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A6 to Manchester Airport Relief Road

Noise Insulation Regulations Assessment

Stockport Metropolitan Borough Council

29 May 2019

Notice

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Document history

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1. Introduction

Atkins Acoustics Noise and Vibration has been commissioned by Stockport Metropolitan Borough Council (SMBC) to undertake an assessment of residential eligibility for noise insulating measures with regard to properties potentially affected by the A6MARR road scheme, including the Windlehurst Road junction improvements.

This assessment is based on the 'as built' scheme alignment, bunds and barriers, and updated traffic data forecasts provided by Atkins Transport.

The purpose of this report is to detail the assessment undertaken and identify dwellings which potentially qualify for noise insulation in accordance with the Noise Insulation Regulations 1975 (as amended 1988) hereafter referred to as "the Regulations". The specific qualifying facades and potentially qualifying windows and doors are also identified.

The qualifying building facades have been determined by noise calculations. Site visits were then undertaken, and online photographs reviewed, to ascertain the presence of qualifying windows and doors. However, as individual dwellings have not been surveyed internally, it is not possible to confirm beyond doubt if all qualifying windows and doors are associated with an eligible room (living room, bedroom & study). This would require liaison with individual owner/occupiers.

A glossary of acoustic terms, used in this report, is provided in Appendix A.

2. Noise Insulation Regulations

2.1. Noise Insulation Regulations 1975 as amended 1988

The Noise Insulation Regulations 1975 (as amended 1988) are made under Part 2, Section 20 of the Land Compensation Act, and they set out the circumstances in which a Highway Authority has discretionary power or a duty to offer to carry out or make a grant for carrying out defined noise insulation works to qualifying residential properties affected by noise from a new or altered highway.

The Regulations also detail the criteria for qualifying windows and doors, which must be part of an eligible room, i.e. living room or bedroom or study. The Regulations apply to habitable rooms and so exclude bathrooms, toilets, halls and kitchens which do not include a living area.

Some residential buildings are not eligible under the Regulations. These include clearance areas, mobile homes (which are covered by the Highways Noise Payments and Movable Homes (England) (Amendment) Regulations 2001) and houses first occupied after the "relevant date" (this is the date a new road was first opened to public traffic).

The provisions of the regulations are summarised in the paragraphs below.

2.1.1. Statutory Traffic Noise Insulation

Regulation 3 imposes a duty on the relevant highway authority to offer insulation in respect of a new road, or a road for which a new carriageway has been constructed, if the following four requirements are fulfilled:

- The '*Relevant Noise Level'* must be at least 68 dB(A) $L_{10(18\text{-hour})}$. Note that calculated values of 67.5 dB(A) are rounded up to 68 dB(A).
- The '*Relevant Noise Level'* must be at least 1 dB(A) more than the '*Prevailing Noise Level'*.
- New roads must contribute at least 1 dB(A) to the '*Relevant Noise Level'*.
- The property must be within 300m of a carriageway forming part of the scheme.

The Noise Insulation Regulations require that noise levels are determined in accordance with the technical memorandum 'Calculation of Road Traffic Noise'[1] (CRTN).

2.1.2. Discretionary Traffic Noise Insulation

There are two separate circumstances under which discretionary noise insulation may be provided.

Under Regulation 4(1), the Highway Authority has discretionary powers to offer insulation if the four requirements listed in section 2.1.1 are fulfilled in respect of an altered road.

Under Regulation 4(4), the highway authority has discretionary powers to insulate buildings which do not fulfil the above requirements, but which share the same facade as a qualifying building.

2.1.3. Year of Assessment

The "*relevant noise level*" must be calculated using the maximum expected traffic flows between 06:00 and 24:00 on a normal working day within a 15-year period after the new, or altered, road or carriageway, opens to traffic. Under normal circumstances this would be the 15th year, often referred to as the "design year".

