

NOISE ASSESSMENT

DETAILED APPLICATION FOR THE ERECTION OF A NEW INDUSTRIAL/STORAGE WAREHOUSE (USE CLASS B2/B8) AND OUTLINE APPLICATION FOR THE ERECTION OF TWO INDUSTRIAL/WAREHOUSE (USE CLASS B2/B8) UNITS ON THE PLATEAU SITE AT THE BRETBY BUSINESS PARK

BRETBY GP

DECEMBER 2021

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Revision	Prepared By	Date
1.0	L Jephson BEng (Hons) MIOA	16/12/21

This report has been prepared using all reasonable skill and care within the resources and brief agreed with the client. LF Acoustics Ltd accept no responsibility for matters outside the terms of the brief or for use of this report, wholly or in part, by third parties.

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1. Introduction

LF Acoustics Limited have been appointed by Bretby GP to carry out an assessment of the noise levels to support a detailed planning application for the erection of a new industrial/storage warehouse (Use Class B2/B8) and an outline application for the erection of two industrial/warehouse (Use class B2/B8) units on the plateau site at the Bretby Business Park.

The Application Site is located within the north western corner of the business park. At present, part of the site is used for storage containers, which would be removed, should planning permission be granted.

There are two residential properties located to the north west of the Application Site, along Ashby Road East, which have been considered within this assessment.

The following section of this report presents an overview of the relevant standards and guidelines applicable when assessing noise from this type of facility. Section 3 provides a description of the site, its surroundings and the proposed operation. A baseline noise assessment is provided within Section 4, with details of the calculation and assessment of noise levels associated with the operation of the facility provided in Section 5. Finally, Section 6 provides a summary of the assessment.

2. Standards and Guidelines

A description of the noise units referred to in this report is provided in Appendix A.

2.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) revised in July 2021 [1], sets out the Government's planning policies for England and how these should be applied. It provides a framework upon which locally prepared plans for housing and other development can be produced.

The purpose of the planning system is to contribute to the achievement of sustainable development and at the heart of the Framework is a presumption in favour of sustainable development.

With regards noise, local 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 noise pollution.
- mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development (including cumulative effects) – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Reference is made within the NPPF to the Noise Policy Statement for England (NPSE), which sets out the long-term vision of the Government noise policy. Further information has been provided on the assessment of noise within recent Planning Practice Guidance, updated in July 2019 and available on the Government planning web site. Whilst this guidance does not provide any objective criteria upon which to base noise assessments, the guidance provides a description of the relevant Effects Levels identified within the NPPF and NPSE and this is reproduced in Table 2.1.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect (NOEL)	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level (LOAEL)	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level (SOAEL)	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2.1 Significance Criteria

The NPPF advises that development should seek to ensure that noise from proposed developments does not give rise to significant impacts, i.e. a level identified as a Significant Observed Adverse Effect (SOAEL), which is at a level where the noise would cause a material change in behaviour.

2.2. British Standard BS 4142

BS 4142 [2] is the British Standard for rating and assessing noise of a commercial or industrial nature and is relevant to the noise associated with the operation of the proposed plant.

BS 4142 is a comparative standard in which the estimated noise levels from the proposed development are compared to the representative / typical background noise level from existing uses.

BS 4142 relates the likelihood of complaint to the difference between the Rating Level of the noise being assessed and the background noise level.

The background noise level is the L_{A90} noise level, usually measured in the absence of noise from the source being assessed, but may include other existing industrial or commercial sounds. The background noise levels should generally be obtained from a series of measurements each of not less than 15 minute duration.

The Rating Level of the noise being assessed is defined as its L_{Aeq} noise level (the 'specific noise level'), with the addition of appropriate corrections should the noise exhibit a marked impulsive and/or tonal component or should the noise be irregular enough in character to attract attention. The extent of the correction is dependent upon the degree of tonality or character in the noise and is determined either by professional judgement, where the plant is not operational at present, or by measurement.

Where the noise is tonal in nature, the standard imposes the following penalties when assessing the rating level:

- 2 dB for a tone which is just perceptible;
- 4 dB where the tone is clearly perceptible; and
- 6 dB where the tone is highly perceptible.

Where noise exhibits other sound characteristics, the Standard advises a penalty of 3 dB should be applied.

During the daytime, the specified noise levels are determined over a reference time interval of 1 hour, with a 15 minute reference period adopted when assessing night-time noise.

If the Rating Level of the noise being assessed exceeds the background level by 10 dB or more BS 4142 advises that there is likely to be an indication of a significant adverse impact, depending upon context. A difference between background level and Rating Level of around 5 dB is likely to be an indication of an adverse impact, depending upon context. The lower the Rating Level is, relative to the background noise level, the less likely the specific source will have an adverse or significant adverse impact. Where the Rating Level does not exceed the background noise level is an indication of a low impact, depending upon context.

The assessment method outlined above is intended for the assessment of external noise levels and is not intended to assess the extent of impact at internal locations.

Where the initial assessment of impact, based upon and assessment of the external noise levels, needs to be modified due to the context, all pertinent factors should be taken into account, including:

- The absolute level of sound;
- 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; and
- The sensitivity of the receptor and whether the premises will already incorporate measures to ensure good internal and/or external acoustic conditions.

2.3. British Standard BS 8233

British Standard BS 8233 [3] principally provides design guidance for new buildings. For residential premises, the guidance advises for steady external noise sources, levels of noise internally not exceeding 30 dB $L_{Aeq, 8 \text{ hour}}$ within bedrooms at night are desirable, with a level of 35 dB $L_{Aeq, 16 \text{ hour}}$ representing a desirable standard of noise within living rooms and bedrooms for resting purposes during daytime periods.

Externally within gardens and amenity spaces, the guidance recommends a general limit of 50 dB $L_{Aeq, T}$.

2.4. World Health Organisation Guidelines

The World Health Organisation guidance [4] provides additional guidance upon potential effects in relation to noise.

The guidance advises:

- few people are moderately annoyed by noise levels of below 50 dB L_{Aeq} during the daytime;
- for a good night's sleep, noise levels within bedrooms should not exceed 30 dB L_{Aeq} , with individual noise events not exceeding 45 dB L_{Amax} ; and
- special attention should be given to noise sources in an environment with low background noise levels and to noise sources with low frequency components.

Assuming an open window provides a reduction in noise levels of between 10 – 15 dB(A), during the night-time the WHO guidance indicates that external noise levels should remain below 40 – 45 dB L_{Aeq} to maintain the restorative processes of sleep.

The WHO produced additional noise guidance in relation specifically to night-time noise in 2009 [5]. This report provides a description of the no observed adverse effect level (which is equivalent to a No Observed Effects Level, NOEL) and advises for night-time noise (which is considered to be the most sensitive period of the day) that this concept is less useful, as the adversity of effects are less clear. Instead, it advises the use of the observed effects thresholds, above which an effect starts to occur or shows itself to be dependent upon the exposure level.

The guidance is presented in terms of external and internal recommendations to minimise any potential adverse effects. Externally, the guidance advises that an average night-time noise level L_{night} (the $L_{Aeq, 8 \text{ hour}}$) of 40 dB is equivalent to the Lowest Observed Adverse Effect Level (LOAEL) and advises this guideline value is recommended for the protection of public health from night-noise. However, below this level there was no change in the small number of awakenings identified and hence a reason for considering that the NOEL was not an appropriate descriptor in noise terms for identifying adverse effects and hence recommend the use of the observed effects threshold as an appropriate descriptor to identify the potential for the onset of adverse effects.

The guidance, however, advises that an external night-time noise level of 30 $L_{Aeq, 8 \text{ hour}}$ would be equivalent to the NOEL, as their research indicated that there were no detectable effects internally, below a level of 32 dB L_{Amax} , with no physical awakenings identified below a level of 42 dB L_{Amax} internally.

3. Site Description and Identification of Potentially Affected Dwellings

The site location and its surroundings are indicated on Figure 1.

The Application Site is located within the north western corner of the business park. At present, the southern part of the site is used as a container storage facility.

Three new industrial / commercial units are proposed to be constructed on the site.

Three buildings are proposed to be constructed on the site.

Detailed planning permission is being sought for the main building (Block A), which is proposed as a pre-let to Dellner who are specialist train wagon component manufacturer and are an existing business in the district and are currently located on Hearthcote Road Swadlincote.

Outline planning permission is being sought for the other two units, Block B and C. These are speculative schemes proposed to appeal to smaller enterprises.

It is anticipated that Block A would be operational during the day and evening periods during the weekdays and potentially Saturday mornings, thus maintaining the current operational requirements for Dellner. As the smaller units are speculative at this stage, the operational hours are not known, however, similar units of this size would typically operate during weekday daytime periods.

There are two residential properties located to the north west of the Application site, along Ashby Road East, which would have the potential to be adversely affected by noise from the operation of the units. The location of these properties in relation to the units is indicated on Figure 1.

4. Baseline Noise Assessment

An unattended noise survey was carried out in order to establish the prevailing noise levels at the neighbouring properties upon which the assessment has been based.

The survey was carried out between Tuesday 23 and Tuesday 30 November 2021.

Weather conditions at the start and end of the survey period were good, remaining generally dry with light winds. There was a period of heavy rain and moderate winds overnight on Friday 26 November and continuing into Saturday, which is likely to have affected the noise monitoring results. Data obtained during these two days has therefore been viewed with caution.

A Rion NL-52 Class 1 Sound Level Meter (Serial No. 00987349) was used for the monitoring exercise. The instrument was field calibrated before and after the exercise using a Rion NC-75 Class 1 Sound Calibrator (Serial No. 35270122). Both instruments had been laboratory calibrated within the previous 12 months in accordance with National Standards. The microphone was fitted with Rion WS-15 outdoor microphone protection, which maintains Class 1 performance over a wider range of environmental conditions.

The instrument was located along the rear boundary of the properties close to Thorn Tree Lane, as indicated on Figure 1. The microphone was set in freefield conditions, with the microphone set at a height of 1.3 metres above the ground. This location was selected to ensure baseline conditions were representative of the rear facades of the dwellings, noting that the monitoring position was set back further from Ashby Road East than the properties. The noise levels monitored at this location were therefore likely to have been marginally lower than at the facades and thus provided worst case conditions when evaluating the background noise levels upon which the assessment has been based.

The instrument was configured to record over 15 minute periods during the survey, in accordance with the requirements of BS 4142.

Noise levels monitored were noted to be principally attributable to road traffic associated with vehicles travelling along Ashby Road East. Little noise was observed associated with the operation of the existing units within the business park.

The results of the noise monitoring exercise are presented within Appendix B.

The background noise levels monitored have been subsequently analysed using a statistical approach to derive the typical background noise levels for the day, evening and night-time periods. The typical noise levels evaluated from the analysis are presented in Table 4.1.

