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**Phase 2A, Land to the north of Ann Suckling Road
Little Wratting, Haverhill, Suffolk**

Environmental Noise Assessment

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CONTENTS

	<u>Page No.</u>
1. CONSULTANCY BRIEF	3
2. REPORT SUMMARY	3
3. INTRODUCTION	4
4. NOISE LIMITING CRITERIA	5
5. PREDICTED TRAFFIC NOISE	6
6. NOISE IMPACT & RECOMMENDATIONS	8
7. CONCLUSIONS	11

Appendices

Appendix 1 Explanation of Noise Terms

Appendix 2

Figure 1 Overall site plan

Figure 1a Phase 2A complete site plan

Figure 2 Detailed area of development assessed

1. CONSULTANCY BRIEF

- 1.1. Utilising traffic flow data from previously submitted Transport Assessments (TA) for the site, calculate the predicted noise level generated by passing traffic on the Haverhill northern Relief Road and assess the noise impact on the Phase 2A residential development.
- 1.2. Based on the latest detailed layout, provide a suitable mitigation scheme to protect future residents' amenity in accordance with the previously accepted criteria of the local authority.
- 1.3. Provide a technical report suitable for submission to the planning authority in support of the Reserved Matters application for Phase 2A, detailing the findings and recommendations to enable the planning criteria to be met.

2. REPORT SUMMARY

- 2.1. Persimmon Homes Suffolk is developing a parcel of land north-east of Haverhill, known as the Boyton Place development. Loven Acoustics has been commissioned to provide a noise assessment for Phase 2A of the development, with the construction of 41 no. new dwellings, all with private gardens.
- 2.2. TA based noise data have been assessed against the planning criteria of BS 8233:2014. A scheme for glazing and ventilation has been provided to demonstrate compliance with the criteria for internal noise levels.
- 2.3. All gardens on the site are predicted to be within the BS 8233 guidelines for outside amenity space noise level, based on inherent shielding from on-site buildings, distance attenuation from the road noise and proposed garden boundary treatment in the form of 1.8m to 2.0m high close-boarded fences or masonry walls.
- 2.4. In conclusion, if the recommendations within this report are incorporated into the development design, the criteria for noise of the planning authority is predicted to be met for this phase of the development. This document is therefore considered suitable to support the current planning application for the proposed development.

3. INTRODUCTION

- 3.1. Persimmon Homes Suffolk proposes to develop a parcel of land known as Phase 2A, north-east of Haverhill centre and adjacent to the new Relief Road currently being constructed, by construction of 41 no. new detached, semi-detached, and terraced dwellings. This Phase is part of the Boyton Place development, which has started construction at the Phase 1 site off the A143 Haverhill Road.
- 3.2. The site is former agricultural land north of Ann Suckling Road, and will retain open aspects to the north of the new Relief Road. Further phases of the development will be to all other aspects, with Phase 2B of the development directly to the south of the application site.
- 3.3. The site will be affected by road traffic noise on the new Relief Road north of the site, and traffic flow data from the TA indicates continuous traffic throughout the day and into late evening, significantly subsiding but still reasonably consistent throughout the night. Other roads around the site will be relatively quiet local access roads, and the A143 is situated over 400m to the west of the site at its closest approach, so traffic on that road will have very little noise impact on the development.
- 3.4. Based on the Phase 2A location, noise from passing traffic on the Relief Road is consequently considered to be the only significant noise source with the potential to have an adverse impact on future residents of the development.
- 3.5. Loven Acoustics has been commissioned to provide an assessment of environmental noise affecting Phase 2A, based on the latest layout, and provide a report suitable to support the new Reserved Matters planning application currently submitted (App. No. DC/20/0615/RM).

4. NOISE LIMITING CRITERIA

- 4.1. Persimmon Homes are seeking planning permission for the Reserved Matters Application ref. DC/20/0615/RM. The application has yet to be determined but the Public Health & Housing team, as technical consultees to the planning committee, has asked that a noise assessment be provided to support the application.
- 4.2. The criteria for assessment have been established by the submission of a noise assessment for the first phase of the development in 2017. Conditions 17 and 18 of Application no. DC/16/2836/RM for Phase 1 refer to the criteria of BS 8233:2014 guidelines for target noise levels for both internal habitable rooms and external amenity areas/gardens. The following table summarises the specific maximum noise levels recommended in the condition criteria.