[1] Calculation of Road Traffic Noise (Department of Transport/Welsh Office – 1988) - CRTN

3. Methodology

3.1. Calculation of Road Traffic Noise, 1988

The road traffic noise levels have been calculated at a sufficient number of representative receptors using the methodology detailed in the CRTN. CRTN is the methodology used to determine entitlement under the Regulations and is the accepted method for the prediction of traffic noise in the UK.

The CRTN method of predicting noise from a road consists of five main stages:

- Division of the road scheme into a number of segments.
- Calculation of the "*Basic Noise Level*", at a reference distance of 10 metres away from the nearside carriageway edge, for each road segment.
- Assessment of the noise level (due to each road segment) at the reception point taking into account distance, ground attenuation and/or screening.
- Correction of the noise level at the reception point to take into account site layout features including reflections from buildings and other facades, and the angle of view from the property to the source segments.
- Taking a combination of the contributions from all segments within view to give the predicted noise levels at the reception point for all roads.

An assessment in accordance with the Regulations requires a distinction to be made between the noise contributions from existing roads and new or altered roads.

The A6 MARR Scheme consists principally of a new highway connecting the A6 to Manchester Airport. However, there are a number of sections of altered highway where the existing road intersects with the A6MARR scheme to form new junctions.

This assessment, in accordance with guidance from SMBC, considers the "*relevant noise level*" as that generated by traffic on all these new and altered road sections collectively and does not attempt to differentiate between new and altered roads.

3.2. Computer Modelling of Traffic Noise

The required noise level calculations have been undertaken using NoisemapFive © software which calculates noise levels in accordance with CRTN.

3.2.1. Input Methodology

A three-dimensional noise model was built in the software including features which may affect the generation and propagation of noise. These features have been captured from the following data sources:

- Scheme design, mitigation, base mapping and Addressbase data supplied by SMBC;
- Surrounding topography based on inherited Noise Model from AECOM;
- Site visit observations.

For each receiver point, the calculations were carried out for the actual number of floors for each building assuming that ground floor window height is 1.5m above local ground level and that there is a 2.5m increment for each floor.

It is understood that the scheme roads are surfaced with a low noise thin wearing course. Such surfaces, that have a minimum Road Surface Influence (RSI) of -5dB, are given a noise benefit of -3.5dB in the noise model, in accordance with DMRB HD213/11, provided mean traffic speed is ≥ 75 kph. At lower speeds, a -1dB noise benefit is applied.

3.2.2. Traffic Data

The traffic data used in the noise model is based on the transport assessment of the scheme which provided traffic forecasts for the opening year 2017 and the design year 2032, for scenarios with the scheme and without the scheme in place. This data was supplied by Atkins Transport. The traffic data provided includes: Annual Average Weekday Traffic (AAWT) flow; mean speed and %HGVs.

Based on the traffic data, the noise levels relating to the following two situations were calculated:

- The '*prevailing noise level*' (normally based on traffic flows and conditions for the year preceding that when construction works commenced).
- The '*relevant noise level*' based on the highest predictions of noise levels within the period up to 15-years after the scheme is opened.

The *prevailing noise level* has been calculated based on 2017 Do-Minimum scenario traffic data.

The *relevant noise level* has been calculated based on 2032 Do-Something scenario traffic data.

Modelled speeds between 0 – 20 kph were manually adjusted to 20kph as the CRTN methodology is not valid at lower speeds.

3.3. Site Visits and Online Photography

Qualifying facades were reviewed by a combination of site visits on 8th April 2019 and a review of available online maps and photographs. This review was to identify the presence of potentially qualifying windows and doors in the qualifying facades.

3.3.1. Screening

The NoisemapFive © model includes all screening from buildings surrounding the scheme. CRTN methodology states that for reception points below 4 metres above ground, screening effects such as continuous walls and other permanent features should be taken into account. The solid brick wall that provides screening for dwellings on Middlewood Road and dwellings near Lane End House B&B on Buxton Road have been included in the noise model. Basic wooden garden fences or gates have not been included as the acoustic performance of these features cannot typically be verified. Where the acoustic performance of such features can be verified, the integrity of the features cannot be guaranteed for the duration of the assessment period and, as a consequence, these features have also omitted from the assessment.