Day	Typical Noise Levels [dB]					
	Day (07:00 – 19:00)		Evening (19:00 – 23:00)		Night (23:00 – 07:00)	
	L _{Aeq,T}	L _{A90}	L _{Aeq,T}	L _{A90}	L _{Aeq,T}	L _{A90}
Tuesday 23/11/21	51	48	48	44	45	31
Wednesday 24/11/21	55	47	48	42	47	32
Thursday 25/11/21	53	50	48	43	48	39
Friday 26/11/21	56	52	55*	50*	55*	47
Saturday 27/11/21	56*	54*	50	44	44	32
Sunday 28/11/21	49	40	44	37	41	28
Monday 29/11/21	50	49	48	43	47	36
OVERALL	53	49	48	43	45	32

Note: * - Influenced by Poor Weather Conditions

Table 4.1 Typical Noise Levels Evaluated from Survey Results

5. Calculation and Assessment of Noise from the Operation of the Proposed Units

5.1. Operational Assumptions

Block A

Block A is anticipated to be occupied by Dellner, who manufacture train couplings. Noise levels within the unit would be principally associated with the manufacturing operations. To provide a reasonable worst case assessment, an internal noise level of 80 dB L_{Aeq} has been assumed within the main workshop areas, as this represents the Lower Action Value within the Noise at Work Regulations, above which, the employer would need to consider measures to reduce noise exposure to employees.

The final specification for the building cladding would be determined during the detailed design process. For the purposes of the current assessment, cladding to the walls and roof of the units has been assumed with a minimum sound reduction of 35 dB R_w (e.g. Tata Steel Trisobuild Built Up Composite System 120mm thick with a 0.5mm external steel sheet and rock fibre insulation).

Externally, the loading bay area would be located on the south side of the building, thus maximising distance and attenuation to the neighbouring properties. It has been assumed that the doors to the building would remain closed except during periods of loading.

Based upon the data within the traffic assessment, there would be a maximum of 7 HGV movements per hour within the loading bay area, with typically 3 vehicle movements per hour during the day. The modelling has also assumed a forklift operating within the loading bay area 50% of the time during the day. In addition, a further 18 peak hour peak movements have been assumed associated with cars / LGV into the car parking areas.

The noise modelling has been based upon the assumption the unit would be operational between 07:00 – 23:00 hours, with HGV movements / loading activities during the daytime period between 07:00 – 19:00 hours.

No external plant has been assumed within the calculations. It is, however, anticipated that the unit will be heated using Air Source Heat Pumps (ASHP). The external units would be located on the facades facing away from the properties to minimise noise. The units typically generate a noise level of up to 50 dB(A) at a distance of 1 metre. Given that the dwellings would be at least 70 metres from the unit, the noise levels attributable to the operation of the ASHPs would be very low (<20 dB(A)) and thus would not influence the overall noise levels attributable to the operation of the unit.

Blocks B and C

As indicated previously, the future use of these smaller units is not known at this stage.

Units of this size would typically be used for small scale manufacturing or distribution and thus noise levels attributable to their operation would be low. It is also anticipated that these units would normally operate during the daytime periods between 07:00 – 19:00 hours.

To provide an initial assessment of the noise levels attributable to the operation of these units, an internal noise level of 80 dB L_{Aeq} has been assumed within each unit, and assuming walls / roof cladding with a sound reduction of 35 dB R_w . This assumption is likely to represent worst case conditions, as noise levels within this type of unit would be generally low and of the order of 70 dB L_{Aeq} or lower.

Vehicle movements associated with this type of unit would also be low, typically associated with general courier deliveries and collections during the day. Based upon the traffic assessment, 2 HGV movements per hour and 5 car / LGV movements per hour have been assumed to each block during the daytime periods.

No external plant has been assumed within the calculations. It is, however, anticipated that the units will be heated using Air Source Heat Pumps (ASHP). The external units would be located on the facades facing away from the properties to minimise noise. The units typically generate a noise level of up to 50 dB(A) at a distance of 1 metre. Given that the dwellings would be at least 35 metres from and ASHP, the noise levels attributable to the operation of the ASHPs would be very low (<20 dB(A)) and thus would not influence the overall noise levels attributable to the operation of the unit. Consideration would, however, be given to the noise from the ASHPs during the detailed design stage of these units to ensure their operation did not result in adverse noise impacts.

5.2. Calculation of Noise Levels

Calculation of the noise levels at the neighbouring properties has been made upon the basis of the operational assumptions presented in Section 5.1.

Details of the source noise levels used for the proposed plant and equipment are provided in Appendix C.

Calculations of the noise levels at the surrounding properties have been made using the SoundPlan computer modelling package, which implements the calculation methodology from ISO 9613-2.

The calculations have taken account of the land formation around the site, based upon Lidar mapping.

Calculations of the noise levels within the buildings, have been based upon the internal noise levels indicated previously and taking account of the sound reductions from the building facades and roof.

Figures 2 and 3 present the results of the noise level calculations for the day and evening periods in graphical format and additionally presents the calculated façade noise levels in numerical form at the closest existing / proposed properties.

The calculated noise levels at the properties are additionally detailed within Appendix D and summarised in Table 5.1 below.

Location	Calculated Façade Noise Levels [dB L _{Aeq,T}]					
	Daytime (07:00 – 19:00)			Evening (19:00 – 23:00)		
	Block A	Block B/C	Total	Block A	Block B/C	Total
96 Ashby Road East	39	39	42	35	-	35
94A Ashby Road East	38	33	39	34	-	34

Table 5.1 Noise Levels Generated by Operation of Proposed Units

5.3. Assessment

An initial assessment of the potential impacts associated with the operation of the proposed units has been made in accordance with the requirements of BS 4142 at the two locations identified above, which are those most likely to be adversely affected by noise from the proposed operation.

It is not anticipated that the operation of the plant or equipment would be tonal or impulsive in nature, however, the general site operations could have other sound characteristics and thus a correction of 3 dB(A) has been applied to determine the rating noise level, in accordance with the requirements of BS 4142.

Uncertainties within the assessment have been considered. To minimise uncertainty associated with the background noise levels, unattended noise monitoring was carried out over a period of 1 week, with the monitoring equipment positioned further from the road than the potentially affected properties. With regards to the calculations, uncertainties have been minimised, by assuming internal noise levels higher than would be expected from the type of units proposed, thus seeking to ensure that the predicted noise levels are worst case.

The initial BS 4142 assessment is provided in the tables below.

Description	Noise Level [dB]	
	Daytime	Evening
Calculated Noise Level at Dwelling [dB $L_{Aeq,T}$]	42	35
Character Correction	3	3
Rating Level [dB $L_{Aeq,1\text{ hour}}$]	45	38
Background Level [dB L_{A90}]	49	43
Excess Over Background	-4	-5
Likelihood of Impact	Indication of Low Impact	Indication of Low Impact

Table 5.2 Initial BS 4142 Assessment – 96 Ashby Road East

Description	Noise Level [dB]	
	Daytime	Evening
Calculated Noise Level at Dwelling [dB $L_{Aeq,T}$]	39	34
Character Correction	3	3
Rating Level [dB $L_{Aeq,1\text{ hour}}$]	42	37
Background Level [dB L_{A90}]	49	43
Excess Over Background	-7	-6
Likelihood of Impact	Indication of Low Impact	Indication of Low Impact

Table 5.3 Initial BS 4142 Assessment – 94A Ashby Road East

The initial BS 4142 assessments presented above indicate that the noise levels attributable to the operation of the units, based upon the current operational assumptions, would remain below the prevailing background noise levels and thus result in the potential for a low impact.

The assessments above indicate that should the units be fully operational during the evening time, noise levels would only marginally exceed the prevailing background noise levels and thus still ensure a low potential for adverse noise impacts when assessed against the requirements of BS 4142. Thus, it is considered that an acceptable noise environment would be maintained, should deliveries be required during the evening periods or should the smaller units operate during this time.

At the present time, it is not anticipated that there would be a requirement for the units to operate overnight and thus no assessment has been undertaken for this period. Should overnight working be considered in the future, a further assessment would be made, with additional mitigation operational constraints implemented to ensure that the operation did not result in adverse impacts at the neighbouring properties.

In summary, the operation of the site would result in the potential for a low impact, both during the day and evening periods, when assessed against the requirements of BS 4142. The levels of noise predicted would ensure that the operation did not result in any adverse noise effects and thus fully comply with the requirements of the NPPF.

6. Summary

LF Acoustics Limited were appointed by Bretby GP to carry out an assessment of the noise levels to support a detailed planning application for the erection of a new industrial/storage warehouse (Use Class B2/B8) and an outline application for the erection of two industrial/warehouse (Use class B2/B8) units on the plateau site at the Bretby Business Park.

The Application Site is located within the north western corner of the business park. At present, part of the site is used for storage containers, which would be removed, should planning permission be granted.

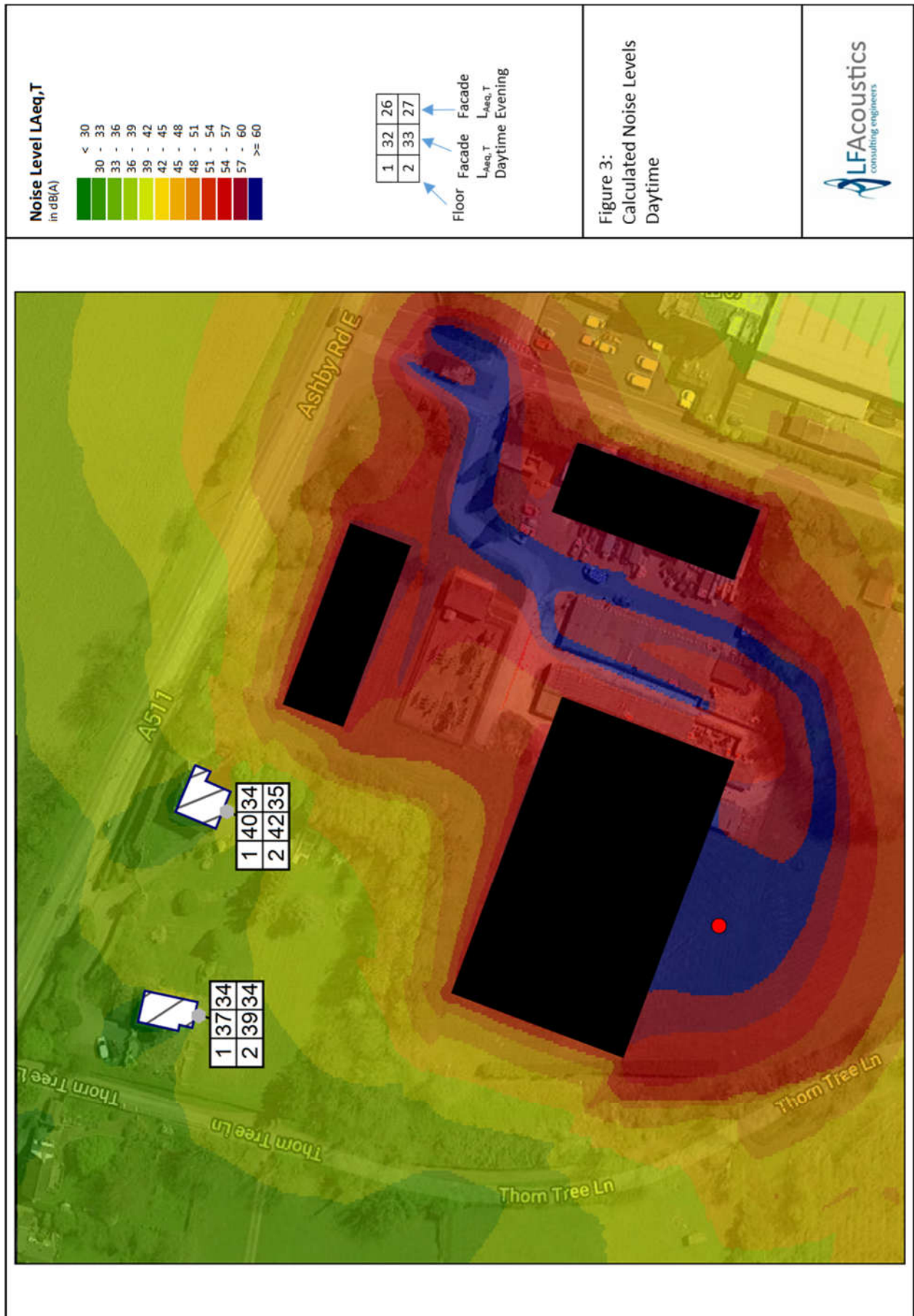
There are two residential properties located to the north west of the Application Site, along Ashby Road East, which have been considered within this assessment.