Table 1. Guidance for internal & external noise levels.

Guidance	Living rooms (0700-2300)	Bedrooms (2300-0700)	Outside Amenity Areas (0700-2300)
BS 8233:2014 <i>Sound insulation and noise reduction for buildings</i>	35dB L _{Aeq}	30dB L _{Aeq}	≤50dB L _{Aeq}

- 4.1. Glazing and other mitigation measures will be considered which will achieve the design standard noise levels as listed for the BS 8233 recommendations, thus conforming with the local authority requirements.

5. PREDICTED TRAFFIC NOISE

- 5.1. Whilst no specific assessment of traffic on the new relief road has been carried out for the current planning application, there are documents and guidelines available to provide the information required for this assessment. A Transport Assessment (TA) by MLM was provided with an earlier application for the overall site in 2009, which predicted peak time traffic flow on the new road from all traffic including the completed new development. This document is considered to be sufficiently accurate to provide the basis for calculating the likely overall traffic flow and noise, post-development, including non-development traffic.
- 5.2. Table 2 below summarises the findings of the TA in terms of development traffic predictions at peak times on the section of the relief road, past the Phase 2A site. The TA predicted the traffic flow up to 2019, with a growth factor of 1.164 from 2007. It is considered reasonable to utilise a similar growth factor for the 12-15 years from 2020 up to 2035.

Table 2. Predicted relief road 'existing' + full development traffic at 2019, from 2009 TA, up to 2035

Period (1 hour)	Traffic flow (both ways) 2019	Extrapolated flow to 2035
Peak a.m.	541	630
Peak p.m.	638	742

- 5.3. The TA suggests that to establish the AADT the peak hour flow should utilise a factor of 13.37 on the a.m. flow or 12.34 on the p.m. flow. By utilising the values above for the 2035 flow, it is seen that the p.m. flow with a AADT factor of 12.34 gives the higher flow of the two periods at 9156 AADT. This value will be utilised to provide the most robust assessment.
- 5.4. The *National Traffic Survey: 2012* (NTS), commissioned by the Department of Transport, and revised in September 2013, provides data on the spread of traffic volumes during weekdays and weekends. The chart on page 11 of the document, based on Table NTS0501 on their website shows the daily relative spread in graphical form. The findings are that peak hours generally account for approximately 10% of the overall daily traffic flow on non-motorway roads. By utilising the data in the table, the Survey provides it is possible to extrapolate the predicted peak traffic level on the link road to determine an 18-hour basic noise level in accordance with the methodology of the document *Calculation of Road Traffic Noise* (CRTN) issued by the Department of Transport Welsh Office.

Assessment of noise impact

- 5.5. Table 3 below summarises the CRTN noise level calculations, taking into account the various parameters and corrections suggested by the guidelines and arrives at a 16hr L_{Aeq} value (daytime 07:00 to 23:00). The table also shows the predicted 8hr night-time values (23:00 to 07:00), based on the likely level of traffic indicated by the NTS findings.
- 5.6. It should be noted that at this stage the speed limit on the relief Road is not known, or whether there will be any further traffic calming measures. The road will be used by HGV and will also be a bus route, so it expected that the speed limit will be 40mph at the most. In reality due to the location of a roundabout proposed at the north-western corner of the site (as shown on Figure 1 in the appendix), the typical speed past the site may be lower than 40mph. These factors will be considered in relation to the overall noise, as detailed in CRTN.
- 5.7. For the purposes of the calculations it has been assumed that the percentage of HGV traffic (including buses) could be 10% of overall traffic. The road does not appear to have any significant gradient at the point it passes the Phase 2A site.

