



Architectural & Environmental Acousticians
Noise & Vibration Engineers

NOISE ASSESSMENT

LAND SOUTH OF BRICK LANE, MEPAL

THE HAVEBURY HOUSING PARTNERSHIP

RP01-18894

NOISE ASSESSMENT

PROJECT: LAND SOUTH OF BRICK LANE, MEPAL

CLIENT: THE HAVEBURY HOUSING PARTNERSHIP

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1. INTRODUCTION

- 1.1 Cass Allen has been instructed by The Havebury Housing Partnership to assess the suitability of the proposed new development at Land South of Brick Lane, Mepal with regards to noise.
- 1.2 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 1.3 The aims of the assessment were:
- To establish the suitability of existing noise levels at the site for the proposed development
 - Where required, identify appropriate measures in the design of the development and achieve acceptable noise levels in habitable areas
- 1.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

2. PROJECT DESCRIPTION

- 2.1 The site is situated in a residential area of Mepal with the A142 (Brangehill Lane) running to the west and Sutton Road running to the south and east. An annotated aerial photo of the site is shown in Figure 1 below.

Figure 1 Annotated Aerial Photo (Red-line approximate)



- 2.2 The proposal is to develop the site into residential properties to be accessed from Brick Lane. A drawing of the development layout is shown in Appendix 1.

3. PLANNING POLICY

National Policy

- 3.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Section 170 of the NPPF states:

The planning system should contribute to and enhance the natural and local environment by...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of...noise pollution.

and in Section 180:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Local Policy

- 3.2 East Cambridgeshire District Council Local Plan (April 2015) provides further guidance in-line with the above national policy on the assessment of noise in the district. This has been taken into account in this assessment.

4. NOISE AFFECTING THE DEVELOPMENT

Design criteria – Internal noise levels

- 4.1 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.
- 4.2 Relevant BS8233 design criteria are summarised in Table 1 below.

Table 1 BS8233:2014 Internal Noise Criteria

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

- 4.3 BS8233 also states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as a upper guideline value. BS8233 recognises however that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practical noise levels in the amenity spaces.
- 4.4 The following acoustic design criteria have therefore been adopted for the development:
- Average noise levels in living rooms during the day should not exceed 35 dB LAeq,0700-2300hrs;
 - Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
 - Where possible, average noise levels in external amenity areas during the day should be lower than 50-55 dB LAeq,0700-2300hrs.

Existing site noise levels

- 4.5 A noise survey was carried out at the site from the 14th to 16th January 2019 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 4.6 Average noise levels across the site were dictated by road traffic on the A142. Very occasional vehicle movements were observed on Sutton Road however were not sufficiently frequent to significantly affect average noise levels at the site.
- 4.7 Areas of the development at the western edges of the site were found to be subject to the highest noise levels. The noise survey results show that noise levels at the measurement position are as follows:
- Western edge of the site facing road:
 - Average noise levels during the daytime - 63 dB LAeq,0700-2300hrs
 - Average noise levels during the night-time - 58 dB LAeq,2300-0700hrs

- 4.8 Based on the results of the site noise survey, a 3D computer noise model was developed to predict and assess the noise levels that will exist across the entire development.
- 4.9 The 3D noise model was developed using Cadna/A v2020 environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - *Calculation of Road Traffic Noise* (CRTN) for the assessment of road traffic noise propagation.
- 4.10 The layout of the development and surrounding area was input into the model. Including the 3.3m high acoustic barrier to the west of the site (as shown in the site layout in Appendix 1) consisting of 1.7m high earth bund and 1.6m high acoustic fence (i.e. imperforate fence with minimum surface mass 10kg/m²).
- 4.11 To calculate the spread of noise levels around the site, day and night-time average noise levels were input for the A142 and calibrated to the results of the on-site noise measurements.
- 4.12 The methodology and results of the noise modelling are provided in Appendix 3.