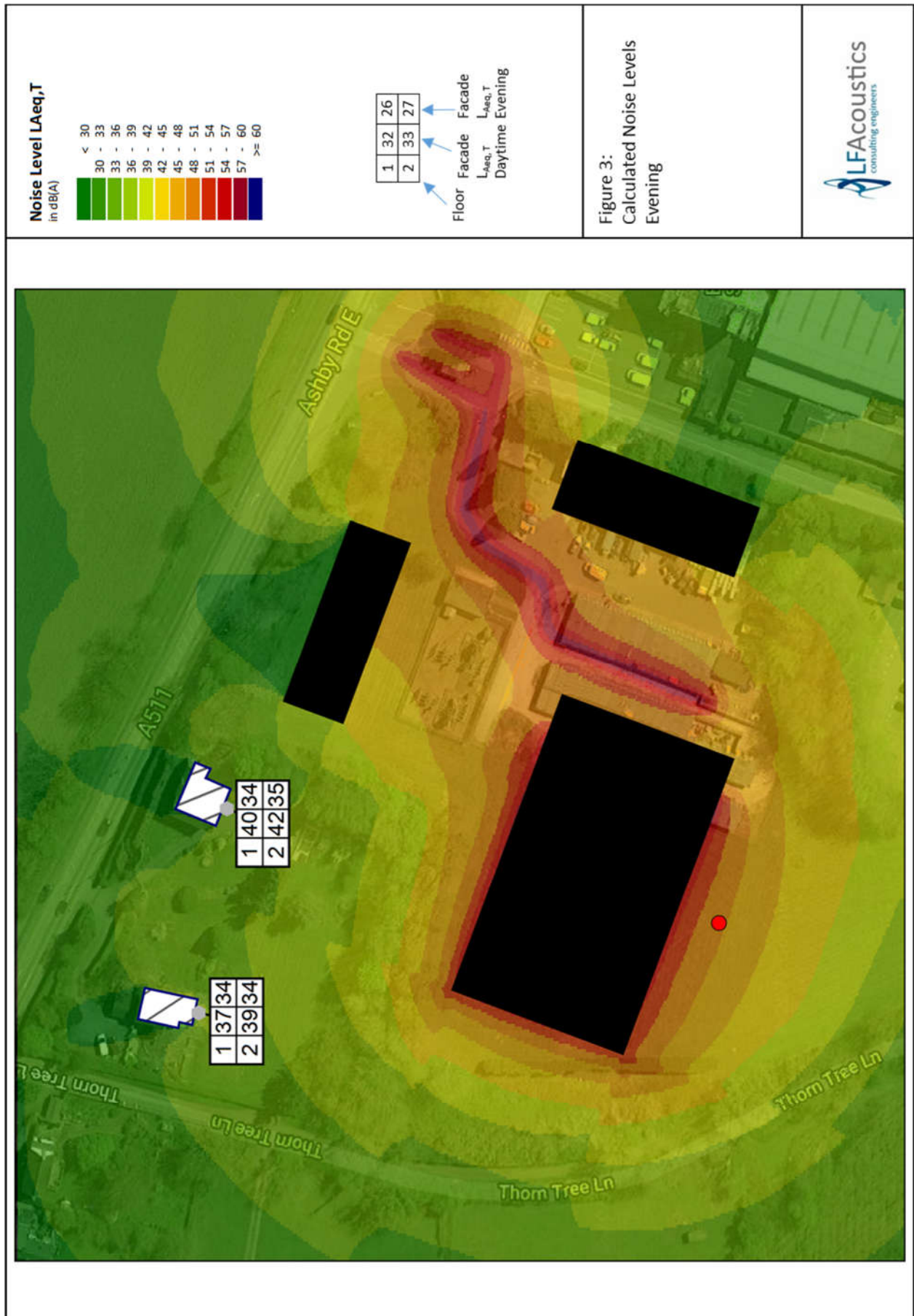
Calculations and an assessment of the noise levels generated by the operation of the proposed units have been undertaken for the dwellings potentially most affected. The assessment, made in accordance with the requirements of BS 4142, indicates that the noise would result in the potential for a low impact. On this basis, the levels of noise predicted would ensure that the operation did not result in any adverse noise effects and thus fully comply with the requirements of the NPPF.

References

1. Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2021.
2. British Standards Institute. Methods for Rating and Assessing Industrial and Commercial Sound. BS 4142:2014 +A1:2019.
3. British Standards Institute. Guidance on Sound Insulation and Noise Reduction in Buildings. BS 8233: 2014.
4. World Health Organisation. Guidelines for Community Noise. 1999. WHO Geneva.
5. World Health Organisation. Night Noise Guidelines for Europe. 2009.

Figures





Appendix A

Noise Units

Decibels (dB)

Noise can be defined as unwanted sound. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic.

The dynamic range of the auditory system is generally taken to be 0 dB to 140 dB. Generally, the addition of noise from two sources producing the same sound pressure level, will lead to an increase in sound pressure level of 3 dB. A 3 dB noise change is generally considered to be just noticeable and a 10 dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness. A 5 dB change is generally considered to be clearly discernible.

A-weighting

The bandwidth of the frequency response of the ear is usually taken to be from about 18 Hz to 18,000 Hz. The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit which has a frequency response similar to the human auditory system.

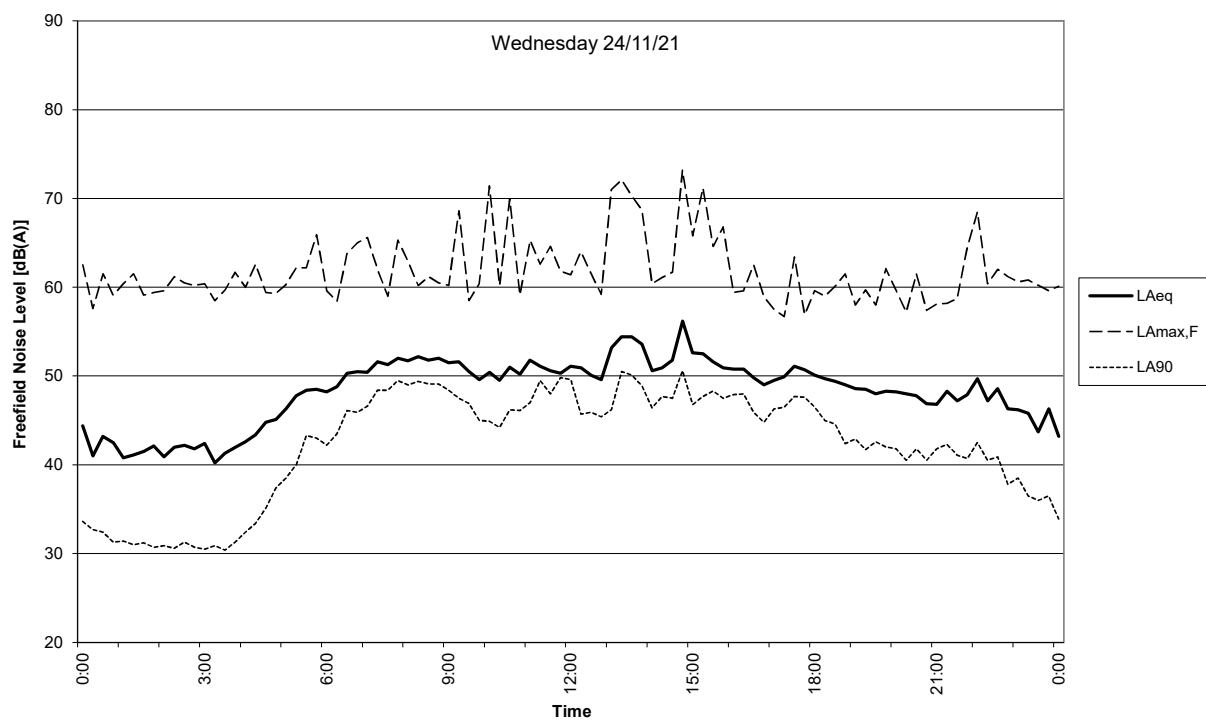
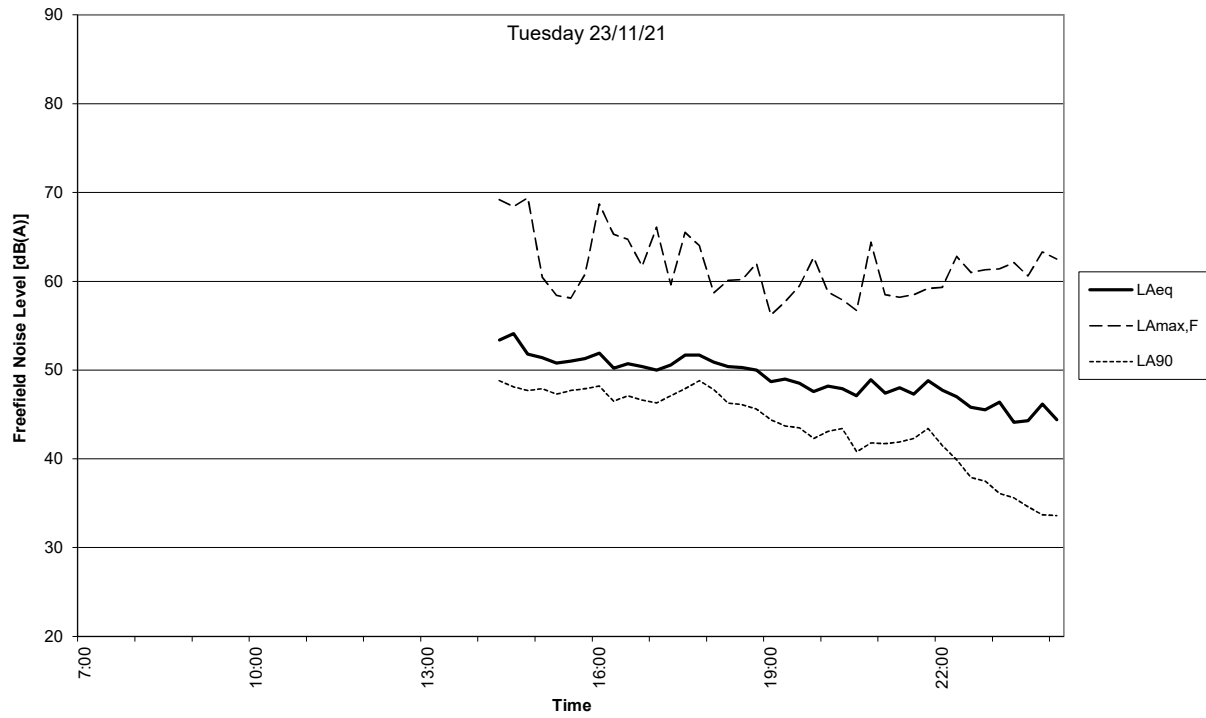
Units Used to Describe Noises Which Change Their Level with Time