4. Qualifying Facades Results

4.1. A6 MARR Qualifying Facades

Noise calculations have been undertaken at all dwellings within 300 of the A6MARR in accordance with CRTN. The results of the calculations have been processed and the prevailing and relevant noise levels were compared. Where all the criteria, detailed in Paragraph 2.1.1 above, have been satisfied, the property and qualifying façade(s) potentially eligible for noise insulation works have been identified and listed in Table 4-1 below.

Table 4-1 – A6MARR: Qualifying Dwellings and Facades

Property Address	Qualifying Façade(s)
Apartment Building Hampton Court, Wilmslow Road, Wilmslow, Sk9 3GA	North
178 Buxton Road, Stockport, SK7 6LY	Southeast
Wrenbury, Buxton Road, Stockport, SK7 6NG	South & West
Ellesmere House, Buxton Road, Stockport, SK7 6NG	South
247 Buxton Road, Stockport, SK7 6NG	South
Richmond, Buxton Road, Stockport, SK7 6NG	South
Eventide, Buxton Road, Stockport, SK7 6NF	East
1 Werneth View, Stockport, SK7 6NH	West
46 Carsdale Road, Manchester, M22 0LS	South
115 Macclesfield Road, Stockport, SK7 6DT	West
117 Macclesfield Road, Stockport, SK7 6DT	West
119 Macclesfield Road, Stockport, SK7 6DT	West
121 Macclesfield Road, Stockport, SK7 6DT	South, West
Bungalow next to 121 Macclesfield Road, Stockport, SK7 6DT (Address TBC)	South, West
9 Sandiway Road, Wilmslow, SK9 3SN	Northwest
1 St. James Way, Cheadle, SK8 6PZ	South & Southwest
133 Stanley Road, Cheadle, SK8 6RF	South
132 Woodford Road, Stockport, SK7 1PD	Southeast
156A Woodford Road, Stockport, SK7 1PD	Northwest
129 Woodford Road, Stockport, SK7 1QD	Southwest
131 Woodford Road, Stockport, SK7 1QD	Southwest
133A Woodford Road, Stockport, SK7 1QD	Northwest

Property Address	Qualifying Façade(s)
2 Yew Tree Avenue, Stockport, SK7 6AW	North

These 22 dwellings and one apartment building have been reviewed for presence of qualifying windows and/or doors to eligible rooms i.e. bedrooms, living rooms and studies, prior to any offer being made. The findings of this review are detailed in Section 5.

4.2. Windlehurst Road Junction Qualifying Facades

Noise calculations have been undertaken, in accordance with CRTN, at all dwellings within 300 of the altered junction between Windlehurst Road and the A6. The results of the calculations have been processed and the prevailing and relevant noise levels were compared. Where all the criteria, detailed in Paragraph 2.1.1 above, have been satisfied, the property and qualifying façade(s) potentially eligible for noise insulation works have been identified.

At total of 16 dwellings, plus two apartments buildings, have been identified and listed in Table 4-2 below and are indicated on Figure C1 in Appendix C.

Table 4-2 – Windlehurst Road: Qualifying Dwellings and Facades

Property Address	Qualifying Façade(s)
Netherfield, Middlewood Road	Northeast & Northwest
Longbourn, Middlewood Road	Northeast
Pemberley, Middlewood Road	Northeast
9, 10 & 11 Buxton Road	South
6, 8 & 10 Buxton Road	North
13 Buxton Road	West, East & South
15, 17, 19 & 21 Buxton Road	Southwest
Old Schoolhouse, Buxton Road	North & West
Public House, Buxton Road	South, West & East
Two Apartment buildings: 1 to 18 Windlehurst Court	(See Appendix C)

5. Assessment Qualifying Windows/Doors

5.1. A6 MARR Assessment

By visiting the sites from publicly accessible locations and using online photography and maps, a review has been undertaken of all the dwellings identified in Table 4-1 above. Properties deemed eligible for an offer at this stage are shaded in Table 5-1 below.

