

1-10 Glebe Road, Letchworth

Proposed Residential Development Noise Impact Assessment

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Issued to

Wheatley Homes

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1. SUMMARY

- Wheatley Homes are seeking to obtain planning permission for 9 residences at 1-10 Glebe Road, Letchworth. This report assesses the noise impacts affecting the site arising from the nearby road and industrial premises and recommend noise measures to ensure acceptable low noise impact.
- Road traffic noise levels have been established by measurement for the existing situation and modelled for the proposed development. Analysis of noise ingress shows that wholly acceptable indoor noise levels will be achieved with standard (non-acoustic) façade elements.
- Spectrum have had involvement with the industrial uses nearby this site in the past and have good quality 'at source' noise output information for these sources. Again, measurement and numerical noise modelling of the proposed development has been used to inform the assessment of industrial noise.
- This analysis shows that a 2m fence on the southern and eastern site boundary provides worthwhile noise reduction from ground floor and outdoor amenity areas
- The upper stories of Plots 1, 2 and 3 have industrial noise exposure that is not attenuated by the site fence. Before consideration of context, and the inclusion of noise mitigation measures, this is assessed to be an adverse noise impact.
- MVHR with mechanical cooling is proposed for these dwellings so that windows may be kept closed when industrial noise is occurring, without compromising the indoor noise or temperature environment.
- Accordingly, following the procedure in BS4142 the noise impact of the proposed development will be low and in accordance with the requirements of the relevant local and national planning policies.
- Other existing and future industrial noise sources have a low impact and do not exacerbate the impact for Plots 1, 2 and 3.



2. INTRODUCTION

Wheatley Homes are seeking to obtain planning permission for 9 residences at 1-10 Glebe Road, Letchworth. Spectrum Acoustic Consultants have been engaged to assess the noise impacts affecting the site arising from the nearby road and industrial premises and, where necessary, recommend measures to ensure acceptable levels of noise for the proposed development.

3. SITE DESCRIPTION

The subject site was formerly the Glebe Road Industrial Estate, a single, multi-let industrial building located on the southern side of Glebe Road in Letchworth Garden City. The majority of properties on Glebe Road are residential and the area to the north beyond is also residential. Directly to the south and west of the site, is a mix of existing and former commercial uses on Icknield Way and Norton Way.

The property immediately to the west was formerly in use by Letchworth SEAT. It is understood that there are proposals for this to be brought back into use as a Volvo showroom.

South west of the subject site is Furmston Court, a small trading estate comprising a number of mixed commercial/light industrial units, accessed off Icknield Way. The unit which adjoins the southern boundary of the subject site is currently occupied by Comfort Plus Products Ltd, a company supplying mobility products. This unit has 10 small condenser units mounted on its northern external wall near to the subject site.

Immediately to the south of the subject site, adjacent to Furmston Court, is the former Progress Suzuki and Hyundai showroom which is now disused.

Further to the east along Icknield Way is Carn House, an industrial unit occupied by LPC Plating Services who carry out electroplating and metal finishing at the unit. This unit has a significant amount of mechanical ventilation plant, the majority of which is located along the western façade of the Carn House building. There are a number of different items of plant, some or all of which operate continuously during the daytime, including fans, compressor units and other enclosed plant.

Approximately 80m further east along Icknield Way, beyond a number of industrial buildings, is a new residential development of 57 dwellings.

It is proposed to demolish the existing building on the subject site and construct 9 new houses in the form of three terraces, each comprising three dwellings. These will all be 3-bed houses over three storeys. Each property will also have a private rear garden and off-street parking to the front. The existing green space between Glebe Road and the new dwellings will be retained as landscaped space.

A site location plan drawing showing the locations of the existing building and the surrounding commercial and industrial units is included in Appendix A.

A proposed site and floor layout plans and elevations are included in Appendix B.



4. BACKGROUND

Spectrum have had a good deal of involvement with the subject site and surrounding industrial units over a period of 6 years. The information from this previous work helps to inform the analysis conducted for the proposed development. A summary of the work undertaken previously is provided below.

4.1 PREVIOUS REPORTS

4.1.1 Glebe Road Industrial Estate – Noise Impact Assessment (MM960, April, 2019)

This report provided an assessment of the noise impact on the subject site for a previous residential scheme of 9 houses. It described the site and proposals; the policy and guidance context, the results of ambient noise surveys; and assessment of the industrial noise affecting the site.

It concluded that noise from two of the adjoining industrial uses, LPC Plating and the SEAT garage, would be a significant adverse impact on residents of the proposed dwellings. The report discussed outline methods of noise control to reduce the impact of industrial noise including 'at source' noise reductions, particularly from the LPC Plating mechanical equipment as well as alterations to the residential layout to screen industrial noise.

No further development of the subject site occurred following this report.

4.1.2 LPC Plating Services - Impact Assessment and Outline Mitigation Recommendations (MM1267, November 2020)

This report was prepared for Letchworth Garden City Heritage Foundation (LGCHF) who are landowners for both Carn House (occupied by LPC Plating) and Glebe Road Industrial Estate (the subject site). It describes a survey undertaken to identify the location and noise level of each individual significant noise source at LPC Plating. Using this information, a numerical noise model was derived to determine the noise impact for the nearest noise-sensitive receptor, 13 Glebe Road, immediately to the north.

This report recommended noise control measures to specific items of plant in the form of screens, enclosures and in-line attenuators. It was predicted that, following the implementation of these modifications, noise levels for residents of No.13 Glebe Road would experience noise levels at or below those recommended in the Guidelines for Community Noise -World Health Organization, 1999 which would help to prevent noise nuisance occurring.

4.1.3 LPC Plating Services - Review of Noise Mitigation Measures Implemented (ARC7148, October 2021)

LPC Plating Services received a copy of the Spectrum report described in point 4.2 above and advised LGCHF that they had implemented noise mitigation measures which they considered reduced noise levels.

This report duplicated the detailed 'at source' measurements and analysis of noise levels from the mechanical plant.

Some reduction in noise level was identified both at source and at nearby noise-sensitive receptors, although the extent of this reduction was not as much as recommended in the November 2020 report.



4.2 CURRENT INVESTIGATIONS

Prior to commencing this Noise Impact Assessment, Spectrum contacted a Senior Environmental Protection & Housing Officer at North Herts District Council to discuss the requirements for the investigation. They requested that the operators of the nearby industrial uses be contacted to obtain a description of, and potentially 'at source' measurements of, noisy equipment and activity. Spectrum have identified that the condenser units on the rear wall of Comfort Plus Products at Furmston Court were still operational. Also, both the SEAT and Suzuki / Hyundai showrooms had ceased operations.

Spectrum approached LPC Plating Services, but they were unwilling to assist or participate further in the investigation of noise emission from their premises.

4.3 SUMMARY

Accordingly, the main environmental noise sources that affect the subject site are:

- Industrial noise from LPC Plating Services to the south east
- Condenser units located at the rear of Furmston Court, and
- Road traffic noise on surrounding roads

5. GUIDELINES FOR ACCEPTABILITY

5.1 NOISE POLICY GUIDELINES - NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The **National Planning Policy Framework** (NPPF) sets out the government's guidance for local planning authorities and planning application decision-takers.

It says that the planning system should contribute to and enhance the environment by (among other things) preventing development from contributing to, being put at risk from, or being adversely affected by unacceptable levels of noise pollution. (Para. 187.e)

Paragraph 198 states:

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:

- *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;*
- *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."*

Paragraph 200 states that planning policies and decisions should ensure that:



Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

The NPPF refers to the **Noise Policy Statement for England** (NPSE) which sets out the long term vision of Government noise policy as follows: *Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.*

The NPSE aims to clarify the principles and aims of existing policy documents, legislation and guidance that relate to noise. Its noise policy aims are to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

through the effective management and control of environmental, neighbour and neighbourhood noise.

These aims are developed by reference to the concepts NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level). NPSE also refers to SOAEL (Significant Observed Adverse Effect Level).

It recognises that there is no universally applicable threshold for these concepts. Consequently, the SOAEL is likely to vary with different noise sources, different receptors and at different times. Even so, significant effects should be avoided, taking account of sustainability aims.

Where noise impact is between LOAEL and SOAEL, the NPSE requires that all reasonable steps should be taken to mitigate adverse effects while taking account of sustainable development aims. It notes (para. 2.7) that *the NPSE should consider noise alongside other relevant issues and noise should not to be considered in isolation.*

In July, 2019, **Planning Practice Guidance on Noise**¹ (PPG-N) was updated. This provides advice on *'how planning can manage potential noise impacts in new development'*.

It confirms that neither the NPSE² nor the NPPF³ *'expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development'*.

It also details the hierarchy of noise exposure, including the thresholds LOAEL and SOAEL, based on the likely average response, referred to within NPSE. The noise exposure categories are summarised below.

¹ PPG - Noise, MHCLG, July, 2019

² Explanatory Note to the Noise Policy Statement for England, paragraphs 2.23 and 2.24 , DEFRA, 15 March 2010)

³ National Planning Policy Framework, MHCLG, July 2021

- No Observed Adverse Effect: noise can be heard but does not cause any change in behaviour or attitude.
- Observed Adverse Effect: noise can be heard and causes small changes in behaviour and/or attitude.
- Significant Observed Adverse Effect: noise causes a material change in behaviour and/or attitude.
- Unacceptable Adverse Effect: extensive and regular changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or psychological effects.

The guidance advises, in accordance with the first and second aims of the NPSE, that where there is no observed effect or no observed adverse effect, no specific measures are required to manage the acoustic environment. Where there is an observed adverse effect, consideration needs to be given to mitigating and minimising those effects. Where there are significant adverse effects, the planning process should be used to avoid these effects occurring, and where there are unacceptable adverse effects, the situation should be avoided / prevented.

It further states that, because of the subjective nature of noise, there is no simple relationship between noise level and its impact. This informs the values for LOAELs and SOAELs which represent the onset levels of adverse effects and significant adverse effects respectively. These will depend on a number of factors in a particular situation, such as:

- The source, its absolute level and the time of day.
- For intermittent sources, the number and duration of events
- The spectral frequency content of the noise

Other factors will need to be considered in many cases, which are more fully described and detailed within the full PPG guidance, but include issues such as:

- Whether internal effects can be completely removed for example by closing windows (relevant with new residential development subject to ventilation being developed)
- Whether existing noise sensitive locations already experience high noise levels,
- The potential effect of a new residential or other sensitive development being located close to an existing noisy business or site, and for noise mitigation to be considered.

PPG-N does not provide any detail on the how assessment of these factors should be carried out. Instead, reference is usually made to existing British Standards and other guidance.

5.2 BS8233:2104 AND WHO GCN

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS8233) gives absolute limits for steady state noise inside residential properties for noise that does not have a specific character (an example of such noise is that from road traffic).

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Table 1: Indoor ambient noise levels for dwellings recommended in BS8233:2014

BS 8233 also provides guidelines for noise levels in private amenity areas. It says:

For traditional external areas that are used for amenity space, such as gardens and patios, 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 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.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$, or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.

These guidelines are in keeping with "Guidelines for Community Noise", 1999 (GCN) published by the World Health Organization.

Area	Critical health effect	Noise level
Outdoor living area	Serious annoyance, daytime and evening	$L_{Aeq,16hr}$ 55 dB
	Moderate annoyance, daytime and evening	$L_{Aeq,16hr}$ 50 dB
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	$L_{Aeq,16hr}$ 35 dB
	Sleep disturbance, night-time	$L_{Aeq,8hr}$ 30 dB
		$L_{AFmax,typ}$ 45 dB

Table 2: WHO GCN guideline values for community noise

The values in Table 2 need further elaboration. There is a variability in individual response to environmental noise, with some people being more noise-sensitive than others. The levels given for outdoor living areas are the noise level below which **few** people will be moderately annoyed or seriously annoyed. They do not represent an onset of moderate / serious annoyance for the general population. In effect, the levels protect the more sensitive section of the population. In addition, the L_{Amax} value is not the highest single noisy event that occurs during any night, but rather the WHO guidelines note *For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10 to 15 times per night.*

Although there is a more recent document from the WHO on noise (Environmental Noise Guidelines for the European Region) guidance on a range of issues set out in the 1999 guidance is absent from it. While the more recent guidance was intended to supersede the older, it recognises this absence and states that *'indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid.'*



Spectrum recommend that although WHO guidance should be noted, it should not be relied upon in assessments without reference to other relevant, detailed guidance especially that in British Standards. These may align better with Planning Practice Guidance⁴ in England.

$L_{Aeq,T}$ is the average noise level, measured over the time period T. BS8233 and WHO advise that the time period for the daytime should be a 16-hour average (0700-2300). The night period is defined as 2300-0700 hours.

5.3 BS 4142:2014+A1:2019

British Standard document BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes sound from mechanical plant and equipment as well as sound from the loading and unloading of goods and materials at industrial and / or commercial premises.

The principal of assessment under BS4142 is to compare the sound from the source under investigation (if appropriate, with adjustments for duration and character) with the background L_{A90} (the typical minimum sound level) in the absence of the sound to be assessed. The standard states (Section 11):

- a) *Typically, the greater this difference, the greater the magnitude of the impact.*
- b) *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

BS4142 requires a 15-minute period L_{A90} level for assessments of night-time sound (7.00 am to 11.00pm) and a 1-hour period L_{A90} for daytime assessments.

Where the sound rating level is assessed to be 10 dB *above* the background sound level, this is generally taken to be a Significant Observed Adverse Effect Level (SOAEL). Where the sound rating level is assessed to be 10 dB *below* the background sound level, this is generally taken to be the No Observed Adverse Effect Level (NOAEL). The Lowest Observed Adverse Effect Level (LOAEL) occurs in a range of "sound rating level minus background sound level" between 0dB and 5 dB depending upon context.

5.4 PROFESSIONAL PRACTICE GUIDANCE ON PLANNING AND NOISE

Professional Practice Guidance on Planning and Noise (ProPG) was produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

The National Planning Policy Framework (NPPF) encourages improved standards of design. The CIEH, IOA and the ANC produced ProPG which is intended to encourage better acoustic design for new residential development and aims to protect people from the harmful effects of noise.

⁴ PPG - Noise, MHCLG, 6 March 2014



ProPG says ‘Good acoustic design is about more than the numbers. It is a holistic design process that creates places that are both comfortable and attractive to live in, where acoustics is considered integral to the living environment. Good acoustic design can involve, for example, careful site layouts and better orientation of rooms within dwellings. Good acoustic design does not mean “gold plating” or significantly increasing costs. [ProPG] seeks to encourage and promote design outcomes that are proportionate and reasonable in the particular circumstances of each development site.

ProPG provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers. It aims to complement Government planning and noise policy and guidance. In particular, it aims to:

- advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- encourage the process of good acoustic design in and around new residential developments;
- outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- improve understanding of how to determine the extent of potential noise impact and effect; and
- assist the delivery of sustainable development.

ProPG notes that *This Professional Practice Guidance does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate.*

ProPG Supplementary Document 2 “Good Acoustic design notes: *It is acknowledged that the inherent challenge of introducing noise-sensitive development in noisy locations can limit the extent to which good acoustic design can be achieved in harmony with the other factors that influence the overall quality of a scheme and that compromises may need to be made e.g. accepting that it may not always be possible to achieve acoustic standards with windows open or accepting that noise levels in parts of the outdoor amenity areas may not be optimal.... A good acoustic design will be one that continues to minimise noise impacts and to avoid significant noise effects for the lifetime of the development or as long as is practicable taking into account other economic, environmental and social impacts.*

5.5 NORTH HERTFORDSHIRE LOCAL PLAN 2011 – 2031

5.5.1 Policy D3: Protecting living conditions

This policy states:

Planning permission will be granted for development proposals which do not cause unacceptable harm to living conditions Where the living conditions of proposed developments would be affected by an existing use or the living conditions of an existing development would be affected by a proposed use, the Council will consider whether there are mitigation measures that can be taken to mitigate the harm to an acceptable level. If the Council is not satisfied that mitigation proposals would address the identified harm, development proposals will not be permitted.

9.19 All development has the potential to have an adverse impact on its neighbours, in a wide variety of ways. Such harm may arise from traffic generation, parking, loss of daylight and sunlight, noise, overlooking, pollution (including light pollution) and dominance as well as other issues.



9.20 A significant number of proposed sites for housing in the District are on previously developed land within urban areas. Such sites are often close to existing residential areas. Care is needed to ensure that the adverse impacts of any such development on neighbouring residents is minimised. It is not practical to provide absolute protection for existing residents' current living conditions, instead, there is a need to ensure that any impacts a development has are identified and appropriate mitigation built into the scheme.

9.22 There are two ways mitigation may occur. Either the development can incorporate measures to reduce the effect it has, or it can fund works off site to reduce the impact on those affected by it. This latter course of action may be appropriate for development such as the expansion of airfields, where there will inevitably be an increase in noise, but it may be possible to provide sound protection to those buildings affected by that noise.

9.23 This policy also covers the situation where there is an existing use which will have an adverse impact on a proposed residential development site. The proposed development will need to show that satisfactory living conditions will be achieved taking into account the nature of the existing development – for example, homes proposed in a noisy area.

6. AMBIENT SOUND SURVEY

Ambient sound measurements were carried out during a series of site surveys in October 2024.

These surveys consisted of continuous, unattended sound measurements of ambient conditions at three locations on the subject site. The purpose of the measurements was to obtain representative noise data to inform the assessments of noise conducted in this report. The measurement positions and survey dates were as follows:

- Position LT1:** At 2.5m height above local ground level, 7.5m from Glebe Road at the roadway entrance to the subject site. The microphone was in free field conditions and had a clear line of sight to traffic on Glebe Road and Norton Way. The survey was conducted between 10 and 14 October.
- Position LT2:** Near the south west corner of the site, on the southern boundary, near the rear of Furmston Court at 4m height above local ground level with the microphone in free field conditions. The survey was conducted between 3 and 7 October.
- Position LT3:** At 4m height above local ground level, in the south east corner of the site, closest to LPC Plating Services. The microphone was in free field conditions. Measurements of octave band sound levels were obtained between 3 and 7 October. Measurements of 1/3rd octave band sound levels were obtained between 14 and 17 October.

These locations are indicated in Appendix A. The following equipment was used during the survey:

Position LT1

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3024398
- Bruel & Kjaer Type 4189 Microphone s/n 3147720
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3021283
- Bruel & Kjaer Type UA 1404 Outdoor microphone attachment, and
- Bruel & Kjaer Type AO 0441 10m microphone extension cable



Position LT2

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3023840
- Bruel & Kjaer Type 4189 Microphone s/n 3130623
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3030524
- Bruel & Kjaer Type UA 1404 Outdoor microphone attachment, and
- Bruel & Kjaer Type AO 0441 10m microphone extension cable

Position LT3 – 3 to 7 October

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3024398
- Bruel & Kjaer Type 4189 Microphone s/n 3147720
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3021283
- Bruel & Kjaer Type UA 1404 Outdoor microphone attachment, and
- Bruel & Kjaer Type AO 0441 10m microphone extension cable

Position LT3 – 14 to 17 October

- Bruel & Kjaer Type 2250 Light Sound Level Meter s/n 3006952
- Bruel & Kjaer Type 4952 Microphone s/n 3390455
- Bruel & Kjaer Type UA 1404 Outdoor microphone attachment, and
- Bruel & Kjaer Type AO 0441 10m microphone extension cable

Before and after the survey, the sound level meters were field-calibrated in accordance with the manufacturer's guidelines, and no significant drift was observed. The meters, microphones and field calibrators are laboratory calibrated biennially in accordance with UKAS procedures or to traceable National Standards. Weather conditions were monitored throughout the survey. Wind speeds and precipitation were within acceptable limits for the type of measurements undertaken.

6.1 RESULTS OF NOISE MONITORING

Measurements have been summarised into contiguous 5-second periods to present the sound profile throughout the monitoring period. Measurement metrics included L_{AFmax} , $L_{Aeq,T}$, and L_{A90} levels (the sound level exceeded for 90% of the individual measurement period). Overall A-weighted and octave or 1/3rd-octave band measurements were stored for later analysis.

The results of the measurements are shown graphically and in tabular form in Appendix C. A summary of the relevant results for the purposes of this assessment is shown in Table 3.



Noise Parameter	Measured level (dB)			
	LT1	LT2	LT3 ¹	LT3 ²
Daytime L_{Aeq}	54	49	52	54
Night-time L_{Aeq}	47	43	47	45
Night-time L_{AFmax} ³	67	63	63	62
Daytime L_{A90}	44	43	47	46

Table 3: Aggregated summary results of noise monitoring

Note 1: 3 to 7 October.

Note 2: 14 to 17 October.

Note 3: The numerical L_{AFmax} levels for each 8 hour night-time period have been sorted by value from highest to lowest. From this, it is possible to read off the 10-15th highest L_{AFmax} level for each night. The highest of these values is then taken as the representative L_{Amax} at the monitoring location for subsequent use in calculating L_{AFmax} levels inside residences on the site. This is in accordance with the guidance in the WHO "Guidelines for community noise" document, which states that, for a good nights' sleep, the L_{Amax} level should not exceed 45 dB more than 10 to 15 times. This is also the approach adopted in ProPG.

In Appendix C, L_{Aeq} and L_{A90} measured noise levels at each location show a general pattern of reduction overnight, in keeping with greater and more regular activity during the daytime than at night-time, particularly in respect of road traffic noise.

Both sets of measurement data at LT3 showed weekday daytime noise levels (in-particular measures of continuous noise such as $L_{A90,T}$) plateau, exhibiting a consistent level throughout the day. These periods corresponded with the operating hours at LPC Plating and are considered to include components of external mechanical noise from LPC Plating.

