

Noise Impact Assessment

Site: Trub Farm, Rochdale
Reference: 51-156-R3
Date: July 24





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EXECUTIVE SUMMARY

Site Address	Trub Farm, Rochdale, OL11 2LY.
National Grid Reference	E 388221, N 410054.
Proposed Development	Proposed 162 residential dwellings with associated access roads, parking, landscaping and adopted drainage infrastructure.
Surveys Completed	A full 24-hour road traffic sound survey has been conducted for the M62 motorway. A full 24-hour rail noise survey has been undertaken for the railway line to the west. An attended vibration survey has also been conducted to check the perceptibility of vibration. It was shown that the perceptibility of vibration from the railway line is unlikely.
Assessments Completed	A 3D noise model has been constructed to assess road traffic and rail sound impact across the site and incident upon all facades and floors and in any external amenity areas. Road traffic and rail sound has been assessed in accordance with the criterion set out in BS 8233:2014.
Mitigation Recommendations	The assessment determined that certain facades require higher specification glazing to control internal noise levels across the development. A whole dwelling ventilation system is assumed to be installed across the site as per approved document F. A full overheating assessment in accordance with the guidelines indicated in Part O is required to allow for the provision of an alternative method of providing the mitigation of overheating without the need for opening windows. Furthermore, acoustic barriers are required for several plots to control noise levels in external amenity areas.
Conclusion and Discussion	With mitigation measures in place, this assessment has shown that no adverse impact is predicted day or night at the receptors due to road or rail traffic sound.



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1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by MCI Developments Ltd to undertake a Noise Impact Assessment for a proposed residential development on land at Trub Farm in Rochdale, to be referred to hereafter as 'the site'.

This assessment looks to determine the key noise sources that have potential to impact upon the noise sensitive development and to assess their impact, if any, upon proposed receptors and to specify mitigation measures, where required.

1.2. REPORT OBJECTIVES

The objectives of this report are as follows.

- ✦ Establish and measure the existing sound levels across the site, day and night.
- ✦ Consider the potential sources of sound impacting the site and to measure source sound levels of all applicable sources.
- ✦ Measure and assess the vibration levels generated by the railway line.
- ✦ Provide advice on mitigation measures, where required.

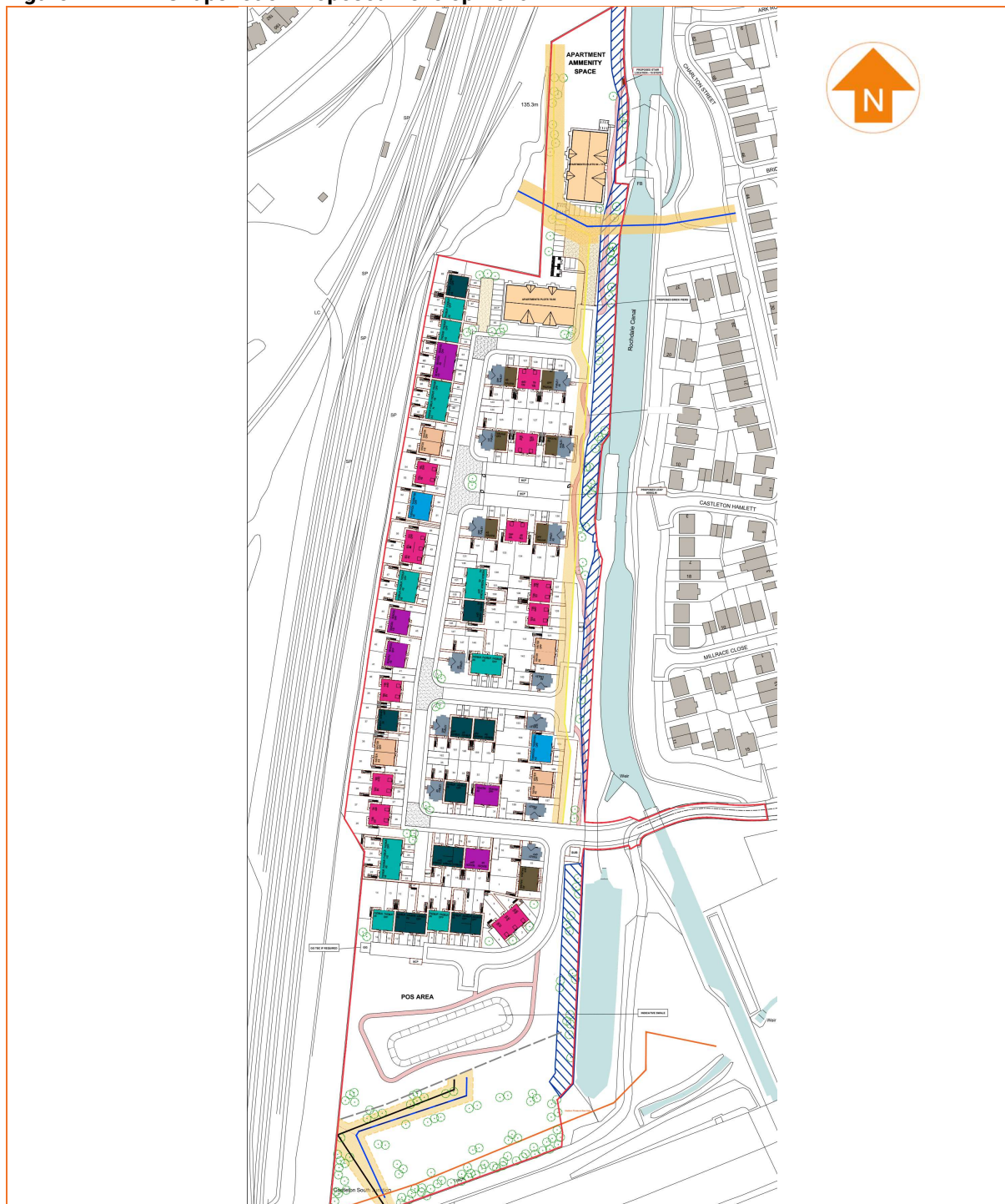
1.3. PROPOSED DEVELOPMENT

MCI Developments propose to construct 162 residential dwellings with associated access roads, parking, landscaping and adopted drainage infrastructure.

A snapshot of the proposed development layout is indicated in Figure 1.



Figure 1 **Snapshot of Proposed Development**





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 1 summarises the noise exposure hierarchy, based on the likely average response.

Table 1 Noise Exposure Hierarchy

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
Not Applicable	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 LAeq,T, averaged over 8 hours (between 11pm and 7am).*
- b. 55dB LAFmax, 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

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.

Table 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.

