REC

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NOISE IMPACT ASSESSMENT
ALTRINCHAM RETAIL PARK

REC REFERENCE: AC106976-1R2

REPORT PREPARED FOR: ORCHARD STREET INVESTMENT MANAGEMENT LLP

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EXECUTIVE SUMMARY

Resource and Environmental Consultants Limited has been commissioned by Orchard Street Investment LLP to undertake a Noise Impact Assessment for the proposed redevelopment at Unit 1, Altrincham Retail Park, George Richards Way, Altrincham, WA14 5GR.

A full weekday and weekend Background Sound Survey has been completed in a location representative of the nearest sensitive receptors at the north east of the site.

The below has been supplied for the sound Pressure level for the external mechanical plant items for the proposed Lidl store:

- 8 no. Food Refrigeration Dry Cooler 42dB @5m;
- 2 no. VRF Outdoor Units for Sales AHU 62dB @1m; and
- 1 no. VRF Outdoor Units AHU 61dB @1m.

Additionally, the following hours are proposed for deliveries associated with the new store:

- Monday to Sunday between 07:00 and 23:00.

Regarding commercial sound, the predicted daytime rating level at the centre of the nearest garden area exceeds the measured background sound pressure level and the BS4142:2014 criterion. Therefore, the following barrier heights have been recommended in order to achieve the criterion in BS4142:2014:

- 3m high barrier along the north eastern site boundary.

The proposed barriers for the Site can include or be a combination of wooden fences, ground bunds or brick wall construction and where applicable be of close boarded construction, be free from holes, sealed at the base and have a minimum mass of 10kg/m^2.

With the above mitigation in place, it is considered that the No Observed Adverse Effect Level (NOAEL), perceived as 'noticeable and not intrusive', would be achieved for the nearest gardens resulting in the following observation:

"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."

This assessment has shown that in principle and provided the above mitigation measures are implemented, there should be no adverse impact at the existing receptors as a result of the proposed operations.

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1. INTRODUCTION

Resource and Environmental Consultants (REC) Limited was commissioned by Orchard Street Investment Management LLP to prepare a Noise Impact Assessment in order to support a planning application for the proposed redevelopment at Unit 1, Altrincham Retail Park, George Richards Way, Altrincham, WA14 5GR, to be referred to hereafter as 'the Site'.

This assessment has been undertaken to identify the potential noise impact of proposed operations upon existing noise- sensitive receptors.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.1 Site Location and Proposed Development

The Site currently exists as a Homebase store on Altrincham Retail Park featuring a delivery yard to the north and a garden centre to the west. Beyond the site boundaries lie residential and commercial properties to the north on Huxley Street, Manchester Road to the east, parking and George Richards Way to the south and further commercial units to the west.

The nearest sensitive receptor has been identified as dwellings to the north east of the site on Huxley Street.

It is understood that the proposals comprise the redevelopment of the existing Homebase to provide a new Lidl supermarket and garden centre. The following information has been provided regarding proposed fixed plant items and have been used to inform the assessment:

- 8 no. Food Refrigeration Dry Cooler 42dB @5m;
- 2 no. VRF Outdoor Units for Sales AHU 62dB @1m; and
- 1 no. VRF Outdoor Units AHU 61dB @1m.

Additionally, the following hours are proposed for deliveries associated with the new store:

- Monday to Sunday between 08:00 and 23:00.'

The Planning Layout is shown in Figure 1 of Appendix III.

1.2 Limitations

Where mitigation measures are specified in our report, it should be noted that these measures are relative to a specific sound source, both in terms of the measured sound pressure level and the character of the source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, REC cannot be held responsible for any subsequent variations in the proposed mitigation performance.

Further limitations of this report are presented in Appendix I.

1.3 Reliance

REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2. ASSESSMENT METHODOLOGY

2.1 National Planning Practice Guidance

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

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

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The Observed Effect Levels are as follows:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
- Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected.
- No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 1 summarises the noise exposure hierarchy, based on the likely average response.

Table 1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing effect level	Action
Not Noticeable	No effect.	No Observed Effect	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			

Perception	Examples of Outcomes	Increasing effect level	Action
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			
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 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

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.

These factors include:

- The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night.
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise.
- the spectral content of the noise and the general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- Where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration.
- 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.
- If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.2 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound'

This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

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

The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is typical.'

The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00 – 23:00) 1 hour; and
- Night-time (23:00 – 07:00) 15 minutes.

