

**473-475 Oldham
Road, Rochdale,
Greater Manchester,
OL16 4TD:
Noise Assessment**

Varley/Warrior Developments Ltd

Echo Acoustics 23 Aug 2023

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EXECUTIVE SUMMARY

This report presents the results of an assessment of noise arising from the proposed redevelopment of the site at 473 to 475 Oldham Road, to provide 2 retail units, one of which will be a local convenience food-store.

The assessment indicates that indicates that sound associated with deliveries is likely to give rise to elevated levels of noise and suitable mitigation measures are incorporated into the design.

A potential for the build-up of reverberant noise from the plant equipment located the building and retaining wall for Watkin Street is identified and suitable mitigation measures are incorporated into the design.

Sound associated with the slow movement of customers cars in the food-store car park, is unlikely to have any significant adverse effect for local residents, in the context of the existing elevated noise associated with traffic movements on Oldham Road and, to a lesser extent on Watkin Street.

The assessment concludes that, with these mitigation measures in place, there is little likelihood for disturbance to local residents from the operation of the retail units and that noise, therefore, need not be a reason for refusal of planning permission for the development.

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1 INTRODUCTION

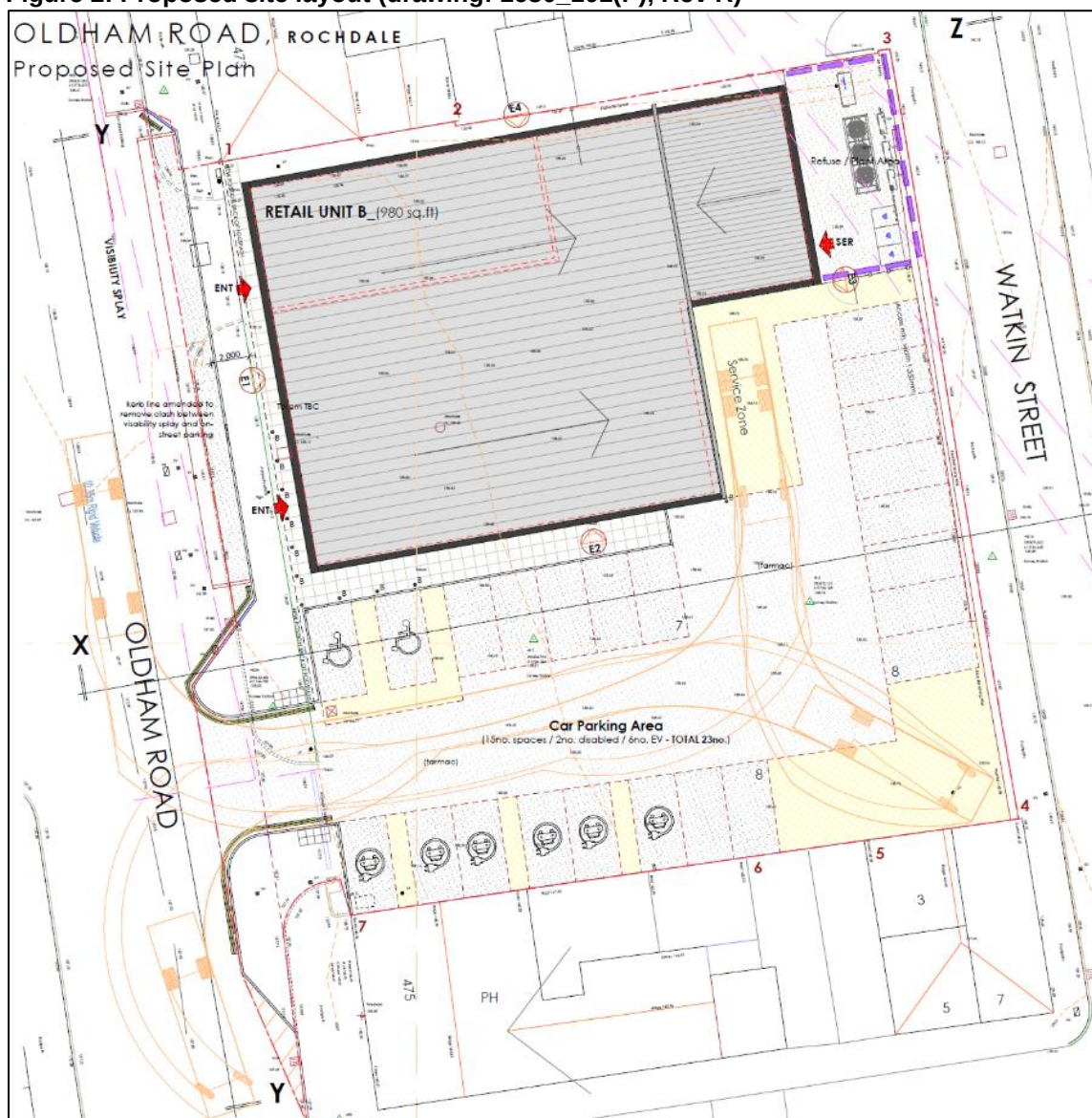
- 1.1 Echo Acoustics was commissioned by Varley/Warrior Developments Ltd to undertake an assessment of noise associated with the redevelopment, for retail use, of land at 473 to 475 Oldham Road, Rochdale OL16 4TD.
- 1.2 The site, which has been cleared, is located in a mixed residential and commercial area to the south of Rochdale town centre. Oldham Road, which is a very heavily trafficked road, defines the site's western boundary with a residential street, Watkin Street, on its eastern boundary; residential properties on the opposite side of Watkin Street face the site. On the southern boundary is The Plough Public House and a residential property, 5 (formerly 3 to 7) Argyle Street, which is at the junction of Argyle Street and Watkin Street. On the site's northern boundary is a Scout Hut (on Argyle Street) and a shop (on Oldham Road). Residential properties are also present on Oldham Road opposite the site.
- 1.3 The site and its immediate surroundings are presented in Figure 1.

