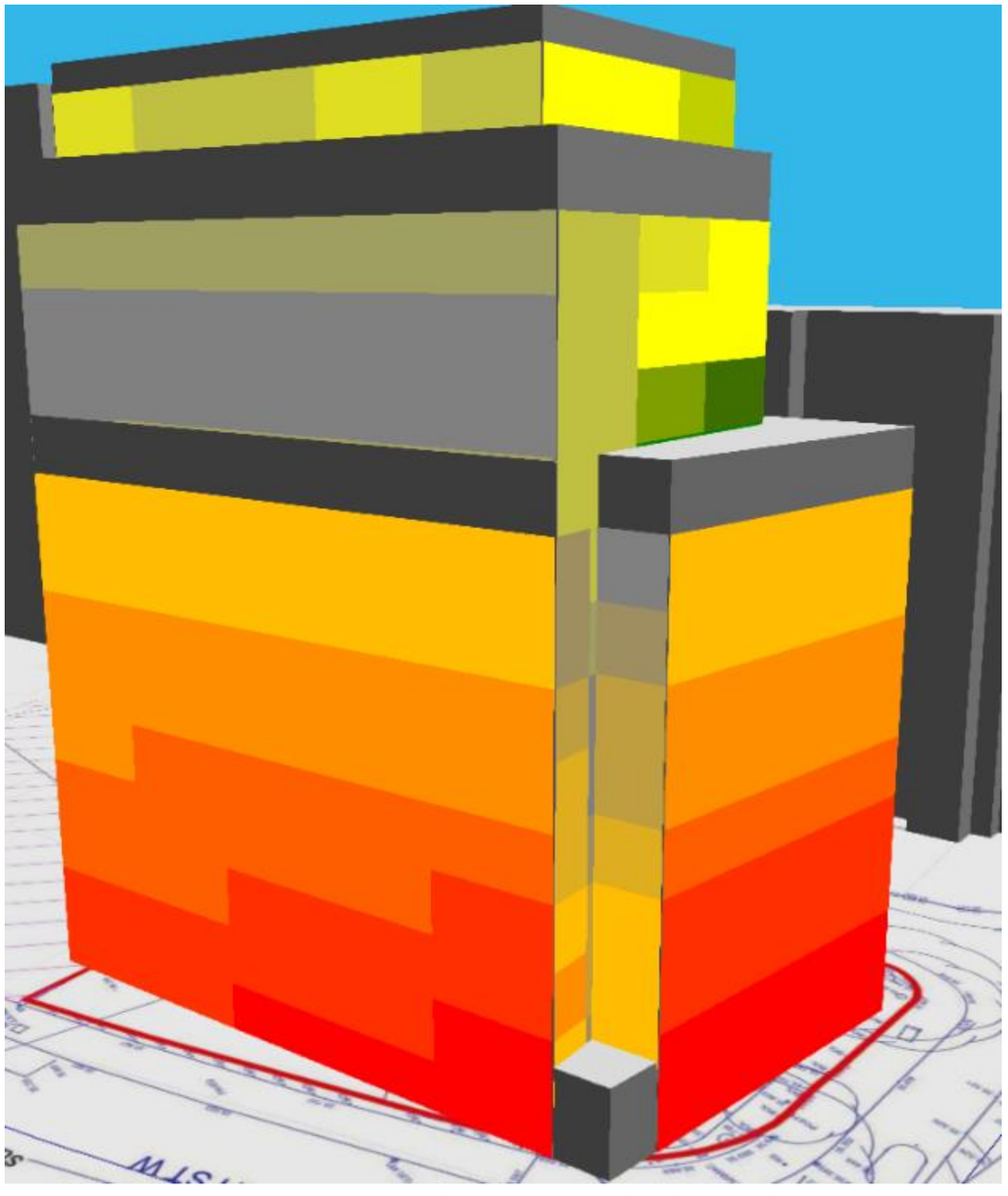


Figure 3.3: Northern & Western Elevations (Night)