Internal noise levels in noise-sensitive rooms

- 4.13 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). This type of construction provides a high level of sound insulation and consequently, internal noise levels would be dictated by external noise ingress via glazing and ventilators.
- 4.14 The ventilation scheme for the project will utilise trickle ventilators in the external facades with openable windows for the provision of purge ventilation (as per System 1 from Building Regulations Part F).
- 4.15 All dwellings have been designed as far as practicable to have at least one facade that will meet reasonable internal noise levels with open windows (i.e. with a 5 dB relaxation on the criteria given in Paragraph 4.4) as per the guidance in BS8233. It can be seen from the modelling results in Appendix 3 that all dwellings are calculated to meet these reasonable internal noise levels with open windows except for Plots 6, 8, 14, 17, 18 and 27 where night time noise levels are calculated to marginally exceed this level by 1 dB (or 2dB in the case of Plot 8) whereas daytime noise levels are calculated to meet the reasonable level in all cases with the exception of Plots 8 and 27 where a 1dB exceedance is calculated. These minor exceedances are considered negligible in practice as a change of up to 3dB is generally imperceptible in a normal environment. The proposed ventilation strategy is therefore considered acceptable in terms of acoustics
- 4.16 Calculations were carried out using façade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the habitable rooms of the development.
- 4.17 The results of the calculations are summarised in Table 2 below.

Table 2 Outline Acoustic Requirements for Habitable Rooms

Outline Façade Specification	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements
FS01 (Upgraded)	29 dB Rw+Ctr	40 dB Dne,w + Ctr
FS02 (Standard)	27 dB Rw+Ctr	31 dB Dne,w + Ctr

Note The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

- 4.18 The required sound insulation performance values in Table 2 could typically be achieved by the glazing and ventilator types shown in Table 3.

Table 3 Typical Glazing / Ventilator Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
Standard thermal double glazing	27
Marginally acoustically upgraded double glazing	29
Example Ventilators	Typical Acoustic Performance (Dnew + Ctr)
Standard 'hit & miss' in-frame trickle ventilator	31
Passivent AL-dB 450 Air supply window vent	40

- 4.19 It can be seen from the above that acceptable internal noise levels will be readily achievable in the development subject to the installation of commercially available glazing and ventilation systems (which could be secured with a suitable planning condition if desired by East Cambridgeshire District Council). It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.

Noise levels in external amenity areas

- 4.20 The layout of the development has also been reviewed in relation to the BS8233 recommendation that noise levels in external amenity areas should ideally not exceed 50 – 55 dB LAeq,T.
- 4.21 Noise levels in gardens closest to the A142 are predicted to exceed the 55 dB LAeq,T limit by up to 4 dB. However whilst this is not ideal, it is not uncommon for noise levels in gardens in areas directly adjacent to main roads to be higher than the BS8233 recommended levels.
- 4.22 As per BS8233 guidance, to reduce noise levels in these gardens as far as practicable, it is recommended that 1.8m high close-boarded timber fencing is used around the gardens where levels are predicted to be higher than the BS8233 recommended levels. Fences where this is recommended are indicated by the blue line in Appendix 4, Figure 1.
- 4.23 In summary of the above, noise levels in external amenity areas compliant with BS8233 guidance are predicted provided that 1.8m high close-boarded timber fencing is used around gardens where indicated. If deemed necessary, this could be secured through the imposition of a suitable planning condition.

5. CONCLUSIONS

- 5.1 Cass Allen Associates was instructed by The Havebury Housing Partnership to assess the suitability of the site for the proposed development with regards to noise.
- 5.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 5.3 A noise survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from the A142.
- 5.4 A 3D noise model of the development was constructed based on the results of a site noise survey. The noise model was used to calculate road traffic noise levels at all facades of the development.
- 5.5 Noise affecting the development has been assessed in accordance with relevant standards and guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and ventilation and acoustic screening around gardens in a small number of areas. This can be investigated further at the detailed design stage and may be secured by the imposition of a noise related planning condition by the Local Planning Authority.
- 5.6 In summary of the above it is our view that the site is suitable for the development in terms of noise levels and that there are no noise related reasons why planning permission should not be granted.

[illegible]

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were dictated by road traffic on the A142.

Survey Period:

14/01/2019 to 16/01/2019

Survey Objectives:

- To identify noise and vibration sources that contribute to ambient noise levels at the site;
- To measure noise and vibration levels around the site over a typical day and night-time period.