Figure 1: Site and immediate surroundings



- 1.4 The current proposals involve the construction of 2 purpose-built, modern format retail units, Unit A being a local convenience food-store. The current design proposal is presented in Figure 2.

Figure 2: Proposed site layout (drawing: 1630_101(P), Rev R)



- 1.5 The proposed operational hours for the units are 6:00am to 11:00pm, with delivery hours to match.
- 1.6 This report presents the results of a baseline noise measurement survey and assessment of the potential noise impact of the stores' operations with respect to the neighbouring residential properties.
- 1.7 A Glossary of Acoustic Terminology is presented at Appendix A.

2 GUIDANCE

- 2.1 The assessment of the retail unit noise was broadly undertaken using the guidance contained in British Standard (BS) 4142:2014 + A1:2019 *Methods for rating and assessing industrial and commercial sound*.
- 2.2 The standard provides a method for determining the noise arising from an industrial or commercial site, defined as the site's 'specific' noise level (dB L_{Aeq}) to which is added a correction for tonal, impulsive or intermittent elements, to provide the site's 'rating' noise level (dB $L_{Ar,Tr}$).
- 2.3 The rating noise of the industrial or commercial activity under investigation is derived by applying a 'penalty' to tonal, impulsive and intermittent noises, as separate entities. The simplest method is a subjective assessment with a sliding scale of up to +6 dB for tonal noise, up to +9 dB for impulsive noise and +3 dB for intermittency. The objective methods provided only allow for the assessment of tonal noise. The rating noise level is then compared with the 'background' (dB L_{A90} or 90th percentile) noise level as measured or calculated outside a building, usually a residential property.
- 2.4 The standard indicates significance of noise effects according to varying degrees of "adverse impact": a difference between the background noise and industrial ("rating" noise) of +10 dB *"is likely to be an indication of a significant adverse impact, depending on the context"* whilst *"a difference of around +5dB is likely to be an indication of an adverse impact, depending on the context"* and that *"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 or a significant 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, depending on the context"*.
- 2.5 The Standard includes a specific requirement that assessments should take account of "context" in determining the significance of any predicted impact, which is critical in providing a reasoned and pragmatic assessment, avoiding rigid adherence to limit values at the exclusion of any other considerations.
- 2.6 In this instance, the principal sources of noise arising from the operation of the new units will be from:
- Fixed plant equipment, located at the site's north-eastern corner adjacent the scout hut and Watkin Street; Watkin Street is elevated relative to the site level with a brick retaining wall such that the plant equipment will be relatively contained.
 - Occasional delivery noise.
 - Lesser intermittent noise associated with vehicles parking at the side of Unit A (behind the PH), accessed from Oldham Road.
- 2.7 With respect to plant equipment noise, the scheme is not yet at the stage where plant equipment will have been specified; this report uses the baseline noise survey data to determine an appropriate 'limit' value for future plant equipment operation alongside an

indicative calculation of plant equipment noise using data previously recorded at a similarly-sized food store elsewhere.

- 2.8 With respect to delivery noise, previously recorded data from a delivery at a Co-Operative food-store in Stockport were used.
- 2.9 With respect to customer vehicle noise, a qualitative assessment was undertaken as there is no robust data available to allow for the low speed movement of a varying number and types of vehicles that might use the car parking area; relative to the significant noise of free-flowing traffic on Oldham Road, the vehicles on the car park are unlikely to represent a significant source of noise.

3 METHODOLOGY

- 3.1 The assessment incorporated a noise measurement survey comprising continuous, consecutive measurements at the site's eastern and western boundaries, as indicated in Figure 3.

Figure 3: Noise monitoring location



- 3.2 Data at position 1 were recorded between 11:45am on Tuesday 14 June and 11:45am on Wednesday 15 June 2022.
- 3.3 Data at position 2 were recorded between 12:00pm (midday) on Tuesday 14 June and 5:58am on Wednesday 15 June 2022, at which time the meter stopped recording, possibly due to interference.
- 3.4 The surveys were undertaken by Mike Potts, Acoustic Consultant at Echo Acoustics. Mr Potts is a full corporate Member of the Institute of Acoustics (MIOA).
- 3.5 The surveys utilised:
- At Position 1, an NTi XL2, Class 1 (IEC 61672: 2013) integrating, averaging sound level meter. The meter was placed within a locked weatherproof enclosure with the microphone mounted

on a tripod at a height of approximately 1.3 metres above local ground level with a clear and uninterrupted line of sight of Oldham Road. The microphone was enclosed in a proprietary weatherproof foam enclosure.