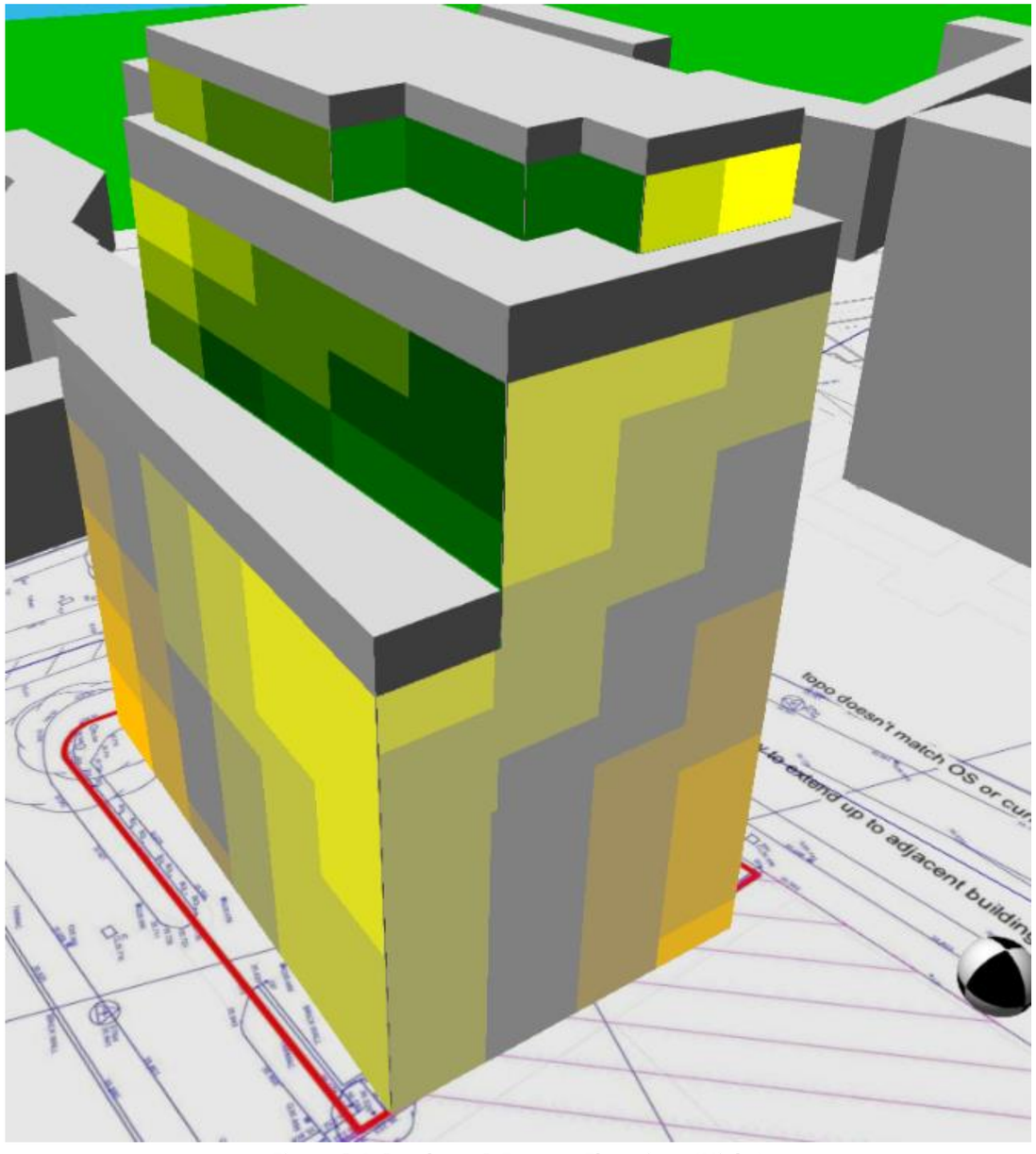


Figure 3.4: Southern & Eastern Elevations (Night)