2.6. BRITISH STANDARD BS 6472-1: 2008: GUIDE TO EVALUATION OF HUMAN EXPOSURE TO VIBRATION IN BUILDINGS

With respect to human exposure to building vibration, BS 6472 provides guideline values of the Vibration Dose Value (VDV) above which various degrees of adverse comment may be expected from the occupants of residential buildings. The VDV is defined mathematically as the fourth root of the time integral of the fourth power of the vibration acceleration, after it has been frequency weighted. The guideline values recommended by BS 6472 are shown in Table 3.



Table 3 BS-6472 Guideline Values

RECEPTOR	LOW PROBABILITY OF ADVERSE COMMENT	ADVERSE COMMENT POSSIBLE	ADVERSE COMMENT PROBABLE
	VDV (m/s)		
Residential Building (16-hour day)	0.2-0.4	0.4-0.8	0.8-1.6
Residential Buildings (8-hour night)	0.1-0.2	0.2-0.4	0.4-0.8

Where the vibration is intermittent rather than continuous in nature, BS 6472 defines procedures for calculating the estimated VDV, based on the number and duration of vibration events and the recorded value of the root mean square frequency weighted vibration acceleration. The frequency weighting takes into account the response of the human body to vibrations of different frequency and whether the person is lying down or standing. The VDV can then be taken as the VDV for use in the assessment of human exposure to vibration in buildings.

The above guidance relates to vibration measured at the point of entry into the human body, which is usually taken to mean the ground surface or at a point mid-span of an upper storey floor, rather than the point of entry into the building (a foundation element).

2.6.1. BRITISH STANDARD 5228-2:2009+A1: 2014 – CODE OF PRACTISE FOR NOISE AND VIBRATION CONTROL PART 2

E3P will use the criteria within BS 5228-2 and carry out a preliminary survey to measure Peak Particle Velocity (PPV). Where levels are below the below levels stated within BS 5228-2 a further full Vibration Dose Value (VDV) survey, in accordance with BS 6472-1 will not be required as levels will be in perceptible to residents.

Human beings are known to be very sensitive to vibration, the threshold of perception being typically in the PPV range of $0.14 \text{ mm} \cdot \text{s}^{-1}$ to $0.3 \text{ mm} \cdot \text{s}^{-1}$

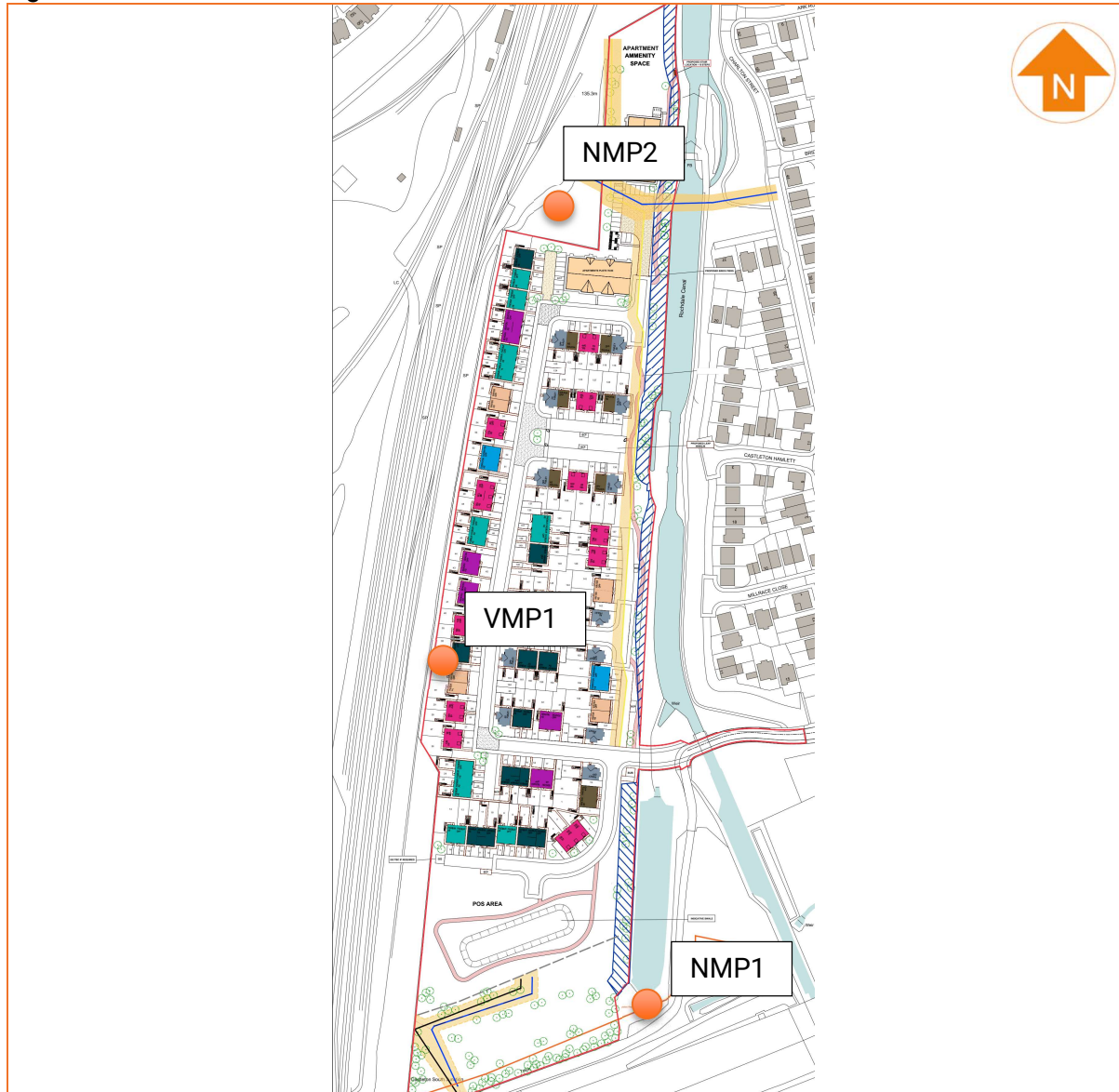
Where levels are below 0.14 mms^{-1} further consideration will not be required in relation to vibration.



3. SURVEY RESULTS

The measurement positions are detailed in Figure 2.

Figure 2 Noise Measurement Positions



3.1. SOUND CLIMATE

Prior to the surveys and during, E3P undertook a site walkover across the Site to determine the existing sound climate and associated sources.

It was noted that the main source of sound was road traffic sound associated with the M62 motorway with occasional rail noise from the west. As such, E3P carried out unattended road traffic measurements and an unattended rail noise measurement.



3.2. ROAD TRAFFIC MEASUREMENT – M62

E3P has conducted an unattended road traffic sound measurement in accordance with the measurement procedure given in Calculation of Road Traffic Noise (CRTN). The survey was carried out over the following periods:

- 📍 16:00 Wednesday 20th March 2024 until 12:00 Friday 22nd March 2024.

Data was used between 23:00 20th March to 23:00 21st March as outside of these time adverse weather was in effect.

