ENVIRONMENTAL NOISE ASSESSMENT

On behalf of

One Silk Street Ltd

For the site at:

1 Silk Street, Manchester, M4 6LZ

REPORT DATE: 16th March 2023

REPORT REF: AA/23/3/NG/1SS/NIA2

0161 820 1112 info@amberacoustics.co.uk
www.amberacoustics.co.uk 34 Bury Old Road, Manchester, M25 0FT

CLIENT: One Silk Street Ltd

ENGINEER:

Amber Acoustics

34 Bury Old Road

Manchester

M25 0FT

Tel:0161 820 1112

Email:info@amberacoustics.co.uk

Report Prepared By:

.....

Aharon Horwich, PGDip, MSc, CEnv, MCABE, MCIEH, MIEnvSc, MEI, AMIOA

Report Checked By:

.....

Matthew Gore, BSc MSc MIOA

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1. INTRODUCTION

1.1. General

Amber Acoustics has been commissioned by One Silk Street Ltd to carry out an Environmental Noise assessment to discharge a planning condition at 1 Silk Street, Manchester, M4 6LZ.

1.2. Assessment Scope

This report will seek to demonstrate that the plant on site will not cause an adverse impact on the surrounding buildings and their occupants.

Amber Acoustics have completed this report for the benefit of the individuals referred to in Section 1.1 and any other relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use, or rely upon, the contents of this report unless explicit written approval has been gained from Amber Acoustics.

Amber Acoustics accepts *no* responsibility or liability for the consequences of this documentation being used for any purpose or project other than that for which it was commissioned. It should also be noted herein that the issue of this document to any third party with whom approval for use has not been agreed.

2. SITE DESCRIPTION

The development site is the erection of a 9 storey building to form ground, first and second floor office accommodation (Use Class B1) (3124 sqm) together with 75 residential apartments (Use Class C3a) with associated car parking, amenity provision and other associated works following demolition of existing buildings at 1 Silk Street, Manchester, M4 6LZ.

Condition 12 of the planning decision (ref 120893/FO/2018) dated 9th August 2018, stated

12) Notwithstanding the noise and vibration report stamped as received by the City Council, as Local Planning Authority, on the 3 August 2018, prior to the (a) first occupation of the residential element and (b) first use of the office accommodation, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval. The approved scheme shall be implemented prior to the first occupation of the residential element and office accommodation and thereafter retained and maintained in situ.

Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).

3. ASSESSMENT STANDARDS

This section of the report outlines the context of the proposed development with respect to noise.

Following correspondence with Laura Miller, the Environmental Protection Officer at Manchester City Council, a methodology was proposed for a noise survey involving sample measurements of the noise emanating from the smoke extraction shafts, and both day and night time background noise levels to be taken, with the noise impacts to be modelled to the nearest residential receptor.

The officer also stated that:

As this is emergency plant it can be up to 10dB above background and any testing can only occur during daytime hours on a weekday (9am-5pm).

This methodology was approved in email correspondence on 14th October 2022.

3.1. National Planning Policy Framework and Planning Practice Guidance

The NPPF, published in March 2012, sets out the Government's planning policies for England and howthese are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans and is to be a material consideration in planning decisions.

Paragraph 123 of the NPPF advises that, with respect to noise emissions, planning policies anddecisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as aresult of new development;
- Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions

Planning Practice Guidance, published in March 2014, advises on how planning can manage potential noise impacts in new development. The guidance states that noise needs to be considered when *"…new developments would be sensitive to the prevailing acoustic environment*." Although noise canoverride other planning concerns, "*neither the NPSE1 nor the NPPF expects noise to be considered inisolation from the economic, social and other environmental dimensions of the proposed development*. "

When making decisions, local planning authorities should take account of the acoustic environmentand in doing so consider:

- Whether or not a significant adverse effect is likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

In line with the Explanatory Note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level. The guidance points to the Explanatory Note for Noise Policy Statement for England 2010 for further information.

3.2. Noise Policy Statement for England 2010

The NPSE sets out the long-term vision of Government noise policy. The Noise Policy Vision is supported by the following Noise Policy Aims:

- Avoid significant impacts on health and quality of life;
- Mitigate and minimise adverse effects on health and quality of life; and

- Where possible, contribute to the improvement of health and quality of life.

The NPSE categorises noise exposure through the concept of observed effect levels:

No Observed Effect Level (NOEL): The level below which no effect can be detected.

Lowest Observed Adverse Effect Level (LOAEL): the level above which adverse effects onhealth and quality of life can be detected.

Significant Observed Adverse Effect Level (SOAEL): the level of noise exposure above whichsignificant adverse effects on health and quality of life occur.

The second Noise Policy Aim refers to the situation where the noise impact lies between the LOAEL and the SOAEL. It requires that, "*…all reasonable steps should be taken to mitigate and minimise effects on health and quality of life… This does not mean that such adverse effects cannot occur*."