3.1.3 Night Time – L_{Amax}

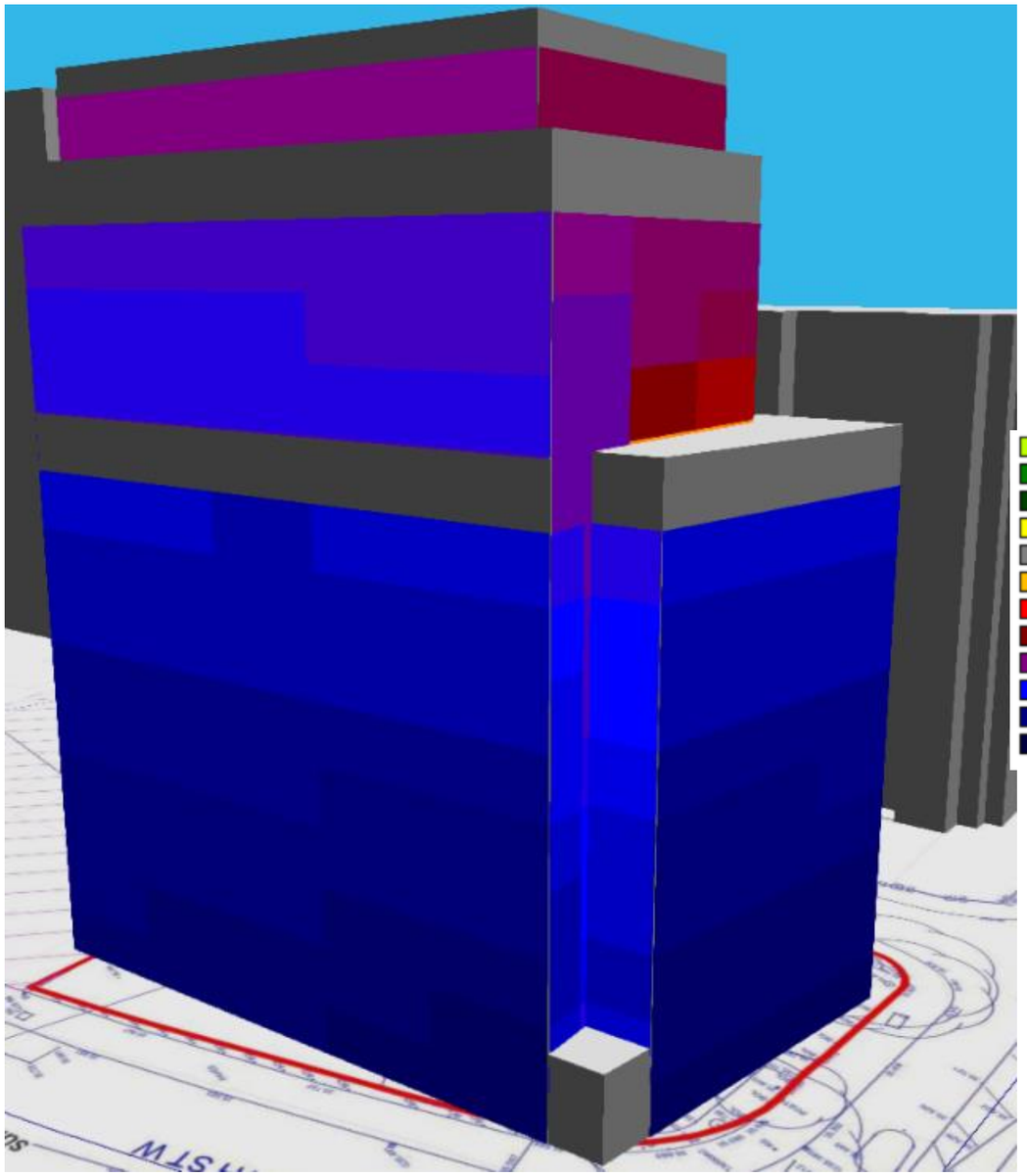


Figure 3.5: Northern & Western Elevations (Night Maximum)

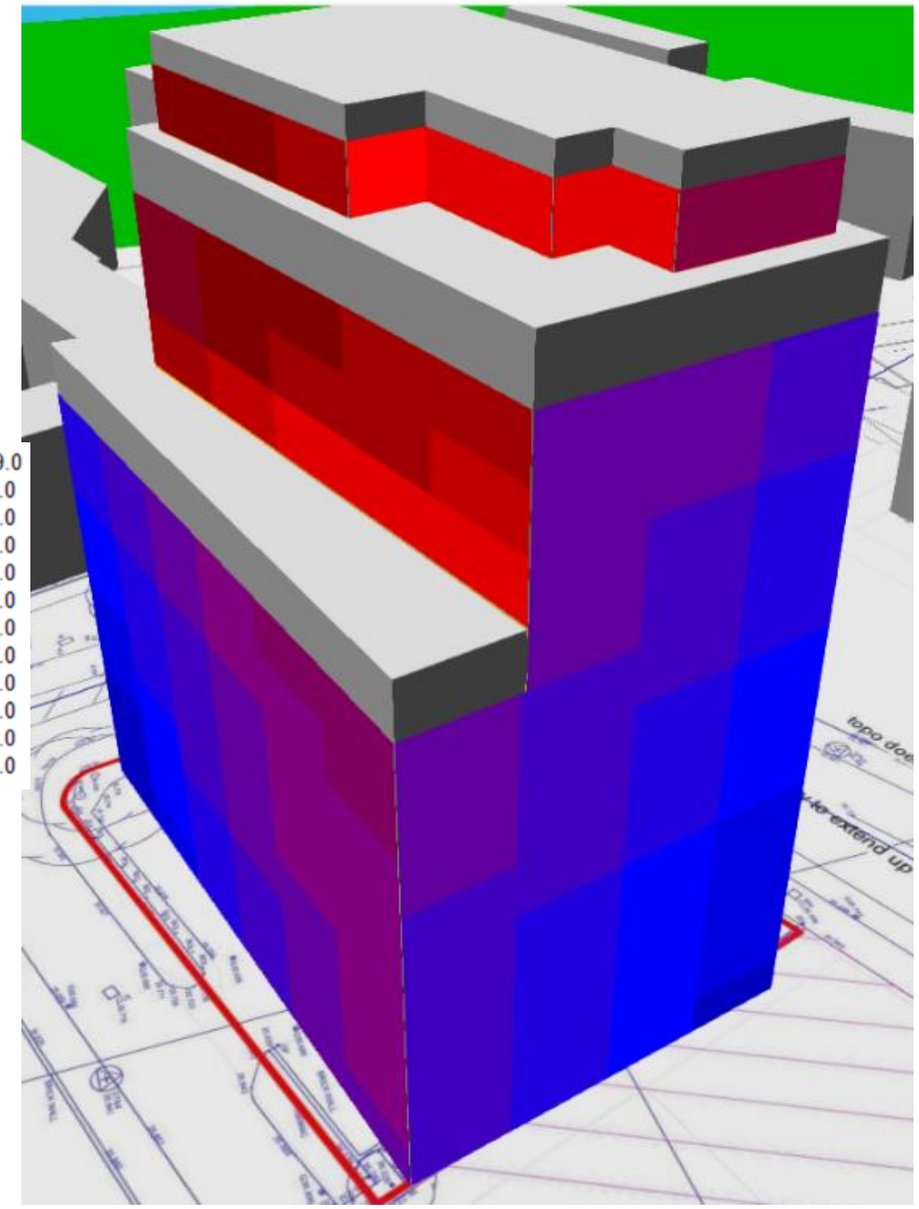


Figure 3.6: Southern & Eastern Elevations (Night Maximum)

4.0 FAÇADE NOISE BREAK-IN

4.1 Façade Exposure Categories

Based on the modelled noise levels, the façades have been divided up as outlined below which shows the maximum noise levels predicted for each category. These categories have also been illustrated in Appendix B.