Table 5-1 – Review of Qualifying Facades – A6 MARR

Address	Qualifying Façade(s)	Assessment	Eligible for Offer*	Appendix B Figure Ref:
Apartment Building Hampton Court, Wilmslow Road, Wilmslow, SK9 3GA	North	Windows present – No. of dwellings TBC.	YES	-
178 Buxton Road, Stockport, SK7 6LY	Southeast	Gable end – No windows or doors on qualifying façade.	NO	B-1
Wrenbury, Buxton Road, Stockport, SK7 6NG	South & West	All facades clearly have living room and/or bedroom windows present.	YES	-
Ellesmere House, Buxton Road, Stockport, SK7 6NG	South			
247 Buxton Road, Stockport, SK7 6NG	South			
Richmond, Buxton Road, Stockport, SK7 6NG	South			
Eventide, Buxton Road, Stockport, SK7 6NF	East	1st floor windows present and could be eligible. Ground floor door is a lobby (not eligible).	YES	-
1 Werneth View, Stockport, SK7 6NH	West	Gable end only – no qualifying windows or doors.	NO	B-6
46 Carsdale Road, Manchester, M22 0LS	South	Gable end – One window, but based on experience, likely to be a stair/hall (not eligible). Ground floor door behind fencing and likely to be to kitchen.	UNLIKELY - TBC	B-2
115 Macclesfield Road, Stockport, SK7 6DT	West	All facades clearly have living room and/or bedroom windows present.	YES	-
117 Macclesfield Road, Stockport, SK7 6DT	West			
119 Macclesfield Road, Stockport, SK7 6DT	West			
121 Macclesfield Road, Stockport, SK7 6DT	South & West			
Bungalow adjacent to 121 Macclesfield Road, Stockport, SK7 6DT (Address TBC)	South & West			
9 Sandiway Road, Wilmslow, SK9 3SN	Northwest	Large 1st floor and ground floor	YES	-

Address	Qualifying Façade(s)	Assessment	Eligible for Offer*	Appendix B Figure Ref:
		windows to living room/bedroom.		
1 St. James Way, Cheadle, SK8 6PZ	South & Southwest	South -Gable end with no windows. Southwest – Conservatory ground floor not eligible but bedrooms upstairs eligible.	YES	B-3
133 Stanley Road, Cheadle, SK8 6RF	South	Façade is obscured from view, access to property and/or consultation with resident required to confirm.	TBC	B-4
156A Woodford Road, Stockport, SK7 1PD	Northwest	Door and two small windows. Not clear if eligible rooms are on this façade.	UNLIKELY - TBC	B-5
132 Woodford Road, Stockport, SK7 1QD	Southeast	Qualifying position was at first floor level and this is a bungalow. Also, no qualifying windows or doors on this façade.	NO	-
129 Woodford Road, Stockport, SK7 1QD	Southwest	Living room and/or bedroom windows present.	YES	-
131 Woodford Road, Stockport, SK7 1QD	Southwest			-
133A Woodford Road, Stockport, SK7 1QD	Northwest			-
2 Yew Tree Avenue, Stockport, SK7 6AW	North	Qualifying position was at first floor level and this is a bungalow, therefore, no qualifying windows or doors.	NO	-

*Subject to a surveyor's report/quote.

5.2. Windlehurst Road Junction Assessment

By visiting the sites from publicly accessible locations and using online photography and maps, a review has been undertaken of all the dwellings identified in Table 4-2Table 4-1 above. Properties deemed eligible for an offer at this stage are shaded in Table 5-2 below.