It should be noted that the daytime background sound levels quoted in Table 3 are taken from periods outside of LPC Plating's operating hours.

6.2 RESULTS OF NOISE MONITORING DATA FROM 14 TO 17 OCTOBER AT LT3

In addition to standard daytime and night-time period parameters, the noise measurement results have been processed to include:

- Daytime periods when LPC Plating was operating, and
- Evening periods shortly after LPC Plating had ceased work for the day.

In this way, the ambient sound level and the residual sound level (both as defined in BS4142) at this location have been obtained. This allows the determination of the specific sound level at LT3 from LPC Plating, as follows:

- Ambient sound level $L_{Aeq,T}$ 55 dB
- Residual sound level $L_{Aeq,T}$ 52 dB
- Specific sound level $L_{Aeq,T}$ 52 dB.

In addition, a review of the 1/3rd octave band values have been undertaken to determine whether the Specific sound exhibited any tonal characteristics. This is as shown in Figure 1.

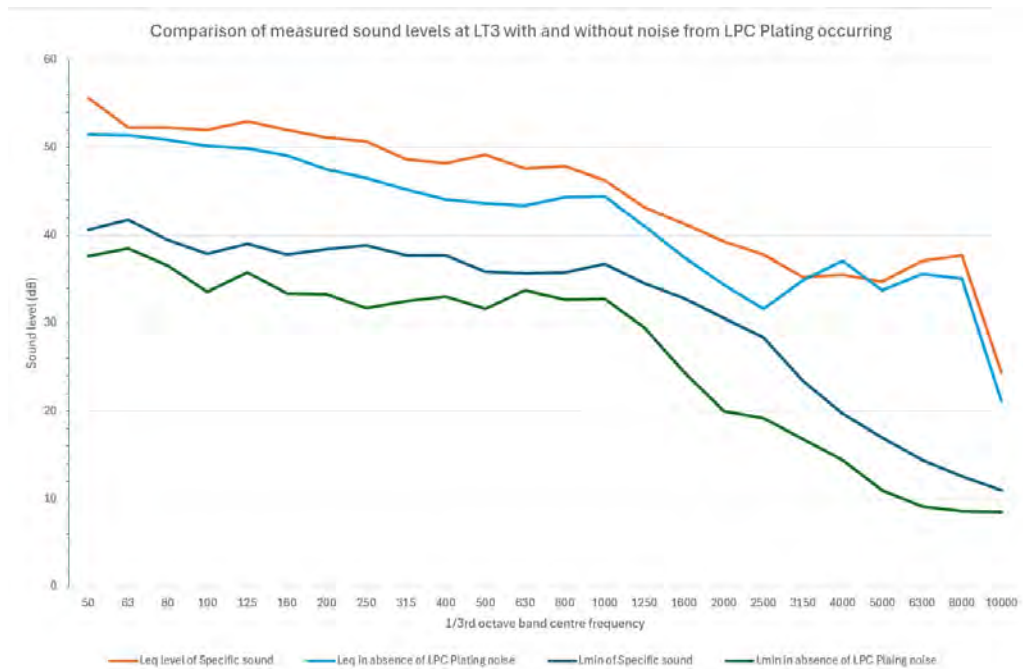


Figure 1: Comparison of 1/3rd octave band sound pressure levels with and without LPC Plating noise

7. PREDICTION OF ENVIRONMENTAL NOISE LEVELS ACROSS THE SITE – ROAD TRAFFIC

The measurement results obtained from the survey described in Section 6 are representative of the levels at the specific measurement locations. However, it is necessary to know how the noise exposure varies across the proposed development in order to assess how noise will affect the noise-sensitive receptor locations.

The predominant noise sources near the site which control ambient noise levels across the site are, as described in Section 4.2:

- Industrial noise from LPC Plating Services to the south east
- Condenser units located at the rear of Furnston Court, and
- Road traffic noise on surrounding roads

This section of the report will deal with road traffic noise and subsequent sections will address industrial noise sources.

7.1 METHOD

The main road traffic noise sources affecting the site are from Glebe Road, Icknield Way and Norton Way. Noise exposure at the various parts of the proposed development will depend upon differing degrees of distance attenuation, ground attenuation, screening and angle of view to these roads. Therefore, analysis has been undertaken to predict the noise levels across the development, based on the measurement results and taking these effects into account.

The procedure that has been followed is as summarised below:



- Generate a three-dimensional numerical noise model of the site conditions at the time of the surveys using GMBR Software's 'iNoise' program. This acoustic model implements the procedures set out in ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*.
- Validate the noise prediction model against actual noise measurement data taken at the survey positions. This validation is carried out in respect of daytime and night-time L_{Aeq} levels, as well as L_{AFmax} noise levels at night-time.

The above procedure establishes the noise exposure for the site, prior to development taking place. In particular, it calibrates the source sound power level of the nearby roads.

Subsequently, the noise model has been used to calculate the noise environment that will affect the proposed development, following the steps below:

- Alter the various noise models to include the proposed residences at their indicated location and height. Carry out predictions of noise levels at a representative number of locations around the façades at the window locations of the proposed habitable rooms as well as in private amenity spaces.
- Use these noise level predictions as the starting point for noise ingress calculations for key habitable room locations.
- Predict the indoor ambient noise level using the procedure described in Annex G2 of BS8233:2014.
- Compare predicted indoor noise levels against the guideline noise levels in terms of:
 - o L_{eq} noise levels in studio rooms during the daytime (i.e. 35 dB), and
 - o L_{eq} noise levels in studio rooms during the night-time (i.e. 30 dB)
 - o $L_{AFmax,typ}$ noise levels in studio rooms during the night-time (i.e. 45 dB)
- Provide appropriate sound insulation specifications to the relevant façade components to ensure these guidelines are met.

Noise ingress predictions have been carried out at a number of the most affected proposed habitable rooms within the development.

7.2 RESULTS – PROPOSED DEVELOPMENT

Appendix D shows plan and axonometric views of the numerical noise model, indicating the height and location of the proposed buildings, the surrounding existing buildings and roads.

The numerical results of noise level predictions for the most noise-affected residential façades are shown in Appendix E.



8. ANALYSIS OF INDOOR NOISE LEVELS FOR PROPOSED RESIDENCES – TRAFFIC NOISE

8.1 CALCULATION OF NOISE INGRESS

BS 8233:2014 at Annex G2 describes a 'more rigorous calculation method' for determining internal noise levels, using octave band data (i.e. more rigorous than for single-number estimates). This is calculated from external octave band noise levels, given the size and sound insulation properties of the building façade elements including glazing and ventilation, as well as acoustic properties of the receiving room, such as the volume and reverberation time. Usually, it is the glazing and, depending upon the particular strategy, the ventilation apertures that admit most noise into residences. It is then a matter of providing façade elements with appropriate acoustic performance to achieve sufficient noise reduction to meet the internal noise target.

The analysis carried out for this development assumes typical internal finishes for habitable rooms, based on reverberation times that Spectrum have measured in a range of occupied dwellings. The general construction of the building envelope is assumed to be brick-block external walls and concrete roof tiles on timber truss, pitched roofs with an insulated loft space to plasterboard ceilings.

Sound insulation data for the façade elements have been taken from sources such as standard data provided by BRE and DETR, Spectrum library of measurement data, calculations using Marshall Day's *Insul* software as well as manufacturer's data and the BRE/CIRIA publication 'Sound Control for Homes'.

Appendix F shows sample noise ingress calculations following the BS8233 method for the most noise-exposed residential facades. During the daytime, this is the southern façade, facing toward Icknield Way and the industrial units. At night-time, the façade facing Glebe Road has the highest incident noise levels, those directly facing Glebe Road. The combination of acoustic effects mean that predicted intrusive noise levels are greatest for rooms at these locations. In other words, noise ingress levels at all other locations will be lower, given the same external building envelope materials. Note that daytime noise level calculations include the predicted component of noise from nearby industrial noise sources.

The example calculations show that the daytime L_{Aeq} inside living rooms and the night-time L_{Amax} levels inside bedrooms meet BS8233 guidelines.

The minimum wall and roof sound reduction index specification required for habitable rooms in order to meet the noise standards shown in Section 4 are:

Walls:	$R_w \geq 50$ dB, $R_w + C_{tr} \geq 47$ dB
Roofs:	$R_w \geq 48$ dB, $R_w + C_{tr} \geq 35$ dB

The analysis shows that standard thermal double-glazed windows and non-acoustic trickle vents would provide sufficient sound insulation for BS8233 indoor noise levels to be met.

In all locations, the following window and trickle vent acoustic specification is acceptable for all habitable rooms. These performances are equivalent to standard thermal double glazing and non-acoustic trickle vents. In fact, even with these 'basic standard' façade elements indoor noise levels are predicted to be at least 5dB below the guideline levels in BS8233. For reference, the acoustic performance of these elements is:



Habitable Room Windows:	$R_w \geq 29$ dB, $R_w + C_{tr} \geq 25$ dB
Trickle vents (all rooms):	$D_{n,e,w} \geq 33$ dB, $D_{n,e,w} + C_{tr} \geq 32$ dB

Double glazed windows having the performance indicated are readily available commercially. These figures relate to the whole window performance including frames, seals and furniture. Both the $D_{n,e,w}$ and $D_{n,e,w} + C_{tr}$ parameters of the selected trickle vents should comply with the levels stated above. Again, commercially available vents having this performance are readily available.

8.2 VENTILATION

Approved Document F of the Building Regulations (ADF) describes methods of providing adequate ventilation for people in a building. It focuses on performance-based guidance, suggesting what level of ventilation should be sufficient, rather than how it should be achieved. It recognises that in noisy locations, it may be appropriate to use either sound attenuating background ventilators or mechanical ventilation solutions, depending on the noise level and any planning conditions.

In habitable rooms, there is a requirement for whole dwelling ventilation (low-rate continuous fresh air ventilation), extract ventilation (to remove vapour or smells) and purge ventilation (for the rapid removal of pollutants, usually by open windows). Purge ventilation is required for a short time for a specific irregular occurrence such as to clear odours or smoke. At these times, residents won't require the same indoor noise standards and accordingly the BS8233 indoor noise targets don't apply for these periods of purge ventilation.

Generally, the proposals for this development are to use *System 1: Background ventilators and intermittent extract fans*. This method of ventilation includes a component of environmental noise entering habitable rooms through trickle vents.

However, as discussed in Section 9.4 later in this report, for other reasons, *System 3: Continuously mechanical supply and extract with heat recovery* is proposed for some of the dwellings.

9. PREDICTION OF ENVIRONMENTAL NOISE LEVELS ACROSS THE SITE – INDUSTRIAL NOISE

Earlier sections of this report describe that previous investigations carried out by Spectrum included:

- At-source measurements of industrial noise
- Determination of individual source sound power levels
- Creation of a numerical noise model to predict industrial noise propagation to the surrounding area

Accordingly, the iNoise numerical has again been used to predict industrial noise affecting the proposed dwellings on the site. This includes:

- The mechanical equipment noise sources including noise control measures at LPC Plating as described in Spectrum's October 2021 report, and
- The condenser unit sound power levels at Furmston Court as described in Spectrum's 2019 report.

It should be noted that the LPC Plating specific sound level derived from this process agrees very closely with the levels predicted for this location in Spectrum's October 2021 report as described in Section 4.1.3, above. Figures showing the elements of this noise model are shown in Appendix G.



9.1 CHARACTER OF THE INDUSTRIAL NOISE AND BS4142 FEATURE CORRECTION

Figure 1 indicates that there is no apparent tonality within the specific sound from LPC Plating. Further, the sound is not level varying, intermittent or does not, in other ways, contain acoustic features that would increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. However, the character of the noise LPC is different to ambient traffic noise. BS4142 says *"Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied"*. Accordingly, the Sound Rating Level for assessment purposes is considered to be equal to Specific Sound Level plus 3 dB.

It is considered quite cautious to add a 3dB character correction where no 'attention-catching' characteristics occur. However, doing so provides a robust assessment of the noise impact in this case.

9.2 NOISE CONTROL MEASURES

Initial review of the noise model output for industrial noise showed that some reduction of noise on the subject site from LPC Plating would be desirable, particularly at ground floor level and in the rear amenity areas. Consideration was given to a number of noise control strategies. Wheatley Homes have expressed the view that whatever measures are incorporated should be wholly within their control, so that the design, implementation and maintenance of the measures can be properly delivered.

Accordingly, a 2m, solid, imperforate site boundary barrier is proposed for the southern and eastern site boundaries to attenuate LPC Plating noise.

9.3 RESULTS

Appendix H includes the predicted specific sound levels at various locations across the proposed residential development as well as a coloured contour plot showing regions of equal predicted specific sound level.

This shows that highest predicted Specific Sound Level is 51dB at 2nd floor level of Plot 1 making a Rating Level of 54 dB. This is 7dB above the Background Sound Level.

At ground floor level highest predicted Specific Sound Level is 48dB at 2nd floor level of Plot 1 making a Rating Level of 51 dB. This is 4dB above the Background Sound Level.

The contour plot in Appendix H shows the noise from LPC Plating mostly affects the eastern-most plots of the subject development (Plots 1, 2 and 3), with noise levels, particularly at ground floor level reducing significantly towards the west (Plots 7, 8 and 9).

9.4 ASSESSMENT, CONSIDERATION OF CONTEXT AND DISCUSSION

As noted in Section 5.3:

A difference [between rating level and background sound level] of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. This is generally taken to be a Significant Observed Adverse Effect Level (SOAEL).



A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. The Lowest Observed Adverse Effect Level (LOAEL) occurs in a range of "sound rating level minus background sound level" between 0dB and 5 dB depending upon context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context. Where the sound rating level is assessed to be 10 dB below the background sound level, this is generally taken to be the No Observed Adverse Effect Level (NOAEL).

At upper floors of the proposed development on the south east side, i.e., those closest to LPC Plating, the difference between rating and background sound is assessment is up to 7dB. This is considered an adverse impact.

At ground floor level and in gardens, the difference is ≤ 4 dB. This is between a low impact and an adverse impact.

According to BS4142, *where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.*

- 1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.*
- 2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/ or commercial nature is likely to be perceived and how people react to it.*
- 3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*
 - i) *facade insulation treatment;*
 - ii) *ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
 - iii) *acoustic screening.*

In the context of an urban setting, the residual sound is neither high nor low, so context point 1 does not change the assessment.

Point 2 is discussed in the section on feature correction. Spectrum consider that the feature correction may be greater than is necessary, given the characteristics of industrial sound, however, it is included



here to present a robust assessment. Accordingly, this consideration of context does not change the assessment.

As regards Point 3, there are a number of relevant considerations.

Residents of the proposed new dwellings will be coming to the area and, to an extent, will accept the noise environment as they find it. This is contrast to an existing resident exposed to a new industrial noise who would be aware of the difference in the noise environment.

Section 8.1, above shows that, even when industrial and road traffic noise are combined, indoor noise levels are predicted to be at least 5dB below the guideline levels in BS8233. So the proposed buildings already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

The proposals include for acoustic screening which provides around 5 dB attenuation of industrial noise at ground floors and in gardens.

In relation to ventilation, Wheatley Homes have agreed that Plots 1, 2 and 3, the most affected by LPC Plating noise, will have ADF Type 3 ventilation - *mechanical ventilation with heat recovery* - using units that incorporate active heating and cooling which reduces the need for window opening. This type of unit is commercially available from a number of manufacturers with an example product shown in Appendix I.

These points combine to provide a context that mitigates the impact of the industrial noise for the proposed development to 'at or below' adverse noise impact.

Section 5 notes that it is a stated aim of the NPPF and the NPSE to mitigate and minimise adverse impacts. This aim is met by the subject development.

Taking all of these points into consideration, the industrial noise impact on residents of the proposed scheme is suitably low.

9.5 FORMER SEAT SHOWROOM.

Spectrum understand that the commercial site immediately to the west of the subject site (formerly a SEAT showroom) may come back into use as a showroom and workshop for Volvo cars. Proposal drawings for this development are shown in Appendix J.

These show a workshop building and a car valeting building near the boundary with the subject site. While no noise impact assessment for the proposals has been sighted, points of note include:

- Both the workshop and the valeting building are fully enclosed structures,
- There is only one facade in each building which has vehicle access doors and, in both cases, these face west, directly away from the subject site,
- There are no proposals for external mechanical plant or equipment

Therefore, the risk of adverse noise impact from this potential use is likely to be low.



10. NOISE LEVELS IN OUTDOOR AMENITY SPACES

10.1 PREDICTED NOISE LEVELS IN AMENITY SPACES

The outdoor amenity spaces included within the development comprises private gardens to the rear (southern side) of the dwellings. These are as shown in Appendix B.

The numerical noise model described in Section 8.1 has been used to calculate noise levels at 1.5m height within the proposed amenity areas, including the effect of the 2m southern boundary fence.

The results of the noise model shows that all have gardens have road traffic noise levels at or below $L_{Aeq,1hr}$ 47 dB. When noise from surrounding industrial sources is included, this is still $L_{Aeq,1hr}$ 47 dB at the western end of the development, rising to around $L_{Aeq,1hr}$ 50 dB at the eastern end. As discussed in the previous section, the noise impact in these areas following the procedure in BS4142 is for a mitigated adverse impact which, when context is considered, has an assessment of acceptably low impact.

Accordingly, the proposals in respect of outdoor amenity space are considered acoustically acceptable.

11. DISCUSSION ON PROPG

The following sections provide commentary on this development based on recommendations for an *Acoustic Design Statement*, as described in ProPG. The recommendations taken directly from ProPG are shown in *blue italics* and site-specific comments in normal text.

2.69 An Acoustic Design Statement (ADS) should provide sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 to 4 have been followed.

An initial noise risk assessment has been carried out and general noise exposures indicate the site has a 'low risk of adverse effect'.

2.70 An ADS should be proportionate to the scale of the development and to the degree of noise risk at the proposed development site. An ADS should not normally be necessary where the noise risk has been properly assessed as negligible during Stage 1. The level of detail provided in an ADS should increase with increasing level of risk.

Given the detail provided with the analysis (in particular, the use of long-term measured noise levels and comprehensive numerical noise modelling) the analysis carried out in this report is considered proportionate.

2.71 Applicants should always have regard to any local planning and noise policies and seek prior agreement from the LPA before deciding what level of detail is expected in an ADS to avoid misunderstanding and possible delays.

The local plan policies and guidelines for acceptability for this development have been properly taken into account within the assessment carried out in this report. The proposals are in accordance with relevant local and national policies.

2.72 In general terms an ADS should be expected to address the following issues:



a) Present the initial site noise risk assessment. This should include a description of the acoustic conditions prior to development and should determine the appropriate level of noise risk to the finished development were no additional noise mitigation measures undertaken. Particular care should be taken to ensure that any noise events (as quantified by L_{AFmax}) have been properly identified and assessed (see Appendix A). (Stage 1).

The site noise risk assessment identifies this site as having 'low' risk generally, without further mitigation measures. The issue of L_{AFmax} levels affecting the site have been considered.

b) Describe the external noise levels that occur across the site (before and after any noise mitigation measures) in an appropriate level of detail that reflects the scale and height of the proposed development. The external post mitigation noise assessment should use an informed judgement of typical worst case conditions over the foreseeable future, but it should exclude atypical noise events. Noise mapping and modelling techniques are likely to be useful for more complex sites. (Stage 2).

The external noise levels affecting the site have been measured and described. Noise modelling techniques have been utilised, including the effect of noise mitigation measures.

c) Demonstrate how good acoustic design is integrated into the overall design and how the proposed acoustic design responds to the specific circumstances of the site (exploiting opportunities and reflecting constraints) (Stage 2 Element 1).

As with all developments, there are numerous criteria that must be met in order to provide residences that are acceptable in all respects, not only for noise.

The design of the proposed residential scheme at Glebe Road has been developed with careful consideration to site constraints, local character, and best practice guidance, including ProPG: Planning & Noise. The dwellings are arranged in a linear terrace formation, positioned parallel to the road frontage, which aligns with the established street pattern of Glebe Road and reflects the prevailing Garden City layout principles.

From an acoustic perspective, this linear layout provides a more predictable and manageable noise environment for residential use. It avoids inward-facing façades around a shared courtyard, which under the previous withdrawn proposal which had a 'horseshoe'-type layout. The previous, discarded layout would have led to unwanted reverberation of sound from surrounding activity and car movements. That arrangement risked creating noise "hot spots" within the enclosed space, limiting the effectiveness of traditional mitigation techniques such as façade insulation and boundary screening.

By contrast, the revised layout adopts a single-sided linear arrangement, which allows each dwelling to benefit from clear separation between the public frontage (vehicle access and street, including the separation of the retained mature green space which includes the retention of mature trees and foliage) and private rear gardens which can be planted with trees for further visual screening. This supports good acoustic design as promoted in the ProPG guidance, enabling:

- Logical orientation of habitable rooms away from the primary noise sources, which are primarily to the rear and eastern sides of the site;
- Better control over external amenity space noise levels;
- Simpler façade treatment strategies to manage sound exposure.



Unit 9 has been designed purposefully further set forward on the site, both to mirror that of unit 1, but also to bring this further forward from the rear corner of the site. Bathrooms/ensuites (non-habitable rooms) are set on the outer corner of the unit to further bring habitable rooms further from the boundary line.

The current scheme is also more conducive to good layout planning, natural surveillance, and integration of biodiversity and drainage features. The design issues and acoustic limitations inherent in the previous horseshoe layout have now been properly addressed through this revised approach, ensuring an appropriate and policy-compliant design that aligns with both planning and acoustic objectives. “

Considering the constraints of the site in terms of space and the number of dwellings yielded, landscaping and highways requirements, maximum use of building and room orientation and shielding has been included to protect dwellings from environmental noise.

d) Confirm how the internal noise level guidelines in Figure 2 will be achieved. Include, where relevant, full details of the design measures and building envelope specifications that will achieve the internal noise level guidelines. The LPA may request evidence of underlying calculations, in order to assist them in understanding any specific aspects of the assessment, which would need to be undertaken by a suitably qualified practitioner.

