

Residential development at 492 to 494 Claremont Road, Rusholme, Manchester M14 5WA:

Noise Assessment

R&S Builders Ltd

Echo Acoustics 11 March 20251

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EXECUTIVE SUMMARY

The results of a noise measurement survey and desk-based assessment are presented, with respect to the proposed residential development of land at 492 to 494 Claremont road, Rusholme, Manchester M14 5WA.

The proposed development is subject to a pre-commencement planning condition, part (a) of which requires the achievement of specific external and internal noise levels.

The assessment shows that the site is principally affected by elevated levels of traffic noise, particularly during the night time.

Appropriate noise mitigation measures are recommended and the assessment concludes that, with the provision of these mitigation measures, part (a) of the pre-commencement condition site will be achieved and will have been complied with.

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1 INTRODUCTION AND SITE DESCRIPTION

- 1.1 Echo Acoustics was commissioned by Crown Advisory, on behalf of R&S Builders Ltd, to undertake an assessment of noise affecting the proposed residential development of land at 492 to 494 Claremont Road, Rusholme, Manchester M14 5WA.
- 1.2 The site, a former storage yard, is located in an urban area surrounded by existing residential housing, with Claremont Road on its northern boundary and Victory Street on its western boundary, as shown in Figure 1.

Figure 1: Site area and surroundings



- 1.3 The ambient noise affecting the site is dominated by traffic noise on Claremont Road and general urban noise from the surrounding urban area. Victory Street is a local access road along which occasional vehicles pass.
- 1.4 The proposals comprise the construction of 7 houses as presented in Figure 2.

Figure 2: Proposed development layout



- 1.5 The development is subject to a pre-commencement planning condition (reference: 130987/FO/2021):

“a) Before the development is first occupied a scheme for acoustically insulating the proposed residential accommodation against noise from Claremont Road and Victory Street shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises.

The potential for overheating shall also be assessed and the noise insulation scheme shall take this into account. The approved noise insulation and ventilation scheme shall be completed before any of the dwelling units are occupied.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not exceed 45 dB L_{Amax,F} by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

Gardens and terraces (daytime) 55 dB LAeq

b) Prior to first occupation of the residential units, a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the internal noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance and to reduce the potential for overheating, pursuant to Core Strategy Policy DM1”.

- 1.6 The pre-commencement condition guideline values are based on those presented in British Standard (BS) 8233: 2014 *Guidance on sound insulation and noise reduction for buildings*.
- 1.7 This report presents the results of a noise measurement survey and desk-based assessment of noise affecting the site, its significance with respect to pre-commencement condition (a) and, where appropriate, a discussion of suitable noise mitigation requirements for the site. Condition (b) will be the subject of a later report once the development has been completed.
- 1.8 A glossary of acoustic terminology is presented at Appendix A.

2 METHODOLOGY

- 2.1 The assessment incorporated a noise measurement survey at a single position at the front corner/façade of one of the completed houses, overlooking Claremont Road, as presented in Figures 3 and 4.

Figure 3: Noise measurement location (image shows part-completed development)



Figure 4: Measurement position on Claremont Road



- 2.2 The survey comprised continuous consecutive measurement of 5-minute data samples, between 11:10am on Wednesday 13 October and 11:25am on Thursday 14 October 2021.
- 2.3 The weather during both surveys was warm with occasional showers during the afternoon of the Wednesday but dry during the night time and morning of the Thursday. Winds were generally light to negligible.