The NPSE does not contain specific noise level limits to define the SOAEL as it is likely to be differentfor different noise sources and parameters. In the absence of national LOAEL and SOAEL noise level criteria, noise levels have been assessed against criteria contained within BS8233:2014 and WHO Guidelines.

3.3. The World Health Organisation Guidelines

The WHO Guidelines for Community Noise 1999 consolidate scientific knowledge on the health impacts of community noise and provide guidance to protect people from the harmful effects of noise in non-industrial environments.

Although this guidance was updated in 2018, the specific references to noise levels were omitted, and have still, to the best of the authors' knowledge, not been updated or clarified by the WHO. Therefore, the 1999 guidelines are referenced herein as they contain the specific noise level targets which tie in nicely with those listed in other British Standards.

The WHO Guidelines for Community Noise set out health-based guideline values for community noise, including recommended noise level values for the onset of sleep disturbance, annoyance and speech interference for the general population. Guideline values are provided for outdoor living areas,

living rooms and bedrooms, for both continuous noise and discrete noise events. These are:

$L_{Aeq,T}$ - the A-weighted equivalent continuous noise energy level over a given period of time T, applied to fluctuating noise levels to give single figure descriptor and sometimes referred to as the 'average'; and

L_{AFmax} - the maximum A-weighted noise instantaneous sound pressure level recorded during a measurement period using a fast time response.

With regard to outdoor living areas, the WHO Guidelines for Community Noise state that, "… in order to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB LA_{eq} on balconies, terraces, and in outdoor living areas".

Table 1: WHO Guideline Values for Community Noise

Specific Environment	Critical Health Effect (s)	L_{Aeq} dB(A)	Time base (hours)	LA_{Fmax} fast dB(A)
Outdoor living area	Serious annoyance, daytime and evening.	55	16	-
	Moderate annoyance, daytime evening.	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedroom	Sleep disturbance night-time	30	8	45
Outside bedroom	Sleep disturbance, window open (outdoor values)	45	8	60

Source: World Health Organisation 1999

3.4. BS8233:2014

BS8233:2014 contains suggested criteria for common situations, such as resting and sleeping, and proposes noise levels that normally satisfy those criteria for most people. For dwellings, the main considerations are:

- For bedrooms, the acoustic effect on sleep; and
- For other rooms, the acoustic effect on resting, listening and communicating.

Suggested noise levels reflect those contained within the WHO Guidelines. BS8233:2014 advises thatthe time period T, should be appropriate for the activity involved, in this case the daytime $L_{Aeq,16hr}$ (07:00-23:00) and night-time $L_{Aeq,8hr}$ (23:00-07:00).

Table 2 below details guideline values for dwellings as recommended within BS8233:2014.

Table 2: BS8233:2014 Recommended Noise Levels

Criterion	Typical situations	Time		
		Daytime 07:00 to 23:00 (L_{Aeq})	Night-time 23:00 to 07:00 (L_{Aeq})	Night-time 23:00 to 07:00 (L_{AMax})
Resting	Living room	35	-	
Sleeping (daytime resting)	Bedroom	35	30	45

Source: BS8223:2014

With regard to external noise levels in amenity spaces such as gardens, the guidance advises that "…it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited."

3.5. Assessment Methodology

The noise source as identified in correspondence with Laura Miller, The Environmental Protection Officer at Manchester City Council, was the smoke shaft serving the building and to be used in the event of a fire within the complex.

4. SURVEY MEASUREMENTS

The Environmental Noise Assessment took place over 21st and 22nd February 2023.

The Noise survey was carried out generally in accordance with BS7445: 2003 'Description and Measurement of Environmental Noise'.

4.1. Measurement Locations

The Measurement locations are set out below and annotated in image 1.

MP1 – North Easterly smoke shaft (Closest to Radium Street)

MP2 - South Westerly smoke shaft (closest to Bengal Street)

MP3 – Background measurement point 1 at ground level for the closest Residential receptor to MP2 at the Bengal Street end of the building.

MP4 – Background measurement point 2 at ground level for the closest Residential receptor to MP1 at the Radium Street end of the building.