Equipment Used (Appendix 2, Table 1):

Type	Manufacturer	Model	Serial Number
Sound level meter ¹	Rion	NL-32	00530374
Calibrator	Bruel & Kjaer	4231	2115551

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

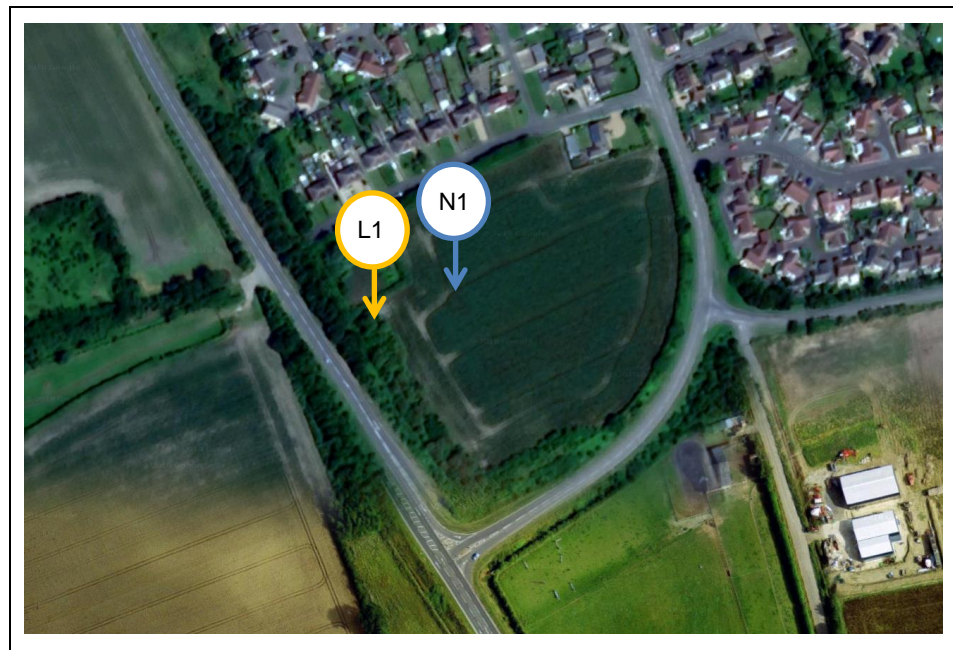
Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

Measurement Positions (Appendix 2, Table 2):

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to nearby roads
L1	Unattended noise logging position. 1.5m above ground level. Free-field. Direct line of sight to nearby roads.

Site Plan showing Measurement Positions (Appendix 2, Figure 2):



Attended Noise Monitoring Results (Appendix 2, Table 3):

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
16/01/2019	N1	16:06	5 mins	61	67	58	Noise dictated by road traffic from A142

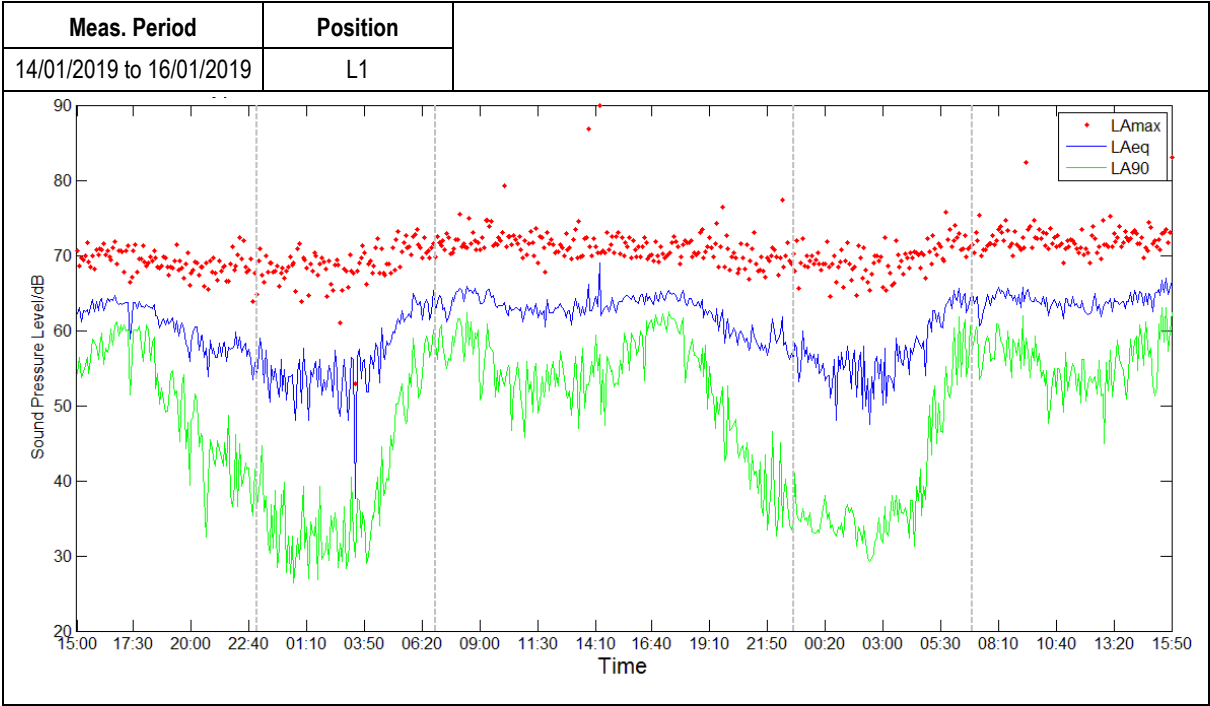
Unattended Noise Monitoring Results (Appendix 2, Table 4):

