

MILLER GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING

Noise Assessment

on behalf of

TEAKWOOD DEVELOPMENTS LTD.

for the site at

PROPOSED CONTAINER STORAGE AT WILLOW LANE, HUDDERSFIELD

REPORT DATE: 4TH JUNE 2024

REPORT NUMBER: 103154

Miller Goodall Ltd
Ground Floor
Ashworth House
Deakins Business Park
Blackburn Road
Egerton
Bolton
Lancashire
BL7 9RP

Tel: 01204 596166

www.millergoodall.co.uk

Company registration number5201673

Summary

A noise impact assessment has been undertaken to predict the potential impact on existing noise-sensitive receptors from patrons using the proposed Proposed Container Storage at Willow Lane, Huddersfield. This was requested by Teakwood Developments Ltd. to support a planning application for the site.

The proposal involves the erection of 90 No. self-storage units, with access to the site off Willow Lane. Residential dwellings are located to the north of the site. The containers will form a perimeter wall around the full boundary of the site, providing a built-in noise barrier.

Measurements were made at a location representative of the nearest residential dwellings to the north of the proposed site to identify the pre-development background noise levels. This data was subsequently used to predict the potential impact of noise from likely activities associated with the proposed development when in use.

A noise model has been assembled for the proposed development site based on predicted patron usage details provided by the client and historical sound level measurements of vehicles, the results from which are provided within this report.

Record of changes

Prepared By:	Will Wright MIOA	**Reviewed By:**	Jo Lacy MIOA
Signed:		**Signed:**	
Date:	4th June 2024	**Date:**	4th June 2024

Version	Date	Change	Initials
1	4th June 2024	First issue	WW

Contents

Summary **1**

Contents **2**

1 Introduction **4**

2 Site Description **4**

3 Proposed Development **4**

4 Policy, Guidance and Assessment Methodology **5**

5 Local Authority Consultation **5**

6 Noise Survey **6**

6.1 Measurements of Existing Noise Sources 6

6.2 Monitoring Results 8

7 Impact of Noise from the Proposed Development **9**

7.1 Computer Modelling 9

7.2 BS 4142:2014+A1:2019 Assessment 10

7.3 $L_{AF,max}$ Assessment 13

7.4 Predicted Internal Noise Levels Assessed to BS 8233:2014 and WHO GCN Recommended Limits 13

7.5 External Noise Levels 14

7.6 Summary 14

8 Summary and Conclusions **14**

APPENDICES **16**

Appendix 1: Planning Policy **17**

Noise Policy Statement for England 17

National Planning Policy Framework 18

Planning Practice Guidance – Noise 19

Appendix 2: Acoustic Standards and Guidance **21**

ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development – May 2017 21

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings 23
World Health Organisation (WHO) Guidelines for Community Noise 1999 25
BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' 25

Appendix 3: Site Location Plan with Monitoring Position 27

Appendix 4: Proposed Site Layout 28

Appendix 5: Time History Graph of Measured Sound Levels at MP1 29

Appendix 6a: CadnaA 3D Noise Model - Daytime Vehicle Movements 30

Appendix 6b: CadnaA 3D Noise Model – Night-time Vehicle Movements 31

Appendix 6c: CadnaA 3D Noise Model – Night-time Door Slams 32

Glossary of Terms 33

1 Introduction

1.1 Miller Goodall Ltd has, on behalf of Teakwood Developments Ltd., undertaken a noise assessment in respect to the impact of noise from Proposed Container Storage at Willow Lane, Huddersfield on the existing noise-sensitive receptors in the vicinity of the site. The site lies within the administrative area of Kirklees Council (KC).

1.2 This noise assessment assesses the potential noise impact of predicted vehicle movements and general usage of the proposed storage units by future patrons.

2 Site Description

2.1 The site is located on the former Ben Shaw Car Park, to the north of Willow Lane, Huddersfield, which is an urban area located approximately 900 m to the north of the town centre. Trees and thick vegetation encircle the site, some of which will be retained as part of the design. The site location plan is presented in Appendix 3.

2.2 Properties on Bay Hall (a road) border the site to the north, although the rear exterior of the properties provides an approximate 20 m standoff between the site perimeter and a residential window. A private access, and future site access for the development borders the site to the northeast, with a commercial usage building located beyond. Willow Lane borders the site to the east and south, with a mix of residential and commercial units located beyond. St John's Road borders the site to the west, with residential dwellings located across the road. A café and barber shop borders the site to the northwest.

2.3 The existing noise environment at the site at the time of writing this report is predominantly traffic noise from surrounding roads.

3 Proposed Development

3.1 The proposal is for a container storage site comprising 90 metal shipping containers. The containers will be installed around the perimeter and face inward to provide built-in screening from both sight and sound. The site will be accessed from Willow Lane towards the northeast corner, andthe proposed site plan is presented in Appendix 4.

3.2 Proposed hours of business are set out by the client as follows:

- 07:00 – 19:00 hours Monday to Saturday

- 10:00 – 16:00 hours on Sundays

3.3 For the purpose of the planning application for the proposed development, the assessment will look at 24/7 operation to understand the potential for future flexibility of the site. This application, however, is only for the proposed daytime business hours.

3.4 The client has stated the following with regard to expected storage container usage in terms of vehicles visiting the site:

"A container used by someone during a house move typically has 2 vans arrive to fill the container then when the selling/buying is complete 2 vans arrive to empty it, this is very often 12 months apart. We will have self-employed trades men visiting, most of the trades people, it is expected would visit 2 or 3 times per week Mon to Fri. Probably 20% of the clients visit weekly."

3.5 Based on 20% of a maximum of 90 No. clients (one client per container) visiting the site three times per week, we have determined a reasonable worst-case prediction of 3 No. vehicles per hour.