Façade Exposure Category	Period, T	Start	End	Predicted Highest $L_{Aeq,T}$ (dB)	Predicted L_{Amax} (dB)
1	Daytime (16hour)	07:00	23:00	56	-
	Night Time (8hour)	23:00	07:00	50	66
2	Daytime (16hour)	07:00	23:00	62	-
	Night Time (8hour)	23:00	07:00	55	74
3	Daytime (16hour)	07:00	23:00	66	-
	Night Time (8hour)	23:00	07:00	60	79

Figure 4.1: Facade exposure level predicted noise levels

Of these noise levels, the night time peak noise levels are the highest and therefore dictate the sound insulation requirements of the façade.

4.2 Façade Sound Insulation Requirements

Under normal ventilation conditions it is understood that there is no requirement to open any windows, therefore the sound insulation will need to be provided by the solid elements of the façade, where night time peak noise levels are the most onerous to comply with.

Therefore, based on windows closed, BS 8233 requirements and the WHO night time maximum limit of 45 dB L_{Amax} can be met with façade elements achieving the following:

Façade Exposure Category	Element	Minimum Required Sound Reduction Indices						
		125 Hz	250 Hz	50 Hz	1 kHz	2 kHz	4 kHz	R_w
1	Windows	22	22	26	37	46	47	**32**
	Solid Facade	34	45	50	55	50	55	**52**
2	Windows	23	28	38	42	43	52	**40**
	Solid Facade	34	45	50	55	50	55	**52**
3	Windows	26	32	42	45	45	50	**43**
	Solid Facade	34	45	50	55	50	55	**52**

Table 4.1: Minimum Façade Reduction Indices Required

Where these specifications are required is illustrated in Appendix B.

5.0 NOISE POLLUTION

5.1 BS 4142:2014

BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions.

The likelihood of complaints in response to a noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level, where BS 4142 states the following:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

5.2 Design Target

Based on the above, plant noise limits are proposed to be set at 5dB below background noise levels during both daytime and night-time.

Note, this target is subject to agreement with the local authority.

5.3 Plant Noise Limits

Based on the proposed design target and the measured background noise levels from the survey the plant noise limits at the nearest noise sensitive receivers can be established as outlined in the table below.

Time Period	Assessed Background Noise Level (dB L_{A90})	Plant Noise Limit dB $L_{Aeq,T}$
		At Nearest Sensitive Receivers
Daytime (07:00 - 23:00)	54	49
Night-Time (23:00 - 07:00)	42	37

Table 5.1: Proposed Plant Noise Limits

Measured background noise levels are presented in Appendix A.

5.4 Operational Noise

As the development is a new student accommodation, the main noise source associated with the development in use is likely to be noise from students entering and leaving the site. As the ambient noise climate has been found to be high, this is not likely to have any significant impact on any nearby noise sensitive receivers.

Furthermore, there is no car park or significant vehicle movements associated with the development, therefore it is unlikely that the development will have any noticeable impact on road traffic and vehicle movements in the area.

Based on the above it is considered that operational noise associated with the development is not likely to significantly impact the local noise climate around the site.

APPENDIX A – ENVIRONMENTAL NOISE SURVEY

To establish the existing environmental noise levels on site, a noise survey was conducted between 16:00 on the 25/02/2021 and 16:00 on the 26/02/2021.

This site assessment was undertaken by Louis Lister of MACH Group.

At the time of survey, the third national COVID-19 lockdown was in operation. For this reason, road traffic and train noise were seen to be at a reduced level in comparison to the typical noise climate of the site. Therefore, the measured noise levels are at a risk of uncertainty.

A.1 Site Description

The site is located at the former Gamecock Pub, Booth Street West, M15 6GE. The surroundings are almost entirely residential, with some small local shops and a pharmacy located along the east of booth street west. The intersection of booth street west and boundary lane seems not to be a particularly busy intersection.

A.1.1 Site Map

The site in relation to its surroundings is presented in Figure 5.1. The Nearest Noise sensitive receivers are also highlighted.

Figure 5.1 - Proposed Development (Red) and Nearest Noise Sensitive Receivers (Blue), and existing buildings (Orange)

A.1.2 Subjective Noise Climate

Noise Source	Description	Time of Observation
Roads	The main source of noise was traffic noise from Boundary lane and booth st west	throughout
Aircraft	A small aircraft was heard flying overhead, although had a negligible noise contribution.	Unknown

Table 5.2 Subjective Summary of the Noise Sources

5.4.1 Non-Representative Noise Sources

During the survey, no noise events occurred which would be deemed as atypical of the site location.

A.2 Measurements Map

Below is the map of where the measurements were taken.

Figure 5.2 - Map of the Measurement locations

A.3 Fixed Measurement

A fixed microphone position was used to record noise levels between 16:00 on the 25/02/2021 and 16:00 on the 26/02/2021. Thus, a fixed long-term meter was set to measure consecutive 'A' weighted 5-minute time samples. Measurements have been taken in free field conditions or have been corrected where appropriate.

To help with the understanding of the site and the measurement locations, the figure below presents the location of the microphone and site photo of the location. The results of the environmental noise survey are provided within Section A.3.1 of this report.

Figure 5.3 Fixed Measurement location

A.3.1 Fixed Measurement Results

The following table and graph present the noise levels recorded over the measurement period at the fixed location (F1).