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAmix, dB ²
14/01/2019 to 16/01/2019	L1	63	56	59	35	71

Note 1: Typical lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results (Appendix 2, Figure 3):



Appendix 3 Modelling Results

Modelling Software:

CADNA/A Version 2020

**Modelled
Scenarios:**

Day and night-time average noise levels across the site:
- Ground floor and first floor

Data inputs:

- Noise survey results
- Topographical data for the site
- Development layout

**Calculation Algorithms
Used:**

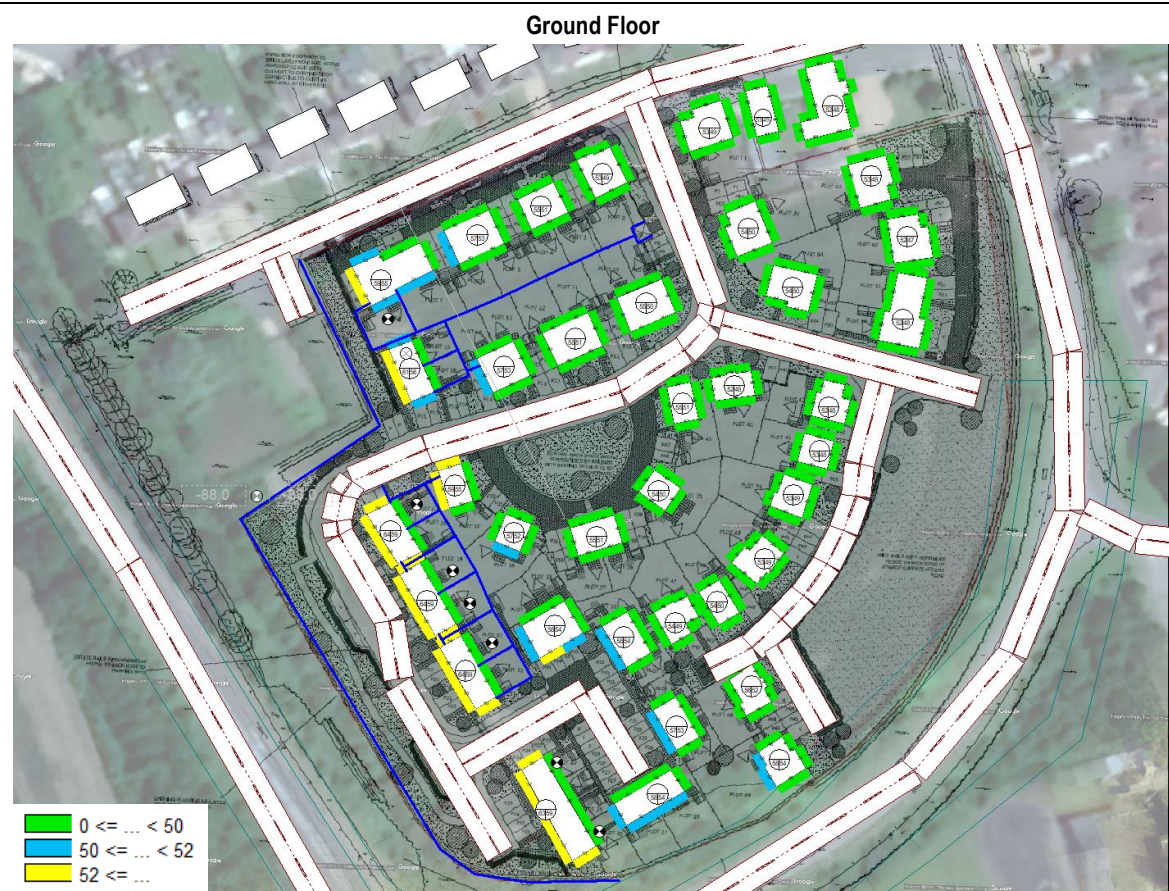
- Calculation of Road Traffic Noise 1988 – Department of Transport
- ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613-2:1996 Acoustics-Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Modelling Printout (Appendix 3, Figure 1):