3.6 A worst case of 2 vehicles per 15-minutes during the night time (23:00 – 07:00) has been assessed with respect to the possibility for extended opening hours of the site in the future.

4 Policy, Guidance and Assessment Methodology

4.1 National planning policy is outlined in Appendix 1: Planning Policy. The acoustic standards and assessment techniques referred to in this assessment are outlined in Appendix 2: Acoustic Standards and Guidance.

5 Local Authority Consultation

5.1 Environmental Health at Kirklees Council (KC) was consulted in respect of the methodology used in this assessment[1]. It was agreed that an assessment is required that assesses the impact of potential noise generation from the proposed site using the methodology outlined in BS4142:2014 along with internal and external requirements of BS 8233:2014. Both the survey location and the duration were agreed, and the Environmental Health Officer stated that any mitigation measures will need to be stated clearly in the report.

[1] Email to environmental.health@kirklees.gov.uk dated 7th May 2024. Response from Mohammed Nasim dated 9th May 2024

6 Noise Survey

6.1 Measurements of Existing Noise Sources

6.1.1 Noise measurements were undertaken at a representative location consistent with the existing noise-sensitive receptors in accordance with BS 7445-1: 2003[2] by Stephen Maslivec on behalf of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (≤ 0.1 dB). Details of the equipment used are shown in Table 1.

Table 1: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1[3,4] Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-15860-E0	27/02/2023	06143/1
Pre-amplifier	NTi MA220	NTi Audio	8102	27/02/2023	06143/1
Microphone	NTi MC230A	NTi Audio	A16445	27/02/2023	06143/1
Outdoor microphone housing	NTi WP30	NTi Audio	NA	NA	NA
Calibrator	NOR 1251	Norsonic	34123	13/10/2023	05972/1

*No reference number available, but the certificate is available upon request.

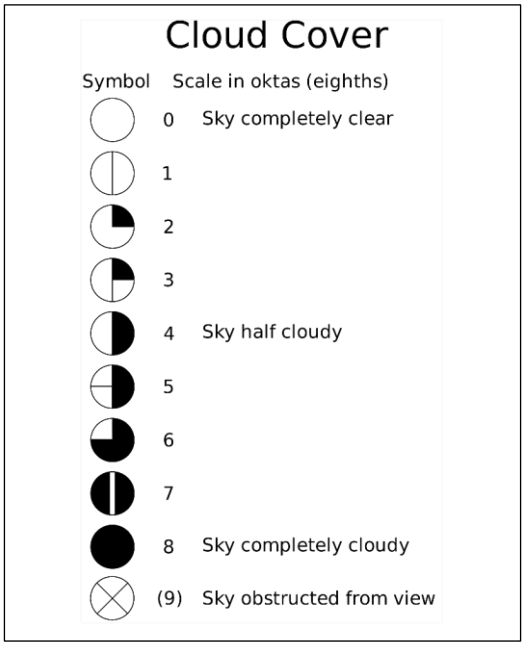
6.1.2 Background and ambient noise monitoring was undertaken at the times specified in Table 2, below. Weather conditions were determined both at the start and on completion of the survey. Additionally, the forecast showed no predicted inclement weather which would adversely affect the noise survey works being undertaken, and there was no indication in the noise data that weather had impacted the levels measured. It is therefore considered that meteorological conditions were appropriate for environmental noise measurements throughout the survey period. The measurement location is shown on the location plan presented in Appendix 3.

[2] BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

[3] IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

[4] IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

Table 2: Dates, times and weather conditions during noise measurements

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
P1	24/05/24, 12:30 to 28/05/24, 07:00	Temperature:	11 °C	11 °C
		Precipitation:	Light	Dry
		Cloud cover (oktas – see opposite):	0	0
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	Slight	No
		Wind speed:	3.0 m/s	3.5 m/s
		Wind direction:	Variable, generally east and north	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

6.1.3 Measurements were taken over a weekday and weekend period to capture the typical background sound levels at the site. Measurements were made under free-field conditions at a height of 1.5 m above local ground level.

6.1.4 The measurement location is detailed below and indicated on the site location plan in Appendix 3.

- MP1 At the northern boundary of the site, adjacent to the nearest residential boundary

6.1.5 The noise sources within the vicinity of the measurement location are summarised in Table 3, below:

Table 3: Description of noise sources affecting the site

Measurement Locations	Noise Sources
MP1	Local and distant road traffic

6.2 Monitoring Results

6.2.1 A summary of the broadband measurement data is provided in Table 4 below with a time-history graph of measured sound levels presented in Appendix 5. All data are sound pressure levels in dB re 20 μPa.

Table 4: Summary of noise measurements

Measurement Location	Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq,T}$ (dB)	Overall $L_{AF,max}$ (dB)	$L_{A90,T}$ (dB)
MP1	Friday Daytime (12:30)	10:30	55	84	48
	Friday Night Time (23:00)	08:00	60	106	34
	Saturday Daytime (07:00)	16:00	54	83	48
	Saturday Night Time (23:00)	08:00	54	89	36
	Saturday Daytime (07:00)	16:00	56	89	46
	Saturday Night Time (23:00)	08:00	53	86	37
	Saturday Daytime (07:00)	16:00	57	89	47
	Saturday Night Time (23:00)	08:00	55	87	31

6.2.2 Each measurement period consisted of sequential 100 ms samples which therefore allowed the variation in noise level over time to be assessed. This data was used to determine the daytime and night-time $L_{A90,1hour}$ and $L_{A90,15minute}$ values respectively to deduce appropriate assessment criteria for the noise impact assessment in line with BS 4142:2014[5] methodology.