The level of building façade reduction and acoustic specifications that provide these are described in Section 8.1.

e) A detailed assessment of the potential impact on occupants should be undertaken where individual noise events are expected to exceed 45 dB L_{AFmax} more than 10 times a night inside bedrooms (see Appendix A).

The building façade measures necessary to prevent this from occurring are also shown in Section 8.1.

f) Priority should be given, as part of good acoustic design, to enable the use of openable windows as extensively as is practical across the development site. Where it is not considered practical to achieve the internal noise level guidelines with windows open a justification should be provided to the LPA setting out the reasons for this. Where it is proposed that windows need to be closed in order to meet the internal noise guidelines then full details of the proposed ventilation and thermal comfort arrangements must be provided.

As described in previous sections, the opportunity for acceptable indoor acoustic conditions with windows normally opened is taken into consideration by the proposed layout of this site. Where it is proposed, outline information of the proposed ventilation and thermal comfort arrangements have been provided.

g) Where the LPA accepts that there is a justification that the internal L_{Aeq} target noise levels can only be practically achieved with windows closed, and provided care has been taken to design the accommodation so that it provides good living conditions (in respect of acoustics, ventilation and thermal comfort), then internal noise levels can be assessed with windows closed. In this scenario any systems used to provide “whole dwelling ventilation” (e.g. trickle ventilators) should be in the open position and the internal L_{Aeq} target noise levels should not generally be exceeded. It should also be noted that the internal noise level guidelines are generally not applicable when windows or other natural ventilators are open solely to provide “purge ventilation” as this should only occur occasionally.

The analysis in Section 8.1 indicates that internal noise targets can readily be achieved.



h) Reasonable steps should be taken to minimise overheating during summer months through good design. Where openable windows / ventilators are proposed to mitigate overheating and where the internal noise level guidelines are likely to be exceeded when they are open a more detailed assessment of the potential impact on occupants during the overheating condition should be provided in the ADS. This more detailed assessment may include:

- (i) the alternative design measures considered / applied to reduce noise impact on occupants,*
- (ii) the expected internal noise levels when windows / ventilators are opened to provide relief from overheating, and*
- (iii) an estimate of the amount of time that windows are likely to be open to provide relief from overheating*

This element of the design would be undertaken at a later stage. At present it appears that there is a good chance that a proportion of dwellings will be able to mitigate overheating by open windows. Where windows may be closed against industrial noise, MVHR units that have integral comfort cooling are proposed.

i) Present the findings of the external amenity area noise assessment – applying the information on external noise from (b) above to a wider consideration of the effects of noise on external amenity areas. This assessment should be more detailed in medium and high noise risk sites because of the higher external noise levels on site prior to development (Stage 2 Element 3).

Section 10 of this report describes amenity area noise levels. Outdoor amenity areas will have noise levels generally at or below L_{Aeq} 50 dB. This is considered an acceptable situation in accordance with guidance and standards.

j) Present the findings of the assessment of other relevant issues. Close liaison with the LPA is recommended to fully address any local issues and local policies that are of particular importance to the specific scheme and locality (Stage 2 Element 4).

The site is considered capable of providing a residential development that is consistent with national and local noise planning policies and guidelines. Taking into account other constraints upon residential development, it will be possible to achieve recommended internal noise levels in all cases and to maximise the extent of locations where this can occur with windows open.

k) Confirm, for a low noise risk site, how the adverse impacts of noise will be mitigated and minimised in the finished development (NPPF).

Transportation noise sources will be mitigated by a combination of site layout, internal layout, façade sound insulation and, where appropriate, .

l) Confirm, for a medium or high noise risk site, how the adverse impacts of noise will be mitigated and minimised and clearly demonstrate that a significant adverse noise impact has been avoided in the finished development (NPPF).

The outline measures will be as described for k) above but, for the avoidance of doubt, wholly acceptable indoor and outdoor noise levels are achievable across the site with building measures that are commercially available and widely used in residential developments.



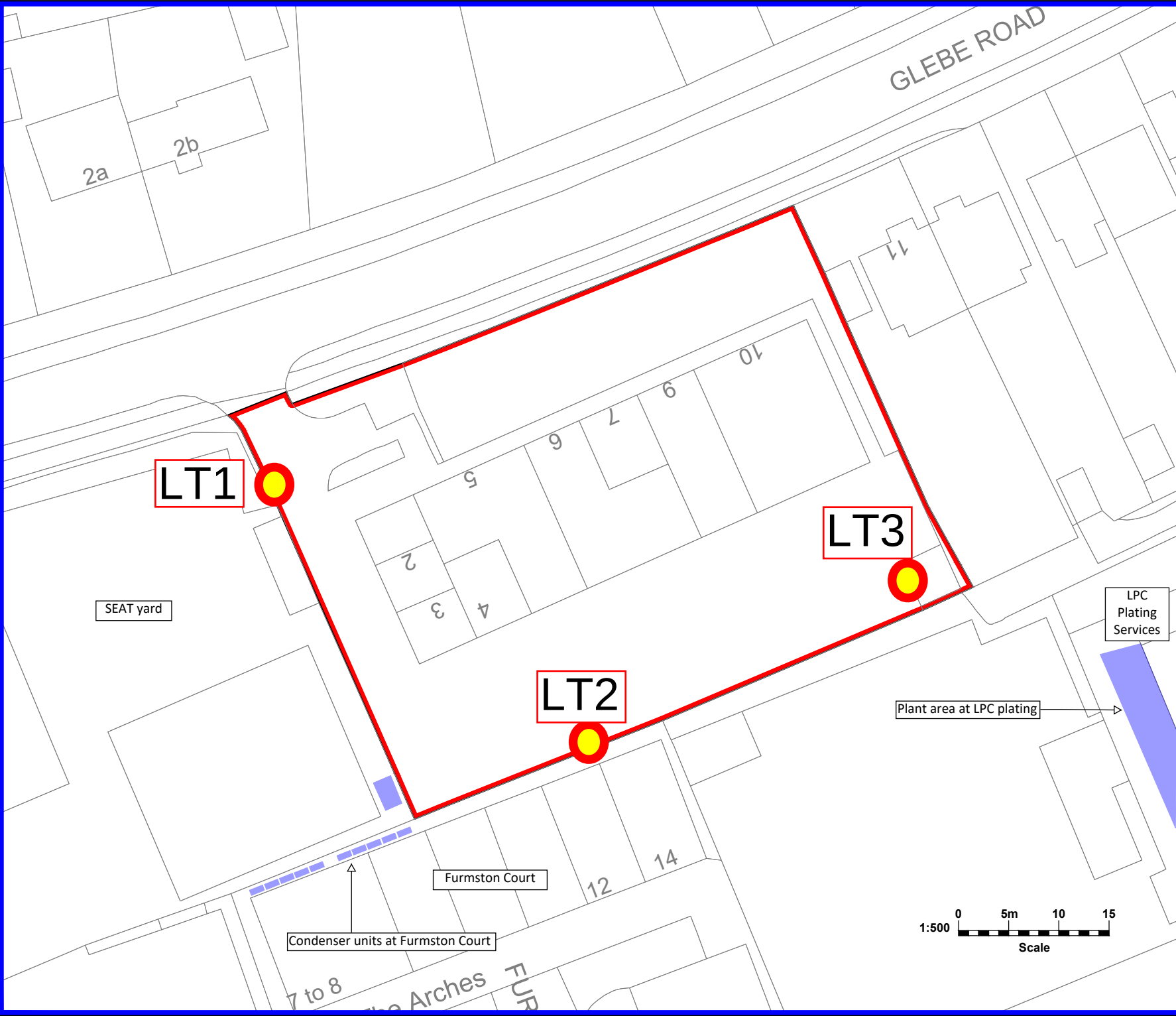
12. CONCLUSION

The acoustic issues associated with this proposed residential development have been assessed according to the appropriate guidance and standards and recommendations provided to ensure that acceptable acoustic standards will be provided for residents of this scheme. This includes indoor ambient noise levels within dwellings during the day- and night-times, as well as in outdoor amenity areas.

Providing the facade sound insulation measures, site boundary measures and MVHR recommendations described within this report are provided, the noise impact of the proposed development will be in accordance with the requirements of the relevant local and national planning policies.

A P P E N D I X A

Site location plan showing noise monitoring locations



Notes:-

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Rev	Date	Description	Drawn

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Project:
Glebe Road Industrial Estate

Drawing: Site Location Plan	Rev: 1
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Scale: 1:500 @ A4	Date: December 2018	Drawn: SAJ
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File location: s:\card\glebe_road\industrial_estate\site_location_plan.dwg

A P P E N D I X B

Site layout plans and proposal drawings

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NOTES

0 10 20



Proposed Location Plan
1:1250 scale

0 50m 100m
Scale 1:1250

Materials

Hard landscaping:
Permeable paving, block keyblock pavements
to car parking areas, colour to selection.

Saxon textured paving to pedestrian areas
and to rear terrace areas.

1.8 m close-boarded fenced where noted.

Additional Landscaping Items:
Bird boxes to appropriate facing external
walls.

Bat boxes to appropriate facing external
walls.

Garden sheds to accommodate secure cycle
storage.

EV charging points



Proposed Site and Roof Plan
1:200 scale

PLANNING

PENTANGLE

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JOB TITLE

Proposed Residential Development
at Glebe Road Industrial Estate,
Letchworth Garden City

DRAWING TITLE

Proposed Site Plan and Location Plan

SCALE	DRAWING NUMBER	REVISION
1:200		
DATE April '25		
SHEET A2		
JOB NUMBER 3879		

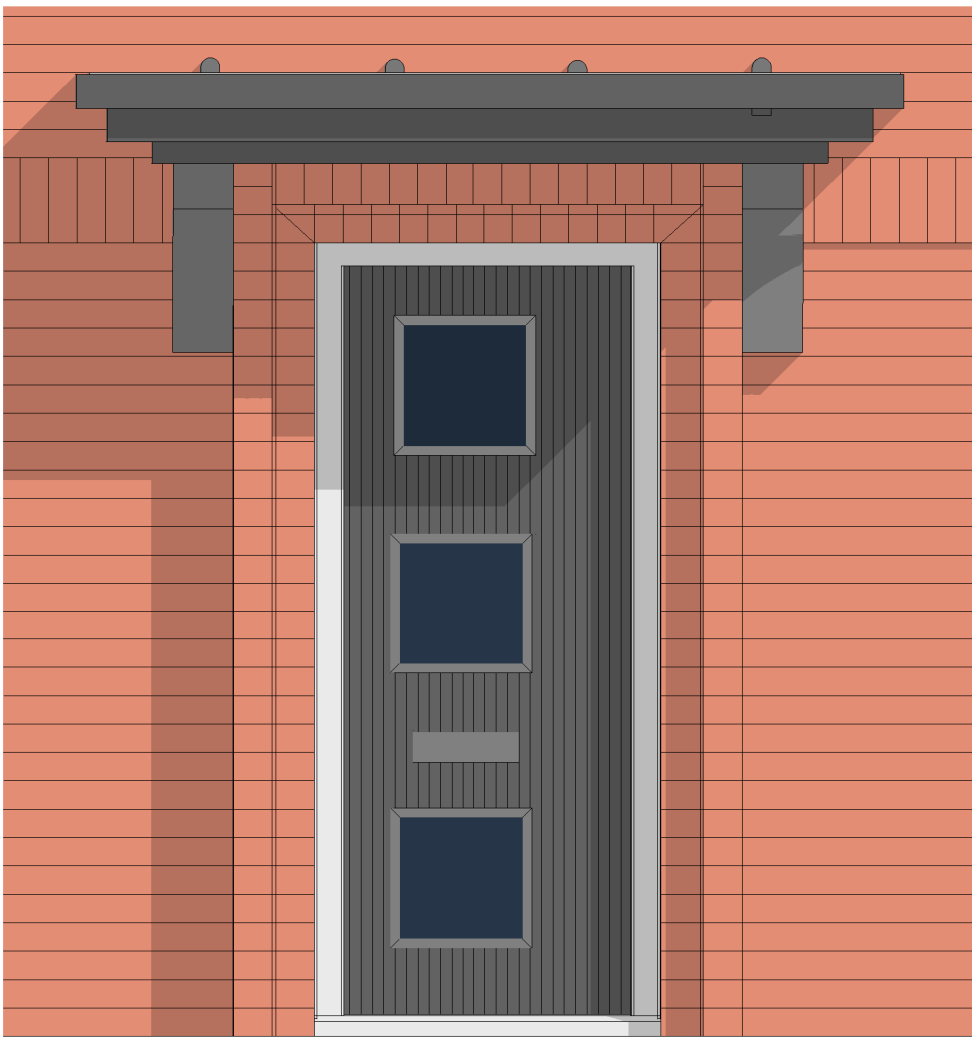
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ARCHITECTS & INTERIOR DESIGNER

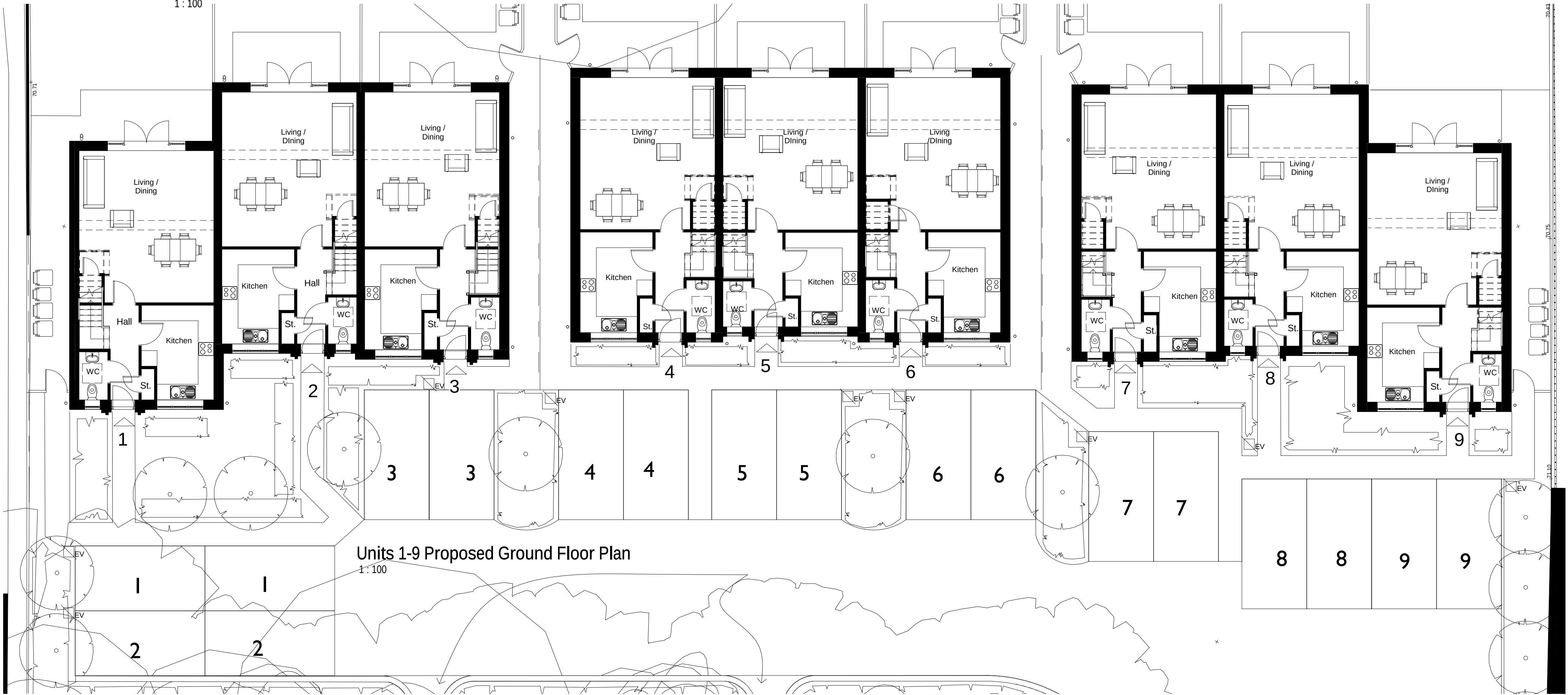


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NOTES



Front Door Detail
1:20

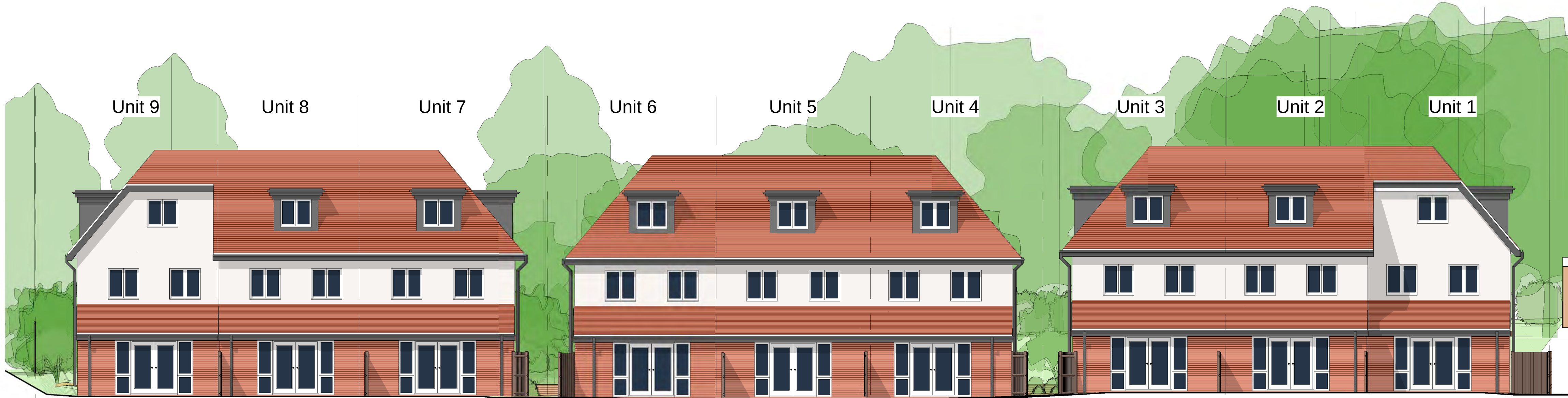


DISCUSSION
PENTANGLE
DESIGN GROUP
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T:01462 431133 E:pdg@pentangledesign.co.uk

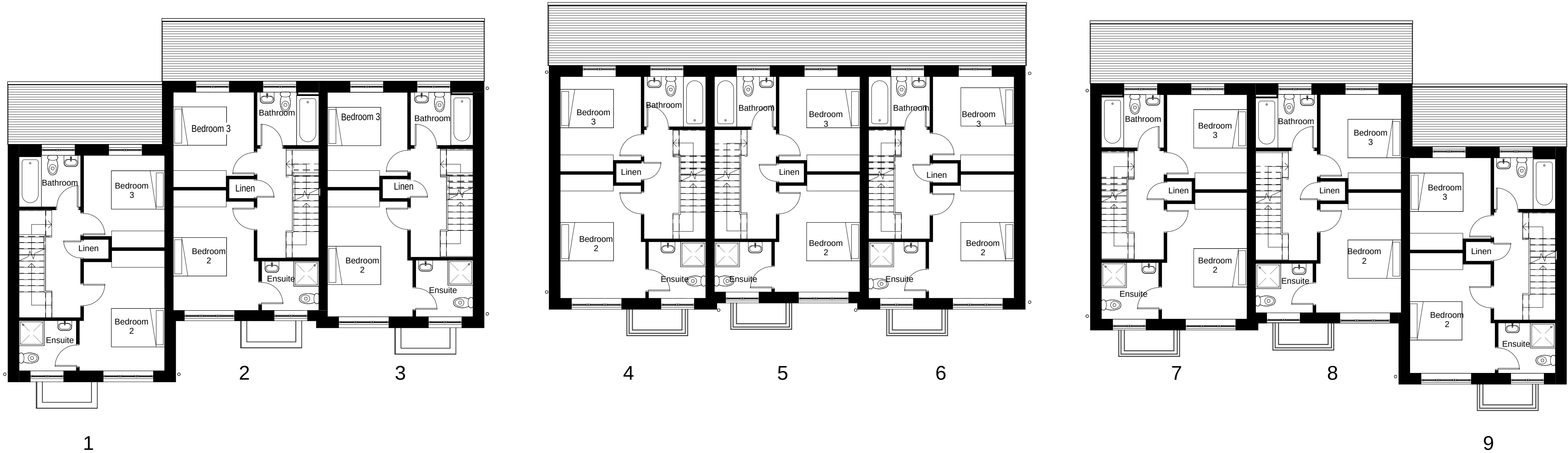
JOB TITLE
Proposed Residential Development
at Glebe Road Industrial Estate
for
DRAWING TITLE
Units 1-9 Ground Floor Plan and Front Elevation

SCALE	DRAWING NUMBER	REVISION
As indicated	61	E
DATE April '25		
SHT A1		
JOB NUMBER 3879		

ARCHITECTS AND INTERIOR DESIGNERS



Units 1-9 Rear Elevations
1 : 100



Units 1-9 Proposed First Floor Plan
1 : 100

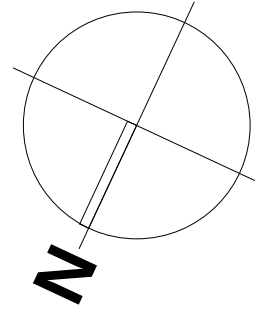
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NOTES

