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GLADMAN DEVELOPMENTS LIMITED

LAND OFF ASHFORD ROAD, SELLINDGE

NOISE ASSESSMENT REPORT

JANUARY 2024

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JANUARY 2024

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EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) has carried out a noise assessment to establish the likely noise impact and mitigation requirements for the proposed residential development at Land off Ashford Road, Sellindge.

Noise during the construction phase has the potential to affect the existing sensitive receptors directly to the north west and another receptor in the centre of the site bordered by the proposed development. The assessment has shown that best working practice measures should be implemented during each phase of the earthworks and construction works at the site and it is recommended that a noise management plan is drafted once the methodology and construction programmes have been finalised.

A baseline noise survey has been undertaken during the daytime and night-time, to establish the noise levels affecting the proposed development site, as well as the baseline acoustic environment.

A noise model has been set-up to consider operational phase noise at the development site, with all surrounding existing noise sources included. The noise model has been used to calculate noise levels across the developed site, and to determine if and what mitigation measures are required to achieve the internal and external noise guideline levels.

During the daytime all noise sensitive rooms across the site will meet internal noise guideline levels, however, some will require an alternative form of ventilation to that provided by an open window. During the night–time all bedrooms will meet internal noise guideline levels however will require an alternative form of ventilation to that of an open window. Daytime noise level guidelines for external amenities will be met at the majority of the site, with only a few of the properties at the norther boundary exceeding the recommended level.

Appropriate glazing and ventilation options have been proposed for the development site, to control noise from nearby transportation noise sources, these are shown on Drawings GM12932-006 and GM12932-007.

The assessment demonstrates that with the implementation of appropriate glazing and ventilation systems, as recommended by national guidance and policy, noise from the transportation sources can be mitigated adequately to provide acceptable living conditions for future residents.

1 INTRODUCTION

1.1.1 By email instruction, dated 20th July 2023, from Beth Ambrose of Gladman Developments Limited (Gladman), Wardell Armstrong LLP (WA) were instructed to update the initial Noise Impact Assessment produced in March 2020 by WA. This update was required to consider the new proposed proving layout for the development.

1.1.2 The proposed development site is located to the west of Sellindge and currently comprises open land. In the centre of the site area lies an existing dwelling which is not within the application boundary. This dwelling will remain following the construction of the development.

1.1.3 To the north of the site lies the A20 Ashford Road, with the Dukes Head public house beyond. To the east, the site is bordered by a private road with open land beyond. To the south, the site is bordered by open land, with the M20 motorway and Ashford to Folkestone high speed railway line (HS1) approximately 240m beyond. To the west of the site is open land, with existing commercial/agricultural premises (thought to be a plant nursery) approximately 60m beyond. To the north west, the site is bordered by an existing dwelling off Ashford Road.

1.1.4 It is understood that the proposed development will comprise up to 55 residential dwellings together with associated infrastructure. The total site area is 1.19ha. The location of the site is shown on drawing number GM12932-001.

1.1.5 This noise report has been prepared to accompany an outline planning application. It assesses the results of a noise survey carried out in accordance with current guidance and includes recommendations for mitigation that have been incorporated into the site layout design.

2 ASSESSMENT METHODOLOGY

2.1 Scope of Works

2.1.1 The scope of the assessment includes a consideration of the noise impact associated with the construction phase of the development noise at existing dwellings. It also considers the noise impact during the operational phase at proposed residential areas, specifically in terms of the potential impact of existing transportation and commercial noise sources in the vicinity of the site.

2.2 Noise Survey

2.2.1 As part of this assessment, Wardell Armstrong LLP has carried out attended and unattended noise surveys to assess the current noise levels at the development site. The survey is detailed in Section 3.

2.3 Assessment Methodology

2.3.1 The potential noise impacts have been assessed with reference to the following policies, standards and guidance:

- National Planning Policy Framework, 2023 (NPPF).
- Noise Policy Statement for England, 2010 (NPSE).
- Planning Practice Guidance – Noise, 2019 (PPG).
- ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, 2017 (ProPG).
- Department of Transport's memorandum, "Calculation of Road Traffic Noise", 1998 (CRTN).
- British Standard 5228 -1:2009+A1:2014 "Code of Practice for noise and vibration control on construction and open sites – Part 1: Noise" (BS5228-1).
- British Standard 5228-2:2009+A1:2014 "Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration" (BS5228-2).
- Acoustics, Ventilation & Overheating – Residential Design Guide, 2020 (AVO).
- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233, 2014).
- British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142).