6.2.3 The 100 ms noise levels have not been presented in this report but are kept on file for future reference.

6.2.4 The lowest daytime $L_{A90,1hour}$ was measured to be **41 dB** and occurred between 22:00 – 23:00 hours on Sunday 26th May 2024. As the lowest measured daytime $L_{A90,1hour}$ level, and as it occurred on a Sunday outside of the proposed operating hours, this is considered a worst-case level against which to assess.

6.2.5 The night-time $L_{A90,15minute}$ level to be used in the assessment of noise impact overnight has been based on the lowest modal value. This $L_{A90,15minute}$ value is **30 dB**, which occurred four. times overnight between Monday 27th and Tuesday 28th May 2024. A lower background sound level of 29 dB $L_{A90,15minute}$ occurred only twice throughout all measured night-time periods.

7 Impact of Noise from the Proposed Development

7.1 Computer Modelling

7.1.1 Predictions of potential noise levels generated by clients of the proposed storage units have been undertaken using the CadnaA noise modelling package, and historical measurement data from Miller Goodall's library of surch sources. Specific model parameters were applied as follows:

- Propagation of noise using algorithms within ISO 9613: 1993 *Acoustics - Attenuation of sound during propagation outdoors*.
- Client vehicles were modelled as line sources at a height of 0.5 m above ground level and calibrated using historical measurement data of transit-style van passbys.
- Door slams of client vehicles were modelled as point sources at a height of 0.5m and calibrated using historical measurement data of transit-style van door slams.
- Default ground absorption G = 0.8 (equivalent to grassed areas with some tarmac coverage and consistent with the dominant ground cover at the site).

[5] BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound

- Ground attenuation: spectral all sources
- No adverse meteorological effects
- Three orders of reflection
- Topographical data was obtained using DEFRA LIDAR contours for the site and surrounding assessment area.

7.1.2 The octave band L_{eq} and L_{Fmax} source data shown in Table 5 were imported directly into the model. This data was obtained from historical surveys undertaken by Miller Goodall Ltd. Transit-style vans are used as a worst case, however, some clients may attend site in smaller vehicles. The noise data is presented as L_{eq} and L_{Fmax} Sound Pressure Levels at 10 m from the source.

Table 5: Noise source data used within CadnaA

Description	Sound Pressure Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Transit Van Passby L_{Aeq}	32	35.3	38.8	43.7	47.6	48.2	42.1	34.2	52.5
Transit Van Single Door Slam $L_{AF,max}$	52.0	53.3	53.4	57.8	59.5	56.8	53.5	46.3	63.3

7.2 BS 4142:2014+A1:2019 Assessment

7.2.1 A BS 4142 noise impact assessment has been undertaken in order to assess the potential noise impact at the most affected location of the proposed development site and is detailed in this section of the report.

7.2.2 Three scenarios were modelled using the proposed site layout plan provided: hourly daytime L_{Aeq} noise levels affecting the nearest noise sensitive, night-time 15-minute L_{Aeq} noise levels and night-time $L_{AF,max}$ noise levels. Screenshots from each model are provided in Appendix 6.

7.2.3 The following BS 4142 assessment has considered both the day and the night-time impact. Whilst proposed business hours are as stated in Section 3 of this report, an assessment of 24/7 business hours has been undertaken as a worst-case and for future flexibility.

7.2.4 The assessment has been based on the background sound levels discussed in section 6.2 of this report and are as follows:

-Daytime $L_{A90,1hour}$ 41 dB, and

-Night-time $L_{A90,15minute}$ 30 dB.

7.2.5 Based on the above background levels, the BS 4142 assessment of noise impact at the most affected location of the proposed development site is shown in Table 6 and Table 7 below:

Table 6: BS 4142:2014 Noise Impact Assessment: Daytime

Results		Relevant Clauses of BS 4142:2014	Commentary
Background Sound Level	$L_{A90,1hour}$ = 41 dB	8.1.2 8.3	Determined from the lowest $L_{A90,1hour}$ measured during the daytime across the whole survey.
Assessment made during the daytime, so the reference interval is 1 hour		7.2	
Modelled Specific Sound Level	$L_{Aeq,1hour}$ = 21dB		Model results of three vehicles arriving and leaving from site during the day
Acoustic feature correction	+ 6 dB	9.2	Impulsiveness (banging sounds from loading) clearly perceptible at receptor
Rating Level	(21 + 6) = 27 dB		
Excess of Rating Level over Background Sound Level	(27 – 41) = - 14 dB		
Assessment indicates likelihood of negligible impact		11	Initial estimate only
Context		11 8.5	The assessment relates to a new source in an area where noise from vehicles in that location, and loading and unloading (by hand) is not a part of the existing acoustic environment. To mitigate this, conservative assumptions have been made about the number of visits per hour and conservative background $L_{A90,T}$ levels have been chosen for the assessment.
Uncertainty of the assessment		10	There is a small uncertainty related to the inherent margin of error within CadnaA modelling software. This is, however, unlikely to affect the results of the assessment.

7.2.6 It can be seen from the above table that the initial estimate of noise impact of the container storage development during the daytime, based on the BS 4142 methodology, indicates a likelihood of low noise impact at the closest area of the proposed development site.