0 5 10 m



Material Schedule

Walls:
Red multi-brick to ground floor and
accent walls

White/cream coloured render to first
floors and gables

Roofs:
Plain tiles, red

Lead facing to dormers

External windows and doors:
White windows

Grey entrance door

DISCUSSION

PENTANGLE
DESIGN GROUP

SUITE 1, 21 BANCROFT HITCHIN HERTS SG5 1JW
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JOB TITLE

Proposed Residential Development
at Glebe Road Industrial Estate

for

DRAWING TITLE

Units 1-9 First Floor Plan and Rear Elevation

SCALE

1 : 100

DATE

April '25

SHT SIZE

JOB NUMBER

3879

DRAWING NUMBER

62

REVISION

C

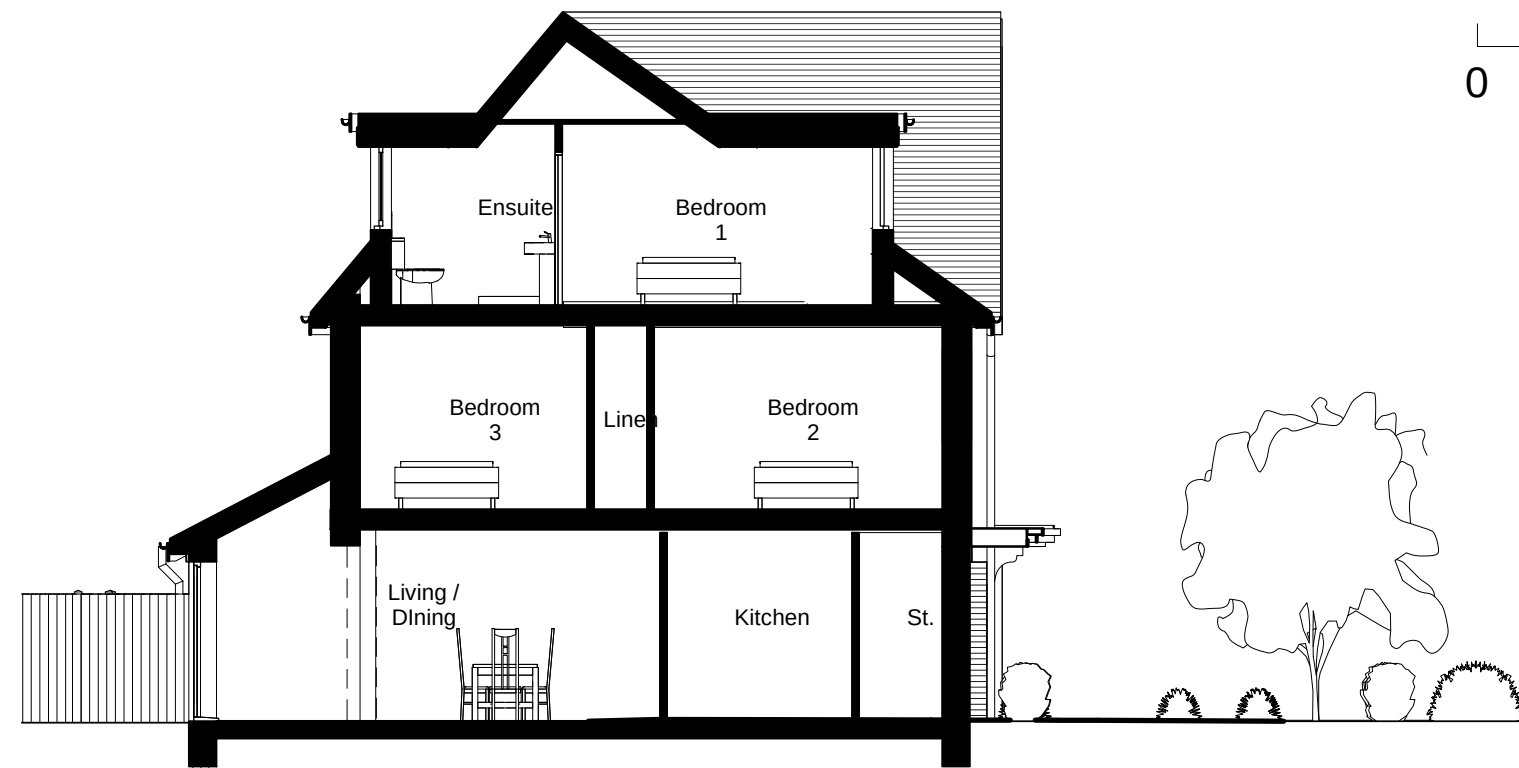
ARCHITECTS AND INTERIOR DESIGNERS



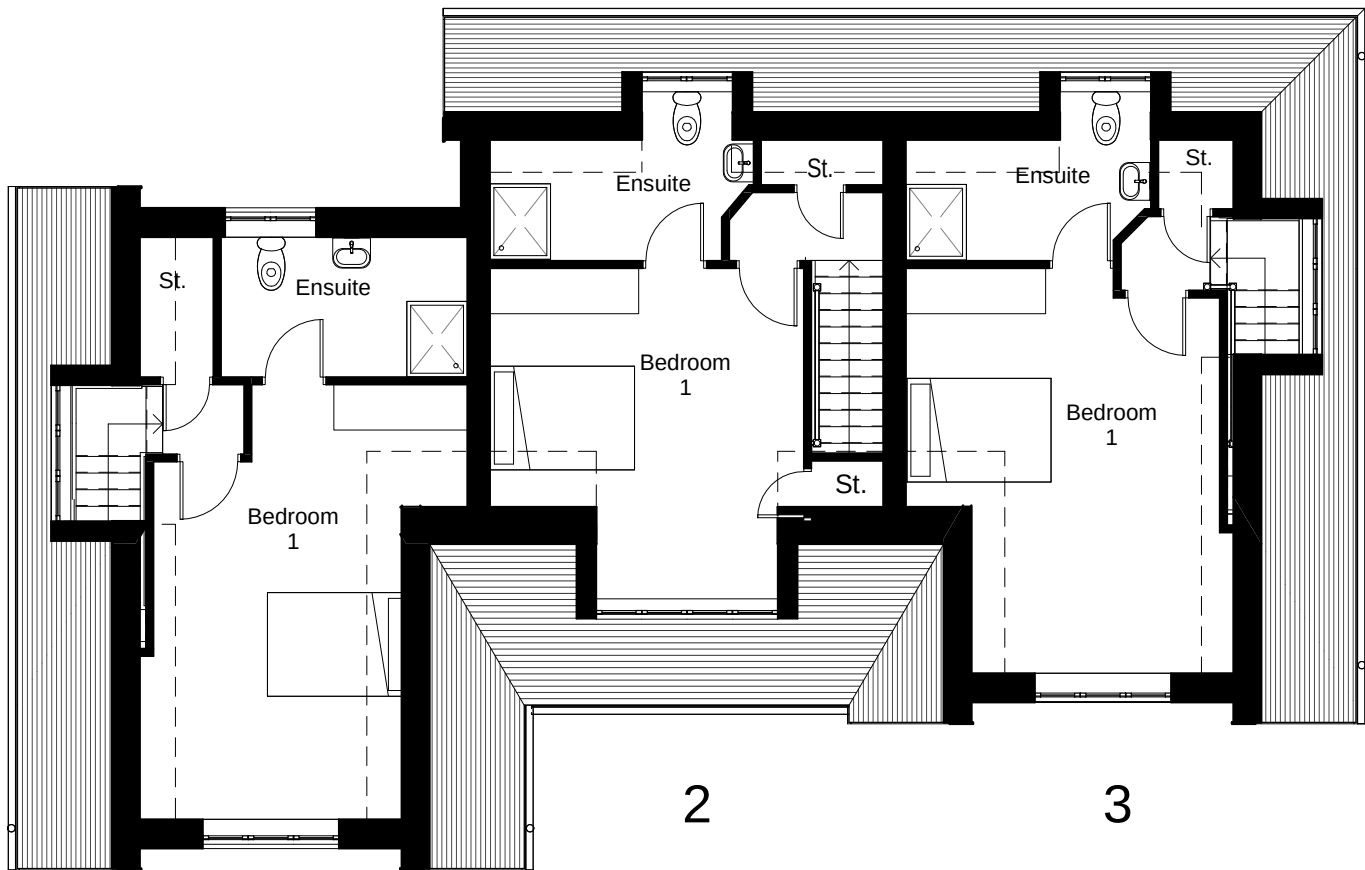
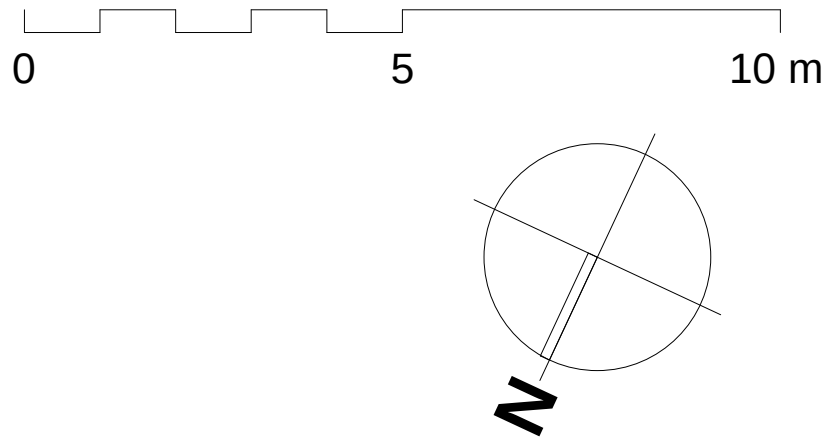
Units 1-3 East Elevation
1 : 100



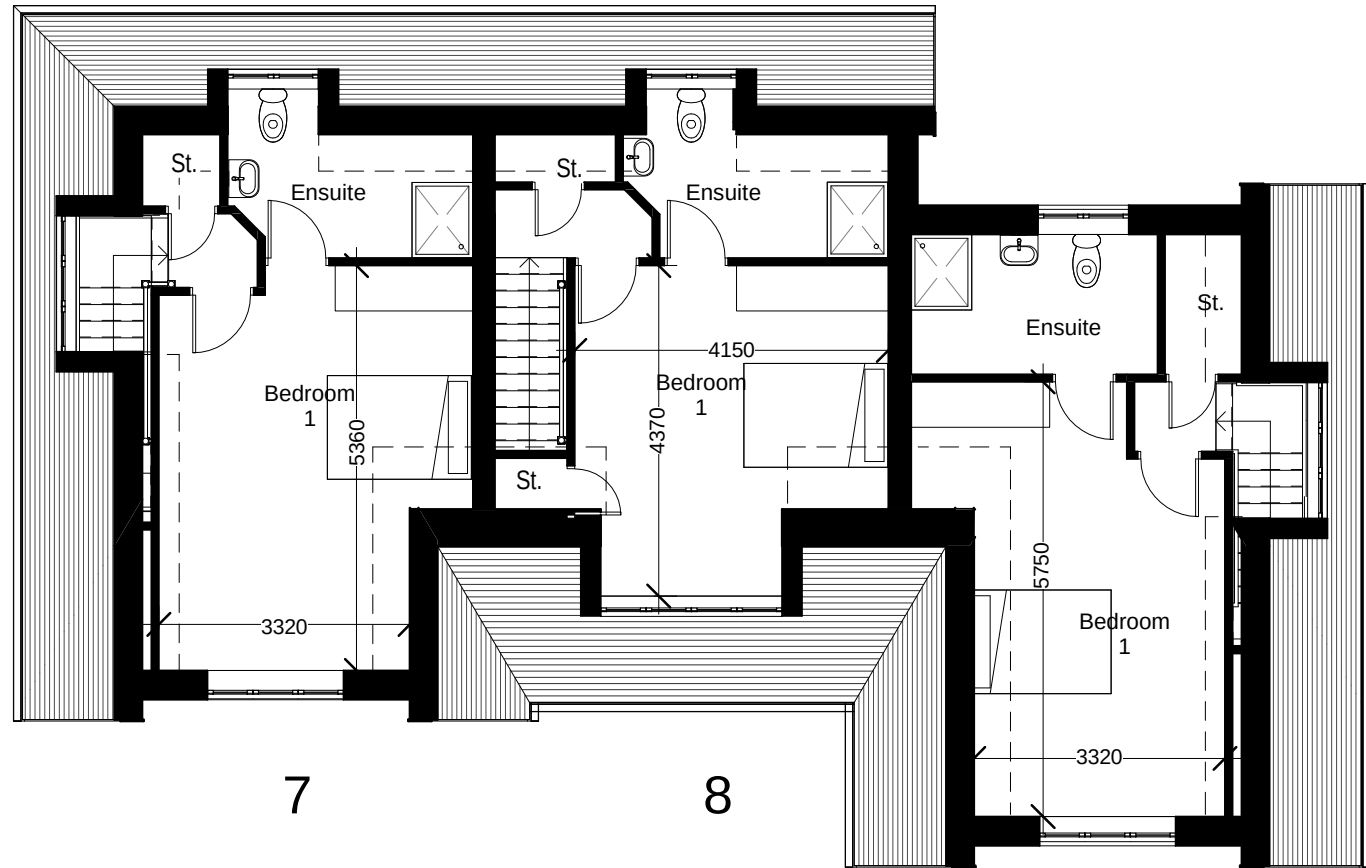
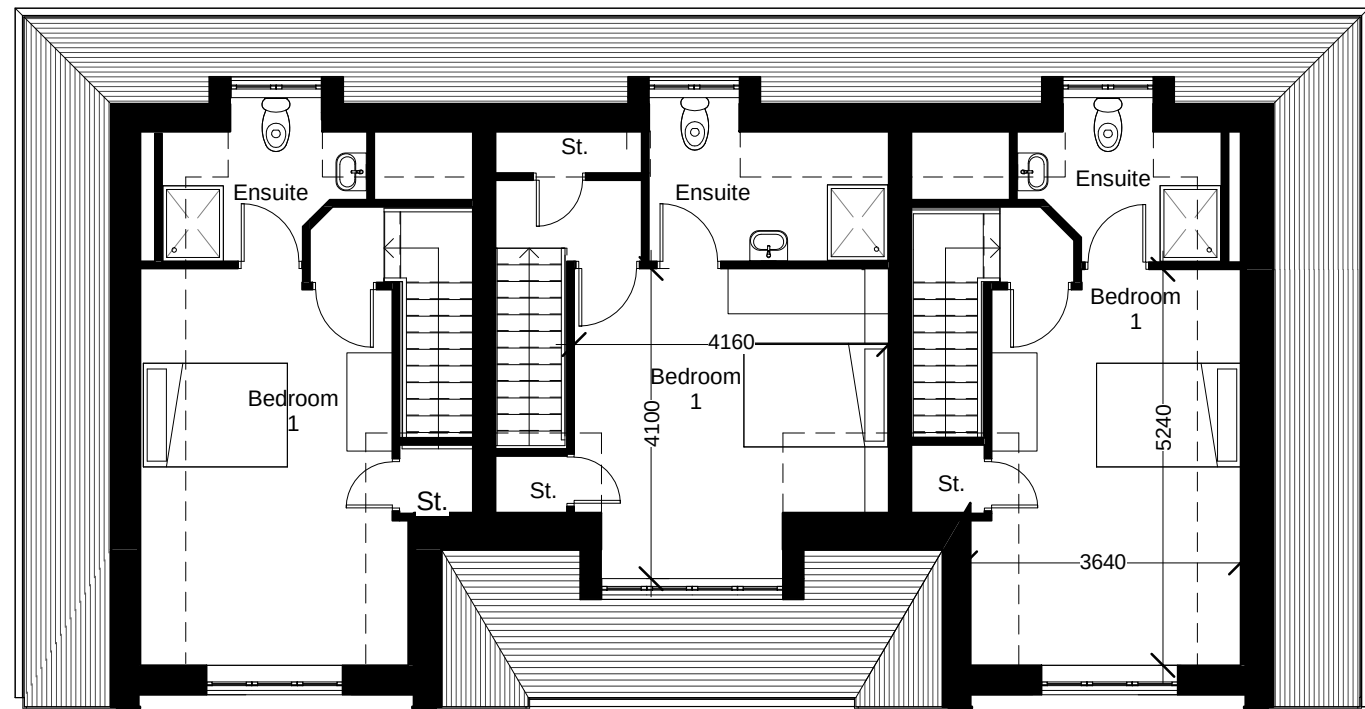
Units 1-3 West Elevation
1 : 100



Unit 5 Cross Section
1 : 100



Units 1-3 Proposed Second Floor Plan
1 : 100



Schedule of Accommodation:

Unit 1, 9:	124 m ² / 1333 sqft
Unit 2, 8:	121 m ² / 1300 sqft
Unit 3, 7:	127 m ² / 1370 sqft
Unit 4:	122 m ² / 1311 sqft
Unit 5:	119 m ² / 1277 sqft
Unit 6:	122 m ² / 1309 sqft

2no. parking spaces per dwelling
3no. visitors spaces

bicycles store in garden sheds

bins provisions to sides and rears of
each dwelling
bin setting out position to site entrance

DISCUSSION

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DESIGN GROUP

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JOB TITLE
Proposed Residential Development
at Glebe Road Industrial Estate

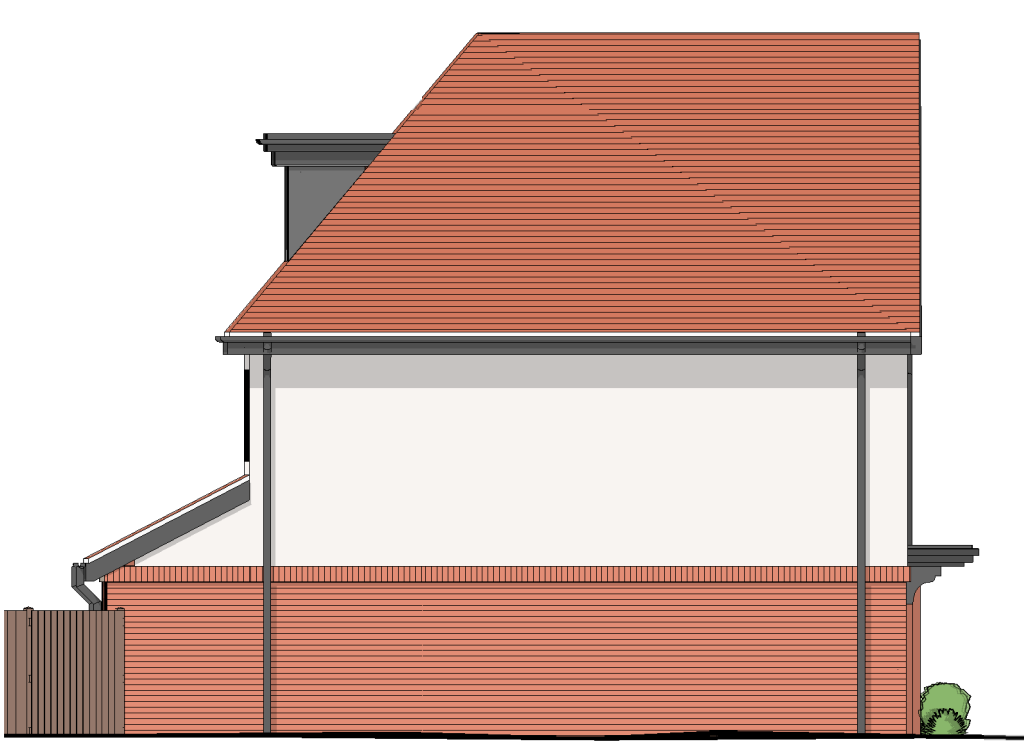
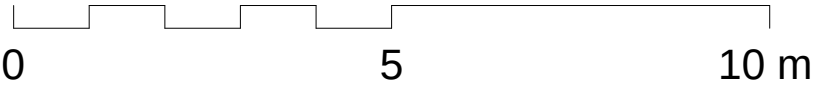
for
DRAWING TITLE
Units 1-9 Second Floor Plan and Units 1-3
Elevations