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

- 📍 Noise Measurement Position 1 (NMP1): Located along the southern boundary of site approximately 30 m from the nearside edge of the M62 Motorway. The microphone was located at a height of 1.5 m above ground level and in free field conditions.

A summary of the measured sound pressure levels from the Road Traffic Noise Survey is presented in Table 4. The $L_{Amax,fast}$ is expressed as a 10th highest 1-minute maximum noise level during the night-time period.

Table 4 Hourly Noise Levels - M62 Motorway

MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVELS (dB)			
	L _{Aeq,1hr}	L _{Amax,fast}	L _{A10,1hr}	L _{A90,1hr}
23:00 – 00:00	66.6	76.9	69.4	61.4
00:00 – 01:00	65.2		68.2	57.2
01:00 – 02:00	64.8		68.6	55.8
02:00 – 03:00	64.5		68.3	56.2
03:00 – 04:00	64.5		68.0	57.3
04:00 – 05:00	66.7		70.0	60.2
05:00 – 06:00	70.1		72.3	66.4
06:00 – 07:00	72.0		73.4	69.1
07:00 – 08:00	72.2	N/A	73.5	70.4
08:00 – 09:00	72.7		73.9	71.0
09:00 – 10:00	76.5		74.2	71.2
10:00 – 11:00	72.8		74.1	70.9
11:00 – 12:00	76.4		74.5	71.1
12:00 – 13:00	73.7		74.9	71.9
13:00 – 14:00	73.7		74.9	72.1
14:00 – 15:00	73.4		74.7	71.6
15:00 – 16:00	73.4		74.5	71.9
16:00 – 17:00	73.6		74.7	72.0
17:00 – 18:00	72.9		74.0	71.4
18:00 – 19:00	73.1		74.0	70.5
19:00 – 20:00	71.2		72.8	68.9
20:00 – 21:00	71.2		72.9	68.7
21:00 – 22:00	69.6		71.8	66.0
22:00 – 23:00	68.8		71.0	65.1
Daytime Average Noise Level, L _{Aeq,16hr}				73.3
Night-time Average Noise Level, L _{Aeq,8hr}				67.7



3.3. RAIL TRAFFIC SOUND MEASUREMENT

E3P has conducted a Rail Traffic Noise Survey to measure the level of noise generated by locomotives along the railway line. The survey was carried out over the following time periods in accordance with Calculation of Rail Noise (CRN):

- 📍 16:00 Wednesday 20th March 2024 until 12:00 Friday 22nd March 2024.

Data was used between 23:00 20th March to 23:00 21st March as outside of these time adverse weather was in effect.

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

- 📍 Noise Measurement Position 2 (NMP2): Located approximately 30 m from the nearside rail, on the western boundary of the Site. The microphone was located at a height of 1.5 m above ground level and in free-field conditions.

A summary of the measured sound pressure levels from the Rail Traffic Noise Survey are presented in Table 5.

Table 5 Hourly Noise levels - Railway line

MEASUREMENT START TIME	MEASURED SOUND PRESSURE LEVELS (dB)			
	L _{Aeq,1hr}	L _{Amax,fast}	L _{A10,1hr}	L _{A90,1hr}
23:00 – 00:00	53.0	74.2	49.7	44.3
00:00 – 01:00	50.5		50.6	45.3
01:00 – 02:00	51.7		52.6	46.9
02:00 – 03:00	49.6		51.6	46.5
03:00 – 04:00	53.9		51.6	46.4
04:00 – 05:00	53.9		54.3	48.3
05:00 – 06:00	58.0		59.2	54.0
06:00 – 07:00	60.0		61.1	56.3
07:00 – 08:00	60.3	N/A	60.6	56.5
08:00 – 09:00	59.8		60.7	56.6
09:00 – 10:00	59.3		59.5	56.6
10:00 – 11:00	59.6		60.3	56.8
11:00 - 12:00	60.3		60.9	57.3
12:00 – 13:00	61.0		61.2	58.4
13:00 – 14:00	61.1		61.7	58.7
14:00 – 15:00	60.7		61.3	58.1
15:00 – 16:00	60.4		60.8	58.1
16:00 – 17:00	60.9		61.3	58.3
17:00 – 18:00	60.1		60.1	57.5
18:00 – 19:00	60.2		60.7	56.9
19:00 – 20:00	59.0		59.4	56.0
20:00 – 21:00	59.0		58.8	55.6
21:00 – 22:00	57.4		57.0	53.1
22:00 – 23:00	57.4		56.1	52.4
Daytime Average Noise Level, L _{Aeq,16hr}				59.9
Night-time Average Noise Level, L _{Aeq,8hr}				55.2

The equipment outlined in 6 was used for the noise survey.



Table 6 Noise Measurement Equipment and Calibration Dates

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
NMP1	Sound Level Meter	01dB Fusion	14616	29th June 2024
	Pre-amplifier	01dB Pre22	20951	
	Microphone	GRAS 40CD	494264	
	Calibrator	Cirrus CR 515	99206	
NMP2	Sound Level Meter	Cirrus CR:171A	G303884	15th September 2025
	Pre-amplifier	Cirrus MV:200F	12731F	
	Microphone	Cirrus MK:224	215899D	
	Calibrator	Cirrus CR:515	99403	

The sound level meter was calibrated before and after measurements with no significant drift witnessed.

3.4. RAIL VIBRATION SOURCE MEASUREMENT

E3P have undertaken attended vibration measurements of rail pass-bys, capturing approximately 10 train pass-bys.

The highest measured vibration level, in all axis, was 0.150 mm/s. For the vast majority of pass-bys, levels did not exceed the vibration floor of 0.025 mm/s.

One single event marginally exceeded the criterion of 0.14 mm/s below which vibration is unlikely to be perceptible even in the most sensitive situations. However, given that the measurement location was at the red line boundary and the dwellings are located several meters away from the boundary, levels at the proposed properties will likely be significantly lower than the levels required to be perceptible.

Accordingly, no further consideration to rail vibration is given.

Table 7 Calibration Information

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE AT TIME OF SURVEY
VMP1	Vibration Meter	Vibrocock V9000	2329	8th April 2024



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 and rail traffic sound.

The following inputs have been included in the model:

- ✿ Site Layout - Drawing Number MCI-000-DR-A-500 REV H – Dated 28.03.24.
- ✿ M62 Motorway is calibrated using NMP1.
- ✿ The railway line is calibrated using NMP2.
- ✿ 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. Finished floor levels of the proposed dwellings have also been included.
- ✿ Existing buildings are included.
- ✿ A reflection order of 2 has been used in all calculations.
- ✿ Noise levels generated using ISO 9613-1 and ISO 9613-2 "Acoustics – Attenuation of sound during propagation outdoors" as incorporated into CadnaA software.

Figures 3 and 4 determine the noise levels across the Site during the daytime and night-time periods, respectively, due to road and rail traffic sound.

