



Acoustic Survey and Assessment for Proposed change of use of the former Castleton Service Station, Manchester Road, Rochdale, OL11 3A.

Prepared for:

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Contents

1. Introduction	3
Site Location and Context	3
2. Policy and Guidance	4
3. The Assessment	8
The development	8
Existing Situation	8
Tyre Recycling Activity.	9
Recommendations	9
Tyre fitting operation	11
BS4142:2014+A1:2019	11
4 Conclusion	13
Figure 1 – Aerial Photograph	14
Appendix A – Full Monitoring Results	15
Appendix B – Report Author Details	16



1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a planning application for the retrospective change of use of the former Castleton Service Station, Manchester Road, Rochdale, OL11 3AD into a tyre recycling and fitting centre.

Site Location and Context

- 1.2. The development site is situated to the east of Manchester Road. To the north is a disused commercial site, to the rear two large distribution centres. To the west across the busy Manchester Road commercial units and to the south a block of flats.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. The report has been produced to clarify the potential impact on the neighbouring land uses and to identify mitigation measures if required to ensure the development is appropriate in terms of noise impact.



2. Policy and Guidance

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in September 2023, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:
- NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
- LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
- SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night-time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, L_{A90} sound levels.
- 2.13. The "residual" L_{Aeq} measurement is then subtracted from the "ambient" L_{Aeq} measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.



- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" L_{A90} measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact.
- 2.16. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the WHO and BS 8233: 2014 guidance.

Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.

2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



3. The Assessment

The development

- 3.1 The proposed development will see the regularisation of the current tyre recycling and fitting business which occupies the site. Prior to this the site was used a car sales and servicing centre and before the year 2000 a service station.
- 3.2 Within the existing building and located to the west of the site is a small tyre fitting centre containing ne tyre changing machine, one wheel balancing machine and a small compressor.
- 3.3 To the rear of the site and the existing building is the tyre recycling compressor. This compressor is manually loaded with old tyres, compacted, tied and removed from the machine by the electric forklift.
- 3.4 Waste tyres are brought to site by sheeted HGV wagon, 2-3 a week and removed by HGV wagon once every 7-10 days, i.e. no more than once a week. Loading of HGV's is undertaken to the north of the site, while unloading adjacent to the building towards the southwest corner.

Existing Situation.

- 3.5 In order to obtain representative background sound levels for the area on site monitoring was undertaken over the 19th June 2024, while the site was in operation.
- 3.6 A Cirrus Optimus Green sound level meter was utilised for the monitoring. The meter was placed at a height of ~1.3m along the southern boundary with the residential properties, away from reflective surfaces and opposite the tyre compactor.
- 3.7 The meter was field calibrated at the start and end of the monitoring period with no significant variation and full laboratory calibration certificates are available on request.
- 3.8 The weather during the monitoring was dry with little to no wind <5m/s.
- 3.9 The full results are shown in Appendix A, a review of the monitoring has identified clear periods of compactor operation. The compactor being located ~8m from the microphone position and 11.5m from the façade of the housing.
- 3.10 Background sound levels were dominated by passing traffic and the industrial units to the rear of the site, including reversing alarms.



Tyre Recycling Activity.

- 3.11 The compactor sound levels, which were clearly identified frequently throughout the day were 72dB $L_{Aeq,1min}$ with the busiest hour having 21 operations. This results in a SEL level of 64.3dB(A) over the hour at the façade of the nearest property.
- 3.12 Forklift truck noise was identified at 55-61dB(A) at the monitoring point, 51.8-57.8dB(A) at the façade of the residential properties.
- 3.13 Delivery HGV's arriving to site park the trailers to the east of the building thus reversing alarms, previously identified and controlled by EU legislation at ≤ 75 dB(A) at 7m. the current position of the trailer being ~10m from the façade of the residential properties. Resulting in sound levels of ≤ 56.2 dB $L_{Aeq,1hr}$ at the property.
- 3.14 Given a 15dB attenuation¹ for an open window the sound levels to be experienced from the compactor by the future occupants are 49.3dB(A) above those identified within the guidance documents detailed in section 2 of the report. Therefore, further mitigation measures are required.