- At position 2, a Casella CEL 633, Class 1 (IEC 61672: 2013) integrating, averaging sound level meter. The meter was placed within a locked weatherproof enclosure with the microphone mounted on a tripod at a height of approximately 1.3 metres above the level of Watkin Street, on the top of the retaining wall with a clear and uninterrupted line of sight of Watkin Street. The microphone was enclosed in a proprietary weatherproof foam enclosure.

3.6 The meters were field-calibrated before and after the survey and no significant variation in calibration tone was observed.

3.7 The weather during the survey was dry and warm with very light south to south-westerly air movement and minimal cloud cover.

3.8 With respect to the previously recorded operational data, as discussed in paragraphs 2.7 to 2.8, this is as follows:

- Delivery noise: a delivery to a similar-sized store in Stockport was found to take 25 minutes from arrival to completion and gave rise to a sound pressure level of 71.0 dB $L_{Aeq, 25min}$ at 5.6 metres from the delivery ramp. The BS 4142 assessment utilises a 1-hour assessment period during the day time so the data was 'adjusted' to allow for the relative period of occurrence (the 'on-time'). This resulted in a calculated sound pressure level, at 5.6 metres, of was determined to be **67.2 dB $L_{Aeq, 1h}$** .
- Plant equipment noise: plant equipment recorded at a Co-operative food-store in North Ferriby was found to produce a sound pressure level 39.3 dB L_{Aeq} at a distance of 13 metres from the equipment; the plant equipment operated continuously such that its hourly sound pressure level, at 13 metres, was determined to be **39.3 dB $L_{Aeq, 1h}$** .

4 ASSESSMENT RESULTS / CALCULATIONS

- 4.1 The summarised baseline measurement data are presented in Table 1; the part day time periods at position 1 (11:45m to 11:00pm and 7:00am to 11:45pm) were combined to produce a single 16-hour 'day time' value. The 15-minute measurement data are presented at Appendix B.

Table 1: Measured noise data

Location	Period	Measured noise (dB)		
		L _{A90} *	L _{Aeq}	L _{AFmax}
Oldham Rd	Day (07:00 - 23:00)	59.0	67.3	-
	Night (23:00 - 07:00)	40.0	63.2	86.9
Watkin St	Day (07:00 - 23:00)	53.0	60.5	-
	Night (23:00 - 05:58)	38.0	54.8	79.7

* Modal (most frequently occurring or 'typical') value, rounded to the nearest whole value (BS 4142)

- 4.2 Figures 4 and 5 present the 1-minute (position 1) and 1-second (position 2) ambient (dB L_{Aeq}) noise data recorded at the two measurement positions throughout the survey period.