There are a number of 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows:

Tonality

- +2dB: where the tonality is just perceptible;
- +4dB: where the tonality is clearly perceptible; and
- +6dB: where the tonality is highly perceptible.

Impulsivity

- +3dB: where the impulsivity is just perceptible;
- +6dB: where the impulsivity is clearly perceptible; and
- +9dB: where the impulsivity is highly perceptible.

Intermittency

- +3dB: where the intermittency is readily distinctive against the acoustic environment.

In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment.

BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background noise level can yield the following commentary:

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

With the above in mind, it is common that a Local Planning Authority will specify their own criteria for the rating level relative to the background sound level and, where this is the case, this criteria usually takes precedence over a simple comparison of the rating level against the background sound level.

3. NOISE SURVEYS

The noise measurement locations are shown on Figure 1 of Appendix III.

3.1 Ambient and Background Sound Survey

REC has undertaken a full weekday and weekend Ambient and Background Sound Survey at a location deemed representative of the nearest sensitive receptor. The survey was carried out during the following time period:

- 13:00 Thursday 7th February to 10:00 Tuesday 12th February 2019.

The following location was chosen for the survey:

- Noise Measurement Position 1 (NMP1): Located on the north western boundary of the existing delivery yard in a location deemed representative of the existing receptors adjacent to the Site on Huxley Street. Road traffic noise and commercial activities associated with existing units was audible on site. This location was also chosen as it was considered a suitably secure location to leave equipment unattended throughout the weekend period.

A summary of the range of measured 1-hour daytime background and 15-minute night-time sound pressure levels are presented in Table 2 below. A full tabulated representation is shown in Table A3 of Appendix IV.

Table 2 Range of Measured Background Sound Pressure Levels

Date	Period	Free-field Measured Ambient Sound Pressure Level (dB) $L_{Aeq,T}$	Free-field Measured Background Sound Pressure Level (dB) $L_{A90,T}$
Thursday 7th February 2019	Daytime (13:00 – 23:00)	52.3	41.0 - 52.5
	Night-time (23:00 – 07:00)	46.5	35.1 - 48.7
Friday 8th February 2019	Daytime (07:00 – 23:00)	54.4	43.4 - 51.6
	Night-time (23:00 – 07:00)	55.9	43.4 - 51.6
Saturday 9th February 2019	Daytime (07:00 – 23:00)	54.3	39.7 - 53.2
	Night-time (23:00 – 07:00)	43.7	28.3 - 40.5
Sunday 10th February 2019	Daytime (07:00 – 23:00)	52.1	37.6 - 49.1
	Night-time (23:00 – 07:00)	45.0	32.0 - 47.1
Monday 11th February 2019	Daytime (07:00 – 23:00)	53.2	39.2 - 50.9

Date	Period	Free-field Measured Ambient Sound Pressure Level (dB) $L_{Aeq,T}$	Free-field Measured Background Sound Pressure Level (dB) $L_{A90,T}$
	Night-time (23:00 – 10:00)	44.5	30.2 - 45.9
Tuesday 12th February 2018	Daytime (07:00 – 10:00)	54.1	49.1 – 50.0

3.2 Meteorological Conditions

Table 3 details the recorded meteorological conditions at the start and end of the noise survey.

Table 3 Record of Meteorological Conditions at Start and End of Survey

Period	Measured Wind Speed (m/s)	Wind Direction	Precipitation Occurred?	Fog or Mist Evident?	Was the Ground Wet, Frozen or Snow Covered?	Measured Temp (°C)	Cloud Cover (%)
Start Thursday 13:00	9.4	W	Light rain	N	Y	7	75
Friday 07:00	5.4	S	Light rain	N	Y	8	75
Saturday 07:00	10.3	SW	N	N	N	7	50
Sunday 07:00	1.3	W	Light Rain	N	Y	4	75
Monday 07:00	2.7	W	N	N	N	3	25
End Tuesday 10:00	3.1	S	N	N	N	7	25

Weather conditions were fine throughout the majority however there were periods of wind speeds exceeding 5.0 m/s.

Table 4 details the equipment used for the Noise Survey.

Table 4 Noise Measurement Equipment

Measurement Position	Equipment Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
NMP1	Sound Level Meter	01dB-Metravib Black Solo	65211	30th March 2019
	Pre-amplifier	01dB-Metravib PRE 21 S	16831	
	Microphone	01dB Metravib MCE212	142644	

Measurement Position	Equipment Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
	Calibrator	01dB-Metravib CAL-21	34113643	26th October 2019

The sound level meters were field-calibrated on Site prior to and after noise measurements were taken. No significant drift was witnessed. Calibration certificates are available upon request.