Table 3. Calculation & assessment for internal noise levels

Parameters	Values
Estimated overall traffic flow per day based on TA data (5.3)	9156 AADT
18hr (06:00 to 00:00) flow extrapolated from NTS spread (97%)	8881 18hr
Basic noise level (at 3.5m from kerb) from CRTN Chart 3	68dB $L_{A10,18hr}$
Correction for speed (40mph and 10% HGV) Chart 4 CRTN	+1dB
Correction for road surface (unknown but assumed impervious as worst case) Section 16.1 CRTN	-1dB
Resultant 18hr basic noise level	68dB $L_{A10,18hr}$
Conversion to 16hr L_{Aeq} (as described in former PPG24)	-2dB
16hr average daytime L_{Aeq} (07:00-23:00) at 3.5m from kerb	66dB $L_{Aeq,16hr}$
Extrapolation to night-time noise (23:00-07:00) based on expected traffic flow* at 3.5m from kerb	54dB $L_{Aeq,8hr}$

* Night-time traffic volumes as per NTS flow spread

- 5.8. The following assessment will be based on the data in the table above. Suitable corrections for distance and any shielding will be included in calculations.

6. NOISE IMPACT & RECOMMENDATIONS

- 6.1. The noise data shown in Table 3 above indicate that traffic on the new Relief Road is predicted to generate a reasonably high noise level during the day, although there will be a significant reduction overnight. Based on the data a practical mitigation scheme may be provided to ensure an adequate level of protection against noise. A detailed scheme is provided below.
- 6.2. It should be noted that this scheme is based on the latest layout drawing provided: -
- No. 041-P-101 Rev.B dated 29/09/20

The site layout is shown in Figure 2 in the appendix.

Internal Noise Levels

- 6.3. To ensure that internal noise levels will meet the BS 8233:2014 criteria detailed in Table 1, suitable glazing and ventilation should be installed. Note that the following scheme is based on the plot numbers shown on the aforementioned layout drawing provided.
- 6.4. Table 4 below summarises a suitable scheme of glazing and ventilation to meet the requirements for internal noise levels. The calculations utilise the logarithmic averages of the data measurement periods as required by BS 8233 methodology. The time periods shown relate to 07:00-23:00 (Daytime) and 23:00 to 07:00 (Night-time). The plot numbers indicated refer to the drawing number shown in section 6.2.

Table 4. Predicted internal noise levels and indicative glazing and ventilation recommendations

Affected Plot Numbers (see Fig 2 in Appendix) Façades facing..	Daytime (dBL_{Aeq})	Night-time (dBL_{Aeq})	Indicative glazing performance (ventilation) *	
			Day rooms	Bedrooms
Plots 12, 15, 16, 26, 29, 30, 31 North, West, East	32	200	R _w 29 (TV)	R _w 29 (TV)
Plots 1, 24, 25, 27, 28, 32-34 North, West, East	30	18	R _w 29 (TV)	R _w 29 (TV)
Plots 2-5, 35-37 North, West, East	26	15	R _w 29 (TV)	R _w 29 (TV)
All other plots and façades	<25	<15	R _w 29 (TV)	R _w 29 (TV)

*** NOTE:**

- 6.5. (TV) Indicates background ventilation, as required by Part F of the Building Regulations can be provided by good quality frame mounted trickle vents. The calculations have assumed that trickle vents will be fully open with a subsequent loss of attenuation from the window of up to 5dB.
- 6.6. It may be noted that, as previously mentioned, traffic noise from the A143 is considered to be insignificant in comparison with the Relief Road, due to the distance, and will not have a significant impact on the overall noise environment or influence the recommended mitigation shown above.
- 6.7. The glazing specification shown in Table 4 above is overall sound insulation level (SRI). Table 5 below shows indicative configurations of glazing which will meet the requirements. However, any other glazing configuration that can be demonstrated to at least match the performance specification should be acceptable.

Table 5. Indicative glazing configurations

Glazing specification (from Table 4)	Indicative Glazing Configuration (mm) glass/air/glass	Indicative Glazing Supplier
R _w 29dB	4/12-20/4	Pilkington

- 6.8. **Note:** It will be the responsibility of the window provider to ensure that the sound insulation values above are not compromised by the frames and sash seals. The above glazing applies to habitable rooms only. Any non-habitable rooms such as hallways, bathrooms and separate kitchens will require only thermal glazing.