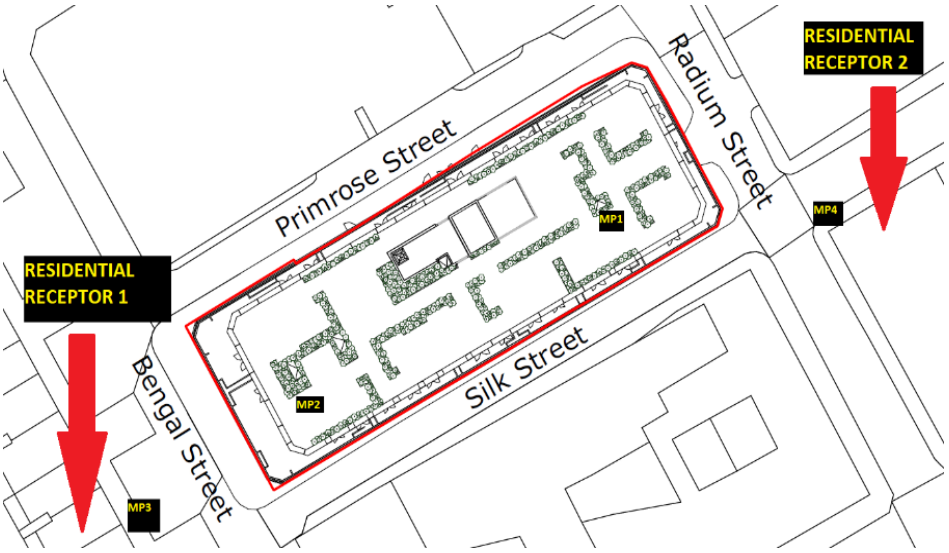


Image 1: Measurement Point Locations

4.2. Meteorological Conditions

No excessive precipitation was noted during the survey, and the general wind speed in all directions was less than 5m/s, which is suitable for a noise survey. Detailed weather conditions are given in **Appendix C**.

4.3. Measurement Equipment

$L_{Aeq,T}$ and L_{AFmax} sound levels were recorded using a Type 1 Svantek SV307 Sound Analyser (serial number 100907). Measurements were A-weighted and recorded using a fast time response.

The sound level meter was calibrated using a Svantek SV36 Sound Calibrator (serial number 83149) at the start and finish of the monitoring period. No significant calibration drifts were observed. A detailed equipment list is given in **Appendix B** with calibration information in **Appendix D**.

4.4. Observations

The primary noise source under investigation was the smoke shaft serving the building and to be used in the event of a fire within the complex.

From street level, the noise from the smoke shaft was masked by the general ambient environmental noise from the surroundings.

5. RESULTS

To assess the environmental noise impact of the smoke shafts, and as agreed in correspondence with Laura Miller, the Environmental Protection Officer at Manchester City Council, three samples of 5 minutes were carried out at both MP1 and MP2 with the smoke shaft in full operation.

It should be noted that we have been advised that the smoke shaft can only be operated on a floor-by-floor basis, as the smoke would be recirculated to an upper floor if the shaft was open on two floors at the same time. As a result of this operational function, the smoke shaft was only required to be tested with it functioning on a floor by floor basis.

The results of the environmental noise survey can be seen below, evidencing that after distance attenuation, the smoke shaft could not be heard at the nearest residential receptors.

Barrier calculations can be seen at Appendix F. These calculations incorporate the height of both the development site as well as the height of the buildings containing the nearest residential receptors. The roof level which houses the plant is encompassed by a wall of 1.3 metres high.

			Background Levels (LA90)			Background Levels (LA90) + 10db			
Position	Time of Sample	LAeq 5 min	Position	Day	Night	Day	Night	Barrier Calc Result	PASS/FAIL
MP1	10:30	98.9	MP4	47.9	43.8	57.9	53.8	41.2	PASS
MP1	10:35	99.0	MP4	49.0	44.2	59.0	54.2	41.3	PASS
MP1	10:40	99.0	MP4	50.9	43.0	60.9	53.0	41.3	PASS
MP2	10:46	98.4	MP3	54.0	45.3	64.0	55.3	40.7	PASS
MP2	10:51	98.8	MP3	52.0	46.2	62.0	56.2	41.1	PASS
MP2	10:56	98.8	MP3	51.7	44.7	61.7	54.7	41.0	PASS

Table 1: Measurement Summary of Noise Survey Positions Results.

6. ASSESSMENT

6.1. Existing Noise Climate

Ambient sound levels in the vicinity of the site were predominantly affected by the road traffic from Oldham Road.

Standard required by Environmental Health Officer

As per the conversation with Laura Miller, the Environmental Protection Officer at Manchester City Council, the requirement for compliance with condition 12 of planning application was specifically defined as "**As this is emergency plant it can be up to 10dB above background and any testing can only occur during daytime hours on a weekday (9am-5pm)".**

With regard to internal sound levels, from the site measurement data, the measured levels **DO** achieve those levels.

7.0 Conclusion

Amber Acoustics was commissioned by One Silk Street Ltd to carry out an Environmental Noise assessment to discharge a planning condition at 1 Silk Street, Manchester, M4 6LZ.

The Environmental Noise Assessment has sought to establish that the plant on site will not cause an adverse impact on the surrounding buildings and their occupants.

