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COUNTRYSIDE PROPERTIES PLC

BARUGH GREEN ROAD, BARNSELY

NOISE ASSESSMENT

AUGUST 2020

DATE ISSUED: AUGUST
JOB NUMBER: LD10092
REPORT NUMBER: 0001
VERSION: V1.0
STATUS: FINAL

COUNTRYSIDE PROPERTIES PLC

BARUGH GREEN ROAD, BARNSELY

NOISE ASSESSMENT

AUGUST 2020

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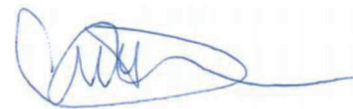
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CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION	2
2 ASSESSMENT METHODOLOGY	3
2.1 Consultation and Scope of Works.....	3
2.2 Assessment Guidance	3
2.3 Noise Modelling	4
2.4 Assumptions & Limitations	4
2.5 Third Party Traffic Data	4
3 NOISE SURVEY	5
3.2 Existing Noise Levels	6
3.3 Site Survey Observations	7
4 NOISE AND OVERHEATING RISK ASSESSMENT	9
5 NOISE IMPACT ASSESSMENT	11
5.2 Assessment of External Noise Levels	11
5.3 Assessment of Internal Noise Levels	11
5.4 AVO Stage 2 Assessment	11
6 INDUSTRIAL NOISE ASSESMENT	13
6.2 Specific Sound Sources	13
6.3 Identification of the Background	15
6.4 Application of a Rating Penalty.....	15
6.5 Comparison of the Background and Rating Levels	16
6.6 BS4124 Context Assessment.....	17
Absolute level of Sound	18
Character and Level of Residual Sound Compared with the Specific Sound	18
6.7 Uncertainty and Assumptions.....	19
6.8 Summary of Assessment.....	20
7 ACOUSTIC DESIGN STATEMENT	21
7.1 Transportation Noise Mitigation	21
7.2 Industrial Noise Mitigation	22
7.3 Overheating and Ventilation Requirements.....	22
7.4 Summary of Mitigation Requirements	23
8 CONCLUSIONS	24

APPENDICES

	TITLE
APPENDIX A	Noise Legislation and Guidance
APPENDIX B	Noise Monitoring Results
APPENDIX C	Noise Break-in Calculations
APPENDIX D	AVO Stage 2 Assessment
APPENDIX E	Noise Break-in Calculations – Industrial Noise
APPENDIX F	Noise Rating Curve Assessment – Daytime
APPENDIX G	Noise Rating Curve Assessment - Night-time
APPENDIX H	Noise Rating Curve Assessment - Night-time Max

FIGURES

	TITLE
LD10092-002	Noise Monitoring & Proposed Receptor Location Plan
LD10092-003	ProPG Stage 1 – Grid Noise Map – Daytime
LD10092-004	ProPG Stage 1 – Grid Noise Map – Night-time
LD10092-005	ProPG Stage 1 – Grid Noise Map – Daytime (with committed)
LD10092-006	ProPG Stage 1 – Grid Noise Map – Night-time (with committed)
LD10092-007	ProPG Stage 2 – Grid Noise Map – Daytime
LD10092-008	ProPG Stage 2 – Façade Noise Map – Daytime
LD10092-009	ProPG Stage 2 – Façade Noise Map – Night-time
LD10092-010	ProPG Stage 2 – Façade Noise Map – Night-time Max
LD10092-011	Daytime Industrial Façade Noise Map
LD10092-012	Night-time Industrial Façade Noise Map
LD10092-013	Night-time Max Industrial Façade Noise Map
LD10092-014	Summary of Façade Insulation Requirements (GF)
LD10092-015	Summary of Façade Insulation Requirements (1 st Floor)

EXECUTIVE SUMMARY

Wardell Armstrong LLP has carried out a noise assessment to accompany a full planning application for a residential development at Barugh Green Road, Barnsley.

An assessment of noise has been carried out in accordance with ProPG, BS8233, BS4142 and AVO. The assessment has been supported by noise monitoring data obtained during a site survey carried out during the SARS-CoV-2 pandemic.

The results of the assessment show that noise levels within outdoor living areas will be within the guideline levels, and is shown to be acceptable, with the use of close boarded fencing between the Barugh Green Road and the proposed garden areas.

For internal noise sensitive rooms, the majority of the site will achieve the required internal levels even with open windows, only those dwellings which are located closest to the sources of road traffic noise and industrial noise will require windows to be closed. It is shown that alternative ventilation in the form of PIV will be sufficient for these dwellings.

The results of the AVO assessment has found that some form of overheating mitigation will be required for dwellings located in the northern of the site, closest to the sources of road traffic noise and industrial noise.

1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP was commissioned by Countryside Properties PLC undertake a noise assessment to accompany a full application for a development at Barugh Green Road, Barnsley.
- 1.1.2 The development is situated to the south-east of Barugh Green, Barnsley and currently comprises open land. To the north of the site is the A635, Barugh Green Road, with The Chestnut Tree Public House, an Aldi food store, and a number of other Class B use units. To the east, the site is bordered by residential dwellings. To the south of the site is open land. To the west is also open land and a small garden centre. Further west is Higham.
- 1.1.3 We understand that the proposed development includes approximately 140 residential dwellings with associated infrastructure.
- 1.1.4 This assessment has been carried out in accordance with current guidance and includes recommendations for noise mitigation where required.
- 1.1.5 It should be noted that the noise monitoring was carried out during the SARS-CoV-2 pandemic, and therefore, due to the government-imposed restrictions, measured noise levels may not be representative of pre-Covid levels
- 1.1.6 The development site has been allocated as part of the wider MU1 development. The open land to the south and the west of the site is also part of the MU1 development. It is understood this will comprise a link road and roundabout and residential dwellings.

2 ASSESSMENT METHODOLOGY

2.1 Consultation and Scope of Works

- 2.1.1 The general principles of the assessment methodology were sent to Mr Paul Denton, Environmental Health Officer (EHO) at Barnsley Metropolitan Borough Council (BMBC). The Council's position was also sought on whether they would consider noise data, obtained via a survey during the SARS-CoV2- pandemic, appropriate to support assessments.
- 2.1.2 Mr Denton stated that he was in general agreement with the methodology but could not guarantee the application to be acceptable. He suggested that consideration should be given to how the development would fit into the MU1 project, and with the known noise impact from the proposed link road and associated roundabout, the details of which are set out in application reference no: 2020/0027. Mr Denton provided contact information for the noise consultant, working for Environmental Noise Solutions, so that the traffic data could be acquired.
- 2.1.3 Mr Denton stated that he would be happy for us to carry out noise surveys and make suitable adjustments if required, provided the data was reliable.

2.2 Assessment Guidance

- 2.2.1 The noise assessment will take into account current guidance including:
- National Planning Policy Framework, 2019 (NPPF).
 - Planning Practice Guidance – Noise, 2019 (PPG).
 - Noise Policy Statement for England, 2010 (NPSE).
 - Department of Transport's memorandum, "Calculation of Road Traffic Noise" (CRTN), 1998.
 - ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, 2017 (ProPG).
 - Acoustics, Ventilation & Overheating – Residential Design Guide, 2020 (AVO).
 - British Standard 8233:2014 Guidance on Sound Insulation and noise reduction for buildings (BS8233).
 - British Standard BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142).
- 2.2.2 Further details of these documents are included in **Appendix A**.

2.3 Noise Modelling

- 2.3.1 Noise modelling using SoundPLAN version 8.2 has been used to assess the potential levels of road traffic and industrial noise at the proposed receptors.
- 2.3.2 The noise model uses OS vector mapping and Terrain 5 topography data to create a geographical model of the study area on which to generate noise contours. SoundPLAN also uses the noise prediction methodology set out in ISO 9613-2:1996 'Attenuation of sound during propagation outdoors'.
- 2.3.3 The results of the noise model have been checked for accuracy against the measured levels of noise at the monitoring locations and therefore the results of the noise model have been used to inform the assessment.

2.4 Assumptions & Limitations

- 2.4.1 For the assessment of industrial noise, WA has made reasonable assumptions about the noise emissions, the number of events and the likely on-time for these sources of noise. The assumptions are set out within the industrial noise assessment in this report and they are based on our experience of similar schemes.

2.5 Third Party Traffic Data

- 2.5.1 Traffic data was provided by Mr Thomas Crabb, at Environmental Noise Solutions (ENS), for the adjacent roundabout and link road. The data was provided with the approval of the applicant for the proposed link road and roundabout development on the site which is adjacent to the west.
- 2.5.2 At the time of writing, it is believed that the application(s) for the MU1 development is pending approval. However, it is understood that the development is likely to be approved, and therefore we have considered noise from development led road traffic from the MU1 development in this assessment. The MU1 development is included in the future year 2033 with the committed link road and roundabout, and residential development scenario.

3 NOISE SURVEY

- 3.1.1 On the 21st and 24th July 2020, Wardell Armstrong LLP carried out a noise survey at the proposed development site.
- 3.1.2 Noise measurements were made using Class 1, integrating sound level meters with continuous audio recording. In accordance with guidance, the microphones were mounted on tripods, 1.5 metres above the ground and more than 3.5 metres from any other reflecting surfaces with the diaphragm horizontal.
- 3.1.3 Noise measurements were undertaken at a total of five Noise Monitoring Locations, (MLs). Details of the noise monitoring are set out in Table 1 and are shown on Drawing LD10092-001.

Table 1 - Summary of Noise Monitoring Locations			
Monitoring Location	Description	Time Period Monitored	
		Start	End
ML1	Located at the northern boundary of the site, approximately 35m away from the plant at the Chestnut Tree Public House	2022hrs 21/07/2020	2046hrs 21/07/2020
ML2	Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 100m away from the Aldi delivery bay	2100hrs 21/07/2020	1132hrs 22/07/2020
ML3	Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 25m away from the EB Manufacturing Entrance	2104hrs 21/07/2020	0802hrs 22/07/2020
ML4	Located in the north western boundary of the site, approximately 7m from Barugh Green Road and approximately 60m away from Road and Trails Motorbike Dealer and Granite Worktops.	0800hrs 22/07/2020	1449hrs 24/07/2020
ML5	Located at the hedgerow near to the southern boundary of the site.	1200hrs 22/07/2020	0700hrs 24/07/2020

- 3.1.4 A-weighted¹ L_{eqs} ² were measured in accordance with the requirements of BS8233. The maximum and minimum sound pressure levels, A-weighted L_{90s} ³, A-weighted L_{10s} ⁴, frequency and audio were also recorded to provide additional information. The measured noise levels are set out in full in **Appendix B**.
- 3.1.5 The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No significant drift in the calibration during the survey was noted.

3.2 Existing Noise Levels

- 3.2.1 The measured ambient noise levels at all monitoring locations have been split into the daytime and night-time period. The results for each of the monitoring locations are presented in Table 2.

Table 2: Daytime and Night-time Noise Levels at the Site (Figures in dB $L_{Aeq,16hour}$ (day) and $L_{Aeq,8hour}$ (night))		
Monitoring Location	Time	Measured Noise Level
ML1	0700-2300	61
ML2	0700-2300	64
	2300-0700	55
ML3	0700-2300	66*
	2300-0700	58
ML4	0700-2300	64
	2300-0700	56
ML5	0700-2300	48
	2300-0700	43
*Derived from a 1-hour measurement, between 0700 and 0800hrs, during the daytime period.		

- 3.2.2 The maximum noise levels from transport noise, measured during the night-time, are summarised in Table 3. ML5 has not been included as it is close to the centre of the

¹ A' Weighting An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions

² L_{eqs} Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

³ L_{90} The noise level which is exceeded for 90% of the measurement period.

⁴ L_{10} The noise level which is exceeded for 10% of the measurement period.

site well away from any source of noise and has been used to establish the background noise levels at the site.

- 3.2.3 In accordance with ProPG up to the 10th highest maximum noise level can be considered for the assessment of noise at the dwellings. Therefore, the 10th highest $L_{Amax,F,1minute}$ has been used measured in a single night-time period.

Table 3: Summary of the Maximum Measured Transport Night-time Noise Levels (Figures in dB $L_{Amax,F}$)	
Monitoring Location	Maximum Measured Noise Level
ML2	78
ML3	82
ML4	78

3.3 Site Survey Observations

- 3.3.1 On the 21st July 2020, the weather conditions during the evening were as follows:

- Low winds <5m/s.
- Partial cloud cover.
- Dry.

- 3.3.2 On the 22nd July 2020, the weather conditions during the survey were as follows:

- Low winds <5m/s.
- Partial cloud cover.
- Dry during the night-time period.
- Mainly dry during the daytime with intermittent, light showers.

- 3.3.3 On the 23rd July 2020, the weather conditions during the survey were as follows:

- Low winds <5m/s.
- Partial cloud cover.
- Mainly dry during the daytime and night-time with intermittent, light showers.

- 3.3.4 On the 24th July 2020, the weather conditions during the survey were as follows:

- Low winds <5m/s.
- Partial cloud cover.

- Dry during the daytime and night-time period.
- 3.3.5 Attended noise monitoring and playback of audio recordings, allow observations and detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following:

Road Traffic Noise: Road traffic noise from Barugh Green Road was dominant across the development site.

Industrial Noise: Plant noise was noted to be audible from The Chestnut Tree during the daytime and evening period.

Noise was audible from the B class use units, located to the north-west of the site. Of these units, delivery noise was noted to be audible from Floor Master during the early morning period of the night-time (0600-0700hrs) and daytime. Delivery machinery noise was audible from White Rose Interiors during the daytime. No noise was noted from Road and Trials Motorbike dealer.

Noise from car parking and deliveries at Aldi were audible at the site during the daytime and evening periods. No deliveries were observed during the night-time period.

Vehicles were noted to be going to and from EB Manufacturing, including HGVs. However, HGVs going to this site park, load and unload on the rear side of the building and so no noise was audible at the development site.

Other Noise:

Bird noise was occasionally audible at the development site. Noise from grazing horses was audible on 24th July at approximately 0700hrs.

4 NOISE AND OVERHEATING RISK ASSESSMENT

ProPG - Stage 1 Noise Risk Assessment

- 4.1.1 In accordance with ProPG 2017, a Site Noise Risk Assessment (SNRA) has been carried out. The SNRA assesses the risk of noise from transportation having an adverse impact on the proposed development based on the overall measured levels with no development or mitigation in place.
- 4.1.2 SoundPLAN has been used to inform the Stage 1 SNRA. The results of the assessment for the existing levels of road traffic noise are shown on Drawings LD10092-003 and LD10092-004 for during the daytime and night-time period, respectively.
- 4.1.3 ProPG states, however, that it is good professional practice to give regard to any foreseeable changes in the existing and/or new sources of noise. Therefore, the impact of the road traffic noise with the committed development in place has been considered. The results of the assessment for the future year 2033 are shown on Drawing LD10092-005 and LD10092-006 for the daytime and night-time periods, respectively.
- 4.1.4 In determining the potential noise impact, the coloured noise contours on the drawings should be compared to the risk of an adverse effect scale in ProPG for the daytime and night-time periods.
- 4.1.5 The noise contours shown on Drawings LD10092-005 and 006 identify that the majority of the site will be subject to a 'Negligible' to 'Low' risk of adverse effect during the day and night-time. However, both drawings show that there is an increase to a 'Medium' to 'High' risk of adverse effect in the northern part of the site.
- 4.1.6 ***ProPG states that***

'At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development'.

'As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impact of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development

High noise levels indicate that there is an increased risk that development be refused on noise ground. This risk may be reduced following a good acoustic design process that is demonstrated in an details ADS. Applicants are strongly advised to seek expert advice.'

- 4.1.7 The Site Noise Risk Assessment shows that local noise mitigation and good acoustic design are required to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.
- 4.1.8 In accordance with ProPG 2017, a Stage 2 full Noise Assessment, which includes an Acoustic Design Statement, is required to ensure future residents are protected and good acoustic design has been implemented.

AVO – Stage 1 Overheating Risk Assessment

- 4.1.9 In January 2020 the Acoustics Ventilation and Overheating: Residential Design Guide (AVO) was published by the Association of Noise Consultants. Therefore, the risk of an overheating condition within proposed dwellings can be considered in accordance with the AVO guide.
- 4.1.10 In accordance with AVO, the noise levels across the proposed development site should be compared to the Level 1 site risk assessment shown in Table 3.2 of AVO, to establish the potential risk of an overheating condition.
- 4.1.11 The noise contours shown on Drawings LD10092-004 and LD10092-005 identify that, in accordance with Table 3.2 of AVO, the development could be subject to a 'Negligible' to 'High' risk of an overheating condition.
- 4.1.12 Dwellings across the site that are subject to a negligible risk of noise effect will be able to keep windows open to mitigate any overheating condition. However, where there is a requirement to keep windows closed to mitigate noise and rely on alternative means of ventilation, such as for those properties in the northern and western part of the site, sensitive rooms may be subject to an increased risk of overheating. Therefore, a Stage 2 overheating assessment is required for these dwellings which is detailed in Section 5.4 of this report.

5 NOISE IMPACT ASSESSMENT

5.1.1 The results of the Stage 1 ProPG Assessment show an increased risk of an adverse noise impact at some areas of the site. This Section therefore forms part of the Stage 2 Assessment.

5.2 Assessment of External Noise Levels

5.2.1 As part of the Stage 2 Assessment, the road traffic noise has been predicted across the site with the development in place and the resulting noise levels assessed against the upper guideline noise level for outdoor living areas is 55dB $L_{Aeq,16hour}$.

5.2.2 The grid noise map shown on Drawing LD10092-007 shows the level of noise within the garden areas with standard 1.8m high close boarded fencing.

5.2.3 The drawing indicates that the level of noise within all external garden areas will be below the guideline noise level and therefore no additional noise mitigation measures are required.

5.3 Assessment of Internal Noise Levels

5.3.1 The recommended guideline noise level for living rooms and bedrooms during the daytime period is 35dB $L_{Aeq,16hour}$. The recommended noise level for bedrooms during the night-time period is 30dB $L_{Aeq,8hour}$ and 45dB $L_{Amax,F}$.

5.3.2 To determine the internal ambient noise level within sensitive rooms, non-uniform partition calculations have been carried out using the level of noise and spectrum at the facades. The site layout plan indicates that many of the noise sensitive rooms are of similar size and dimensions and have similar glazing to brickwork ratios. The calculations therefore consider the worst-case noise sensitive room type, when considering distance to the road, glazing to brickwork ratio, and internal volume. The calculations are shown in **Appendix C**.

5.3.3 The results of the calculations are used to specify a degree of façade mitigation so that the respective internal noise levels are achieved. The specification comprises glazing together with alternative ventilation and are set out within Section 7.

5.4 AVO Stage 2 Assessment

5.4.1 The results of the stage 1 overheating assessment indicate that the development could be subject to a 'Negligible' to 'High' risk of overheating.

- 5.4.2 Those receptors that are in the central part of the site or screened by the development itself, will have a negligible risk of overheating as windows are not required to be closed to mitigate noise. Therefore they do not need to be considered further.
- 5.4.3 However, the risk of overheating should be considered for proposed dwellings that are located to the north and to the west of the site. An assessment has therefore been carried out in accordance with AVO and can be seen in full in **Appendix D**.
- 5.4.4 Table 4 below sets out the summary of the Stage 2 overheating assessment. This assessment considers the use of mitigation for dwellings closest to Barugh Green Road.

Table 4: Summary Stage 2 Overheating Risk Assessment					
Location	Mitigation Considered	Noise Exposure			Assessment to AVO Table 3-3
		Day	Night	Max	
Northern elevations closest to Barugh Green Road	Mitigation in the form of increased equivalent air exchange or mechanical cooling	No Observed Effect	No Observed Effect	No Observed Effect	The internal noise levels are low and should not cause a change in behaviour.
Western Elevations closest to the link road	Mitigation not required but may be considered. Assessment considers open window (-13dB attention)	LOAEL	LOAEL	NOAEL	Increased likelihood of impact. Change in behaviour may occur but only for limited periods.

- 5.4.5 The stage 2 overheating assessment shows that mitigation would be required for those dwellings located closest to Barugh Green Road. Mitigation is not required for those dwellings located closest to the link road. However, if mitigation were to be provided it would reduce the risk of overheating.
- 5.4.6 To mitigate the risk of overheating these dwellings should be designed so that the equivalent air exchange is 50% greater than the requirements of The Building Regulations Part F. Alternatively, mechanical cooling could be provided.

6 INDUSTRIAL NOISE ASSESMENT

6.1.1 The results of the survey found that industrial noise was audible at the development site, and therefore an assessment of this noise has been carried out in accordance with BS4124. SoundPLAN V8.2 has been used to support this industrial noise assessment.

6.1.2 As outlined in Section 3, noise was observed to be audible from:

- The Chestnut Tree during the daytime period.
- Aldi during daytime period.
- The B Class Units:
 - Floor Master
 - White Rose Interiors

6.1.3 During the survey noise from vehicles going to EB Manufacturing was audible at the development site. However, the vehicles pulled up to the rear of the building; the screening provided by the building meant that no noise from loading and or unloading was audible.

6.1.4 We observed no deliveries at Aldi during the night-time period. However, from our experience, Aldi stores do receive deliveries during the night-time and therefore, noise from deliveries have been included in this assessment.

6.1.5 The assessment of the industrial noise from the existing commercial premises has been carried out for the daytime and night-time periods.

6.1.6 The impact of the industrial noise has been calculated at three proposed sensitive receptors (PSRs). Their locations are illustrated on Drawing LD10092-002 and are representative of the locations of the proposed dwellings in the northern part of the site.

6.2 Specific Sound Sources

6.2.1 The site survey found plant noise from The Chestnut Tree to be audible at the development site. The measured level of noise in the absence of road traffic at ML1 has been used as the specific level of noise from this sound source. The sound power of the plant has been calculated and has been used to inform the assessment.

6.2.2 Delivery noise from Aldi was noted to be audible during the daytime. However, the road traffic remained the dominant source of noise during each delivery event,

therefore, we are unable to obtain a specific level of noise from the delivery. In the absence of a measured specific noise level WA have used archived data to support this assessment.

- 6.2.3 Delivery noise was audible at the development site from Floor Master during the night-time and daytime periods. The sources of noise associated with this event include HGV movements, idling engines, forklift trucks, and the actual unloading/loading process itself. Whilst we only observed a delivery event at Floor Master, we would also anticipate that deliveries may occur at the other B Class units on that estate, and therefore additional events have also been considered within the model.
- 6.2.4 Machinery noise was audible from White Rose Interiors during the daytime period. The noise was coming from inside the unit with the roller shutter doors open.
- 6.2.5 The specific sound level of each source of noise within the acoustic model is set out within Table 5. Where a specific level of noise has not been determined, Wardell Armstrong archive data has been used to determine the levels of the potential sources of noise, together with noise source information within the SoundPLAN library.

Table 5: Specific sound level of sources of sound	
Noise Source	Specific Sound Level
The Chestnut Tree Plant	85 dB L _{WA}
Idling HGV Engine Noise	85 dB L _{WA}
Accelerating HGV	72 dB L _{WA} ^{m/2}
HGV Max	112 dB L _A F _{Max}
Unload/Loading Event	87 dB L _{WA}
Car Parking	N/A*
Machinery	70 L _{WA} /m ²
*Calculated using the carpark calculation process within the noise model, this is based on the number of spaces across the Sainsburys car park and assumes 120 spaces.	

On time

- 6.2.6 In accordance with BS4142, the level of the specific sound sources should be corrected to reflect the on-time of the noise over the respective reference interval (T_r), 1-hour daytime (0700-2300) and 15-minute night-time (2300-0700) period.

- 6.2.7 The results of the survey showed that deliveries are likely to occur at Aldi, EB Manufacturing and the industrial estate. It is assumed that a delivery could occur at each of these premises during the 1-hour daytime and 15-minute night-time reference period, however it is not likely that a delivery will occur at all the premises within the same periods. The on-time has been calculated based on 1 event at each premises during the daytime and night-time and vehicle speed of 10kph on site.
- 6.2.8 It is assumed that ancillary plant noise associated with The Chestnut Tree may occur throughout the entire 1-hour daytime assessment period.
- 6.2.9 It is assumed that idling engine noise and delivery noise may only occur for 30-minutes, which is half of the daytime reference period of one hour but will cover the entire night-time assessment period of 15 minutes.
- 6.2.10 The Aldi food store is open between 0800 and 2200hrs and therefore parking noise has been excluded from the night-time period. The on-time for the car park assumes one event per parking space (approximately 120) for the daytime period.
- 6.2.11 The machinery noise from White Rose Interiors is assumed to be operational throughout the entire daytime period.
- 6.2.12 Three scenarios have been carried out, which show the noise levels at proposed receptors. Each scenario comprises a delivery occurring at each of the premises, together with the operation of the other continuous sources of industrial noise.

6.3 Identification of the Background

- 6.3.1 The background sound levels have been established from the noise monitoring carried out at monitoring location ML5. The levels used for the assessment are the mean average L_{90} noise levels, measured throughout the respective daytime and night-time period. The levels are shown in Table 6 below.

Table 6: Background Noise Levels for Assessment	
Assessment Period	Noise Level dB L_{A90}
Daytime	42
Night-time	39

6.4 Application of a Rating Penalty

- 6.4.1 The character of the overall industrial noise, as experienced at the receptor locations, is not likely to be intermittent, tonal or impulsive. It is likely, however, that it would

still be readily distinctive against the existing acoustic environment and therefore a +3dB correction feature has been applied to the level of the specific noise at the receptor locations.

6.5 Comparison of the Background and Rating Levels

6.5.1 In accordance with BS4142, the rating noise level of operations at the proposed development, as experienced at the proposed receptors, has been compared with the corresponding background sound levels for the daytime and night-time periods. The results are shown in Tables 7 and 8.

6.5.2 The assessment shows the highest calculated noise impact for each of the three scenarios, at each of the three PSRs.

6.5.3 For the daytime, the level of noise has been considered at the ground floor level, as it is likely that the occupants will be within the living room or garden area. During the night-time, the level at the proposed receptors has been considered at the 1st floor, as the occupants are likely to be within the bedroom areas.

Table 7: BS4142 Assessment of the Rating Levels at Proposed Receptors for the Daytime Period						
Description	Receptor					
	PSR1		PSR2		PSR3	
	Front Façade	Rear Garden	Front Façade	Rear Garden	Front Façade	Rear Garden
Specific sound level (including on-time correction), dBA	48	38	46	36	47	29
Application of rating penalty	+3	+3	+3	+3	+3	+3
Noise rating level	51	41	49	39	50	32
Background sound level, LA90	42	42	42	42	42	42
Excess of noise rating over background level	+9	-1	+7	-3	+8	-10
During the daytime it is considered that the receptors would be within the garden area or located within the ground floor of the building. Therefore, the level of noise is therefore considered at the ground floor level at the front façade and the rear garden.						

6.5.4 The results of the industrial noise assessment for the daytime period show that the noise rating level exceeds the background noise level by between 7 and 9dB at the front of the facades of the three PSRs. This is an indication that the impact is **‘Moderate Adverse’**, subject to context.

6.5.5 The results of the assessment show that the rating sound level is less than the background sound level within the external garden areas. This is an indication that the impact is '**Low**', subject to context.

Table 8: BS4142 Assessment of the Rating Levels at Proposed Receptors for the Night-time Period			
Description	Receptor		
	PSR1	PSR2	PSR3
Specific sound level (including on-time correction), dBA	53	52	52
Application of rating penalty	+3	+3	+3
Noise rating level	56	55	55
Background sound level, L _{A90}	39	39	39
Excess of noise rating over background level	+17	+16	+16
During the night-time It is considered that the receptors would be internally and within the 1 st floor of the building. Therefore, the level of noise is considered at 1 st floor level and at the front façade.			

6.5.6 The results of the assessment show that the noise level exceeds the background noise by more than 10dB at the 1st floor facades. This is an indication that the impact is around '**Significant Adverse**', subject to context.

6.6 BS4124 Context Assessment

6.6.1 BS4142:2014 States; "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs".

6.6.2 The first requirement of this statement has been determined within the noise impact assessment section above. To determine the context in which the proposed industrial sound will reside, three factors must be considered, these are;

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sounds and,
- The sensitivity of the receptor.

Absolute level of Sound

6.6.3 When considering the absolute level of sound BS4142 states:

'Where background sound levels and rating levels are low, absolute levels might be as, or more relevant than the margin by which the rating level exceeds the background. This is especially true at night.'

'Where residual sound levels are very high, the residual sound might itself result in adverse impacts of significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impact worse.'

6.6.4 During the daytime the background sound level is 42dB, with the rating levels being between 53 and 56dB at the front facades and between 39 and 38dB at the rear. During the night-time the background sound levels is 39dB, with the rating levels being between 56 and 59dB.

6.6.5 These background sound levels and noise rating levels are considered to be moderate at the front of the facades, across both periods, and therefore the exceedance of the rating over the background could be considered to be more relevant than the absolute noise level at the front of the façade. The impact in this case therefore remains the same.

6.6.6 The noise rating level is considered to be low, however, for the daytime at the rear of the dwellings. Therefore, the absolute level of noise at this location may be considered to be more relevant than the margin by which the rating exceeds the background sound level. This indicates that the impact is less than was identified at these areas.

Character and Level of Residual Sound Compared with the Specific Sound

6.6.7 The general ambient noise at the site comprises of mainly road traffic noise from Barugh Green Road. This is similar in character to the movements of customer vehicles, deliveries going to and from Aldi and the other industrial premises.

6.6.8 The level of the existing ambient noise is also likely to be louder than the level of the industrial noise.

6.6.9 The road traffic noise is therefore likely to mask the industrial noise, particularly at the northern boundary of the site.

Sensitivity of Receptor

6.6.10 The proposed receptors will have moderate to high sensitivity given their residential nature. However, BS4142 suggests that the sensitivity of the receptor, should consider whether the development will incorporate design measure that secure good internal and /or outdoor acoustic conditions, such as:

- i) Façade insulation treatment;
- ii) Ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation; and,
- iii) Acoustic screening.

6.6.11 During the daytime the noise impact should be considered in gardens and within internal noise sensitive areas on the ground floor. For during the night-time period, the noise impact should be considered internally and should consider the façade noise insulation and ventilation scheme.

6.6.12 In determining the façade insulation requirements to mitigate industrial noise within internal noise sensitive rooms, façade noise break-in calculations have been carried out using the spectrum of industrial noise at the facades of the proposed receptors.

6.6.13 To determine the appropriate façade sound insulation, the predicted internal noise levels have been compared against the NR curves, and assessed against the recommended noise guideline levels set out within BS8233, which suggest 35dB L_{Aeq} , 30dB L_{Aeq} and 45dB L_{AFmax} . In good practice, consideration should also be made to a maximum instantaneous noise event, L_{AFmax} . The relationship between NR and dB L_p is taken as approximately $NR = dBA - 6$.

6.6.14 The industrial noise break-in calculations are set out in **Appendix E**, and comparison of the internal noise levels against the NR curves is set out in **Appendix F**, **Appendix G** and **Appendix H**. The internal noise levels are below the respective NR curve with the specified façade insulation in place. This is an indication that the impact of noise from the industrial premises will be low.

6.7 Uncertainty and Assumptions

6.7.1 To reduce assessment uncertainty the following steps have been taken:

- The background noise levels used for the assessment have been obtained from previous monitoring in close proximity to the site and are assumed to be appropriate for the assessment.

- The noise model was run with OS mapping and geographical data and with a reflection order of 2.
- The sound power information used for the assessment is considered to be representative of the actual noise sources in the vicinity of the site.
- The on-time of the sources of noise are representative of the actual events.
- Vehicles would travel approximately 6mph on site.

6.8 Summary of Assessment

- 6.8.1 When considering the impact in context, in particular the consideration of noise internally and with the use of the appropriate façade insulation, the actual noise impact is considered to be '**Low**', at all existing receptors. The façade insulation requirements to mitigate the industrial noise is set out within Section 7.

7 ACOUSTIC DESIGN STATEMENT

7.1 Transportation Noise Mitigation

Outdoor Living Areas

7.1.1 The noise level within external areas across the site is shown on Drawing LD10092-007. The drawing shows that the external noise levels will be within the recommended guideline noise level of 55dB L_{Aeq} with standard 1.8m high close boarded fencing surrounding the garden areas and therefore no additional noise mitigation measures are required.

7.1.2 The close boarded fence would need to be erected ensuring no gaps, and a minimum density of 15kg/m².

7.1.3 *Internal Living Area*

7.1.4 The requirement to mitigate noise within internal noise sensitive rooms has been determined based on the predicted façade noise level during the daytime and night-time. A number of suitable specifications have been determined and are set out below:

- Green Façade – Open windows (ventilation can be provided via open windows)
- Orange Façade - Pilkington 4/16/4 Glazing and Positive Input Ventilation (PIV)

7.1.5 The façade noise map shown on Drawing LD10092-008 shows the level at each façade during the daytime. The maps have been illustrated with the required mitigation scheme for facades of plots, to ensure that the recommended internal ambient noise level for the daytime period is achieved.

7.1.6 The façade noise maps shown on Drawings LD10092-009 and LD10092-010 show the ambient and fast max levels of noise at each façade during the night-time. The maps have been illustrated with the required mitigation scheme to achieve the recommended internal ambient noise level, and the fast-max noise level, during the night-time period.

7.1.7 It should be noted that some of the required mitigation for facades of dwellings may be greater for the night-time period than the daytime. The higher specified mitigation for the façades of the dwellings should therefore be used.

7.1.8 Other products or specifications may be suitable, it is recommended that the acoustic performance of the glazing and ventilation meets the specifications assumed in the

calculations of **Appendix C**.

7.2 Industrial Noise Mitigation

- 7.2.1 The results of the industrial noise assessment show that the impact of the noise during the daytime is likely to be low. However, during the night-time period, and when considering the impact of the industrial noise in context, noise mitigation would be required in the form of façade insulation.
- 7.2.2 The required façade insulation has been determined by comparing the internal level of noise against the NR criteria and recommended internal noise levels set out by BS8233.
- 7.2.3 The specification for façade insulation is illustrated on Drawing LD10092-011-012 and 013, for the daytime, night-time and night-time maximum noise levels. These drawings show where ground floor and 1st floor noise sensitive rooms will require façade insulation.

7.3 Overheating and Ventilation Requirements

- 7.3.1 It is to our understanding that the development is using alternative ventilation in the form of positive input ventilation (PIV) for the scheme.
- 7.3.2 In any case, it is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2000 Approved Document F1 Means of Ventilation and British Standard BS5925 1991: “Code of Practice for Ventilation Principles and Designing for Natural Ventilation” (ADF). Acoustic ventilation is recommended only for noise sensitive rooms, which are bedrooms and living/dining rooms.
- 7.3.3 The results of the overheating assessment found that the majority of the site would be at a low risk of overheating and therefore no mitigation would be required. However, for dwellings located closest to the northern boundary of the site, closest to Barugh Green Road, mitigation would be required, and for dwellings located to the western part of the site, closest to the link road, mitigation would be advisable, though not necessary.
- 7.3.4 To mitigate the risk of overheating, dwellings should be designed to allow for an equivalent air exchange 50% greater than that of the requirements set out in the Building Regulations Approved Document F. Alternatively, if this is not achievable, mechanical cooling should be provided for these dwellings.

7.4 Summary of Mitigation Requirements

7.4.1 The requirements for the combined acoustic, ventilation and overheating requirements are illustrated on Drawing LD10092-014 for the ground floor, and LD10092-015 for the 1st floor, which sets out a third specification in addition to those in paragraph 7.1.4:

- Green Façade – Open windows (ventilation can be provided via open windows)
- Orange Façade - Pilkington 4/16/4 Glazing and Positive Input Ventilation (PIV)
- Red Façade - Pilkington 4/16/4 Glazing and Positive Input Ventilation (PIV) with increased equivalent air exchange or mechanical cooling

7.4.2 The specifications within the drawing should be considered as the absolute mitigation requirements for the scheme on a plot-by-plot basis.

8 CONCLUSIONS

- 8.1.1 Wardell Armstrong LLP has carried out a noise assessment to accompany a full planning application for 140 dwellings off Barugh Green Road, Barnsley.
- 8.1.2 To support the assessment, a noise survey was carried out at the site. The dominant sources of noise were found to be industrial activity and road traffic.
- 8.1.3 To inform the assessment noise modelling has been carried out using SoundPLAN V8.2. The sources of noise which affect the site have been input into the model and noise contours across the development site have been generated.
- 8.1.4 The LPA requested that the noise from the MU1 link road and associated development located to the west of the proposed site area should also be considered. Therefore, this has been included in the assessment.
- 8.1.5 The results of the Stage 1 SNRA show that the majority of the site would have a Negligible to Low risk of adverse effect from noise during the daytime and night-time. However, dwellings located at the northern part and western parts of the site, closest to the sources of road traffic noise would be subject to a Medium to High risk of adverse effect.
- 8.1.6 The results of the Stage 1 AVO assessment found that the site would be at a Negligible to High risk of overheating.
- 8.1.7 The results of the BS8233 assessment show that noise levels within outdoor living areas will be below the recommended level across the site with the use of standard 1.8m high close boarded fencing surrounding the garden areas and therefore no additional noise mitigation measured would be required for outdoor living areas.
- 8.1.8 The BS8233 assessment for internal noise sensitive areas shows that the internal noise levels would be acceptable across the majority of the site. However, for dwellings located closest to Barugh Green Road and the link road, façade insulation would be required in the form alternative ventilation to allow the windows to remain closed when the occupant wishes. The use of the façade insulation would ensure the internal noise levels achieved.
- 8.1.9 The BS4142 assessment showed that the impact of noise from the industrial premises would result in a low impact at during the daytime across the site. However, during the night-time, and when considering the impact within context, the results of the assessment found that mitigation would be required for those dwellings located

closest to the sources of industrial noise. Façade insulation has therefore been specified to reduce the impact within internal noise sensitive rooms to an acceptable level.

8.1.10 The results of the Stage 2 AVO assessment show that overheating mitigation would be required for dwellings located in the northern part of the site, closest to Barugh Green Road.

8.1.11 The cumulative requirements for facade mitigation across the site have been summarised in drawings LD10092-014 and LD10092-015.

Appendix A

Policy, Standards & Guidance

APPENDIX A

Policy, Standards and Guidance

National Planning Policy Framework

- A.1 In February 2019 the 'National Planning Policy Framework' (NPPF) was introduced as the current planning policy guidance within England. Paragraph 180 of the NPPF states:
- A.2 '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:
- 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 values for this reason;”*

Noise Policy Statement for England

- A.3 With regard to 'adverse impacts' the NPPF refers to the 'Noise Policy Statement for England' (NPSE), which defines three categories, as follows:
- 'NOEL – No Observed Effect Level
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
 - LOAEL – Lowest Observed Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected.
 - SOAEL – Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur'.
- A.4 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are

taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance – Noise

- A.5 The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable; however, it has no adverse effect as it does not cause any change in behaviour or attitude.
- A.6 Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise.
- A.7 Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.
- A.8 At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. The following Table summarises the noise exposure hierarchy.

Table 1: National Planning Practice Guidance Noise Exposure Hierarchy			
Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No specific measures required
		No Observed Effect Level	
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

A.9 The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

“It can, where justified, although 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 on whether noise is likely to pose a concern.”

A.10 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB L_{Aeq} (16 hour) during the day time in noise sensitive rooms
- 30 dB L_{Aeq} (8 hour) during the night time in bedrooms
- 45 dB $L_{A_{f,Max}}$ during the night time in bedrooms
- 50 dB L_{Aeq} (16 hour) desirable external noise levels for amenity space such as gardens and patios
- 55 dB L_{Aeq} (16 hour) upper guideline value which would be acceptable in noisier environments.

A.11 In addition, for internal noise levels it 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.”

A.12 Furthermore, with regard to external noise, the Standard states;

“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”.

BS8233 Guidance on sound insulation and noise reduction for buildings

A.13 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014 bases its advice on the WHO Guidelines. In addition, for internal noise levels it 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.”

A.14 Furthermore, with regard to external noise, the Standard states:

“For traditional external areas that are used for amenity space such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guidance value of 55 dB $L_{Aeq,T}$ 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.”

British Standard 4142:2014 (BS4142), Method for rating and assessing industrial and commercial sound:

A.15 BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

A.16 The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:
 - 1) Investigating complaints;
 - 2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
 - 3) Assessing sound at proposed new dwellings or premises used for residential purposes.

- A.17 The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.
- A.18 BS4142 refers to noise from the industrial source as the 'specific noise' and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with the industrial noise. The 'specific noise' levels, of the existing industrial premises that have been measured are detailed in the industrial noise assessment section.
- A.19 BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). Section 4 provides details of the background noise survey undertaken.
- A.20 Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular BS4142 identifies that the absolute level of sound, the character, and the residual sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.
- A.21 The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around +5dB 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.
- A.22 During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.

A.23 Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

A.24 ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

A.25 A two-stage process is suggested:

- Stage 1 – Initial Noise Risk Assessment
- Stage 2 – Detailed assessment (Acoustic Design Statement), required where the Stage 1 risk is identified above negligible.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance - Noise and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

A.26 The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

A.27 The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients,

environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

Guidance on Assessment of Road Traffic Noise

A.28 The Department of Transport's memorandum, "Calculation of Road Traffic Noise" (CRTN), 1998 defines a shortened measurement procedure which is used to calculate the LA10,18hour noise level from a measured 3-hour period. The method requires the measurement of noise over 3 consecutive hours between 1000 and 1700 hours.

A.29 From the measured 3-hour period, the arithmetic average of the three LA10,1Hour measurements is taken. The LA10,18Hour noise level is then determined using the following calculation method;

- **$L_{A10,18Hour} = L_{A10,3hour} - 1$**

A.30 The document "Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping" by P G Abbott and P M Nelson (The TRL Method) provides a calculation method to convert the calculated $L_{A10,18Hour}$ into a daytime L_{Aeq} as described below.

- **$L_{day} = 0.95 \times L_{A10,18hour} + 1.44dB$**

A.31 The calculation for the night-time period is shown below.

- **$L_{night} = 0.90 \times L_{A10,18hour} - 3.77$**

Appendix B

Noise Monitoring Results

Appendix B

Noise Monitoring Results

Monitoring Location 1 – Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 35m away from the plat at the Chestnut Tree						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
21/07/2020 – Daytime						
2200-2300	61.4	43.9	79.7	46.2	65.3	Plant noise and vehicle noise

Monitoring Location 2 – Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 100m away from the Aldi delivery bay						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
21/07/2020 – Daytime						
2100-2200	59.8	41.2	94.0	44.9	61.6	Delivery audible, road traffic noise dominant
2200-2300	57.0	37.2	81.5	41.7	60.0	
Overall	58.6	37.2	94.0	42.7	60.9	
22/07/2020 – Night-time						
2300-2315	54.0	38.0	75.5	40.2	55.0	Road traffic noise dominant
2315-2330	54.5	36.8	75.7	39.0	54.2	
2330-2345	51.5	37.9	73.7	39.7	49.3	
2345-0000	41.6	37.2	52.0	39.1	43.2	
0000-0015	49.0	37.0	73.2	38.6	44.8	
0015-0030	54.0	37.2	77.4	39.2	49.1	
0030-0045	50.6	36.9	73.6	38.5	43.8	
0045-0100	46.2	35.6	71.5	37.0	41.1	
0100-0115	45.7	35.3	69.6	37.4	42.2	
0115-0130	49.9	35.8	72.8	37.0	49.9	
0130-0145	51.9	34.9	76.9	36.5	46.8	
0145-0200	46.1	33.0	70.2	36.1	44.7	
0200-0215	46.7	34.4	73.3	35.6	42.5	
0215-0230	40.2	35.1	55.9	36.0	41.7	
0230-0245	47.7	34.0	73.7	35.9	43.1	
0245-0300	43.8	35.5	66.2	36.5	40.4	
0300-0315	48.1	37.2	73.4	38.7	43.2	
0315-0330	51.4	37.0	75.2	38.8	43.7	
0330-0345	46.9	37.7	68.3	38.9	44.1	
0345-0400	48.6	36.8	68.6	38.7	45.8	
0400-0415	48.1	36.8	74.4	38.7	44.4	
0415-0430	53.5	37.9	73.8	39.5	49.7	
0430-0445	51.6	38.0	74.1	39.5	51.7	
0445-0500	54.6	37.0	75.4	38.4	53.0	
0500-0515	56.6	37.3	76.6	39.8	58.0	
0515-0530	56.6	37.3	74.3	41.5	57.4	
0530-0545	58.4	38.9	78.1	42.0	61.1	
0545-0600	60.1	42.4	79.2	44.1	61.9	
0600-0615	59.3	43.4	77.1	45.1	61.8	
0615-0630	58.5	39.3	74.1	43.2	62.3	
0630-0645	61.2	45.2	74.7	48.8	64.7	
0645-0700	62.4	44.4	75.5	46.9	66.1	
Overall	54.9	33.0	79.2	39.5	50.0	

Monitoring Location 2 – Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 100m away from the Aldi delivery bay						
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
23/07/2020 – Daytime						
0700-0800	64.0	41.4	79.4	48.2	68.1	Road traffic noise dominant
0800-0900	63.8	42.9	81.5	49.0	67.8	
0900-1000	63.8	44.7	84.6	48.3	67.6	
1000-1100	63.5	45.8	80.4	49.8	67.5	
Overall	63.8	41.4	84.6	48.8	67.8	

Monitoring Location 3 – Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 25m away from the EB Manufacturing Entrance						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
21/07/2020 – Daytime						
2104-2204	61.2	34.9	83.7	39.8	61.6	Road traffic noise dominant
2204-2300	59.5	33.0	81.9	38.1	57.8	
Overall	60.4	33.0	83.7	38.8	59.6	
22/07/2020 – Night-time						
2300-2315	56.7	36.6	80.5	39.3	52.1	Road traffic noise dominant
2315-2330	58.2	33.5	82.5	37.0	50.3	
2330-2345	52.7	33.7	74.2	36.6	44.8	
2345-0000	39.4	33.4	47.0	36.8	41.2	
0000-0015	50.7	33.6	77.5	36.6	43.0	
0015-0030	56.1	33.7	82.8	37.1	45.8	
0030-0045	52.7	34.6	77.7	37.2	42.6	
0045-0100	48.2	32.8	76.7	34.9	39.4	
0100-0115	46.1	31.7	74.0	35.4	40.1	
0115-0130	49.1	32.8	73.7	35.0	40.1	
0130-0145	54.2	31.7	83.9	34.0	39.9	
0145-0200	46.8	31.5	73.0	34.0	39.0	
0200-0215	47.4	31.1	77.4	33.4	38.4	
0215-0230	43.8	32.5	68.5	35.0	39.5	
0230-0245	49.3	32.3	76.6	34.7	41.5	
0245-0300	46.8	31.1	74.5	34.2	39.1	
0300-0315	48.3	34.2	76.5	36.2	42.1	
0315-0330	52.8	34.7	78.4	37.2	42.4	
0330-0345	50.8	34.2	76.3	37.2	42.7	
0345-0400	50.8	34.0	75.2	36.9	43.9	
0400-0415	51.3	35.0	79.4	37.2	44.0	
0415-0430	56.9	35.5	79.1	38.3	49.1	
0430-0445	54.4	36.1	82.4	38.0	46.9	
0445-0500	57.8	33.5	80.0	36.1	51.5	
0500-0515	59.7	33.4	79.4	36.6	56.7	
0515-0530	59.3	35.6	79.8	39.0	56.0	
0530-0545	61.0	35.4	82.0	40.0	60.0	
0545-0600	62.6	38.8	82.2	42.1	61.0	
0600-0615	62.3	39.8	81.0	43.4	60.6	
0615-0630	61.5	36.2	81.0	39.5	61.5	
0630-0645	64.5	39.0	83.6	43.4	68.1	

Monitoring Location 3 – Located at the northern boundary of the site, approximately 7m from Barugh Green Road and approximately 25m away from the EB Manufacturing Entrance						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
0645-0700	65.1	39.8	83.0	42.8	69.2	
Overall	57.7	31.1	83.9	37.3	47.9	
23/07/2020 – Daytime						
0700-0800	66.4	37.2	84.6	43.9	71.3	Road traffic noise dominant

Monitoring Location 4 – Located in the north western boundary of the site, approximately 60m away from Road and Trails Motorbike Dealer and Granite Worktops.						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
22/07/2020 – Daytime						
0800-0900	63.6	38.8	80.3	46.0	67.8	Road traffic noise dominant. Noise also audible from deliveries and machinery at the B class use industrial estate.
0900-1000	62.9	36.9	90.5	43.5	66.7	
1000-1100	62.6	38.0	77.6	44.9	67.1	
1100-1200	63.6	41.6	82.1	47.9	67.8	
1200-1300	64.2	39.9	76.5	46.8	68.4	
1300-1400	63.9	37.7	81.6	45.1	68.0	
1400-1500	63.8	40.9	81.3	46.7	67.9	
1500-1600	64.3	42.0	80.3	48.5	68.4	
1600-1700	65.2	44.6	78.0	51.5	69.2	
1700-1800	64.8	40.1	76.5	48.3	69.0	
1800-1900	63.8	37.8	88.2	43.9	68.2	
1900-2000	62.0	37.6	78.8	42.4	67.1	
2000-2100	60.2	35.3	84.7	38.9	64.9	
2100-2200	62.8	34.6	95.9	38.4	63.5	
2200-2300	57.6	34.8	78.3	38.1	58.9	
Overall	63.3	34.6	95.9	42.1	67.7	
23/07/2020 – Night-time						
2300-2315	61.5	35.0	89.5	37.5	50.5	Unattended measurement. Road traffic noise dominant.
2315-2330	53.4	34.8	73.7	36.9	46.6	
2330-2345	55.1	35.5	77.2	37.5	51.1	
2345-0000	48.8	34.9	68.9	37.8	42.5	
0000-0015	53.8	34.6	74.9	37.9	48.2	
0015-0030	51.8	34.8	76.7	37.2	42.4	
0030-0045	51.7	33.8	73.2	36.2	43.7	
0045-0100	45.1	33.0	70.8	35.9	40.8	
0100-0115	54.0	34.2	81.4	36.2	41.1	
0115-0130	50.0	34.4	75.0	36.6	43.7	
0130-0145	50.1	34.0	72.7	36.6	43.2	
0145-0200	50.3	32.8	71.1	35.4	44.8	
0200-0215	46.9	32.4	73.5	35.4	40.3	
0215-0230	49.8	33.7	75.6	36.1	41.3	
0230-0245	43.5	32.6	67.2	34.5	39.1	
0245-0300	46.8	32.0	71.1	34.8	40.3	
0300-0315	36.2	30.3	50.8	33.2	38.1	
0315-0330	49.5	30.1	75.9	32.9	38.8	
0330-0345	49.3	30.4	75.2	33.2	39.0	
0345-0400	37.2	29.8	44.8	32.4	40.2	
0400-0415	49.5	34.7	73.1	36.8	42.7	

Monitoring Location 4 – Located in the north western boundary of the site, approximately 60m away from Road and Trails Motorbike Dealer and Granite Worktops.						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
0415-0430	54.8	38.8	76.2	41.6	49.8	
0430-0445	51.3	38.8	74.7	40.2	44.5	
0445-0500	56.6	37.9	76.7	40.6	50.7	
0500-0515	59.0	39.3	78.4	41.6	58.2	
0515-0530	58.0	37.2	77.6	40.1	56.2	
0530-0545	59.8	38.2	79.4	41.6	62.7	
0545-0600	60.6	37.6	80.2	40.9	59.4	
0600-0615	59.3	39.4	77.9	42.3	60.2	
0615-0630	60.6	40.6	77.5	43.8	64.7	
0630-0645	62.7	42.9	77.6	46.0	68.3	
0645-0700	63.2	41.4	77.7	45.2	68.3	
Overall	56.4	29.8	89.5	38.0	48.2	
22/07/2020 – Daytime						
0700-0800	64.3	41.4	82.9	46.1	69.1	Unattended measurement. Road traffic noise dominant
0800-0900	64.3	44.7	78.1	48.2	68.7	
0900-1000	64.2	45.2	78.1	50.1	68.7	
1000-1100	65.2	41.9	79.0	49.3	69.4	
1100-1200	64.3	42.6	79.8	48.5	68.6	
1200-1300	64.5	41.9	79.9	47.9	68.6	
1300-1400	64.2	41.3	85.9	47.1	68.3	
1400-1500	64.3	43.6	81.5	49.1	68.2	
1500-1600	64.9	45.4	83.8	50.7	68.9	
1600-1700	65.3	44.6	77.9	50.6	69.3	
1700-1800	65.3	43.3	80.4	50.3	69.3	
1800-1900	63.4	39.5	83.4	44.2	68.3	
1900-2000	62.5	38.4	78.3	43.7	67.6	
2000-2100	60.9	37.0	78.1	40.5	65.8	
2100-2200	58.4	37.1	80.5	40.3	61.5	
2200-2300	56.9	35.0	79.8	38.3	57.6	
Overall	63.8	35.0	85.9	43.7	68.4	
24/07/2020 – Night-time						
2300-2315	56.6	35.8	79.3	38.5	54.5	Unattended measurement. Road traffic noise dominant
2315-2330	53.4	32.6	75.2	36.1	49.6	
2330-2345	55.1	32.4	82.6	34.8	44.1	
2345-0000	51.2	30.5	75.7	32.9	43.0	
0000-0015	50.9	31.1	73.9	33.6	42.7	
0015-0030	50.9	30.7	75.6	32.7	40.5	
0030-0045	36.0	31.1	44.5	33.6	37.5	
0045-0100	35.6	31.6	44.4	33.4	37.1	
0100-0115	44.9	31.2	71.0	33.6	38.0	
0115-0130	36.0	30.0	45.3	33.3	37.6	
0130-0145	37.5	32.0	45.0	34.9	39.3	
0145-0200	48.0	30.7	75.6	33.3	38.7	
0200-0215	44.8	30.9	71.4	33.4	37.7	
0215-0230	48.6	30.9	76.7	33.3	37.9	
0230-0245	45.3	32.0	66.7	34.1	41.2	
0245-0300	44.6	32.7	71.2	35.3	39.6	
0300-0315	44.9	30.7	67.5	33.9	39.8	
0315-0330	36.2	31.0	44.0	33.7	38.1	
0330-0345	46.3	32.0	70.6	34.4	40.0	

Monitoring Location 4 – Located in the north western boundary of the site, approximately 60m away from Road and Trails Motorbike Dealer and Granite Worktops.

Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
0345-0400	48.9	31.5	71.5	34.8	40.8	
0400-0415	49.2	31.8	76.1	34.2	40.5	
0415-0430	52.3	30.7	74.0	34.8	46.2	
0430-0445	51.9	33.8	74.7	36.1	43.5	
0445-0500	53.9	34.4	76.0	37.2	49.4	
0500-0515	58.4	37.4	77.2	40.1	58.1	
0515-0530	59.7	39.2	84.6	42.5	58.7	
0530-0545	60.8	38.6	78.7	42.8	64.6	
0545-0600	58.0	38.7	78.2	40.7	57.6	
0600-0615	59.2	37.5	78.9	39.4	59.9	
0615-0630	60.9	38.9	79.3	40.9	65.0	
0630-0645	62.7	37.6	80.0	41.5	67.9	
0645-0700	63.6	38.6	78.1	41.1	68.4	
Overall	55.8	30.0	84.6	36.1	46.8	
24/07/2020 – Daytime						
0700-0800	64.8	38.2	100.6	44.2	68.6	Noise from road traffic dominant. Maximum noise level occurred due to grazing animals at meter location.
0800-0900	64.4	41.1	80.9	48.7	68.6	
0900-1000	63.7	42.3	83.2	48.0	68.0	
1000-1100	63.4	41.5	84.9	47.7	67.7	
1100-1200	63.9	43.1	92.5	48.4	67.6	
1200-1300	63.9	39.3	79.7	46.9	68.0	
1400-1400	63.0	40.5	76.3	46.9	67.3	
Overall	63.9	38.2	100.6	47.2	68.0	

Monitoring Location 5 – Located at the hedgerow near to the southern boundary of the site.

Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
22/07/2020 – Daytime						
1200-1300	44.1	39.4	58.8	41.8	45.6	Unattended measurement. Road traffic noise dominant
1300-1400	42.7	38.6	57.0	40.3	44.2	
1400-1500	46.3	39.9	66.3	42.1	46.6	
1500-1600	46.9	40.9	56.8	44.1	48.8	
1600-1700	49.0	43.6	75.4	45.7	49.9	
1700-1800	47.4	42.2	64.2	44.7	48.9	
1800-1900	46.6	41.0	58.3	43.8	48.6	
1900-2000	45.8	40.2	57.7	43.2	47.5	
2000-2100	44.4	38.2	60.7	40.7	46.5	
2100-2200	46.3	37.0	75.6	40.5	45.9	
2200-2300	42.6	37.5	56.3	39.7	44.9	
Overall	46.1	37.0	75.6	41.2	48.1	
23/07/2020 – Night-time						
2300-2315	44.2	38.0	67.3	39.1	43.6	Unattended measurement. Road traffic noise dominant
2315-2330	41.3	37.8	49.1	38.8	43.2	
2330-2345	42.0	37.6	52.0	39.4	43.8	
2345-0000	41.9	37.4	52.5	39.5	43.5	

Monitoring Location 5 – Located at the hedgerow near to the southern boundary of the site.						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
0000-0015	41.9	36.5	50.6	39.0	43.8	
0015-0030	41.3	37.2	50.4	38.8	42.9	
0030-0045	40.2	35.6	49.4	37.9	41.8	
0045-0100	40.5	35.0	51.6	37.2	42.5	
0100-0115	41.1	36.0	54.9	37.9	42.1	
0115-0130	41.4	36.9	49.5	38.5	43.4	
0130-0145	40.9	35.6	49.5	38.2	42.9	
0145-0200	40.3	34.6	48.2	37.2	42.5	
0200-0215	39.9	35.7	48.4	37.1	41.9	
0215-0230	40.4	36.4	49.9	38.2	42.1	
0230-0245	38.9	35.0	47.8	36.7	40.7	
0245-0300	40.2	35.7	49.8	37.2	42.3	
0300-0315	38.0	33.1	49.5	35.3	39.8	
0315-0330	38.2	32.4	49.6	34.6	40.5	
0330-0345	37.9	32.5	49.0	34.7	39.6	
0345-0400	38.6	32.1	45.1	34.5	41.2	
0400-0415	40.5	35.8	52.5	38.0	42.0	
0415-0430	45.2	39.4	62.1	41.1	46.9	
0430-0445	42.5	38.6	54.8	40.1	44.0	
0445-0500	43.4	39.4	54.3	40.4	46.0	
0500-0515	45.6	41.1	56.6	42.8	47.7	
0515-0530	44.2	39.7	52.7	41.5	46.5	
0530-0545	45.4	41.0	54.9	42.9	47.1	
0545-0600	45.9	40.2	61.2	41.9	47.8	
0600-0615	46.0	41.5	55.3	44.0	47.6	
0615-0630	47.0	43.2	56.0	45.1	48.5	
0630-0645	48.5	45.5	53.1	46.9	49.6	
0645-0700	48.1	43.4	60.5	45.6	49.8	
Overall	43.3	32.1	67.3	39.4	44.0	
23/07/2020 – Daytime						
0700-0800	49.2	43.1	76.9	46.0	49.9	Unattended measurement. Road traffic noise dominant
0800-0900	48.0	44.4	54.2	46.3	49.2	
0900-1000	50.2	46.3	62.2	48.0	51.8	
1000-1100	48.6	44.4	61.5	46.6	49.8	
1100-1200	47.3	43.2	54.3	45.5	48.6	
1200-1300	46.7	43.3	54.4	44.9	47.9	
1300-1400	46.8	42.3	56.0	44.7	48.4	
1400-1500	48.1	44.4	57.5	46.4	49.3	
1500-1600	49.1	45.6	63.9	47.1	50.2	
1600-1700	48.8	45.4	57.1	47.4	49.8	
1700-1800	48.6	44.0	60.9	46.7	49.9	
1800-1900	47.9	42.3	58.8	45.3	49.6	
1900-2000	47.4	41.3	55.9	44.4	49.3	
2000-2100	46.2	39.9	58.2	42.8	48.2	
2100-2200	47.3	39.7	67.7	42.9	49.9	
2200-2300	45.9	38.5	62.6	41.1	47.3	
Overall	48.0	38.5	76.9	44.6	49.7	
24/07/2020 – Night-time						
2300-2315	45.2	38.6	52.3	42.2	47.2	

Monitoring Location 5 – Located at the hedgerow near to the southern boundary of the site.						
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
2315-2330	42.7	38.3	50.1	39.6	45.0	Unattended measurement. Road traffic noise dominant
2330-2345	41.6	36.0	57.3	38.3	42.1	
2345-0000	39.7	35.4	48.2	37.2	41.3	
0000-0015	40.5	36.2	49.4	38.1	42.2	
0015-0030	39.6	34.0	47.0	36.4	41.5	
0030-0045	39.1	34.3	48.2	36.6	40.8	
0045-0100	38.5	34.0	47.8	36.2	40.4	
0100-0115	38.8	34.1	52.0	35.8	40.9	
0115-0130	38.4	33.6	49.0	35.6	40.1	
0130-0145	39.3	34.1	47.6	36.7	41.1	
0145-0200	39.3	33.8	51.1	36.4	41.2	
0200-0215	38.8	34.9	52.0	36.4	40.1	
0215-0230	39.6	35.0	51.2	36.9	41.2	
0230-0245	39.8	35.3	47.6	37.4	41.5	
0245-0300	39.5	34.9	48.8	37.0	41.4	
0300-0315	39.1	34.4	46.6	36.4	41.1	
0315-0330	39.2	35.2	48.2	37.1	40.7	
0330-0345	40.3	34.5	49.6	37.8	42.2	
0345-0400	41.2	35.4	56.2	37.6	43.5	
0400-0415	41.5	35.7	55.2	37.8	43.2	
0415-0430	41.4	35.3	52.6	38.0	43.7	
0430-0445	42.5	37.5	53.5	39.2	44.5	
0445-0500	44.4	38.2	57.9	40.3	46.7	
0500-0515	46.4	40.7	58.2	42.4	49.1	
0515-0530	47.7	42.1	61.4	44.6	50.1	
0530-0545	47.5	42.9	61.5	44.7	49.3	
0545-0600	46.1	42.4	56.8	44.1	47.3	
Overall	42.4	33.6	61.5	38.5	43.2	

Appendix C

Noise Break-in Calculations

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Livingroom

Description: Daytime - Spec 1

Surface Area Wall 5.9

Surface Area Glazing 4.9

Number of vents 0

Room Volume 34.1

Room RT 0.5

Ref	Description
Wall 1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties
Glazing 23	
Vent 20	
Source type 3	
	Open window
	No Vent
	Reverberant field

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	51	53	47	44	44	47	40	32	22
Maximum Noise Level (dB)	0	0	0	0	0	0	0	0	0

SRI DATA

Total Façade Area	10.8	Effective Façade Area	10.8
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Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	13	13	13	13	13	13	13	13	13
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.019	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.025	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Composite SRI (dB)	16	16	16	16	16	16	16	16	16

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	51	53	47	44	44	47	40	32	22
Maximum External Noise Level (dB)	3	3	3	3	3	3	3	3	3

Composite SRI	16	16	16	16	16	16	16	16	16
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	10	10	10	10	10	10	10	10	10
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	35	36	31	27	27	30	24	15	6
A weighted (N/A)	-4	10	15	19	24	30	25	16	5
Internal Noise Level dB(A)	32								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	-14	-14	-14	-14	-14	-14	-14	-14	-14
A weighted	-53	-40	-30	-23	-17	-14	-13	-13	-15
Maximum Internal Noise Level dB(A)	-7								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Livingroom

Description: Daytime - Spec 2

Surface Area Wall 5.9

Surface Area Glazing 4.9

Number of vents 0

Room Volume 34.1

Room RT 0.5

Ref	Description
Wall 1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties 4/ (6-16) / 4 No Vent Reverberant field
Glazing 41	
Vent 20	
Source type 3	

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	68	70	64	61	61	64	57	49	39
Maximum Noise Level (dB)	0	0	0	0	0	0	0	0	0

SRI DATA

Total Façade Area	10.8	Effective Façade Area	10.8
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	9	15	21	17	25	35	37	31	31
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.019	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.617	0.155	0.039	0.098	0.015	0.002	0.001	0.004	0.004
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.059	0.015	0.004	0.009	0.001	0.000	0.000	0.000	0.000
-------------	-------	-------	-------	-------	-------	-------	-------	-------	-------

Composite SRI (dB)	12	18	24	20	28	38	40	34	34
--------------------	----	----	----	----	----	----	----	----	----

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	68	70	64	61	61	64	57	49	39
Maximum External Noise Level (dB)	3	3	3	3	3	3	3	3	3

Composite SRI	12	18	24	20	28	38	40	34	34
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	10	10	10	10	10	10	10	10	10
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	56	52	40	40	32	25	17	14	5
A weighted (N/A)	16	25	24	32	29	25	18	15	4
Internal Noise Level dB(A)	35								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	-10	-16	-22	-18	-26	-36	-38	-32	-32
A weighted	-49	-42	-38	-27	-29	-36	-37	-31	-33
Maximum Internal Noise Level dB(A)	-23								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project:Barugh Green Road, Barnsley

Plot:N/A

Plot Type:Southwick

Room:Bedroom

Description:Night-time - Spec 1

Surface Area Wall7.3

Surface Area Glazing2.8

Number of vents0

Room Volume25.9

Room RT0.5

Ref	Description
Wall1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties
Glazing23	
Vent20	
Source type3	
	Open window
	No Vent
	Reverberant field

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	48	50	44	41	41	44	37	29	19
Maximum Noise Level (dB)	66	57	53	50	55	54	48	43	33

SRI DATA

Total Façade Area	10.1	Effective Façade Area	10.1
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	13	13	13	13	13	13	13	13	13
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.023	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.016	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Composite SRI (dB)	18	18	19	19	19	19	19	19	19

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	48	50	44	41	41	44	37	29	19
Maximum External Noise Level (dB)	69	60	56	52	58	57	51	46	36

Composite SRI	18	18	19	19	19	19	19	19	19
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	9	9	9	9	9	9	9	9	9
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	31	32	26	23	23	26	20	11	1
A weighted (N/A)	-8	6	10	14	20	26	21	12	0
Internal Noise Level dB(A)	28								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	52	42	38	35	40	39	33	28	18
A weighted (N/A)	12	16	22	26	37	39	34	29	17
Maximum Internal Noise Level dB(A)	42								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Bedroom

Description: Night-time - Spec 2

Surface Area Wall7.3

Surface Area Glazing2.8

Number of vents0

Room Volume25.9

Room RT0.5

Ref	Description
Wall1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties 4/ (6-16) / 4 No Vent Reverberant field
Glazing41	
Vent20	
Source type3	

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	62	64	58	55	55	58	51	43	33
Maximum Noise Level (dB)	73	64	60	57	62	61	55	50	40

SRI DATA

Total Façade Area	10.1	Effective Façade Area	10.1
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	9	15	21	17	25	35	37	31	31
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.023	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.347	0.087	0.022	0.055	0.009	0.001	0.001	0.002	0.002
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.037	0.009	0.002	0.006	0.001	0.000	0.000	0.000	0.000
Composite SRI (dB)	14	20	26	23	31	41	43	37	37

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	62	64	58	55	55	58	51	43	33
Maximum External Noise Level (dB)	76	67	63	59	65	64	58	53	43

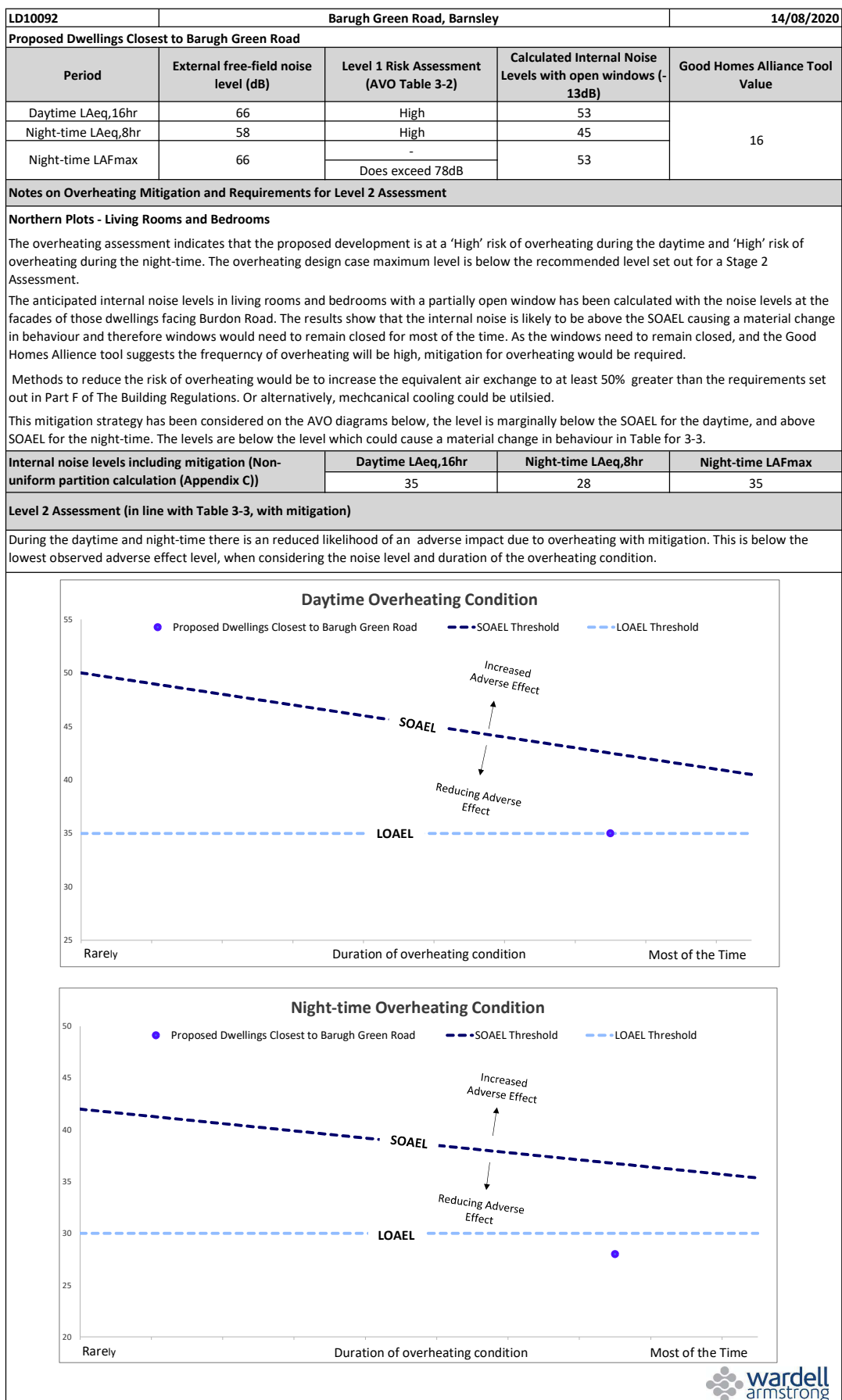
Composite SRI	14	20	26	23	31	41	43	37	37
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	9	9	9	9	9	9	9	9	9
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	49	44	33	33	25	18	10	7	-3
A weighted (N/A)	9	18	17	24	22	18	11	8	-4
Internal Noise Level dB(A)	28								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	62	47	37	38	35	24	16	17	7
A weighted (N/A)	23	21	21	29	32	24	17	18	6
Maximum Internal Noise Level dB(A)	35								

Appendix D
AVO Stage 2 Assessment



LD10092	Barugh Green Road, Barnsley	14/08/2020
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Proposed Dwellings Closest to the Link Road

Period	External free-field noise level (dB)	Level 1 Risk Assessment (AVO Table 3-2)	Calculated Internal Noise Levels with open windows (-13dB)	Good Homes Alliance Tool Value
Daytime LAeq,16hr	56	Low	43	14
Night-time LAeq,8hr	48	Low	35	
Night-time LAFmax	55	- Does exceed 78dB	42	

Notes on Overheating Mitigation and Requirements for Level 2 Assessment

Western Plots - Living Rooms and Bedrooms

The overheating assessment indicates that the proposed development is at a low risk of overheating during the daytime and night-time. The overheating design case maximum level is below the recommended level set out for a Stage 2 Assessment.

The anticipated internal noise levels in living rooms and bedrooms with a partially open window have been calculated with the noise levels at the facades of those dwellings facing the site access road. The results show that the internal noise is low with an open window but this may still result in a requirement to close the windows on some occasions. The Good Homes Alliance tool suggests there is a moderate frequency of overheating. Therefore, mitigation measures are therefore not required but still may be considered. Methods to reduce the risk of overheating would be to increase the equivalent air exchange to at least 50% greater than the requirements set out in Part F of The Building Regulations. Or alternatively, mechanical cooling could be utilised.

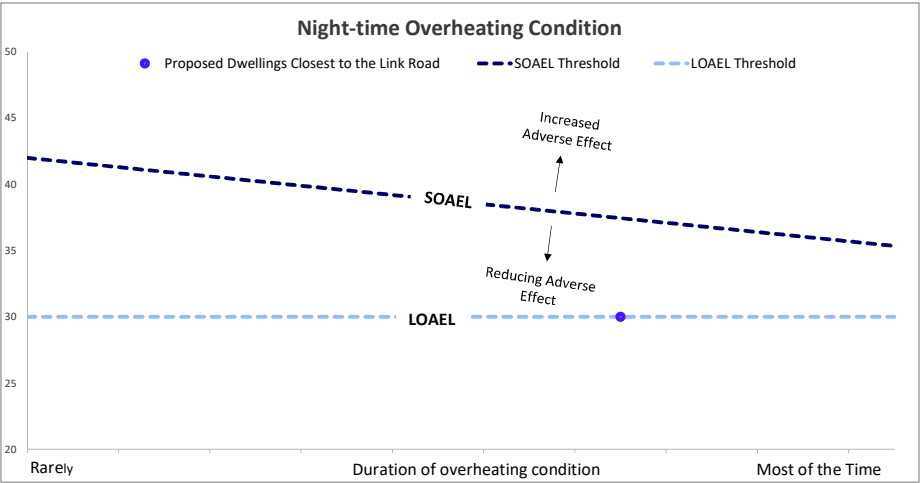
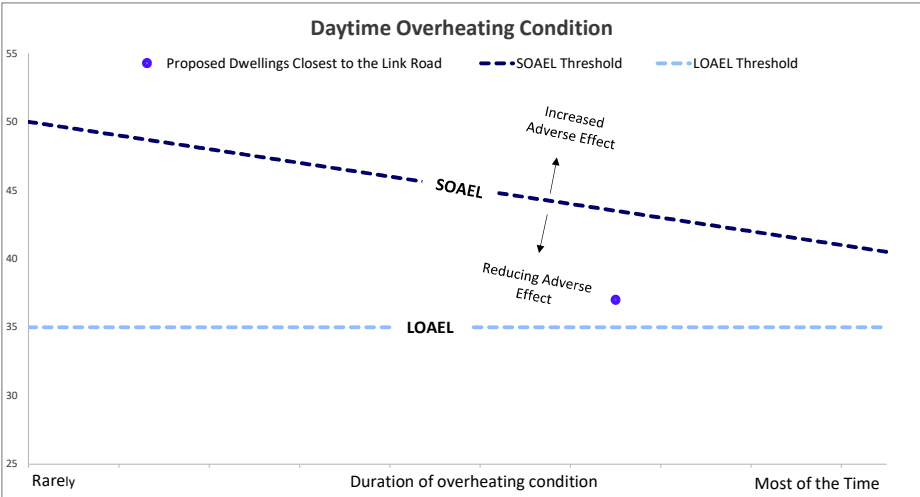
On the AVO diagrams below these levels are below the SOAEL level for the daytime and for the night-time without mitigation. The levels are also below the level of noise which is considered to cause a material change in behaviour (Ref: Table 3-3, AVO).

This mitigation strategy has been considered on the AVO diagrams below, the level is marginally below the SOAEL for the daytime, and above SOAEL for the night-time. The levels are below the level which could cause a material change in behaviour in Table for 3-3.

Internal noise levels without mitigation (Non-uniform partition calculation (Appendix C))	Daytime LAeq,16hr	Night-time LAeq,8hr	Night-time LAFmax
	37	30	37

Level 2 Assessment (in line with Table 3-3, without mitigation)

There is an increased risk of adverse effect. However, they are considered to be below significant observed adverse effect based on the noise levels and frequency of overheating and so mitigation measures would not be required but may be considered.



EARLY STAGE OVERHEATING RISK TOOL Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply.

Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps. Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.



KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	0
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	1
	Grtr London, Manchester, B'ham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure?

Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context

1 0

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	Day - reasons to keep all windows closed	8	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	8
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green?

Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme

1 0

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?

Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels

1 0

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?

Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance

1 0

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future?

Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed	2	0
> 2.8m	1	

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	
#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	3
	Dual aspect	0	

#13 Is there useful external shading?

Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

	Full	Part	0
>65%	6	3	
>50%	4	2	
>35%	2	1	

#14 Do windows & openings support effective ventilation?

Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates		0
	= Part F	+50% +100%	
Single-aspect	minimum required	3 4	0
Dual aspect	minimum required	2 3	

TOTAL SCORE **16** = Sum of contributing factors: **16**

minus Sum of mitigating factors: **0**

High

12

Medium

8

Low

score >12:

Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:

Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:

Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply.

Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps. Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.



KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	0
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	1
	Grtr London, Manchester, B'ham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure?

Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context

1

1

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	Day - reasons to keep all windows closed	8	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	8
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green?

Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme

1

1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?

Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels

1

0

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?

Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance

1

0

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future?

Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed

2

0

> 2.8m

1

0

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	
#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	3
	Dual aspect	0	

#13 Is there useful external shading?

Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

Full Part

>65% 6 3

>50% 4 2

>35% 2 1

0

#14 Do windows & openings support effective ventilation?

Larger, effective and secure openings will help dissipate heat - see guidance

Openings compared to Part F purge rates

= Part F +50% +100%

Single-aspect minimum required 3 4

Dual aspect 2 3

0

TOTAL SCORE **14** = Sum of contributing factors: **16**

minus

Sum of mitigating factors: **2**

High

12

Medium

8

Low

score >12:

Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:

Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:

Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

Appendix E

Noise Break-in Calculations – Industrial Noise

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Livingroom

Description: Daytime - Spec 1

Surface Area Wall 5.9

Surface Area Glazing 4.9

Number of vents 0

Room Volume 34.1

Room RT 0.5

Ref	Description
Wall 1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties
Glazing 23	
Vent 20	
Source type 3	
	Open window
	No Vent
	Reverberant field

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	43	43	40	34	49	36	35	28	18
Maximum Noise Level (dB)	0	0	0	0	0	0	0	0	0

SRI DATA

Total Façade Area	10.8	Effective Façade Area	10.8
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	13	13	13	13	13	13	13	13	13
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.019	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.025	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Composite SRI (dB)	16	16	16	16	16	16	16	16	16

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	43	43	40	34	49	36	35	28	18
Maximum External Noise Level (dB)	3	3	3	3	3	3	3	3	3

Composite SRI	16	16	16	16	16	16	16	16	16
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	10	10	10	10	10	10	10	10	10
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	27	26	24	18	33	19	19	11	2
A weighted (N/A)	-12	0	7	9	29	19	20	12	1
Internal Noise Level dB(A)	30								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	-14	-14	-14	-14	-14	-14	-14	-14	-14
A weighted	-53	-40	-30	-23	-17	-14	-13	-13	-15
Maximum Internal Noise Level dB(A)	-7								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Livingroom

Description: Daytime - Spec 2

Surface Area Wall 5.9

Surface Area Glazing 4.9

Number of vents 0

Room Volume 34.1

Room RT 0.5

Ref	Description
Wall 1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties 4/ (6-16) / 4 No Vent Reverberant field
Glazing 41	
Vent 20	
Source type 3	

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	53	53	50	44	59	46	45	38	28
Maximum Noise Level (dB)	0	0	0	0	0	0	0	0	0

SRI DATA

Total Façade Area	10.8	Effective Façade Area	10.8
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	9	15	21	17	25	35	37	31	31
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.019	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.617	0.155	0.039	0.098	0.015	0.002	0.001	0.004	0.004
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.059	0.015	0.004	0.009	0.001	0.000	0.000	0.000	0.000
Composite SRI (dB)	12	18	24	20	28	38	40	34	34

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	53	53	50	44	59	46	45	38	28
Maximum External Noise Level (dB)	3	3	3	3	3	3	3	3	3

Composite SRI	12	18	24	20	28	38	40	34	34
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	10	10	10	10	10	10	10	10	10
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	41	34	26	24	31	7	5	3	-6
A weighted (N/A)	1	8	10	15	27	7	6	4	-7
Internal Noise Level dB(A)	28								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	-10	-16	-22	-18	-26	-36	-38	-32	-32
A weighted	-49	-42	-38	-27	-29	-36	-37	-31	-33
Maximum Internal Noise Level dB(A)	-23								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Bedroom

Description: Night-time - Spec 1

Surface Area Wall7.3

Surface Area Glazing2.8

Number of vents0

Room Volume25.9

Room RT0.5

Ref	Description
Wall1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties
Glazing23	
Vent20	
Source type3	
	Open window
	No Vent
	Reverberant field

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	42	43	42	36	44	38	37	30	20
Maximum Noise Level (dB)	63	54	50	47	52	51	45	40	30

SRI DATA

Total Façade Area	10.1	Effective Façade Area	10.1
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	13	13	13	13	13	13	13	13	13
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.023	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.016	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Composite SRI (dB)	18	18	19	19	19	19	19	19	19

BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	42	43	42	36	44	38	37	30	20
Maximum External Noise Level (dB)	66	57	53	49	55	54	48	43	33

Composite SRI	18	18	19	19	19	19	19	19	19
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	9	9	9	9	9	9	9	9	9
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	25	25	24	18	26	20	19	12	2
A weighted (N/A)	-15	-1	8	9	23	20	21	13	1
Internal Noise Level dB(A)	27								

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	49	39	35	32	37	36	30	25	15
A weighted (N/A)	9	13	19	23	34	36	31	26	14
Maximum Internal Noise Level dB(A)	39								

Octave Band Composite SRI Break In Sheet

INPUT DATA



Project: Barugh Green Road, Barnsley

Plot: N/A

Plot Type: Southwick

Room: Bedroom

Description: Night-time - Spec 2

Surface Area Wall 7.3

Surface Area Glazing 2.8

Number of vents 0

Room Volume 25.9

Room RT 0.5

Ref	Description
Wall 1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties 4/ (6-16) / 4 No Vent Reverberant field
Glazing 41	
Vent 20	
Source type 3	

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Average Noise Level (dB)	55	55	54	48	56	50	49	42	32
Maximum Noise Level (dB)	73	64	60	57	62	61	55	50	40

SRI DATA

Total Façade Area	10.1	Effective Façade Area	10.1
-------------------	------	-----------------------	------

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
SRI wall	25	31	37	42	52	60	63	68	68
SRI Glazing	9	15	21	17	25	35	37	31	31
SRI Spandrel	20	21	34	40	45	47	45	52	52
D _{ne} Vent	0	0	0	0	0	0	0	0	0

T _{wall} X S _{wall}	0.023	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000
T _{glazing} X S _{glazing}	0.347	0.087	0.022	0.055	0.009	0.001	0.001	0.002	0.002
T _{vent} X S _{vent}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Composite T	0.037	0.009	0.002	0.006	0.001	0.000	0.000	0.000	0.000
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Composite SRI (dB)	14	20	26	23	31	41	43	37	37
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BREAK IN CALCULATIONS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Reflection Corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External Noise Level (dB)	55	55	54	48	56	50	49	42	32
Maximum External Noise Level (dB)	76	67	63	59	65	64	58	53	43

Composite SRI	14	20	26	23	31	41	43	37	37
Surface Area Correction	10	10	10	10	10	10	10	10	10
Absorption Correction	9	9	9	9	9	9	9	9	9
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction									
Screening									

RESULTS

Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	42	36	28	26	26	10	7	6	-4
A weighted (N/A)	2	9	12	17	23	10	9	7	-5
Internal Noise Level dB(A)	25								

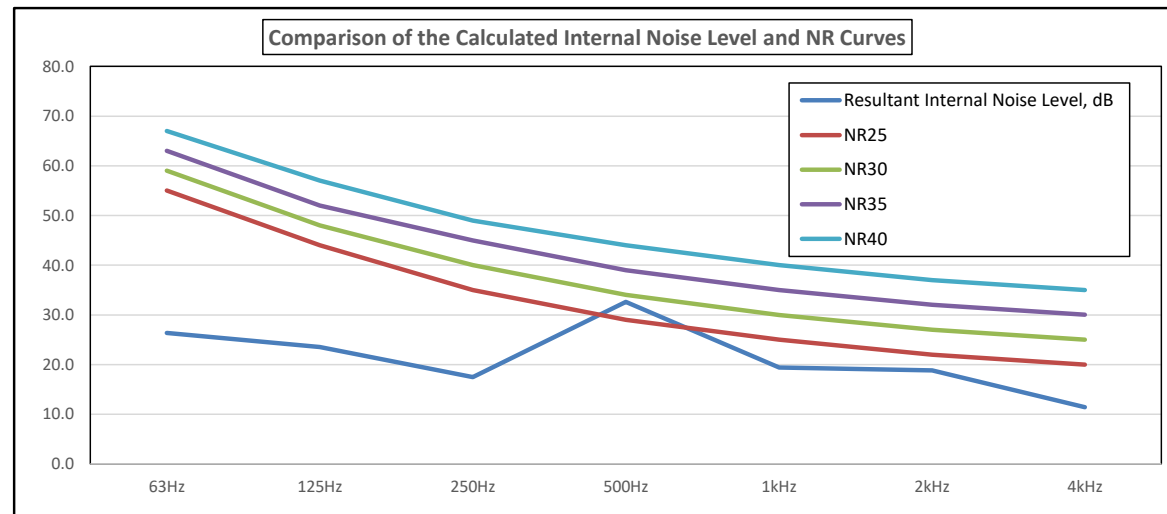
Frequency (Hz)	32	63	125	250	500	1000	2000	4000	8000
Internal Noise Level (dB)	62	47	37	38	35	24	16	17	7
A weighted (N/A)	23	21	21	29	32	24	17	18	6
Maximum Internal Noise Level dB(A)	35								

