Our ref: NIA/9523/20/9463/v2/Station Road

29th April 2021

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NOISE IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL NEW BUILD DEVELOPMENT, LAND TO THE SOUTH-EAST OF STATION ROAD, SKELMANTHORPE, HUDDERSFIELD

KIRKLEES COUNCIL PLANNING APPLICATION REFERENCE 2019/62/90183/E

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited (ENS) has been commissioned by Newett Homes to carry out a noise impact assessment for a proposed new build residential development at land to the south-east of Station Road, Skelmanthorpe, Huddersfield (hereafter referred to as the application site).

1.02 Planning Permission (Reference: 2019/62/90183/E) for the development was granted by Kirklees Council, subject to conditions. Condition 19 relates to the control of noise as follows:

'19 Prior to the commencement of superstructure works, a report specifying the measures to be taken to protect the development from noise shall be submitted to and approved in writing by the Local Planning Authority. The report shall refer to the site layout hereby approved and shall detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required). Unless otherwise agreed in writing by the Local Planning Authority none of the dwellings hereby approved shall be occupied until all works specified in the approved report have been carried out in full. The approved works shall be retained thereafter.'

1.03 The objectives of the noise impact assessment were to:

- Determine external noise levels at the site.
- Assess the potential impact of the external noise climate on the proposed residential development with reference to relevant guidelines.
- Provide recommendations for a scheme of sound attenuation works.

1.04 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to aid in the discharge of Condition 19 of Planning Permission 2019/62/90183/E granted by Kirklees Council.

1.05 This report has been prepared for Newett Homes for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Newett Homes and ENS as to the extent to which the findings may be appropriate for their use.

1.06 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

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2.00 APPLICATION SITE SETTING AND PROPOSED RESIDENTIAL DEVELOPMENT

2.01 The application site is located within a mixed-use setting within the village of Skelmanthorpe in Huddersfield. Irregular in shape (see Appendix 2 for a site layout and noise monitoring positions) the application site is bound by:

- Station Road to the north-west with existing dwellings opposite the application site.
- Existing residential dwellings to the south-west on Boggart Lane.
- Land allocated for residential development (Planning Application Ref: 2019/62/91657/E for 30 no. dwellings) to the north-east
- Agricultural land to the east.

2.02 The proposed residential development consists of 14 no. new build dwellings with associated estates roads and landscaping (a site layout is shown in Appendix 3 or reference).

3.00 NOISE SURVEY

3.01 In order to establish external noise levels at the application site, a noise survey was undertaken on Friday 15th January 2021.

3.02 The following noise monitoring positions were adopted (the approximate locations of the noise monitoring positions are shown in Appendix 2 for reference):

- MP1 was located on the northern-west boundary at circa 4 metres from the nearside kerb of Station Road at 4 metres above ground level (AGL).
- MP1A was the same as MP1 but at 1.5metres AGL.
- MP2 was located at circa 11 metres from the nearside kerb of Station Road at 1.5 metres AGL.
- MP3 was located on the south-eastern boundary of the application site at 1.5 metres AGL.

3.03 Noise measurements were made in free field conditions using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. The calibration of each measurement system was verified immediately before and after the survey using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring.

3.04 Measurements consisted of A–weighted broadband parameters, together with linear octave band L_{eq} levels. Table 3.1 presents a summary of the measurement data for each measurement session, at each measurement position, rounded to the nearest decibel.

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Table 3.1 – Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	15/01/21	1155-1255	56	36	58	Dominated by road traffic on Station Road
		1255-1355	56	35	54	
		1355-1455	56	36	58	
Daytime noise level 54 dB $L_{Aeq\ (0700\text{-}2300)}$ based on CRTN methodology Night time noise level circa 47 dB $L_{Aeq\ (2300\text{-}0700)}$ based on TRL methodology						
MP1A	15/01/21	1056-1112	54	32	45	Dominated by road traffic on Station Road
Daytime noise level circa 54 dB $L_{Aeq,\ T}$						
MP2	15/01/21	1117-1132	47	36	49	Dominated by road traffic on Station Road
		1515-1531	45	34	48	
Daytime noise level circa 45-47 dB $L_{Aeq,\ T}$						
MP3	15/01/21	1135-1152	41	32	43	Dominated by road traffic on Station Road
		1533-1548	38	32	40	
Daytime noise level circa 38-41 dB $L_{Aeq,\ T}$						