2.3.2 Further details on the guidance and standards used in this assessment can be found in Appendix A.

3 BASELINE CONDITIONS

3.1 Existing Sensitive Receptors

3.1.1 Two existing receptors have been identified as the location which is most likely to be affected by noise from the construction phase of the development. Other receptors may be affected by noise from the construction works, however, the noise levels will be lower than at the receptors identified. The existing sensitive receptors are shown in Table 1 below and on Drawing GM12932-001.

Table 1 - Existing Construction Noise Sensitive Receptor Locations

Receptor	Grid Reference		Bearing from Site	Distance from Site boundary
	X	Y		
CNSR1	610030	138219	North-east and bordered by site	5m
CNSR2	609888	138274	The centre of the site bordered by the proposed development	5m

3.2 Noise Survey

3.2.1 On the 18th and 19th September 2019, and 2nd and 3rd October 2019, Wardell Armstrong LLP carried out a noise survey at the development site.

3.2.2 Noise measurements were carried out at four locations. The Monitoring Locations (ML(s)) are detailed in Table 2 and are shown on Drawing Number GM12932-001.

Table 2 - Summary of Noise Monitoring Locations

Monitoring Location	Location Description	Time Period Monitored		Attended or Unattended Monitoring
		Start	End	
ML1	In the northern part of the site, located approximately 6m away from Ashford Road (A20)	22:18 02/10/2019	15:34 03/10/2019	Partially Attended and Unattended
ML2	At the western boundary of the site, located approximately 80m away from the commercial premises to the west of the site.	00:15 18/09/2019	13:01 18/09/2019	Partially Attended and Unattended
ML3	At the southern boundary of the site, approximately 260m from the M20, and a railway line	00:18 18/09/2019	13:18 19/09/2019	Partially Attended and Unattended
ML4	Outside of the site boundary, and approximately 5m away from an existing residential dwelling, which is located centrally to the site.	13:16 18/09/2019	14:16 18/09/2019	Attended

3.2.3 Data obtained at ML1 and ML3 have been used to carry out an assessment of road traffic noise at the development site.

3.2.4 Measurements at ML2 were carried out to assess potential noise from the commercial premises to the west of the proposed development site. No industrial or commercial noise was found to be dominant during the noise survey. Therefore, noise from the industrial premises has not been considered further.

3.2.5 Noise measurements captured at ML4 have been used to determine the impact of the construction phase of the development on existing sensitive receptors.

3.2.6 The noise measurements were made using three Class 1, integrating sound level meters (with continuous audio recording at ML1 and ML2). In accordance with guidance, the meters were mounted vertically on tripods, 1.5m above the ground and more than 3.5m from any other reflecting surfaces.

3.2.7 The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in the calibration during the survey was noted.

3.2.8 On September 17th, the weather conditions during the survey were as follows:

- Wind speeds up to 2-3m/s;
- Dry;
- Temperature approximately 11 - 15˚C; and,
- Approximately 10% cloud cover.

3.2.9 On September 18th, the weather conditions during the survey were as follows:

- Wind speeds up to 1-3m/s;
- Dry;
- Temperature approximately 10 - 18˚C; and,
- Approximately 20% cloud cover.

3.2.10 On October 2nd, the weather conditions during the survey were as follows:

- Wind speeds up to 3-5m/s;
- Dry;
- Temperature approximately 10 - 13˚C; and,
- Approximately 40% cloud cover.

3.2.11 On October 3rd, the weather conditions during the survey were as follows:

- Wind speeds up to 2-3m/s;
- Dry;
- Temperature approximately 6 - 14˚C; and,
- Approximately 50% cloud cover.

3.2.12 For the purpose of this assessment, daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours.

3.2.13 A-weighted[1] L_{eq}[2] overall and one-third octave noise levels were measured to comply with the requirements of BS8233 and BS5228. A-weighted L_{90}[3] and L_{10}[4] noise levels, together with the maximum and minimum sound pressure levels, were also measured to provide additional information. The measured noise levels are set out in full in Appendix B.

3.2.14 Attended noise monitoring and playback of audio recordings allow observations and detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following:

Road Traffic Noise: Road traffic noise from Ashford Road adjacent to the northern boundary, and distant road traffic from the M20 south of the site were dominant throughout the site.

Birdsong: Birdsong was audible at all MLs during the daytime and night-time periods.