4.1. EXTERNAL AMENITY AREA NOISE LEVEL ASSESSMENT

The noise model has been used to predict noise levels in the shared amenity spaces which are to be used for relaxation. The predicted levels range from 44 dB and up to 60 dB in the worst affected external amenity areas. Therefore, noise levels within certain external amenity areas exceed the upper criterion of 55 dB.

As such, it is predicted that some areas will have the lowest observed adverse effect level, which has the following commentary:

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.

As such, mitigation in the form of acoustic barriers is required to reduce noise levels in these areas. Details on mitigation measures will be provided in Section 5.



4.2. INTERNAL NOISE LEVEL ASSESSMENT

With regards internal noise levels, E3P has assumed a standard glazing specification of 4 mm glass/20 mm air space/4 mm glass which affords a sound insulation performance in the order of 29 dB R_w (C_{tr} -1; C_{tr} -4). The primary noise impact here is road traffic sound, as such, the C_{tr} correction is applied. Railway sound is present but not dominate over road traffic sound, the application of the C_{tr} correction is considered worst case.

The model has been used to predict façade noise levels at all floor levels and orientations. 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.

The highest predicted day and night façade levels here are 66 dB and 61 dB respectively. As such, plots closest to the M62 will require higher specification glazing. The exact specifications of the units will be given in section 5.

It is also important to consider the maximum noise levels during the night-time period. Figure 5 has been produced using the 10th Highest maximum noise levels for each road and the railway line. As can be seen on Figure 5 many plots with line of sight to the roads and railway line will require higher specification glazing. Further details will be given in Section 5.

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 openable 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 as it is assumed Natural Ventilation is not appropriate for these dwellings.

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 ($L_{A10,max}$).

As can be seen from Figure 5 & 6, all plots experience an exceedance of the above criterion, particularly the night-time 8-hour criterion. As such, a full overheating assessment in accordance with the guidelines indicated in Part O is required for all plots. A full overheating assessment should be carried out by a suitable qualified consultant.



5. MITIGATION

5.1. EXTERNAL AMENITY AREA

As shown in Section 4.1, several plots would experience an exceedance of the 55 dB criterion in rear garden areas. As such, an additional noise model has been run to determine the required barrier height needed to achieve levels of 55 dB and below.

However, it must be noted that due to the sound climate and proximity to the M62 and major railway line levels of 55 dB and below is not achievable using practicable means for all garden areas. As such the recommended mitigation measures have been selected to provide sufficient protection to external amenity areas, while keeping mitigation measures practicable. For certain gardens closest to the railway line and the M62 a level of 58 dB has been set as the upper criterion.

BS 8233 makes it clear that the 50 to 55 dB criterion range is a guideline only and exceeding this criterion should not automatically lead to refusal in all circumstances. Specifically, BS8233 states:

'..it is also recognized 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, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'

Given that the site clearly falls into the category of 'higher noise area' (as it adjoins the strategic transport network) the recommendations to achieve lowest practicable levels in worst affected external amenity areas can be considered appropriate. This is in accordance with BS 8233.

As shown in Figure 7, barriers for the following plots are required.

-  Plots 1 to 4 – 2.5 m high barrier
-  Plots 14 – 2.8 m high barrier
-  Plots 22 to 26 – 2.5 m high barrier
-  Plot 158 – 2.5 m high barrier

The barriers can be of wooden fence or brick wall construction but must be free from holes, be sealed at the base and have a minimum mass of 10kg/m². Locations of the barriers can be found on Figure 7 in the appendix of the report.

5.2. FAÇADE INSULATION AND VENTILATION

The previous section determined that a whole dwelling ventilation system in accordance with Part F would be installed across the site as it is assumed natural ventilation is not appropriate for these dwellings. Higher specification glazing will be required for across certain facades. Standard thermal double glazing being sufficient across the rest of the site.



Tables 8 the required glazing per façade. 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. Where maximum noise levels need mitigation the R_w value is provided.

It is recommended that a glazier is consulted to ensure any system installed achieves the above reduction as a minimum. These specifications should be reviewed by an acoustician.

Table 8 Glazing Requirements - Dwellings

PLOT	REQUIRED GLAZING REDUCTION (dB)	EXAMPLE GLAZING (GLASS/AIR SPACE/GLASS) (mm)
Plot 1	$29 R_w + C_{tr}$	10/ 6 to 16 / 6
Plot 2 to 14	$31 R_w + C_{tr}$	10/ 6 to 16 / 6
Plot 14 (west façade)	$31 R_w + C_{tr}$ ($31 R_w$)	10/ 6 to 16 / 6
Plot 15	$29 R_w + C_{tr}$	8 / 6 to 16 / 4
Plot 16	$28 R_w + C_{tr}$	6 / 6 to 16 / 4
Plot 17 to 21	$26 R_w + C_{tr}$	6 / 6 to 16 / 6
Plot 157	$26 R_w + C_{tr}$	6 / 6 to 16 / 6
Plot 158	$26 R_w + C_{tr}$	6 / 6 to 16 / 6
Plot 28 to 41	$26 R_w + C_{tr}$ ($32 R_w$)	6 / 6 to 16 / 6
Plot 42 to 69	$26 R_w + C_{tr}$ ($33 R_w$)	4 / 10 / 6
Plot 26 to 27	$31 R_w$	10/ 6 to 16 / 6

Figure 8 in the appendix highlights the facades that need the above glazing specification.



6. CONCLUSIONS AND DISCUSSION

E3P were commissioned by MCI Developments to undertake a Noise Impact Assessment for a proposed residential development at Trub Farm, Oldham.

A full 24-hour road traffic sound survey has been conducted for the M62 motorway. A full 24-hour rail noise survey has been undertaken for the railway line to the west. An attended vibration survey has also been conducted to check perceptibility of vibration. It was shown that perceptibility of vibration from the railway line is unlikely.

A 3D noise model has been constructed to assess road traffic and rail sound impact across the site and incident upon all facades and floors and in any external amenity areas. Road traffic and rail sound has been assessed in accordance with the criterion set out in BS 8233:2014.

The assessment determined that certain facades require higher specification glazing to control internal noise levels across the development. A whole dwelling ventilation system is assumed to be installed across the site as per approved document F. A full overheating assessment in accordance with the guidelines indicated in Part O is required to allow for the provision of an alternative method of providing the mitigation of overheating without the need for opening windows. Furthermore, acoustic barriers are required for several plots to control noise levels in external amenity areas.