It is understood that operational activities will include HGV and FLT manoeuvres associated with deliveries. REC has utilised archived source noise data for these activities.

Table 5 Source Noise Level Data

Source	Measured Sound Level, $L_{Aeq,T}$ (dB)	Measurement Distance (m)
HGV Movement	71.4	3
Unloading operations of the HGV	69.4	2
HGV Departure	75.0	3
FLT Movement	68.0	1

4. NOISE IMPACT ASSESSMENT

4.1 Commercial Sound

For the purposes of the commercial assessment, the predicted sound rating level associated with the fixed plant and deliveries processes will be assessed against the median measured background sound levels over a reference period of 1 hour between 07:00 and 23:00 Monday to Sunday applicable to the daytime period.

The below has been supplied for the sound Pressure level for the external mechanical plant items for the proposed Lidl store:

- 8 no. Food Refrigeration Dry Cooler 42dB @5m;
- 2 no. VRF Outdoor Units for Sales AHU 62dB @1m; and
- 1 no. VRF Outdoor Units AHU 61dB @1m.

It is proposed to locate these units within a dedicated plant area immediately to the north of the proposed building.

This assessment has used the measured noise levels from the library data for HGV and FLT operations to predict the noise level impact at the proposed receptors due to deliveries during the daytime periods.

The service area for the Lidl store is to be located at the existing service yard to the north east of the Site with Huxley Road. Due to the size of the yard, it is anticipated that 1 no. of HGVs will be unloading at the Lidl store at any one time. As further details are not available on the quantity or periods of deliveries, the following has been considered:

- No noise attenuation due to atmospheric absorption has been accounted for in the calculations;
- Distance correction has been applied by way of a 6dB reduction per doubling of distance for a point source;
- It is assumed that during the daytime, the service areas can be in use in any given 1-hour period during the proposed delivery hours;
- The daytime period has been assessed between the hours of 07:00 to 23:00. For the assessment, BS4142:2014 has been used to determine the likelihood of adverse impact within the garden areas over a reference time period of 1 hour;
- The measured on-time periods have been corrected to account for the hourly assessment period given in BS4142:2014; and
- Acoustic penalties have been applied to each plant/operation in accordance with BS4142:2014.

For the BS4142:2014 assessments, penalties are applied to the specific sound level in order to provide the rating level. These penalties relate to the acoustic features of the sound source. Accordingly, the following subjective features have been accounted for in the assessment, in accordance with the subjective methods detailed in BS4142:2014.

Table 6 Acoustic Penalties

Source	Penalty	Applicable?	Attributable Penalty	Comment
All Fixed Plant	Tonality	No	-	No tones.
	Impulsivity	Yes	3dB	Impulsivity just perceptible.
	Intermittency	Yes	3dB	Intermittent operation.
	Other Sound Characteristics	No	-	Other Penalties applied.
HGVs manoeuvring	Tonality	Yes	4dB	Tones clearly perceptible during reversing operations.
	Impulsivity	No	-	Impulsivity not perceptible.
	Intermittency	Yes	3dB	Intermittent operation.
	Other Sound Characteristics	No	-	Other Penalties applied.
HGV Unloading	Tonality	No	-	No tones.
	Impulsivity	Yes	3dB	Impulsivity just perceptible.
	Intermittency	Yes	3dB	Intermittent operation.
	Other Sound Characteristics	No	-	Other Penalties applied.
HGVs Departing	Tonality	Yes	4dB	Tones clearly perceptible during reversing operations.
	Impulsivity	No	-	Impulsivity not perceptible.
	Intermittency	Yes	3dB	Intermittent operation.
	Other Sound Characteristics	No	-	Other Penalties applied.
FLT manoeuvring	Tonality	Yes	4dB	Tones clearly perceptible.
	Impulsivity	No	-	Impulsivity not perceptible.
	Intermittency	Yes	3dB	Intermittent operation.
	Other Sound Characteristics	No	-	Other Penalties applied.

Table 6 details the total penalties which will be added to the specific noise source.