Figure 4: 1-minute measurement data (dB L_{Aeq}) at position 1

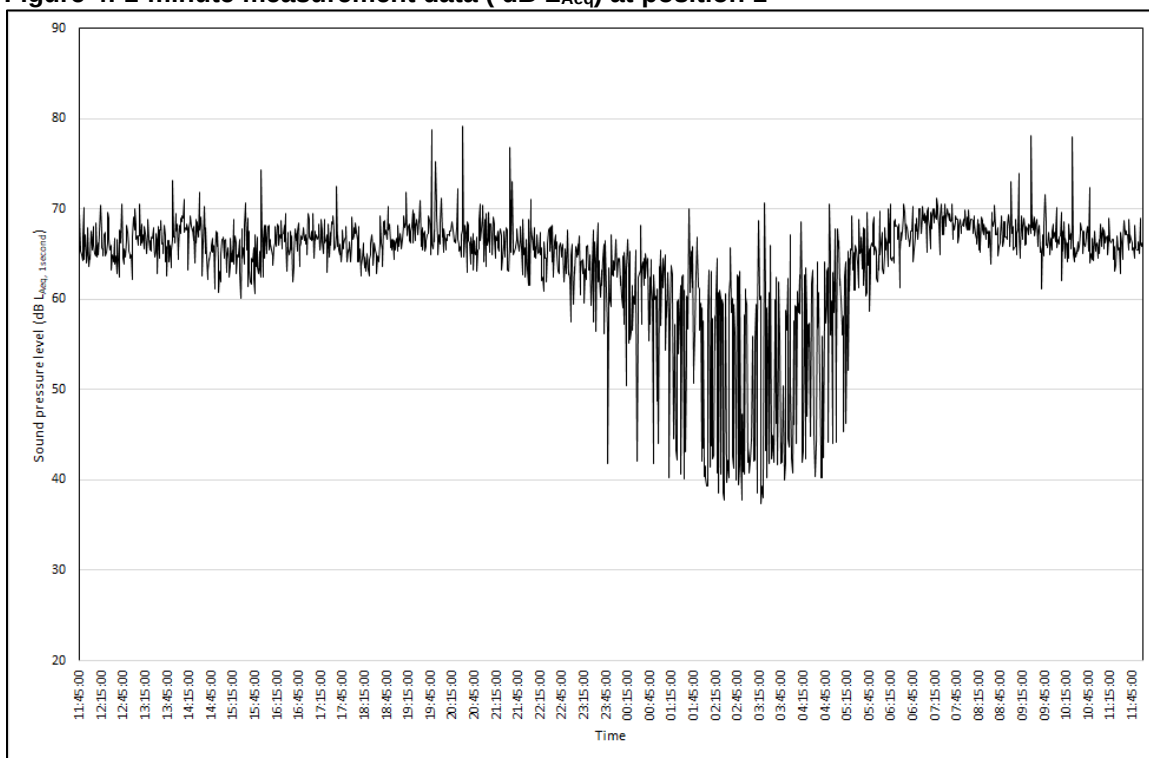
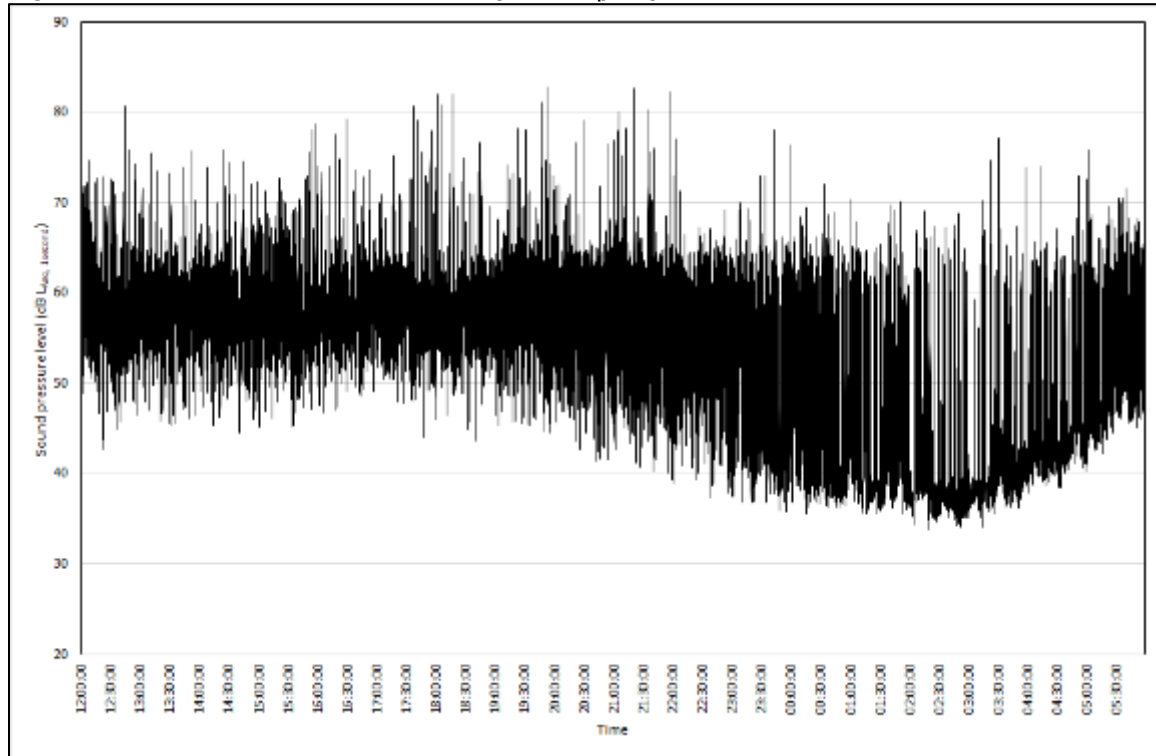