Recommendations

- 3.15 It is proposed that the current operations of the site area amended.
- 3.16 Unloading of tyres will occur towards the north of the site, increasing the separation distance to the residential properties. Waste tyres to be stored on racks by hand, thus no significant sound emissions will occur from the storage operations.
- 3.17 Access to the compactor will also be from the northern side of the building with the current southern section being closed off. The walls and roof to be improved with a composite metal cladding. This will improve the attenuation of the building to the east and south to 40dB R_w ².
- 3.18 In addition, an acoustic barrier will be erected along the rear of the building and inline with the original, extending 1m beyond the building line to provide further attenuation to any sound emissions from the building.
- 3.19 Bailed tyres will be removed from the building using the electric forklift located on site. These will then be stored towards the north of the site, minimising travel distance,

¹ BS8233: 2014; Guidance on sound insulation and noise reduction for buildings

² www.coverworld.co.uk/wp-content/uploads/2015/09/Coverworld-UK-Ltd-Acoustic-Performance-Built-Up-Standard.pdf



increasing separation from the residential units and aiding the loading of wagons for dispatch. The reversing alarms to the forklift are to be switched off, with alternative measures in place to cover health and safety (segregation of roadways and pedestrian walkways).

- 3.20 The vehicle loading ramp currently used will be moved to a position it in line with the building thus the building will act as a barrier to any sound emissions from the forklift movements and the residential receptors.
- 3.21 HGV drivers will be asked to turn of reversing alarms where possible during delivery and collections to and from the site to avoid any unnecessary sound emissions.
- 3.22 Deliveries will be separated by a greater distance of 31m from the residential properties, and similar in nature to the sound levels from the units to the east and south. Deliveries will occur no more than three times a week and are unloaded by hand reducing noise emissions to that of the vehicle movements. Reversing will be kept to a minimum through the use of both gates meaning the majority of the movement will be located behind the building offering a further 10dB attenuation. An assessment assuming the identified 75dB(A) sound level from reversing alarms represents the movement of the vehicle over 1 minute of manoeuvring around the site when leaving. When arriving a sound level from the engine of 64dB(A) at 3m has been used based on previous monitoring.
- 3.23 Both gates will also be used to minimise the about of vehicle reversing required on site.
- 3.24 As a result of the above mitigation measures sound levels at the residential properties will be:
- Compactor < 32dB $L_{Aeq,1min}$ and over the busiest 1-hour period 24.3dB $L_{Aeq,1hr}$
 - Forklift truck movements of bails to storage <38.7dB, with the majority of movements being behind the building and therefore an additional 10dB attenuation will be experienced.
 - Delivery vehicle noise at this new location will be < 45.3dB $L_{Aeq,1hr}$.
 - Loading operations, (forklift movements from storage to wagon) <32.8dB(A).
- 3.25 The resulting sound levels following the implementation of the identified mitigation measures will be below the recommended guideline levels detailed within section 2 of this report. Indicating no significant adverse impact will be experienced by the development.



Tyre fitting operation.

- 3.26 The tyre fitting operation will be located within the building. The side door to the south of the site is to be closed and filled with an insulated panel.
- 3.27 The equipment used within the tyre fitting operation includes a small compressor, tyre fitting machine, wheel balancing and a pneumatic drill for removing wheel bolts. Published sound levels for the compressor and fitting machine are 73 & 75dB(A) respectfully, but experience has identified the occasional bang within tyre fitting establishments and “pop” of tyres when inflated. Literature research has identified sound levels of ~85dB(A) within tyre fitting premises equivalent to the higher action level within the *Control of Noise at Work Regulations 2005*. Although for most of the time sound levels are minimal.
- 3.28 Given the proposed mitigation (closing and insulating the side door), a reduction of >25dB will be achieved by the building structure. This will result in sound levels of 34.4dB(A) at the façade of the residential property.