Table 7: BS 4142:2014 Noise Impact Assessment: Night Time

Results		Relevant Clauses of BS 4142:2014	Commentary
Background Sound Level	$L_{A90,1hour}$ = 30 dB	8.1.2 8.3	Determined from the second lowest $L_{A90,15\ minute}$ value measured during the night time across the whole survey.
Assessment made during the night-time, so the reference interval is 15 minutes		7.2	
Modelled Specific Sound Level	$L_{Aeq,1hour}$ = 19dB		Model results of three vehicles arriving and leaving from site during the day
Acoustic feature correction	+6 dB	9.2	Impulsiveness (banging sounds from loading) clearly perceptible at receptor
Rating Level	(19 + 6) = 25 dB		
Excess of Rating Level over Background Sound Level	(25 – 30) = - 5 dB		
Assessment indicates likelihood of negligible impact		11	Initial estimate only
Context		11 8.5	The assessment relates to a new source in an area where noise from vehicles in that location, and loading and unloading (by hand) is not a part of the existing acoustic environment. To mitigate this, conservative assumptions have been made about the number of visits per hour and conservative background $L_{A90,T}$ levels have been chosen for the assessment.
Uncertainty of the assessment		10	There is a small uncertainty related to inherent margin of error within CadnaA modelling software. This is, however, unlikely to effect the results of the assessment.

7.2.7 It can be seen from the above table that the initial estimate of noise impact of the container storage development during the night-time, based on the BS 4142 methodology, indicates a

likelihood of negligible noise impact at the worst affected receptor positions due to the proposed development, even if operating hours were extended to 24-hours..

7.3 $L_{AF,max}$ Assessment

7.3.1 An assumption of six door slams per vehicle visit has been made as a worst-case scenario (i.e. two passengers leaving vehicle and closing doors, two rear transit-style van doors being closed, and passengers entering their vehicle and closing doors before driving off). A worst-case estimate of up to two. vehicles within a 15-minute period during the night-time has also been used for assessment purposes.

7.3.2 Based on these assumptions, predicted $L_{AF,max}$ sound levels are, in the worst case, 60 dB at the worst-affected receptor.

7.4 Predicted Internal Noise Levels Assessed to BS 8233:2014 and WHO GCN[6] Recommended Limits

7.4.1 The generally accepted rule of thumb is that a window left open for ventilation provides 10 - 15 dB attenuation from external noise source,s with the WHO Guidelines for Community Noise suggesting 15 dB. The DEFRA report NANR116: Open/Closed Window Research[7] suggests the figure to be between 12 and 18 dB for road and rail traffic. ProPG indicates that where external noise levels are more than 15 dB higher than the internal noise targets, openable windows should not be relied upon as the sole means of ventilation. This equates to external noise levels of 45 dB L_{Aeq} / 60 dB $L_{AF,max}$ during the night or 50 dB L_{Aeq} during the day.

7.4.2 External noise levels predicted at the worst-affected noise-sensitive receptor resulting from the proposed storage container site are equal to or below the threshold levels set out above. Below these external levels, internal noise levels remain achievable with the use of open windows for ventilation, and therefore mitigation measures to reduce the noise impact would not be required to meet these threshold sound levels.

[6] World Health Organisation: Guidelines for Community Noise (1995)

[7] NANR116: 'Open/closed window research' Sound Insulation through ventilated open windows, Defra April 2007

7.5 External Noise Levels

7.5.1 The predicted daytime noise due to the site within the nearest external amenity spaces is not expected to exceed a level of 27 dB, i.e. significantly below the lower guideline criteria of 50 dB L_{Aeq}. The site is therefore also compliant with the external amenity area noise limits.

7.6 Summary

7.6.1 It has been shown in the preceeding sections of this report that noise from the proposed container storage development satisfies the requirements of a number of relevant standards and criteria at the worst-affected receptor. This includes the internal and external noise criteria detailed in BS 8233:2014, criteria relating to sleep disturbance, and acoustic amenity of external areas within the current WHO guidelines,

8 Summary and Conclusions

8.1 A noise assessment has been undertaken to predict the impact of noise as a result of a proposed container storage site at Willow Lane, Huddersfield. Computer noise modelling was utilised in addition to baseline noise measurements and the potential impact on existing residents was determined using the methodology set out in BS 4142:2014.

8.2 Noise modelling was used to predict the noise levels at nearby dwellings and was assessed against BS 4142. The Rating Level was found to be 14 dB below the lowest background sound level during the daytime, and 5 dB below the background sound level during the night time, suggesting that complaints are unlikely should the site operate 24 hours a day, 7 days a week. The assessment has concluded that the predicted noise resulting from the use of the container storage site will have a negligible impact on the worst-affected noise-sensitive receptors.

8.3 Resultant external sound levels at the worst affected noise-sensitive receptor façade suggest that internal ambient $L_{Aeq,T}$ and instantaneous $L_{AF,max}$ levels internally will be below sound level criteria recommended In BS 8233:2014 and WHO GCN.

8.4 External daytime $L_{Aeq,16hour}$ sound levels within the worst-affected external amenity areas are predicted to be significantly below the WHO GCN external amenity space thresholds for annoyance.

8.5 In conclusion, the potential impact of noise from the proposed development is not predicted to be significant and no additional mitigation to control noise is required.

APPENDICES

Appendix 1: Planning Policy

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE[8]), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:

> "*Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development*:
>
> - *avoid significant adverse effects 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 makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

> "*…all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development*".

Importantly, the NPSE goes on to state:

> "*This does not mean that such adverse effects cannot occur*".

The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

> "*Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available*"

[8] Noise Policy Statement for England, Defra, March 2010

It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

National Planning Policy Framework

The National Planning Policy Framework (NPPF[9]) initially published in March 2012, was updated most recently in December 2023. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise"[10].

The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

> *"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

At par. 180 we are advised that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…"*

Par. 191 goes on to state:

> *"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*

[9] National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023

[10] Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

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:

a) 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; …"

Par. 193 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

"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."