Figure 5: 1-second measurement data (dB L_{Aeq}) at position 2

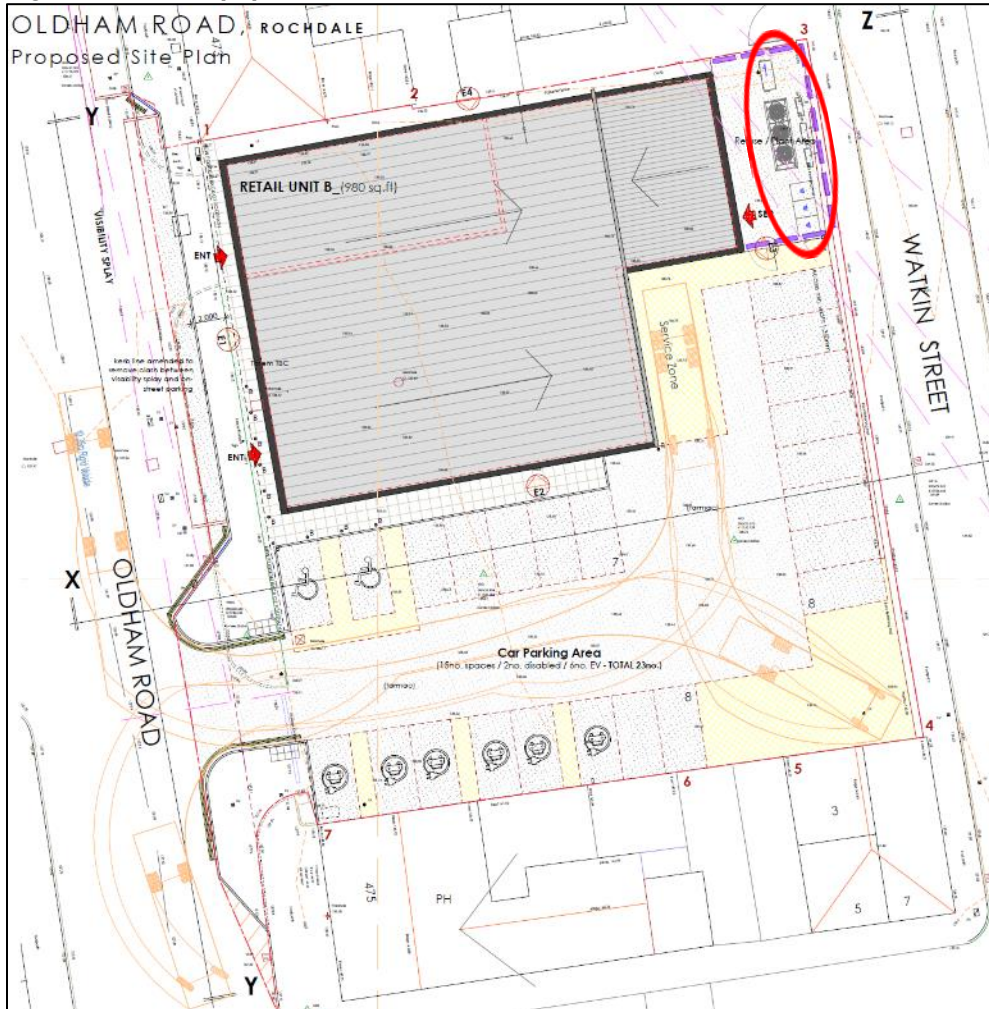


- 4.3 During the day and night time the ambient noise in the vicinity is dominated by traffic noise, particularly from Oldham Road, but Watkin Street is a cobbled road meaning that even slow-moving vehicles generate relatively elevated levels of noise.
- 4.4 In addition to private cars, Oldham Road is used by a significant number of taxis, buses and heavy delivery vehicles. The data in Table 1 and Figures 4 and 5 show that ambient (L_{Aeq}) noise levels do not reduce significantly during the night time.

Plant equipment noise

- 4.5 The measured modal or 'typical' night time background (dB L_{A90}) sound level at the measurement locations was:
- Oldham Road: 59 dB L_{A90, 15 min} during the daytime and 40 dB L_{A90, 15 min} during the night time.
 - Watkin Street: 53 dB L_{A90, 15 min} during the daytime 38 dB L_{A90, 15 min} during the night time.
- 4.6 The plant equipment locations for the 2 units are highlighted in Figure 6.