Date	Period, T	Start	End	Typical $L_{Aeq,T}$ (dB)	10th Highest L_{Amax} (dB)	Modal Background Noise Level L_{A90} (dB)
25/02/21	Daytime (16hour)	07:00	23:00	60	-	56
	Night Time (8hour)	23:00	07:00	54	72	42
26/02/21	Daytime (16hour)	07:00	23:00	61	-	54

Table 5.3: Fixed Position Noise Level Summary

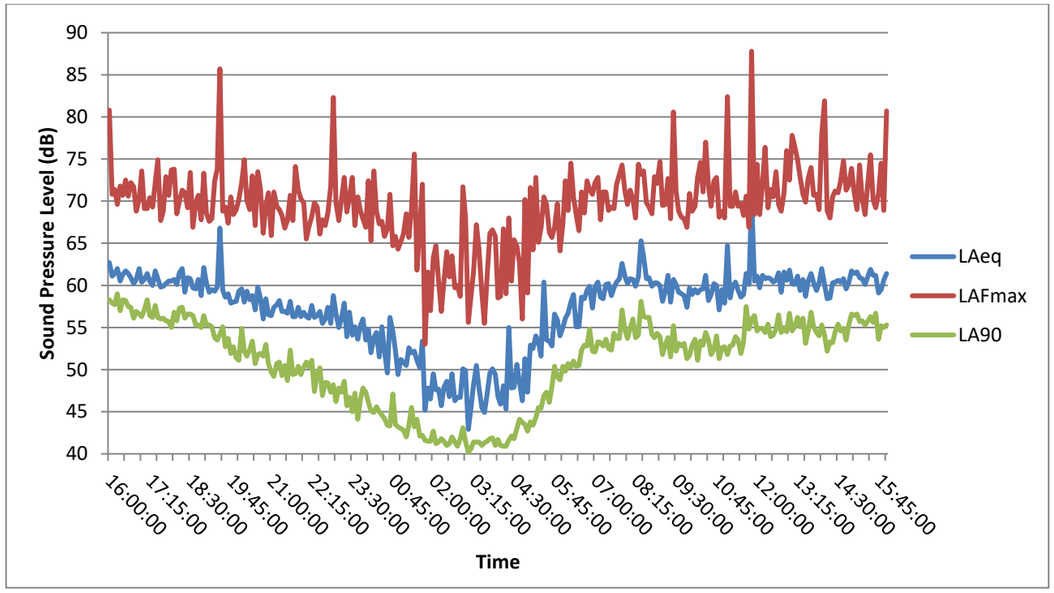


Figure 5.4 - Sound Pressure Level at fixed location, F1

A.4 Spot Measurements S1 & S2

Spot measurements to help quantify existing noise levels at different points around the site. To help with the understanding of the site and spot measurement locations, the figures below present the location of the microphone position in situ. The results of the measured levels at the spot measurements are also presented in Table 5.4. The measurement was taken between 16:25 and 17:10 on 25/02/2021 and between 08:40 and 09:30 on 26/02/2021.

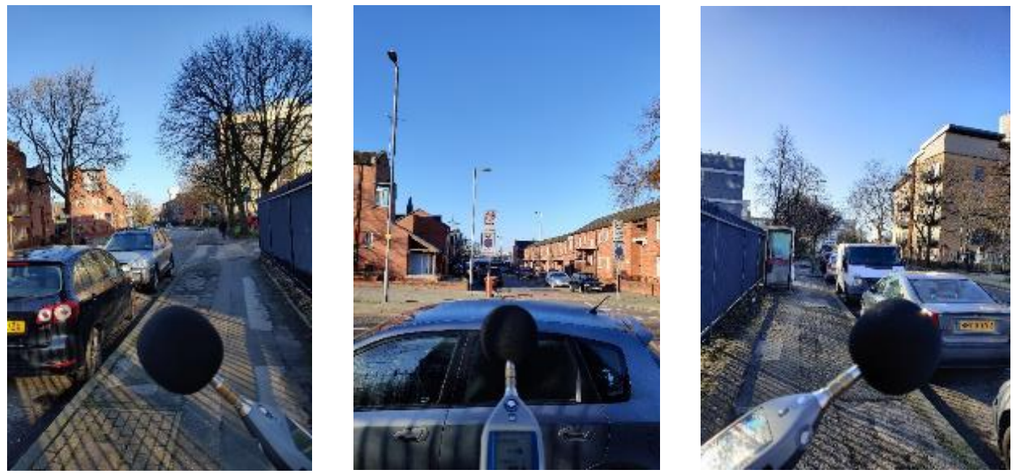


Figure 5.5 - Spot Measurement 1 in situ (Boundary Lane)

Figure 5.6 - Spot Measurement 2 in situ (Booth Street West)

The L_{Aeq}, L_{AFmax}, and L_{A90} levels measured from these spot measurements are shown in Table 5.4 below.