3.05 For the prediction of daytime road traffic noise, the Department of Transport's Memorandum on the Calculation of Road Traffic Noise (CRTN) explains that the following shortened measurement procedure may be used. Measurements of L_{A10} are made over any three consecutive hours between 10:00 and 17:00 hours. Using $L_{A10\ (3\ hour)}$ as the arithmetic mean of the three consecutive values of hourly L_{A10}, the $L_{A10\ (18\ hour)}$ can be calculated from the equation:

(i) $L_{A10\ (18\ hour)} = L_{A10\ (3\ hour)} - 1$ dB

(ii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (0600–0000)} - 2$ dB

3.06 Substituting (ii) into (i) gives the following approximation:

(iii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (3\ hour)} - 3$ dB

3.07 Based on the above formula, the daytime ambient noise level at MP1 is measured / calculated at **54 dB $L_{Aeq\ (0700–2300)}$.**

3.08 A study prepared by TRL Limited on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) entitled 'Converting the UK Traffic Noise Index $L_{A10\ (18\ hour)}$ to EU Noise Indices for Noise Mapping' presents a methodology for calculating night time road traffic noise levels based on daytime road traffic noise level based on the following formula:

(iv) $L_{Aeq\ (23:00–07:00)} \approx 0.90 * L_{A10,\ 18\ hour} - 3.77$ (for non-motorways)

3.09 Based on the above formula, the night time ambient noise level at MP1 is measured / calculated at **47 dB $L_{Aeq\ (2300–0700)}$.**

3.10 Typical maximum noise levels associated with a passing vehicle were measured at circa **73 dB L_{AFMax}.**

3.11 The noise environment at the application site is characterised by road traffic on Station Road, with no other significant noise sources noted.

Coronavirus Travel Restrictions

3.12 During November 2020, the UK Government announced measures to stem the coronavirus pandemic, including restrictions on non-essential travel. The previous restrictions in March showed initially traffic volumes were reduced to circa 40 % of typical flows, traffic flows by the end of June 2020 were circa 65 % of typical traffic volumes and rising to 90 % in September 2020.

3.13 Data produced by the Department for Transport (DFT) show that on the day of the noise survey overall traffic volumes were reduced to circa 59% of typical flows. Using the methodology in the Calculation of Road Traffic Noise (CRTN), a 41 % reduction in traffic volumes equates to a 2 dB reduction in noise levels – this correction has been robustly applied to the measured noise level across the application site to account for a potential increase in measured L_{Aeq} noise levels once traffic flows are back to 'normal'.

4.00 NATIONAL PLANNING POLICY FRAMEWORK AND OTHER RELEVANT GUIDANCE

National Planning Policy Framework

4.01 The National Planning Policy Framework (NPPF) was updated in 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

4.02 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 170 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

4.03 Paragraph 180 advises that:

'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…..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'.

4.04 The NPPF also refers to the DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

Noise Policy Statement for England

4.05 The Noise Policy Statement for England (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life.
- Mitigate and minimise adverse impacts on health and quality of life.
- Where possible, contribute to the improvement of health and quality of life.

4.06 NPSE describes the following levels at which noise impacts may be identified:

- 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.

Planning Practice Guidance – Noise

4.07 Planning Practice Guidance (PPG) is an online resource (last updated 2019) which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

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

4.08 In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

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

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

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

ProPG Planning and Noise: New Residential Development

4.10 ProPG Planning and Noise: New Residential Development (ProPG) was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

4.11 Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233), see Table 4.1.

Table 4.1 – Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700–2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700–2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700–2300)}$	30 dB $L_{Aeq\ (2300–0700)}$ 45 dB $L_{AFMax\ (2300–0700)}$

4.12 Note 4 to the above table states:

'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. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.'