BS4142:2014+A1:2019

- 3.29 A BS4142:2014 assessment is considered appropriate for this development. A review of the third octave frequency data showed no tonal noise associated with the compactor. The use of equipment will however be ad-hoc., However operation of the compactor only takes ~1minute to complete and the busiest hour was identified with 21 operation cycles, with the forklift used once during this period. A correction for intermittency of +3dB has been applied.
- 3.30 There was also some impact noise associated with its use, as such a correction for impulsivity has been applied +3dB.

Measured Ambient sound level		Mitigation measures are not in place so unable to monitor
Residual Sound level	$L_{Aeq} = 52.9dB$	Identified from monitoring results with no audible operations
Background Sound Level	$L_{A90} = 45dB$	Background taken from second monitoring point.
Reference period	60 minutes	Normal ref period,



Specific sound Level	$L_{Aeq} = 24.3\text{dB}$	Calculated at receptor following mitigations
On-time correction	$10\lg(1320/3600)$ $= -4.4\text{dB}$	Based on 22 operations of the compactor at 1 min each
Acoustic feature	+3dB +3dB	+3dB for impulsivity +3dB for intermittency
Rating level	$24.3 + 6 - 4.4 =$ 25.9dB(A)	
Background sound level	$L_{A90} = 45\text{dB}$	
Excess of Rating level over background level	$(25.9 - 45) \text{ dB} = -$ 19.1dB indicates no significant adverse impact	
Uncertainty		

3.31 The assessment; when considering the above mitigation measures in the form of standard glazing will not result in any adverse impact on the future residents.



4 Conclusion

- 4.1 On-site monitoring has identified existing background sound levels will result in an adverse impact on the proposed development. As such additional mitigation measures are required.
- 4.2 These have been identified as a recladding of the building and provision of a barrier along the south of the building. Positioning of activities will also be changed to move forklift truck movements and deliveries/collections away from the nearby residential units towards the north of the site and to use the building as a barrier.
- 4.3 The inclusion of the above mitigation measures will ensure that the sound levels at the neighbouring properties are acceptable and will result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 4.4 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise.

Figure 1 – Aerial Photograph





Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AFMax} (dB)	L _{A90} (dB)	On site activity during this period.
19/06/2024 07:35	53	81.8	46.3	
19/06/2024 08:00	62.5	96.5	45.7	
19/06/2024 09:00	67.1	98.5	46.3	
19/06/2024 10:00	67.4	98.2	46.6	
19/06/2024 11:00	66.9	97.6	46.4	
19/06/2024 12:00	65.9	93.1	46.7	
19/06/2024 13:00	67	99.7	46.5	
19/06/2024 14:00	60.3	91.1	45.7	
19/06/2024 15:00	54.4	70.7	45.5	
19/06/2024 16:00	60.3	90.6	45.3	
19/06/2024 17:00	61.4	93.8	46.3	
19/06/2024 18:00	54	73.4	44.6	



Appendix B – Report Author Details

This report has been produced by Neil Martin, BSc (Hons), PGDip, CEnvH MCIEH, MIOA.

Neil is the principal acoustic consultant at Martin Environmental Solutions Ltd, a consultancy company specialising in Environmental Health disciplines including environmental noise assessment and control. He holds a Bachelor's degree in Environmental Health and Diploma in Acoustics. He is a Chartered Member of the Chartered Institute of Environmental Health and a Full member of the Institute of Acoustics.

Neil has over 20 years' experience working within a Local Authority Environmental Health setting, principally in the Environmental Protection and Public Health areas and has been working as an acoustic consultant since 2011.

Since its formation, Martin Environmental Solutions has advised and assisted many groups including residents, developers and local authorities about the problems of noise and vibration in the environment and the possible solutions. Neil also acts as an expert witness in the area of acoustics.