SCALE 1 : 100	DRAWING NUMBER	REVISION
DATE April '25	63	C
SHT SIZE		
JOB NUMBER 3879		

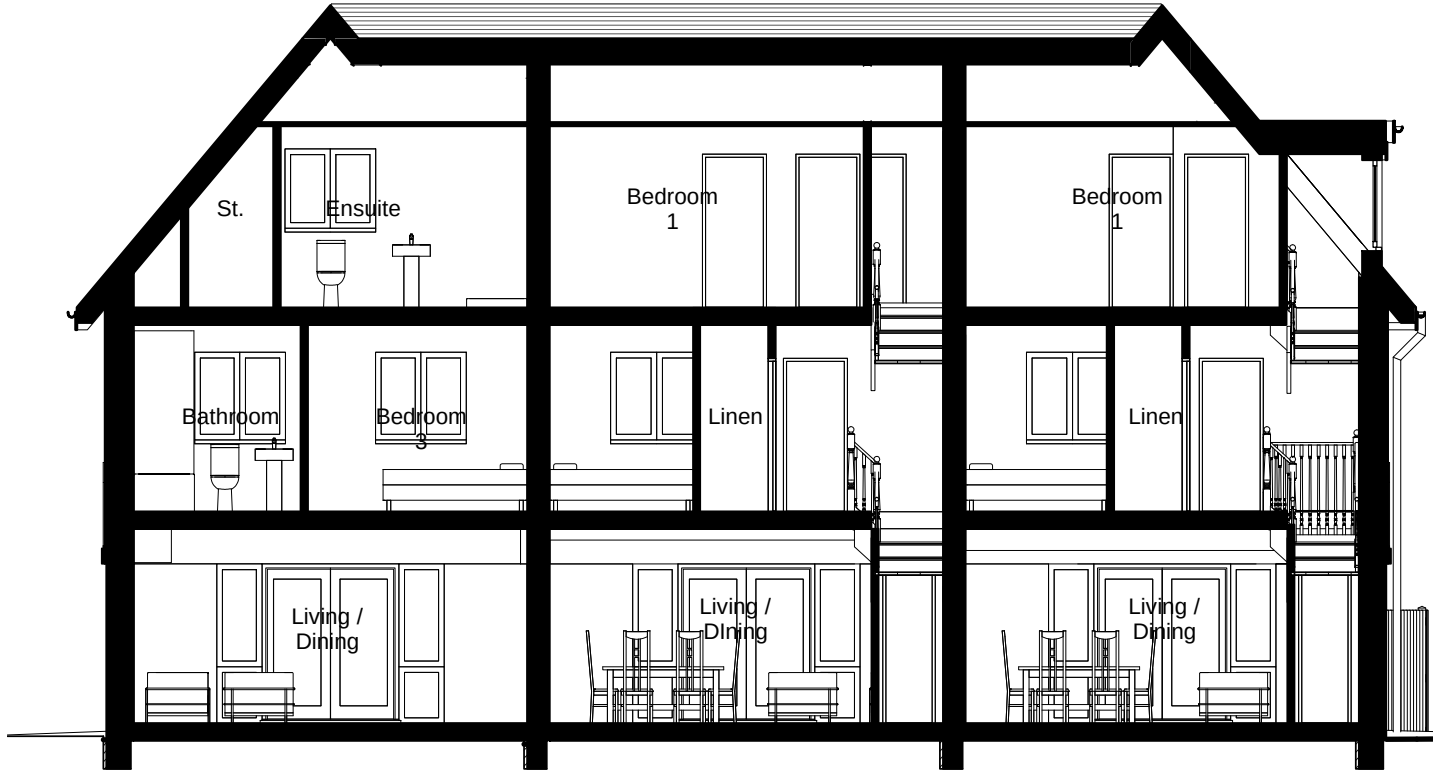
ARCHITECTS AND INTERIOR DESIGNERS

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NOTES



Units 4-6 East Elevation
1 : 100



Typical Long Section (Units 1-3)
1 : 100



Units 4-6 West Elevation
1 : 100



Units 7-9 East Elevation
1 : 100



Units 7-9 West Elevation
1 : 100

DISCUSSION

PENTANGLE
DESIGN GROUP

SUITE 1, 21 BANCROFT HITCHIN HERTS SG5 1JW
T:01462 431133 E:pdg@pentangledesign.co.uk

JOB TITLE
Proposed Residential Development
at Glebe Road Industrial Estate

for
DRAWING TITLE
Units 7-9 and 4-6 Elevations

SCALE	DRAWING NUMBER	REVISION
1 : 100	64	C
DATE April '25		
SHT SIZE A2		
JOB NUMBER 3879		

ARCHITECTS AND INTERIOR DESIGNERS



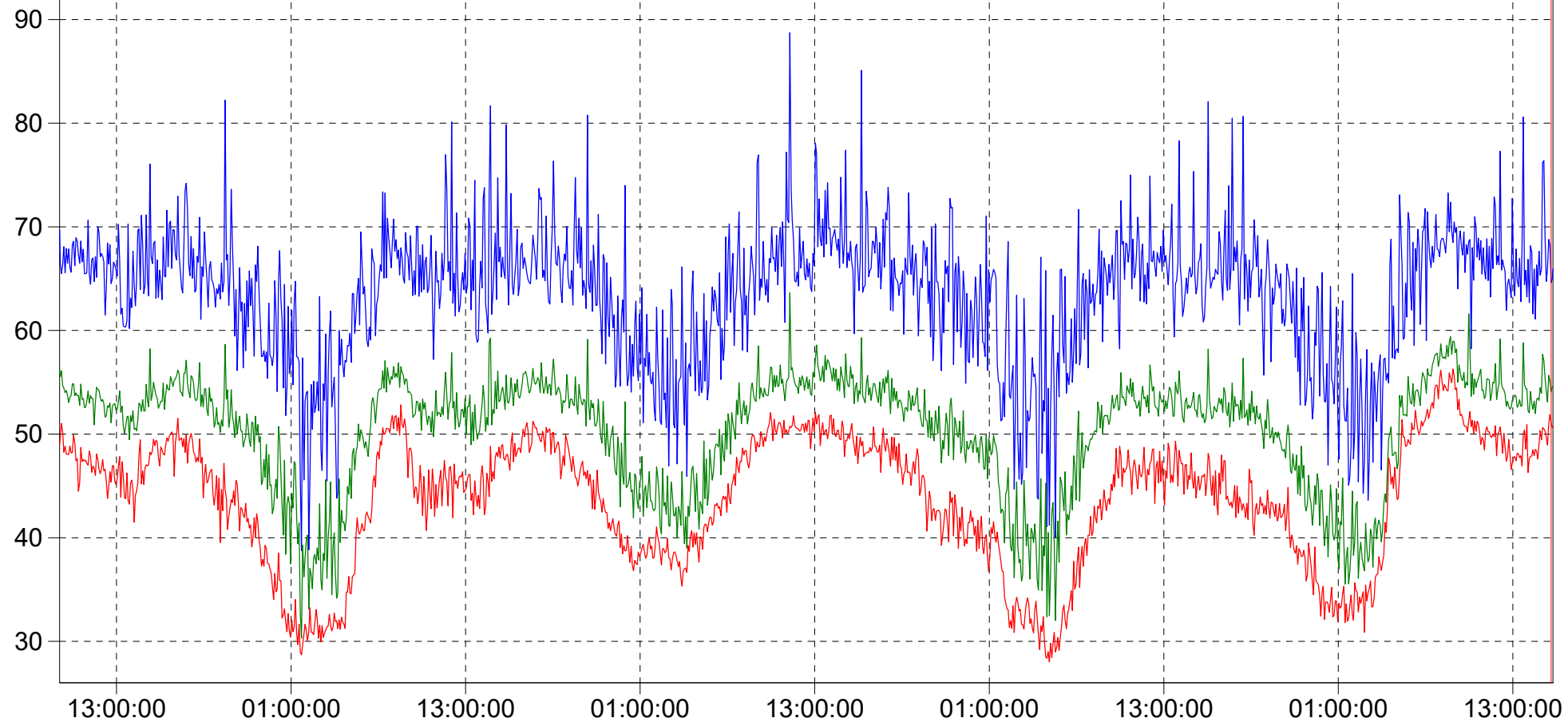
APPENDIX C

Graphical and tabular results of noise monitoring

LT1 Glebe Road

Weekday Daytime Night-time Weekend Daytime

dB

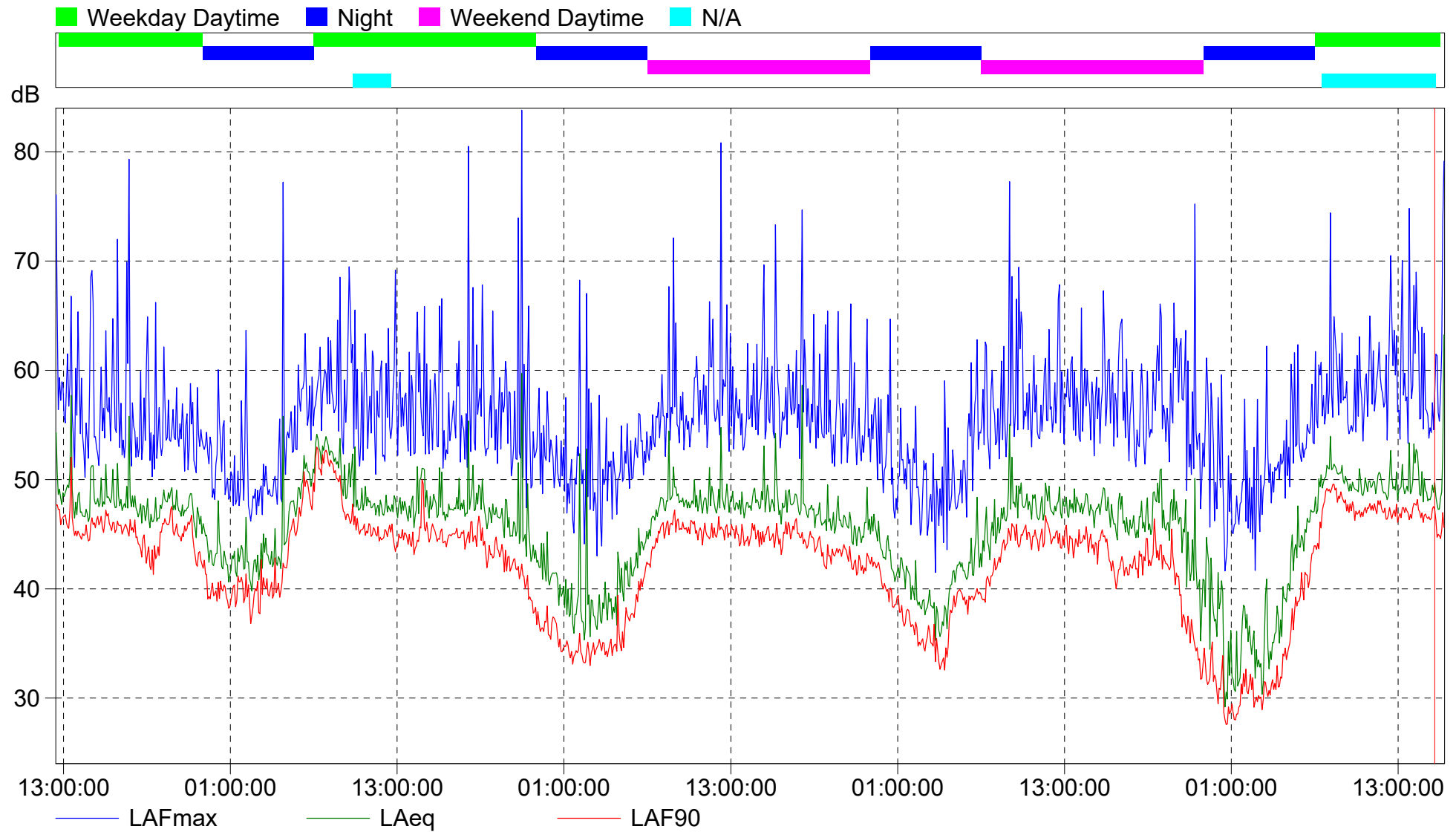


LAFmax LAeq LAF90

LT1 Glebe Road in Calculations

Name	Start time	LAFmax [dB]	LAeq [dB]	LAF90 [dB]	LZeq 63Hz [dB]	LZeq 125Hz [dB]	LZeq 250Hz [dB]	LZeq 500Hz [dB]	LZeq 1kHz [dB]	LZeq 2kHz [dB]	LZeq 4kHz [dB]	LZeq 8kHz [dB]
Total	10/10/2024 08:35:16	93.9	52.8	37.6	57.8	52.9	50.1	48.7	49.4	44.6	38.8	36.3
Unmarked	10/10/2024 08:35:16	93.9	62.1	50.9	60.4	57.4	55.9	57.2	56.0	54.1	54.1	54.8
(All) Weekday Daytime	10/10/2024 08:45:00	82.2	54.2	46.4	59.8	54.8	51.7	50.2	50.9	45.9	39.4	36.1
(All) Night-time	10/10/2024 23:00:00	74.0	46.8	32.9	50.5	45.7	43.6	42.8	43.4	38.7	33.8	29.8
(All) Weekend Daytime	12/10/2024 07:00:00	88.7	53.4	43.8	58.3	53.4	50.8	49.3	50.2	45.2	38.7	35.0
Weekday Daytime	10/10/2024 08:45:00	82.2	53.4	45.3	59.4	53.6	50.9	49.3	50.2	45.1	38.2	35.2
Weekday Daytime	11/10/2024 07:00:00	81.7	53.9	46.1	60.0	55.1	52.1	50.2	50.6	45.1	36.7	34.1
Weekday Daytime	14/10/2024 07:00:00	80.6	55.7	49.7	60.2	55.8	52.3	51.5	52.2	47.9	43.0	39.0
Night-time	10/10/2024 23:00:00	69.5	46.3	31.6	51.4	45.9	43.5	42.7	43.4	37.6	28.6	22.3
Night-time	11/10/2024 23:00:00	74.0	46.0	38.6	50.4	45.5	44.4	42.9	42.5	37.0	31.8	28.4
Night-time	12/10/2024 23:00:00	71.0	45.6	31.8	49.4	44.7	42.1	41.0	42.2	37.8	32.8	29.3
Night-time	13/10/2024 23:00:00	73.1	48.6	34.6	50.4	46.5	44.1	44.1	44.9	41.1	37.3	33.3
Weekend Daytime	12/10/2024 07:00:00	88.7	54.4	46.6	58.9	54.1	51.6	49.8	51.1	46.4	40.7	37.0
Weekend Daytime	13/10/2024 07:00:00	82.1	52.3	42.1	57.6	52.6	49.8	48.6	49.2	43.7	34.6	31.3

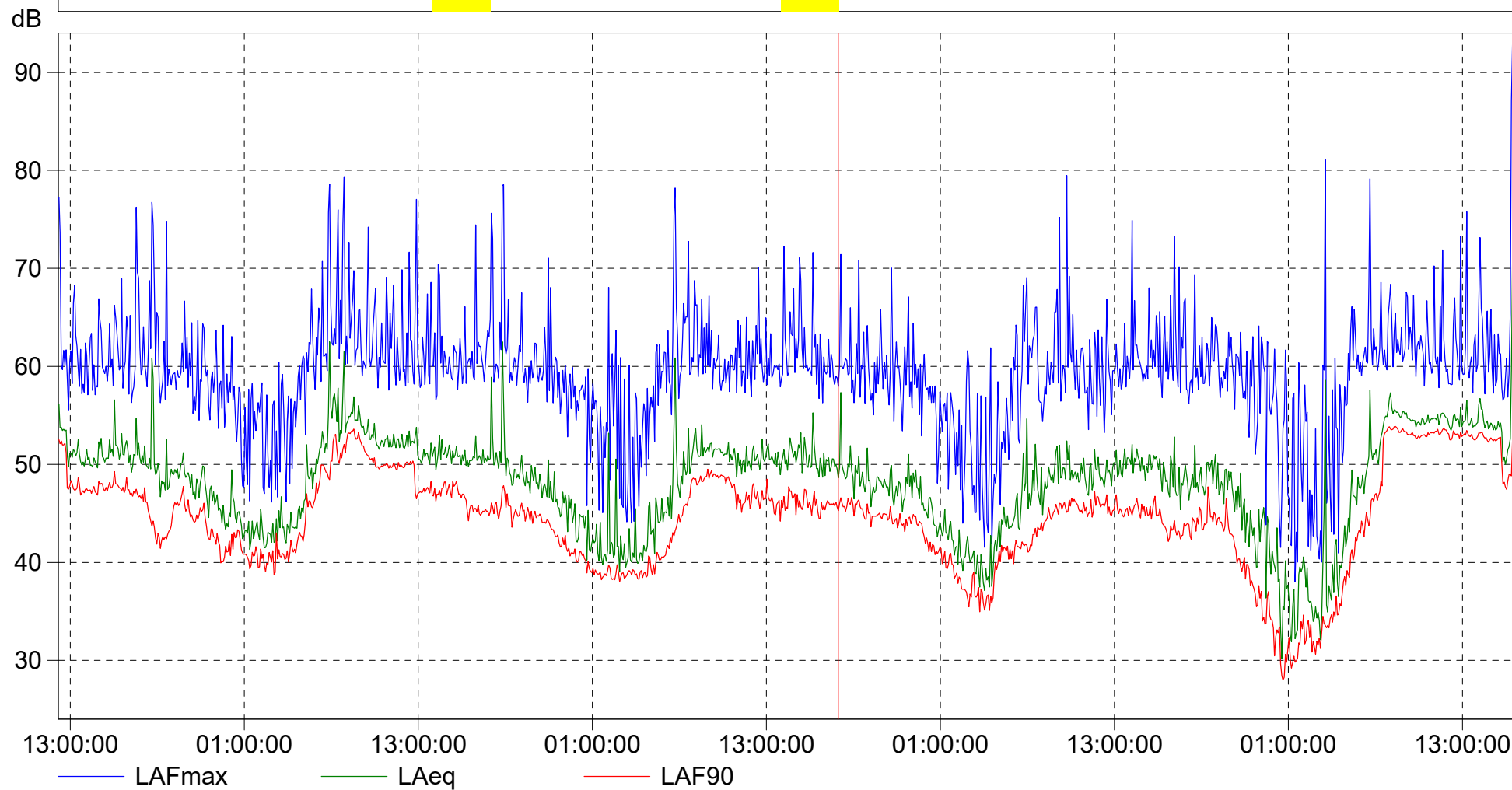
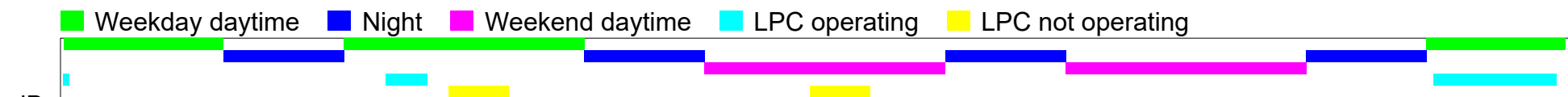
LT2 SW Corner



LT2 SW Corner in Calculations

Name	Start time	LAFmax [dB]	LAeq [dB]	LAF90 [dB]	LZeq 63Hz [dB]	LZeq 125Hz [dB]	LZeq 250Hz [dB]	LZeq 500Hz [dB]	LZeq 1kHz [dB]	LZeq 2kHz [dB]	LZeq 4kHz [dB]	LZeq 8kHz [dB]
Total	03/10/2024 12:26:36	83.8	47.4	36.9	53.5	50.0	47.4	45.0	43.7	36.6	30.3	27.3
Unmarked	03/10/2024 12:26:36	79.2	51.7	46.4	55.3	50.8	49.6	46.9	45.9	42.4	38.2	46.7
(All) Weekday Daytime	03/10/2024 12:40:00	83.8	49.2	44.6	55.4	52.1	49.4	47.0	45.3	37.9	31.2	26.0
(All) Night	03/10/2024 23:00:00	77.2	43.2	33.0	48.1	44.5	41.9	40.7	40.0	32.4	27.1	21.6
(All) Weekend Daytime	05/10/2024 07:00:00	80.8	47.7	42.7	53.8	50.0	47.6	44.8	44.1	37.4	31.1	25.7
(All) N/A	04/10/2024 09:50:00	74.8	49.6	46.4	55.8	52.1	50.3	47.5	45.4	38.8	32.5	28.2
Weekday Daytime	03/10/2024 12:40:00	79.3	48.4	44.8	55.0	52.5	48.7	46.0	44.8	37.2	29.1	24.0
Weekday Daytime	04/10/2024 07:00:00	83.8	49.2	43.8	55.4	51.8	49.1	47.2	45.5	37.3	31.1	24.7
Weekday Daytime	07/10/2024 07:00:00	74.8	49.9	46.9	55.8	52.2	50.7	47.8	45.7	39.3	32.9	28.7
Night	03/10/2024 23:00:00	77.2	46.1	39.8	50.3	47.0	44.7	43.6	43.4	33.6	25.1	19.3
Night	04/10/2024 23:00:00	68.2	41.9	34.7	48.2	44.4	40.8	39.8	38.3	31.5	24.7	16.9
Night	05/10/2024 23:00:00	64.7	42.0	35.8	46.0	42.6	40.4	38.8	38.0	33.1	30.2	25.2
Night	06/10/2024 23:00:00	62.4	40.8	29.9	46.4	42.5	39.8	38.3	37.0	31.1	25.8	20.6
Weekend Daytime	05/10/2024 07:00:00	80.8	48.1	44.0	54.2	50.4	48.1	45.1	44.6	37.7	31.2	25.8
Weekend Daytime	06/10/2024 07:00:00	77.3	47.2	41.3	53.4	49.5	47.1	44.4	43.5	37.0	31.1	25.7
N/A	04/10/2024 09:50:00	65.5	48.0	45.2	55.2	51.4	48.5	46.0	43.9	36.3	30.0	23.9
N/A	07/10/2024 07:30:00	74.8	50.0	47.1	55.9	52.3	50.8	47.9	45.8	39.4	33.1	29.0