A.4.1 Spot Measurement Results

Date	Start	End	Duration	Location	$L_{Aeq,T}$ (dB)	L_{AFmax}	L_{A90}
25/02/2021	16:21	16:24	00:03:13	Boundary Lane	65	79	57
	16:25	16:29	00:04:58		63	76	54
	16:30	16:34	00:04:58		64	77	57
	16:35	16:39	00:04:58		67	80	57
	16:40	16:44	00:04:58		65	80	55
26/02/2021	09:10	09:14	00:04:52		62	77	49
	09:15	09:19	00:04:58		62	79	51
	09:20	09:24	00:04:58		65	76	52
	09:25	09:29	00:04:58		62	76	48
25/02/2021	16:46	16:49	00:03:35	Booth Street West	65	80	55
	16:50	16:54	00:04:58		64	79	55
	16:55	16:59	00:04:58		63	79	55
	17:00	17:04	00:04:58		65	79	56
	17:05	17:09	00:04:58		63	83	55
26/02/2021	08:37	08:39	00:02:47		64	76	56
	08:40	08:44	00:04:58		65	78	55
	08:45	08:49	00:04:58		65	76	57
	08:50	08:54	00:04:58		63	78	54
	08:55	08:59	00:04:58		64	78	51
	09:00	09:04	00:04:58		63	77	53

Table 5.4 - Spot Measurement 1 Results Table

A.5 Measurement Equipment

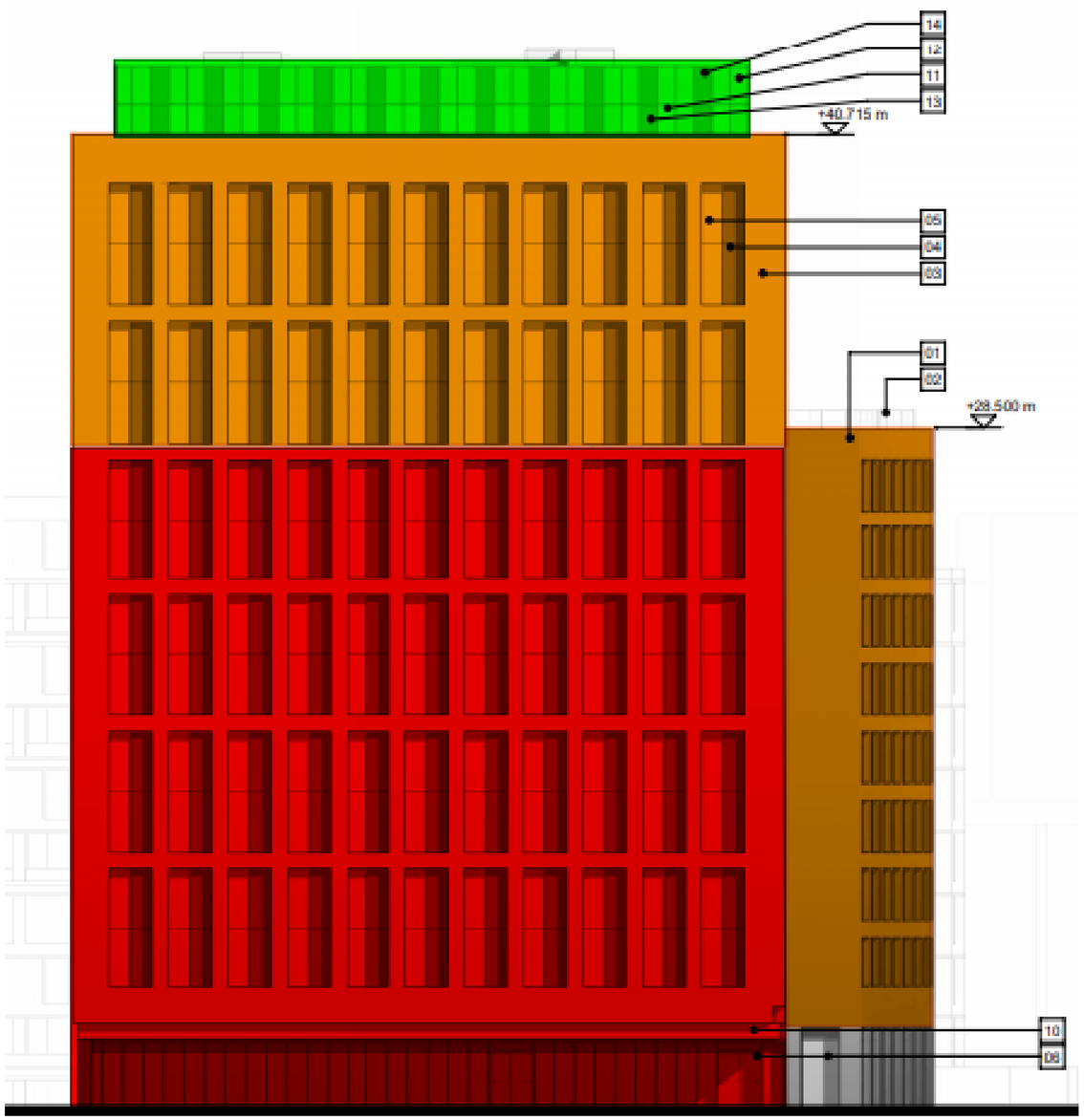
Item	Serial No.	Last Calibration	Certificate No.	Calibration Due
NTI Precision Sound Analyser XL2 TA	A2A-11002-E0	Dec-19	134917	Dec-21
NTI Pre-amplifier MA220	7183	Dec-19	134917	Dec-21
NTI Microphone Capsule MK:224	212171B	Dec-19	134904	Dec-21
Svantek Acoustic Calibrator SV33A	64138	Nov-20	149121	Nov-21
Norsonic Precision Sound Analyser Type 131	1313109	Jul-19	32423	Jul-21
Norsonic Type 1207 Pre-amplifier	12303	Jul-19	32423	Jul-21
Norsonic Type 1227 Microphone	170603	Jul-19	32422	Jul-21
Norsonic Sound Calibrator Type 1251	32090	Mar-20	140610	Mar-21