Table 7 Acoustic Penalties

Plant	Tonality Penalty (dB)	Impulsivity Penalty (dB)	Intermittency Penalty (dB)	Other Sound Characteristic Penalty (dB)
All Fixed Plant	2	0	3	0
HGVs manoeuvring	4	0	3	0
HGV Unloading	0	3	3	0
HGVs Departing	4	0	3	0
FLT manoeuvring	4	3	3	0
Highest Penalty Applicable	**4**	**3**	**3**	0
Total Value of Penalties to Apply*	**10**			

*Summation of row 'Highest Penalty Applicable'
Note: BS4142 (Section 9.1) states; "*Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.*" It goes on to state "*Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.*"

Sound source levels data for delivery operations have been time corrected using the assumed On-Time during each 1-hour period. Table 8 calculates the specific sound level at the residential receptors off Huxley Road.

Table 8 Calculation of Specific Noise Level at Receptor – Residential at Huxley Road

Area	Source	Measured Sound Level, $L_{Aeq,T}$ (dB)	Measurement Distance	Distance to Receptor (m)	Quantity Proposed	Measurement Duration, On-time (seconds)	BS4142:2014 Reference Period (seconds)	Quantity / Time Corrected Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Calculated Total Specific Sound Level at Receptor (dB)
Fixed Plant	Food Refrigeration Unit	42	5	32	8	3600	3600	34.9	47.0
	VRF Outdoor Unit for Sales	62	1	32	2	3600	3600	34.9	
	VRF Outdoor Unit	61	1	32	1	3600	3600	30.9	
Delivery Operations	HGV Movement	71.4	3	16	1	300	3600	46.1	

Area	Source	Measured Sound Level, $L_{Aeq,T}$ (dB)	Measurement Distance	Distance to Receptor (m)	Quantity Proposed	Measurement Duration, On-time (seconds)	BS4142:2014 Reference Period (seconds)	Quantity / Time Corrected Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Calculated Total Specific Sound Level at Receptor (dB)
	Loading/ Unloading	69.4	2	20	1	1200	3600	44.6	
	HGV Pulling Away	75	3	16	1	300	3600	49.7	
	FLTs manoeuvring	68	1	24	1	600	3600	32.6	

Table 9 details the BS4142 assessment where the sound rating level from activities associated with the Lidl store are compared against criterion corresponding with the median measured Background Sound Level. The assessment has been undertaken for the nearest garden at 8 Huxley Street during the below proposed operating hours:

- Monday to Sunday between 07:00 and 23:00.

Table 9 Calculation of Rating Level and Comparison with Criterion – 8 Huxley Street

Period	Calculated Specific Sound Level, $L_{Aeq,1hr}$ (dB)	Acoustic Penalties (dB)	Rating Level, $L_{A,r}$ (dB)	Median Measured Background Sound Level, $L_{A90,1hr}$ (dB)	Criteria, $L_{A,r} = L_{A90}$ (dB)	Difference +/- (dB)
Monday to Sunday (07:00 – 23:00)	47	10	57	47	47	**+10**

Table 9 indicates that the rating level exceeds the measured Background Sound Level and the BS4142:2014 criterion at the centre of the nearest garden areas. Accordingly, mitigation measures are required for external amenity areas.

5. MITIGATION STRATEGY

5.1 Effective Site Management

In order to ensure the noise levels from Site are kept to a minimum, the following recommendations should be adhered to, where possible:

- All HGV engines should be switched off when not in operation;
- Whilst unloading/loading operations are taking place, the spaces furthest from the receptors should be used, where practicable;
- Signage should be installed along the perimeter of the yard reminding HGV drivers and yard operatives to keep noise levels to a minimum particularly during the evening period; and,
- Staff and operatives who work in the yard area should be informed, as part of on-going inductions and on-going training to keep noise levels to a minimum.

5.2 Barrier Requirements

Section 4.2 has determined that the BS4142:2014 criterion will be exceeded in the nearest garden areas by 10dB. As such, a barrier height of 3m is recommended in order to provide line of sight removal from the sound sources on the north eastern Site boundary and the nearest gardens on Huxley Street.

The proposed barrier for the Site can be of wooden fence or brick wall construction and should be of close boarded construction, be free from holes, sealed at the base and have a minimum mass of 10kg/m^2.

Table 10 reviews the BS4142 assessment at the exceeding garden areas against criterion, considering the recommended barrier heights:

Table 10 Calculation of Rating Level and Comparison with Criterion – 8 Huxley Street

Receptor	Calculated Specific Sound Level, $L_{Aeq,1hr}$ (dB)	Acoustic Penalties (dB)	Rating Level, $L_{A,r}$ (dB)	Attenuation Provided from 3m Barrier	Median Measured Background Sound Level, $L_{A90,1hr}$ (dB)	Criteria, $L_{A,r} = L_{A90}$ (dB)	Difference +/- (dB)
Monday to Sunday (07:00 – 23:00)	47	10	57	10.6	47	47	-1

Table 10 demonstrates that with mitigation in place, the rating level will fall below the existing measured background and achieve the BS4142:2014 criterion for the proposed receptors, and the specific sound level achieves the 50dB criterion for garden areas given in the WHO Guidelines and BS8233:2014.

