# Noise Impact Assessment

Land at Mount Road, Gorton

Reference: 50-710-R1-6

Date: October 2023

# NOISE IMPACT ASSESSMENT

Land at Mount Road,
Gorton

Prepared for:

**Kellen Homes and Greater Manchester Youth Federation (GMYF)**

**Report Ref: 50-710-R1-6**
**Date Issued: 30th October 2023**

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## QUALITY ASSURANCE

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# EXECUTIVE SUMMARY

## BACKGROUND

| | |
|---|---|
| **Site Address** | Mount Road, Gorton, M18 7SU |
| **National Grid Reference** | E 388336, N 395037 |
| **Proposed Development** | Full planning application proposing the erection of a youth, sports and community hub (Use Class E(d)(g)), F2(b)), 2no football pitches combined netball and basketball court, cricket strip (Use Class F2 (c)), a three storey apartment building comprising 36no apartments for young person's accommodation (Use Class C3) and 267no dwellinghouses (Use Class C3a), with associated landscaping, public realm, ecological mitigation, refuse storage, drainage, car parking and other associated works, with access from Wembley Road and Mount Road. |
| **Report Objectives** | The objectives of this report are to:<br>• Identify, measure and assess the potential impact of any existing noise sources in the immediate vicinity of the Site upon proposed residential receptors.<br><br>The report follows current and relevant British Standards in order to provide a robust assessment. |

## ASSESSMENT

| | |
|---|---|
| **Surveys Completed** | An attended road traffic sound measurement has been undertaken for Mount Road and Wembley Road during a typical weekday period in accordance with Calculation of Road Traffic Noise.<br><br>No other notable sources of sound impact upon the site. |
| **Assessments** | A 3D noise model has been constructed to assess road traffic and sports pitch sound across the site and incident upon facades.<br><br>Road traffic sound impact is assessed in accordance with the criterion, for day and night, given in BS 8233:2014+A1:2019. Proposed sports pitches are assessed in accordance with 'Artificial Grass Pitches - Acoustics Sport England'. |
| **Mitigation Requirements** | The assessment has recommended higher specification glazing for certain plots. A whole dwelling ventilation system is assumed to be installed across the site in accordance with Building Regulations ADF.<br><br>Certain plots cannot rely on the opening of windows to mitigate overheating and as such a full overheating assessment for these plots is required.<br><br>Furthermore, acoustic barriers of 1.8 m in height are also required to protect certain gardens from road traffic and sports pitch sound. |

## CONCLUSIONS

With mitigation measures in place, this assessment has shown that no adverse impact is predicted day or night at the receptors due to road traffic or sports pitch sound.

As such, noise need not be a material consideration in the granting of planning permission if the recommendations of this report are followed and included within the design stage.

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# 1. INTRODUCTION

## 1.1. BACKGROUND

This Noise Impact Assessment has been prepared by E3P on behalf of Kellen Homes and the Greater Manchester Youth Federation ("GMYF") and is submitted in support of an application for full planning permission at Land at Mount Road, Gorton ("the site"). The description of development is as follows:

> *Full planning application proposing the erection of a youth, sports and community hub (Use Class E(d)(g)), F2(b)), 2no football pitches combined netball and basketball court, cricket strip (Use Class F2 (c)), a three storey apartment building comprising 36no apartments for young person's accommodation (Use Class C3) and 267no dwellinghouses (Use Class C3a), with associated landscaping, public realm, ecological mitigation, refuse storage, drainage, car parking and other associated works, with access from Wembley Road and Mount Road.*

The application site is owned by GMYF in its entirety. GMYF is a charity, originating from the mid 1800s, who work with a wide variety of voluntary youth groups and projects throughout the most disadvantaged communities of Greater Manchester. GMYF's aim is to provide as many opportunities as possible for young people to grow and be the best that they can be, helping them to move beyond their boundaries. In simple terms, it is about getting young people off the streets, into clubs and doing something positive with their time.

The application site was previously in use as football pitches but has been vacant and underutilised since 2019 with no public access. GMYF selected Kellen Homes as their developer partner and together, with their professional teams, they have developed proposals for the site which will secure its future as a youth, community and sports hub whilst also providing much needed housing in Gorton.

The proposed development is described fully in the Design and Access Statement prepared by Gillespies and presented on the application drawings. The application proposals have been developed in consultation with Manchester City Council ("MCC") Officers and other key stakeholders."