A.6 Meteorological Conditions

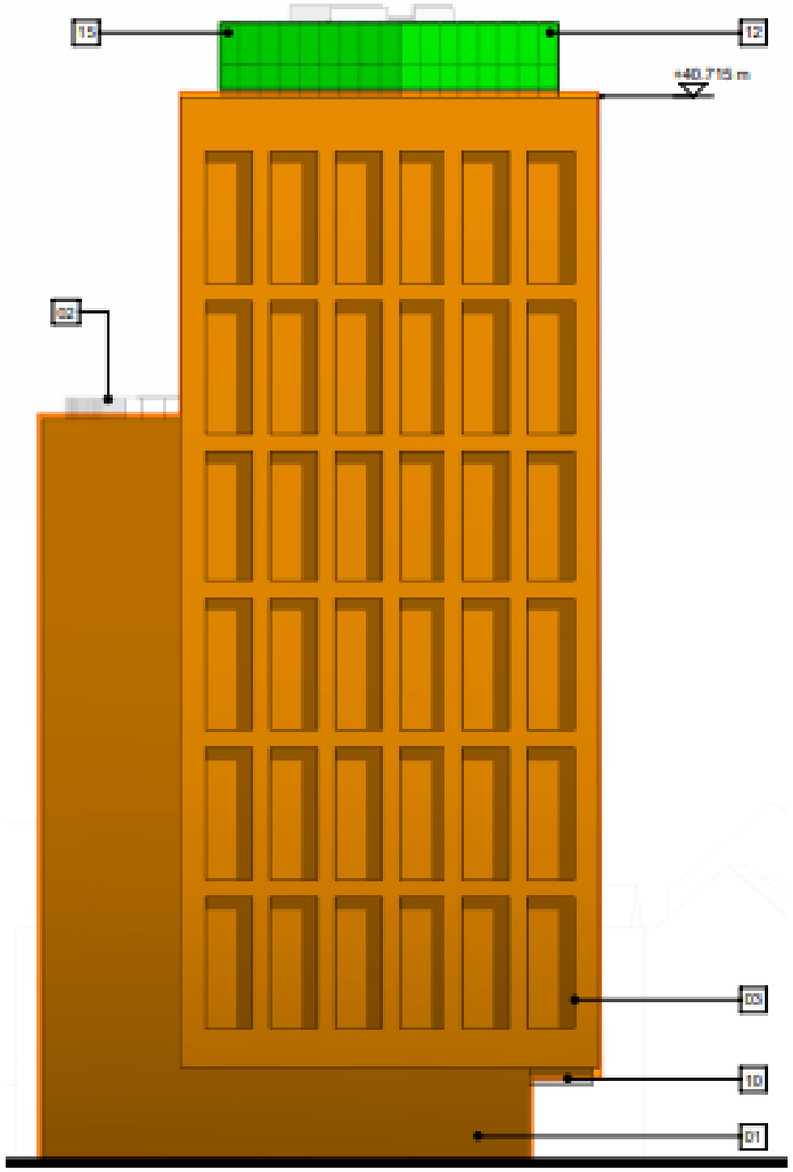
Date	Time (hh:mm)	Temperature (High / Low) (°C)	Humidity (%)	Pressure (hPa)	Wind Speed (m/s)	Wind Direction	Conditions
25/02/2021	12:00	10 / 7	63	1027	5.56	W	Quite Cool
	18:00	7 / 2	85	1032	1.67	S	Chilly
26/02/2021	00:00	3 / 1	92	1034	1.94	S	Chilly
	06:00	9 / 0	86	1036	1.94	N	Cool
	12:00	10 / 7	65	1037	2.5	W	Partly Sunny