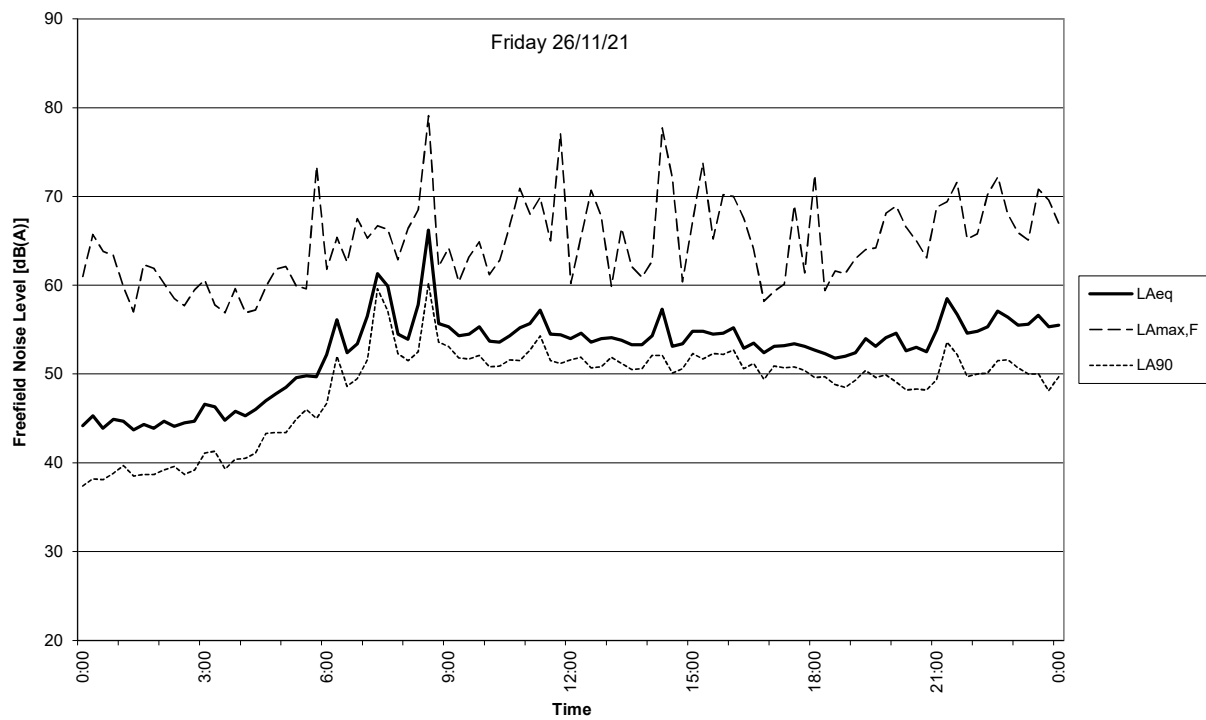
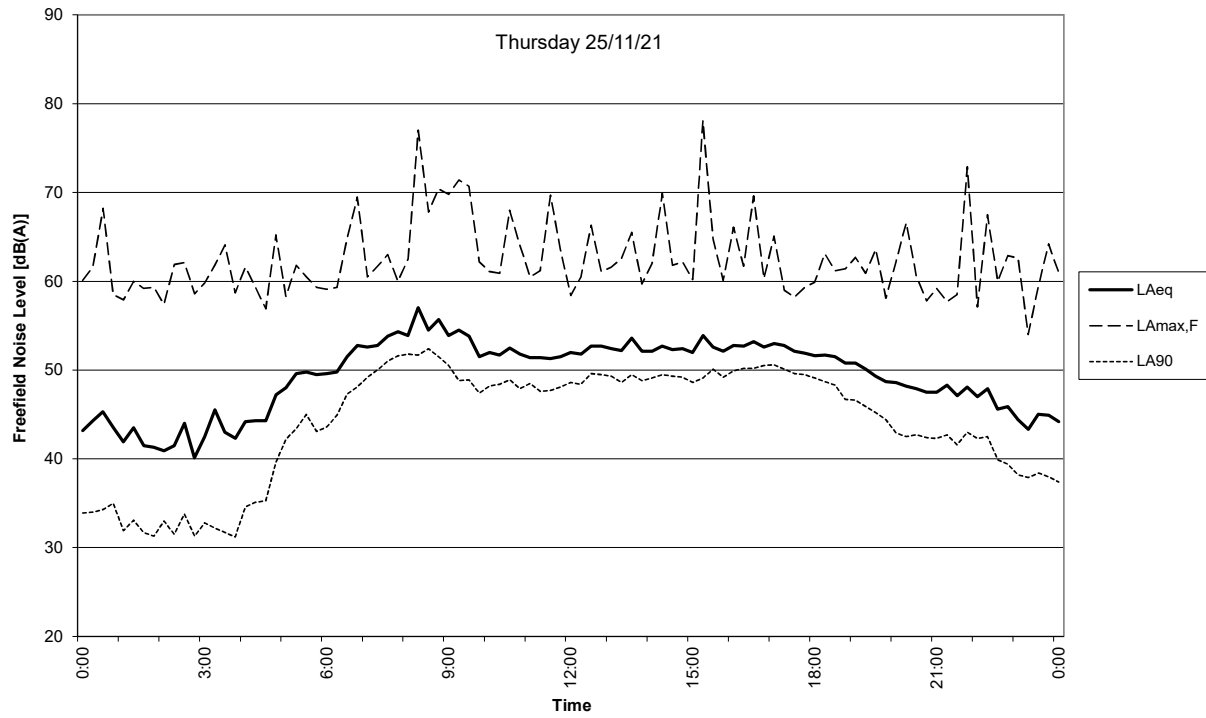
The Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$) is the principal measurement index for environmental noise. The $L_{Aeq,T}$ is defined as the A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.

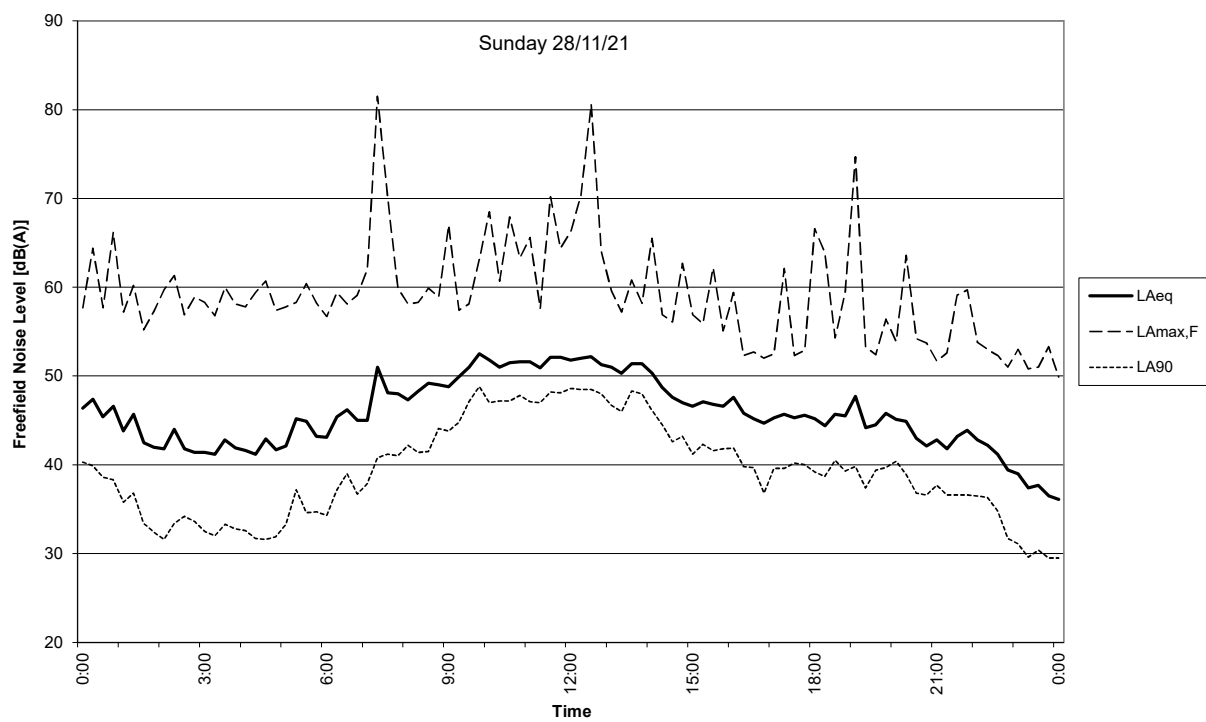
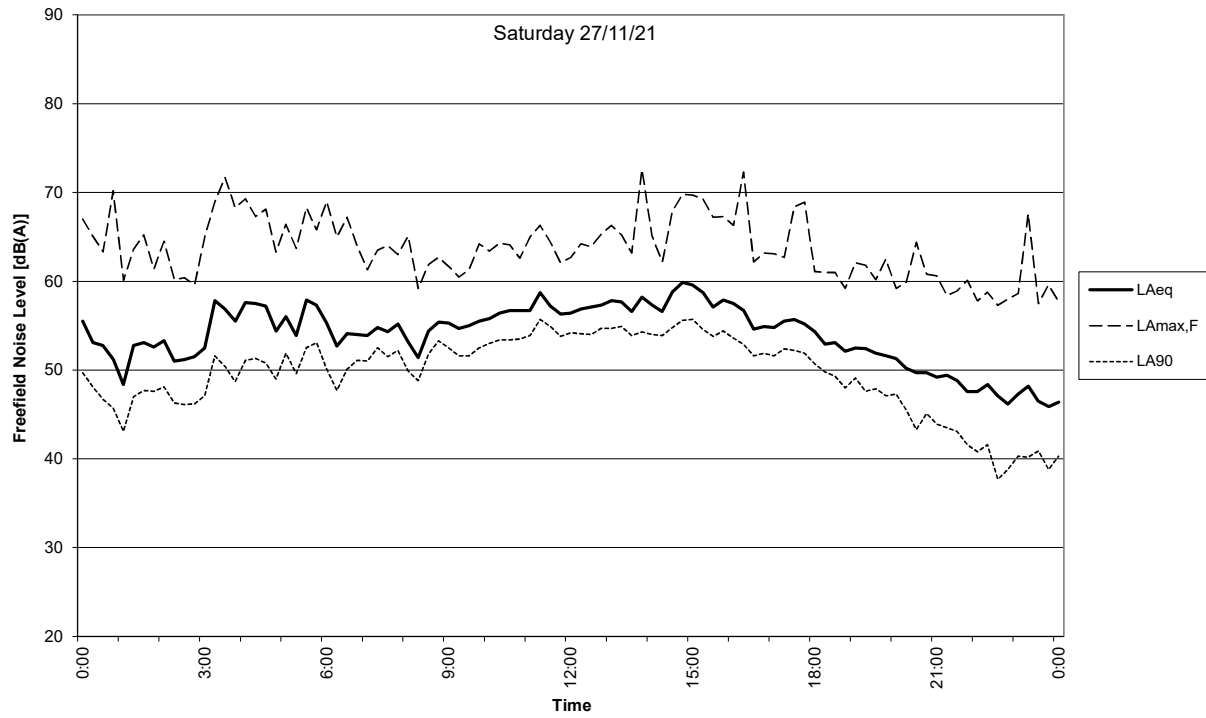
The L_{A90} is the noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise which is present even during the quieter parts of the measurement period.