## 1.2. PROPOSED DEVELOPMENT

Full planning application proposing the erection of a youth, sports and community hub (Use Class E(d)(g)), F2(b)), 2no football pitches combined netball and basketball court, cricket strip (Use Class F2 (c)), a three storey apartment building comprising 36no apartments for young person's accommodation (Use Class C3) and 267no dwellinghouses (Use Class C3a), with associated landscaping, public realm, ecological mitigation, refuse storage, drainage, car parking and other associated works, with access from Wembley Road and Mount Road.

The key source of sound impacting upon the Site is road traffic associated with Mount Road and Wembley Road. Schools are located to the west and the south-east of the site however whilst in attendance at site, no significant noise was noted.

This assessment has been undertaken in accordance with the following supplied drawings:

- CAD Site Layout (KH008 A-100 Rev P3) dated 7th September 2023.

## 1.3. LIMITATIONS

Where a noise or vibration survey is required to inform an assessment, E3P will endeavour to ensure that all noise and vibration measurements taken are robust, representative, and reliable in order to inform an accurate assessment.

Where mitigation measures are specified in this report, it should be noted that these measures are relative to a specific sound or vibration source, both in terms of the measured sound pressure and vibration level and the character of the sound source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, E3P cannot be held responsible for any subsequent variations in the proposed mitigation performance.

# 2. ASSESSMENT METHODOLOGY

## 2.1. NATIONAL PLANNING POLICY FRAMEWORK

To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be considered.

The national planning policy framework states that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development.
- Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

## 2.2. 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-making should take account of the acoustic environment and in doing so consider:

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

In line with the explanatory note of the NPSE, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase, where 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 2.1 summarises the noise exposure hierarchy, based on the likely average response.

TABLE 2.1 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** | | | |
| **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, or having to close windows for some of the time because of the noise where there is no alternative ventilation. 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, having to keep windows closed most of the time because of the noise where there is no alternative ventilation. 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 (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 situation. These factors include the following:

- 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. 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 can be important.
- The spectral content of the noise and the general character of the noise. The local topology and topography should also be considered 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 considered 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.
- If external amenity spaces are an intrinsic part of the overall design, then the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

## 2.3. BUILDING REGULATIONS: APPROVED DOCUMENT F - VOLUME 1: DWELLINGS (JUNE 2022)

Approved document F Volume 1: Dwellings (ADF) provides guidance set by the Department for Levelling Up, Housing and Communities, that relates to means of ventilation within dwellings. The ventilation strategy specified within the ADF are as follows.

> *1.9 The ventilation strategy in this approved document relies on a combination of all of the following.*
>
> *a. Extract ventilation from rooms where water vapour or pollutants are likely to be released (e.g. bathrooms and kitchens), to minimise their spread to the rest of the building. Ventilation fans may be either intermittent operation or continuous operation.*
>
> *b. Whole dwelling ventilation to provide fresh air to the building and to dilute, disperse and remove water vapour and pollutants not removed by extract ventilation.*
>
> *c. Purge ventilation to remove high concentrations of pollutants and water vapour. Purge ventilation is used intermittently and required only for pollutants produced by occasional activities (e.g. fumes from painting).*
>
> *1.10 Ventilation may be delivered through natural ventilation, mechanical ventilation or a combination of both.*

*1.11 The ventilation systems in this approved document are examples of systems that comply with Part F of the Building Regulations. Other ventilation systems may be acceptable if they can be shown to meet an equal level of performance.*

Within the ADF there are three system specific ventilation systems that can be utilised to provide sufficient ventilation. These methods are as follow.

1. ***Natural ventilation with background ventilators and intermittent extract fans*** *(guidance suitable only for less airtight dwellings) - Ventilation provided by thermal, wind or diffusion effects through doors, windows or other intentional openings without the use of mechanically driven equipment. For the purposes of this approved document, natural ventilation refers to a ventilation strategy using background ventilators and intermittent extract ventilation.*

2. ***Continuous mechanical extract ventilation*** *- Mechanically driven ventilation that continuously extracts indoor air and discharges it to the outside.*

3. ***Mechanical ventilation with heat recovery -*** *A mechanically driven ventilation system that both continuously supplies outdoor air to the inside of the dwelling and continuously extracts indoor air and discharges it to the outside. For the purposes of this approved document, the guidance for mechanical ventilation with heat recovery applies to centralised or decentralised supply and extract systems, with or without heat recovery.*

## 2.4. BUILDING REGULATIONS: APPROVED DOCUMENT O – OVERHEATING (JUNE 2022)

Approved document O - Overheating (ADO) provides guidance set by the Department for Levelling Up, Housing and Communities, that relates to the mitigation of overheating. In relation to noise the ADO provides the following guidance.