Noise survey results and assessment indicate that, based upon the sample measurements taken, the resultant levels meet the requirements as set out by the Environmental Protection Officer at Manchester City Council

APPENDICES

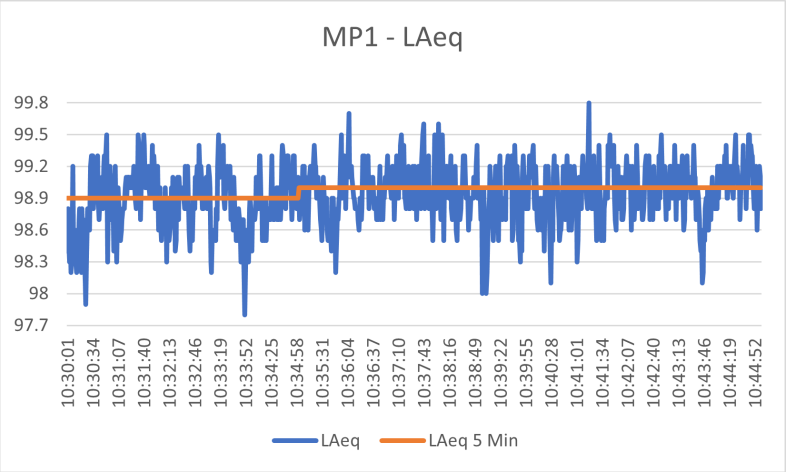
APPENDIX A - Measurement Details					
Measurement	Kit	Start Date	Start Time	End Date	End Time
MP1	AA2	21st Feb 2023	10:30	21st Feb 2023	10:45
MP2	AA2	21st Feb 2023	10:46	21st Feb 2023	11:01
MP3 – Day	AA2	21st Feb 2023	12:00	21st Feb 2023	12:15
MP3 – Night	AA2	22nd Feb 2023	23:15	22nd Feb 2023	23:30
MP4 – Day	AA2	21st Feb 2023	12:20	21st Feb 2023	12:35
MP4 – Night	AA2	22nd Feb 2023	23:40	22nd Feb 2023	23:55

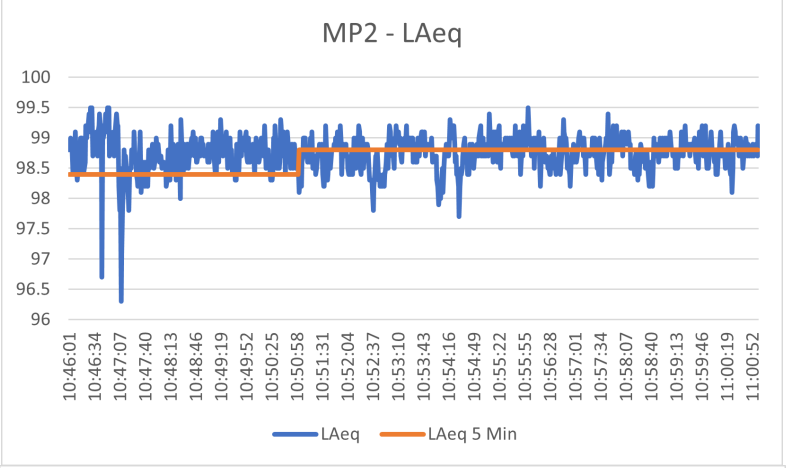
APPENDIX B - Equipment Details					
Kit	Equipment	Make	Model	Class	Serial Number
AA2	Sound Meter	Svantek	SV307	1	100907
AA3	Calibrator	Svantek	SV36	1	83149

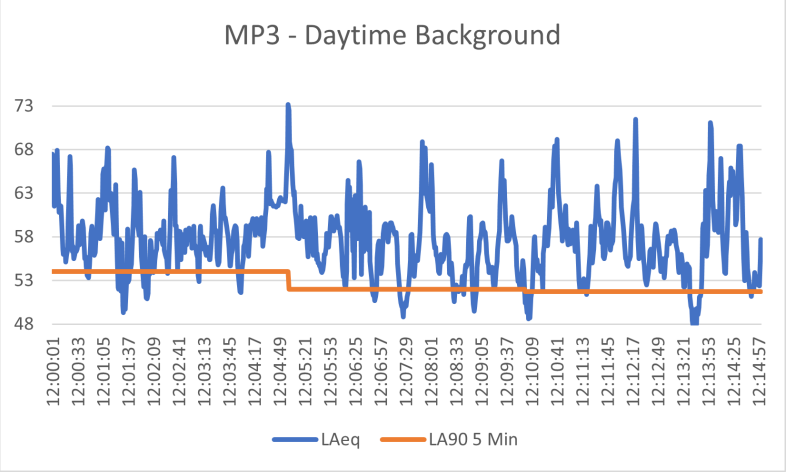
APPENDIX C - Meteorology Details			
Measurement	Temp C (Average)	Wind Speed m/s	Humidity %
MP1-MP4	11.2	2.3	84

APPENDIX D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
MP1-MP4	114	114.2	-0.2	114.1	-0.1