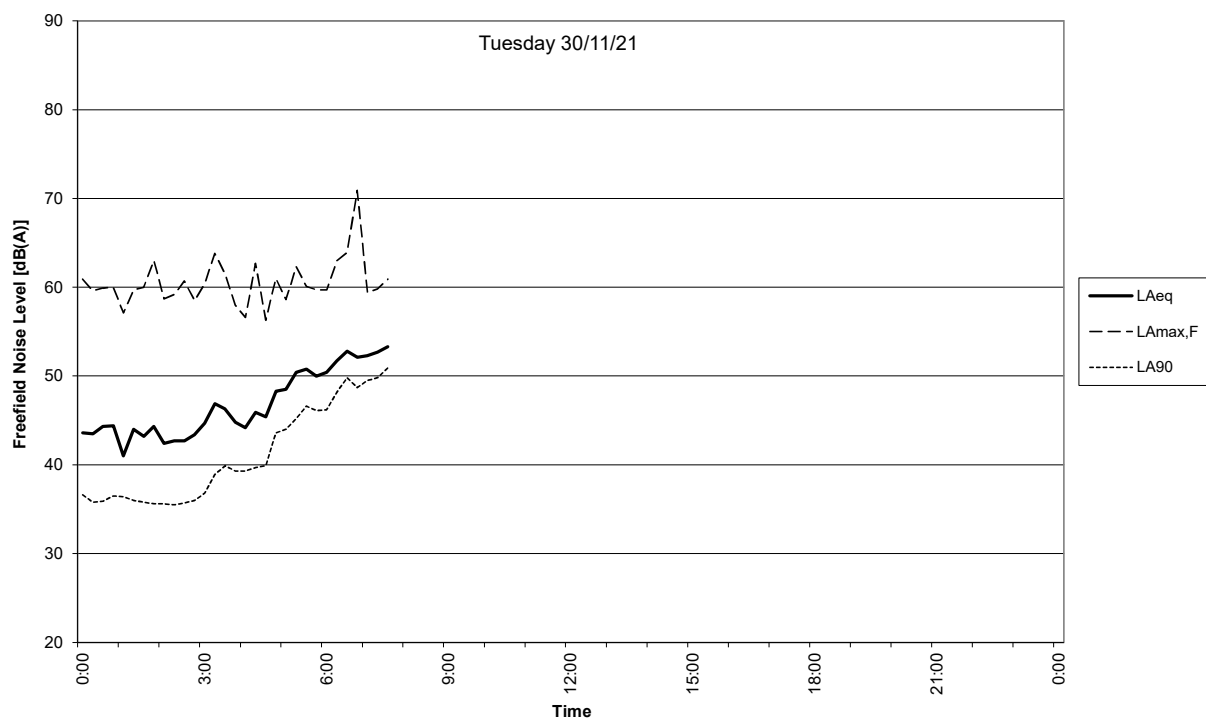
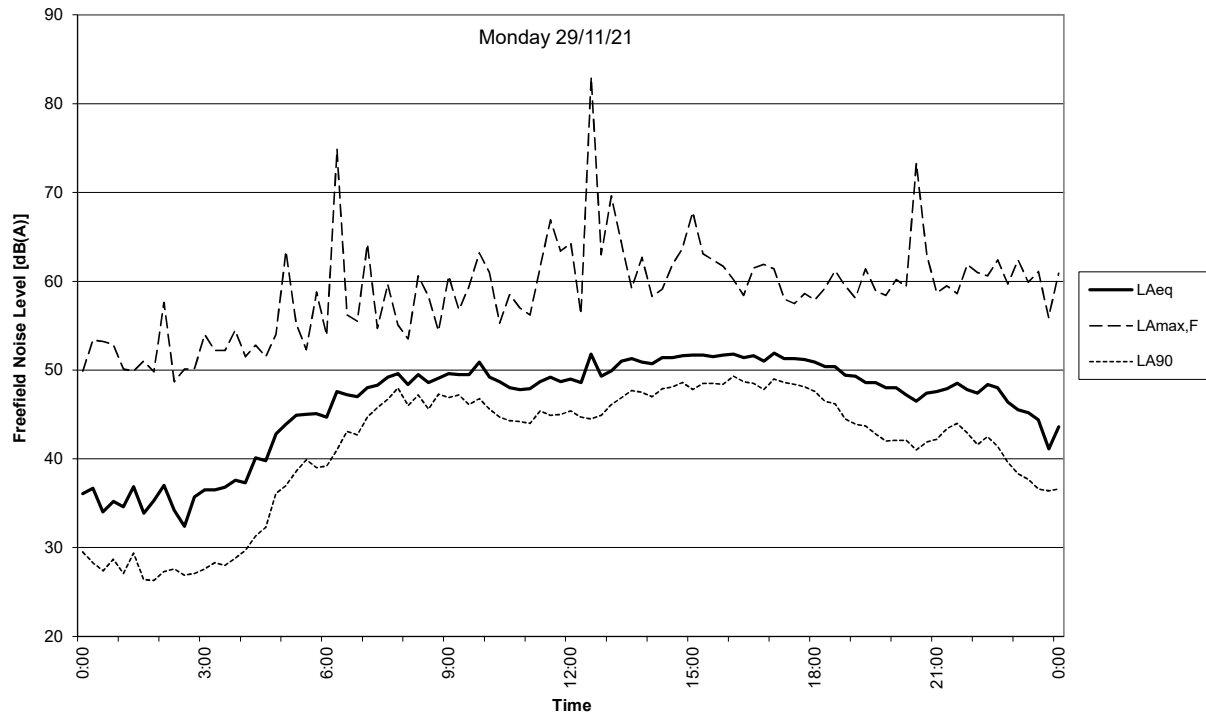
The L_{Amax} is the single maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax F}$, or Fast, is averaged over 0.125 of a second and $L_{Amax S}$, or Slow, is averaged over 1 second. The measured L_{Amax} noise levels in this assessment are Fast.

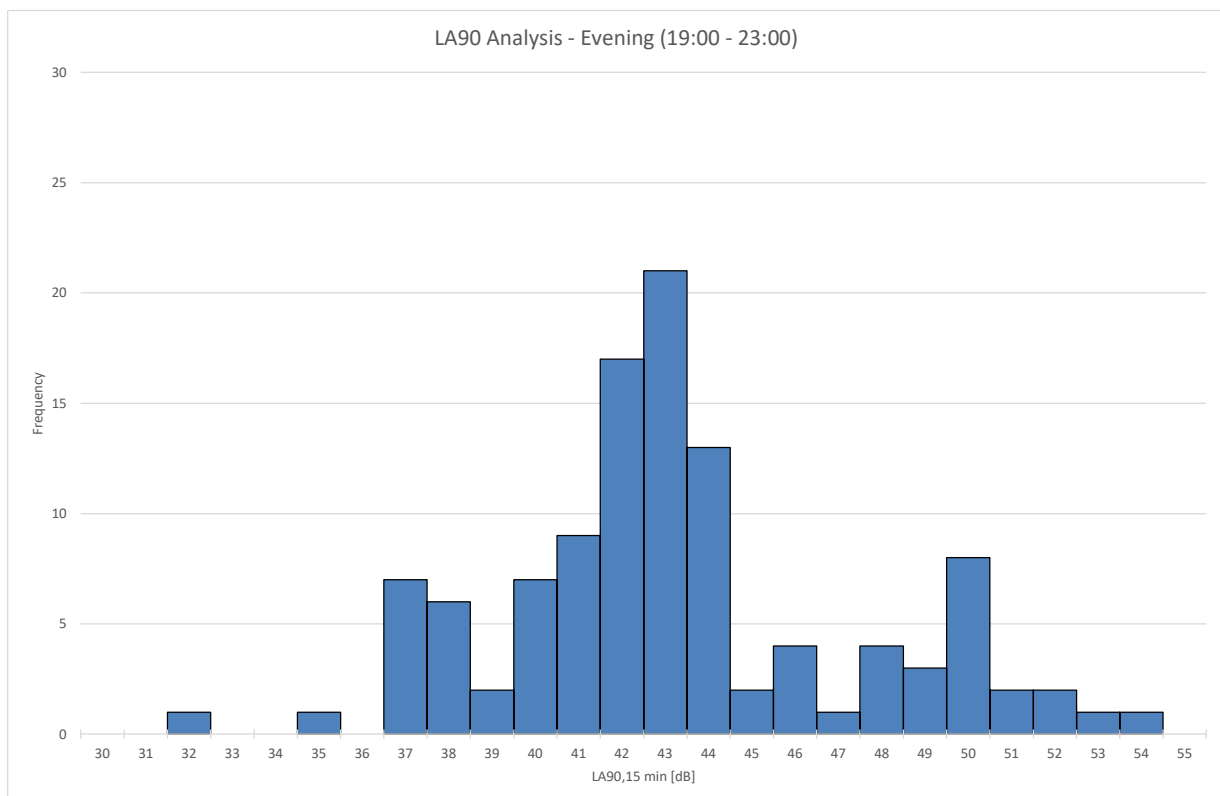
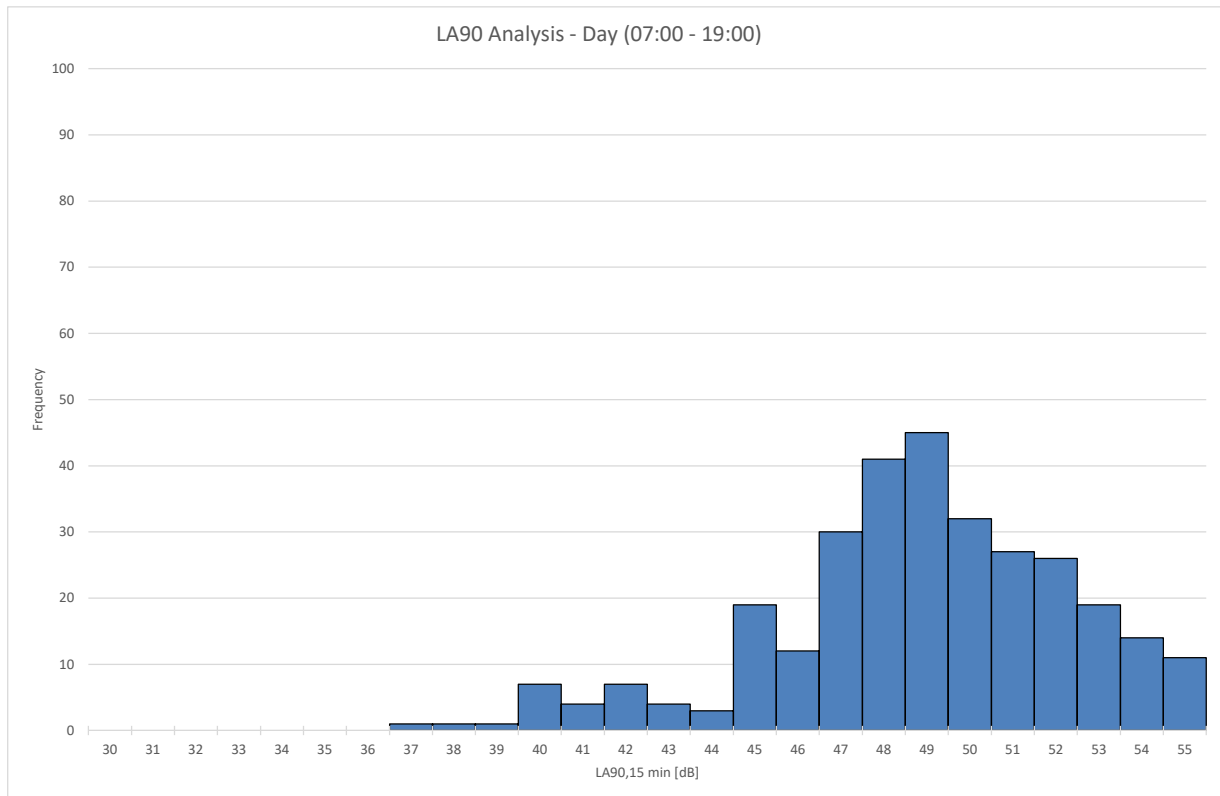
Appendix B
Results of Unattended Noise Survey