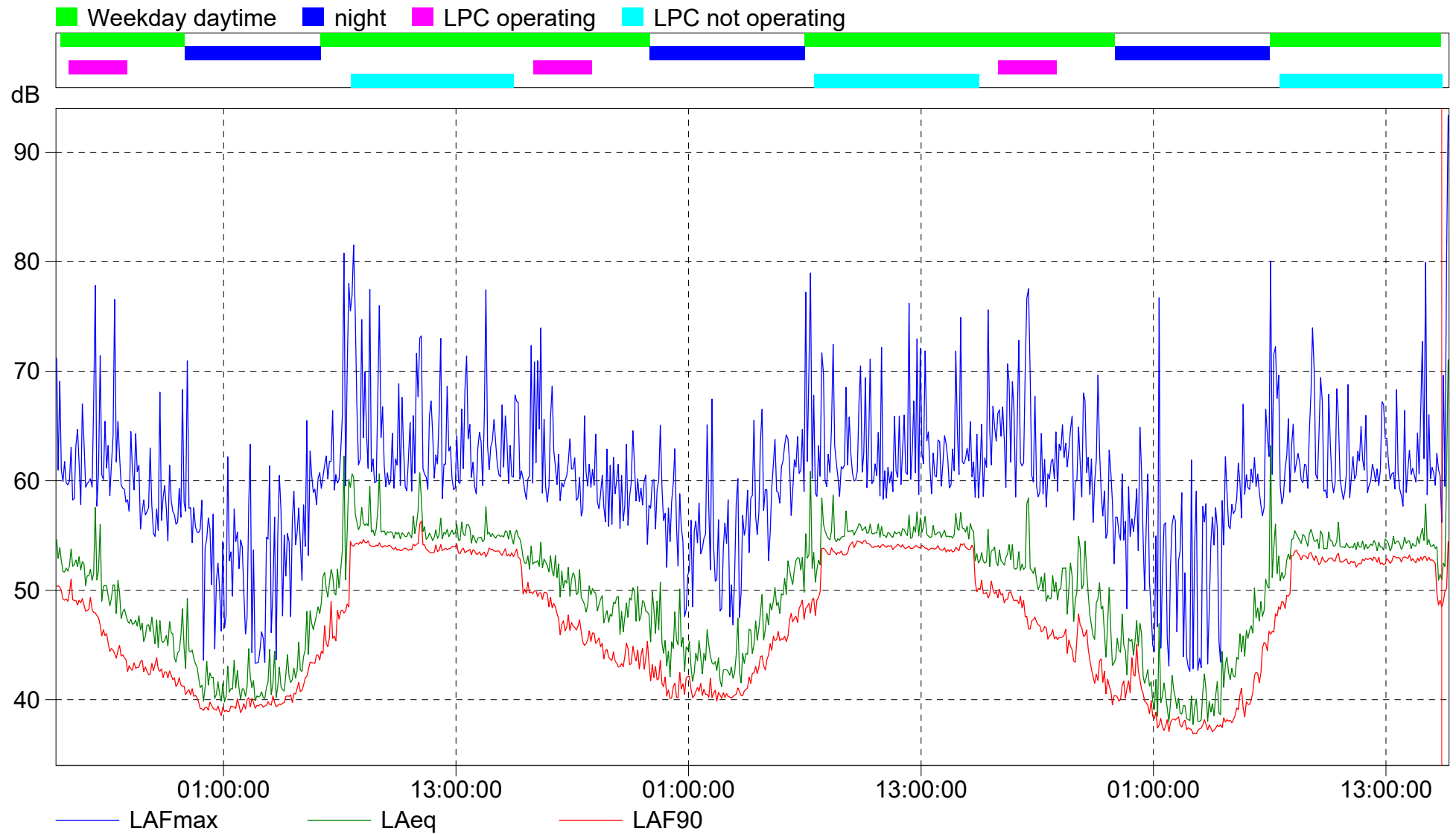
LT3 SE Corner - 1st survey



LT3 SE Corner - 1st survey in Calculations

Name	Start time	LAFmax [dB]	LAeq [dB]	LAF90 [dB]	LZeq 63Hz [dB]	LZeq 125Hz [dB]	LZeq 250Hz [dB]	LZeq 500Hz [dB]	LZeq 1kHz [dB]	LZeq 2kHz [dB]	LZeq 4kHz [dB]	LZeq 8kHz [dB]
Total	03/10/2024 12:10:47	93.7	50.5	39.8	53.3	51.5	49.5	47.4	46.8	39.7	39.1	35.7
Unmarked	03/10/2024 12:10:47	93.7	59.5	49.5	59.6	57.7	56.6	56.2	55.5	50.2	48.3	48.2
(All) Weekday daytime	03/10/2024 12:25:00	79.4	52.7	45.7	55.3	53.8	51.9	49.9	48.8	41.4	41.1	37.1
(All) Night	03/10/2024 23:00:00	81.1	46.5	35.5	48.4	46.2	43.6	42.1	41.9	36.1	39.0	34.8
(All) Weekend daytime	05/10/2024 07:00:00	79.5	49.7	44.1	53.1	51.0	48.7	46.3	46.7	39.1	34.0	33.4
(All) LPC operating	03/10/2024 12:20:00	75.8	54.2	50.9	56.5	55.6	54.0	52.1	50.5	43.4	36.2	36.0
(All) LPC not operating	04/10/2024 14:00:00	74.4	50.9	46.0	54.7	52.3	49.9	47.6	47.9	40.0	34.6	31.9
Weekday daytime	03/10/2024 12:25:00	76.7	50.9	44.8	54.5	52.7	50.5	47.6	47.1	39.5	40.8	32.1
Weekday daytime	04/10/2024 07:00:00	79.4	52.3	45.4	54.8	53.2	51.1	49.1	48.3	40.4	42.7	38.9
Weekday daytime	07/10/2024 07:00:00	75.8	54.4	52.3	56.6	55.6	54.1	52.2	50.8	43.9	36.2	36.7
Night	03/10/2024 23:00:00	78.6	48.4	40.9	50.1	47.9	45.4	44.4	44.0	36.6	41.4	34.9
Night	04/10/2024 23:00:00	78.2	46.3	39.0	49.1	46.3	43.2	41.8	41.0	34.1	40.1	35.6
Night	05/10/2024 23:00:00	69.1	44.7	37.7	46.6	44.8	42.5	40.5	40.4	34.8	33.5	36.0
Night	06/10/2024 23:00:00	81.1	45.7	31.6	46.6	44.9	42.5	40.4	41.0	38.0	37.6	31.6
Weekend daytime	05/10/2024 07:00:00	72.7	50.4	45.4	53.6	51.5	49.1	46.9	47.4	39.6	35.0	33.2
Weekend daytime	06/10/2024 07:00:00	79.5	49.0	42.9	52.6	50.4	48.4	45.5	45.8	38.5	32.8	33.7
LPC operating	03/10/2024 12:20:00	61.7	53.5	52.0	56.5	54.7	53.2	50.7	50.3	43.0	35.0	26.1
LPC operating	04/10/2024 09:50:00	71.7	52.4	49.9	55.6	54.6	52.8	50.7	48.4	40.0	35.4	30.4
LPC operating	07/10/2024 07:30:00	75.8	54.7	52.9	56.8	55.9	54.3	52.5	51.0	44.2	36.5	37.1
LPC not operating	04/10/2024 14:00:00	74.4	50.9	46.3	55.0	53.0	50.7	48.0	47.9	38.8	33.6	32.8
LPC not operating	05/10/2024 14:00:00	72.3	50.8	45.8	54.3	51.5	49.0	47.1	47.9	40.9	35.5	30.8

LT3 SE Corner - 2nd survey



LT3 SE Corner - 2nd survey in Calculations

Name	Start time	LAFmax [dB]	LAeq [dB]	LAF90 [dB]
Total	14/10/2024 16:20:45	93.4	52.7	40.4
Unmarked	14/10/2024 16:20:45	93.4	61.4	49.9
(All) Weekday daytime	14/10/2024 16:35:00	81.5	53.9	45.5
(All) night	14/10/2024 23:00:00	76.7	45.4	38.7
(All) LPC operating	14/10/2024 17:00:00	77.8	51.9	46.3
(All) LPC not operating	15/10/2024 07:35:00	81.5	55.2	53.0
Weekday daytime	14/10/2024 16:35:00	77.8	49.9	42.8
Weekday daytime	15/10/2024 06:00:00	81.5	54.3	46.1
Weekday daytime	16/10/2024 07:00:00	79.0	54.2	46.4
Weekday daytime	17/10/2024 07:00:00	80.1	54.5	52.0
night	14/10/2024 23:00:00	70.9	43.2	39.5
night	15/10/2024 23:00:00	67.5	47.4	41.0
night	16/10/2024 23:00:00	76.7	44.2	37.7
LPC operating	14/10/2024 17:00:00	77.8	51.6	45.3
LPC operating	15/10/2024 17:00:00	74.0	51.4	46.6
LPC operating	16/10/2024 17:00:00	77.5	52.6	47.0
LPC not operating	15/10/2024 07:35:00	81.5	55.9	53.7
LPC not operating	16/10/2024 07:30:00	76.2	55.4	53.5
LPC not operating	17/10/2024 07:30:00	79.9	54.2	52.4

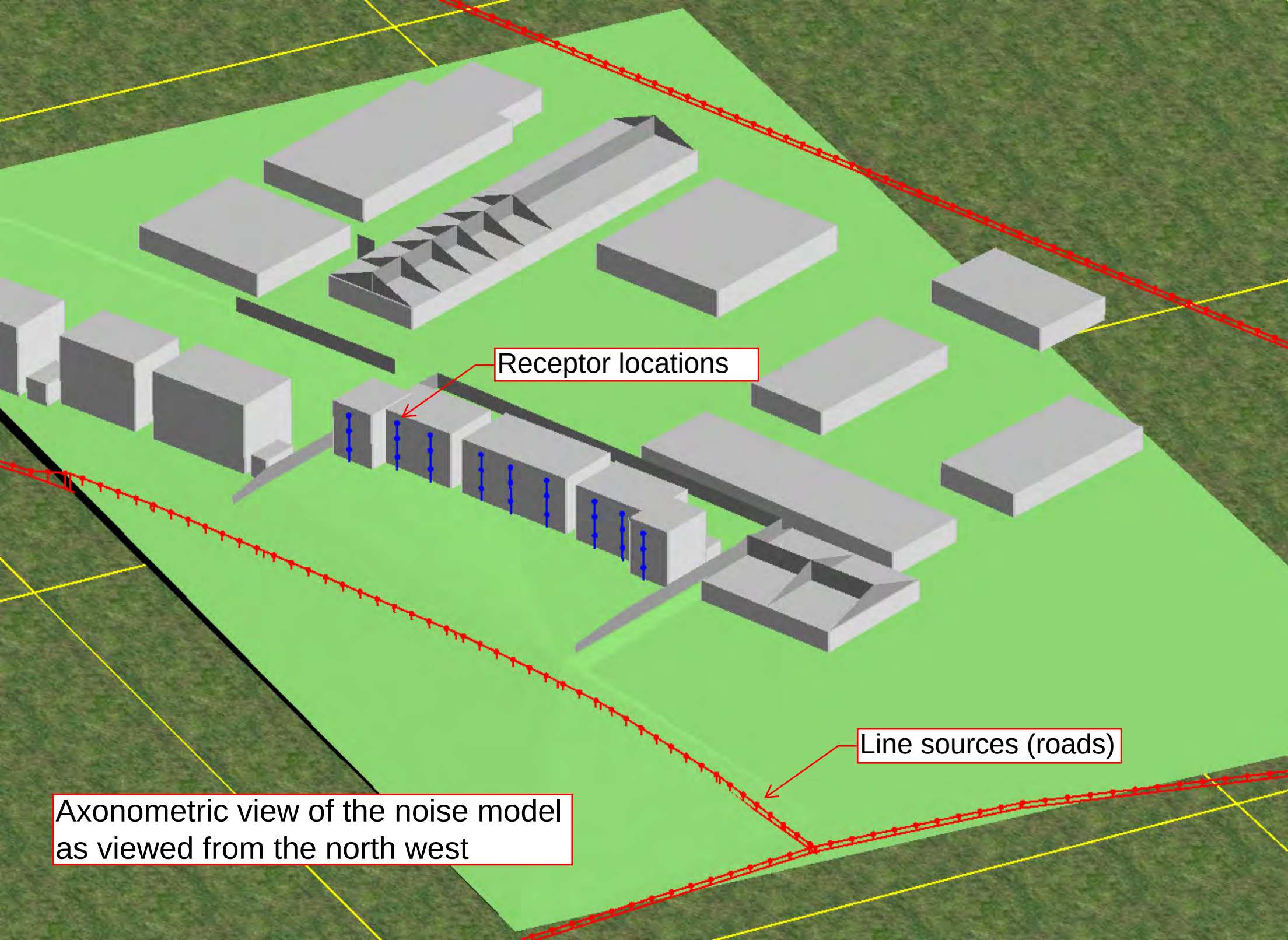


A P P E N D I X D

Figures showing elements of the numerical noise model – traffic noise

Elements of traffic noise model





Receptor locations

Line sources (roads)

Axonometric view of the noise model
as viewed from the north west



A P P E N D I X E

Results of traffic noise predictions at most affected locations

1-10 Glebe Road

Traffic Noise Calculations

Daytime

Report: Table of Results
 Model: As proposed 2025 - traffic
 LAeq: total results for receivers
 Group: (main group)
 Group Reduction: No

Name		
Receiver	Height	Day
RrG9_C	6.80	54
RrG8_C	6.80	53
RrG6_C	6.80	53
RrG7_C	6.80	53
RrG5_C	6.80	53
RrG4_C	6.80	52
RrG3_C	6.80	52
RrG2_C	6.80	52
RrG5_B	4.50	51
RrG6_B	4.50	51
RrG9_B	4.50	51
RrG4_B	4.50	51
RrG8_B	4.50	51
RrG3_B	4.50	51
RrG7_B	4.50	51
RrG2_B	4.50	51
RrG1_C	6.80	50
G9_C	6.80	49
G1_C	6.80	49
RrG1_B	4.50	49
G2_C	6.80	49
G9_B	4.50	49
G8_C	6.80	49
G3_C	6.80	49
G5_C	6.80	49
G7_C	6.80	49
G4_C	6.80	49
G6_C	6.80	48
G8_B	4.50	48
G1_B	4.50	48
G2_B	4.50	48
RgI2_A	1.70	48
G2_A	1.70	48
G7_B	4.50	48
RgI4_A	1.70	48
RgI5_A	1.70	48
G1_A	1.70	48
G5_B	4.50	48
RgI3_A	1.70	48
G3_B	4.50	48
G6_B	4.50	48
G4_B	4.50	48
G5_A	1.70	48
G4_A	1.70	48
G3_A	1.70	48
G6_A	1.70	48
G9_A	1.70	48
G8_A	1.70	47
G7_A	1.70	47
RgI6_A	1.70	47
RgI1_A	1.70	47
RgI7_A	1.70	47
RgI8_A	1.70	46

All shown dB values are A-weighted

1-10 Glebe Road

Traffic Noise Calculations

Night-time

Report: Table of Results
 Model: As proposed 2025 - night
 LAeq: total results for receivers
 Group: (main group)
 Group Reduction: No

Name		
Receiver	Height	Night
RrG9_C	6.80	49
RrG8_C	6.80	49
RrG7_C	6.80	49
RrG6_C	6.80	49
RrG5_C	6.80	48
RrG4_C	6.80	48
RrG3_C	6.80	47
RrG6_B	4.50	47
RrG2_C	6.80	47
RrG5_B	4.50	47
RrG9_B	4.50	47
RrG8_B	4.50	47
RrG7_B	4.50	47
RrG4_B	4.50	47
RrG3_B	4.50	46
RrG2_B	4.50	46
RrG1_C	6.80	46
RrG1_B	4.50	44
RgI2_A	1.70	43
RgI4_A	1.70	43
RgI3_A	1.70	43
RgI5_A	1.70	43
RgI6_A	1.70	42
RgI1_A	1.70	42
G9_C	6.80	42
G1_C	6.80	41
RgI7_A	1.70	41
G2_C	6.80	41
G9_B	4.50	41
G8_C	6.80	41
RgI8_A	1.70	41
G3_C	6.80	41
G7_C	6.80	41
G5_C	6.80	41
G4_C	6.80	41
G6_C	6.80	41
G8_B	4.50	40
G1_B	4.50	40
G2_B	4.50	40
G2_A	1.70	40
G7_B	4.50	40
G1_A	1.70	40
G5_B	4.50	40
G3_B	4.50	40
G6_B	4.50	40
G4_B	4.50	40
G5_A	1.70	40
G4_A	1.70	40
G3_A	1.70	40
G6_A	1.70	40
G9_A	1.70	40
G8_A	1.70	39
G7_A	1.70	39

All shown dB values are A-weighted

1-10 Glebe Road

Traffic Noise Calculations

Night-time Lmax

Report: Table of Results
 Model: As proposed 2025 - max
 LA;max: total results for receivers
 Group: (main group)

Name Receiver	Height	Night
G9_B	4.50	65
G9_C	6.80	65
G7_C	6.80	64
G8_C	6.80	64
G2_A	1.70	64
G8_B	4.50	64
G7_B	4.50	64
G6_C	6.80	64
G2_C	6.80	64
G1_A	1.70	63
G3_C	6.80	63
G2_B	4.50	63
G5_C	6.80	63
G4_C	6.80	63
G1_C	6.80	63
G6_B	4.50	63
RrG4_B	4.50	63
G1_B	4.50	63
RrG4_C	6.80	63
RrG5_B	4.50	63
RrG3_B	4.50	63
RrG5_C	6.80	63
RrG3_C	6.80	63
G5_A	1.70	63
RrG6_B	4.50	63
RrG6_C	6.80	63
G4_A	1.70	63
G6_A	1.70	63
RrG8_C	6.80	63
RrG9_C	6.80	63
RrG2_B	4.50	63
RrG2_C	6.80	63
RrG7_C	6.80	62
G3_A	1.70	62
G4_B	4.50	62
G5_B	4.50	62
RrG1_B	4.50	62
RrG1_C	6.80	62
G3_B	4.50	62
RrG9_B	4.50	61
G7_A	1.70	60
G9_A	1.70	60
RrG8_B	4.50	59
RrG7_B	4.50	59
RgI4_A	1.70	59
G8_A	1.70	59
RgI5_A	1.70	59
RgI3_A	1.70	59
RgI6_A	1.70	59
RgI2_A	1.70	59
RgI1_A	1.70	58
RgI7_A	1.70	54
RgI8_A	1.70	53

All shown dB values are A-weighted

APPENDIX F

Sample noise ingress calculations

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project: 1-10 Glebe Road, Letchworth
Project number: 24150
Date: 19/05/2025

Plot: Plot 1
Room: LKD

Daytime (L Aeq,16hr)				Octave band centre frequency											
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k	Broadband term		
EXTERNAL NOISE LEVEL															
External noise level			Rear façade - traffic	L eq,1	54	51	48	46	44	36	32	28	L Aeq,1	48 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
External noise level			Front façade - traffic	L eq,1	55	48	45	44	45	40	32	28	L Aeq,1	48 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
External noise level			Rear façade - plant noise	L eq,1	50	49	45	46	43	39	33	31	L Aeq,1	48 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Rear façade - traffic	L eq,ff	54	51	48	46	44	36	32	28	L Aeq,ff	48 dB	
Incident noise level			Front façade - traffic	L eq,ff	55	48	45	44	45	40	32	28	L Aeq,ff	48 dB	
Incident noise level			Rear façade - plant noise	L eq,ff	50	49	45	46	43	39	33	31	L Aeq,ff	48 dB	
ROOM DATA															
Room description and reverberation time	Volume	91	Living Room	RT60	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	s		
FAÇADE ELEMENTS (Rear façade - traffic)															
Glazing	Area	6.6	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr	29 / 25 dB	
Wall	Area	15	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	2	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr	33 / 32 dB	
None			--												
FAÇADE ELEMENTS (Front façade - traffic)															
Glazing	Area	1.92	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr	29 / 25 dB	
Wall	Area	10.08	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	1	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr	33 / 32 dB	
None			--												
FAÇADE ELEMENTS (Rear façade - plant noise)															
Glazing	Area	6.6	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr	29 / 25 dB	
Wall	Area	15	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	2	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr	33 / 32 dB	
None			--												
RESULTS															
Contribution from Rear façade - traffic				L eq,2	33	28	27	19	15	3	-	-	L Aeq,2	22 dB	
Contribution from Front façade - traffic				L eq,2	29	20	19	13	13	4	-	-	L Aeq,2	17 dB	
Contribution from Rear façade - plant noise				L eq,2	29	26	24	19	14	6	-	-	L Aeq,2	21 dB	
Total calculated indoor noise level				L eq,2	35	30	29	23	19	9	3	-	L Aeq,2	25 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project: 1-10 Glebe Road, Letchworth
 Project number: 24150
 Date: 19/05/2025

Plot: Plot 1
 Room: Bedroom

Night time ($L_{Aeq,8hr}$)				Octave band centre frequency											
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k	Broadband term		
EXTERNAL NOISE LEVEL															
External noise level			Façade 1	$L_{eq,1}$	47	46	45	45	45	37	43	38	$L_{Aeq,1}$	49 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Façade 1	$L_{eq,ff}$	47	46	45	45	45	37	43	38	$L_{Aeq,ff}$	49 dB	
ROOM DATA															
Room description and reverberation time	Volume	34	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2		s	
FAÇADE ELEMENTS (Façade 1)															
Glazing	Area	1.92	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr	29 / 25 dB	
Wall	Area	11.28	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	2	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr	33 / 32 dB	
Roof	Area	20.21	Tiles, 100mm rafters (600c/s), m.wool, plbld (lt)	Rw	17	20	40	48	53	50	55	60	Rw / Rw+Ctr	48 / 35 dB	
RESULTS															
Total calculated indoor noise level				$L_{eq,2}$	35	32	23	18	19	6	11	-	$L_{Aeq,2}$	23 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project: 1-10 Glebe Road, Letchworth
 Project number: 24150
 Date: 19/05/2025

Plot: Plot 1
 Room: Bedroom

Night time (L AMax)				Octave band centre frequency											
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k	Broadband term		
EXTERNAL NOISE LEVEL															
External noise level			Façade 1	L Max,1	66	64	63	61	62	56	51	46	L AMax,1	65 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Façade 1	L Max,ff	66	64	63	61	62	56	51	46	L AMax,ff	65 dB	
ROOM DATA															
Room description and reverberation time	Volume	34	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2		s	
FAÇADE ELEMENTS (Façade 1)															
Glazing	Area	1.92	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr	29 / 25 dB	
Wall	Area	11.28	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	2	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr	33 / 32 dB	
Roof	Area	20.21	Tiles, 100mm rafters (600c/s), m.wool, plbd (lt)	Rw	17	20	40	48	53	50	55	60	Rw / Rw+Ctr	48 / 35 dB	
RESULTS															
Total calculated indoor noise level				L Max,2	54	50	41	34	36	25	19	5	L AMax,2	40 dB	



APPENDIX G

Figures showing elements of the numerical noise model – industrial noise





A P P E N D I X H

Results of industrial noise predictions at most affected locations

1-10 Glebe Road

Industrial Noise Calculations

Daytime Specific Sound Level

Report: Table of Results
 Model: As proposed 2025 - plant noise receptors
 LAeq: total results for receivers
 Group: (main group)
 Group Reduction: No

Name		
Receiver	Height	Day
RrG1_C	6.80	51
RrG2_C	6.80	51
RrG1_B	4.50	51
RrG2_B	4.50	51
RrG3_C	6.80	50
RrG3_B	4.50	50
RrG4_C	6.80	49
RrG4_B	4.50	49
RrG5_C	6.80	48
RrG5_B	4.50	48
RrG6_C	6.80	48
RgI1_A	1.70	48
RrG6_B	4.50	47
RgI2_A	1.70	47
RrG7_C	6.80	47
RrG8_C	6.80	47
RgI3_A	1.70	47
RrG7_B	4.50	46
RrG8_B	4.50	46
RgI4_A	1.70	46
RgI5_A	1.70	45
RgI6_A	1.70	44
RgI7_A	1.70	43
RgI8_A	1.70	43
RrG9_C	6.80	42
RrG9_B	4.50	41
G1_C	6.80	37
G2_C	6.80	35
G3_C	6.80	34
G1_B	4.50	34
G5_C	6.80	33
G8_C	6.80	33
G6_C	6.80	32
G4_C	6.80	32
G1_A	1.70	32
G7_C	6.80	31
G2_B	4.50	31
G3_B	4.50	31
G9_C	6.80	30
G3_A	1.70	29
G2_A	1.70	29
G5_B	4.50	29
G6_B	4.50	29
G4_B	4.50	28
G8_B	4.50	28
G6_A	1.70	28
G5_A	1.70	27
G7_B	4.50	27
G4_A	1.70	27
G8_A	1.70	27
G7_A	1.70	26
G9_B	4.50	26
G9_A	1.70	25

All shown dB values are A-weighted



A P P E N D I X I

Example MVHR unit including comfort cooling

Zehnder ComfoClima 36 with ComfoAir Q450

Product data sheet

always the best climate

Technical specification document version #24.04.12



ComfoClima 36 with ComfoAir Q450

The Zehnder ComfoClima 36 is our next generation air temperation device designed to help reduce the risk of overheating in homes and supplement heat in the winter. It combines with the ComfoAir Q450 or Q600 and compliments its features to ensure it automatically activates and deactivates to provide a comfortable, healthy and energy-efficient indoor climate. The Zehnder ComfoAir Q, with state of the art design and intelligent technology, regardless of whether you are working on a new build or an old building, with Zehnder comfortable ventilation you have an innovative, tried and tested complete system. It contains features such as its automatic modulating true summer by-pass, world class heat recovery efficiency and integrated humidity sensor to provide a comfortable, healthy and energy-efficient indoor climate.