APPENDIX E – Survey Data







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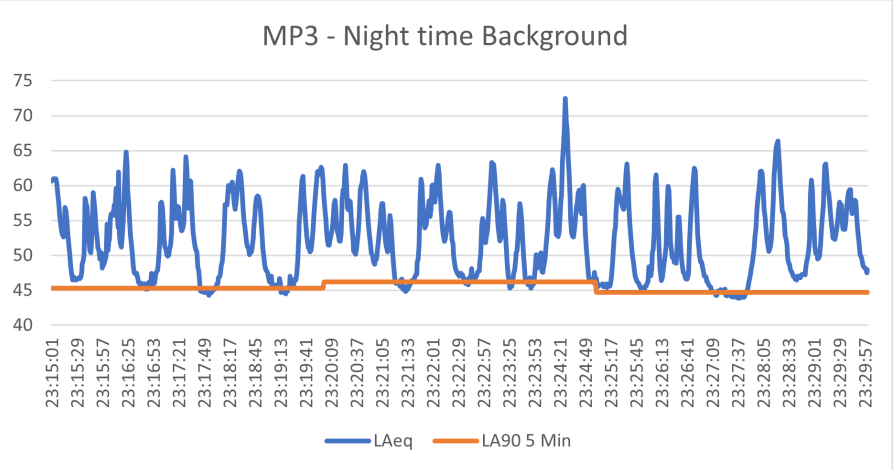