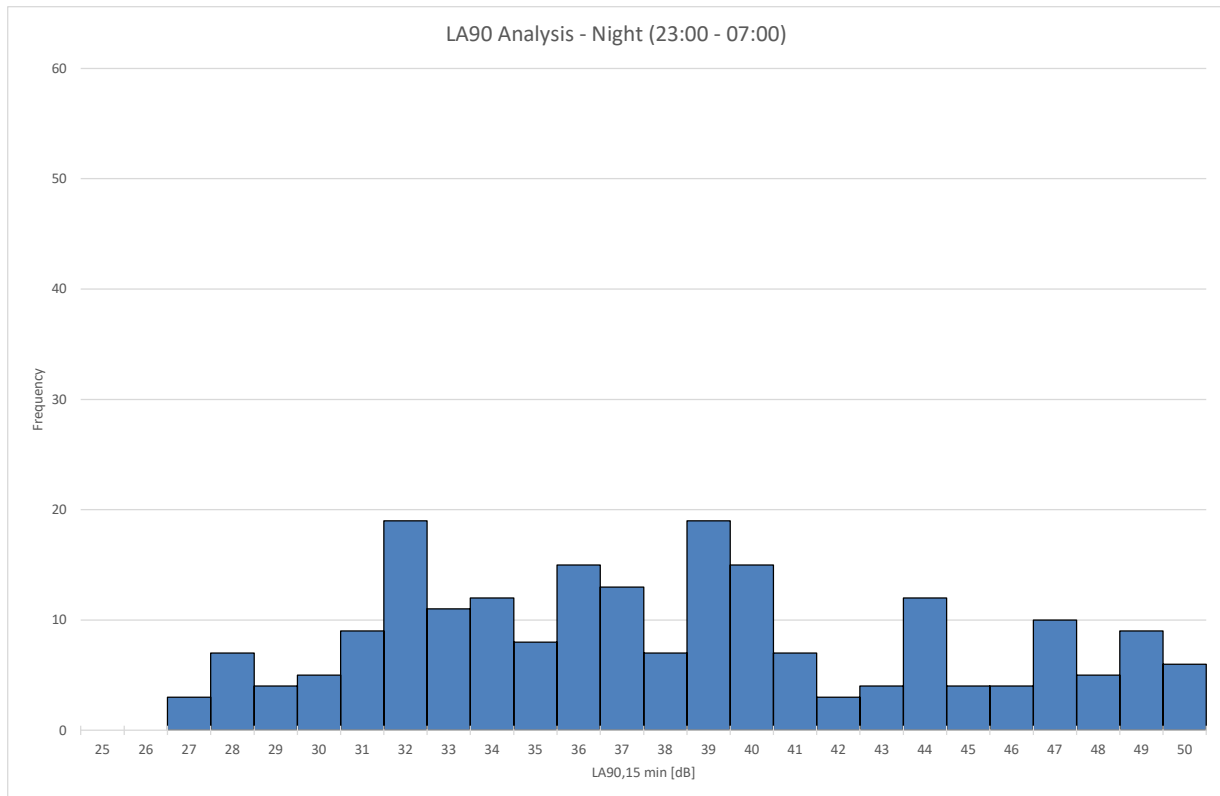












Appendix C
Source Term Data Used for Calculations

Bretby Business Park

EmisX.abs - SoundPLAN Emission Library

No.	Element name	Unit	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	Sum
4	Car / Van Movement	dB(A)/ Lw/unit	65.7	75.5	78.0	76.5	77.8	78.8	84.1	91.5
			70.4	80.4	79.7	74.3	78.4	75.8	74.0	
			70.8	77.7	79.4	77.6	79.9	82.3	73.2	
5	Forklift	dB/ Lw/unit	96.8	88.7	89.3	83.2	81.3	81.4	79.3	101.4
			90.7	87.3	83.9	85.9	84.2	80.1	77.8	
			92.5	87.1	80.7	86.1	91.1	80.2	74.8	
3	HGV Movement	dB(A)/ Lw/unit	64.7	79.6	85.1	87.3	91.1	89.6	86.6	101.2
			73.0	85.0	88.1	87.9	93.5	89.8	84.8	
			74.8	85.9	89.0	89.4	91.8	89.0	83.0	
2	Internal Level (80dB(A))	dB(A)/ Lp level	40.1	51.3	61.2	64.2	69.3	69.8	68.6	80.0
			37.7	61.1	62.3	66.4	70.6	69.9	68.8	
			43.4	63.2	63.5	67.9	70.3	70.0	66.1	

	LF Acoustics	1 / 1
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Bretby Business Park
 TransX.abs - SoundPLAN Transmission Library

No.	Element name	Unit	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	Rw
3	Composite Cladding (35dB RW)	dB	12.1 14.7 11.6	19.5 24.0 29.8	33.9 38.6 40.0	40.9 43.9 47.0	48.6 49.6 50.1	35.0

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SoundPLAN 8.2

Appendix C

Calculation Results

Bretby Business Park Mean propagation Leq - Mitigated

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Legend

Source		Source name
Source type		Type of source (point, line, area)
Time slice		Name of time slice
Li	dB(A)	Level inside
R'w	dB	Rated transmission loss
L'w	dB(A)	Sound power level per m, m²
Lw	dB(A)	Sound power level per unit
I or A	m, m²	Size of source (length or area)
Ko	dB	Correction for propagation in limited spacial angle
S	m	Distance source - receiver
Adiv	dB	Mean attenuation due to geometrical spreading
Agr	dB	Mean attenuation due to ground effect
Abar	dB	Mean attenuation due to screening
Aatm	dB	Mean attenuation due to air absorption
dLrefl	dB(A)	Level increase due to reflections
Ls	dB(A)	Unassessed sound pressure level at receiver
Ls=Lw+Ko+ADI+Adiv+Agr+Abar+Aatm+Afol_site		house+Awind+dLrefl
dLw	dB	Correction due to source operation time
Lr	dB(A)	Assessed level of time slice

LF Acoustics

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Bretby Business Park Mean propagation Leq - Mitigated