BS4142:2014 provides the following guidance in relation to this outcome:

"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact."

Given the above, it is considered that the No Observed Adverse Effect Level (NOAEL), perceived as 'noticeable and not intrusive', would be achieved for all external and internal areas resulting in the following observation:

"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."

6. CONCLUSION

REC Limited has been commissioned by Orchard Street Investment Management LLP to undertake a Noise Impact Assessment for the proposed development at Unit 1, Altrincham Retail Park, George Richards Way, Altrincham, WA14 5GR.

It is understood that the proposals comprise the redevelopment of an existing Homebase Store including an additional unit for a Lidl supermarket. As such, the potential noise impact upon existing sensitive receptors has been assessed.

In order to inform the assessment, a weekday and weekend Background Sound Survey has been completed in a position deemed representative of the existing receptors in the vicinity of the Site, to the north.

Regarding the commercial sound, it has been determined the sound rating level would exceed the measured background level and therefore the BS4142:2014 criterion in the centre of certain areas during the daytime. Therefore, mitigation measures have been recommended in the form of acoustic barriers.

This assessment has shown that in principle and provided the above mitigation measures are implemented, there should be no adverse impact at the existing receptors as a result of the proposed operations.

APPENDIX I LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Limited and the Client as indicated in Section 1.2.

2. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

3. REC cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.

APPENDIX II GLOSSARY OF ACOUSTIC TERMINOLOGY

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A1 Typical Sound Pressure Levels

Sound Pressure Level	Location/Example
0	Threshold of hearing
20 - 30	Quiet bedroom at night
30 - 40	Living room during the day
40 - 50	Typical office
50 - 60	Inside a car
60 - 70	Typical high street
70 - 90	Inside factory
100 - 110	Burglar alarm at 1m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

Acoustic Terminology

Table A2 Terminology

Descriptor	Explanation
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10-5Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq,T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} & L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Fast	A time weighting used in the root mean square section of a sound level meter with a 125millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000millisecond time constant.

APPENDIX II FIGURES

Figure 1 - Noise Survey Measurement Positions

Customer:
Ochard Street Investment Management LLP

Project:
Unit 1, Altrincham Retail Park

Project-No:
AC106976-1r0

N

Noise Map Objects

Receiver

REC

Project Engineer: Michaela Moffatt
Created: 29/03/2019

APPENDIX IV MEASURED BACKGROUND SOUND LEVELS

Table A3 Measured Background Sound Levels at NMP1

Period Start	Measured Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Measured Background Sound Level, $L_{A90,1hr}$ (dB)
07/02/2019 12:00	57.2	52.2
07/02/2019 13:00	57.1	52.5
07/02/2019 14:00	56.8	52.3
07/02/2019 15:00	54.5	50.5
07/02/2019 16:00	52.3	48.6
07/02/2019 17:00	52.6	47.8
07/02/2019 18:00	52.8	47.7
07/02/2019 19:00	51.2	46.8
07/02/2019 20:00	49.8	45.1
07/02/2019 21:00	50.0	43.4
07/02/2019 22:00	46.6	41.0
07/02/2019 23:00	44.3	39.0
08/02/2019 00:00	45.9	38.6
08/02/2019 01:00	43.9	36.8
08/02/2019 02:00	45.0	37.0
08/02/2019 03:00	46.1	37.0
08/02/2019 04:00	42.9	37.3
08/02/2019 05:00	47.1	42.1
08/02/2019 06:00	50.9	46.1
08/02/2019 07:00	54.2	49.9
08/02/2019 08:00	54.7	51.2
08/02/2019 09:00	54.9	51.6
08/02/2019 10:00	57.0	51.2
08/02/2019 11:00	58.1	51.0
08/02/2019 12:00	53.6	50.4
08/02/2019 13:00	55.6	51.6
08/02/2019 14:00	53.8	50.4