Figure 6: Plant equipment location

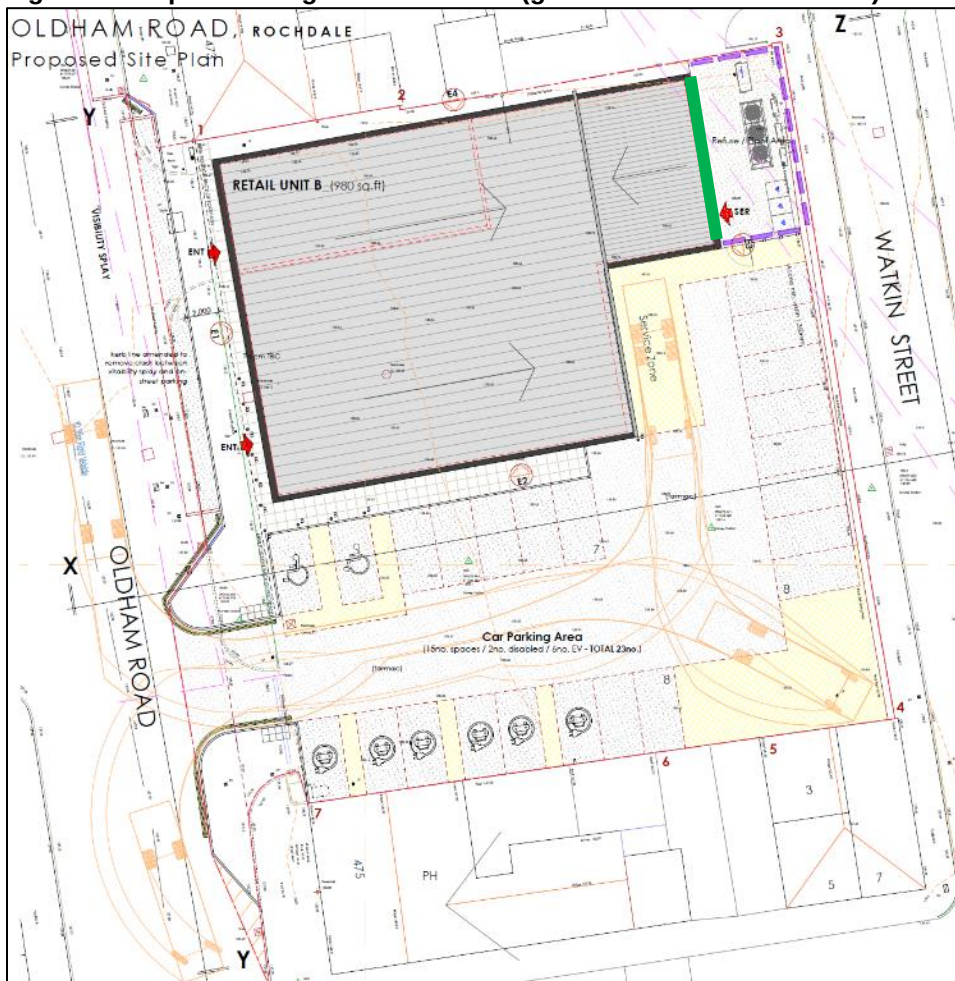


- 4.7 In these positions, they will be completely shielded from properties on Oldham Road by the buildings themselves, to the extent that they are unlikely to be audible although care will need to be taken to avoid a build-up of noise between the building and the retaining wall for Watkin Street; the current design includes an acoustic fence, indicated by the purple dashed line in Figure 6, with a minimum height of 2 metres above the level of Watkin Street. This will provide a minimum sound attenuation of 10 dB . The closest residential façade on Watkin Street will be approximately 13 metres from the plant equipment.
- 4.8 Suitable receptor rating sound pressure levels for plant equipment are typically set at up to 5 dB below the background (dB L_{A90}) sound pressure level(s). In this instance, it was calculated that the equipment to be installed should generate a sound pressure level, at the nearest residential receptors, in the region of 48 dB $L_{Ar,1h}$ during the daytime and 33 dB $L_{Ar,15min}$ during the night time.
- 4.9 Based on the data presented at paragraph 3.8 and allowing an approximate sound attenuation of 10 dB by the retaining wall, the calculated equipment sound, affecting properties on Watkin Street, will be 29.3 dB L_{Aeq} ; these levels are below the recommended values presented in paragraph 4.8, being significantly below the *day time* background (90th

percentile or dB L_{A90}) level and 8.7 dB below the *night time* background (90th percentile or dB L_{A90}) level on Watkin Street.

- 4.10 At these levels, the plant equipment would be unlikely to give rise to any significant disturbance.
- 4.11 However, placing the plant equipment in a narrow space, constrained on 3 sides by solid structures creates the potential for the build-up of reverberant noise within the space. Additional mitigation will be required in the form of sound-absorbent material on the walls immediately adjacent the plant equipment, as indicated in Figure 7 - this should extend across the full width of the eastern façade of the delivery area and from 2.0 metres above the ground to level with the top of the vertical noise barrier i.e. the lower 2.0 metres of the delivery area wall will have no absorbent treatment,;
- 4.12 The proposed mitigation is shown in Figure 7.

Figure 7: Proposed mitigation measures (green = absorbent material)



- 4.13 With these measures in place, the residential properties will be suitably protected from the plant equipment noise.

Delivery noise

- 4.14 The proposals are for deliveries to take place at the rear of the store adjacent Watkin Street, such that this is unlikely to be cause of noise disturbance to properties on Oldham Road.
- 4.15 Additionally, deliveries will be restricted to the hours of 6:00am to 11:00pm such that overnight disturbance is avoided.
- 4.16 With respect to the properties on Watkin Street, it has been shown that that the delivery activity gives rise to a sound pressure level of 67.2 dB $L_{Aeq, 1h}$ at 5.6 metres; the closest residential façade to the area in which deliveries might occur is approximately 13 metres.
- 4.17 The additional distance was calculated to reduce the delivery noise by 7.3 dB, resulting in a sound pressure level of 59.9 dB $L_{Aeq, 1h}$.
- 4.18 As the noise from the deliveries includes some impulsive sounds, BS 4142 suggests a character correction be added; it was judged that a character correction of +3 dB would be appropriate. This gives rise to a 'rating' sound level of **62.9 dB** $L_{Ar, 1h}$ at the closest property façade.
- 4.19 This level is 9.9 dB greater than the day time measured 'modal' background level measured on Watkin Street which, according to the significance criteria presented in BS 4142, would be predicted to give rise to a likelihood of the occurrence of a significant adverse impact during the day time (nominally up to 11:00pm).
- 4.20 Mitigation against this noise will be provided through the continuation of the 2 metre barrier along the site's Watkin Street boundary, thereby providing approximately 10 dB of sound attenuation.