*3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

*3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*

*a. 40dB $L_{Aeq,T,}$ averaged over 8 hours (between 11pm and 7am).*
*b. 55dB $L_{AFmax,}$ more than 10 times a night (between 11pm and 7am).*

*3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants'*

*Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.*

*NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)*

## 2.5. BRITISH STANDARD BS 8233:2014+A1:2019 – GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

### 2.5.1. NOISE CRITERIA LIMITS

The scope of this standard is the provision of recommendations for the control of noise in and around buildings including residential dwellings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table 2.2.

TABLE 2.2 BS 8233:2014 RECOMMENDED INTERNAL NOISE LEVELS

| CRITERION | TYPICAL SITUATION | DESIGN CRITERION, $L_{Aeq,T}$ (dB) |
|---|---|---|
| **Suitable Resting and Sleeping Conditions** | Living Room | 35 |
| | Bedroom | 30 |

BS 8233 goes on to recommend noise levels for gardens:

> *It is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors might be warranted.*

BS 8233 goes on to say:

> *In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.*

### 2.5.2. VENTILATION REQUIREMENTS

Where a partially open window cannot be relied upon to provide an adequate level of façade sound insulation performance, it is necessary to consider alternative ventilation for habitable rooms. Section 8.4.5.4 within BS 8233 states:

> *The Building Regulations' supporting documents on ventilation [48, 49, 50] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice.*

> *Alternatively, acoustic ventilation units (see 7.7.2 below) are available for insertion in external walls. These can provide sound reduction comparable with double glazed windows. However, ducted systems with intakes on the quiet side of the building might be required in very noisy situations, or where appearance rules out through-the-wall fans.*

Section 7.7.2 states:

> *NOTE 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.*

## 2.6. WORLD HEALTH ORGANISATION (WHO) – GUIDELINES FOR COMMUNITY NOISE

The WHO gives guidance on desirable levels of environmental noise. The levels presented in the WHO Community Guidelines are those at which adverse effects become measurable. The 1980 WHO document suggested that *"general daytime outdoor noise levels of less than 55 dB(A) $L_{eq,16hr}$ are desirable to prevent any significant community annoyance."* This level is an external free-field noise level. The 1980 document also stated in relation to internal levels, *"that night-time noise levels of 35 dB(A) $L_{eq,8hr}$ or less will not interfere with the restorative process of sleep"*.

A report was submitted to the WHO in 1995 for consideration as a revision to the 1980 document and revised community guidelines were issued in 2000. In the 2000 guidelines, it is considered that the sleep disturbance criteria should be taken as an internal noise level of 30 dB $L_{Aeq,8\ hr}$ or an external level of 45 dB $L_{Aeq,8\ hr}$. It also recommends that internal $L_{Amax}$ levels of 45 dB and external $L_{Amax}$ levels of 60 dB should be limited where possible.

# 3. SURVEY RESULTS

## 3.1. ROAD TRAFFIC SOUND MEASUREMENT – WEMBLEY ROAD

E3P have undertaken a road traffic sound survey in accordance with the shortened measurement procedure given in Calculation of Road Traffic Noise (CRTN) during a typical weekday period. The survey was undertaken during the following period:

- 10:00-13:00 Friday 6th January 2023.

The following noise measurement position was chosen for the Road Traffic Noise Survey:

- Noise Measurement Position 1 (NMP1): Located on the eastern boundary of the site approximately 13 m from the roadside edge. The microphone was located at a height of 1.5 m above ground level and in free-field conditions. Sound sources consisted of road traffic along Wembley Road.

Table 3.1 details the measured sound pressure levels.

TABLE 3.1 MEASURED ROAD TRAFFIC SOUND LEVELS – WEMBLEY ROAD

| MEASUREMENT START TIME | MEASURED SOUND PRESSURE LEVELS (dB) | | | |
|---|---|---|---|---|
| | $L_{Aeq,T}$ | 10th Highest $L_{Amax,fast}$ | $L_{A90,T}$ | $L_{A10,T}$ |
| 10:00 | 54.5 | 72.5 | 47.8 | 57.6 |
| 11:00 | 54.6 | | 48.6 | 57.6 |
| 12:00 | 54.7 | | 48.9 | 58.1 |
| **Derived Daytime Noise Level, $L_{Aeq,16hr}$** | | | | **54.8** |
| **Derived Night-time Noise Level, $L_{Aeq,8hr}$** | | | | **47.3** |

During the survey, conditions remained dry and wind speeds rarely exceeded 5 m/s.