Table 5-2 – Review of Qualifying Facades – Windlehurst Road

Address	Qualifying Façade(s)	Assessment	Eligible for Offer*
Netherfield, Middlewood Road	Northeast & Northwest	Living room and/or bedroom windows present.	YES
Longbourn, Middlewood Road	Northeast		YES
Pemberley, Middlewood Road	Northeast		YES
9, 10 & 11 Buxton Road	South		YES
6, 8 & 10 Buxton Road	North		YES
13 Buxton Road	West, East & South		YES
15, 17, 19 & 21 Buxton Road	Southwest		YES
Old Schoolhouse, Buxton Road	North & West		YES
Public House, Buxton Road	South & West*		YES
Two Apartment buildings : 1 to 18 Windlehurst Court	(See Appendix C)		YES

*East façade appears to have no qualifying windows or doors.

5.3. Discussion

5.3.1. A6 MARR

Generally, the new A6 MARR road is well mitigated in terms of noise by the surrounding earth bunds and/or timber noise fencing. A low noise road surface also reduces noise. Where existing roads have been altered to accommodate new road junctions there are some dwellings that are predicted to experience an increase in noise that qualify them for noise insulation.

A total of 15 dwellings and one apartment building have been identified as eligible for an offer of noise insulation under the provision of the Regulations. However, during the process of obtaining a quote for the work, a surveyor will need to confirm the presence of an eligible room(s) (living room, bedroom & study) associated with the qualifying windows/doors. A surveyor will also need to ensure there are no flueless combustion appliances present, as this will mean the relevant room is not eligible for noise insulation.

In addition, there are two dwellings with windows/doors on the qualifying facade which, from experience, do not appear to be linked to eligible rooms. Further investigation may need to be carried out where necessary, however, it is considered ‘unlikely’ that these dwellings will be eligible for noise insulation.

At 133 Stanley Road the qualifying façade is not visible from the roadside or aerial photography. This will require a visit to the property with consent of the owner/occupier to confirm the presence of a qualifying window/door to an eligible room.

Two dwellings 132 Woodford Road and 2 Yew Tree Avenue were calculated to satisfy the qualifying criteria at 1st floor level (4 metres above ground). However, upon review the buildings have been identified as bungalows. The 1st floor noise levels have subsequently been be discounted from the assessment, and these two dwellings are not considered to be eligible for noise insulation.

At 178 Buxton Road and 1 Werneth View the qualifying façades clearly have no qualifying windows or doors and are therefore not eligible for noise insulation.

5.3.2. Windlehurst Road Junction

The A6 has been altered either side of the Windlehurst Road junction and based on future year traffic increases compared to prevailing conditions, predicted noise increases qualify these adjacent dwellings for noise insulation.

A total of 16 dwellings and two apartment buildings have been identified as eligible for an offer of noise insulation under the provision of the Regulations, as shown in Table 5-2 and Appendix C. However, as stated above, a surveyor may identify non-eligible rooms and/or flueless combustion appliances which could affect eligibility.

Two dwellings on Buxton Road, namely the Old Schoolhouse and the Public House, have commercial use areas which are not eligible for noise insulation, however, the permanent residential rooms in these building may be eligible.

6. Conclusions

Atkins Acoustics Noise and Vibration has built two 3D computer noise models, one of the 'prevailing' situation prior to the construction, and one of the current 'relevant' situation with the A6MARR and Windlehurst Road junction in full operation. The prevailing and relevant noise levels have been calculated in accordance with the methodology prescribed in CRTN.

The road traffic forecast flow, speed and composition had been updated and were provided by Atkins Transport team for years 2017 (prevailing) and 2032 (relevant). 'As built' scheme topography and barriers were provided by SMBC.

The calculated noise levels were compared and assessed against the criteria in the Regulations, detailed in Paragraph 2.1.1 above, which identified 38 dwellings and three apartment buildings with a qualifying façade(s).

These dwellings were reviewed by visiting the sites and using available online maps and photography, checking for qualifying windows and doors. This assessment identified 31 dwellings and three apartment building that are considered eligible for an offer under the provision of the Regulations.