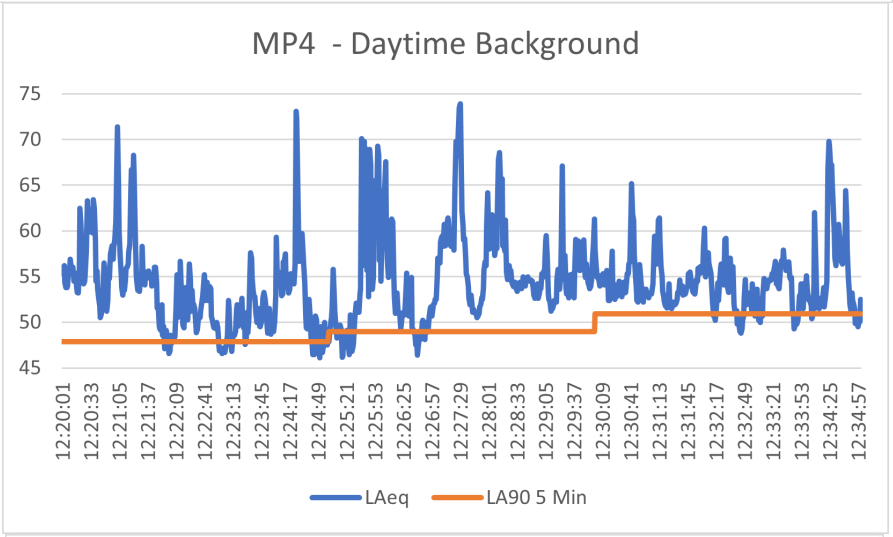

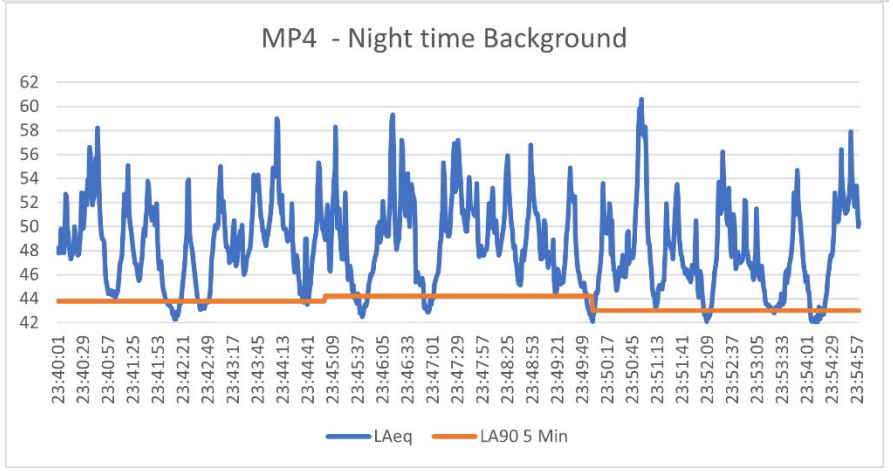

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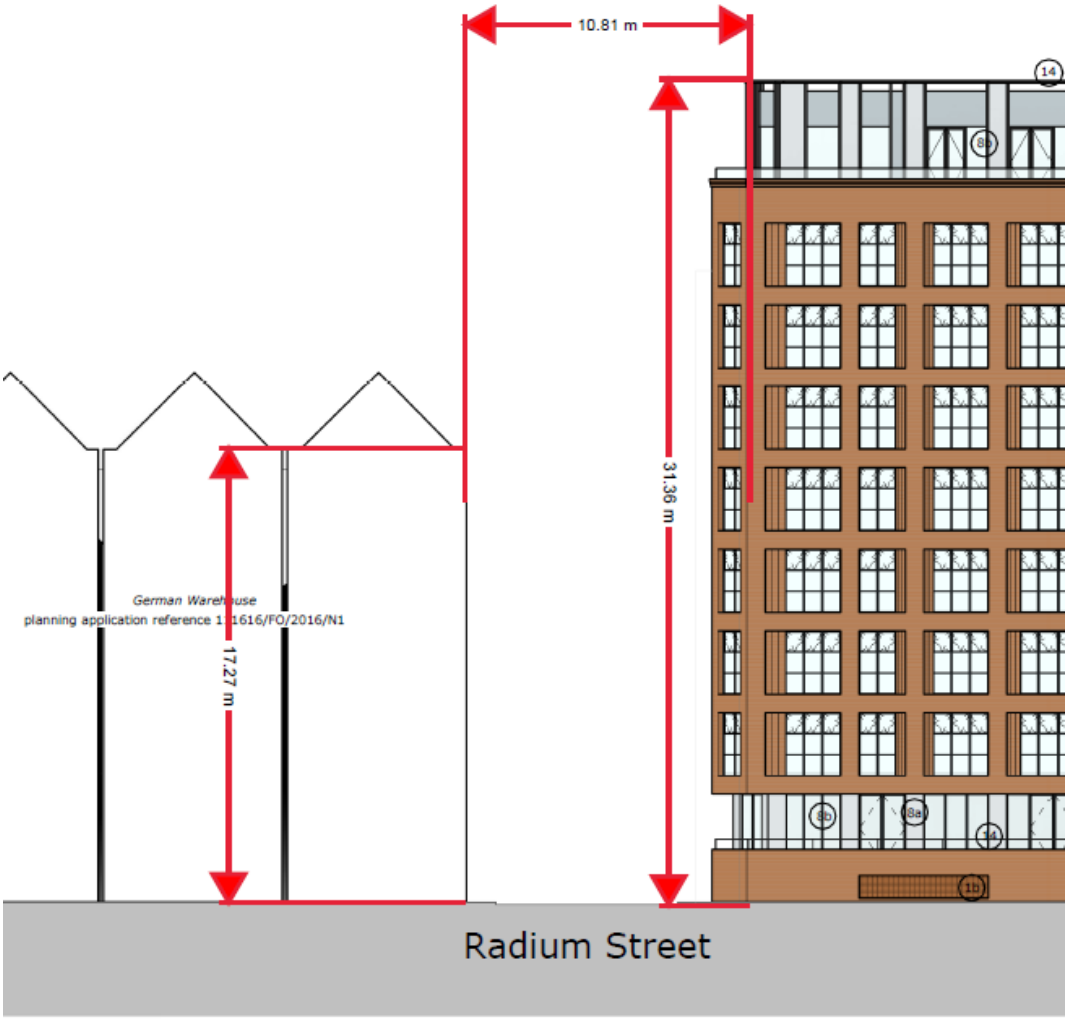
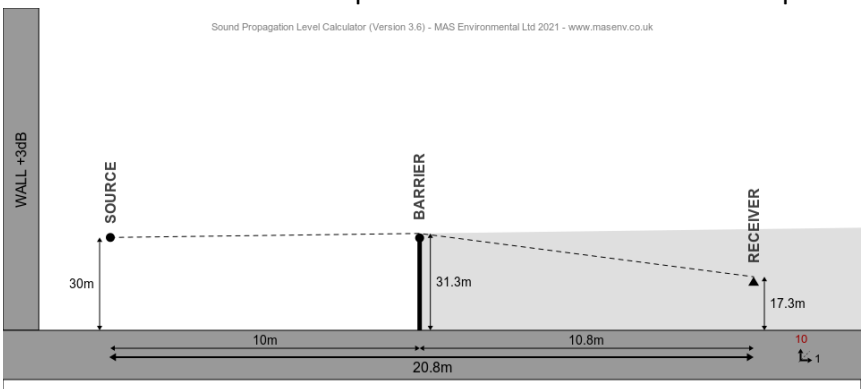


MP1 to Nearest Residential Receptor

MP1 to Residential Receptors Barrier Calcs – Samples 1 -3

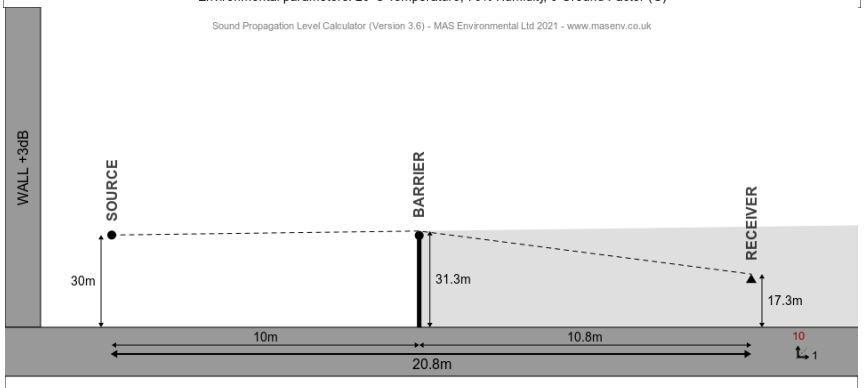
Sound Propagation Level Calculator (Version 3.6) - MAS Environmental Ltd 2021 - www.masenv.co.uk