## 3.2. ROAD TRAFFIC SOUND MEASUREMENT – MOUNT ROAD

E3P have undertaken a road traffic sound survey in accordance with the shortened measurement procedure given in CRTN during a typical weekday period. The survey was undertaken during the following period:

- 13:10-16:10 Friday 6th January 2023.

The following noise measurement position was chosen for the Road Traffic Noise Survey:

- Noise Measurement Position 2 (NMP2): Located along the western boundary of site approximately 5 m from the roadside edge. The microphone was located at a height of 1.5 m above ground level and in free-field conditions. Sound sources consisted of road traffic along Mount Road.

Table 3.2 details the measured sound pressure levels.

TABLE 3.2 MEASURED ROAD TRAFFIC SOUND LEVELS – MOUNT ROAD

| MEASUREMENT START TIME | MEASURED SOUND PRESSURE LEVELS (dB) | | | |
|---|---|---|---|---|
| | $L_{Aeq,T}$ | 10th Highest $L_{Amax,fast}$ | $L_{A90,T}$ | $L_{A10,T}$ |
| 13:10 | 64.2 | 76.3 | 55.8 | 67.1 |
| 14:10 | 64.4 | | 56.7 | 67.1 |
| 15:10 | 63.8 | | 56.8 | 66.5 |
| **Derived Daytime Noise Level, $L_{Aeq,16hr}$** | | | | **63.9** |
| **Derived Night-time Noise Level, $L_{Aeq,8hr}$** | | | | **55.5** |

During the survey, conditions remained dry and wind speeds rarely exceeded 5 m/s.

The equipment outlined in Table 3.3 was used for the noise survey.

TABLE 3.3 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

| MEASUREMENT POSITION | EQUIPMENT DESCRIPTION | MANUFACTURER & TYPE NUMBER | SERIAL NUMBER | CALIBRATION DUE DATE |
|---|---|---|---|---|
| NMP1 and NMP2 | Sound Level Meter | 01dB Fusion | 14226 | 01/12/2023 |
| | Pre-amplifier | 01dB Pre22 | 2135072 | |
| | Microphone | GRAS 40CD | 470570 | |
| | Calibrator | Cirrus CR 515 | 99204 | 25/07/2023 |

The sound level meter was field calibrated on site using the above-mentioned calibrators prior to and after noise measurements were taken. No significant drift was witnessed as noted above. Calibration certificates are available upon request.

# 4. NOISE IMPACT ASSESSMENT

For the purposes of this assessment, E3P has used noise modelling software, CadnaA 2023 MR1, to determine the impact of noise from road traffic and proposed sports pitch sound.

The following inputs have been included in the model:

- Wembley Road is calibrated using NMP1 and Mount Road is calibrated using NMP2.
- Sports fields have been modelled in accordance with 'Artificial Grass Pitches - Acoustics Sport England' which states that "a typical free-field noise level of 58 dB $L_{Aeq\ (1hr)}$ at a distance 10 metres from the sideline halfway marking has been determined as representative for noise from an AGP".
- Site elevations have been taken as existing by way of a 2 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
- Existing buildings are included.
- A reflection order of 1 has been used in all calculations.
- Ground absorption has been taken as 0.5 due to the mixed landscape.
- Noise levels generated using ISO 9613-1 and ISO 9613-2 "*Acoustics – Attenuation of sound during propagation outdoors*" as incorporated into CadnaA software.

Figures 2 and 3 determine the noise levels across the Site during the daytime and night-time periods, respectively, due to road traffic and sports pitch sound.

## 4.1. EXTERNAL AMENITY AREA NOISE LEVEL ASSESSMENT

The noise model has been used to predict noise levels in rear garden areas and external amenity space to be used for relaxation. The predicted levels range between 37 dB and up to 63 dB.

As such, it is predicted that the No Observed Adverse Effect Level (NOAEL) is achieved in most rear garden areas with the following commentary:

> *"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."*

Accordingly, no action is required for these areas.

However, the gardens bounding the sports fields and a handful of gardens on the eastern boundary exposed to road noise are subject to noise levels in excess of 55 dB. As such, barriers are required in order to control external noise.

Section 5.0 details the locations and required heights.

## 4.2. INTERNAL NOISE LEVEL ASSESSMENT

With regards to internal noise levels, E3P has assumed a standard glazing specification of 4 mm glass/20 mm air space/4 mm glass affords sound insulation performance in the order of 29 dB however this is for a pink noise spectrum. The same unit, weighted for road traffic noise using the '+$C_{tr}$' correction, has a sound insulation performance value of approximately 25 dB and so this value has been used to calculate internal noise levels. The recently published AVO guide recommends that a partially open window provides approximately 13 dB attenuation.