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

END OF REPORT

APPENDIX I

LIMITATIONS





GENERAL

1. This report and any associated works (together comprising the "Services") were compiled and carried out by E3P for the client (as present in Section 1) under the E3P "Terms of Business" or with those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.
2. Unless explicitly agreed otherwise, in writing, this report has been prepared under E3P Standard Terms and Business as included within our proposal to the Client.
3. Project-specific appointment documents may be agreed upon at our discretion and a charge may be levied for both the time to review and finalise appointment documents and also for associated changes to the appointment terms. E3P reserves the right to amend the fee should any changes to the appointment terms create an increased risk to E3P.
4. The report needs to be considered in light of the proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

NOISE AND VIBRATION IMPACT ASSESSMENTS

5. 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.
6. 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.
7. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walkover inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. E3P cannot be held responsible for any disclosures that are provided post-production of our report and will not automatically update our report.
8. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, E3P reserves the right to review such information and, if warranted, to modify the opinions accordingly.
9. E3P does not warrant work/data undertaken/provided by others.

APPENDIX II

GLOSSARY





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 LAeq, LA90 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 9 **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 10 Terminology

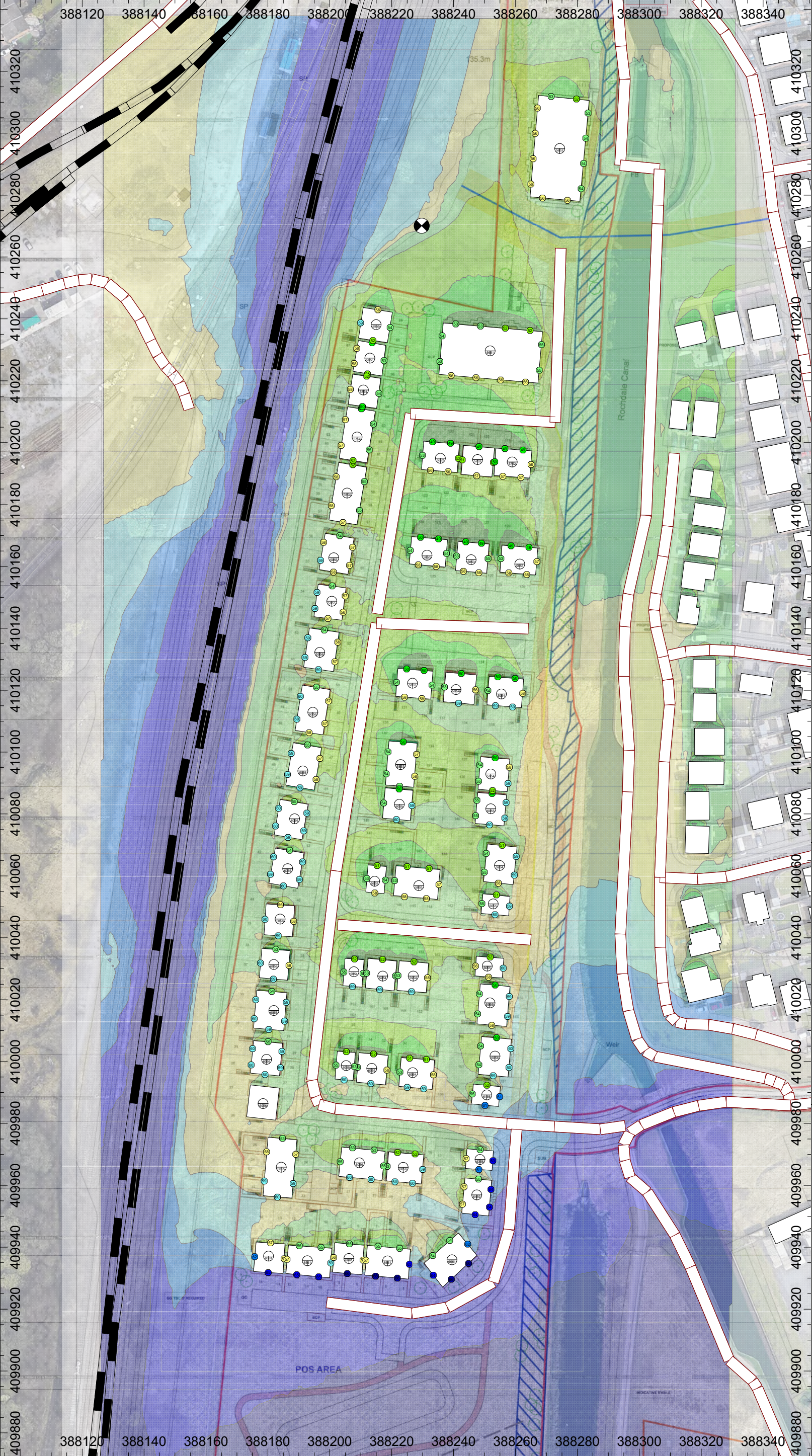
DESCRIPTOR	EXPLANATION
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2E-05 Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level 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.
LAeq, T	LAeq 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.
LAmx	LAmx is the maximum A-weighted sound pressure level recorded over the period stated. LAmx is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the "fast" sound level meter response.
L10 and L90	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L10 is the level exceeded for 10% of the time and as such can be regarded as the "average maximum level". Similarly, L90 is the "average minimum level" and is often used to describe the background noise. It is common practice to use the L10 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.
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.

APPENDIX III

FIGURES



Figure 3 - Daytime Grid Noise Map (BS 8233) - Calculation at 1.5 m above ground level