Frequency - Hz	63	125	250	500	1k	2k	4k	8k	Total
Source - dB	73.7	82.8	91.9	97.6	95	90.1	84.7	77.5	100.8
Receiver - dB(A)	-0.1	16.5	30.4	38.5	36.1	29.4	20.4	6.8	41.2

Environmental parameters: 20°C Temperature, 70% Humidity, 0 Ground Factor (G)

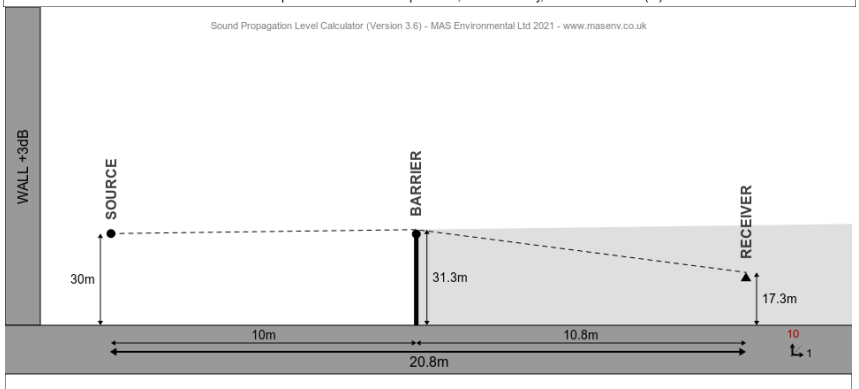
Sound Propagation Level Calculator (Version 3.6) - MAS Environmental Ltd 2021 - www.masenv.co.uk



Frequency - Hz	63	125	250	500	1k	2k	4k	8k	Total
Source - dB	73.7	82.7	91.6	97.6	95.2	90.2	84.8	77.7	100.8
Receiver - dB(A)	-0.1	16.4	30.1	38.5	36.3	29.5	20.5	7	41.3

Environmental parameters: 20°C Temperature, 70% Humidity, 0 Ground Factor (G)

Sound Propagation Level Calculator (Version 3.6) - MAS Environmental Ltd 2021 - www.masenv.co.uk



Frequency - Hz	63	125	250	500	1k	2k	4k	8k	Total
Source - dB	73.5	82.6	91.4	97.6	95.2	90.2	84.8	77.7	100.8
Receiver - dB(A)	-0.3	16.3	29.9	38.5	36.3	29.5	20.5	7	41.3

Environmental parameters: 20°C Temperature, 70% Humidity, 0 Ground Factor (G)