The model has been used to predict façade noise levels at all floors. In order to determine any requirements for mitigation, E3P has added the reduction provided by the glazing (25 dB) to the relevant criterion for day (35 dB) and for night (30 dB). As such, any facades subject to noise levels higher than 60 dB during the day and/or 55 dB during the night will require higher specification glazing.

As can be seen in Figures 2 and 3, only façades on the eastern boundary exposed to Wembley Road and the sport pitches are subject to noise levels higher than these values. As such, these plots will require higher specification glazing. Standard double glazing is sufficient across the rest of the Site.

Exact glazing requirements for plots on the eastern boundary will be discussed in section 5.

Consideration must also be given to maximum noise levels generated by road traffic on Wembley Road and Mount Road. The 10th highest maximum noise level has been used and distance corrected to the closest plot for both Wembley Road and Mount Road. The maximum noise level at the worst affected facades would be 79 dB for Wembley Road and 63 dB for Mount Road.

Internal maximum noise levels of 45 dB $L_{Amax}$ should also not be exceeded. The sound insulation performance achieved by standard glazing (29 dB) has been added to the 45 dB maximum internal noise level limit. As, such facades subject to maximum noise levels above 74 dB will require higher specification glazing.

As shown above, facades along Wembley Road are subject to levels of 79 dB $L_{Amax}$ due to the bus route along this road. Therefore, higher specification glazing is required on these plots to mitigate against maximum noise levels generated by road traffic from Wembley Road.

With regards opening windows, there is a requirement to consider the need to open windows for ventilation and the mitigation of overheating. At this stage, the assessment assumes that ventilation would be provided by way of extract fans in kitchens and bathrooms and open windows.

### 4.2.1. VENTILATION CONDITION

It is assumed that the developer would be installing a whole dwelling ventilation system in accordance with Part F of the Building Regulations across the site. It is assumed Natural Ventilation (formerly system 1 ventilation) is not appropriate for these dwellings as this option is to less airtight dwellings only.

Where background ventilators form part of the system, consideration is required to the sound reduction provided by these when in the open position and, as such, are discussed in Section 5.0.

### 4.2.2. OVERHEATING CONDITION

E3P has considered the potential impact of noise, internally, should windows be opened to mitigate overheating, as per the criteria stipulated in ADO. Any plots/facades that pass this test can open windows for this without resulting in unacceptable internal noise levels. Those that fail the test would be subject to a Part O Overheating Assessment by a suitably qualified consultant.

Part O only applies to bedrooms at night in relation to the average 8-hour noise level and 10th highest maximum noise level.

Given that the site is within a moderate risk location, as per guidance within Approved Document O the external noise limit threshold is 49 dB during the night-time ($L_{Aeq,8hr}$) and 64 dB more than 10 times a night ($L_{Af,max}$).

As can be seen from the figure 4, eastern and western plots with line of sight to the roads will experience an exceedance of the above criterion. As such, the opening of windows is not a suitable method of mitigation against overheating. Therefore, a full overheating assessment will be required for these plots and should be undertaken by a suitably qualified consultant.

# 5. MITIGATION

## 5.1. ACOUSTIC BARRIERS

The previous section determined that sound levels in certain garden areas would exceed the 55 dB upper criterion stipulated in BS 8233. As such, additional grid noise maps, Figure 5 has been run to determine the required barrier heights.

As such, following barriers are required to achieve noise levels equal to or below the upper guideline value of 55 dB:

- 1.8 m high at plot 95.
- 1.8 m high at plots 102 and 103.
- 1.8 m high at plots 122 and 123.
- 1.8 m high at plots 245 to 263 and 267.

The barriers can be of wooden fence or brick wall construction but must be free from holes, sealed at the base and have a minimum mass of 10 kg/$m^2$.

## 5.2. FAÇADE INSULATION

The previous section determined that certain facades would require higher specification glazing and whole dwelling ventilation is required for certain plots. Specifically, the following glazing specifications are required, per facade, along with details on whole dwelling ventilation.

The worst-case required glazing is chosen per facade. For example, where a glazing needed due to night-time noise is higher than for daytime periods, the night-time requirements are recommended.

Maximum noise level events will also determine the glazing requirement and where mitigation is required due to maximum noise levels the sound reduction values will be given in terms of $R_w$ and $R_w+C_{tr}$. This will allow for the correct glazing units to be selected for each facade. Figure 5 highlights the affected facades.