Customer vehicles

- 4.21 The slow movement of customer vehicles within the car park at the side of Unit A, between the hours of 6:00am and 11:00pm, is unlikely to generate significant noise relative to the existing elevated noise from traffic travelling on Oldham Road. This aspect of the proposals is not considered to represent any significant concern with respect to noise disturbance.

5 CONCLUSION

- 5.1 An assessment has been undertaken to determine the potential noise effects associated with the redevelopment of the site at 473 to 475 Oldham Road, to provide 2 retail units, one of which will be a local convenience food-store.
- 5.2 The assessment indicates that delivery activity occurring at the rear of the retail units, is likely to give rise to a potential for significant adverse effect, for residents on Watkin Street. Sound associated the operation of fixed plant equipment adjacent Watkin Street, and with the slow movement of customers cars in the food-store car park, is unlikely to have any significant adverse effect for local residents.
- 5.3 However, the potential for the build-up of reverberant noise from the plant equipment, located within an enclosed area between the building and the retaining wall for Watkin Street, is recommended to be mitigated by the application of sound-absorbent material to the east-facing wall of the delivery area. The design includes a significant 2 metre-high solid barrier acoustic barrier along the site boundary with Watkin Street to protect properties on Watkin Street from both plant equipment noise and delivery noise.
- 5.4 The assessment concludes that with these mitigation measures in place, there is little likelihood for disturbance to local residents from the operation of the retail units and that noise, therefore, need not be a reason for refusal of planning permission for the development.

6 APPENDICES

Appendix A: Glossary of Acoustic Terms

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 micro-Pascals (μPa), the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB(A) / A-weighting: decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change (in steady noise) of 3 dB(A) is the minimum perceptible under normal conditions and a change of 10 dB(A) corresponds roughly to halving or doubling the *loudness* of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A)¹.

L_{A10}: the 10th percentile noise level – a statistical parameter describing the noise level exceeded for 10% of the measurement period. In CRTN, the *L_{A10}* [18-hour] is based upon the *L_{10, 1h}*, the hourly 10th percentile level.

L_{A10} [18-hour]: The average of the values of the hourly *L₁₀* for each of the eighteen one-hour periods between 06:00 to 24:00 hours

L_{Aeq,T}: the equivalent continuous sound level - the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). *L_{Aeq}* is used to describe many types of noise and can be measured directly with an integrating sound level meter.

Noise: any audible sound. Often defined as unwanted sound. Can be damaging to hearing if it is too loud or can be just annoying if it interferes with the normal enjoyment of others.

Sound / sound pressure: a fluctuation in air pressure over the static ambient pressure.

Sound pressure level: the sound pressure relative to a standard reference pressure of 20 μPa (20×10^{-6}) on the decibel scale.

¹ DEFRA, (1997). Planning Policy Guidance Note (PPG) 24 "Planning and noise". TSO, London

Appendix B: Noise measurement data

Table 2: 15-minute measurement data, position 1

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{AFmax}
11:45	57.4	66.4	86.0
12:00	58.5	66.8	82.4
12:15	58.1	66.6	86.9
12:30	57.4	66.0	80.5
12:45	57.6	66.0	79.7
13:00	59.9	67.7	83.7
13:15	59.4	66.7	79.3
13:30	56.8	66.7	82.9
13:45	58.2	67.5	87.0
14:00	56.7	68.0	81.5
14:15	58.5	68.2	84.6
14:30	58.1	66.3	84.7
14:45	56.7	65.1	83.9
15:00	58.5	65.4	80.6
15:15	56.8	65.5	83.4
15:30	56.3	66.3	87.0
15:45	58.5	66.9	87.8
16:00	58.1	66.4	77.9
16:15	58.4	67.2	80.9
16:30	59.9	66.2	78.9
16:45	60.3	67.2	85.7
17:00	60.5	67.0	86.2
17:15	60.5	66.9	78.6
17:30	58.8	67.5	89.2
17:45	57.7	66.5	77.4
18:00	60.1	66.3	76.7
18:15	58.9	64.9	77.8
18:30	59.6	66.4	81.2
18:45	60.0	66.9	84.2
19:00	58.6	67.8	83.9
19:15	57.3	68.0	79.5
19:30	58.2	67.6	85.6
19:45	56.9	70.8	96.7
20:00	57.7	67.5	84.0
20:15	55.0	67.5	87.8
20:30	55.6	69.9	98.1
20:45	53.4	67.3	87.3
21:00	56.2	67.4	84.9