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments

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

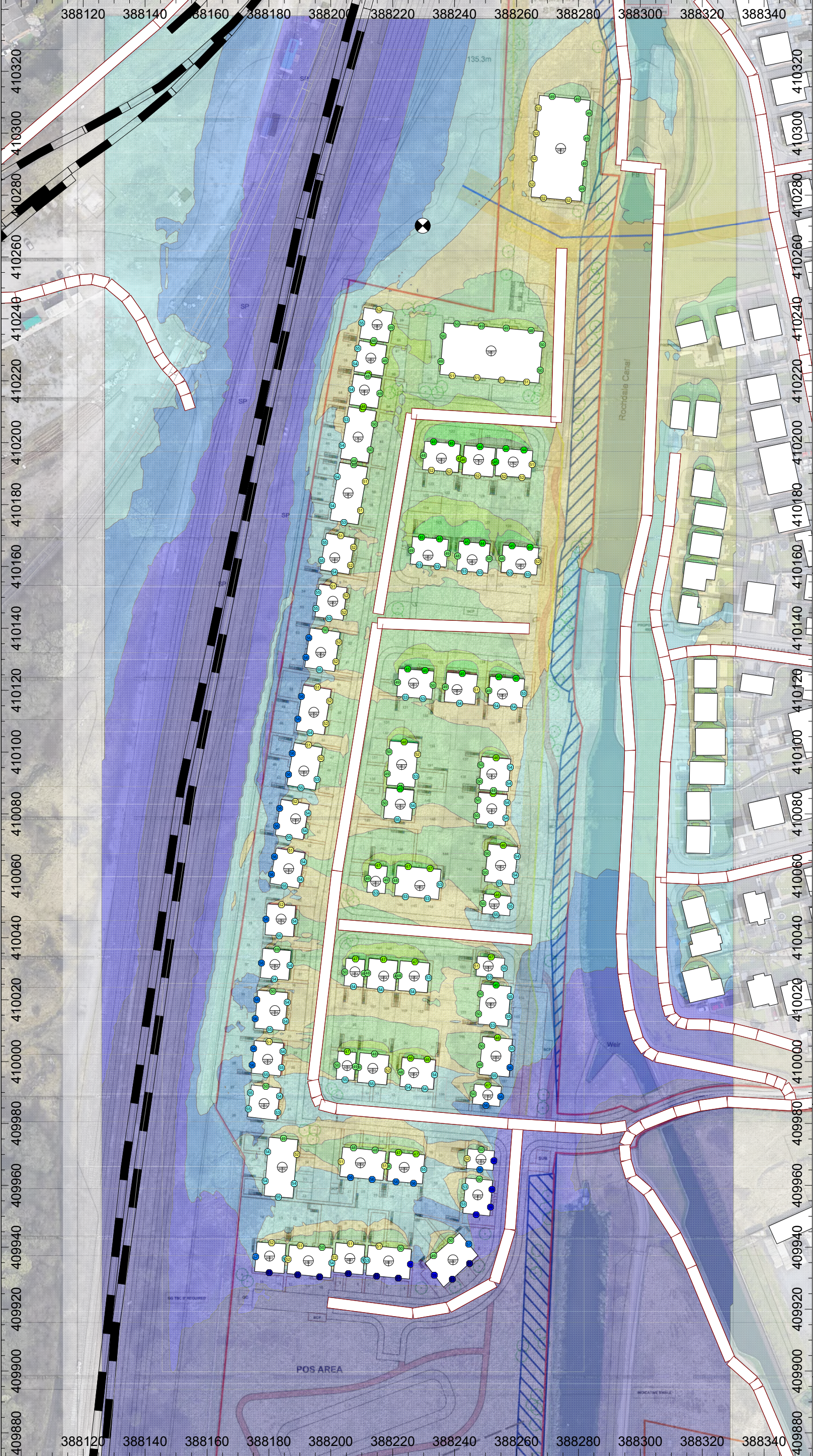
...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 56
56 < ...	<= 58
58 < ...	<= 60
60 < ...	<= 62
62 < ...	<= 65
65 < ...	

Noise Map Objects

- Line Source
- Road
- Railway
- Building
- Barrier
- Bridge
- Receiver
- Building Evaluation
- Calculation Area

Project Engineer: Scott Boughton
Date: 03/04/2024

Figure 4 - Night-time Grid Noise Map (BS 8233) - Calculation at 4.5 m above ground level



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments

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

- ... <= 42
- 42 < ... <= 45
- 45 < ... <= 47
- 47 < ... <= 50
- 50 < ... <= 52
- 52 < ... <= 55
- 55 < ... <= 57
- 57 < ... <= 60
- 60 < ...

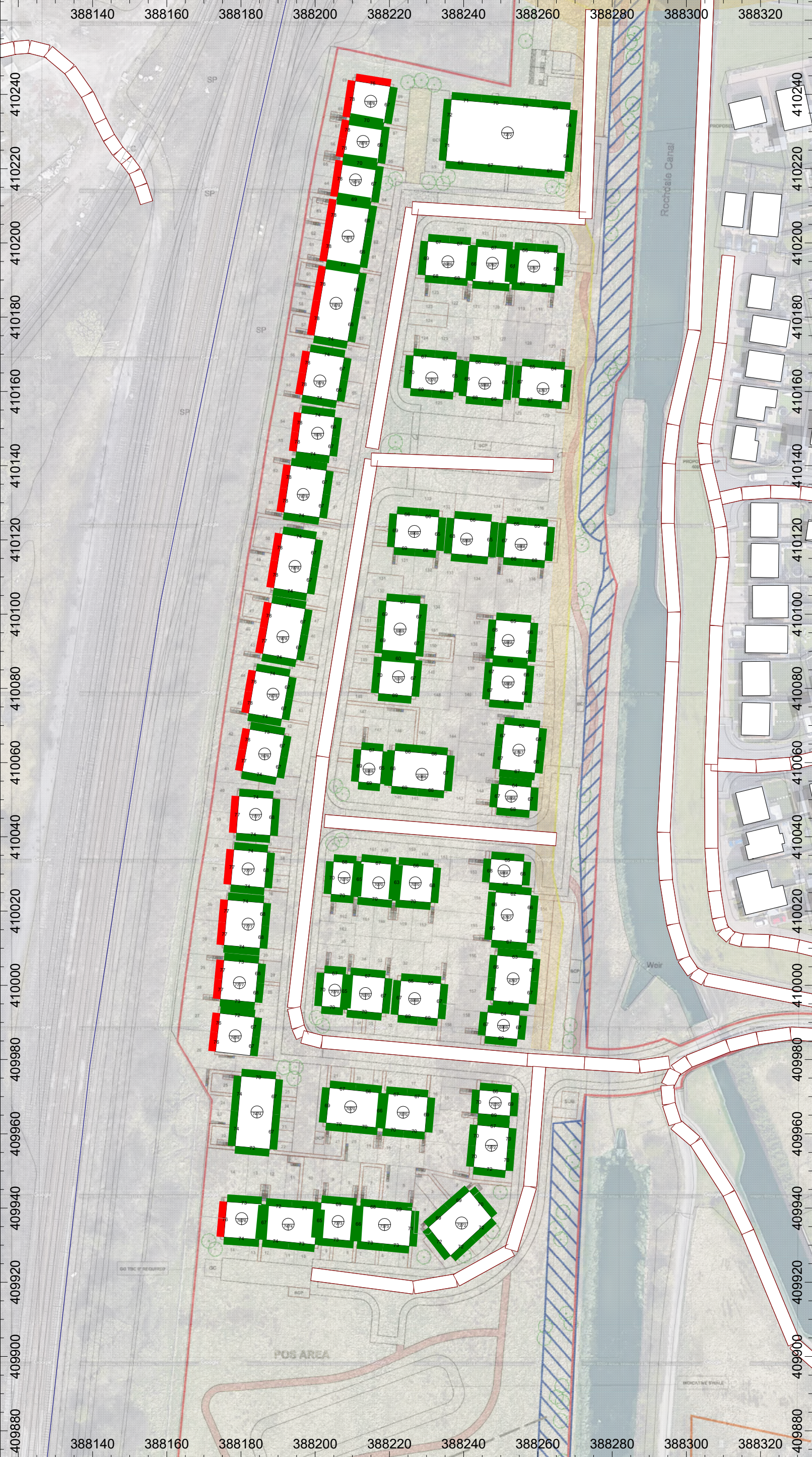
Noise Map Objects

- Line Source
- Road
- Railway
- Building
- Barrier
- Bridge
- Receiver
- Building Evaluation
- Calculation Area



Project Engineer: Scott Boughton
Date: 03/04/2024

Figure 5 - 10th Highest Maximum Night-time Grid Noise Map (BS 8233) - Calculation at 4.5 m above ground level



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments

10th Highest
Night-time Noise Level,
LAf,max 1min (dB)

... ≤ 74
74 < ...