TABLE 5.2 GLAZING AND VENTILATION REQUIREMENTS

| PLOT | REQUIRED GLAZING REDUCTION, (dB) | EXAMPLE GLAZING | WHOLE DWELLING VENTILATION SYSTEM |
|---|---|---|---|
| **Plot 95 to 101** | 34 $R_w$ (29 $R_w$ + $C_{tr}$) | 10 / 16 / 4 | Whole dwelling ventilation in accordance with the requirements in ADF and subject to Overheating Assessment |
| **Plots 102 and 103** | 34 $R_w$ (29 $R_w$ + $C_{tr}$) | 10 / 16 / 4 | |
| **Plots 123 to 129** | 34 $R_w$ (29 $R_w$ + $C_{tr}$) | 10 / 16 / 4 | |

Following the overheating consideration, Figure 6 highlights facades that would experience an exceedance of the external limits and thus internal ADO noise limits at night and, therefore, a full overheating assessment , is required for these plots.

All plots not highlighted in Figure 6 may rely on opening windows to mitigate overheating as when windows are open internal noise levels are acceptable. Any installed whole dwelling ventilation system should be in line with the requirements of Approved Document Part F, Volume 1: Dwellings.

It is assumed that this would be continuous mechanical extract ventilation as the dwellings are not likely to be suitable for natural ventilation. This will consist of either a central extract system, individual room extract fans or a combination of both.

Additionally, background ventilators should satisfy the requirements of ADF and, in order to achieve the required internal ambient noise levels, must achieve a reduction of at least that of the glazing specified for each facade, which is at most 34 dB $D_{n,e,w}$ in the open position. This level of reduction is likely to be achieved by a standard background ventilator.

# 6. CONCLUSION AND RECOMMENDATIONS

E3P were commissioned by Kellen Homes and Greater Manchester Youth Federation (GMYF) in order to undertake a Noise Impact Assessment for a proposed residential development on Land at Mount Road, Gorton.

Attended road traffic measurements have been undertaken for Wembley Road and Mount Road in accordance with Calculation of Road Traffic Noise.

A 3D noise model has been constructed to assess noise levels across the site due to road traffic. The predicted external and internal noise levels have been compared to the criteria given in BS 8233:2014.

Consideration has been given to external amenity space and internal habitable rooms.

The assessment has recommended higher specification glazing for certain plots located on the eastern boundary of the site. It is assumed a whole dwelling ventilation system will be installed across the site in accordance with the ADF.

Certain plots cannot rely on the opening of windows to mitigate overheating and as such a full overheating assessment for these plots is required.

Acoustic barriers of up 1.8 m in height are also required to protect certain gardens from road traffic and sports pitch sound.

The assessment has shown that, with mitigation measures in place, no adverse impact is expected due to existing sound sources. As such, noise need not be a material consideration in the granting of planning permission.

## END OF REPORT

# APPENDIX I
# 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 a factory |
| 100–110 | Burglar alarm at 1 m 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 (2E-05 Pa). |
| **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 $L_{eq}$ noise level but will still affect the noise environment. Unless described otherwise, it is measured using the "fast" sound level meter response. |
| **$L_{10}$ and $L_{90}$** | If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The $L_n$ 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 125-millisecond time constant. |
| **Slow** | A time weighting used in the root-mean-square section of a sound level meter with a 1000-millisecond time constant. |

# APPENDIX II
# FIGURES

**Figure 1 - Noise Measurement Positions**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**50-710**

**Client:**
**Kellen Homes**

N

e3p

Project Engineer: Melissa Bailey
Date: 30/10/2023

**Figure 2 - Daytime Grid Noise Map - Calculation at 1.5 m above ground level**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**51-710**

**Client:**
**Kellen Homes**

**Daytime Noise Level, LAeq, 16hr (dB)**

- ... <= 48
- 48 < ... <= 50
- 50 < ... <= 52
- 52 < ... <= 56
- 56 < ... <= 58
- 58 < ... <= 60
- 60 < ... <= 62
- 62 < ... <= 65
- 65 < ...