Planning Practice Guidance – Noise

As of March 2014, a Planning Practice Guidance[11] for noise was issued which provides additional guidance and elaboration on the NPPF, the guidance was updated in July 2019. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or 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, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level

[11] Planning Practice Guidance – Noise, https://www.gov.uk/guidance/noise--2 22nd July 2019.

of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

> *"…the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation".*

Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

> *"Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed".*

The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

Appendix 2: Acoustic Standards and Guidance

ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development – May 2017

ProPG: Planning and Noise is new guidance with the aim of delivering sustainable development and promoting good health and well-being through the effective management of noise which may impact on new residential developments. The guidance aims to complement the national planning policy and encourages the use of good acoustic design at the earliest phase of the planning process. It builds upon the recommendations of various other guidance documents including NPPF, NPSE and PPG-Noise, BS 8233 and WHO.

The guidance is applicable to new residential developments which would be exposed predominantly to noise from existing transport sources. The ProPG advocates a risk-based approach to noise using a two-stage process:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of four key elements: –
  - Element 1 – demonstrating a 'Good Acoustic Design Process';
  - Element 2 – observing internal 'Noise Level Guidelines';
  - Element 3 – undertaking an 'External Amenity Area Noise Assessment'; and
  - Element 4 – consideration of 'Other Relevant Issues'.

The ProPG approach is underpinned by the preparation and delivery of an 'Acoustic Design Statement' (ADS), whereby the higher the risk for noise at the site, the more detailed the ADS. The ADS should address the following issues:

- Present the initial site noise risk assessment, including the pre-development acoustic conditions prior to development;
- Describe the external noise levels that occur across the site both before and after any necessary mitigation measures have been incorporated. The external noise assessment with mitigation measures in place should use an informed judgement of typical worst-case conditions;

- Demonstrate how good acoustic design is integrated into the overall design and how the proposed acoustic design responds to specific circumstances of the site;
- Confirm how the internal noise level guidelines will be achieved, including full details of the design measures and building envelope specifications;
- A detailed assessment of the potential impact on occupants should be undertaken where individual noise events are expected to exceed 45 dB $L_{AF,max}$ more than 10 times a night inside bedrooms;
- Priority should be given to enable the use of openable windows where practical across the development. Where this is not practical to achieve the internal noise level guidelines with windows open, then full details of the proposed ventilation and thermal comfort arrangements must be provided;
- Present the findings of the external amenity area noise assessment;
- Present the findings of the assessment of other relevant issues;
- Confirm for a low-risk site how adverse impacts of noise will be mitigated and minimised;
- Confirm for a medium or high noise risk site how adverse impacts of noise will be mitigated and minimised and clearly demonstrate that a significant adverse noise impact has been avoided.

ProPG target noise levels are based on existing guidance from BS 8233 and WHO (see below). Table 8 below outlines the guidance noise levels for different room types during day and night times.

Table 8: ProPG guideline indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,F}$

The footnotes to this table suggest that internal noise level limits can be relaxed by up to 5 dB where development is considered necessary or desirable, and still represent "reasonable" internal conditions. They also suggest that in such cases, external levels which exceed WHO guidance target levels (see WHO section below) may still be acceptable provided that reasonable internal noise levels are achieved. Although, where the acoustic environment of external amenity areas is intrinsic to the overall design, "noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$". The wording of ProPG (and BS 8233:2014) is clear that exceedance of guideline noise levels in external areas should not prohibit the development of desirable developments in any event.

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

This standard carries the full weight of an adopted British Standard, provides recommended guideline acoustic design criteria for new dwellings and is supported by guidance contained within WHO GCN[12]. The guideline noise design criteria of BS 8233 apply to external noise "*without a specific character*" (previously and sometimes termed or referred to as "*anonymous noise*") such as that associated with road and rail traffic.

Internal Amenity

The Standard states that for external noise without a specific character, such as road traffic, it is desirable that the internal ambient noise level does not exceed the guideline values shown in Table 9, below.

The note to paragraph 7.7.1 states that where noise has a specific character (i.e. it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content) *"lower noise limits might be appropriate".*

Table 9: BS 8233: 2014 guideline indoor ambient noise levels for dwellings

Location	Activity	07:00 to 23:00	23:00 to 07:00
Living Room	Resting	35 dB $L_{Aeq,16hr}$	-
Dining room/area	Dining	40 dB $L_{Aeq,16hr}$	-

[12] World Health Organisation Guidelines for Community Noise, 1999

Bedroom	Sleeping (daytime resting)	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Note 7 to Table 4 of BS 8233 states:

> *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."*

Guidance on reasonable acoustic design criteria for individual noise events are also provided, and the Standard advises that:

> *"regular individual noise events…can cause sleep disturbance. A guideline value may be set in terms of SEL[13] or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values".*

For Internal spaces, the Standard states that;

> *"..to avoid sleep disturbance, sound pressure levels at the outside facades of living spaces should not exceed 45 dB L_{Aeq} (taken as a façade level, and equating to a free-field external level of 42 dB L_{Aeq}) and 60 dB L_{AFmax} so that people may sleep with bedroom windows open."*

External Amenity

BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens, patios and private outdoor amenity spaces. BS 8233:2014 adopts guideline external noise level limits provided in WHO for external amenity areas such as gardens and patios. The standard states that it is "*desirable*" that the external noise does not exceed 50 dB $L_{Aeq,16hr}$ with an upper guideline value of 55 dB $L_{Aeq,16hr}$ whilst recognising in paragraph 7.7.3.2 that development in higher noise areas, such as urban areas or those close to the transport network, may require a compromise between elevated noise levels (i.e., above 55 dB $L_{Aeq,16hr}$) and other factors that determine if development in such areas is warranted. In such circumstances, the development should be designed to achieve the lowest practicable noise levels in external amenity areas, but should not be prohibited.