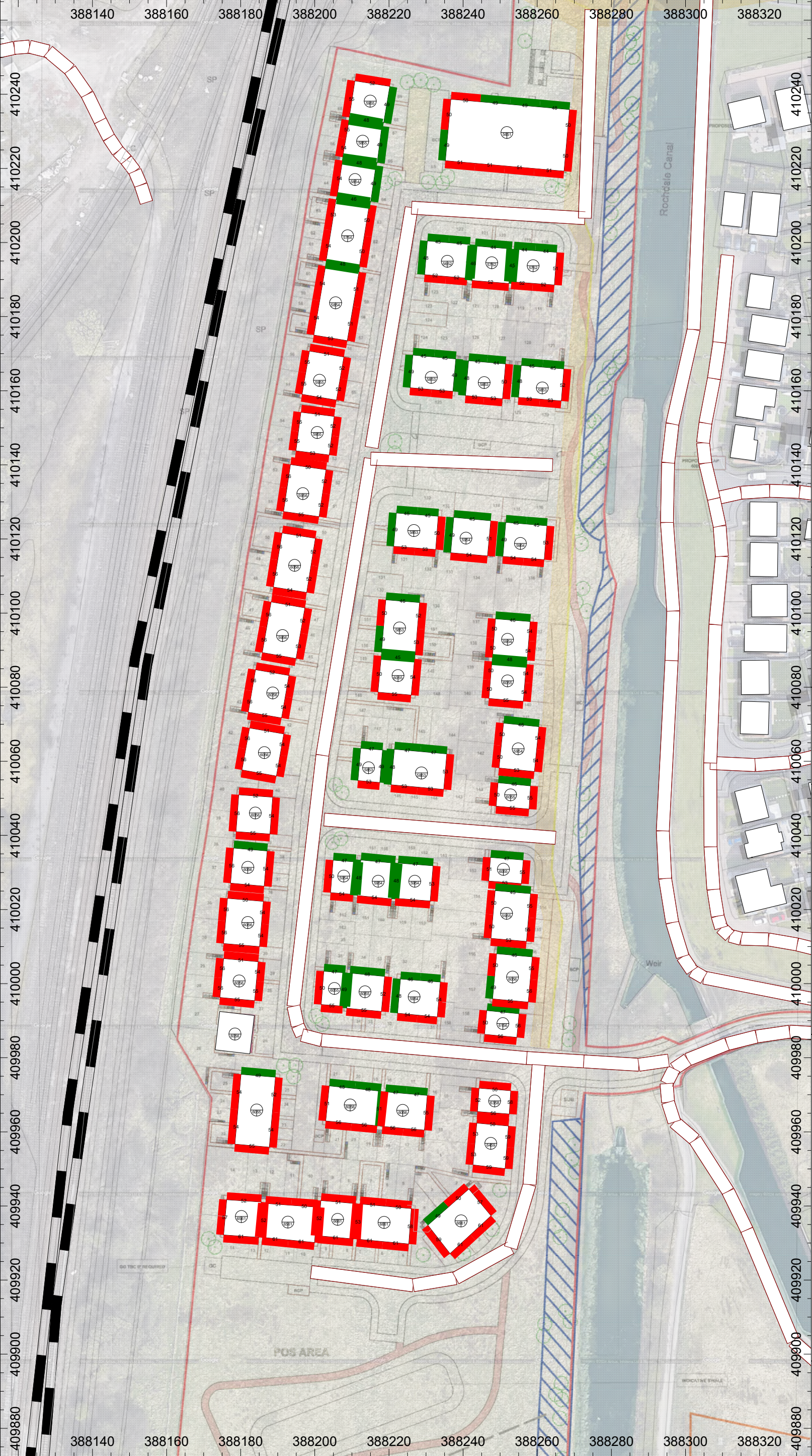
Noise Map Objects

- Line Source
- Road
- Railway
- Building
- Barrier
- Bridge
- Receiver
- Building Evaluation
- Calculation Area



Project Engineer: Scott Boughton
Date: 03/04/2024

Figure 6 - Night-time Grid Noise Map (Part 0) - Calculation at 4.5 m above ground level



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments

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

... <= 49

49 < ...