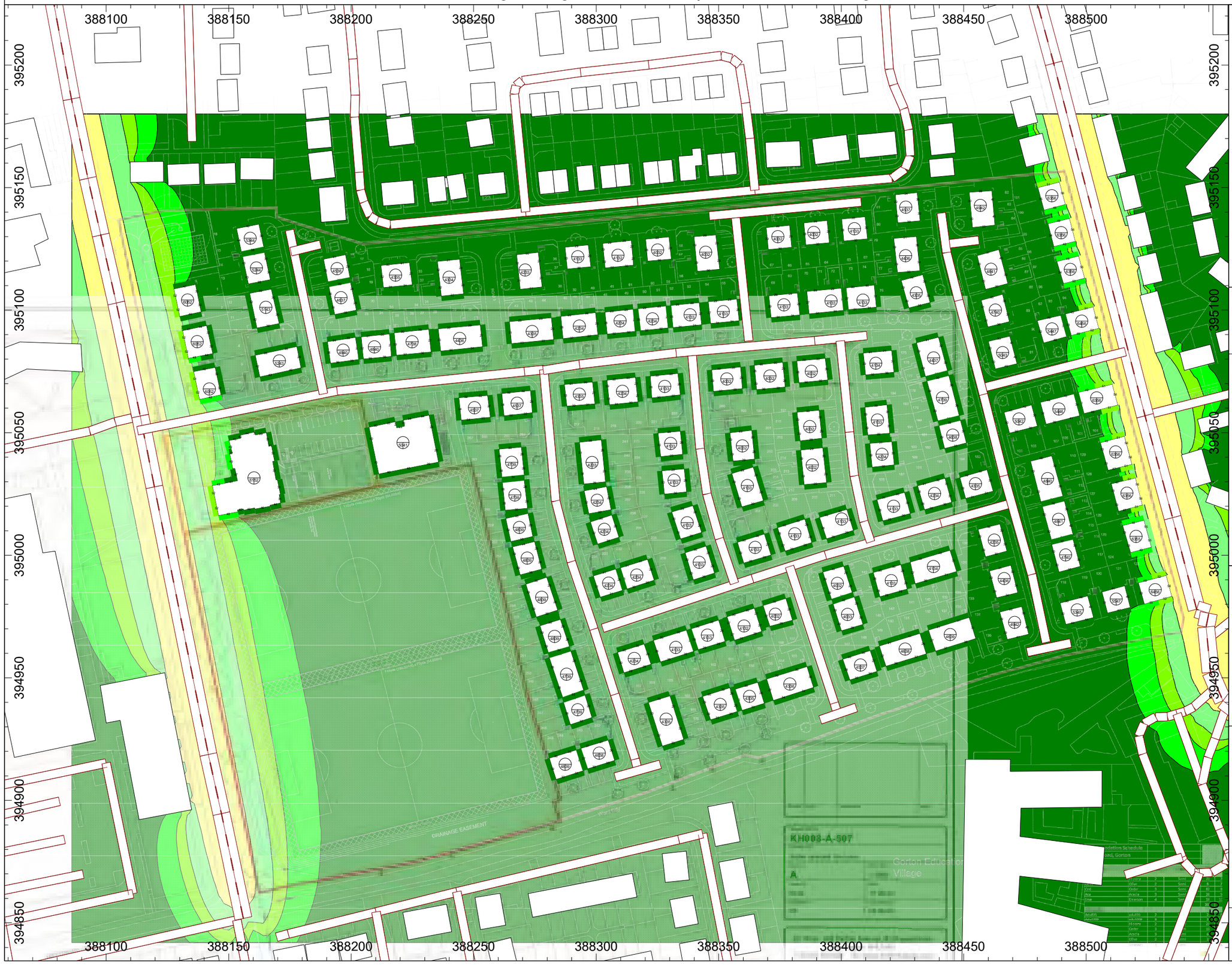
**Noise Map Objects**

- Area Source
- Road
- Building
- Barrier
- Building Evaluation
- Calculation Area

e3p

Project Engineer: M Bailey
Date: 30/10/2023

**Figure 3 - Night-time Grid Noise Map - Calculation at 4 m above ground level**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**51-710**

**Client:**
**Kellen Homes**

**Night-time Noise Level, LAeq, 8hr (dB)**

- ... <= 48
- 48 < ... <= 50
- 50 < ... <= 52
- 52 < ... <= 56
- 56 < ... <= 58
- 58 < ... <= 60
- 60 < ... <= 62
- 62 < ... <= 65
- 65 < ...

**Noise Map Objects**

- Area Source
- Road
- Building
- Building Evaluation
- Calculation Area

e3p

Project Engineer: M Bailey
Date: 30/10/2023

**Figure 4 - AD Part O Requirements - Calculation at 4 m above ground level**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**51-710**

**Client:**
**Kellen Homes**

**Night-time Noise Level, LAeq, 8hr (dB)**

... <= 49.0
49.0 < ...

**Noise Map Objects**

- Area Source
- Road
- Building
- Building Evaluation
- Calculation Area

e3p

Project Engineer: M Bailey
Date: 30/10/2023

**Figure 5 - Daytime with Mitigation Grid Noise Map - Calculation at 1.5 m above ground level**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**51-710**

**Client:**
**Kellen Homes**

**Daytime Noise Level, LAeq, 16hr (dB)**

- ... <= 48
- 48 < ... <= 50
- 50 < ... <= 52
- 52 < ... <= 56
- 56 < ... <= 58
- 58 < ... <= 60
- 60 < ... <= 62
- 62 < ... <= 65
- 65 < ...