Period Start	Measured Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Measured Background Sound Level, $L_{A90,1hr}$ (dB)
08/02/2019 15:00	55.4	50.4
08/02/2019 16:00	53.7	49.5
08/02/2019 17:00	55.2	48.8
08/02/2019 18:00	52.5	47.8
08/02/2019 19:00	52.0	46.6
08/02/2019 20:00	50.6	45.0
08/02/2019 21:00	49.1	44.0
08/02/2019 22:00	48.7	43.4
08/02/2019 23:00	50.3	45.1
09/02/2019 00:00	52.6	45.8
09/02/2019 01:00	54.2	47.3
09/02/2019 02:00	56.1	48.3
09/02/2019 03:00	57.0	50.1
09/02/2019 04:00	57.4	50.4
09/02/2019 05:00	58.4	50.9
09/02/2019 06:00	56.5	48.4
09/02/2019 07:00	54.2	48.8
09/02/2019 08:00	58.6	52.1
09/02/2019 09:00	57.8	52.5
09/02/2019 10:00	58.5	53.2
09/02/2019 11:00	56.3	51.4
09/02/2019 12:00	55.5	50.5
09/02/2019 13:00	54.8	49.9
09/02/2019 14:00	53.1	48.4
09/02/2019 15:00	51.8	47.0
09/02/2019 16:00	50.0	46.7
09/02/2019 17:00	51.4	46.4
09/02/2019 18:00	51.0	46.0

Period Start	Measured Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Measured Background Sound Level, $L_{A90,1hr}$ (dB)
09/02/2019 19:00	49.5	44.3
09/02/2019 20:00	48.5	42.8
09/02/2019 21:00	47.5	41.2
09/02/2019 22:00	45.5	39.7
09/02/2019 23:00	44.9	38.6
10/02/2019 00:00	43.7	38.0
10/02/2019 01:00	42.2	36.8
10/02/2019 02:00	42.8	33.9
10/02/2019 03:00	39.2	32.2
10/02/2019 04:00	38.0	29.4
10/02/2019 05:00	40.6	31.9
10/02/2019 06:00	48.5	35.4
10/02/2019 07:00	51.5	45.7
10/02/2019 08:00	50.6	43.5
10/02/2019 09:00	51.3	47.2
10/02/2019 10:00	52.3	48.4
10/02/2019 11:00	55.3	49.0
10/02/2019 12:00	53.4	48.9
10/02/2019 13:00	52.5	48.9
10/02/2019 14:00	53.3	49.1
10/02/2019 15:00	52.2	48.8
10/02/2019 16:00	51.0	48.0
10/02/2019 17:00	53.3	46.2
10/02/2019 18:00	54.7	45.6
10/02/2019 19:00	51.1	44.7
10/02/2019 20:00	49.9	41.9
10/02/2019 21:00	46.2	39.8
10/02/2019 22:00	46.2	37.6

Period Start	Measured Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Measured Background Sound Level, $L_{A90,1hr}$ (dB)
10/02/2019 23:00	47.7	36.8
11/02/2019 00:00	41.1	34.5
11/02/2019 01:00	37.2	32.5
11/02/2019 02:00	36.6	33.1
11/02/2019 03:00	37.9	33.8
11/02/2019 04:00	39.7	35.3
11/02/2019 05:00	46.9	40.6
11/02/2019 06:00	50.4	44.3
11/02/2019 07:00	55.2	50.9
11/02/2019 08:00	53.7	50.8
11/02/2019 09:00	54.3	49.6
11/02/2019 10:00	53.6	48.3
11/02/2019 11:00	57.2	48.9
11/02/2019 12:00	53.8	48.5
11/02/2019 13:00	52.1	46.5
11/02/2019 14:00	54.9	46.9
11/02/2019 15:00	51.3	45.9
11/02/2019 16:00	53.4	47.0
11/02/2019 17:00	53.7	48.4
11/02/2019 18:00	51.9	47.4
11/02/2019 19:00	50.7	45.8
11/02/2019 20:00	49.2	43.9
11/02/2019 21:00	48.9	42.0
11/02/2019 22:00	45.6	39.2
11/02/2019 23:00	43.6	35.5
12/02/2019 00:00	40.2	32.6
12/02/2019 01:00	42.8	31.2
12/02/2019 02:00	40.7	31.8

Period Start	Measured Sound Pressure Level, $L_{Aeq,1hr}$ (dB)	Measured Background Sound Level, $L_{A90,1hr}$ (dB)
12/02/2019 03:00	37.2	32.7
12/02/2019 04:00	40.0	34.0
12/02/2019 05:00	45.6	38.9
12/02/2019 06:00	50.4	43.8
12/02/2019 07:00	53.2	49.8
12/02/2019 08:00	53.9	50.0
12/02/2019 09:00	54.9	49.1