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{AFmax}
21:15	54.2	66.4	78.3
21:30	53.4	69.0	90.6
21:45	51.6	65.7	82.7
22:00	53.7	66.8	85.4
22:15	50.5	65.4	78.9
22:30	50.4	65.6	79.6
22:45	47.1	64.9	76.9
23:00	47.5	64.3	79.9
23:15	45.0	63.9	83.7
23:30	45.2	64.3	80.7
23:45	41.7	63.2	76.5
00:00	44.1	62.8	77.7
00:15	41.5	61.6	79.6
00:30	41.8	63.6	82.3
00:45	41.2	60.7	75.1
01:00	40.2	61.9	79.7
01:15	40.2	58.6	74.6
01:30	40.2	63.0	84.2
01:45	40.3	60.9	81.5
02:00	39.3	57.4	76.2
02:15	37.4	58.6	77.2
02:30	38.9	58.1	76.7
02:45	37.8	58.1	76.5
03:00	38.8	58.1	80.9
03:15	37.5	60.9	86.9
03:30	39.7	58.5	77.8
03:45	39.5	57.5	80.4
04:00	40.3	60.3	84.2
04:15	40.9	59.4	76.3
04:30	39.2	56.3	73.9
04:45	42.0	63.5	83.2
05:00	43.0	62.1	79.7
05:15	44.4	64.4	81.4
05:30	46.1	65.7	80.7
05:45	45.8	65.4	79.6
06:00	50.7	67.1	80.7
06:15	52.3	66.7	84.4
06:30	55.4	67.9	80.3
06:45	57.5	68.4	79.0
07:00	57.7	68.8	81.9
07:15	59.2	69.3	81.5

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{AFmax}
07:30	59.6	69.0	82.7
07:45	60.1	68.3	80.4
08:00	60.4	68.3	77.4
08:15	58.9	67.4	77.1
08:30	59.4	67.8	78.6
08:45	59.1	67.9	81.2
09:00	60.1	68.6	92.4
09:15	59.0	70.0	92.7
09:30	57.2	67.0	80.9
09:45	59.4	67.4	79.3
10:00	56.8	67.1	84.8
10:15	57.0	69.0	93.7
10:30	58.8	66.9	84.0
10:45	56.7	66.5	84.0
11:00	55.1	66.9	83.7
11:15	57.2	65.7	80.8
11:30	56.0	67.1	82.6

Table 3: 15-minute noise measurement data, Position 2

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{A90}
12:00	53.0	60.9	76.4
12:15	53.0	59.4	74.9
12:30	51.5	60.3	82.9
12:45	53.0	60.1	79.3
13:00	54.0	60.8	77.9
13:15	53.0	59.8	74.9
13:30	52.5	59.9	76.1
13:45	53.0	60.1	78.0
14:00	52.0	60.6	75.7
14:15	53.0	60.6	77.4
14:30	52.5	59.6	76.9
14:45	52.0	59.2	75.2
15:00	53.0	59.3	72.9
15:15	53.5	60.6	74.6
15:30	51.0	59.6	72.2
15:45	54.0	62.0	82.7
16:00	53.0	60.4	76.2
16:15	53.0	61.1	80.9
16:30	53.5	59.7	74.8

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{A90}
16:45	54.5	60.3	75.8
17:00	55.0	60.5	75.0
17:15	55.0	60.7	76.9
17:30	53.0	62.2	82.1
17:45	52.5	61.8	82.3
18:00	54.5	62.1	85.3
18:15	53.5	61.3	83.5
18:30	54.0	60.3	77.7
18:45	54.0	59.9	72.2
19:00	52.5	60.7	78.8
19:15	52.5	61.5	79.9
19:30	52.0	61.0	82.3
19:45	51.5	63.2	84.4
20:00	52.0	60.8	74.3
20:15	49.0	59.8	78.0
20:30	49.5	60.7	80.7
20:45	48.5	60.1	78.9
21:00	50.0	62.1	88.8
21:15	47.5	60.5	85.9
21:30	47.0	61.7	83.6
21:45	46.0	59.4	84.2
22:00	46.5	59.3	79.4
22:15	44.0	57.4	67.8
22:30	44.0	57.6	68.5
22:45	42.5	57.5	72.8
23:00	42.0	57.1	71.4
23:15	41.0	56.8	75.1
23:30	41.0	57.8	79.7
23:45	38.5	54.9	68.0
00:00	39.5	56.4	77.9
00:15	38.0	54.4	70.4
00:30	38.0	55.8	73.5
00:45	37.5	53.0	66.4
01:00	37.5	55.1	72.3
01:15	36.5	51.0	66.6
01:30	37.5	54.4	71.0
01:45	37.0	53.3	71.5
02:00	36.5	50.2	68.5
02:15	35.5	51.2	69.8
02:30	36.0	50.6	69.2
02:45	35.5	50.7	69.8

Time	Measured noise (dB)		
	L _{A90}	L _{Aeq}	L _{A90}
03:00	36.5	49.2	70.9
03:15	37.0	53.2	76.3
03:30	38.5	53.5	78.7
03:45	38.0	51.0	76.8
04:00	40.5	52.9	75.2
04:15	40.5	52.0	68.3
04:30	40.0	50.4	67.3
04:45	42.0	55.9	74.6
05:00	44.0	55.7	78.1
05:15	45.5	57.1	70.9
05:30	47.5	59.0	73.9
05:45	47.5	58.1	69.9