Industrial Noise: Noise from vehicle movements including reverse beepers were distantly audible at the western boundary of the site. However, the noise from reverse beepers was not dominant over transport noise at any time during the noise survey.

Dukes Head Pub: Noise from plant associated the Dukes head pub was observed to be audible at the premises, however, the noise was not audible at any time within the site boundary.

[1] A' Weighting — An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions

[2] L_{eq} — Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

[3] L_{90} — The noise level which is exceeded for 90% of the measurement period.

[4] L_{10} — The noise level which is exceeded for 10% of the measurement period.

Other: Aircraft noise was occasionally audible at the development site throughout the daytime. Noise from building works at an existing dwelling was also occasionally audible at ML2. Noise from ground investigation works at the site were audible between 1232 and 1318 hours at ML3 on the 19th September 2019 and the data collected during this period has been excluded from the assessment.

3.3 Existing Noise Levels

3.3.1 The existing measured noise levels at the site have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours) categories for ML1 and ML3 which both consider transport noise. In the absence of a full 16-hour daytime measurement at ML1, the daytime noise levels have been calculated based on the short measurement procedure detailed in CRTN which determines a methodology to calculate an $L_{A10,18h}$ value.

3.3.2 This calculated level has been converted into an L_{day} for use in this assessment, based on the CRTN and TRL method to calculate $L_{A10,16Hour}$ from three consecutive one-hour measurements, taken between 1000 and 1700 hours. Details of the daytime calculation are in Appendix A Policy, Standards and Guidance. The night-time L_{night} was calculated directly from the measured 8hr night-time period.

3.3.3 The survey results are summarised in Table 3 for all four monitoring locations.

Table 3: Average Measured Daytime and Night-time Noise Levels

Monitoring Location	Time	Measured Noise Level (Figures in dB L_{Aeq})
ML1	0700-2300 2300-0700	69 61
ML2	0700-2300 2300-0700	50 48
ML3	0700-2300 2300-0700	52 50
ML4	1316-1416	53

3.3.4 In accordance with ProPG, up to the 10th highest measured maximum level can be considered for the assessment of maximum noise events from transport. The representative maximum noise levels from transport noise, measured during the night-time period of the survey at ML1 and ML3, are summarised in Table 4.

Table 4: Summary of the Maximum Measured Transportation Night-time Noise Levels (Figures in dB $L_{Amax,F}$)

Monitoring Location	Maximum Measured Noise Level
ML1	81
ML3	62

4 ASSUMPTIONS, LIMITATIONS AND UNCERTAINTY

4.1 Introduction

4.1.1 The assessment is affected by the following assumptions and limitations.

4.2 Assumptions

4.2.1 The following assumptions have been made.

- All buildings within the proposed development are 9 metres high and 2 storeys;
- An open window provides approximately 13dB noise attenuation.

4.3 Limitations

4.3.1 Traffic data has not been provided, however, the measured noise levels from the noise survey have been checked for accuracy against the levels in the noise model. The existing site noise levels have been used in the noise model.

4.3.2 The layout referenced in this report is in outline terms only, finalised mitigation measures should be based off a detailed design layout developed prior to detailed application. As this application is in outline terms only, a suitably worded condition is recommended to achieve compliance in the detailed planning stage.

4.4 Uncertainty

4.4.1 To reduce the level of uncertainty within the assessment, the following steps have been taken:

- The distances between the source and nearest receptors have been measured from scale plans showing the locations of the development.
- The results of each measurement period were reported to the nearest 0.1dB.
- Noise measurements were made using three Class 1, integrating sound level meters.
- The sound level meters were calibrated prior to and following the noise survey, no significant drift in calibration was recorded.

5 DETAILS OF THE NOISE MODEL

5.1 Introduction

5.1.1 This section of the report sets out the details of the methodologies used to prepare the noise model so that existing sources of noise affecting the site can be accurately determined at the proposed development. The model has also been used to identify any required mitigation measures in principle, to provide a good standard of amenity for future residents.

5.2 Noise Model Set-up

5.2.1 The assessment of the propagation of sound across the Proposed Development has been undertaken using the noise modelling software SoundPLAN version 8.2.

5.2.2 SoundPLAN software uses geographical information to create a model of the study area on which to generate noise contours and includes objects that affect the propagation of noise such as buildings and topography.

5.2.3 SoundPLAN model uses the noise prediction methodology set out in ISO 9613-2:1996 'Attenuation of sound during propagation outdoors'. The noise modelling produces noise contour plans demonstrating the levels of transportation noise across the site.