Outside Amenity Space

- 6.9. The detailed site layout of Phase 2A shows that all houses will have private gardens. The design of the site is such that many of the gardens will be protected from traffic noise to a large extent by shielding from their respective building shells, or from other buildings.
- 6.10. BS 8233 (and the more recent document ProPG) suggests that ideally the noise level in gardens and amenity space will not be above the range of 50-55dB $L_{Aeq,16hr}$. However, it does also acknowledge that where this is not possible to achieve, quieter areas of garden available for residents to enjoy may be an acceptable mitigation.
- 6.11. Calculations indicate that the daytime noise levels at the façades of the dwellings range from 48 to 56dB L_{Aeq} , which represents unprotected garden noise levels, and is above the 8233/ProPG range. However, this does not allow for any of the inherent shielding mentioned above. For plots 12, 15 and 16 in the group of dwellings identified as being most affected by traffic noise, the building shells offer protection from the traffic noise of 5-15dB so the garden noise levels will be within the 8233/ProPG range.
- 6.12. Other plots such as Plots 1, 26, 29 and 30, and other plots further into the site, will not benefit from shielding from their building shells, however, so may require additional mitigation in order to meet the guidelines. Table 6 below sets out the predicted noise levels in gardens affected by traffic noise and details inherent shielding and/ or recommended mitigation in the form of local barriers.

Table 6. Predicted external amenity space noise levels and inherent or recommended mitigation

Plot numbers	Inherent and proposed mitigation	Range of attenuation* (dB)	Predicted garden/POS noise levels (dB $L_{Aeq,16 hr}$)
1, 26, 29, 30	No shielding from building shells Recommended 2.0m high masonry wall or close-boarded timber fence to northern boundaries	-6 to -14	42-50
12, 15, 16	Inherent shielding from building shells	-10 to -15	41-46**
All other plots	No or limited shielding from building shells. Recommended 1.8m high-close-boarded timber fence to all exposed garden boundaries	-5 to -11	40-49

* *Dependent on receiving location in garden relative to distance to barrier*

** *With maximum shielding (eg on patio close to house)*

6.13. It can be seen in the table above that with the inherent and recommended mitigation implemented, the noise level in all private gardens is expected to be at a maximum, at or within the 50dB $L_{Aeq,16hour}$ range of levels recommended as a target maximum by BS 8233/ProPG guidance.

7. CONCLUSIONS

- 7.1. Data from previous TA traffic flow for the new Relief Road has been used, with suitable future growth predictions, to assess the noise impact on the proposed Phase 2A development, taking into account the dominant noise source of passing road traffic on the Relief Road, some 35m from the closest plots. Traffic on the A143 will be insignificant as a discrete noise source post-development.
- 7.2. Calculations have shown that a suitable scheme of glazing and ventilation, as detailed in Table 4 of this report, will ensure that internal noise levels in the new dwellings will be within the criteria of BS 8233:2014 guidelines, as required by the local authority Public Health & Housing team.
- 7.3. In terms of outside amenity space noise, based on the latest layout, whilst there will be a small number of private gardens protected by building shells, most won't benefit from inherent shielding and without additional mitigation may not meet the BS 8233/ProPG preferred range of 50-55dB $L_{Aeq,16hour}$. Consequently, further proposed mitigation in the form of acoustic fences or walls is suggested, as detailed in Table 6. With the proposed mitigation implemented all plots are predicted to meet the criteria.
- 7.4. In conclusion it is considered that if the recommendations within this report are incorporated into the design of the Phase 2A dwelling façades and the proposed garden boundary treatment implemented, the impact of environmental noise on future residents will be deemed to meet the requirements of the local authority criteria and will ensure that the noise environment, both internally and externally, will not adversely affect the amenity of future residents. This document is therefore considered suitable to support the Reserved Matters application ref. DC/20/0615/RM.

APPENDIX 1

Explanation of Noise Terms

- A2.1 The L_{Aeq} indicates the average noise level and is the 'equivalent continuous' noise level over a sample period. It is the single parameter now commonly used to describe a noise environment. Most of the guidance on noise now uses ' L_{Aeq} ' to define acceptable levels.
- A2.2 The L_{A10} indicates traffic noise levels and is the noise level exceeded for 10% of the sample period. It gives a good indication of the spread of noise events in a given environment. Near a busy road, the L_{10} and the L_{eq} are closely correlated, with the L_{10} typically 2-5dB higher than the L_{eq} . Here, the correlation is clear, indicating a noise environment dominated by road traffic.