A further three dwellings may require further clarification on the presence of qualifying windows/doors and/or eligible rooms, and four dwellings have been discounted.

The actual offer of works or a grant for the works is dependent on a quotation from a surveyor. During the process of obtaining a quote for the work, the surveyor will need to confirm the presence of an eligible rooms (living room, bedroom & study) associated with the qualifying windows/doors. A surveyor will also need to ensure there are no flueless combustion appliances present, as this will mean the relevant room is not eligible for noise insulation. Therefore, no guarantees should be made to residents/owners until this has been completed.

Appendices

Appendix A. Glossary of Acoustic Terms

A.1.1. Decibel (dB)

The unit of measurement used for sound pressure levels. The scale is logarithmic rather than linear. The threshold of hearing is 0dB and the threshold of pain is 120dB. In practical terms these limits are seldom experienced and typical levels lay within the range 30dB (a quiet night time level in a bedroom) to 90dB (at the kerbside of a busy city street).

A.1.2. A-Weighting dB(A)

The sound pressure level determined when using the frequency-weighting network 'A'. The A-weighting network modifies the electrical response of a sound level meter so that the sensitivity of the meter varies with frequency in approximately the same way that the sensitivity of the human hearing system varies with frequency. The human ear has a non-linear frequency response; it is less sensitive at low and high frequencies and most sensitive in the range 1 to 4 kHz. A-weighted sound levels are often denoted as dB(A).

A.1.2.1. $L_{Aeq,t}$

This is notionally the steady dB(A) level that, over a given time period, contains the same acoustic energy as the actual fluctuating noise level during the same period. It has been shown that LAeq noise levels at locations near busy roads are approximately 3dB lower than LA10 over the same time period.

A.1.2.2. L_{A90}

A-weighted statistical sound level exceeded for 90% of the time. It is commonly referred to as the background noise level.

A.1.2.3. L_{A10}

A-weighted statistical sound level exceeded for 10% of the time. It is commonly used in the assessment of road traffic noise.

A.1.3. AAWT (18-hour)

The 18-hour Annual Average Weekday Traffic. This is the 18 hour traffic flow (06:00 to 24:00) from Monday to Friday for a given road link, averaged out over one year.

A.1.4. Façade Noise Level

A facade noise level is the noise level 1m in front of the most exposed window or door in a building facade. The effect of the sound reflecting of the building produces a slightly higher (+2.5 dB) sound level than it would be if the building was not there.

A.1.5. Prevailing Noise Level

The noise level expressed as LA10(18-Hour) one metre in front of the most exposed of any windows and doors in a facade of a building caused by traffic using any highway immediately before works for the construction of a highway, or for the alteration of a highway, as the case may be, were begun.