4.13 Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

4.14 Note 7 to the above table 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. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable".….Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable*

4.15 This is consistent with the guidance contained within the PPG, which states that:

'… consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

4.16 On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed residential development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime.
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ and 45 dB L_{AFMax} not regularly exceeded during the night time.

4.17 With regard to external amenity, BS 8233 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 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 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.'

5.00 SOUND ATTENUATION SCHEME PROPOSALS

Glazing and Ventilation

Plots 1 to 3

5.01 The design noise levels on the north-western boundary of the application site (representative of plots 1 to 3) have been measured / calculated (including the 2 dB L_{Aeq} adjustment for traffic flows, see paragraph 3.13) as follows:

- **≤ 56 dB $L_{Aeq,T}$** during the daytime.
- **≤ 49 dB $L_{Aeq,T}$** during the night time.
- **≤ 73 dB L_{AFMax}** during the night time

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Plots 4 to 7

5.02 Comparisons made between MP1A and MP2 demonstrate a reduction in level of 3 dB when the distance from the road centre is doubled. Plot 4 is circa 24 metres from the road centre which equates to a distance correction of circa 5 dB. This correction is therefore applied to the measured /calculated noise levels at MP1 in order to derive the design noise level for the centre of the application site (including the 2 dB L_{Aeq} adjustment for traffic flows, see paragraph 3.13) as follows:

- **≤ 51 dB $L_{Aeq,T}$** during the daytime.
- **≤ 44 dB $L_{Aeq,T}$** during the night time.
- **≤ 68 dB L_{AFMax}** during the night time

Plots 8 to 14

5.03 Comparisons made between MP1 and MP3 demonstrate a difference in level of circa 13 dB. This difference is therefore applied to the measured /calculated noise levels at MP1 in order to derive night time design noise levels at MP3. The design noise levels at the rear of the application site on the south-eastern boundary are therefore been measured / calculated (including the 2 dB L_{Aeq} adjustment for traffic flows, see paragraph 3.13) as follows:

- **≤ 43 dB $L_{Aeq,T}$** during the daytime.
- **≤ 36 dB $L_{Aeq,T}$** during the night time.
- **≤ 60 dB L_{AFMax}** during the night time

Sound Attenuation Scheme Proposals

5.04 The sound insulation requirements of habitable rooms at the development have been calculated using the methodology advocated in BS 8233, based on the external noise levels, room/glazing dimensions and reverberation time, together with parameters for the various elements of the building envelope.

5.05 For the purpose of the assessment, worst case room dimensions (i.e. rooms with the highest ratio of glazing area to room volume) have been adopted. Reference has been made to the drawings and site plan supplied by the developer (SK-001 Site Plan – 02.12.20).

Table 5.1 – Scheme of Sound Insulation Works

Location	Noise Level	Internal Criteria	Glazing
Plots 1 to 3 Bedrooms	≤ 56 dB $L_{Aeq, day}$ ≤ 49 dB $L_{Aeq, night}$ ≤ 73 dB L_{AFMax}	≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 30 dB $L_{Aeq\ (2300–0700)}$ ≤ 45 dB $L_{AFMax\ (2300–0700)}$	Standard glazing rated at 25 dB $R_w + C_{tr}$ i.e. 4 / (6-20) 4 and Acoustic Trickle Vents*
Plots 1 to 3 Living rooms	≤ 56 dB $L_{Aeq, day}$	≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$	Standard glazing rated at 25 dB $R_w + C_{tr}$ i.e. 4 / (6-20) 4 and Standard Trickle Vents**
Plots 4 to 7 All habitable rooms	≤ 51 dB $L_{Aeq, day}$ ≤ 44 dB $L_{Aeq, night}$ ≤ 68 dB L_{AFMax}	≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 30 dB $L_{Aeq\ (2300–0700)}$ ≤ 45 dB $L_{AFMax\ (2300–0700)}$	Standard glazing rated at 25 dB $R_w + C_{tr}$ i.e. 4 / (6-20) 4 and Standard Trickle Vents**
Plots 8 to 14 All habitable rooms	≤ 43 dB $L_{Aeq, day}$ ≤ 36 dB $L_{Aeq, night}$ ≤ 60 dB L_{AFMax}	≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 30 dB $L_{Aeq\ (2300–0700)}$ ≤ 45 dB $L_{AFMax\ (2300–0700)}$	Standard glazing rated at 25 dB $R_w + C_{tr}$ i.e. 4 / (6-20) 4 and Standard Trickle Vents**