APPENDIX 2

Figure 1. Overall site plan with Phase 2A residential extent outlined in red

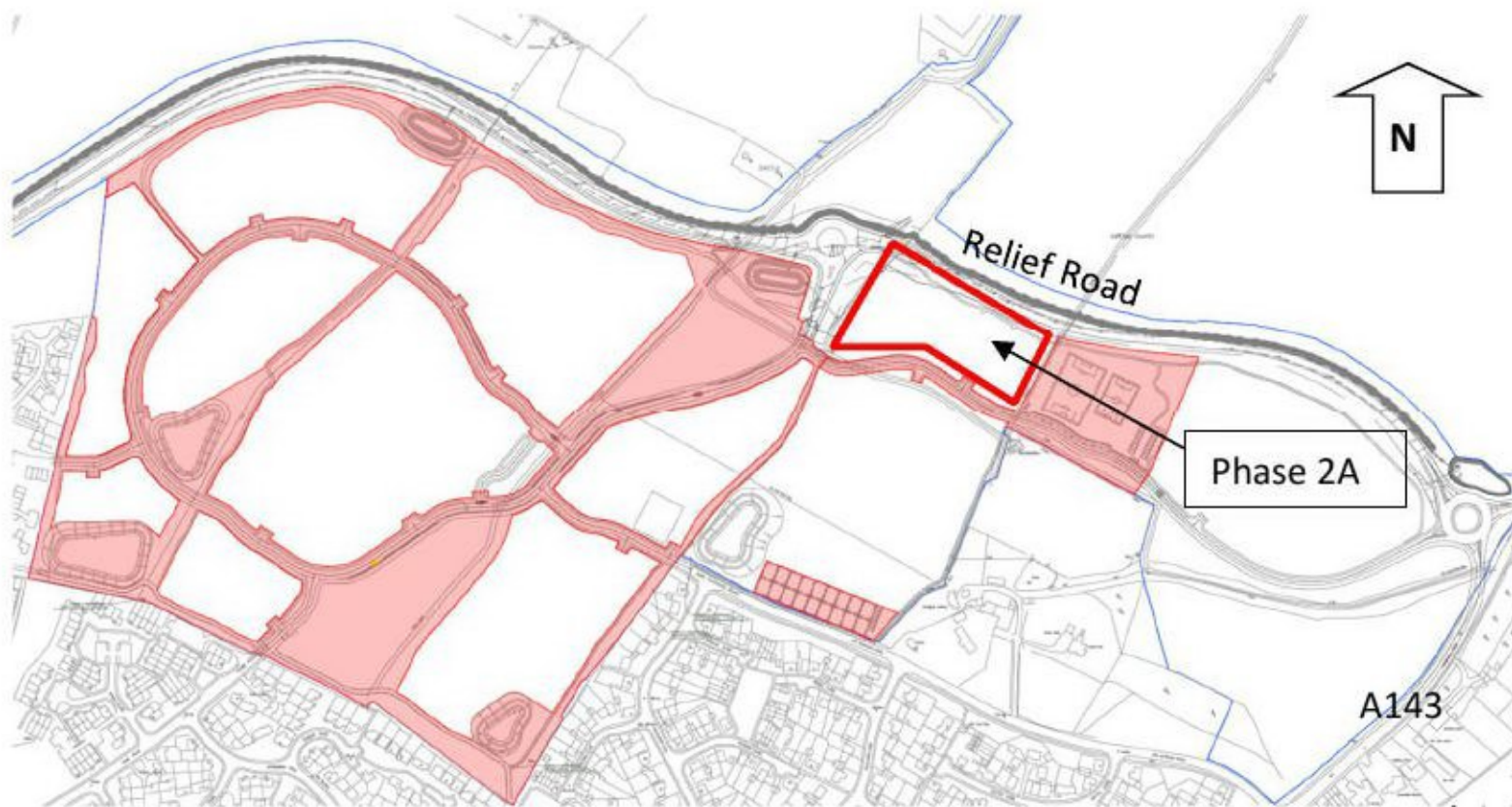