A.1.6. Relevant Noise Level

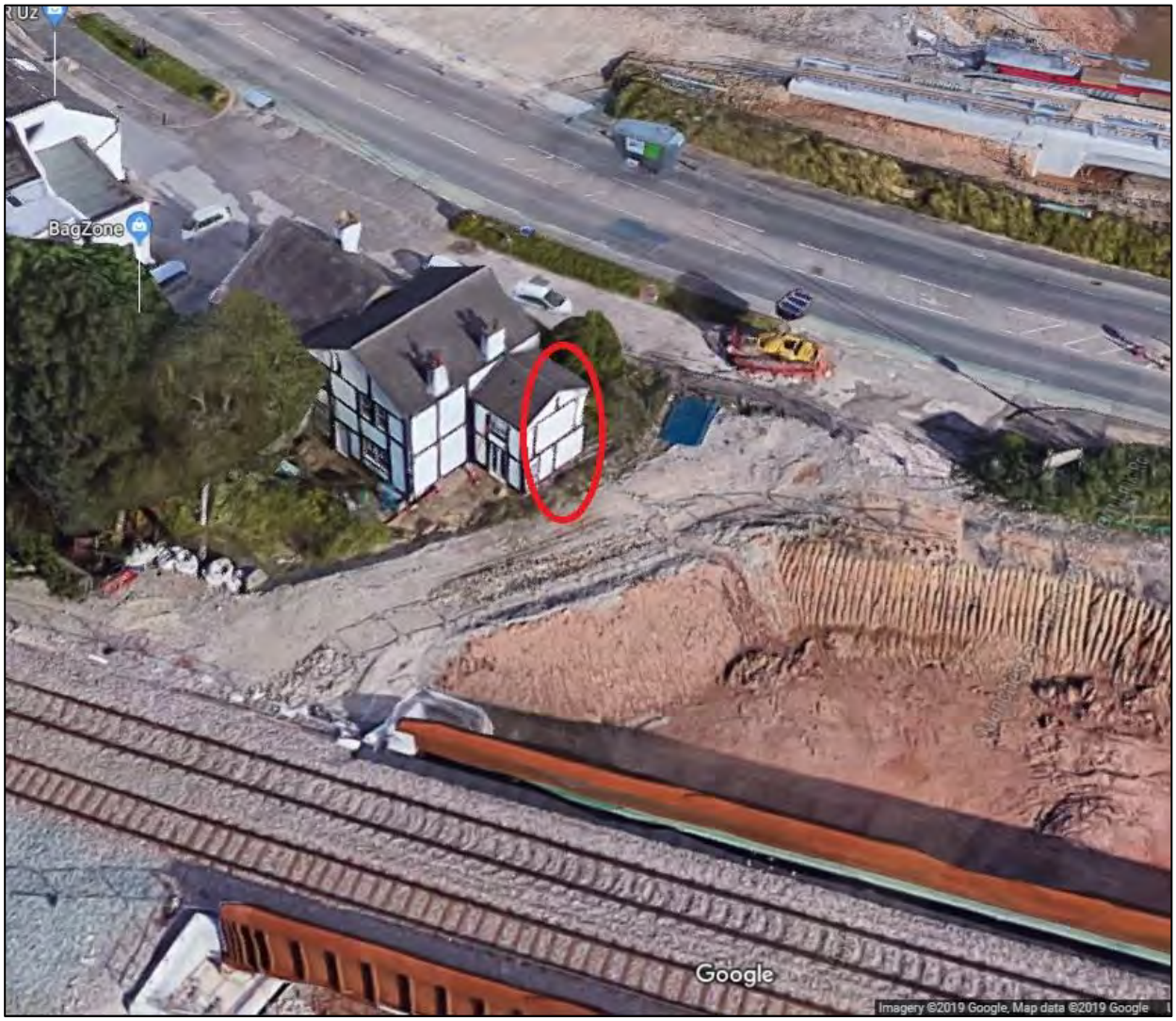
The maximum noise level expressed as L10(18-Hour) one metre in front of the most exposed of any windows and doors in a facade of a building caused by road traffic within the 15 year period after scheme opening. It is quoted in dB using the LA10 (18 hour) index.

A.1.7. Relevant Date

The date on which a highway or additional carriageway was first opened to public traffic, or in the case of an altered highway, the date on which it was first open to public traffic after the completion of the alteration.

Appendix B. Review of Qualifying Facades

Figure B-1 - 178 Buxton Road



No qualifying windows or doors in the qualifying façade.

Figure B-2 - 46 Carsdale Road

Based on shape and location of windows and prior experience, it is likely to be a to a stair/landing, hence not eligible room.

Figure B-3 - 1 St James Way

No qualifying windows in gable end, but west façade has windows.

Figure B-4 - 133 Stanley Road

Qualifying façade obscured.