Modelling Printout (Appendix 3, Figure 2):

Night-time noise levels (LAeq,8hr)



Appendix 4 Outline Façade Acoustic Specification

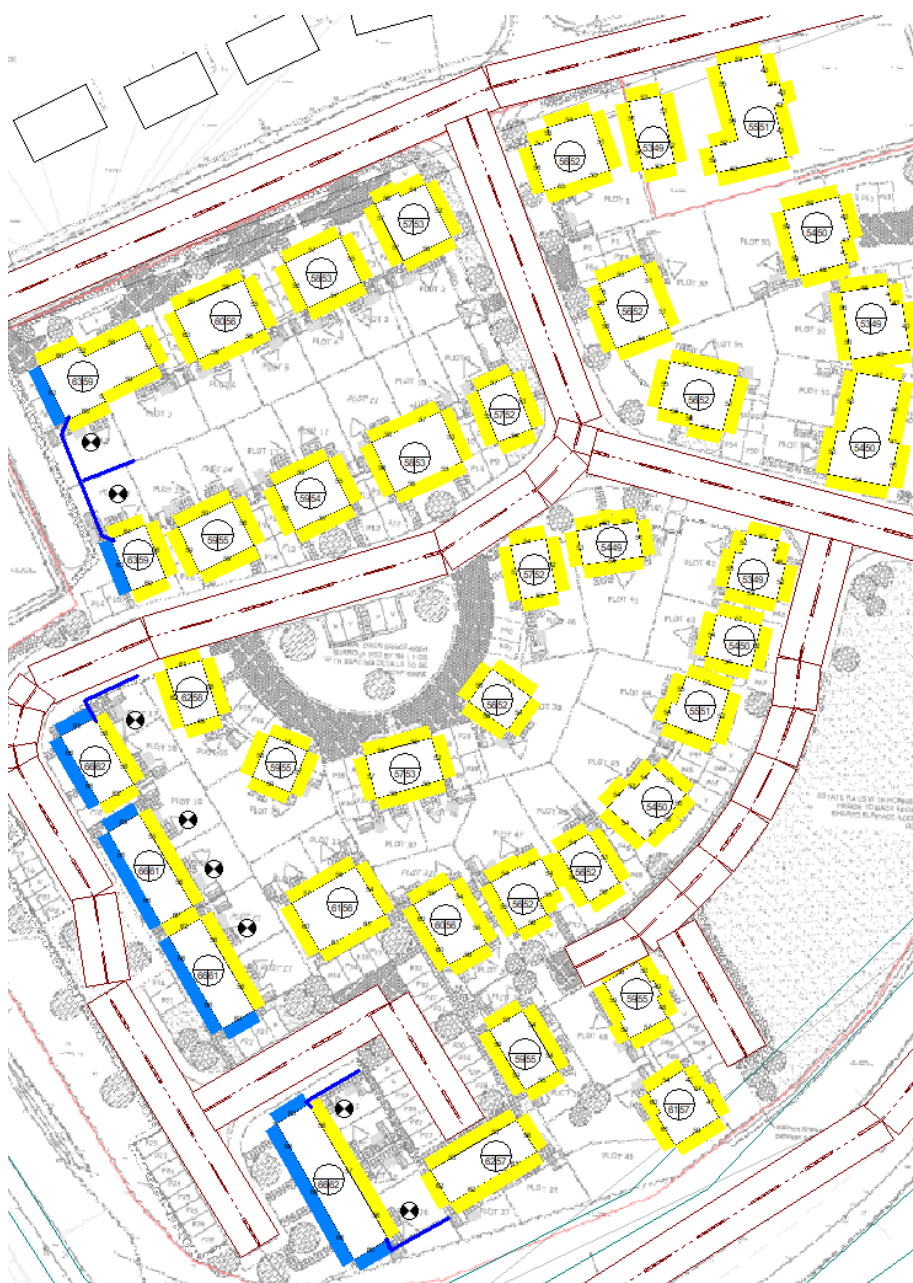
Reference	Colour	Glazing Specification	Ventilator Specification
FS01		29 dB Rw+Ctr	40 dB Dnew+Ctr
FS02		27 dB Rw+Ctr	31 dB Dnew+Ctr

NOTES:

Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation).

The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

All floors:





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