[13] Sound exposure level or L_{AE}

The standard also states:

> *"Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."*

World Health Organisation (WHO) Guidelines for Community Noise 1999

The WHO Guidelines 1999 recommends that to avoid sleep disturbance, indoor night-time guideline noise values of 30 dB L_{Aeq} for continuous noise and 45 dB $L_{AF,max}$ for individual noise events should be applicable. It is to be noted that the WHO Night Noise Guidelines for Europe 2009[14] makes reference to research that indicates sleep disturbance from noise events at indoor levels as low as 42 dB $L_{AF,max}$. The number of individual noise events should also be taken into account and the WHO guidelines suggest that indoor noise levels from such events should not exceed approximately 45 dB $L_{AF,max}$ more than 10 – 15 times per night.

The WHO document recommends that steady, continuous noise levels should not exceed 55 dB L_{Aeq} on balconies, terraces and outdoor living areas. It goes on to state that to protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB L_{Aeq}.

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014+A1:2019[15] provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified

[14] WHO Night Noise Guidelines for Europe 2009

[15] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.

The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

The Specific Noise Level - the noise level produced by the source in question at the assessment location - is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

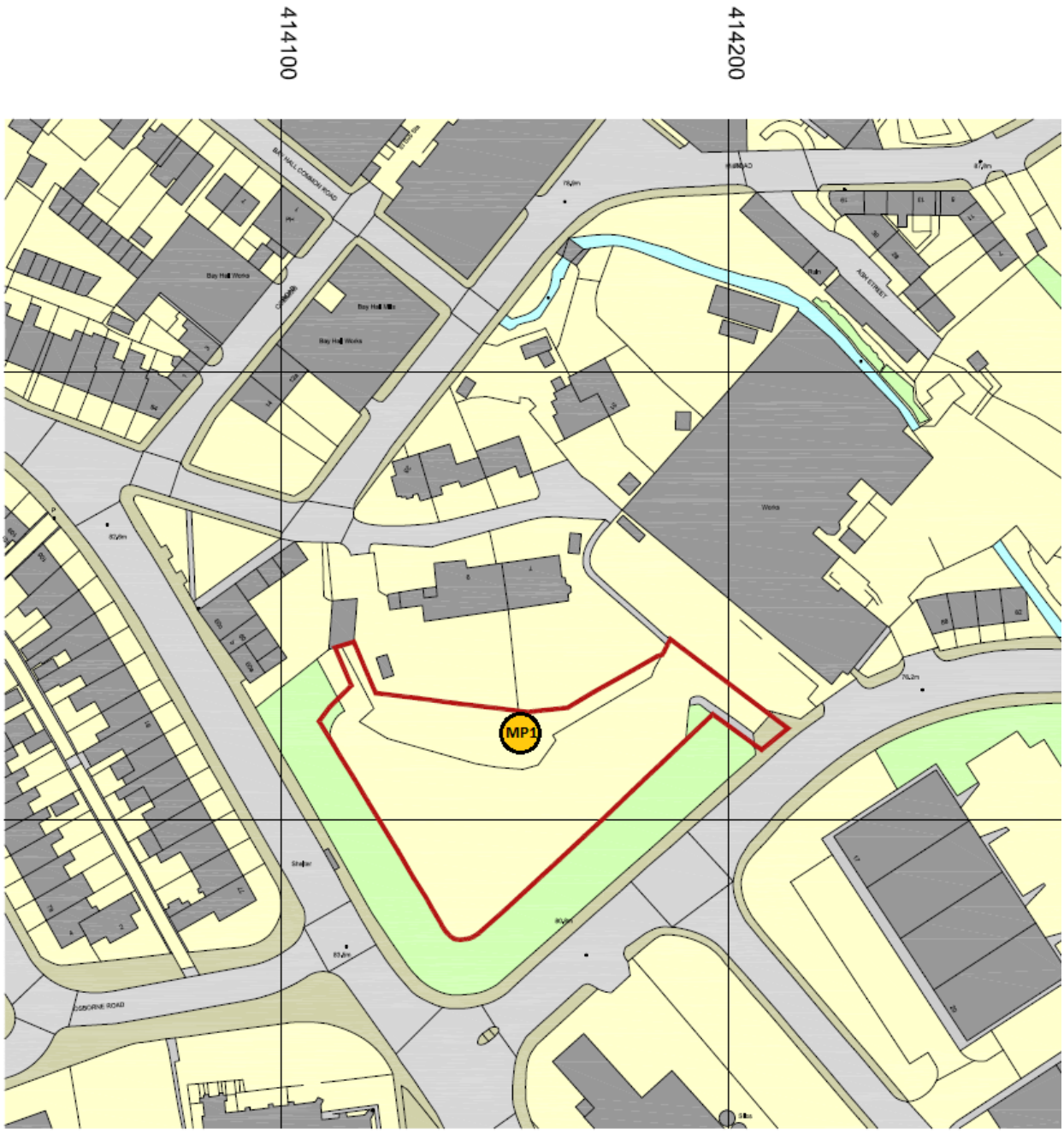
- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending 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.*

In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

> "*An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*"