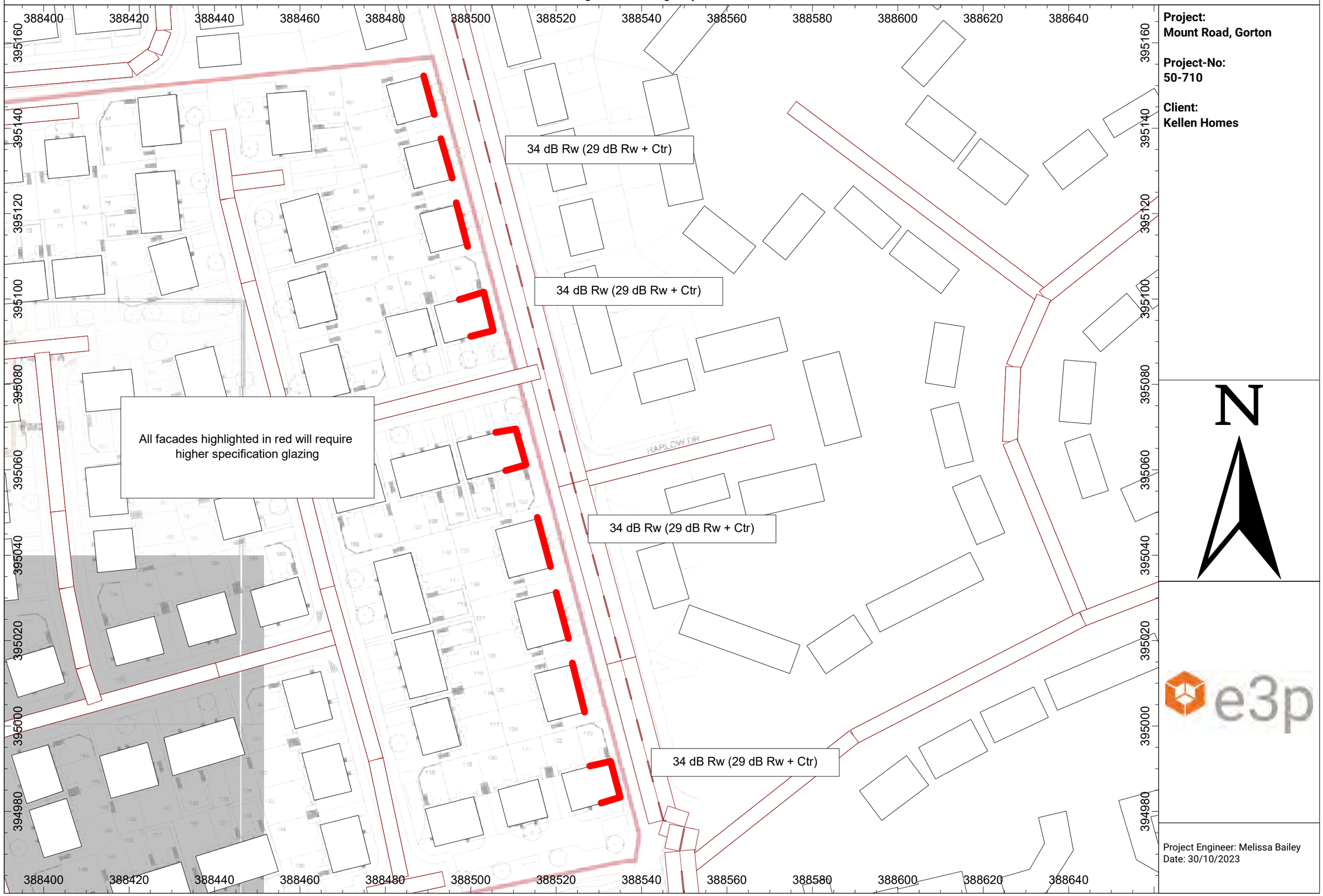
**Noise Map Objects**

- Area Source
- Road
- Building
- Barrier
- Building Evaluation
- Calculation Area

e3p

Project Engineer: M Bailey
Date: 30/10/2023

**Figure 6 - Glazing Requirements**




**Project:**
**Mount Road, Gorton**

**Project-No:**
**50-710**

**Client:**
**Kellen Homes**

N

e3p

Project Engineer: Melissa Bailey
Date: 30/10/2023