*Acoustic trickle vents rated at least 37 dB $D_{n,e,w} + C_{tr}$ (vent open), such as the Greenwood 5000EAW.AC1 (note: 1 no. required per habitable room) – ventilation requirements to be confirmed by developer.
**Standard trickle vents rated at least 32 dB $D_{n,e,w}$ (vent open), (note: 1 no. required per habitable room) – ventilation requirements to be confirmed by developer.

Feasibility of Open Windows

5.06 The World Health Organisation (WHO) Guidelines for Community Noise (1999) states: *'the noise reduction from outside to inside with the window partly open is 15 dB'.*

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5.07 For plots 1 to 3 external ambient noise levels were measured / calculated up to 56 dB $L_{Aeq,T}$ during the day and 49 dB $L_{Aeq,T}$ at night, it follows that internal ambient noise levels would be 41 dB $L_{Aeq,T}$ during the day and 34 dB $L_{Aeq,T}$ at night with windows open. These noise levels represent reasonable internal ambient noise levels indicating that open windows are likely to be suitable for use in assistance with overheating mitigation without posing a high risk of adverse noise impacts.

5.08 For plots 4 to 7 external ambient noise levels were measured / calculated up to 51 dB $L_{Aeq,T}$ during the day and 44 dB $L_{Aeq,T}$ at night, it follows that internal ambient noise levels would be 36 dB $L_{Aeq,T}$ during the day and 29 dB $L_{Aeq,T}$ at night with windows open. These noise levels represent reasonable to good internal ambient noise levels indicating that open windows are likely to be suitable for use in assistance with overheating mitigation without posing a high risk of adverse noise impacts.

5.09 For plots 8 to 14 external ambient noise levels were measured / calculated up to 43 dB $L_{Aeq,T}$ during the day and 36 dB $L_{Aeq,T}$ at night, it follows that internal ambient noise levels would be 28 dB $L_{Aeq,T}$ during the day and 21 dB $L_{Aeq,T}$ at night with windows open. This would satisfy the internal ambient level guideline values set out in Table 4.1 indicating that open windows would be suitable for use in assistance with overheating mitigation without posing a high risk of adverse noise impacts.

External Amenity (Gardens)

5.10 Daytime garden noise levels were measured / calculated at up to 56 dB $L_{Aeq,\ T}$ along the north-western boundary. It is recommended that the garden of plots 1 to 3 be screened from Station Road with a 1.8-metre-high solid timber.

5.11 The acoustic fence should be built from close-boarded timber fencing (mass per unit area $\geq$ 10kg/m^2). The fence should have no gaps or holes and should be fully sealed at the ground (i.e. include a gravel board).

5.12 The provision of the 1.8 metre solid timber fence (Plots 1 to 3) should serve to reduce external noise levels to below 50 dB $L_{Aeq,T}$ across the entire application site thus satisfying the 'desirable' guideline value for external amenity areas, as recommended by BS8233 / ProPG.

6.00 CONCLUSIONS

6.01 A noise impact assessment has been undertaken proposed new build residential development at land to the south-east of Station Road, Skelmanthorpe, Huddersfield

6.02 The noise environment at the application site is characterised by road traffic on Station Road, with no other significant noise sources noted.

6.03 A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

I trust the foregoing is sufficient for your needs. Should you have any queries regarding the above, please do not hesitate to contact me.

Yours sincerely

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MIOA, Diploma in Acoustics & Noise Control
For Environmental Noise Solutions Limited

cc File

Appendix 1
Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript ‘F’ denotes fast time weighting, slow time weighting ‘S’ is also used.

Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2
Site Plan / Noise Monitoring Positions

Appendix 3
Site Layout