3 RESULTS, ASSESSMENT AND DISCUSSION

Results

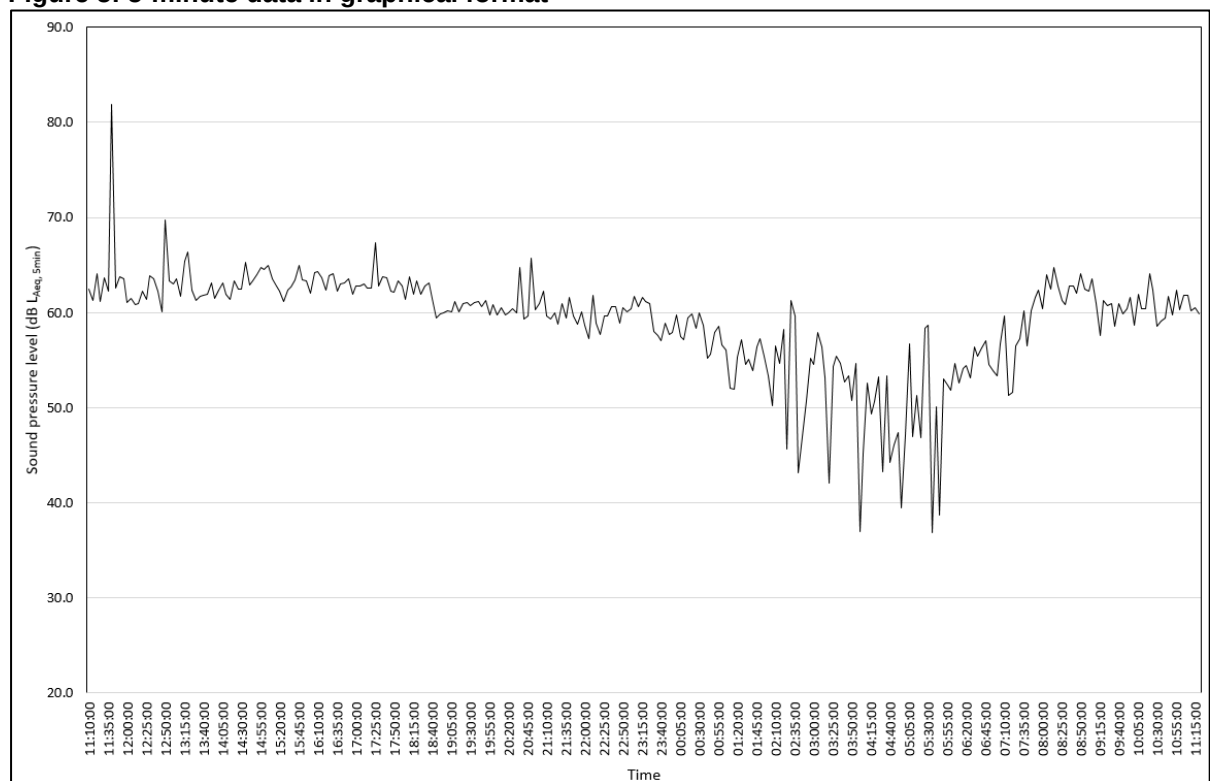
- 3.1 The measured noise data are summarised in Table 1; the two partial daytime measurement data sets are combined to provide an average (16-hour) noise level. The 5-minute data are too numerous to be included in this report but are available on request.

Table 1: Summarised 5-minute noise measurement data

Period	Measured noise (dB)		
	L _{Aeq}		L _{Amax}
Day 1	64.5	63.1	-
Day 2	61.0		-
Night	56.1		86.4

- 3.2 The 5-minute continuous equivalent (L_{Aeq}) measurement data throughout the survey period are presented in graphical form in Figure 5.

Figure 5: 5-minute data in graphical format



- 3.3 Examination of the 5-minute data show that an external noise level of 75 dB L_{Amax, 5min}, commensurate with an internal level of 45 dB L_{Amax} through a closed window (providing 30 dB R_w of sound attenuation), was exceeded 25 times.

External noise assessment

- 3.4 The data in Table 1 indicate that, at 63.1 dB L_{Aeq,16h}, noise levels for garden areas and external amenity spaces would be significantly in excess of the BS 8233 guideline levels. However, as indicated in Figure 6, for the most part, the gardens are partially screened from the road by the houses themselves or by the intervening fences between the houses and will be at least 16 m from Claremont Road; for the most part, this would be expected to

reduce the noise affecting the gardens by between 8 and 12 dB due to the screening and by 5 dB due to distance, giving rise to levels below 55 dB L_{Aeq} .

Figure 6: Site layout



- 3.5 The exception is the corner property whose garden is partially exposed to the road; it will not be possible to fully screen this property without the installation of an intrusive solid fence on the property's southern side.
- 3.6 However, the closest part of the 'rear' garden area will be set back from Claremont Road by approximately 20 metres; relative to the noise measured at 5 metres from the road, the noise level in the exposed area of the garden would be expected to have reduced by approximately 7 dB. This was calculated to give a noise level of 56.1 dB L_{Aeq} which is only marginally above the conditioned level of 55 dB L_{Aeq} . The garden area screened by the building would benefit from significantly lower levels of noise due to the combination building screening and distance.
- 3.7 It is also worth noting that BS 8233 states: *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved"*. The reference to WHO guidelines is to the World Health Organisation *Guidelines for Community Noise*, issued in 1999, and upon which the levels in BS 8233 are based
- 3.8 In light of these considerations, it is considered that a level of 55 dB L_{Aeq} will be achieved in all rear garden areas of the proposed properties except for the corner property, where a rear

garden noise level of 56.1 dB L_{Aeq} may be experienced by the portion of the garden exposed to Claremont Road.