The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

Appendix 3: Site Location Plan with Monitoring Position

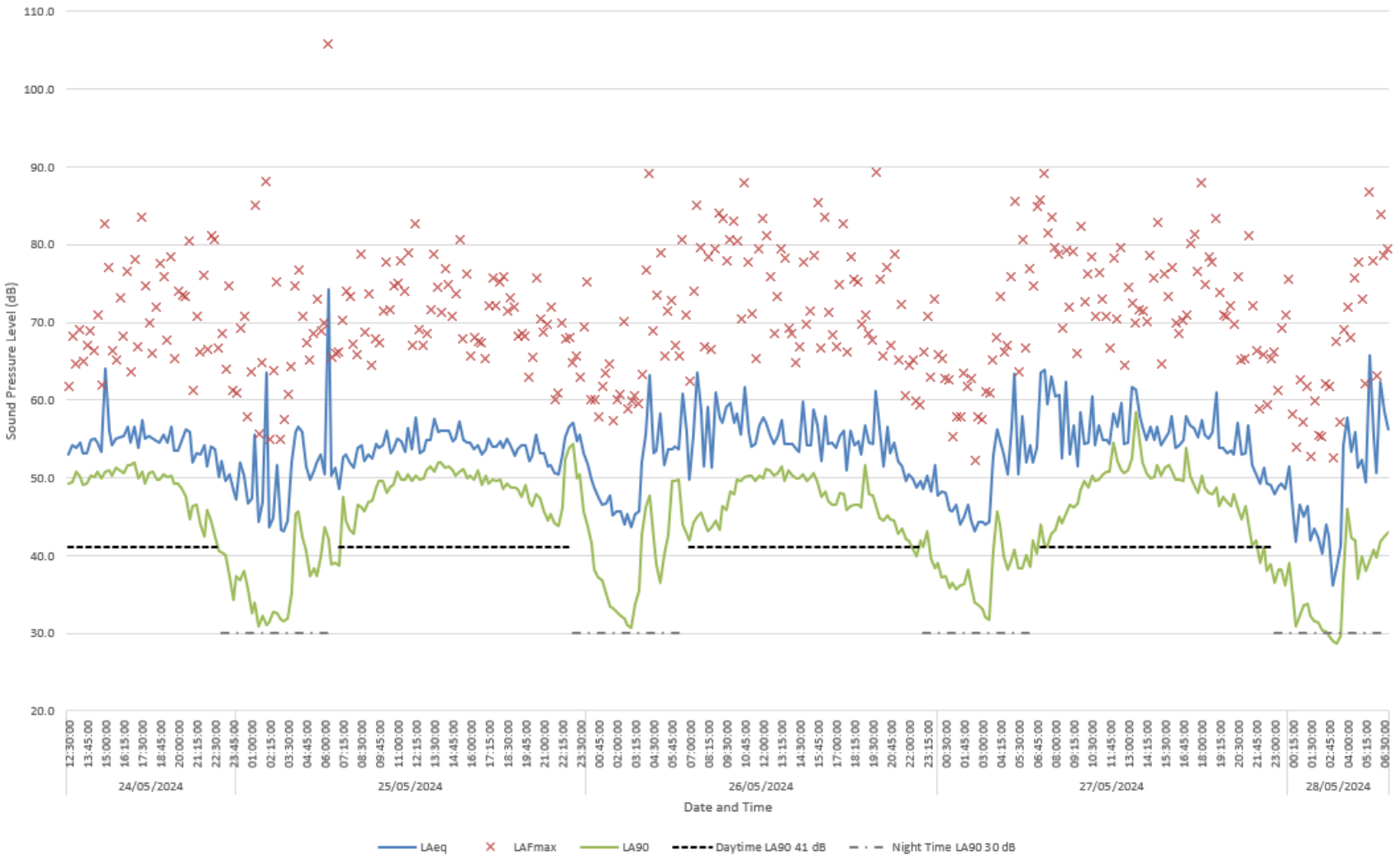


(c) Crown Copyright and Database Rights 2023 OS 100060020

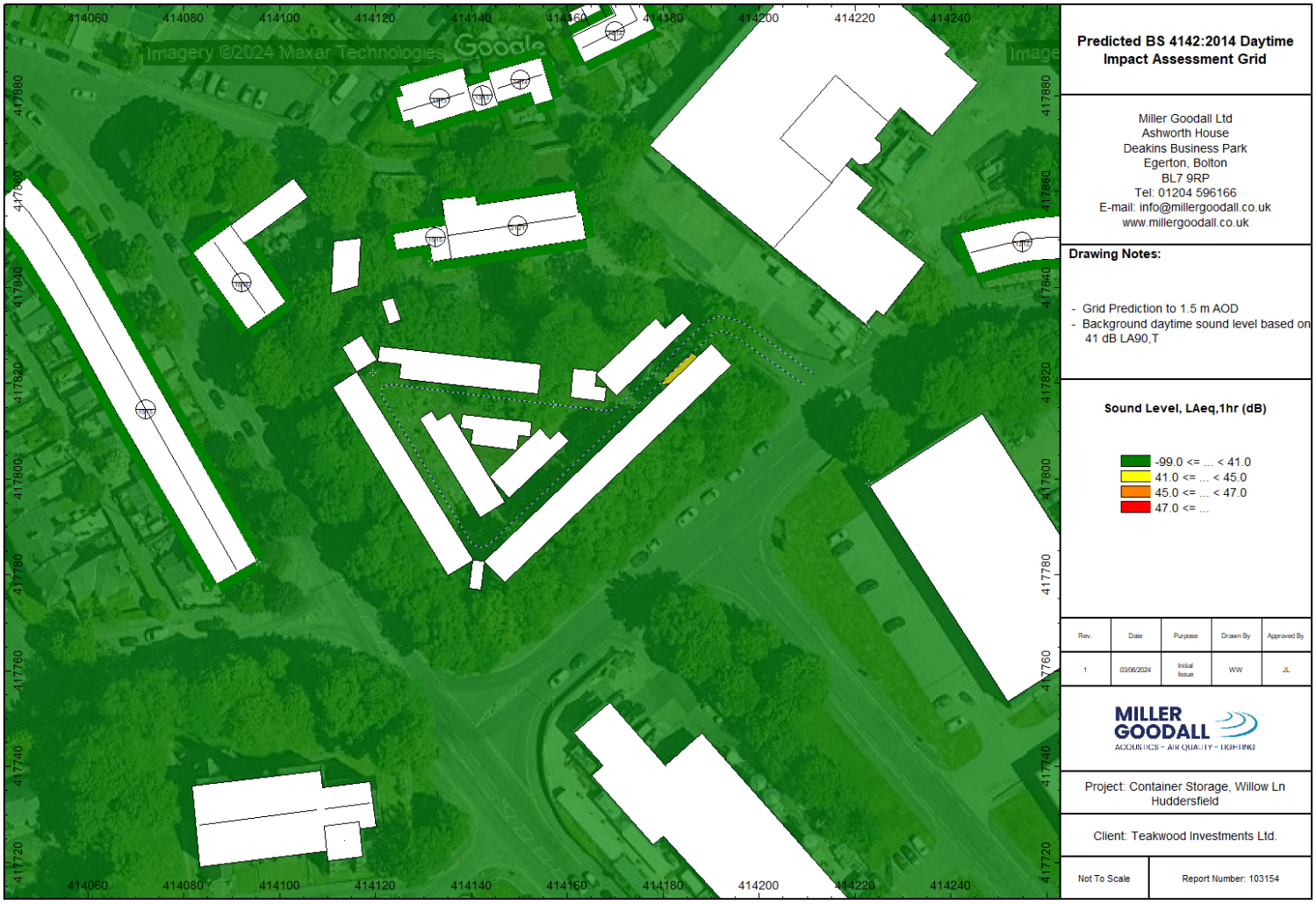
Appendix 4: Proposed Site Layout



Appendix 5: Time History Graph of Measured Sound Levels at MP1



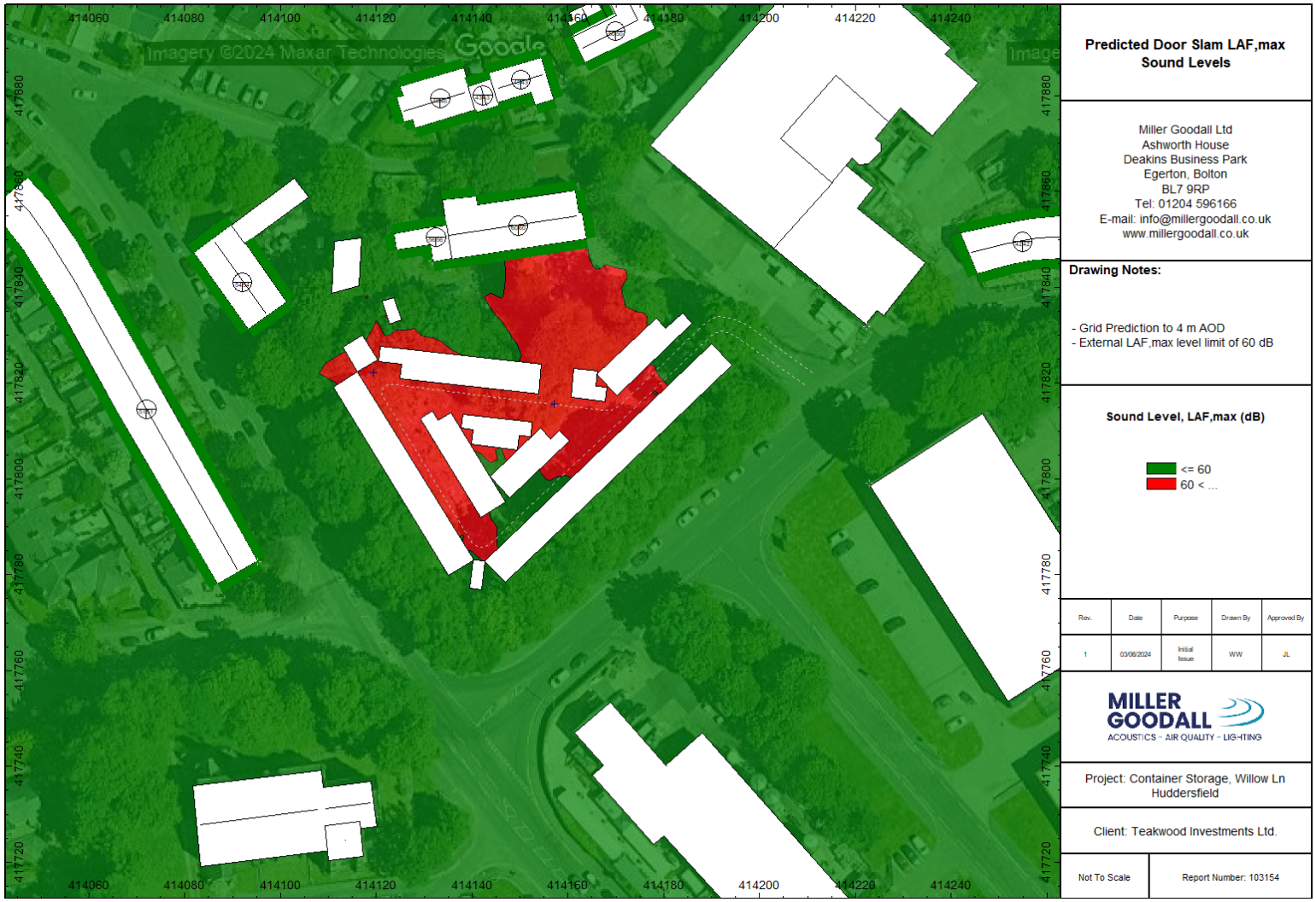
Appendix 6a: CadnaA 3D Noise Model - Daytime Vehicle Movements



Appendix 6b: CadnaA 3D Noise Model – Night-time Vehicle Movements



Appendix 6c: CadnaA 3D Noise Model – Night-time Door Slams



Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A.

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax} The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.


MILLER
GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING