Paul Horsley Acoustics Ltd
Acoustics & Noise Control Consultancy

Acoustic Report

Environmental Noise Survey
Proposed Residential Development at
203 Raikes Lane, Birstall

Our Reference – J2929

Survey Dates – Between 4th to 5th March 2020

Survey and Report by – Paul Horsley MIOA

Report compiled by: Paul Horsley MIOA

Date of Report: 17.03.2020

redacted

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1.0 Agent

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The Barn
3 Primrose Lane
Hightown
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2.0 Subject

Proposed residential dwelling at 203 Raikes Lane, Birstall, Batley, WF17 9QF.

3.0 Aims

The aim of this report is to determine the existing baseline background noise environment levels affecting the proposed development location in relation to noise to allow discharge of Planning Application 2019/91563 Condition No 8 relating to noise.

Condition 8 states the following:

> 8. Before development commences a report specifying the measures to be taken to protect the development from noise from road traffic shall be submitted to and approved in writing by the Local Planning Authority.
> The report shall:
> a) Determine the existing noise climate
> b) Predict the noise climate in gardens (daytime), bedrooms (night-time) and other habitable rooms of the development
> c) Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).
> The development shall not be occupied until all works specified in the approved report have been carried out in full and such works shall be thereafter retained
> **Reason:** In the interests of residential amenity and the amenity of future occupiers of the dwelling in accordance with Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework.

Provide an assessment of the results in accordance with the recommendations laid down in the National Planning Policy Framework, NPPF, for the proposed development site with respect to noise.

Provide mitigating noise control advice relating to the achievement of an acceptable internal environment for the development as recommended with World Health Organization's "Guidance for Community Noise, 1999".

4.0 Location and Description of Existing Noise Sources

The development site is located on land within the bounds of No 203 Raikes Lane, Birstall.

There is a planning approval to allow development of the land with the erection of a detached residential property. Access to the site will be from Raikes Lane via an existing gated entrance.

The site is positioned on sloping land with a steep slope up from Geldard Road at the east to Raikes Lane at the western side of the site. The site is best described as rectangular occupying an area measuring approximately 28m x 16m.

The site is bounded to the north and south by the neighbouring residential properties, No 213 and 201 Raikes Lane respectively. The southern boundary if is formed by the A62, Geldard Road, a primary link road between Huddersfield and Leeds. On the opposite side of Geldard Road are existing residential premises. The northern site boundary is formed by Raikes Lane, a no through road used to access local residential premises positioned along its length.

The primary noise source within the vicinity of the site are predominantly due to distant traffic noise from vehicle movements along the A62, Geldard Road and the local road network. Noise associated with high altitude aircraft and birdsong are also audible.

5.0 Guidance on the Assessment of Noise Levels

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response, deemed as a feeling of annoyance during daytime or disturbance at night. WHO defines annoyance as "a feeling of displeasure evoked by noise"

The main source of information relating to noise and the community response are field studies including noise measurements and social surveys. These surveys attempt to establish a correlation between the two sets of results.

In the absence of any definitive guidance and in order to establish suitable noise criteria, it is necessary to rely on general guidance and assessment methods used for community noise sources. Discussions on the current methods are given below.

5.1 BS4142:2014 'Method for Rating and Assessing Industrial and Commercial Sound'

This recently revised standard provides a method for rating and assessing sound of an industrial and/or commercial nature. The method uses outdoor sound levels to assess the likely effect of sound on people who might be inside or outside a dwelling or premises used for residential purposes. It is limited to applicable sounds and is not intended for noise amounting to nuisance or rating noise outside the scope of the Standard.

Unlike the previous version of the Standard, rating levels are not prescriptive, but more context based, with the following applicable to rating values:

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

The Standard introduces additional rating elements, these being subject assessments of tonality, and impulsivity of a sound source, with weighted rating values accordingly applied at the judgment of the assessor.

The introduction of Uncertainty has been applied to the measured values; again, consideration of this is left to the professional executing the survey and assessment. However, steps are provided within the Standard for the reduction of uncertainty in both measurement and calculations of the sound source and rating value.

Actual meteorological conditions are now required to be recorded and reported upon for the survey and report.

5.2 British Standard 8233:2014

The scope of British Standard 8233: 2014: *Sound insulation and noise reduction for buildings* is the provision of guidance for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations; the primary intention of these is to guide the design of new buildings or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table below.

Indoor Ambient Noise Levels in Spaces When They Are Unoccupied

Activity	Typical Situations	Design Range LAeq, T dB	
		0700h to 2300h	**2300h to 0700h**
Resting	Living rooms	35	--
Dining	Dining Room / Area	40	--
Sleeping	Bedrooms	35	30

BS8233 states in Note 4 that:

"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values."

As such it has been considered appropriate to define a limit for regular maximum indoor noise levels of 45 dB(A) with sporadic events not exceeding 50 dB(A).

BS8233 also suggests noise limits for external areas or a property such as gardens or balconies. It states that:

'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 guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centre's 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.'

5.3 National Planning Policy Framework, NPPF.

The newly incumbent National Planning Policy Framework, NPPF, provides advice to planning authorities in England on how they must seek to minimise the adverse impact of noisy activities on noise sensitive receptors. This NPPF, replacing PPG 24, and is not prescriptive with respect to specific noise levels, and is mainly concerned with the advising on good practice for environmental noise assessment.

In the absence of definitive noise criterion within the NPPF most Local Authorities in England default to the daytime noise levels inside dwellings not to exceed NR 35; and NR 25, to be achieved inside dwellings at night to avoid sleep disturbance, based upon ingress of external noise sources.

5.4 Noise Policy Statement for England, NPSE.

The document "Noise Policy Statement for England" sets out the following vision for ongoing noise policy:
"Promote good health and a quality of life through the effective management of noise within the context of Government policy on sustainable development."

This vision should be achieved through the following Noise Policy Aims:
"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:"
"avoid significant adverse impacts on health and quality of life;"

"mitigate and minimise adverse impacts on health and quality of life; and"
"where possible, contribute to the improvement of health and quality of life."

To achieve this vision the Noise Policy Statement sets three noise levels to be defined by the assessor:

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.

The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL Noise levels, the Policy Statement requires that:
"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development….. This does not mean that such adverse effects cannot occur."

Where noise levels are below the LOAEL it is considered there will be no adverse effect. Once noise levels are below the NOEL there will be no observable change.

5.5 World Health Organization 1999 "Guidance for Community Noise"

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance and speech interference. For bedrooms, the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for sound events. At night time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value is equivalent to that specifies in the Criteria 12 document; however, it is now assumed that the noise reduction from outside to inside with the window open is 15 dB.

To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB LAeq.

To protect the majority of people from being **seriously** annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being **moderately** annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq.

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included.

The relevant extracts of Table 1 are reproduced thus:

Specific Environment	Critical health effect (s)	LAeq dB	Time Base hours	LAMax dB
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate Annoyance, Daytime and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance daytime & evening.	35	16	-
	Sleep Disturbance, night-time	30	8	45
Outside Bedroom	Sleep disturbance, window open (Outdoor Values)	45	8	60

5.6 Subjective Impression of Noise Changes

The following Table provides a semantic scale that may be used to "subjectively" rate changes in sound pressure level.

Table 1: Subjective effect of changes in sound pressure level

Change in sound level dB	Change in Power		Change in apparent loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half / Twice as loud
20	1/100	100	Much quieter / louder

After Bies and Hansen

This table is taken from Professor Colin H Hansen's publication "Fundamentals of Acoustics" page 41, for the Department of Mechanical Engineering, University of Adelaide.

This table also appears in "Engineering Noise Control" by Colin Hansen and David Bies, a comprehensive reference book, amongst others.

6.0 Survey Equipment

Integrating Sound Level Meter, RION NA-27, Type 1, Serial No 431986
RION UC-53A Microphone Serial No 307060
RION NC-74 Calibrator Serial No 530712
Windshield, Tripod

7.0 Survey Method

An un-attended pre-development environmental noise assessment survey was carried out encompassing 4th to 5th March 2020.

LA_{eq}, LA_{90}, LA_{10}, and LA_{max} sound measurements were taken using the sound analyser.

The measurement indices noted above are defined as follows:

LA_{eq}, T — the "A" weighted equivalent continuous noise level of sample period T

LA_{10}, T — the "A" weighted level exceeded for 10% of sample period T

LA_{90}, T — the "A" weighted level exceeded for 90% of sample period T

LA_{max} The "A" weighted maximum level during the sample period T

The sound measurements were taken using the sound analyser. The meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No fluctuations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

The meter was mounted on the tripod at a height of 1.5m above ground and at least 3m from any reflective plain and set to monitor the data over 5 minute sample periods for the duration of the monitoring period.

Refer to Appendix A for a marked up locational sketch for the survey points.

8.0 Prevailing Weather Conditions

4 – 5 March 2020 Temperature range between 3-7 °C
Dry throughout the monitoring period
Humidity ranging from 1004 mb to 1006 mb
Wind up to 2mph S direction
Clear sky throughout

9.0 Pre-Development Noise Survey Results

During the monitoring data was logged covering daytime and nighttime periods. The data was recorded and logged every 5 minutes. This was to establish the general noise levels experienced externally by the site at the most exposed position to the proposed properties and therefore likely to experience the worst case noise climate.

The table of results on the following page indicates the noise levels recorded for the site during the monitoring period, with a brief description of the noise sources contributing to the individually monitored noise levels recorded.

The above monitoring locations should be read in conjunction with the site layout appearing in Appendix A of this report.

10.0 Noise Survey Results Table Overview

The data table below is an average of the remote daytime and nighttime periods derived from the raw data collected during the remote monitoring period

Table 1 Remote Data Overview

Period	LAmax	LAeq	LA10	LA90
	dB	dB	dB	dB
DAYTIME	81.2	61.7	63.2	52.8
NIGHTTIME	68.9	58.3	63.5	43.1

Table 2 Remote Data Time History Chart – Daytime

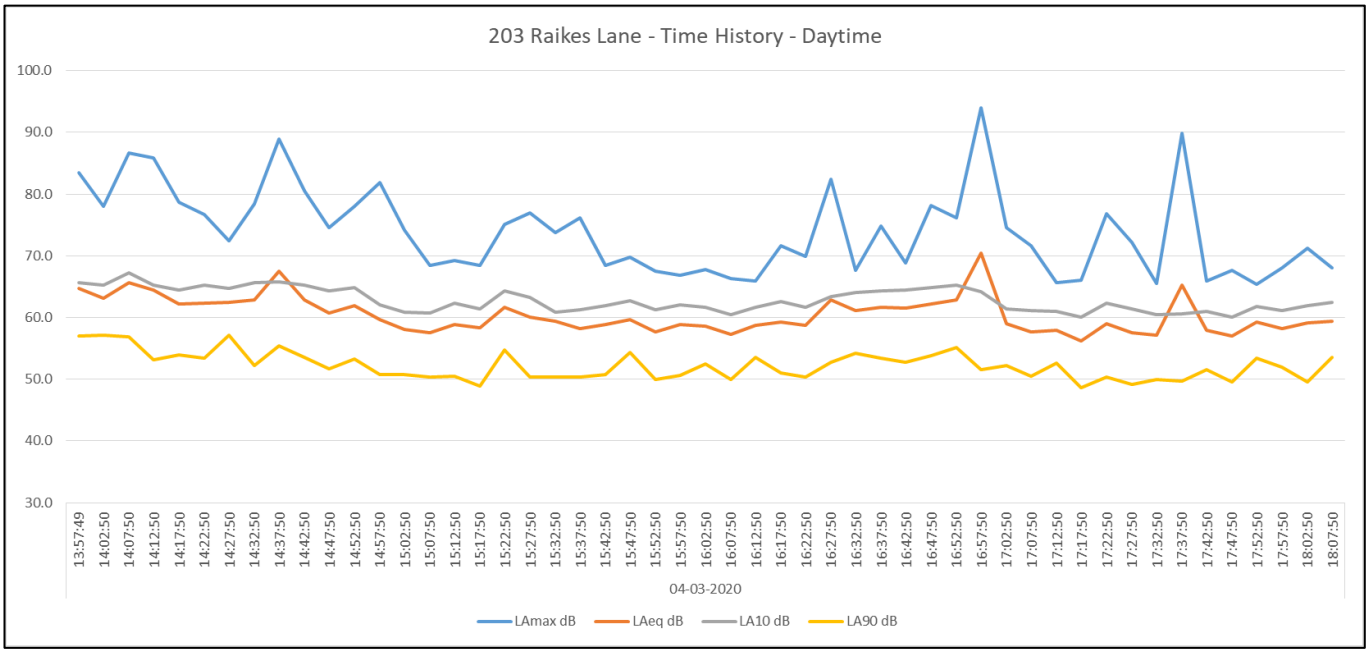
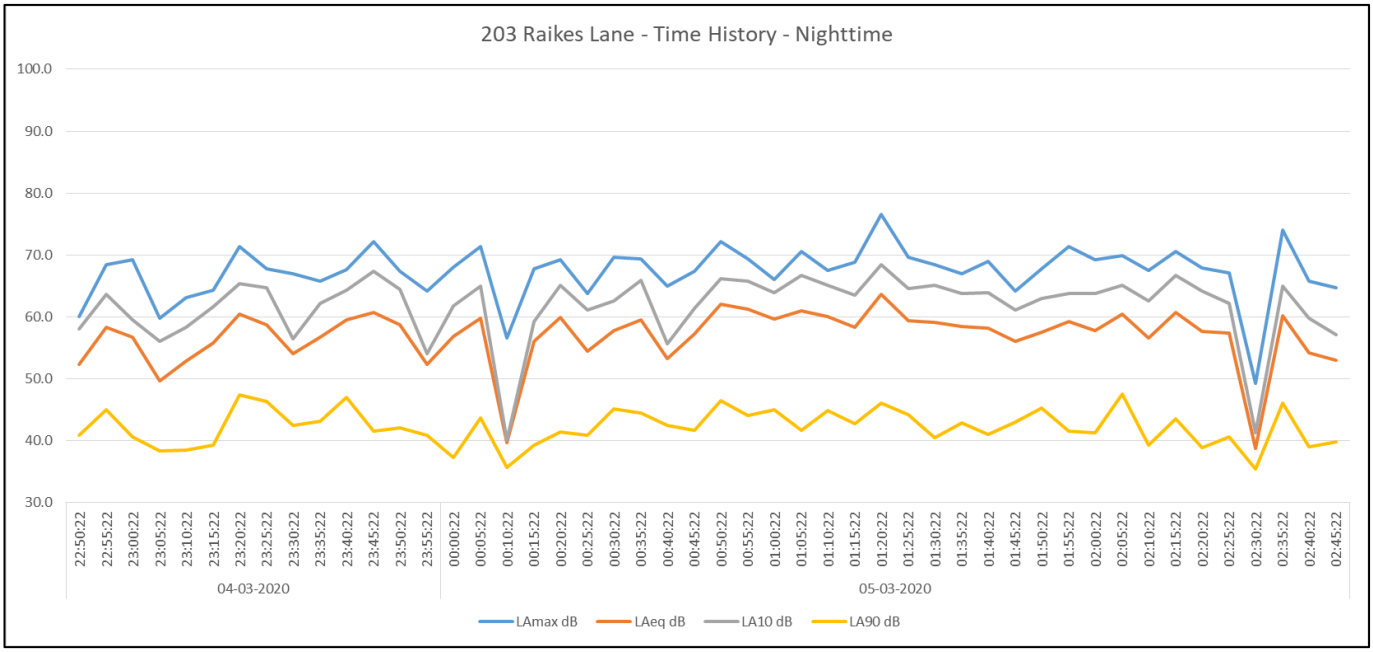


Table 3 Remote Data Time History Chart – Nighttime



11.0 Results Analysis

The above noise survey, carried out between 4th and 5th March 2020, was chosen as a representative weekday period to reflect the typical noise climate for the area surrounding the development site.

The noise survey results obtained for the site can, therefore, be deemed to be representative of normal activities for the area and will be used as the base for analysis and assessment purposes below.

Assessments of the individual results indicate that the monitoring position selected is affected primarily by traffic noise sources from the movements along the A62, Geldard Road and the local road network.

From the data acquired during the various assessment periods the following exposure noise levels have been established for the site.

Table of Exposure Levels

Location	Period	Noise Level
1	Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 62 dB
	Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours – 58 dB LAFmax - 69 dB

12.0 Mitigating Circumstances

The proposal for the development site is for the erection of a detached residential property, as indicated on the site proposal sketch. See Appendix B for details.

There are 4 main areas to consider within the development to ensure that the building provides adequate attenuation against the ingress of external noise sources that are likely to affect the comfort and amenity of the residents.

- Construction Phase (Temporary)
- Building Fabric Construction
- Glazing Units
- External Recreational Areas

12.1 Construction Phase Noise (Temporary)

It is common practice that construction will take place during typical daytime hours only, assumed to be 07.30 to 18.00 hours during week days only and Saturday 08.00 to 13.00 hours. No construction work assumed for Sunday or Public Holidays.

There are items of plant, such as generators that may operate 24 hours dependent upon their function and these plant items may unduly affect the existing amenity of the nearby residential premises.

Noise generated by construction work has the potential to increase the noise levels at the nearby noise sensitive residential premises due to the operation of plant and equipment associated with the construction phase of the development. The level of potential increase will depend on many factors, including locality of the activities on site relative to the recipient, type of activity being undertaken and control measures implemented.

To minimize the potential impact of the noise impact mitigation measures are proposed for the construction phase as noted below.

12.1.1 Construction Noise Mitigation

Construction noise is an inevitable part of any development, however, the change in noise levels is usually short term and temporary during the construction phase of the project only.

12.1.2 Noise Action Plan

It is recommended that a Noise Action Plan is implemented for the development, addressing all aspects of the construction, including mitigation measures and procedures for dealing with on-site activities and complaints, should any arise.

The Control of Pollution Act and BS 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM).

The following are examples of what could be included within a Noise Action Plan.

- Selective location temporary plant so that it is screened by on-site structures, such as site cabins;
- Using modern equipment and ensuring such equipment is properly maintained and correctly operated by trained staff;
- Acoustically enclosing noisy equipment if possible;
- Ensure that mobile plant is well maintained and there are no excessive rattles or vibrations that can be addressed;
- Ensuring plant machinery is turned off when not in use;
- Provide local residents with 24-hour contact details for a site representative;
- Inform local residents about the works advising of any specific noisy events and provide a contact telephone number, as noted above;
- Keep noisy deliveries to the midday period where possible.

12.1.3 Site Training / Instruction

The site training and induction programme, including site specific rules will include good working practice instructions for site staff, managers, visitors and contractors to minimise noise whilst working on the site. Good working practice guidelines/instructions should include the following points as a minimum requirement:

- Avoid unnecessary revving of plant and equipment engines;
- Intermittently used plant should be isolated between operational periods;
- Avoid reversing unnecessarily using tonal reverse horns, fit broad band warning horns where possible;
- Report any defective equipment/plant immediately so that corrective maintenance can be completed; and
- Minimise noise when handling or moving materials on site.

12.1.4 Plant Maintenance

All temporary plant items arriving on site should be in good working order and have written proof of maintenance prior to use.

Maintenance of temporary plant on site should be carried out routinely and in accordance with the manufacturers' guidance and recommendations.

Regular inspection of all plant and equipment must be undertaken to ensure that:

- all plant is in a good state of repair and operating correctly;
- any plant found to require maintenance has been identified and isolated until maintenance has been completed;
- acoustic enclosures fitted to plant are in a good state of repair and correctly fitting;
- doors and covers remain closed during operation; and
- all repairs should be completed by a fully qualified maintenance engineer for the specific plant item under consideration.

Although the above are mainly procedural recommendations and not fully quantifiable it is possible that they could reduce perceived noise levels on the site by about 5 dB.

12.2 Building Fabric Construction

The Building Regulation, relating to the minimum acoustic requirements for the various areas of the development, must be met.

12.2.1 Building Fabric Construction

Based upon the external baseline noise levels recorded, primarily due to traffic noise, the minimum weighted sound reduction, Rw, of the external façades will need to be Rw 45 dB to ensure that an internal specification of 30 $L_{Aeq,\ 8hours}$ dB maximum, (equivalent to NR 25), is met within the noise sensitive dwelling areas during nighttime periods, as determined within the WHO recommendations. The LAFmax of 69 dB will be attenuated such that the internal level will be up to a maximum value of 24 LAFmax dB, again in line with the specific requirements of WHO.

Based upon the proposed wall construction, the envelope will comprise of an internal leaf of concrete block, lined externally with stone and a cavity between of at least 75mm, the following performance would be expected from the external façade construction:

Frequency in Hz	63	125	250	500	1000	2000	4000
R_W of Facade	40	41	45	45	54	58	65

12.2.2 Glazing Units

The primary weakness in any building envelope is usually due to windows, ventilation louvres and other apertures.

The development will not noted as having air conditioning installed within the noise sensitive residential areas of this development, other than extraction from bathrooms which are not within the noise sensitive bedroom areas and therefore the only area of concern are the proposed window systems.

In order to provide adequate attenuation against the sound levels in the area and achieve the Building Regulations and WHO criteria, it is recommended that the formed apertures are fitted with suitable acoustic glazing units.

Using the sound exposure levels assessed for the site the minimum recommended Rw dB rating for the glazing systems for the site should be as follows.

Period	Noise Exposure Level	Internal Living Space / Bedroom Target Level	Minimum Rw Values Required
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 62 dB	LAeq, 16 Hours – 35 dB	**Rw 27 dB**
Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours – 58 dB LAmax - 69 dB	LAeq, 8 Hours – 30 dB LAmax - 45 dB	**Rw 28 dB** **Rw 24 dB**

Based upon Pilkington Glass data for glazing systems, it is possible to provide the necessary sound insulation using an Insulated Glass Unit (IGU) glazing system consisting of a 6mm Glass – 6 to 20mm wide Argon Filled Airspace – 4mm Glass. This system has certified acoustic values of Rw 32 dB, with an R_A 30 dB and $R_{A,tr}$ 28 dB.

This is the recommendation for all elevations of the development and the acoustic properties of this type of glazing is provided below for reference.

Glazing type	Frequency in Hz	63	125	250	500	1000	2000	4000
6/6-20/4	R_W of Facade	18	21	20	26	38	37	39

12.2.3 Ventilation Considerations

If we consider opening a window within a dwelling room such as living space or bedroom to provide additional room ventilation, the accepted attenuation value of the partially open window is -15 dB, this would allow for an internal noise level within a living space of up to 47 LAeq dB for daytime and bedroom of up to 43 LAeq dB at nighttime for all elevations of the development. This level of ingress is deemed as likely to result in disturbance due to external sources, set at 35 LAeq dB daytime and 30 LAeq dB at night within WHO.

If we also consider to intermittent noise source, deemed as the LAFMax dB, recorded at an average of 69 dB, we find that the ingress with a window open scenario will be 54 LAFMax dB. This level of ingress is again deemed as likely to result in sleep disturbance due to external intermittent sources, set at 45 LAFMax dB, as per WHO.

Based upon the above values mitigation measures would be necessary an alternative to opening a window to be opened to provide background ventilation for the occupants.

BS8233:2014 States;
"If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level." and
"The Building Regulations' supporting documents on ventilation [48, 49, 50] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available.

However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice. Alternatively, acoustic ventilation units are available for insertion in external walls. These can provide sound reduction comparable with double glazed windows. However, ducted systems with intakes on the quiet side of the building might be required in very noisy situations, or where appearance rules out through-the-wall fans."

In order to ensure disturbance due to external noise sources is not experienced and still provide adequate ventilation within dwelling areas, an alternative to opening a window would be to consider installation of an acoustic trickle ventilation system.

The trickle ventilation system that provides both adequate background ventilation in accordance with Approved Document F1 and the minimum acoustic properties to maintain the internal noise characteristics

of a closed window using a through ventilator. The Rw values quoted above do not include for the trickle vent combination within their values and as such inclusion of a standard trickle vent will diminish the Rw values quoted.

It is recommended that an alternative ventilation system is installed to fully protect the amenity of future inhabitants. As stated in BS8233:2014 section 5.4.4, having complete enclosure of the noise source or receiver is the most effective barrier of sound. An alternative ventilation strategy allows for maximum sound insulation from the noise source whilst still maintaining a sufficient level of ventilation. It is recommended that the alternative ventilation should provide the same resistance to sound as the glazed elements. The following table provides ventilation systems that meets the above recommendations.

Model	Attenuation (dB)
Titon Sonair F+	55dB $D_{n,e,w}$
Simon Acoustic Trickle Ventilation	38dB Open / 41dB Closed $D_{n,e,w}$

If the above ventilation systems are not deemed suitable for the development, then a mechanical ventilation heat-recovery (MVHR) system should be employed. It should be noted that if a MVHR system is used, the self-generating noise from the system will need to conform to the internal noise levels outlined in BS8233:2014.

12.3 External Recreational Areas

Since the development is to include external recreational areas, these areas would be subject to the recorded noise climate for the site. The recorded external levels of 58 LAeq dB dependent upon location on site due primarily to traffic sources moving along the A62, Geldard Road.

A noise level of this magnitude is above the recommended noise criteria for outdoor areas set at 50 LAeq dB, therefore, mitigation will be required for the external spaces to achieve the limits as indicated within WHO in section 5 above.

In order to reduce the noise levels within the gardens to below 50 LAeq dB, it is recommended that the site boundaries to the southern, western and eastern outdoor spaces of the site are afforded a 2.0m high acoustic barrier.

This barrier could be in the form of acoustic screening having a superficial mass of at least 18 kg/m^2 which is achievable with a solid or close boarded wooden fence system.

Inclusion of the barriers would reduce the specific noise levels to a calculated 45 LAeq dB a noise level that is below the volume at which annoyance would be experienced by the incumbent residents.

12.4 BS8233:2014 Noise Ingress Assessment

To provide further evidence that the above recommended mitigation measures will be adequate to achieve a comfortable internal environment within the dwellings once occupied, a BS8233:2014 assessment will be completed.

This assessment will account for the daytime, nighttime and maximum nighttime values recorded for the worst case facades of the development and compare the results against the limiting criteria necessary to demonstrate an acceptable internal environment without giving rise to any undue loss of amenity to the incumbent residents.

Below is an overview of the results of the calculations completed.

Location	Daytime	Nighttime	Nighttime Maximum	Comments
Limiting Values	35.0 dBA (NR 30)	30.0 dBA (NR 25)	45.0 dBA (NR 40)	
Location 1	26.6 dBA (NR 20)	21.6 dBA (NR 17)	33.2 dBA (NR 29)	Design Target Met

As can be seen from the above overview the mitigation recommendations will allow the internal noise criterion to be fully achieved.

Refer to Appendix C for details of the full calculation data sheets.

13.0 Report Summary

A remote pre-development acoustic assessment of the existing noise levels on land at 203 Raikes Lane Birstall, Batley has been completed in order to allow discharge of Condition No 8 for Planning Application No 2019/91563 with respect to noise.

The noise survey established the pre-existing noise climate and sources for the area; which are primarily due to traffic movements locally and at a distance.

In order to achieve an acceptable and comfortable internal noise climate for the potential residents the WHO guidance community noise has been utilized for the acoustic target levels for the internal criteria of the dwelling areas of the development. The National Planning Policy Framework has been considered, with NR 30 daytime and NR 25 nighttime internal limits being utilized since the NPPF is not prescriptive in its noise limits.

Mandatory mitigating recommendations are necessary to provide adequate protection against intrusion from external noise sources and achieve the WHO guidelines for the internal noise climate of the residences.

Recommendations have been proposed for the glazing systems to be employed on this development, in order to achieve the internal dwelling room design target exposure levels as determined within WHO recommendations.

To provide background ventilation, opening windows are likely to result in an adverse effect on the bedrooms of the development.

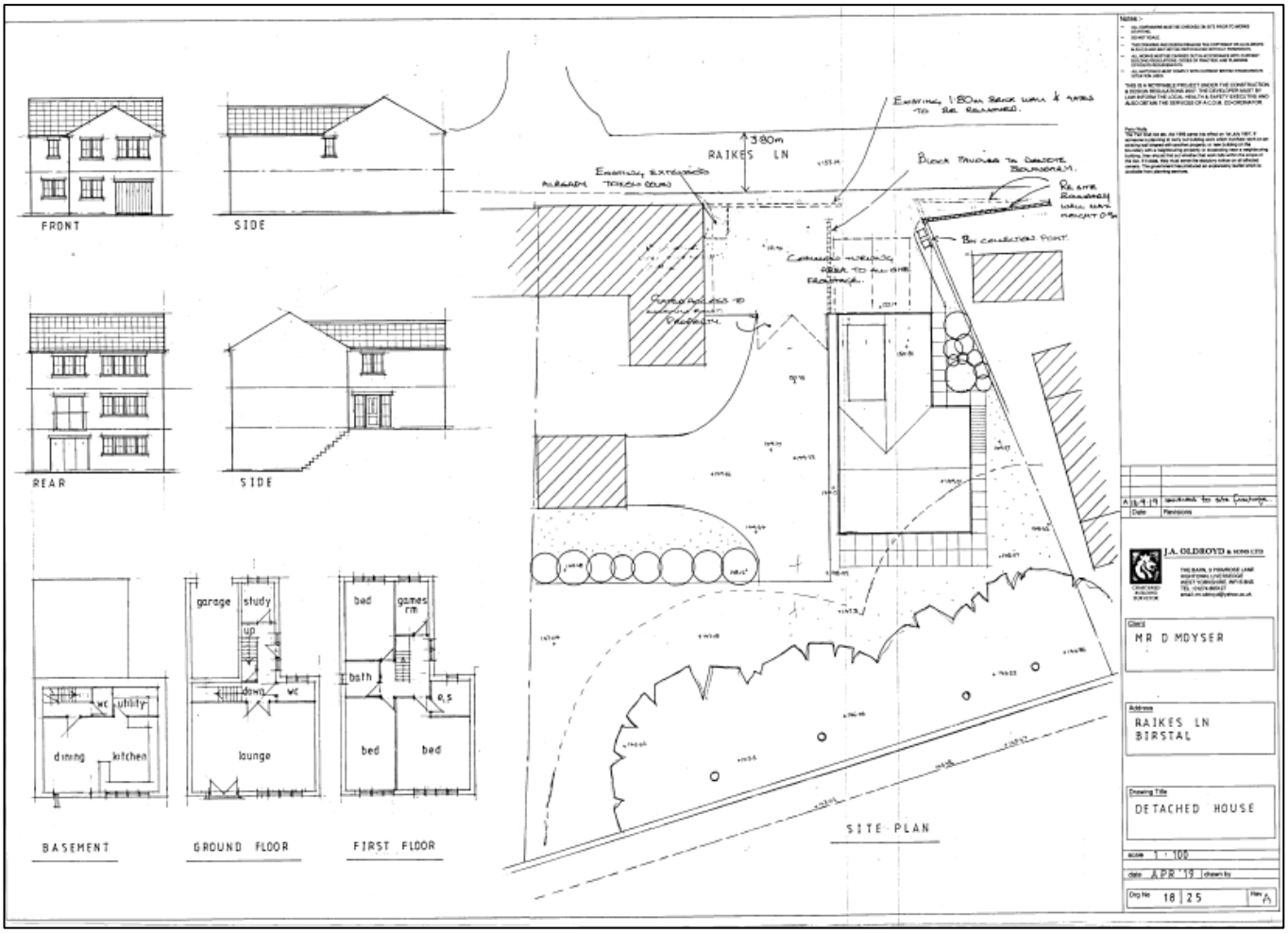
Recommendations have been provided for the acoustic passive or forced ventilation to be used on the development throughout, where these can be successfully integrated with the building fabric design.

The development is noted as have external recreational areas and as such it is recommended that acoustic barriers in the form of acoustic screening is provided along the western, southern and eastern elevations site boundaries.

Provided that the recommended mitigation measures have been incorporated into the development of the site, the internal amenity of the incumbent residents will be achieved.

Appendix A Locational Outline and Monitoring Position

Appendix B Proposal Outline Drawing



Appendix C BS8233 Noise Ingress Assessment Calculations

BS8233:2014 NOISE INGRESS CALCULATION - 203 RAIKES LANE, BIRSTALL

Position Assessment - Living Space	Leq Octave band noise levels (dB)							dBA
	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	
Façade - Daytime								
Average façade noise levels	65.1	56.3	55.0	55.4	59.0	56.0	52.0	**62.4**
Noise reduction through façade elements								
SRI External solid wall	-40	-41	-45	-45	-54	-58	-65	
absorption area	-3	-3	-3	-3	-3	-3	-3	
noise level through wall	22.1	12.3	7.0	7.4	2.0	0.0	0.0	9.2
SRI windows - glazing (6 - 6-20 - 4)	-18	-21	-20	-26	-38	-37	-39	
absorption area - Window 1.2m x 1.8m	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	
noise through windows	40.4	28.6	28.3	22.7	14.3	12.3	6.3	24.5
SRI acoustic ventilator - Trickle Vent	-30	-34	-35	-38	-40	-42	-44	
absorption area - N/A	0	0	0	0	0	0	0	
noise level through vent	35.1	22.3	20.0	17.4	19.0	14.0	8.0	22.4
Total noise internally								
through wall	22.1	12.3	7.0	7.4	2.0	0.0	0.0	9.2
through glazing	40.4	28.6	28.3	22.7	14.3	12.3	6.3	24.5
through vent	35.1	22.3	20.0	17.4	19.0	14.0	8.0	22.4
Combined total	41.4	29.5	29.3	23.7	20.3	16.5	10.6	**26.6**
Criteria - Living Room - Daytime								**35.0**
NR 30 Criteria	**59**	**48**	**40**	**34**	**30**	**27**	**25**	
Variance and Actual NR Value Achieved	-17.6	-18.5	-10.7	-10.3	-9.7	-10.5	-14.4	**NR 20**

Position Assessment - Bedroom	Leq Octave band noise levels (dB)							dBA
	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	
Façade - Nighttime								
Nighttime façade noise levels	57.1	50.0	48.8	49.7	55.3	52.6	41.5	**58.2**
Noise reduction through façade elements								
SRI External solid wall	-40	-41	-45	-45	-54	-58	-65	
absorption area	-3	-3	-3	-3	-3	-3	-3	
noise level through wall	14.1	6.0	0.8	1.7	0.0	0.0	0.0	6.6
SRI windows - glazing (6 - 6-20 - 4)	-18	-21	-20	-26	-38	-37	-39	
absorption area - Window 1.2m x 1.8m	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	
noise through windows	32.4	22.3	22.1	17.0	10.6	8.9	0.0	18.9
SRI acoustic ventilator - Trickle Vent	-30	-34	-35	-38	-40	-42	-44	
absorption area - N/A	0	0	0	0	0	0	0	
noise level through vent	27.1	16.0	13.8	11.7	15.3	10.6	0.0	18.0
Total noise internally								
through wall	14.1	6.0	0.8	1.7	0.0	0.0	0.0	6.6
through glazing	32.4	22.3	22.1	17.0	10.6	8.9	0.0	18.9
through open window	27.1	16.0	13.8	11.7	15.3	10.6	0.0	18.0
Combined total	33.4	23.2	23.1	18.0	16.7	13.3	4.8	**21.6**
Criteria - Bedroom - Nighttime								**30.0**
NR 25 Criteria	**55**	**44**	**35**	**29**	**25**	**22**	**20**	
Variance and Actual NR Value Achieved	-21.6	-20.8	-11.9	-11.0	-8.3	-8.7	-15.2	**NR 17**

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Position Assessment - Bedroom	Leq Octave band noise levels (dB)							dBA
	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	
Façade - Nighttime								
MAX façade noise levels	66.8	62.7	59.4	62.9	67.5	61.4	52.0	**69.4**
Noise reduction through façade elements								
SRI External solid wall	-40	-41	-45	-45	-54	-58	-65	
absorption area	-3	-3	-3	-3	-3	-3	-3	
noise level through wall	23.8	18.7	11.4	14.9	10.5	0.4	0.0	15.2
SRI windows - glazing (6 - 6-20 - 4)	-18	-21	-20	-26	-38	-37	-39	
absorption area - Window 1.2m x 1.8m	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7	
noise through windows	42.1	35.0	32.7	30.2	22.8	17.7	6.3	30.6
SRI acoustic ventilator - Trickle Vent	-30	-34	-35	-38	-40	-42	-44	
absorption area - N/A	0	0	0	0	0	0	0	
noise level through vent	36.8	28.7	24.4	24.9	27.5	19.4	8.0	29.5
Total noise internally								
through wall	23.8	18.7	11.4	14.9	10.5	0.4	0.0	15.2
through glazing	42.1	35.0	32.7	30.2	22.8	17.7	6.3	30.6
through vent	36.8	28.7	24.4	24.9	27.5	19.4	8.0	29.5
Combined total	43.1	35.9	33.7	31.2	28.8	21.9	10.6	**33.2**
Criteria - Bedroom - Nighttime								**45.0**
NR 40 Criteria	**67**	**57**	**49**	**44**	**40**	**37**	**35**	
Variance and Actual NR Value Achieved	-23.9	-21.1	-15.3	-12.8	-11.2	-15.1	-24.4	**NR 29**