- 3.9 However, this is considered acceptable and the no additional noise mitigation measures will be required.

Internal noise assessment

- 3.10 The measurement data in Table 1 were used to calculate the internal noise levels in habitable rooms in the new properties, assuming 30 dB R_w of sound attenuation through a closed window and 15 dB of sound attenuation through a partially open window. The results of this are presented in Table 6.

Table 2: Calculated internal noise levels

Period	Calculated noise (dB)	
	L_{Aeq}	L_{Amax}
Windows open		
Day	48.1	-
Night	41.1	71.4
Windows closed		
Day	33.1	-
Night	26.1	56.4

- 3.11 The data in Table 6 indicate that, with windows open, the pre-commencement/BS 8233 guideline internal noise levels in habitable rooms will be exceeded.
- 3.12 With windows closed, the internal ambient (L_{Aeq}) noise levels will be satisfactory but night time maximum (L_{Amax}) noise levels in bedrooms will exceed the pre-commencement/BS 8233 guideline levels by 11.4 dB. The measurement data suggest this is likely to occur numerous times during the night (see paragraph 4.3).
- 3.13 Consequently, habitable room windows on the road-facing facades will need to remain closed to achieve the pre-commencement/guideline noise levels and alternative means of providing both background and cooling ventilation will be required.
- 3.14 Additionally, first floor bedrooms will require up-rated glazing to mitigate against the elevated maximum (L_{Amax}) noise levels. This will not apply to the roof-level dormer windows on the front of the houses as these will be flush with the roof and will, therefore, benefit from significant protection from traffic noise due to their alignment and screening by the building's front roofline.

4 MITIGATION MEASURES

Glazing

- 4.1 For first floor bedroom windows facing Claremont Road, up-rated glazing providing **41 dB $R_w + C_{tr}$** of sound insulation will be required to achieve the night time guideline maximum noise level of 45 dB L_{Amax} ; C_{tr} is a 'character' correction' which is used to provide a greater level of protection against transport/traffic-related (low frequency) noise.

Ventilation

- 4.2 As windows cannot be for ventilation, alternative means of providing background and cooling ventilation will be required for all habitable rooms with windows facing the roads.
- 4.3 Background ventilation can be achieved using through-window trickle ventilation units which will need to be specified to achieve the following sound insulation performance, *when open*:
- 30 dB $D_{n,e,w}$ for ground floor habitable room windows, facing the road, used during the day time.
 - 41 dB $D_{n,e,w} + C_{tr}$ for first floor bedroom windows facing the roads.
- 4.4 The provision of cooling ventilation will require the additional installation of mechanical ventilation which may be room-specific (through-wall) ventilation units or whole house ventilation systems i.e. mechanical ventilation and heat recovery (MVHR). These units may be used to provide both background and cooling ventilation, negating the need for trickle-ventilation units.
- 4.5 If through-wall mechanical ventilation units are to be used in individual rooms then they should be acoustically-attenuating units with sound insulation performance at least the same as the trickle ventilation units and windows specified in paragraphs 5.1 and 5.3.
- 4.6 With these measures in place residential amenity for future occupants of the development will be suitably protected.

5 SUMMARY & CONCLUSION

- 5.1 The assessment has shown that the site is affected by elevated levels of day and night time traffic noise from Claremont Road.
- 5.2 Mitigation measures have been recommended, comprising uprated glazing for first floor bedrooms facing the roads and alternative means of providing both background and cooling ventilation, to achieve the pre-commencement condition levels.
- 5.3 The assessment concludes that, with the provision of these mitigation measures, pre-commencement condition, part (a), will have been complied with.

6 APPENDICES

Appendix A: Glossary of acoustic terms

Ambient noise: the noise from all sources, both near and far, at any given time. Conventionally defined using the A-weighted equivalent continuous noise level (L_{Aeq}) [see below].

Background noise level (dB L_{A90}): In the UK, the 90th percentile noise level (L_{A90}) is generally used to define 'background' noise. This is a statistical parameter describing the noise level that is exceeded for 90% of the measurement or assessment time. Its value lies in the fact that it is a statistical value, towards the lower end of a measured range of data, and which is relatively 'stable' i.e. not adversely affected by occasional high-energy noise events.

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).

$L_{Aeq,T}$: 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.

L_{Amax} : the maximum single-event noise level attained during a measurement period.

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.