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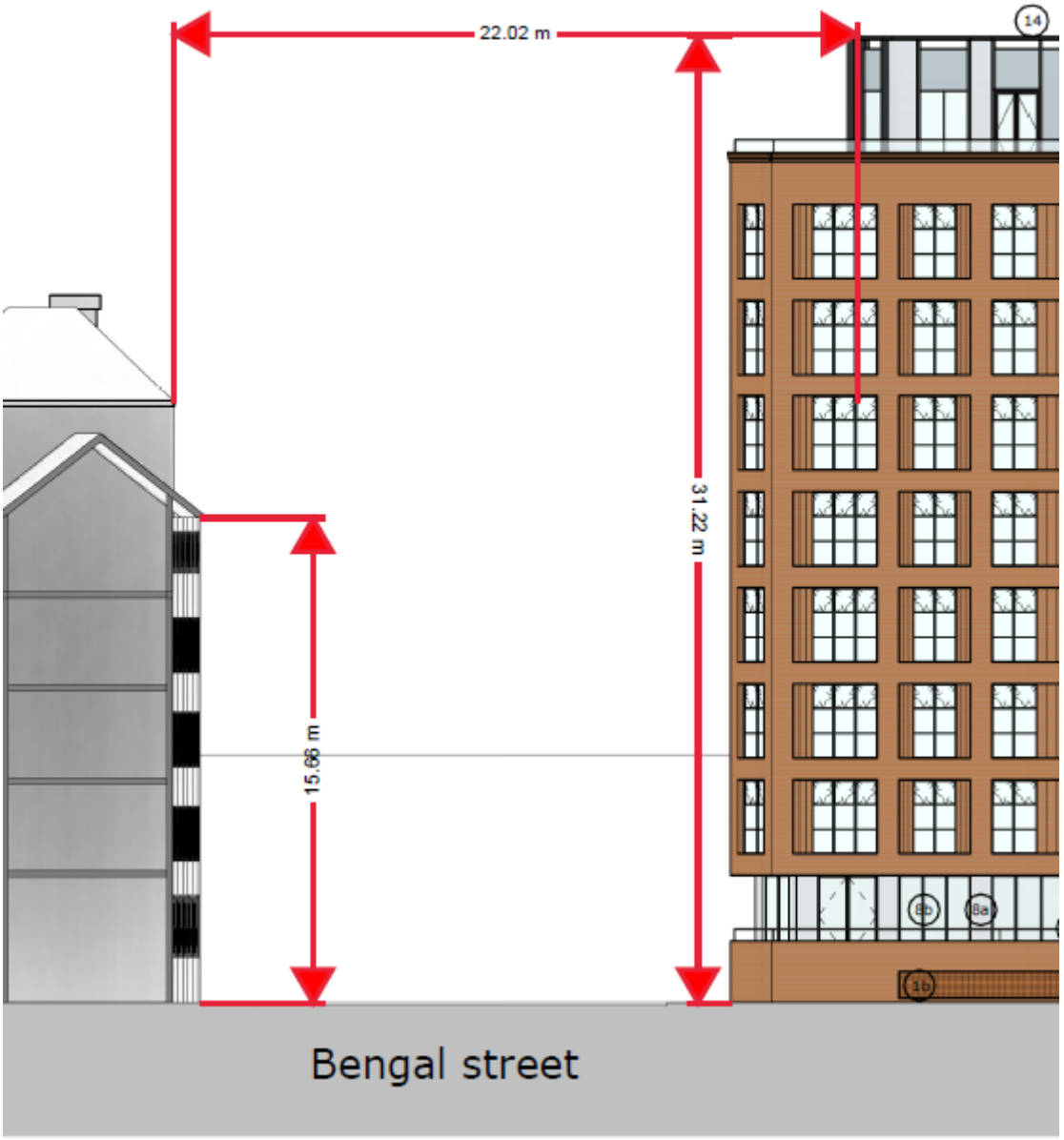

MP2 to Nearest Residential Receptor

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MP2 to Residential Receptors Barrier Calcs – Samples 1 -3

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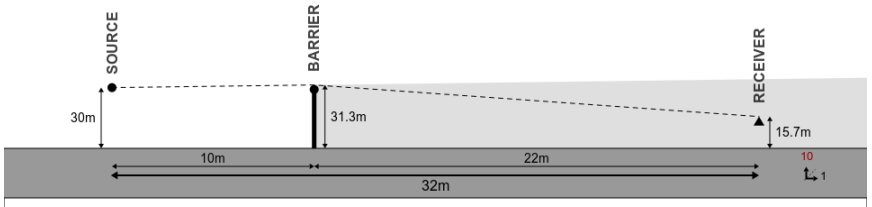

Frequency - Hz	63	125	250	500	1k	2k	4k	8k	Total
Source - dB	73.3	82.9	92.4	97.3	94.4	89.6	84.4	77.5	100.5
Receiver - dB	21.3	28.6	35.4	37.5	31.6	23.7	15	3.2	40.7

Environmental parameters: 20°C Temperature, 70% Humidity, 0 Ground Factor (G)

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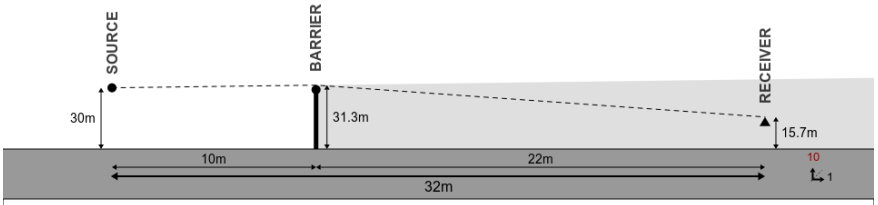

Frequency - Hz	63	125	250	500	1k	2k	4k	8k	Total
Source - dB	73.4	83.1	92.9	97.8	94.6	89.9	84.7	77.7	100.9
Receiver - dB	21.4	28.8	35.9	38	31.8	24	15.3	3.4	41.1

Environmental parameters: 20°C Temperature, 70% Humidity, 0 Ground Factor (G)

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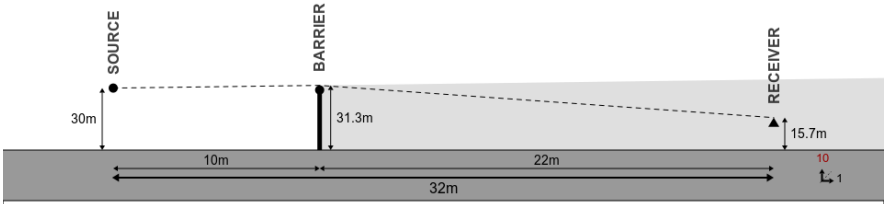

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