Figure 1a. Outline of complete Phase 2A application area

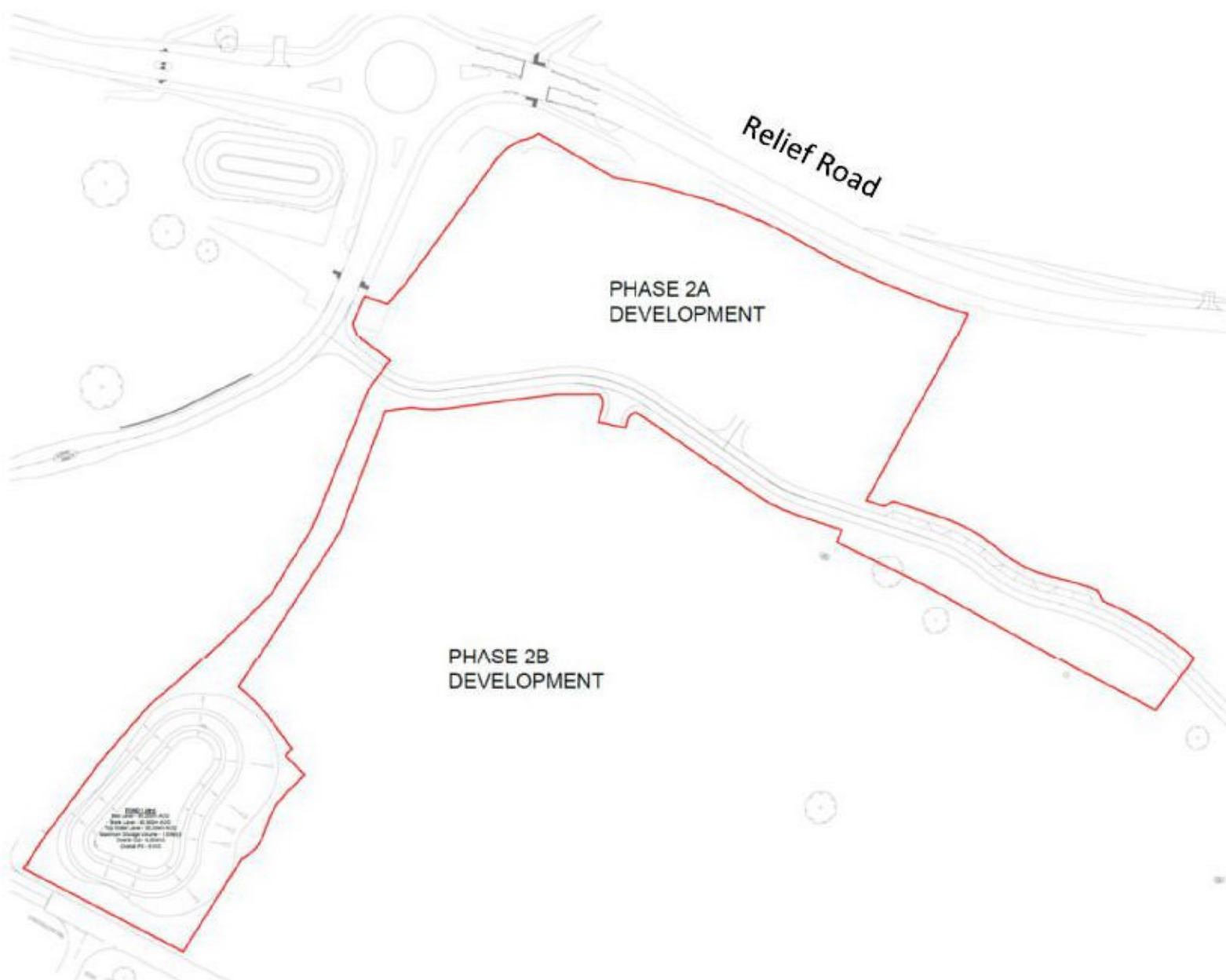


Figure 2. Detailed plot layout of the Phase 2A development