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Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Lr dB(A)
Receiver 96 Ashby Road East FI GF Lday,lim dB(A) Ln,lim dB(A) LAeq, Day 40.4 dB(A) LAeq, Eve 33.6 dB(A)																	
Block A Cars	Line	LAeq, Day			48.5	73.0	285.6	0	106.61	-51.5	2.2	-10.1	-0.7	1.4	14.3	13.0	27.3
Block A HGV	Line	LAeq, Day			58.2	81.9	234.7	0	125.40	-53.0	1.7	-10.1	-0.6	3.2	23.2	8.5	31.6
Block A-Area source 01	Area	LAeq, Day	80.0	35.0	50.5	78.9	698.0	3	119.44	-52.5	-1.7	-17.4	-0.1	0.0	10.3	0.0	10.3
Block A-Area source 03	Area	LAeq, Day	80.0	35.0	50.5	77.6	513.6	3	94.37	-50.5	-1.9	-8.5	0.0	0.0	19.7	0.0	19.7
Block A-Area source 04	Area	LAeq, Day	80.0	35.0	50.5	79.0	704.1	3	74.20	-48.4	-2.1	-1.1	0.0	0.0	30.4	0.0	30.4
Block A-Area source 05	Area	LAeq, Day	80.0	35.0	50.5	82.6	1647.0	0	85.38	-49.6	-1.0	-3.8	-0.1	0.0	28.1	0.0	28.1
Block A-Area source 06	Area	LAeq, Day	80.0	35.0	50.5	82.6	1630.9	0	107.95	-51.7	-0.9	-7.7	-0.1	0.0	22.3	0.0	22.3
Block B Vehicles	Line	LAeq, Day			48.5	71.6	206.3	0	86.65	-49.7	2.1	-10.2	-0.5	2.1	15.3	7.8	23.1
Block B-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	78.2	586.0	3	55.68	-45.9	0.1	-10.7	0.0	0.3	24.9	0.0	24.9
Block B-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	81.51	-49.2	0.9	-15.0	0.0	0.0	12.7	0.0	12.7
Block B-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	77.4	489.6	3	50.88	-45.1	-0.3	0.0	0.0	0.0	34.9	0.0	34.9
Block B-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	34.68	-41.8	-1.0	0.0	0.0	0.0	33.1	0.0	33.1
Block B-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	79.5	791.6	0	54.18	-45.7	0.5	-8.4	0.0	0.1	25.9	0.0	25.9
Block C Movements	Line	LAeq, Day			48.5	71.8	215.3	0	112.68	-52.0	2.5	-11.1	-0.8	1.4	11.7	7.8	19.5
Block C-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	149.53	-54.5	0.9	-12.6	-0.1	0.0	10.3	0.0	10.3
Block C-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	77.4	492.7	3	142.04	-54.0	1.1	-18.8	-0.1	0.0	8.6	0.0	8.6
Block C-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	121.76	-52.7	1.1	-9.0	-0.1	0.0	16.0	0.0	16.0
Block C-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	78.3	604.2	3	126.80	-53.1	0.9	-2.0	-0.1	0.0	27.1	0.0	27.1
Block C-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	80.1	914.7	0	134.51	-53.6	1.1	-8.5	-0.1	0.0	19.1	0.0	19.1
Forklift Movement	Point	LAeq, Day			95.1	95.1		0	129.51	-53.2	1.9	-24.3	-0.7	1.2	19.8	-3.0	16.8
Block A Cars	Line	LAeq, Eve			48.5	73.0	285.6	0	106.61	-51.5	2.2	-10.1	-0.7	1.4	14.3	10.0	24.3
Block A HGV	Line	LAeq, Eve			58.2	81.9	234.7	0	125.40	-53.0	1.7	-10.1	-0.6	3.2	23.2		
Block A-Area source 01	Area	LAeq, Eve	80.0	35.0	50.5	78.9	698.0	3	119.44	-52.5	-1.7	-17.4	-0.1	0.0	10.3	0.0	10.3
Block A-Area source 03	Area	LAeq, Eve	80.0	35.0	50.5	77.6	513.6	3	94.37	-50.5	-1.9	-8.5	0.0	0.0	19.7	0.0	19.7
Block A-Area source 04	Area	LAeq, Eve	80.0	35.0	50.5	79.0	704.1	3	74.20	-48.4	-2.1	-1.1	0.0	0.0	30.4	0.0	30.4
Block A-Area source 05	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1647.0	0	85.38	-49.6	-1.0	-3.8	-0.1	0.0	28.1	0.0	28.1
Block A-Area source 06	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1630.9	0	107.95	-51.7	-0.9	-7.7	-0.1	0.0	22.3	0.0	22.3
Block B Vehicles	Line	LAeq, Eve			48.5	71.6	206.3	0	86.65	-49.7	2.1	-10.2	-0.5	2.1	15.3		
Block B-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	78.2	586.0	3	55.68	-45.9	0.1	-10.7	0.0	0.3	24.9		
Block B-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	81.51	-49.2	0.9	-15.0	0.0	0.0	12.7		
Block B-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	77.4	489.6	3	50.88	-45.1	-0.3	0.0	0.0	0.0	34.9		
Block B-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	34.68	-41.8	-1.0	0.0	0.0	0.0	33.1		
Block B-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	79.5	791.6	0	54.18	-45.7	0.5	-8.4	0.0	0.1	25.9		
Block C Movements	Line	LAeq, Eve			48.5	71.8	215.3	0	112.68	-52.0	2.5	-11.1	-0.8	1.4	11.7		
Block C-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	149.53	-54.5	0.9	-12.6	-0.1	0.0	10.3		
Block C-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	77.4	492.7	3	142.04	-54.0	1.1	-18.8	-0.1	0.0	8.6		
Block C-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	121.76	-52.7	1.1	-9.0	-0.1	0.0	16.0		
Block C-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	78.3	604.2	3	126.80	-53.1	0.9	-2.0	-0.1	0.0	27.1		
Block C-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	80.1	914.7	0	134.51	-53.6	1.1	-8.5	-0.1	0.0	19.1		
Forklift Movement	Point	LAeq, Eve			95.1	95.1		0	129.51	-53.2	1.9	-24.3	-0.7	1.2	19.8		
Receiver 96 Ashby Road East FI F 1 Lday,lim dB(A) Ln,lim dB(A) LAeq, Day 42.0 dB(A) LAeq, Eve 35.0 dB(A)																	
Block A Cars	Line	LAeq, Day			48.5	73.0	285.6	0	106.56	-51.5	2.2	-4.4	-0.7	1.2	19.7	13.0	32.7
Block A HGV	Line	LAeq, Day			58.2	81.9	234.7	0	125.32	-53.0	2.3	-5.5	-0.6	3.0	28.2	8.5	36.6
Block A-Area source 01	Area	LAeq, Day	80.0	35.0	50.5	78.9	698.0	3	119.32	-52.5	-0.9	-17.6	-0.1	0.0	10.8	0.0	10.8
Block A-Area source 03	Area	LAeq, Day	80.0	35.0	50.5	77.6	513.6	3	94.20	-50.5	-1.8	-8.3	-0.1	0.0	19.9	0.0	19.9
Block A-Area source 04	Area	LAeq, Day	80.0	35.0	50.5	79.0	704.1	3	74.01	-48.4	-2.7	0.0	-0.1	0.0	30.9	0.0	30.9
Block A-Area source 05	Area	LAeq, Day	80.0	35.0	50.5	82.6	1647.0	0	85.04	-49.6	-1.3	-3.4	-0.1	0.0	28.3	0.0	28.3
Block A-Area source 06	Area	LAeq, Day	80.0	35.0	50.5	82.6	1630.9	0	107.67	-51.6	-0.5	-7.1	-0.1	0.0	23.3	0.0	23.3
Block B Vehicles	Line	LAeq, Day			48.5	71.6	206.3	0	86.58	-49.7	2.1	-9.1	-0.4	3.9	18.4	7.8	26.2
Block B-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	78.2	586.0	3	55.27	-45.8	-0.3	-10.7	0.0	0.8	25.1	0.0	25.1
Block B-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	81.29	-49.2	0.8	-14.9	0.0	0.0	12.7	0.0	12.7
Block B-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	77.4	489.6	3	50.45	-45.0	-0.7	0.0	0.0	0.0	34.6	0.0	34.6
Block B-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	34.17	-41.7	-1.5	0.0	0.0	0.0	32.8	0.0	32.8
Block B-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	79.5	791.6	0	53.44	-45.5	0.1	-7.3	0.0	0.1	26.7	0.0	26.7
Block C Movements	Line	LAeq, Day			48.5	71.8	215.3	0	112.62	-52.0	2.3	-5.6	-0.8	1.3	17.0	7.8	24.7
Block C-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	149.40	-54.5	1.6	-11.4	-0.1	0.0	12.2	0.0	12.2
Block C-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	77.4	492.7	3	141.91	-54.0	1.6	-18.1	-0.1	0.0	9.8	0.0	9.8

LF Acoustics

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Bretby Business Park Mean propagation Leq - Mitigated

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Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Lr dB(A)
Block C-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	121.60	-52.7	1.5	-7.6	-0.1	0.0	17.7	0.0	17.7
Block C-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	78.3	604.2	3	126.64	-53.0	1.4	-1.1	-0.1	0.0	28.5	0.0	28.5
Block C-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	80.1	914.7	0	134.26	-53.6	1.6	-8.2	-0.1	0.0	19.9	0.0	19.9
Forklift Movement	Point	LAeq, Day			95.1	95.1		0	129.51	-53.2	2.2	-24.2	-0.7	1.0	20.2	-3.0	17.1
Block A Cars	Line	LAeq, Eve			48.5	73.0	285.6	0	106.56	-51.5	2.2	-4.4	-0.7	1.2	19.7	10.0	29.7
Block A HGV	Line	LAeq, Eve			58.2	81.9	234.7	0	125.32	-53.0	2.3	-5.5	-0.6	3.0	28.2		
Block A-Area source 01	Area	LAeq, Eve	80.0	35.0	50.5	78.9	698.0	3	119.32	-52.5	-0.9	-17.6	-0.1	0.0	10.8	0.0	10.8
Block A-Area source 03	Area	LAeq, Eve	80.0	35.0	50.5	77.6	513.6	3	94.20	-50.5	-1.8	-8.3	-0.1	0.0	19.9	0.0	19.9
Block A-Area source 04	Area	LAeq, Eve	80.0	35.0	50.5	79.0	704.1	3	74.01	-48.4	-2.7	0.0	-0.1	0.0	30.9	0.0	30.9
Block A-Area source 05	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1647.0	0	85.04	-49.6	-1.3	-3.4	-0.1	0.0	28.3	0.0	28.3
Block A-Area source 06	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1630.9	0	107.67	-51.6	-0.5	-7.1	-0.1	0.0	23.3	0.0	23.3
Block B Vehicles	Line	LAeq, Eve			48.5	71.6	206.3	0	86.58	-49.7	2.1	-9.1	-0.4	3.9	18.4		
Block B-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	78.2	586.0	3	55.27	-45.8	-0.3	-10.7	0.0	0.8	25.1		
Block B-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	81.29	-49.2	0.8	-14.9	0.0	0.0	12.7		
Block B-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	77.4	489.6	3	50.45	-45.0	-0.7	0.0	0.0	0.0	34.6		
Block B-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	34.17	-41.7	-1.5	0.0	0.0	0.0	32.8		
Block B-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	79.5	791.6	0	53.44	-45.5	0.1	-7.3	0.0	0.1	26.7		
Block C Movements	Line	LAeq, Eve			48.5	71.8	215.3	0	112.62	-52.0	2.3	-5.6	-0.8	1.3	17.0		
Block C-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	149.40	-54.5	1.6	-11.4	-0.1	0.0	12.2		
Block C-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	77.4	492.7	3	141.91	-54.0	1.6	-18.1	-0.1	0.0	9.8		
Block C-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	121.60	-52.7	1.5	-7.6	-0.1	0.0	17.7		
Block C-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	78.3	604.2	3	126.64	-53.0	1.4	-1.1	-0.1	0.0	28.5		
Block C-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	80.1	914.7	0	134.26	-53.6	1.6	-8.2	-0.1	0.0	19.9		
Forklift Movement	Point	LAeq, Eve			95.1	95.1		0	129.51	-53.2	2.2	-24.2	-0.7	1.0	20.2		
Receiver Ashby Road East FI GF Lday,lim dB(A) Ln,lim dB(A) LAeq, Day 37.3 dB(A) LAeq, Eve 34.3 dB(A)																	
Block A Cars	Line	LAeq, Day			48.5	73.0	285.6	0	148.55	-54.4	1.4	-8.1	-0.9	2.6	13.7	13.0	26.7
Block A HGV	Line	LAeq, Day			58.2	81.9	234.7	0	160.31	-55.1	0.9	-8.5	-0.8	3.3	21.7	8.5	30.1
Block A-Area source 01	Area	LAeq, Day	80.0	35.0	50.5	78.9	698.0	3	123.37	-52.8	-1.5	-15.9	-0.1	0.0	11.6	0.0	11.6
Block A-Area source 03	Area	LAeq, Day	80.0	35.0	50.5	77.6	513.6	3	85.06	-49.6	-1.9	0.0	-0.1	0.0	29.0	0.0	29.0
Block A-Area source 04	Area	LAeq, Day	80.0	35.0	50.5	79.0	704.1	3	84.87	-49.6	-2.2	0.0	-0.1	0.0	30.1	0.0	30.1
Block A-Area source 05	Area	LAeq, Day	80.0	35.0	50.5	82.6	1647.0	0	94.58	-50.5	-1.0	-4.3	-0.1	0.0	26.8	0.0	26.8
Block A-Area source 06	Area	LAeq, Day	80.0	35.0	50.5	82.6	1630.9	0	113.63	-52.1	-0.8	-8.7	-0.1	0.1	21.0	0.0	21.0
Block B Vehicles	Line	LAeq, Day			48.5	71.6	206.3	0	137.78	-53.8	1.3	-5.8	-0.9	2.0	14.4	7.8	22.1
Block B-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	78.2	586.0	3	105.32	-51.4	-1.9	-5.3	-0.1	0.3	22.8	0.0	22.8
Block B-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	132.16	-53.4	-1.1	-15.9	-0.1	0.0	5.6	0.0	5.6
Block B-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	77.4	489.6	3	105.16	-51.4	-2.0	-5.0	-0.1	0.0	21.9	0.0	21.9
Block B-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	83.59	-49.4	-2.1	-0.3	-0.1	0.1	24.2	0.0	24.2
Block B-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	79.5	791.6	0	105.87	-51.5	-1.0	-5.9	-0.1	0.1	21.2	0.0	21.2
Block C Movements	Line	LAeq, Day			48.5	71.8	215.3	0	158.43	-55.0	1.6	-6.9	-0.9	2.3	12.9	7.8	20.6
Block C-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	185.07	-56.3	-1.1	-15.9	-0.1	0.0	3.2	0.0	3.2
Block C-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	77.4	492.7	3	183.85	-56.3	-0.8	-15.8	-0.1	0.0	7.5	0.0	7.5
Block C-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	166.94	-55.4	-0.9	-1.1	-0.1	0.0	19.1	0.0	19.1
Block C-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	78.3	604.2	3	166.72	-55.4	-1.0	-1.1	-0.1	0.0	23.7	0.0	23.7
Block C-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	80.1	914.7	0	175.53	-55.9	-0.8	-5.4	-0.1	0.0	17.9	0.0	17.9
Forklift Movement	Point	LAeq, Day			95.1	95.1		0	135.38	-53.6	1.9	-24.2	-0.7	0.7	19.1	-3.0	16.1
Block A Cars	Line	LAeq, Eve			48.5	73.0	285.6	0	148.55	-54.4	1.4	-8.1	-0.9	2.6	13.7	10.0	23.7
Block A HGV	Line	LAeq, Eve			58.2	81.9	234.7	0	160.31	-55.1	0.9	-8.5	-0.8	3.3	21.7		
Block A-Area source 01	Area	LAeq, Eve	80.0	35.0	50.5	78.9	698.0	3	123.37	-52.8	-1.5	-15.9	-0.1	0.0	11.6	0.0	11.6
Block A-Area source 03	Area	LAeq, Eve	80.0	35.0	50.5	77.6	513.6	3	85.06	-49.6	-1.9	0.0	-0.1	0.0	29.0	0.0	29.0
Block A-Area source 04	Area	LAeq, Eve	80.0	35.0	50.5	79.0	704.1	3	84.87	-49.6	-2.2	0.0	-0.1	0.0	30.1	0.0	30.1
Block A-Area source 05	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1647.0	0	94.58	-50.5	-1.0	-4.3	-0.1	0.0	26.8	0.0	26.8
Block A-Area source 06	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1630.9	0	113.63	-52.1	-0.8	-8.7	-0.1	0.1	21.0	0.0	21.0
Block B Vehicles	Line	LAeq, Eve			48.5	71.6	206.3	0	137.78	-53.8	1.3	-5.8	-0.9	2.0	14.4		
Block B-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	78.2	586.0	3	105.32	-51.4	-1.9	-5.3	-0.1	0.3	22.8		
Block B-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	132.16	-53.4	-1.1	-15.9	-0.1	0.0	5.6		
Block B-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	77.4	489.6	3	105.16	-51.4	-2.0	-5.0	-0.1	0.0	21.9		
Block B-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	83.59	-49.4	-2.1	-0.3	-0.1	0.1	24.2		
Block B-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	79.5	791.6	0	105.87	-51.5	-1.0	-5.9	-0.1	0.1	21.2		