Zehnder ComfoClima 36 with ComfoAir Q450

Example controls - sold separately



ComfoSwitch C67

Key benefits

ComfoClima 36

- Up to 1.7 kW cooling capacity.
- Up to 2.2 kW heating capacity.
- Independently tested cooling and heating capacity to EN 14511 and EN 16573
- Fully automatic activation of ComfoClima and increased ventilation rate in summer and winter, with automatic enabling due to Climate Switch technology without the need for user intervention.
- Easy and space-saving installation of left or right handed units directly on top of the Zehnder ComfoAir Q450.
- Left or right hand configuration through software alone, no mechanical alteration required.
- Choice of left or right handed condensate trap for flexibility on site.
- No external device required, just utilise the ventilation units ductwork.
- Filtered fresh supply air, not recycled stale air, using ISO Coarse (G4) as standard with the option to upgrade to ISO ePM1 (F7).
- The 3rd generation of air temperation device from Zehnder, with over 5000 previous units sold and successfully installed world wide.
- Integral sensor for activation based on whole house internal temperature, no risk of false readings due to external sensors cited near appliances, radiators or in direct sunlight.
- Simple clean the only maintenance required once every 2 years.
- Front access for ease of service/maintenance or in situ end of life replacement.
- Wi-Fi enabled as standard for use with the ComfoControl app for IOS or Android.

ComfoAir Q450

- World class 96% efficiency.
- 100% full and filtered modulating summer bypass.
- Left or right hand configuration through software alone, no mechanical alteration required.
- Commissioning wizard for a quick and simple set-up process.
- Flow control to maintain commissioned flow rates.
- Adaptive comfort technology.
- Automatic passive temperature boost in summer.
- Humidity boost continuously monitors the humidity level within the home and looks for a man-made spike before boosting the unit, irrespective of distance or dilution.
- Tool free filter access.
- ISO Coarse (G4), ISO ePM10 (M5) and ISO ePM1 (F7) filter options.
- App for installer and end user option.
- Wireless commissioning option.
- Remote access option.
- KNX compatibility option.
- 0-10V input option.
- Internal pre-heater option.
- Post heater control option.
- Enthalpy cube option.
- Passive House certified.



A P P E N D I X J

Drawings showing parts of the proposed Volvo showroom



Revisions		
No.	Date	Issue Notes

AREA SCHEDULE	(sq.m)	acres
Site Area	3040,9	0,75
Main Building Footprint	395,23	
Workshop Building Footprint	394,45	
% Site Coverage	25.9%	

WORKSHOP

Customer Access

Site Access

SHOWROOM

241218DRAFT

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OX13 6SW, United Kingdom

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Client
Brickhill Construction

Project Title
Volvo Letchworth

Norton Way N, Letchworth Garden City,
SG6 4AD

Drawing Title
Existing Site Plan

Project ID
001

Scale
1:200 @A1
1:400 @A3

Drawn By
AF

Reviewed By
AO

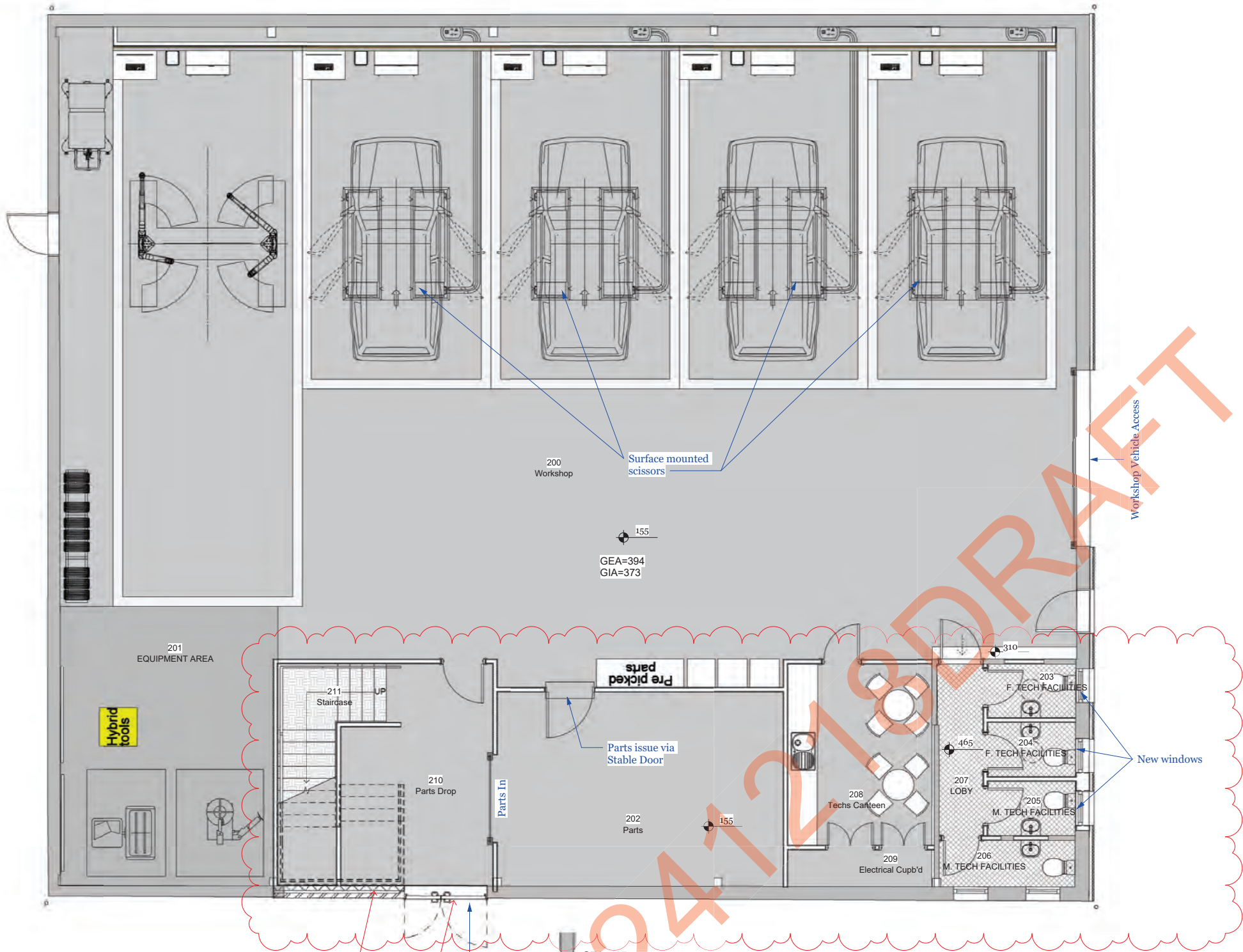
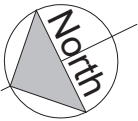
Date
16/07/2024

Drawing No.
P-0010

Revision
of
PLANNING



Revisions		
No.	Date	Issue Notes
A	17/12/24	1.Workshop layout revised; 2. New Staircase added; 3. Techs Canteen added to Ground Floor; 4. Electrical Cupboard added.5. Workshop Mezzanine layout revised; 6. Meeting Room, Offices, Open Plan Office added;7. Kitchenette and Staff Toilets added.

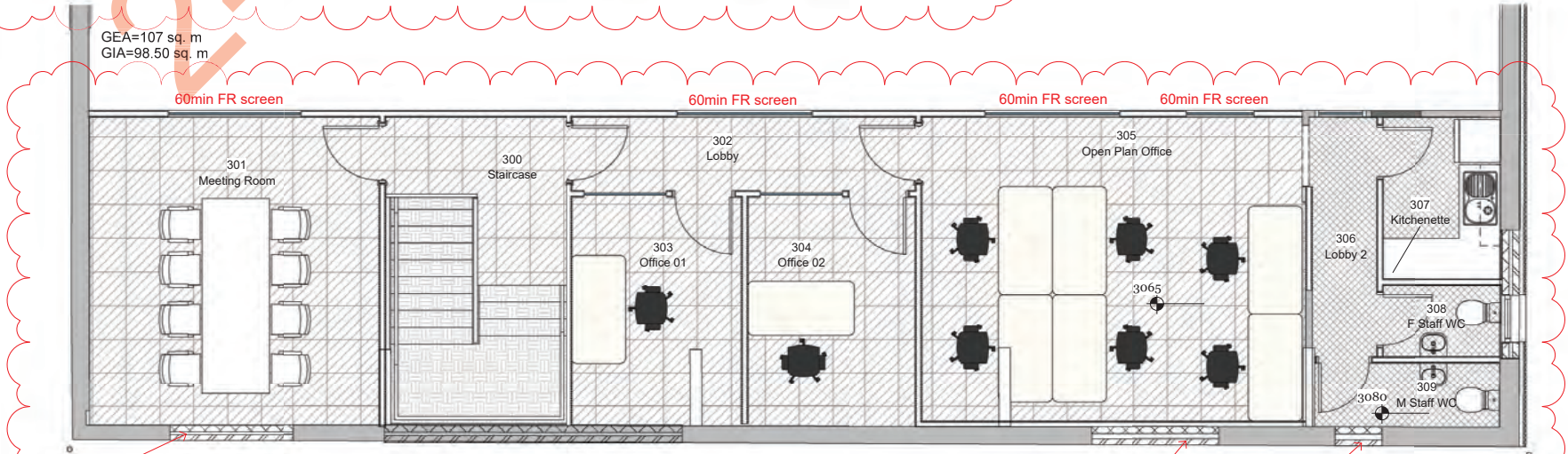


1 Proposed Workshop Ground Floor Plan
1 : 50 @A1 1:100 @A3

Existing Roller Shutter removed,
new blockwork wall infill added

New external door for Parts Drop added

Infill existing windows with blockwork



3 Proposed Workshop Mezzanine Floor Plan
1 : 50 @A1 1:100 @A3

Infill existing windows with blockwork

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Client Brickhill Construction

Project Title Volvo Letchworth

Norton Way N, Letchworth Garden City,
SG6 4AD

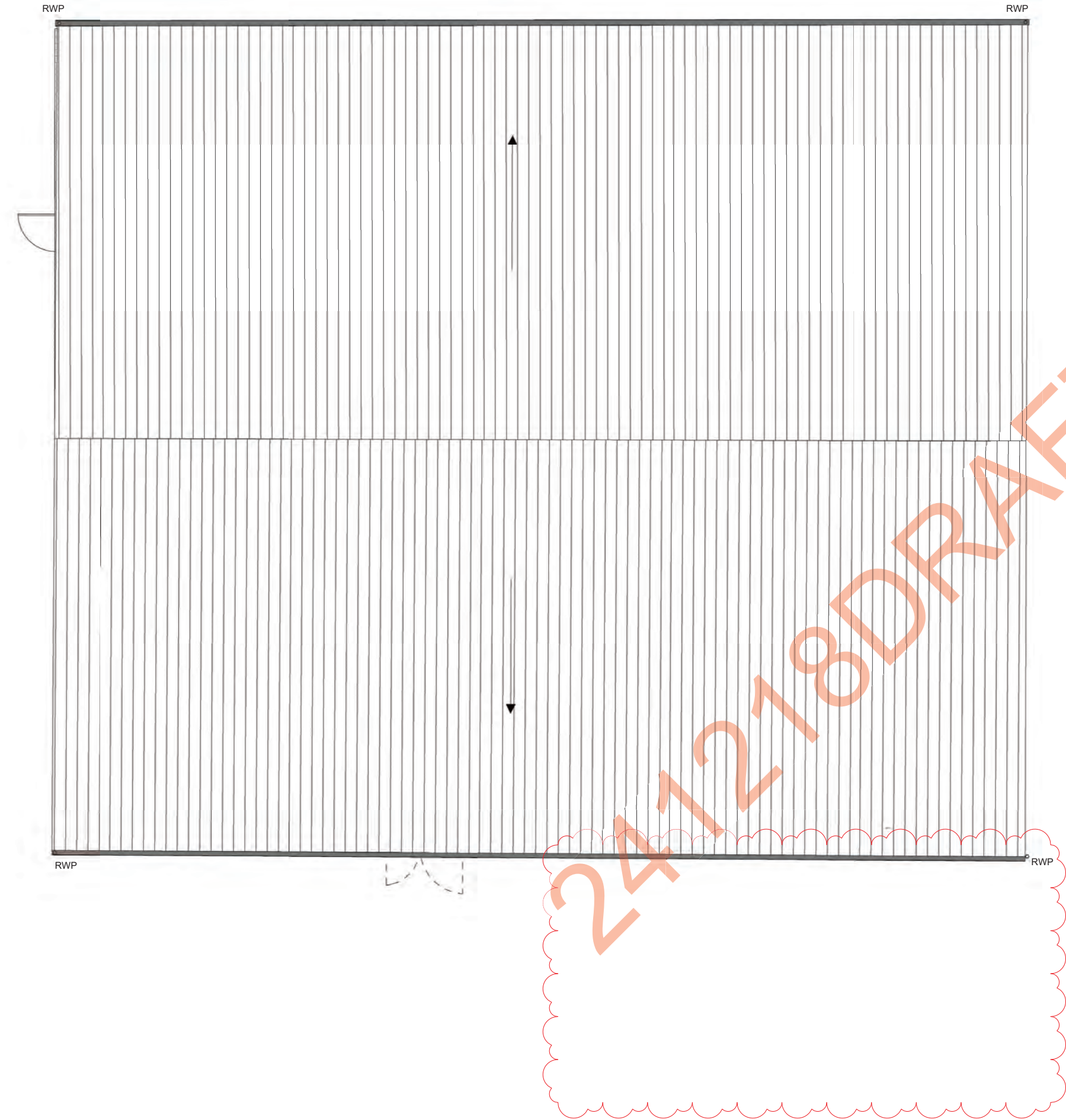
Drawing Title Proposed Workshop Floor Plan

Project ID 001 Scale 1:50 @A1
1:100 @A3

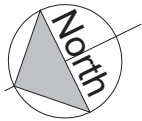
Drawn By AF Reviewed By AO Date 16/07/2024

Drawing No. P-2100 Revision A

of
PLANNING



Revisions		
No.	Date	Issue Notes
A	17/12/24	Valet Building omitted



Roof finishes		
Mark	IMAGE	DESCRIPTION
A		Composite roof cladding panels, QuadCore KS1000RW Roof Panel, with integrated gutter and downpipes. Colour - Grey White RAL 9002

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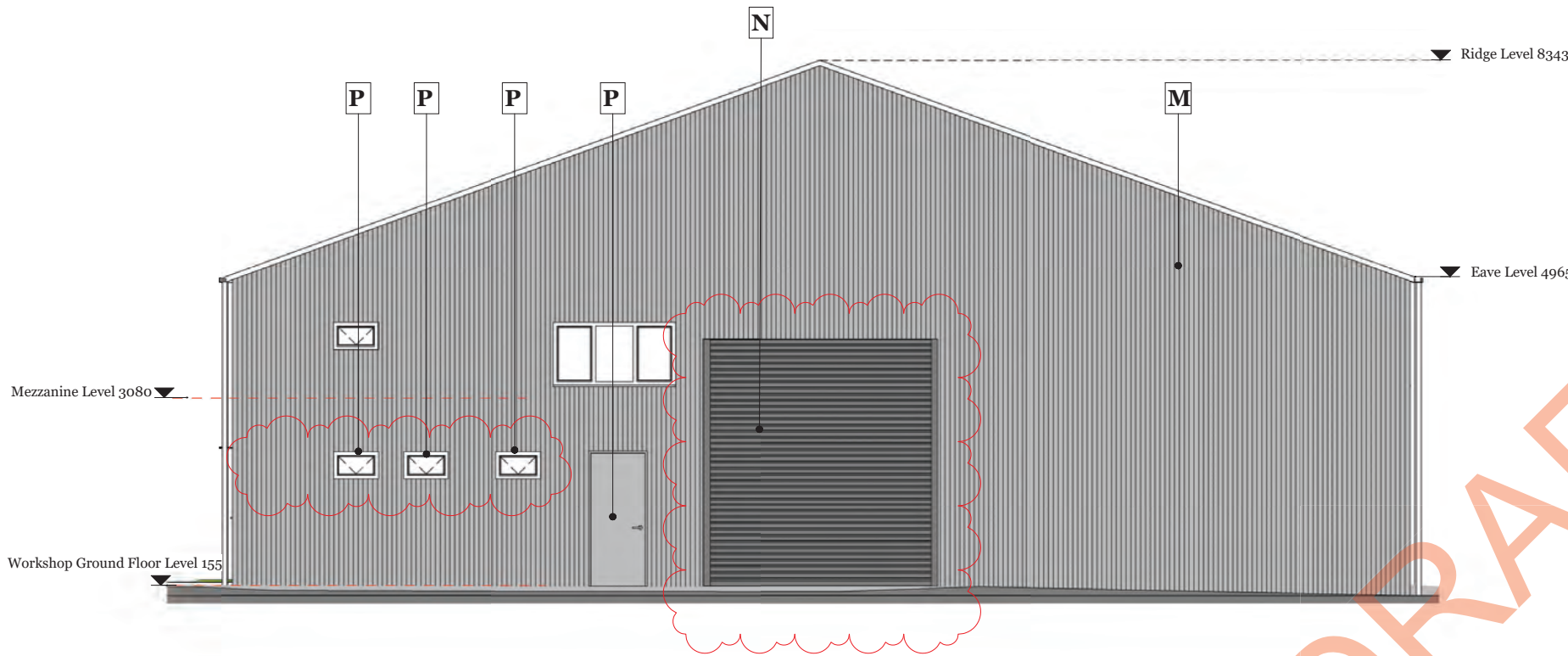
Client	Brickhill Construction
Project Title	Volvo Letchworth Norton Way N, Letchworth Garden City, SG6 4AD
Drawing Title	Proposed Workshop Roof Plan

Project ID	001	Scale	1:50 @A1 1:100 @A3
Drawn By	AF	Reviewed By	AO
Drawing No.	P-2120	Revision	A
of PLANNING			

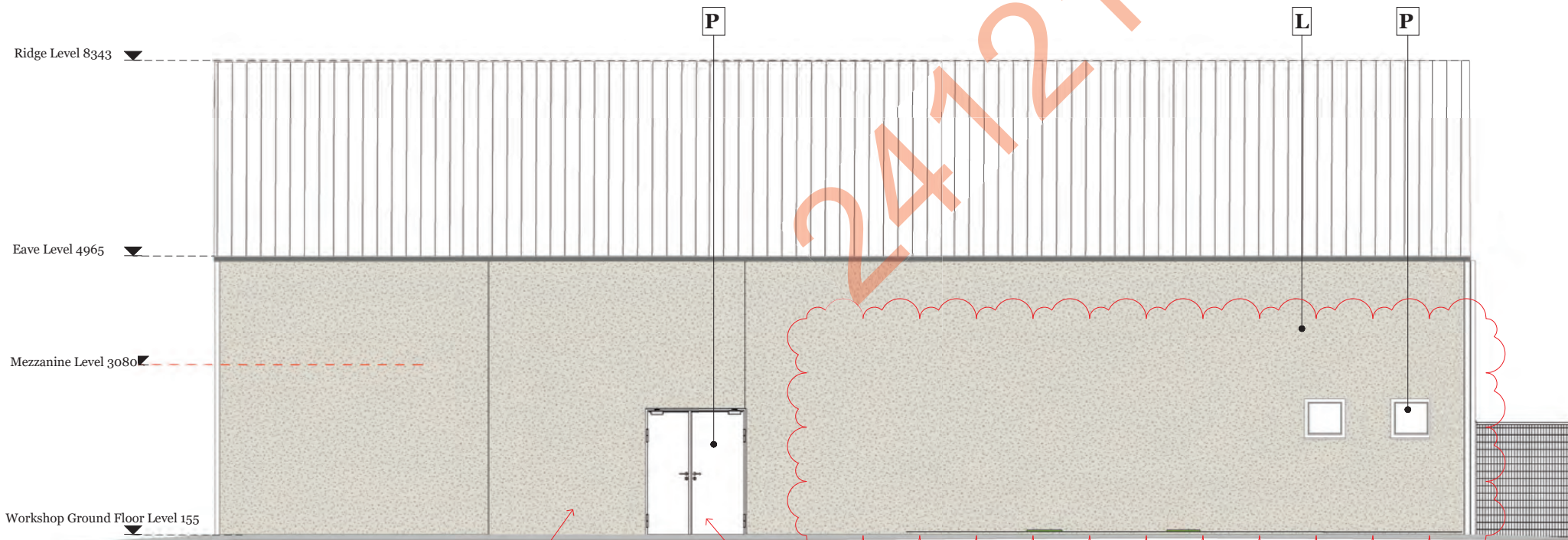
1 Proposed Workshop Roof Plan
1 : 50 @A1 1:100@A3



Revisions		
No.	Date	Issue Notes
A	17/12/24	1. Windows orientation revised; 2. Valet Building omitted from North Elevation; 3. Existing Vehicle door reinstated.