APPENDIX B – FAÇADE NOISE EXPOSURE CATEGORIES

North



East

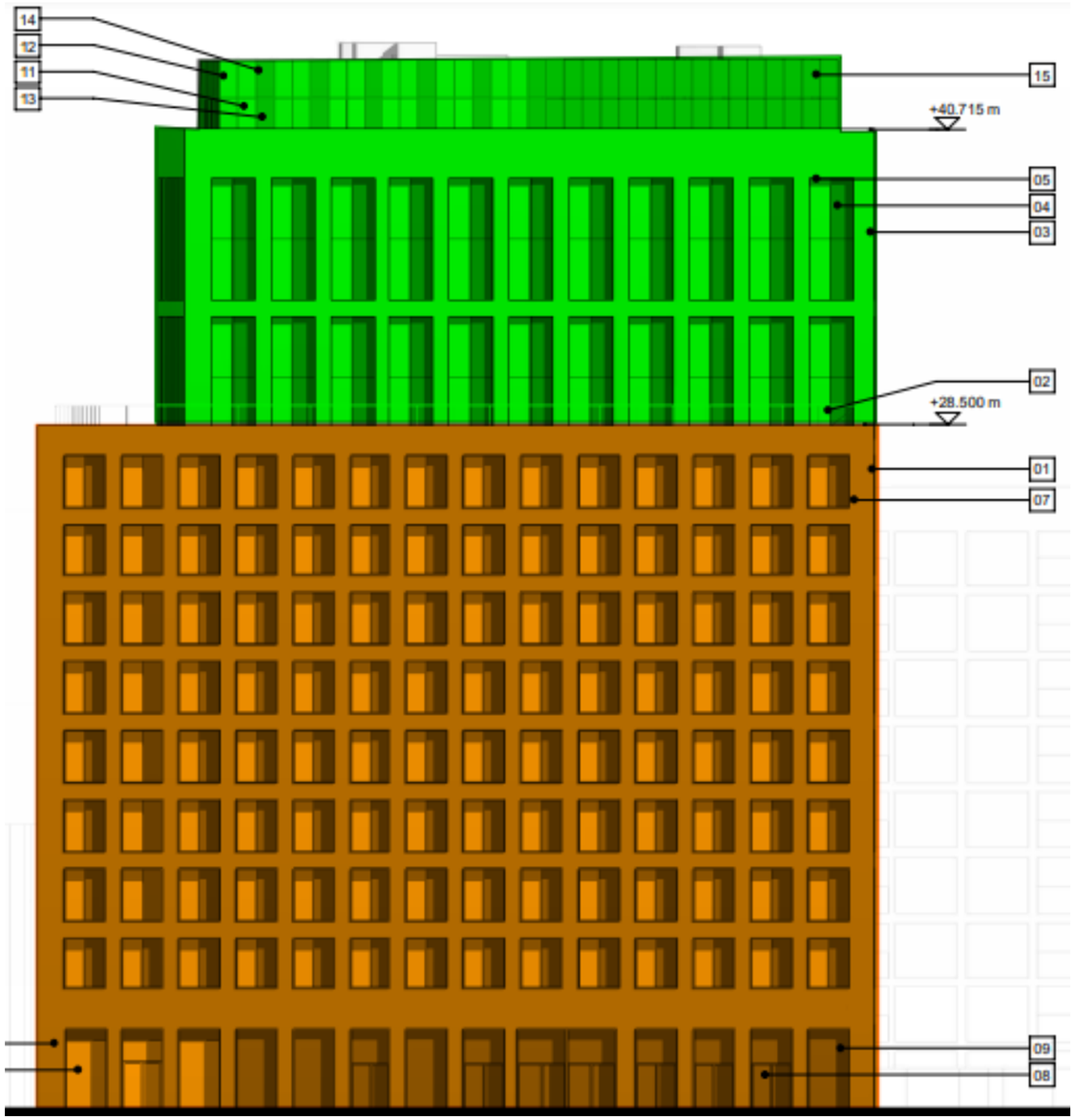


= Exposure level 1

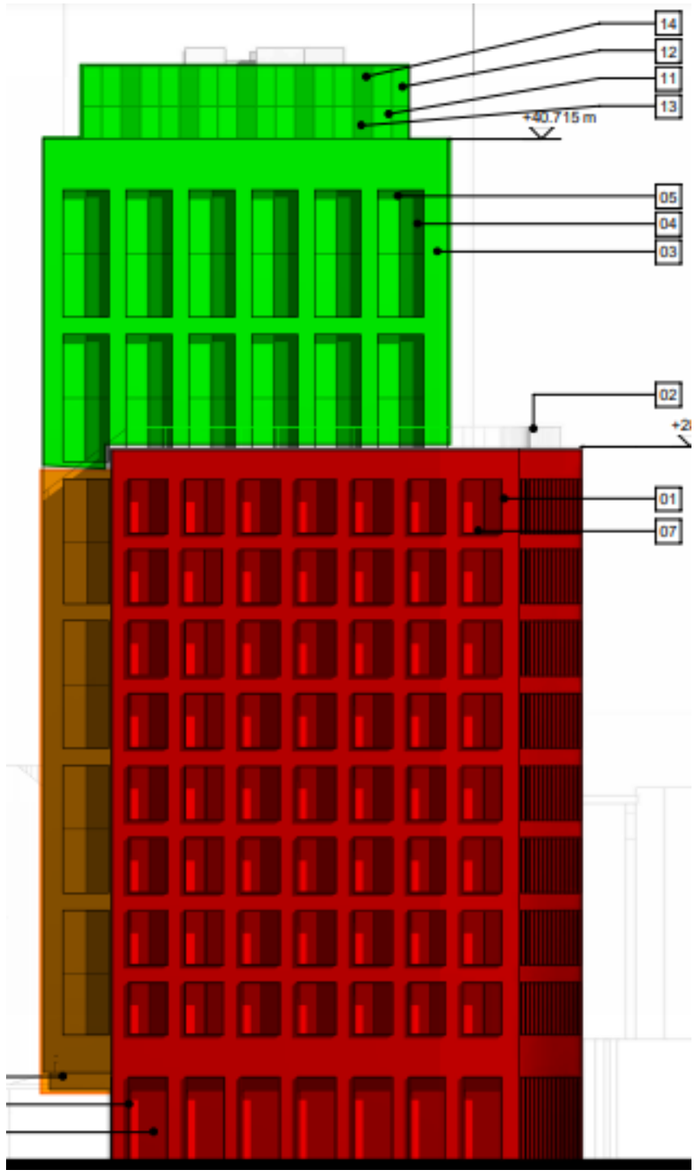
= Exposure level 2

= Exposure level 3

South



West



= Exposure level 1

= Exposure level 2

= Exposure level 3