LFAcoustics

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Bretby Business Park Mean propagation Leq - Mitigated

10

Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	lor A m,m²	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Lr dB(A)
Block C Movements	Line	LAeq, Eve			48.5	71.8	215.3	0	158.43	-55.0	1.6	-6.9	-0.9	2.3	12.9		
Block C-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	185.07	-56.3	-1.1	-15.9	-0.1	0.0	3.2		
Block C-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	77.4	492.7	3	183.85	-56.3	-0.8	-15.8	-0.1	0.0	7.5		
Block C-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	166.94	-55.4	-0.9	-1.1	-0.1	0.0	19.1		
Block C-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	78.3	604.2	3	166.72	-55.4	-1.0	-1.1	-0.1	0.0	23.7		
Block C-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	80.1	914.7	0	175.53	-55.9	-0.8	-5.4	-0.1	0.0	17.9		
Forklift Movement	Point	LAeq, Eve			95.1	95.1		0	135.38	-53.6	1.9	-24.2	-0.7	0.7	19.1		
Receiver Ashby Road East FI F 1 Lday,lim dB(A) Ln,lim dB(A) LAeq, Day 39.2 dB(A) LAeq, Eve 34.3 dB(A)																	
Block A Cars	Line	LAeq, Day			48.5	73.0	285.6	0	148.46	-54.4	1.7	-6.1	-1.1	3.3	16.4	13.0	29.4
Block A HGV	Line	LAeq, Day			58.2	81.9	234.7	0	160.25	-55.1	1.9	-3.9	-0.8	2.5	26.5	8.5	35.0
Block A-Area source 01	Area	LAeq, Day	80.0	35.0	50.5	78.9	698.0	3	123.19	-52.8	-0.9	-16.2	-0.1	0.0	11.9	0.0	11.9
Block A-Area source 03	Area	LAeq, Day	80.0	35.0	50.5	77.6	513.6	3	84.76	-49.6	-2.6	0.0	-0.1	0.0	28.4	0.0	28.4
Block A-Area source 04	Area	LAeq, Day	80.0	35.0	50.5	79.0	704.1	3	84.58	-49.5	-2.9	0.0	-0.1	0.0	29.5	0.0	29.5
Block A-Area source 05	Area	LAeq, Day	80.0	35.0	50.5	82.6	1647.0	0	94.17	-50.5	-1.3	-3.7	-0.1	0.0	27.2	0.0	27.2
Block A-Area source 06	Area	LAeq, Day	80.0	35.0	50.5	82.6	1630.9	0	113.28	-52.1	-0.5	-8.1	-0.1	0.1	22.0	0.0	22.0
Block B Vehicles	Line	LAeq, Day			48.5	71.6	206.3	0	137.69	-53.8	1.7	-1.3	-1.0	2.0	19.2	7.8	27.0
Block B-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	78.2	586.0	3	105.04	-51.4	-2.0	-5.4	-0.1	0.7	23.0	0.0	23.0
Block B-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	131.96	-53.4	-0.6	-16.0	-0.1	0.0	5.9	0.0	5.9
Block B-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	77.4	489.6	3	104.90	-51.4	-2.1	-5.1	-0.1	0.0	21.7	0.0	21.7
Block B-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	72.9	176.3	3	83.28	-49.4	-2.9	-0.1	-0.1	0.2	23.7	0.0	23.7
Block B-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	79.5	791.6	0	105.46	-51.5	-1.2	-5.2	-0.1	0.1	21.7	0.0	21.7
Block C Movements	Line	LAeq, Day			48.5	71.8	215.3	0	158.37	-55.0	1.8	-4.1	-1.2	2.7	16.0	7.8	23.8
Block C-Facade 01	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	184.92	-56.3	-0.8	-14.6	-0.1	0.0	4.7	0.0	4.7
Block C-Facade 02	Area	LAeq, Day	80.0	35.0	50.5	77.4	492.7	3	183.71	-56.3	-0.4	-14.9	-0.1	0.0	8.8	0.0	8.8
Block C-Facade 03	Area	LAeq, Day	80.0	35.0	50.5	73.6	205.1	3	166.77	-55.4	-0.3	0.0	-0.1	0.1	20.8	0.0	20.8
Block C-Facade 04	Area	LAeq, Day	80.0	35.0	50.5	78.3	604.2	3	166.54	-55.4	-0.6	-0.4	-0.1	0.1	24.8	0.0	24.8
Block C-Roof 01	Area	LAeq, Day	80.0	35.0	50.5	80.1	914.7	0	175.29	-55.9	-0.4	-5.5	-0.1	0.0	18.2	0.0	18.2
Forklift Movement	Point	LAeq, Day			95.1	95.1		0	135.32	-53.6	2.2	-23.2	-0.6	0.7	20.5	-3.0	17.5
Block A Cars	Line	LAeq, Eve			48.5	73.0	285.6	0	148.46	-54.4	1.7	-6.1	-1.1	3.3	16.4	10.0	26.4
Block A HGV	Line	LAeq, Eve			58.2	81.9	234.7	0	160.25	-55.1	1.9	-3.9	-0.8	2.5	26.5		
Block A-Area source 01	Area	LAeq, Eve	80.0	35.0	50.5	78.9	698.0	3	123.19	-52.8	-0.9	-16.2	-0.1	0.0	11.9	0.0	11.9
Block A-Area source 03	Area	LAeq, Eve	80.0	35.0	50.5	77.6	513.6	3	84.76	-49.6	-2.6	0.0	-0.1	0.0	28.4	0.0	28.4
Block A-Area source 04	Area	LAeq, Eve	80.0	35.0	50.5	79.0	704.1	3	84.58	-49.5	-2.9	0.0	-0.1	0.0	29.5	0.0	29.5
Block A-Area source 05	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1647.0	0	94.17	-50.5	-1.3	-3.7	-0.1	0.0	27.2	0.0	27.2
Block A-Area source 06	Area	LAeq, Eve	80.0	35.0	50.5	82.6	1630.9	0	113.28	-52.1	-0.5	-8.1	-0.1	0.1	22.0	0.0	22.0
Block B Vehicles	Line	LAeq, Eve			48.5	71.6	206.3	0	137.69	-53.8	1.7	-1.3	-1.0	2.0	19.2		
Block B-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	78.2	586.0	3	105.04	-51.4	-2.0	-5.4	-0.1	0.7	23.0		
Block B-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	131.96	-53.4	-0.6	-16.0	-0.1	0.0	5.9		
Block B-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	77.4	489.6	3	104.90	-51.4	-2.1	-5.1	-0.1	0.0	21.7		
Block B-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	72.9	176.3	3	83.28	-49.4	-2.9	-0.1	-0.1	0.2	23.7		
Block B-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	79.5	791.6	0	105.46	-51.5	-1.2	-5.2	-0.1	0.1	21.7		
Block C Movements	Line	LAeq, Eve			48.5	71.8	215.3	0	158.37	-55.0	1.8	-4.1	-1.2	2.7	16.0		
Block C-Facade 01	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	184.92	-56.3	-0.8	-14.6	-0.1	0.0	4.7		
Block C-Facade 02	Area	LAeq, Eve	80.0	35.0	50.5	77.4	492.7	3	183.71	-56.3	-0.4	-14.9	-0.1	0.0	8.8		
Block C-Facade 03	Area	LAeq, Eve	80.0	35.0	50.5	73.6	205.1	3	166.77	-55.4	-0.3	0.0	-0.1	0.1	20.8		
Block C-Facade 04	Area	LAeq, Eve	80.0	35.0	50.5	78.3	604.2	3	166.54	-55.4	-0.6	-0.4	-0.1	0.1	24.8		
Block C-Roof 01	Area	LAeq, Eve	80.0	35.0	50.5	80.1	914.7	0	175.29	-55.9	-0.4	-5.5	-0.1	0.0	18.2		
Forklift Movement	Point	LAeq, Eve			95.1	95.1		0	135.32	-53.6	2.2	-23.2	-0.6	0.7	20.5		

LF Acoustics

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