Figure B-5 - 156A Woodford Road

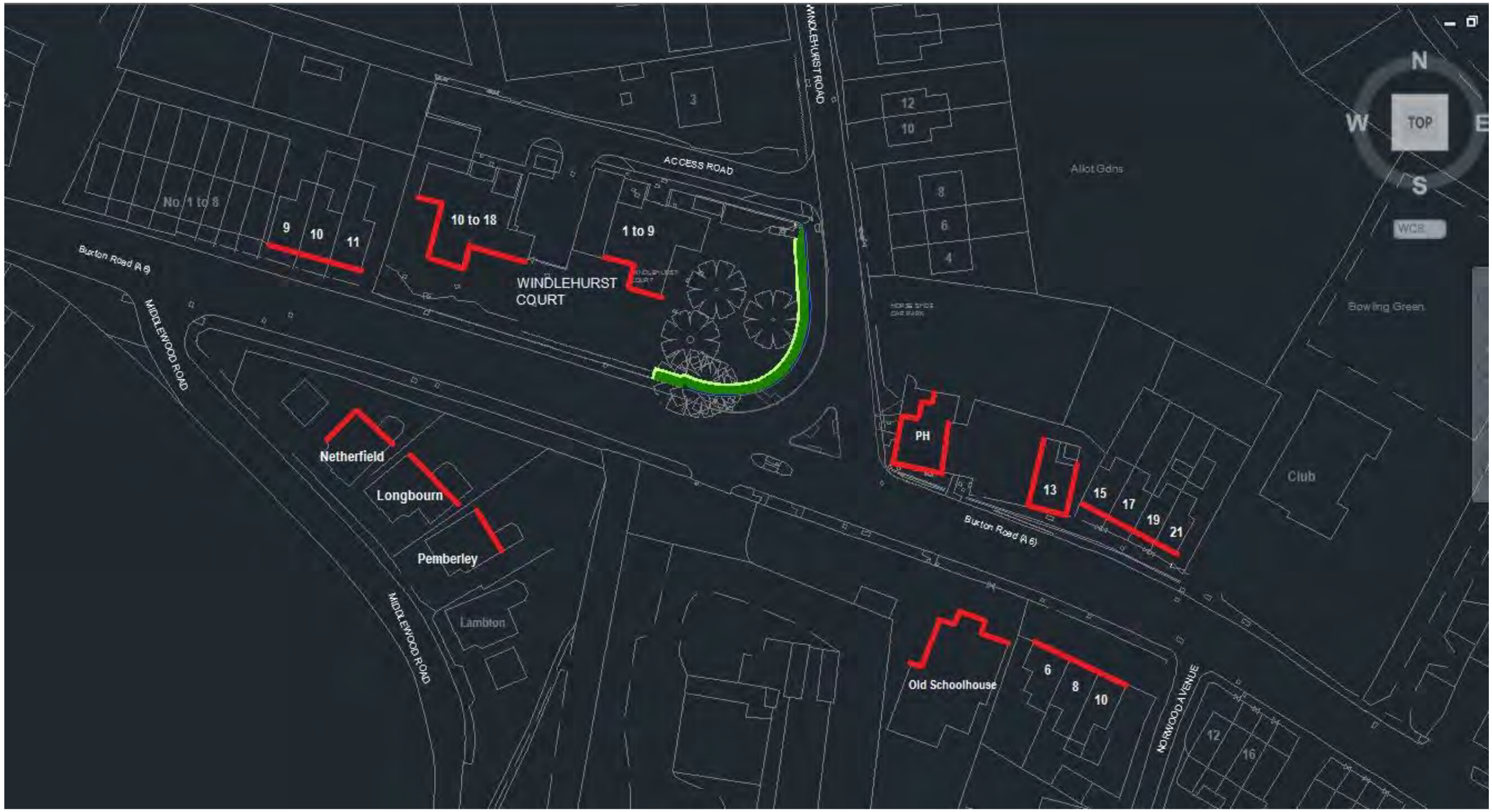
Based on shape and location of windows and prior experience, it is likely to be a to a kitchen/store/utility, hence not eligible room.

Figure B-6 - 1 Werneth View

No qualifying windows in gable end.

Appendix C. Windlehurst Road Junction – Qualifying Facades

Figure C-1 - Qualifying Facades (Red)



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