Appendix F
Noise Rating Curve Assessment – Daytime

Noise Rating Curve Assessment

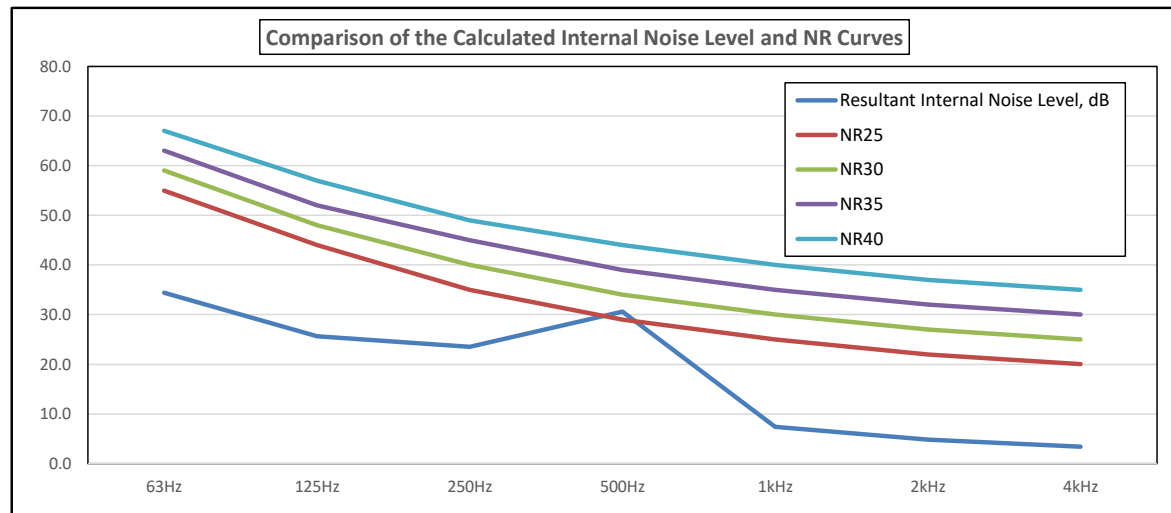
Table 1 - Comparison of the internal daytime noise level from industrial noise against the NR curves with an open window

Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	26.4	55.0	59.0	63.0	67.0
125Hz	23.5	44.0	48.0	52.0	57.0
250Hz	17.5	35.0	40.0	45.0	49.0
500Hz	32.6	29.0	34.0	39.0	44.0
1kHz	19.4	25.0	30.0	35.0	40.0
2kHz	18.8	22.0	27.0	32.0	37.0
4kHz	11.4	20.0	25.0	30.0	35.0



Noise Rating Curve Assessment

Table 1 - Comparison of the internal daytime noise level from industrial noise against the NR curves with 4/12/4 and alternative ventilation					
Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	34.4	55.0	59.0	63.0	67.0
125Hz	25.6	44.0	48.0	52.0	57.0
250Hz	23.5	35.0	40.0	45.0	49.0
500Hz	30.6	29.0	34.0	39.0	44.0
1kHz	7.4	25.0	30.0	35.0	40.0
2kHz	4.8	22.0	27.0	32.0	37.0
4kHz	3.4	20.0	25.0	30.0	35.0



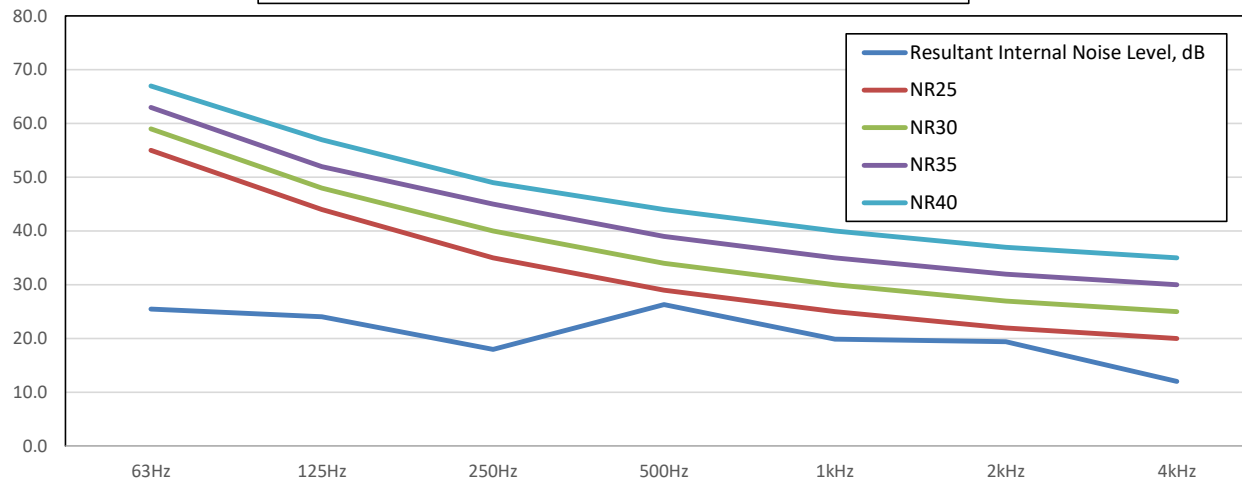
Appendix G
Noise Rating Curve Assessment – Night-time

Noise Rating Curve Assessment

Table 1 - Comparison of the internal night-time noise level from industrial noise against the NR curves with an open window

Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	25.5	55.0	59.0	63.0	67.0
125Hz	24.0	44.0	48.0	52.0	57.0
250Hz	18.0	35.0	40.0	45.0	49.0
500Hz	26.3	29.0	34.0	39.0	44.0
1kHz	19.9	25.0	30.0	35.0	40.0
2kHz	19.4	22.0	27.0	32.0	37.0
4kHz	12.0	20.0	25.0	30.0	35.0

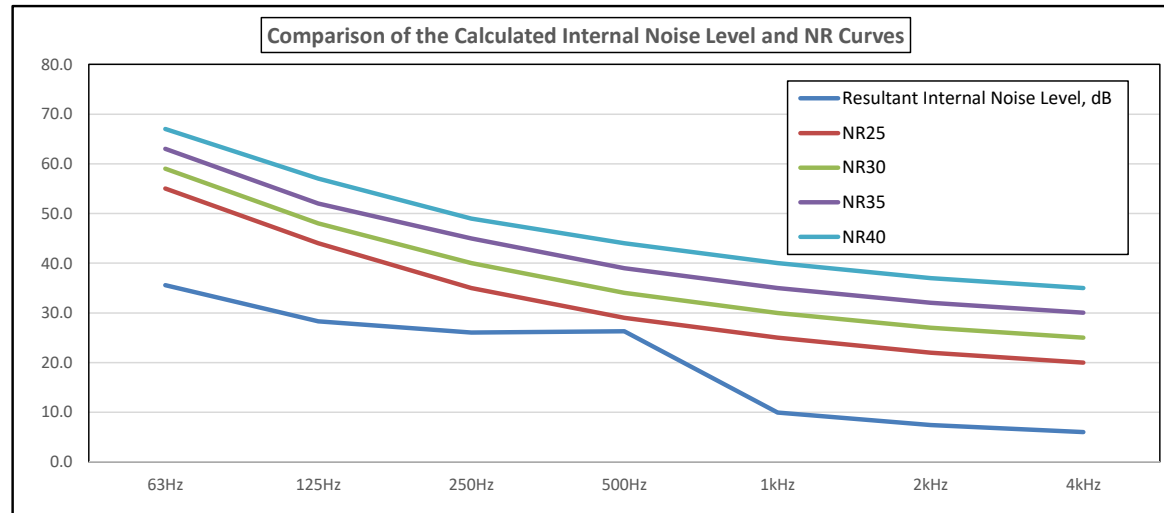
Comparison of the Calculated Internal Noise Level and NR Curves



Noise Rating Curve Assessment

Table 1 - Comparison of the internal night-time noise level from industrial noise against the NR curves with 4/12/4 glazing and alternative ventilation

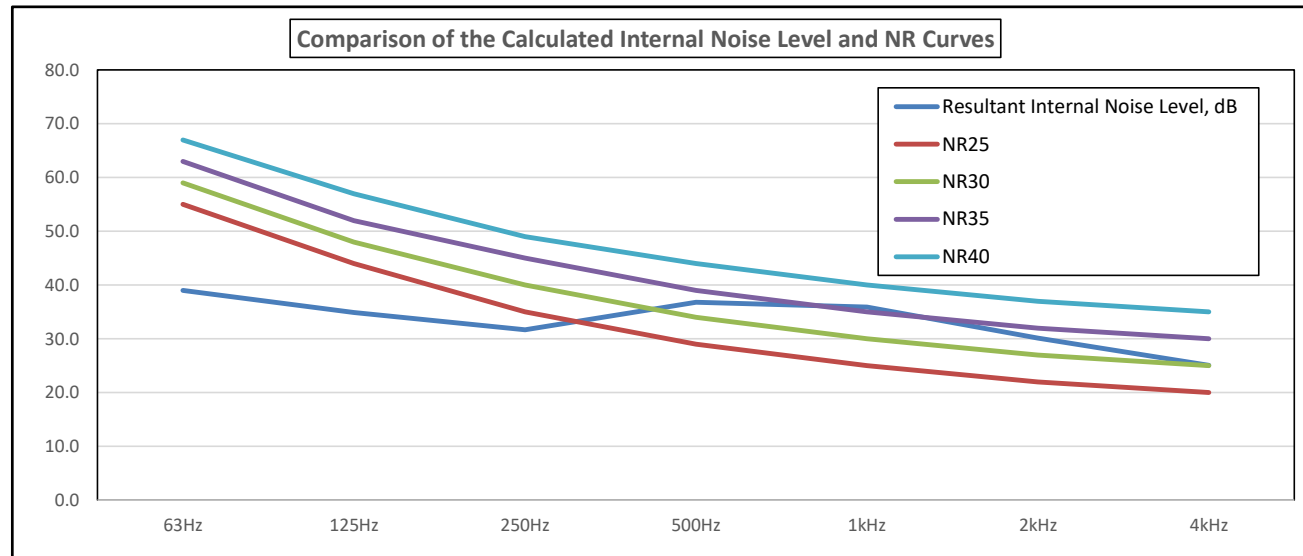
Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	35.6	55.0	59.0	63.0	67.0
125Hz	28.3	44.0	48.0	52.0	57.0
250Hz	26.0	35.0	40.0	45.0	49.0
500Hz	26.3	29.0	34.0	39.0	44.0
1kHz	9.9	25.0	30.0	35.0	40.0
2kHz	7.4	22.0	27.0	32.0	37.0
4kHz	6.0	20.0	25.0	30.0	35.0



APPENDIX H
Noise Rating Curve Assessment - Night-time Max

Noise Rating Curve Assessment

Table 1 - Comparison of the internal night-time max noise level from industrial noise against the NR curves with an open window					
Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	39.0	55.0	59.0	63.0	67.0
125Hz	34.9	44.0	48.0	52.0	57.0
250Hz	31.7	35.0	40.0	45.0	49.0
500Hz	36.8	29.0	34.0	39.0	44.0
1kHz	35.9	25.0	30.0	35.0	40.0
2kHz	30.1	22.0	27.0	32.0	37.0
4kHz	25.1	20.0	25.0	30.0	35.0

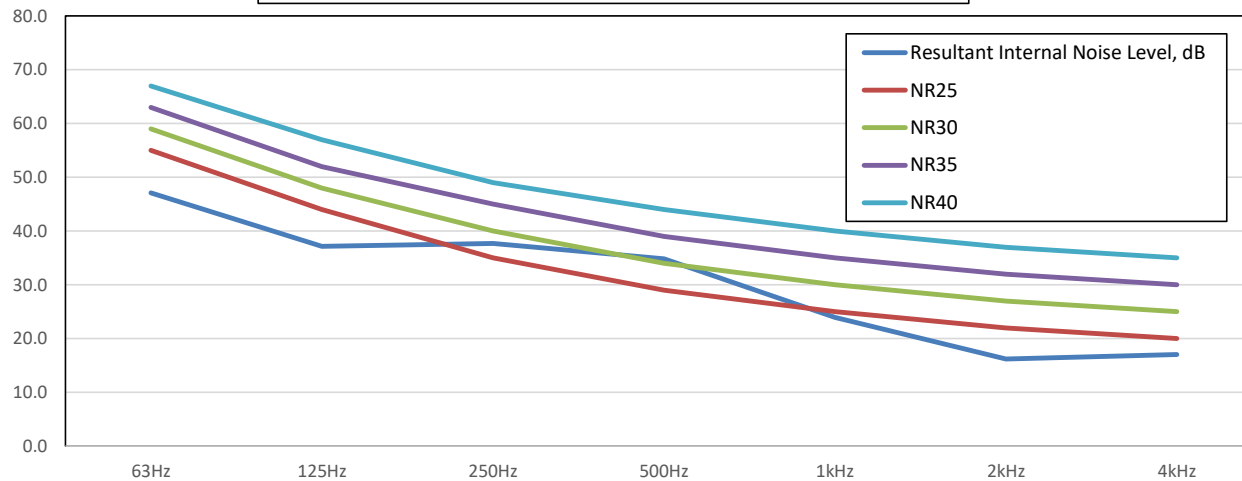


Noise Rating Curve Assessment

Table 1 - Comparison of the internal night-time max noise level from industrial noise against the NR curves with 4/12/4 glazing and alternative ventilation

Frequency (Hz)	Resultant Internal Noise Level, dB	NR25	NR30	NR35	NR40
63Hz	47.1	55.0	59.0	63.0	67.0
125Hz	37.2	44.0	48.0	52.0	57.0
250Hz	37.7	35.0	40.0	45.0	49.0
500Hz	34.8	29.0	34.0	39.0	44.0
1kHz	23.9	25.0	30.0	35.0	40.0
2kHz	16.2	22.0	27.0	32.0	37.0
4kHz	17.1	20.0	25.0	30.0	35.0

Comparison of the Calculated Internal Noise Level and NR Curves



DRAWINGS



KEY

Site Boundary

Noise Monitoring Locations

Proposed Sensitive Receptors

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
CLIENT					
COUNTRYSIDE					
PROJECT					
BARUGH GREEN, BARNSELEY					
DRAWING TITLE					
NOISE MONITORING AND PROPOSED SENSITIVE RECEPTORS LOCATION PLAN					
DRG No.		LD10092/002		REV A	
DRG SIZE		A3		SCALE 1:1,500	
DRAWN BY		EF		DATE 20/08/2020	
CHECKED BY		JS		APPROVED BY MD	

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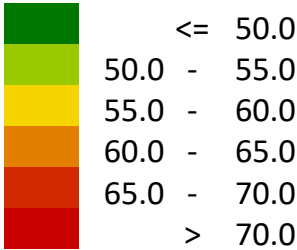
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Key

-  Site Boundary
-  Existing Buildings
-  Road

Daytime L_{Aeq} dB



CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 1 - Grid Noise Map - Daytime		
DRG NO:	LD10092/003	REV: A
DRG SIZE: A3	SCALE: 1:1750	DATE: 20/08/2020
DRAWN BY JS	CHECKED BY RC	APPROVED BY MD



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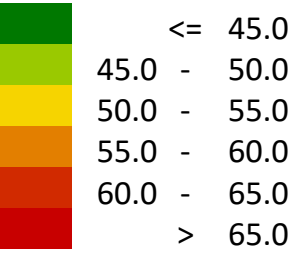
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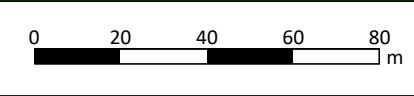
Key