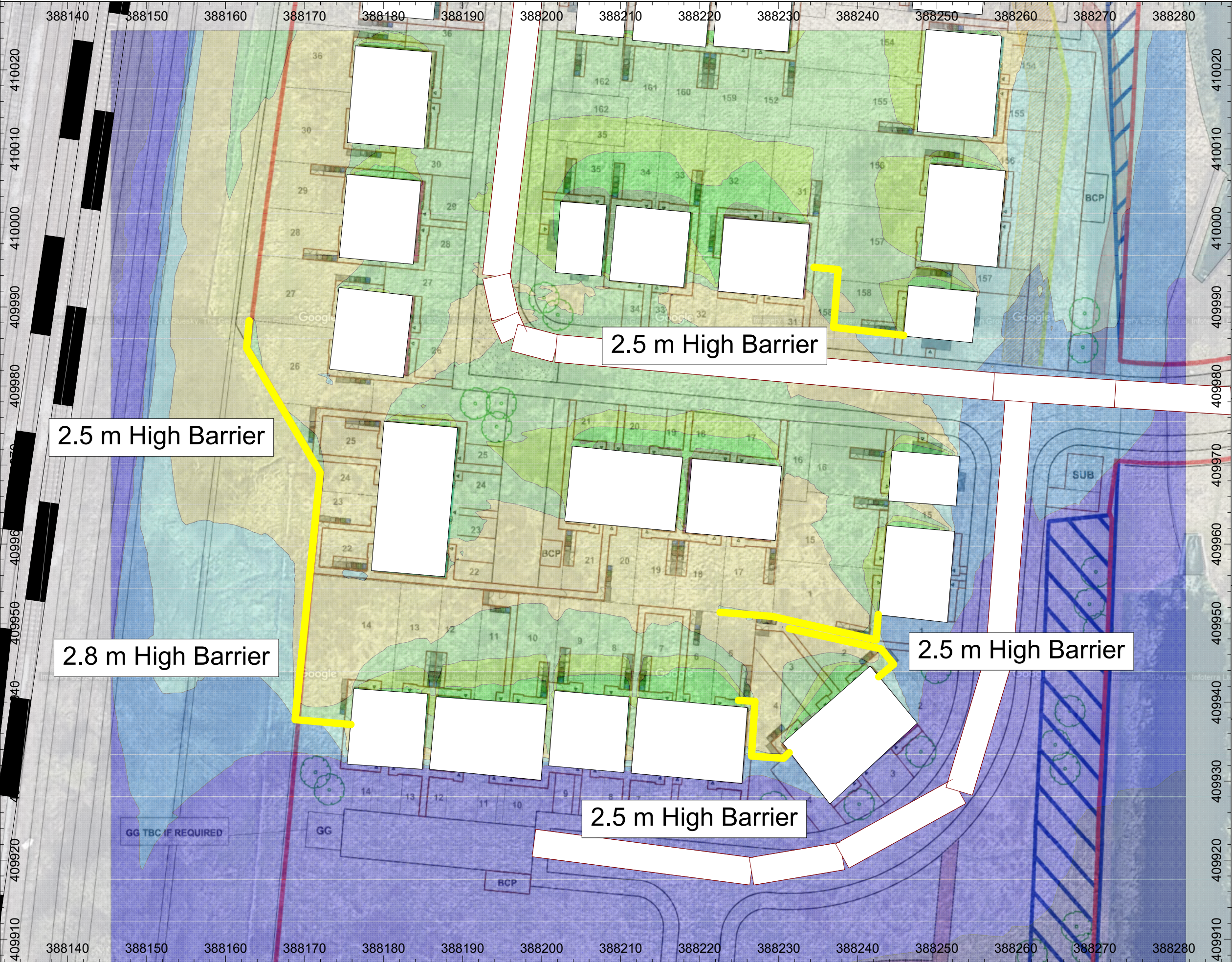
Noise Map Objects

- Line Source
- Road
- Railway
- Building
- Barrier
- Bridge
- Receiver
- Building Evaluation
- Calculation Area



Project Engineer: Scott Boughton
Date: 03/04/2024

Figure 7 - Daytime Grid Noise Map with Mitigation - Calculation at 1.5 m above ground level



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments

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

...	≤ 48
48 < ...	≤ 50
50 < ...	≤ 52
52 < ...	≤ 56
56 < ...	≤ 58
58 < ...	≤ 60
60 < ...	≤ 62
62 < ...	≤ 65
65 < ...	

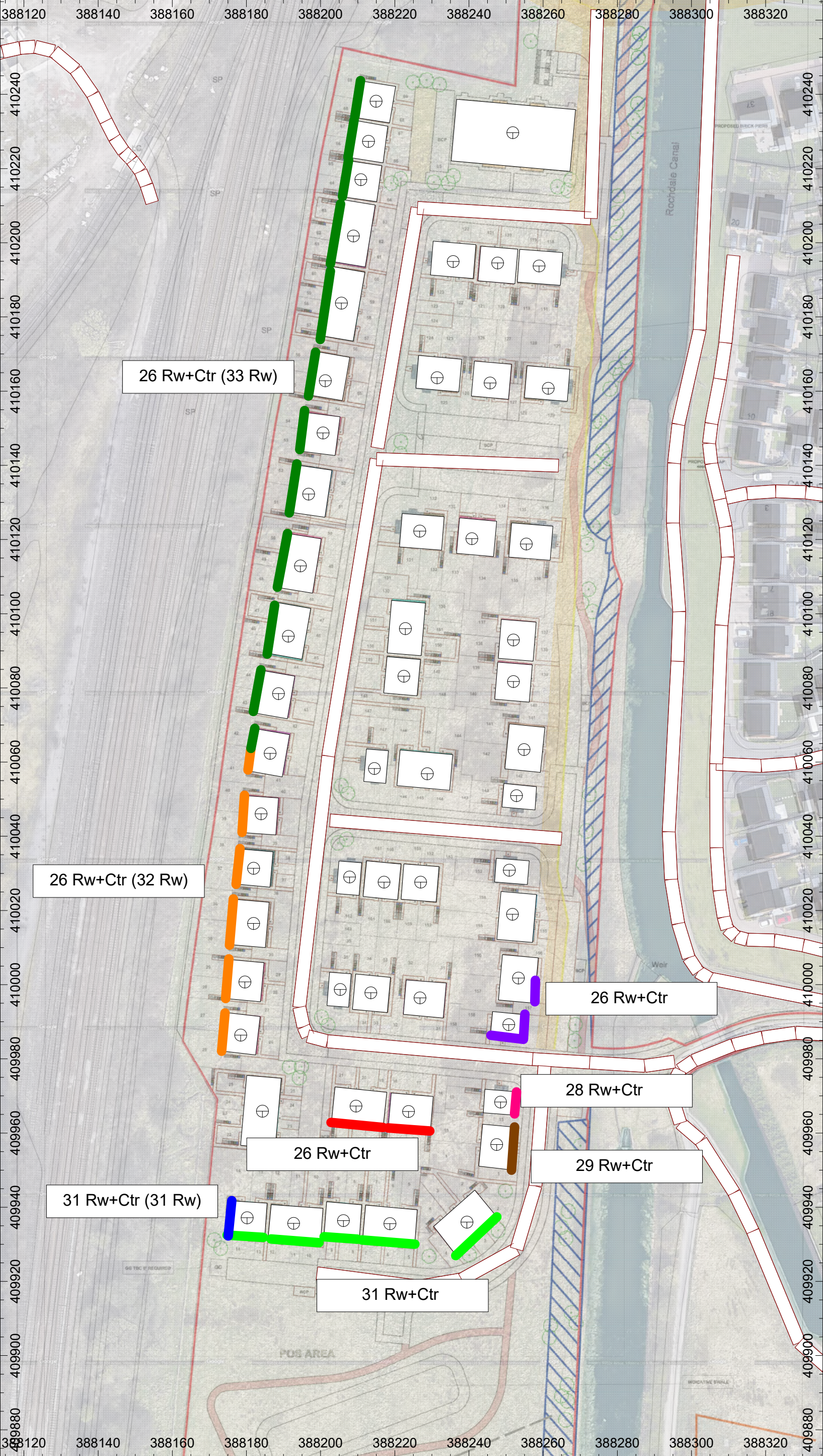
Noise Map Objects

- Line Source
- Road
- Railway
- Building
- Barrier
- Bridge
- Receiver
- Calculation Area

e3p

Project Engineer: Scott Boughton
Date: 03/04/2024

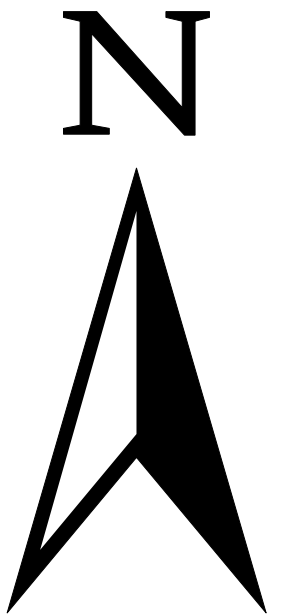
Figure 8 - Galzing Requirements



Project:
Trub Farm,
Rochdale

Project-No:
51-156

Client:
MCI Developments



Project Engineer: Scott Boughton
Date: 04/04/2023