1 Proposed Workshop West Elevation
1 : 50@A1 1:100@A3



Roller Shutter door removed and opening
infilled with new blockwork wall

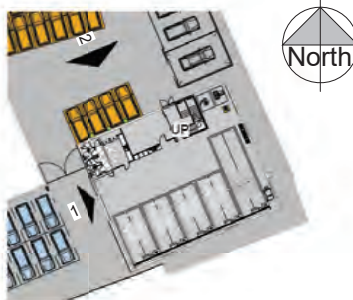
New external Parts Drop door

2 Proposed Workshop North Elevation
1 : 50@A1 1:100@A3

01. WORKSHOP FACADE TREATMENT - MATERIALS LEGEND

TAG	IMAGE	DESCRIPTION
L		Existing brickwork to be painted in grey RAL 7035
M		New profile cladding, vertically laid, colour RAL 7037
P		Back-of-house screen, window, and door frames to be painted grey RAL 7037 externally and internally

NOTE:
KEY PLAN NOT TO SCALE



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Dimensions must be checked on site before work commences. Any discrepancies should be reported to MEDA International.

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Client
Brickhill Construction

Project Title
Volvo Letchworth
Norton Way N, Letchworth Garden City,
SG6 4AD

Drawing Title
Proposed Workshop Elevations 01

Project ID
001

Scale
1:50 @A1
1:100 @A3

Drawn By
AF

Reviewed By
AO

Date
16/07/2024

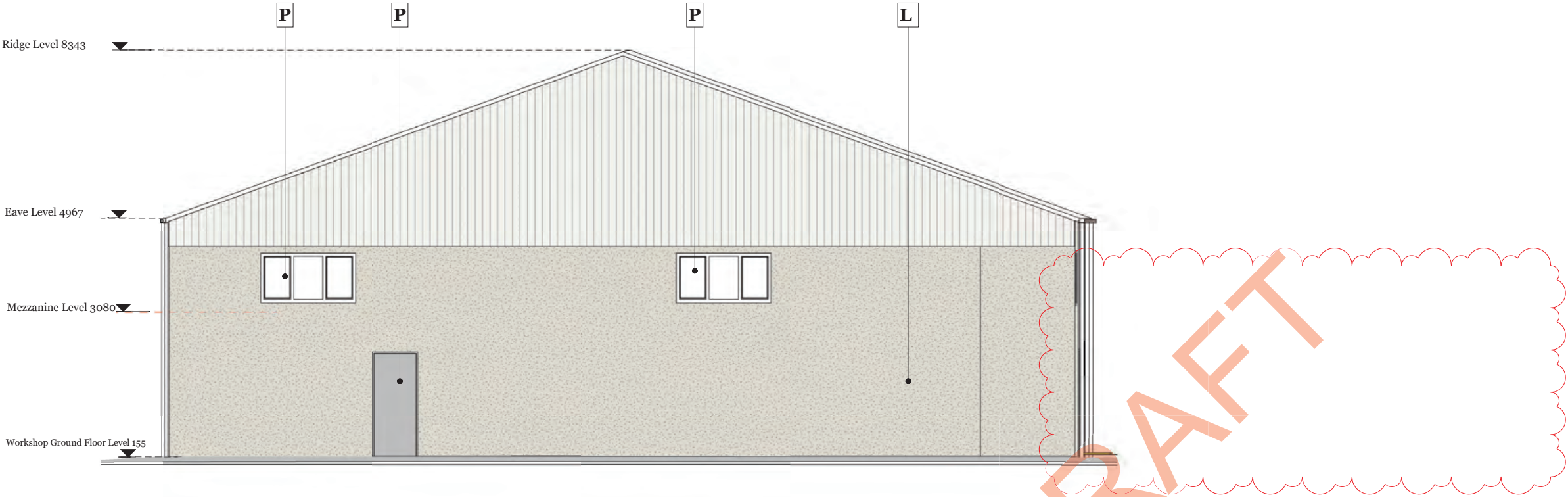
Drawing No.
P-2170

Revision
A

of
PLANNING

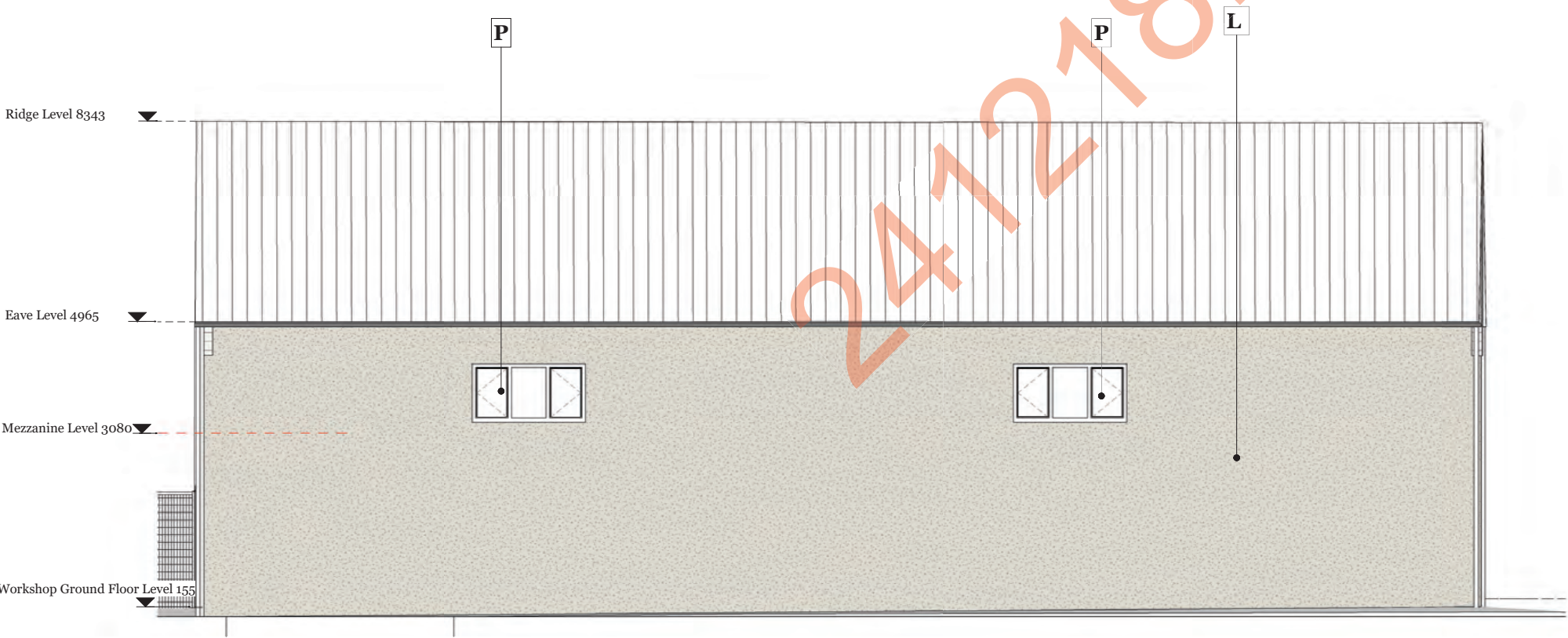


Revisions		
No.	Date	Issue Notes
A	17/12/24	1. Valet Building omitted from East Elevation



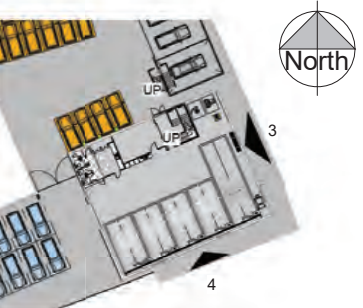
02. WORKSHOP FACADE TREATMENT - MATERIALS LEGEND		
TAG	IMAGE	DESCRIPTION
L		Existing brickwork to be painted in grey RAL 7035
P		Back-of-house screen, window, and door frames to be painted grey RAL 7037 externally and internally

3 Proposed Workshop East Elevation
1 : 50@A1 1:100@A3



4 Proposed Workshop South Elevation
1 : 50@A1 1:100@A3

NOTE:
KEY PLAN NOT TO SCALE



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Steventon, Oxfordshire
OX13 6SW, United Kingdom

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Client
Brickhill Construction

Project Title
Volvo Letchworth
Norton Way N, Letchworth Garden City,
SG6 4AD

Drawing Title
Proposed Workshop Elevations 02

Project ID
001

Scale
1:50 @A1
1:100 @A3

Drawn By
AF

Reviewed By
AO

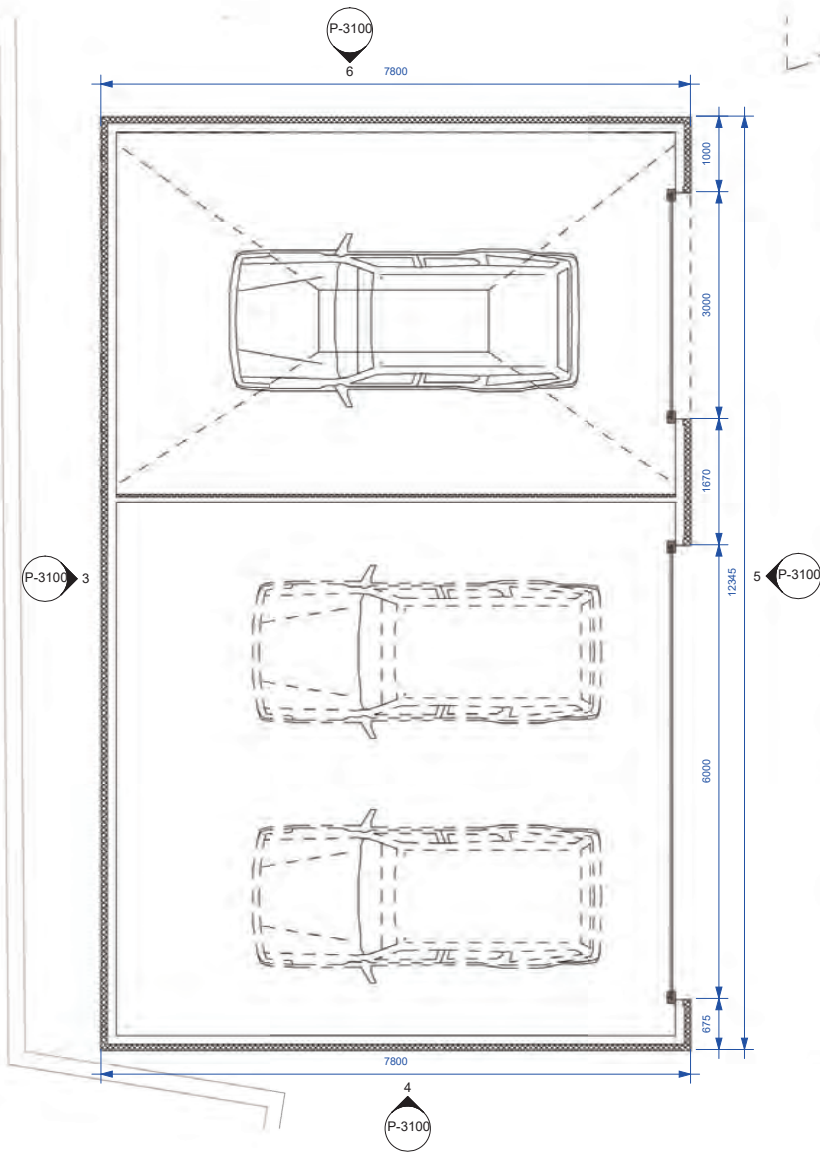
Date
16/07/2024

Drawing No.
P-2171

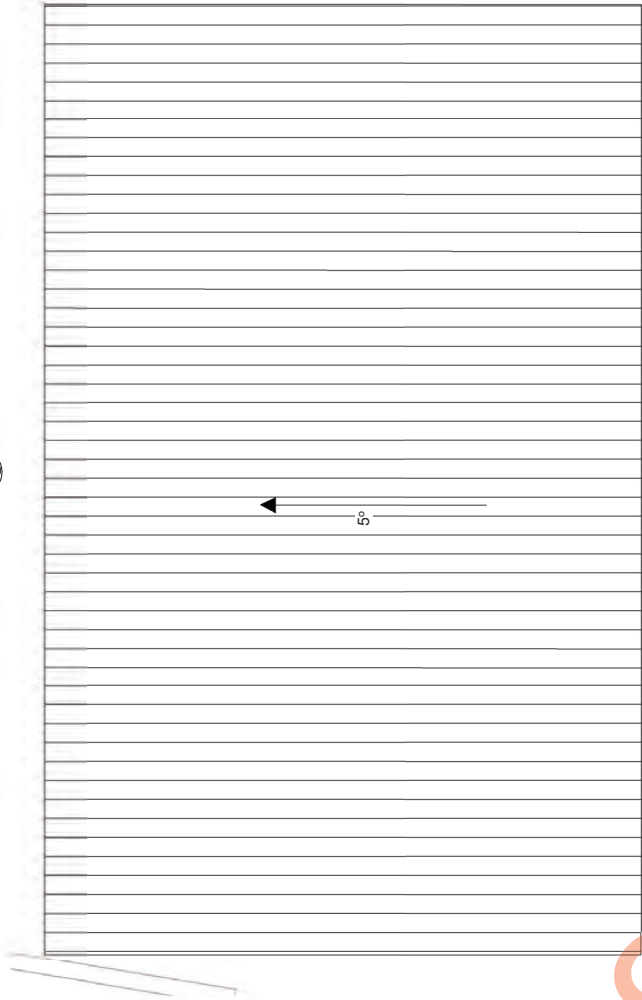
Revision
A

of
PLANNING

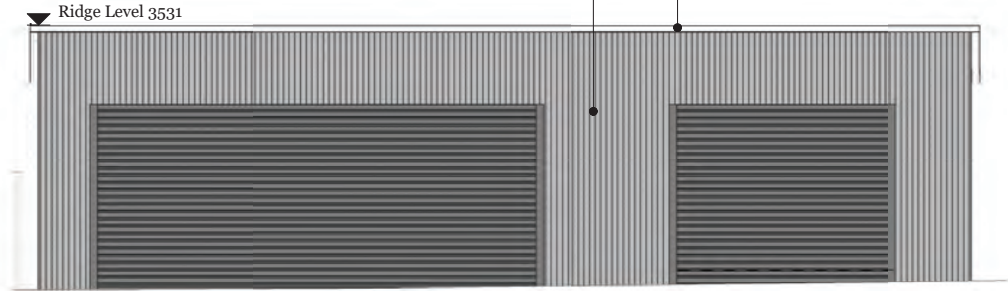




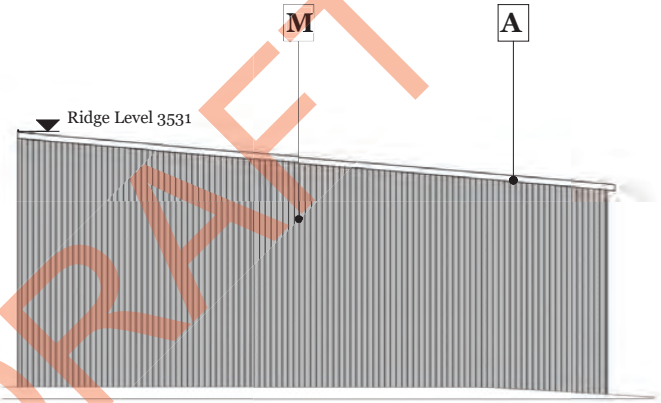
1 Proposed Valet Building Ground Floor Plan
1 : 50@A1 1:100@A3



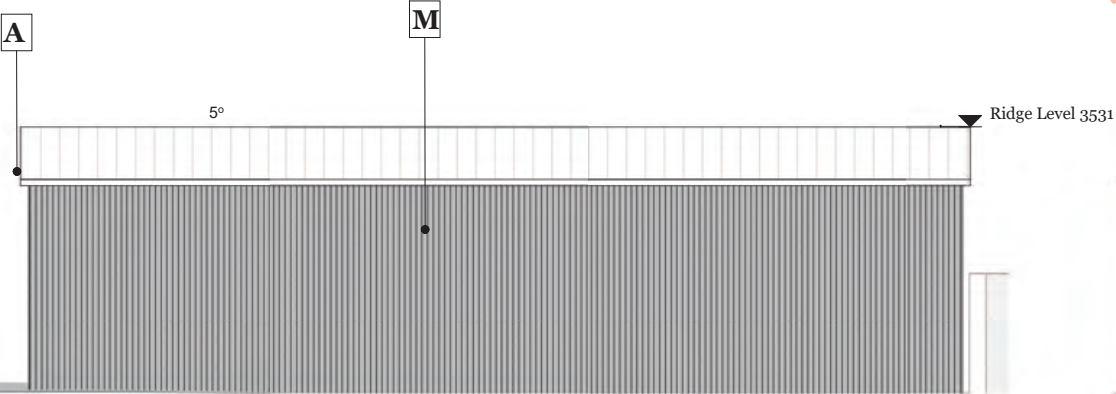
2 Proposed Valet Building Roof Plan
1 : 50@A1 1:100@A3



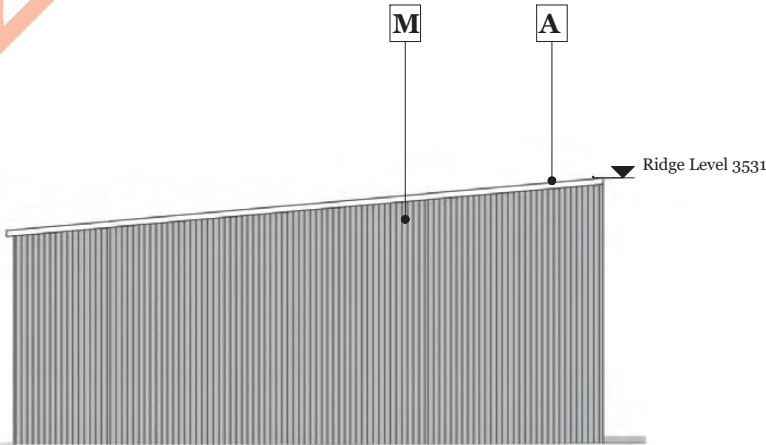
5 Proposed Valet Building West Elevation
1 : 50@A1 1:100@A3



6 Proposed Valet Building South Elevation
1 : 50@A1 1:100@A3



3 Proposed Valet Building East Elevation
1 : 50@A1 1:100@A3



4 Proposed Valet Building North Elevation
1 : 50@A1 1:100@A3

Revisions		
No.	Date	Issue Notes
A	17/12/24	1. Valet Building repositioned on site; 2. Drawing updated.

Roof finishes Valet Building		
Mark	IMAGE	DESCRIPTION
A		Composite roof cladding panels, QuadCore KS1000RW Roof Panel, with integrated gutter and downpipes. Colour - Grey White RAL 9002

02. VALET BUILDING FACADE TREATMENT - MATERIALS LEGEND		
TAG	IMAGE	DESCRIPTION
M		New profile cladding, vertically laid, colour RAL 7037

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Client Brickhill Construction

Project Title
Volvo Letchworth
Norton Way N, Letchworth Garden City,
SG6 4AD

Drawing Title
Proposed Valet Building

Project ID 001 Scale 1:50 @A1 1:100 @A3

Drawn By AF Reviewed By AO Date 16/07/2024

Drawing No. P-3100 Revision A

of
PLANNING

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