- Site Boundary
- Existing Buildings
- Road

Night-time L_{Aeq} dB



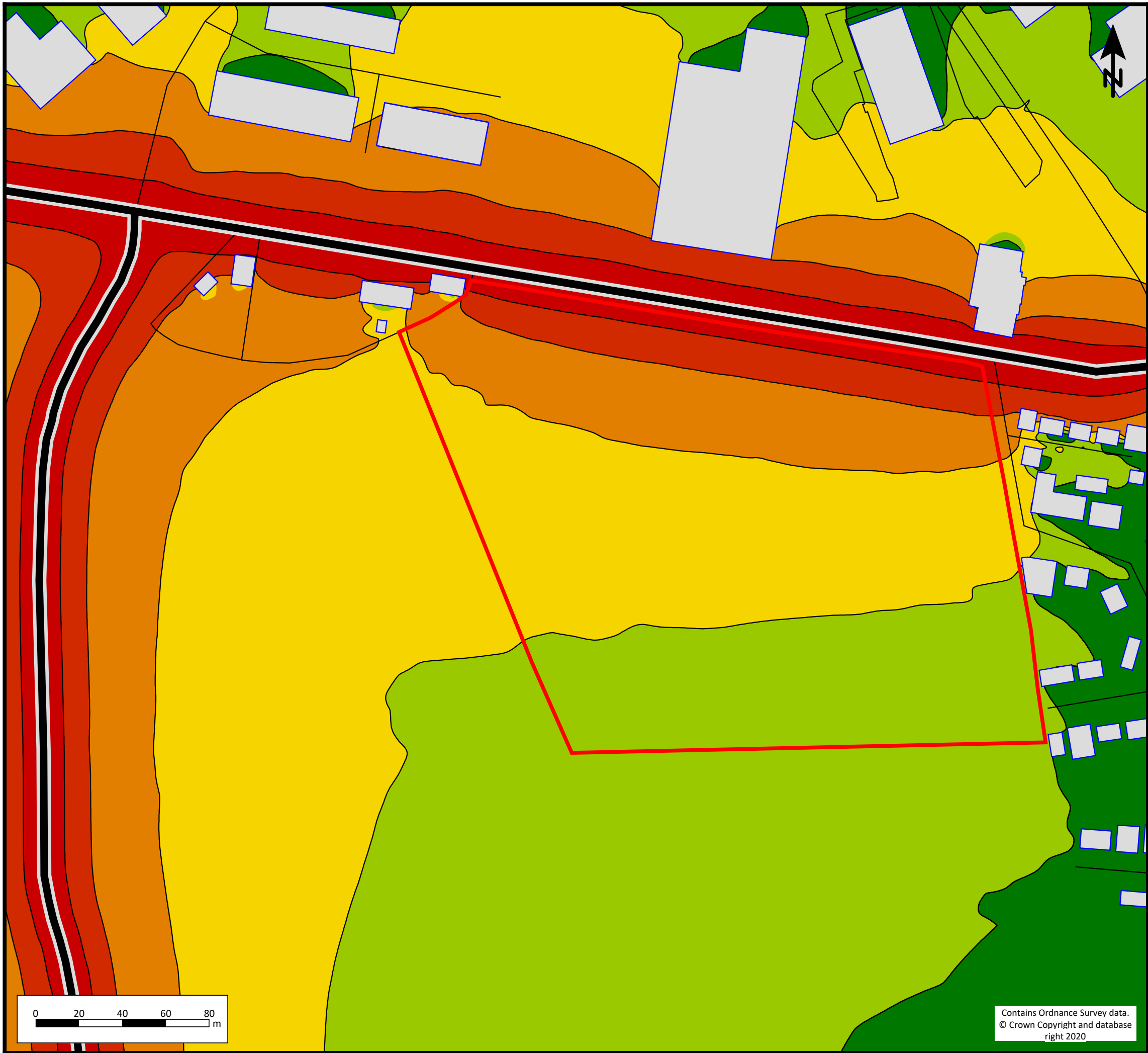
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PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 1- Grid Noise Map - Night-time		
DRG NO:	LD10092/004	REV: A
DRG SIZE:	A3	SCALE: 1:1750
		DATE: 20/08/2020
DRAWN BY	JS	CHECKED BY RC
		APPROVED BY JS



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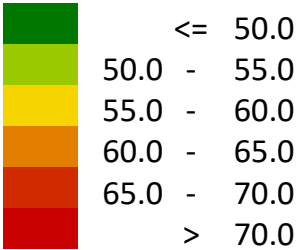
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Key

- Site Boundary
- Existing Buildings
- Road

Daytime L_{Aeq} dB

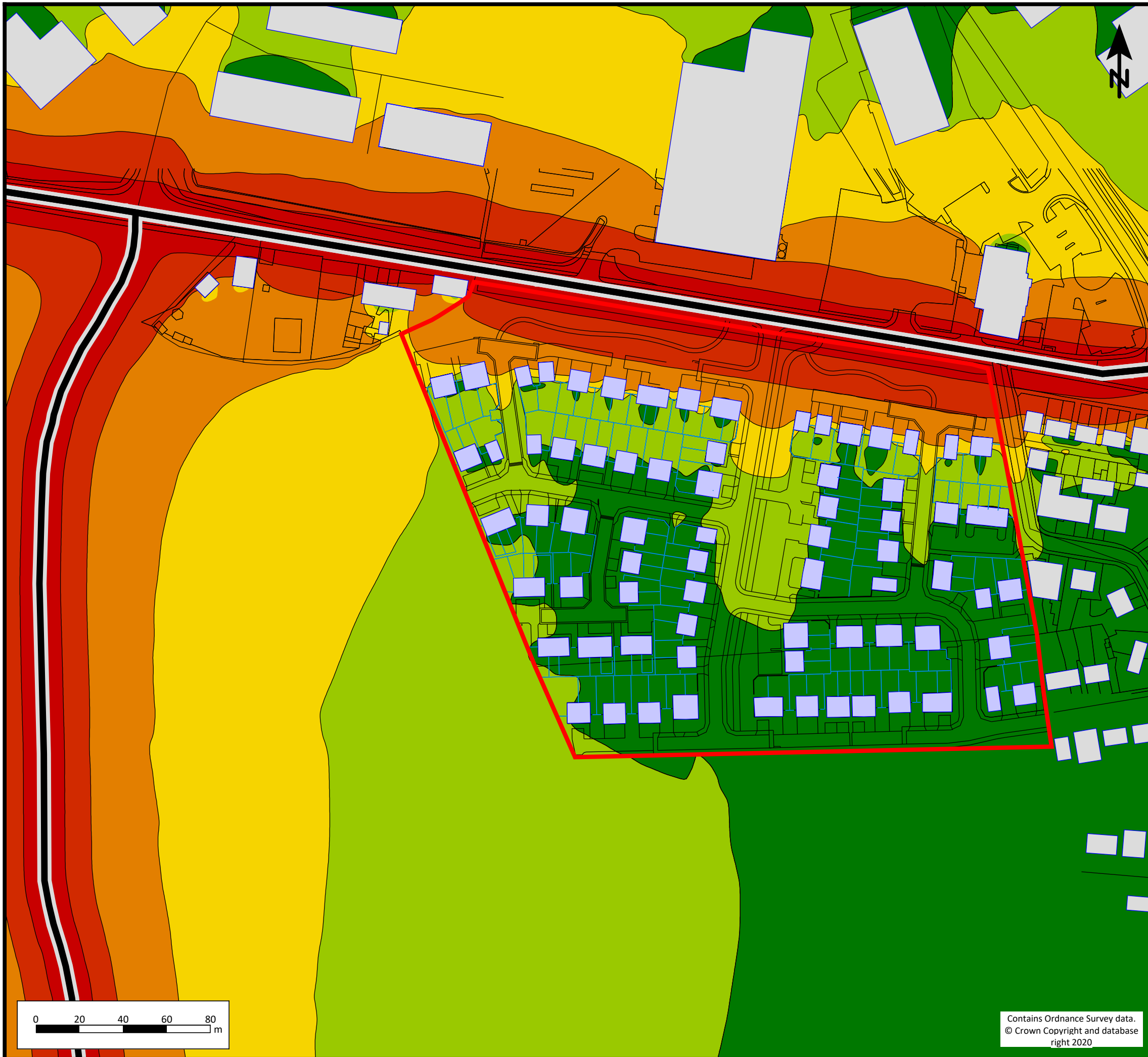


CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 1 - Grid Noise Map - Daytime (with committed)		
DRG NO:	LD10092/005	REV: A
DRG SIZE: A3	SCALE: 1:1750	DATE: 20/08/2020
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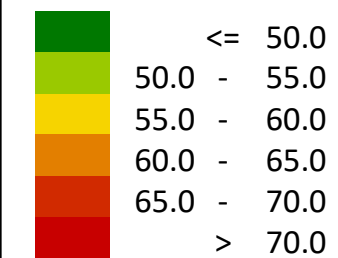
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Key

-  Site Boundary
-  Existing Buildings
-  Road
-  1.8m High Garden Fence
-  Proposed Development

Daytime L_{Aeq} dB

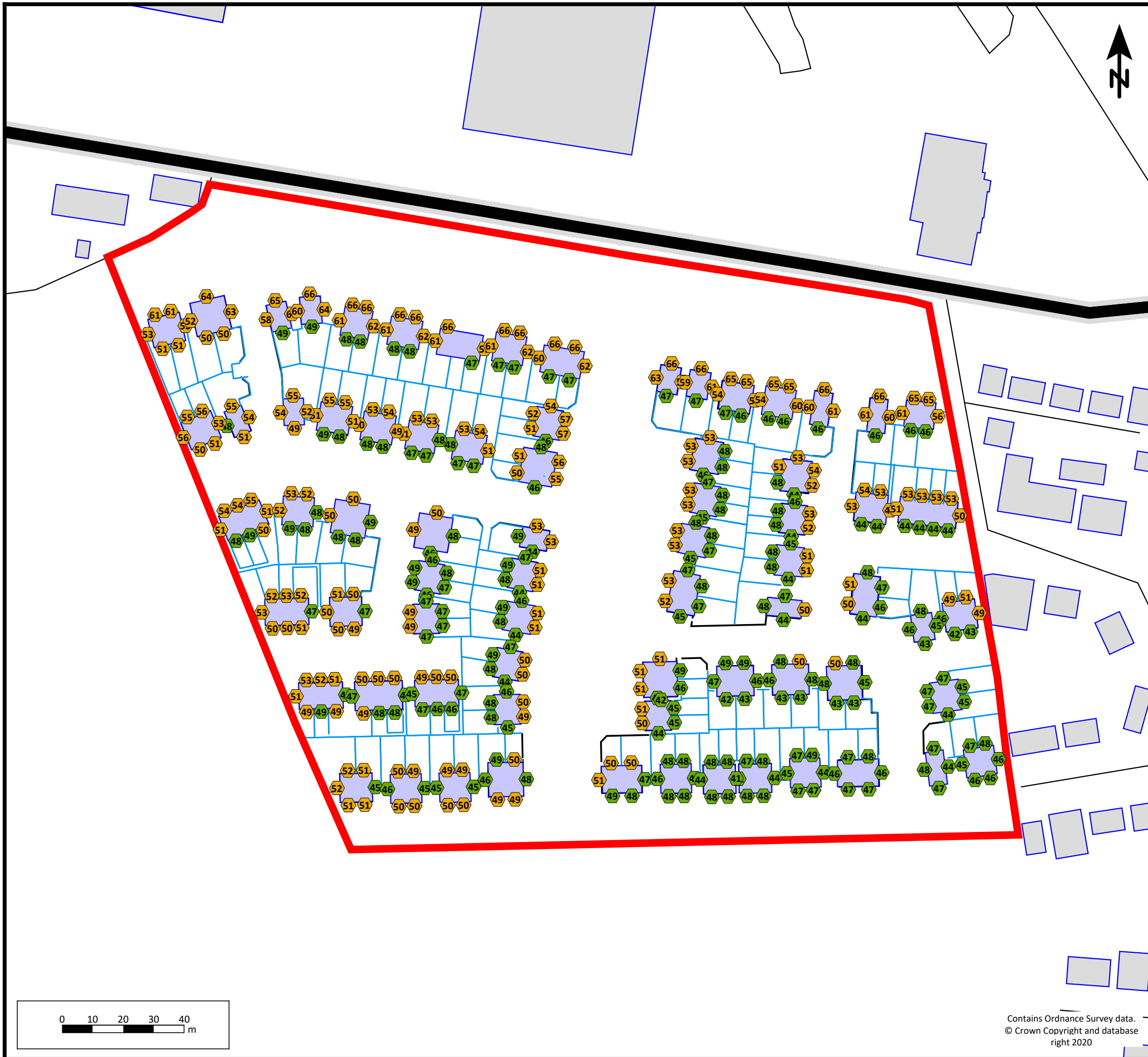


CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 2 - Grid Noise Map - Daytime		
DRG NO: LD10092/007	REV: A	
DRG SIZE: A3	SCALE: 1:1750	DATE: 20/08/2020
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Key

-  Site Boundary
-  Existing Buildings
-  Road
-  Facade Noise Level
-  1.8m High Garden Fence
-  Proposed Development

Daytime L_{Aeq} dB

-  ≤ 49.0 Specification 1
-  > 49.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 2 - Facade Noise Map - Daytime		
DRG NO: LD10092/008		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
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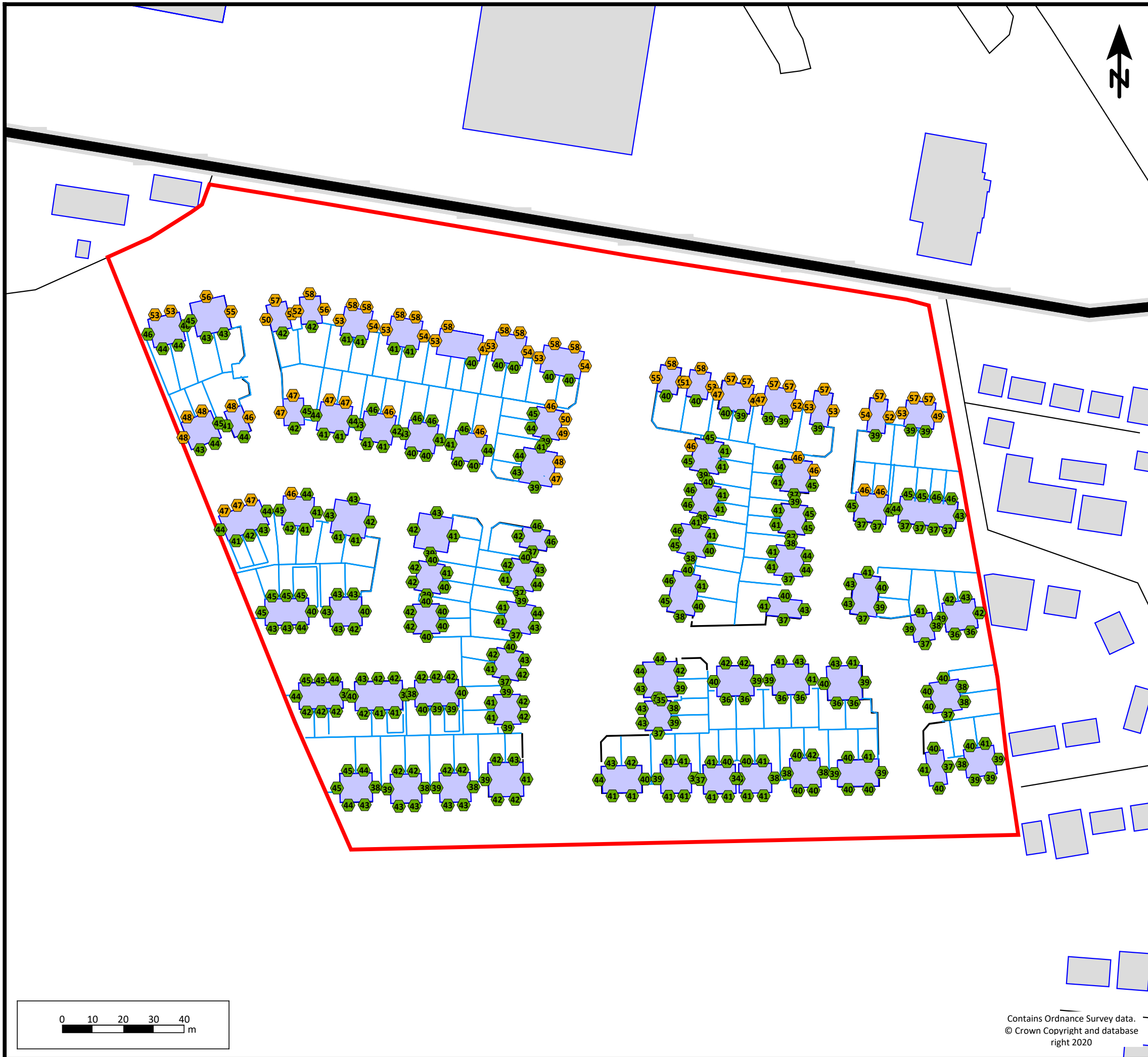
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Key

-  Site Boundary
-  Existing Buildings
-  Road
-  Facade Noise Level
-  1.8m High Garden Fence
-  Proposed Development

Night-time L_{Aeq} dB

-  ≤ 46.0 Specification 1
-  > 46.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 2 - Facade Noise Map - Night-time		
DRG NO: LD10092/009		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
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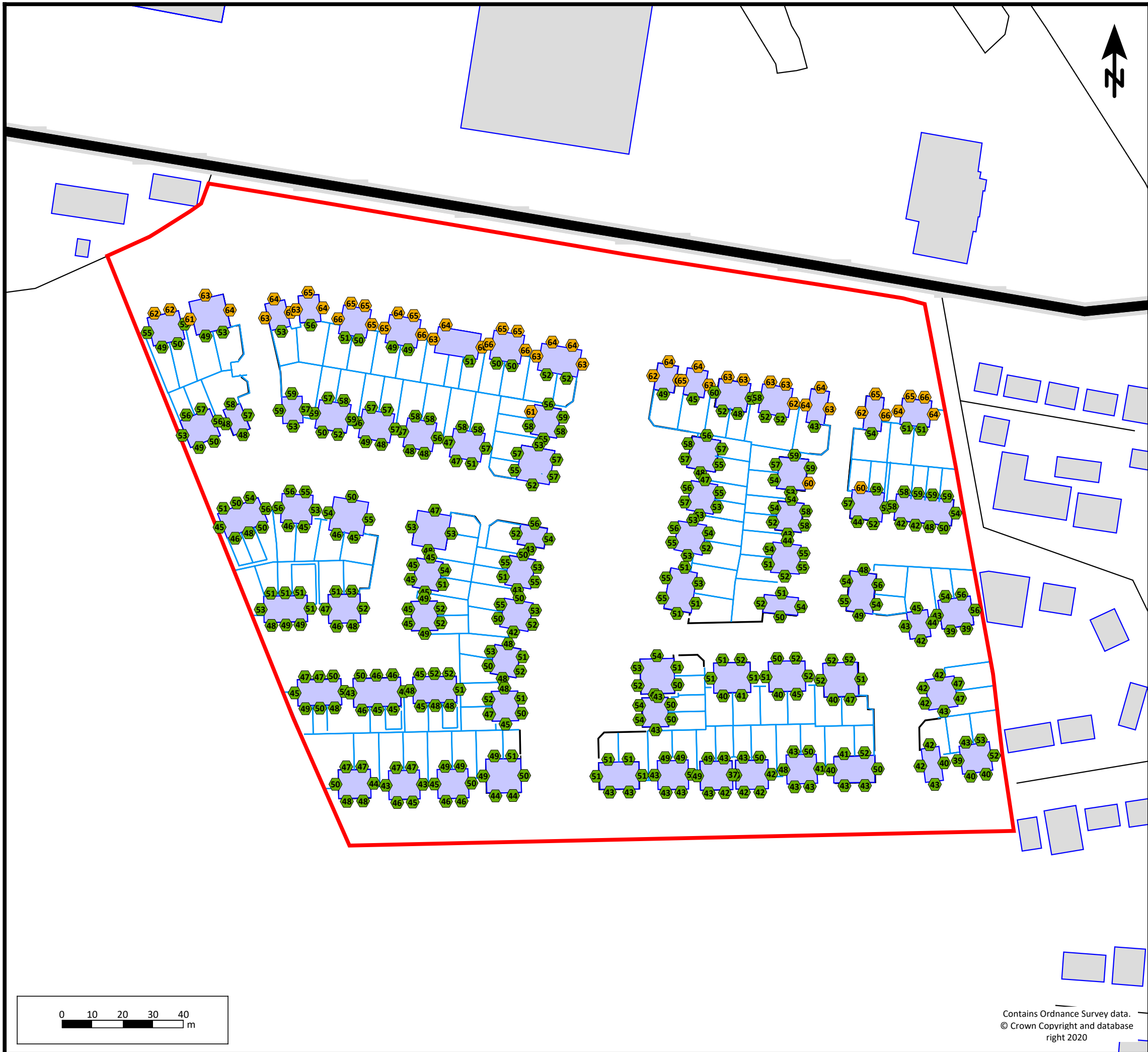
☐ LONDON

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Key

- Site Boundary
- Existing Buildings
- Road
- Facade Noise Level
- 1.8m High Garden Fence
- Proposed Development

Night-time Max L_{AFMax} dB

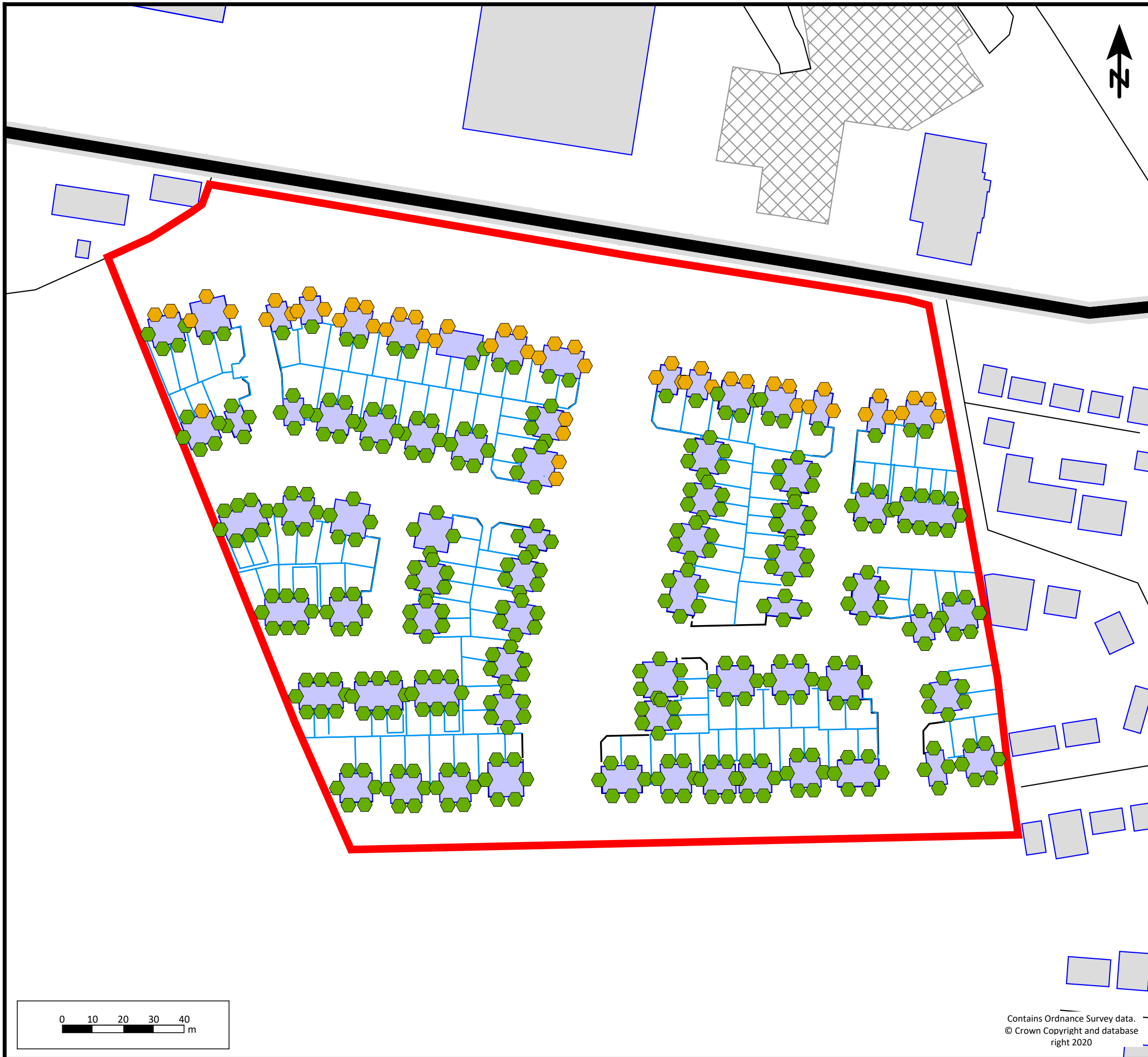
- ≤ 60.0 Specification 1
- > 60.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: ProPG Stage 2 - Facade Noise Map - Night-time Max		
DRG NO: LD10092/010		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
DRAWN BY JS	CHECKED BY RC	APPROVED BY MD



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Key

- Site Boundary
- Existing Buildings
- Road
- Facade Noise Level
- 1.8m High Garden Fence
- Proposed Development
- Car Parking

Daytime L_{Aeq} dB

- ≤ 47.0 Specification 1
- > 47.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: Daytime Industrial Facade Noise Map		
DRG NO: LD10092/011		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
DRAWN BY JS	CHECKED BY RC	APPROVED BY MD

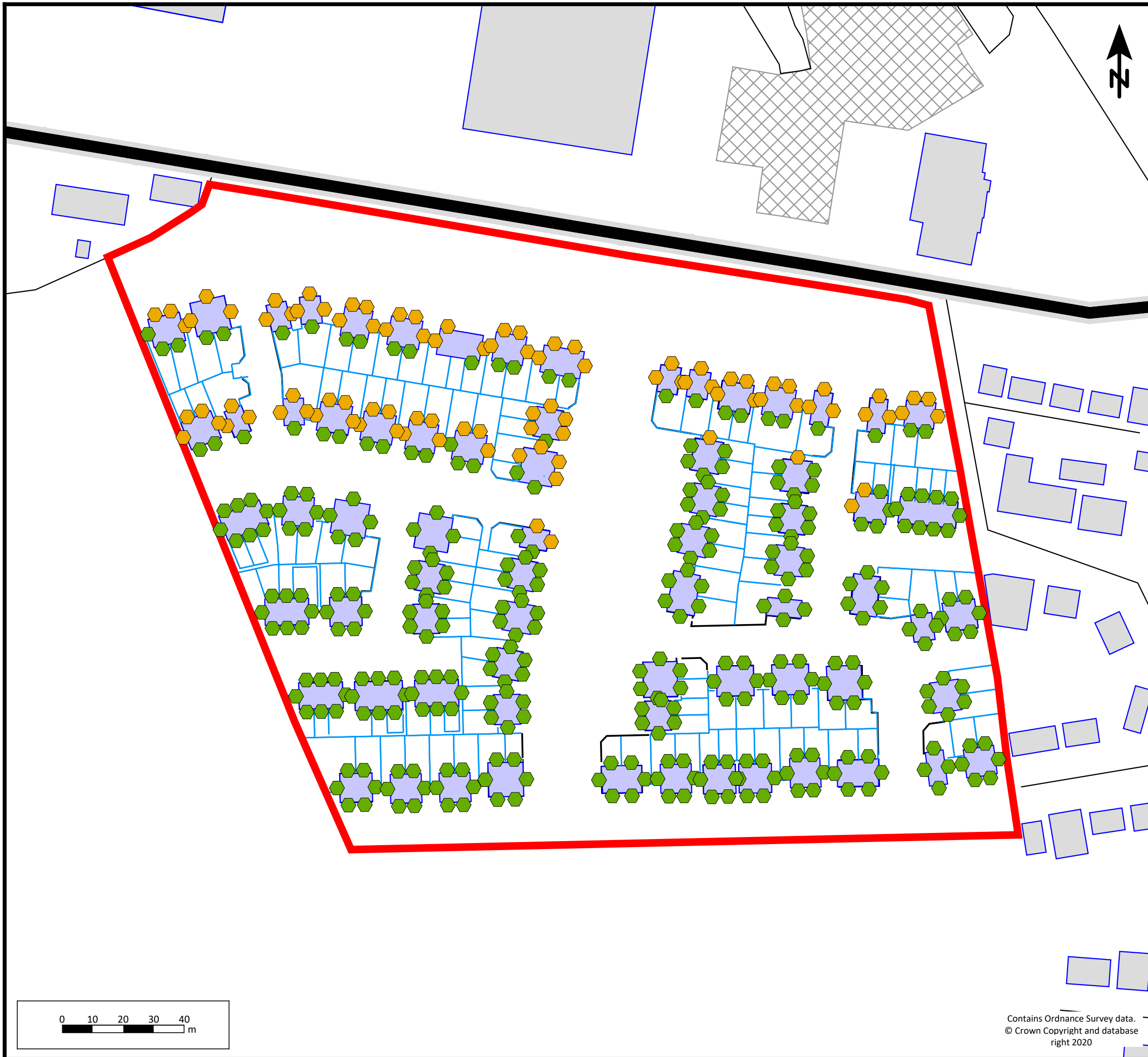


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Key

- Site Boundary
- Existing Buildings
- Road
- Facade Noise Level
- 1.8m High Garden Fence
- Proposed Development
- Car Parking

Night-time L_{Aeq} dB

- ≤ 44.0 Specification 1
- > 44.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: Night-time Industrial Facade Noise Map		
DRG NO: LD10092/012		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
DRAWN BY JS	CHECKED BY RC	APPROVED BY MD

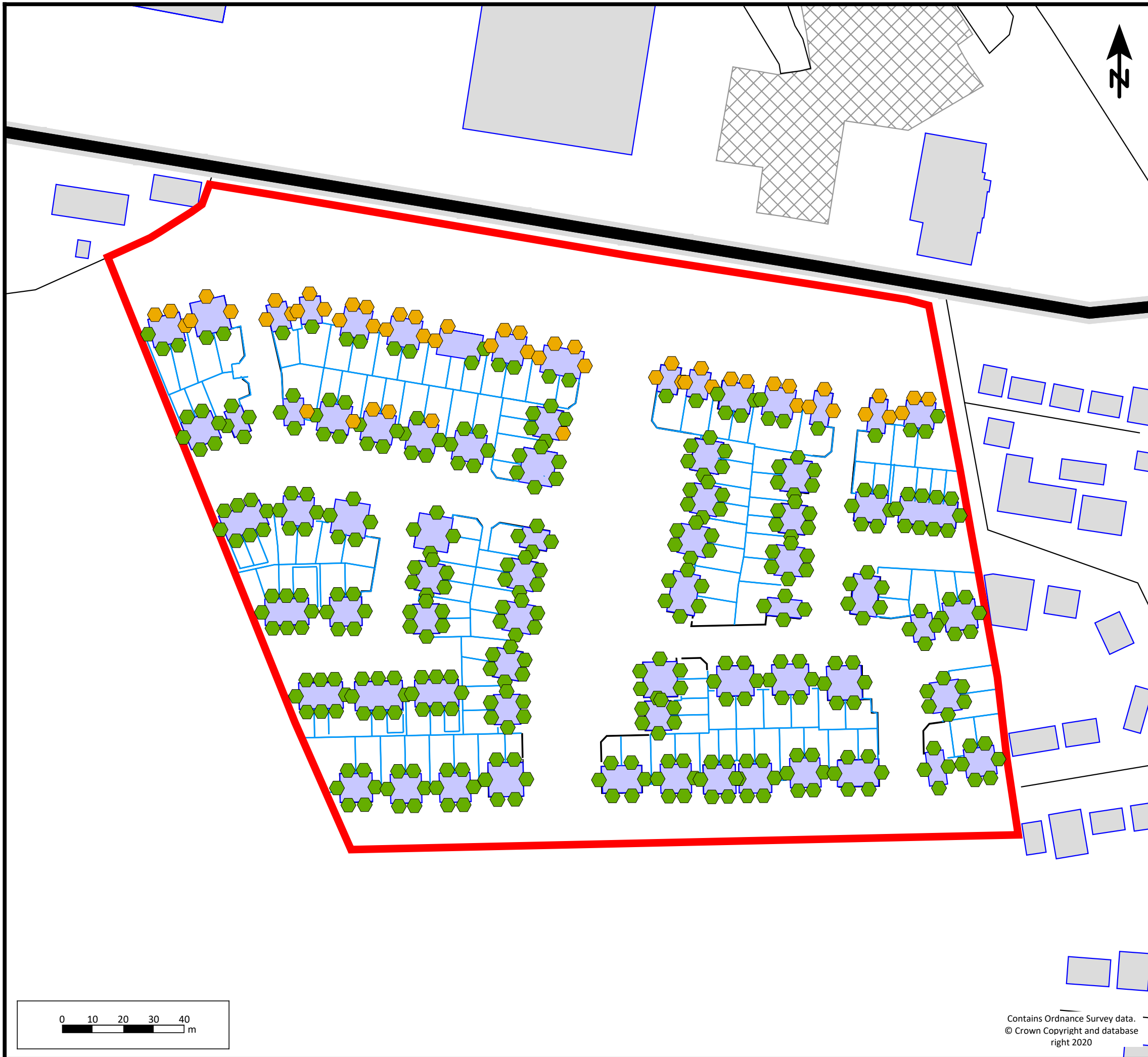


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Key

-  Site Boundary
-  Existing Buildings
-  Road
-  Facade Noise Level
-  1.8m High Garden Fence
-  Proposed Development
-  Car Parking

Night-time Max L_{AFMax} dB

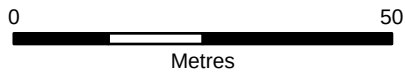
-  ≤ 57.0 Specification 1
-  > 57.0 Specification 2

CLIENT: Countryside Developments		
PROJECT: Barugh Green Road, Barnsley		
TITLE: Night-time Max Industrial Facade Noise Map		
DRG NO: LD10092/013		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 20/08/2020
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- KEY
- Glazing and Ventilation Requirements Ground Floor
- Specification 1
 - Specification 2
 - Specification 3

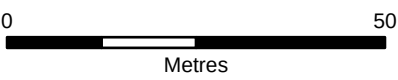
Notes:

Development layout provided by Client.

REVISION	DETAILS			DATE	DRAWN
CHKD					
APPD					
CLIENT					
COUNTRYSIDE					
PROJECT					
BARUGH GREEN, BARNSELEY					
DRAWING TITLE					
SUMMARY OF FACADE INSULATION REQUIREMENTS - GROUND FLOOR					
DRG No.			REV		
LD10092/014			A		
DRG SIZE		SCALE		DATE	
A3		1:1,000		24/08/2020	
DRAWN BY		CHECKED BY		APPROVED BY	
EF		JS		MD	



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KEY

Glazing and Ventilation Requirements First Floor

Specification 1

Specification 2

Specification 3

Notes:

Development layout provided by Client.

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
CLIENT					
COUNTRYSIDE					
PROJECT					
BARUGH GREEN, BARNSELEY					
DRAWING TITLE					
SUMMARY OF FACADE INSULATION REQUIREMENTS - FIRST FLOOR					
DRG No.		LD10092/015		REV A	
DRG SIZE		A3		SCALE 1:1,000	
DRAWN BY		EF		CHECKED BY JS	
				APPROVED BY MD	



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