5.2.4 The model has an assumed temperature of 10^{o}C, 70% humidity, and 1013.3mbar air pressure. The ground across site is a mixture of hard and soft ground, hence the use of 0.6 as the term to represent ground absorption (where 0 = completely absorbent and 1 = completely reflective).

5.2.5 The following noise sources have been included and calibrated in the noise model:

- A20 to the north.
- M20 to the south.

5.2.6 The noise modelling has been checked for accuracy against the measured noise levels, to assess the suitability of the noise model to determine the propagation of noise across the site. This has been undertaken by co-locating a receptor location with the monitoring locations in the model.

5.2.7 The results of this assessment are shown in Table 5 below.

Table 5: Noise Model Calibration

Monitoring Location	Daytime L_{Aeq}		Night-time L_{Aeq}		Night-time $L_{Af,Max}$	
	Measured Level	Modelled Level	Measured Level	Modelled Level	Measured Level	Modelled Level
ML1	69	69	61	61	81	81
ML2	50	54	48	51	N/A	56
ML3	52	53	50	49	62	61

5.2.8 As the results of the noise monitoring and noise modelling are in agreement with one another, the model itself has been used to determine the noise impact from all surrounding noise sources and establish mitigation measures for the proposed sensitive receptors where appropriate. The sound level in some of the locations are overpredicted in the computer noise model, however, the slight over prediction will ensure a robust assessment.

5.2.9 An indicative housing layout has been provided by Gladman to assist in determining the application. This layout shows one way in which dwellings could be located on the site. The final design of the development may differ from that shown in this assessment report.

5.3 Modelling Results

5.3.1 The following noise modelling figures have been prepared, based upon the baseline surveys, and indicative site layout.

5.3.2 The following figures have been produced as part of the noise modelling assessment.

- GM12932-002 – Daytime LAeq, 16hour External Noise Levels
- GM12932-003 – Daytime LAeq, 16hour Façade Noise Levels
- GM12932-004 – Night-time LAeq, 8hour Façade Noise Levels
- GM12932-005 – Night-time LAf,Max Façade Noise Levels

5.3.3 These figures have been used inform the noise impact assessment in Section 7 of this report.

6 SITE NOISE RISK ASSESSMENT

6.1 Introduction

6.1.1 In accordance with ProPG (2017) a Site Noise Risk Assessment (SNRA) has been carried out. The SNRA assesses the initial risk of noise from transportation sources to have an adverse impact on a proposed development based on the overall measured levels with no mitigation in place.

6.1.2 The results of noise measurements carried out during the daytime and night-time periods are presented in Table 6 and have been compared to the information provided on Figure 1 of ProPG 2017.

Table 6: Stage 1 Risk Assessment of Noise Levels in Accordance with ProPG 2017

Monitoring Location	Residential Property Location	Daytime Noise Level (Figures in dB L_{Aeq})	Risk of Adverse Effect (ProPG)	Night-time Noise Level (Figures in dB L_{Aeq})	Risk of Adverse Effect (ProPG)
ML1	Proposed sensitive receptors in the northern part of the site closest to Ashford Road.	69	Medium	61	High
ML3	Proposed sensitive receptors in the southern part of the site closest to the M20 and railway line.	52	Low	50	Low

6.1.3 Table 6 indicates that during the daytime and night-time, proposed receptors in the southern part of the site, would be at low risk of experiencing an adverse noise impact due to road traffic.

6.1.4 In regard to low risk, ProPG states;

> *'At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in the ADS (Acoustic Design Statement) which confirms how the adverse impacts of noise mitigated and minimised in the finished development.'*

6.1.5 Table 6 also indicates that during the daytime, proposed receptors in the northern part of the site, would be at medium risk of experiencing an adverse noise impact due to road traffic.

6.1.6 In regard to medium risk, ProPG states:

> *'As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.'*

6.1.7 During the night-time, Table 6 shows proposed receptors in the northern part of the site, would be at high risk of experiencing an adverse noise impact due to road traffic.

6.1.8 In regard to high risk, ProPG states;

> *'High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.'*

6.1.9 The Site Noise Risk Assessment shows that local noise mitigation and good acoustic design will be required to ensure that the potential noise impact is minimised and guideline internal and external noise levels are achieved.

6.1.10 In accordance with ProPG 2017, a Stage 2 full noise assessment, which includes an acoustic design statement, is required to ensure future residents are protected and good acoustic design has been implemented. This is provided in section 5 of this report.

6.2 AVO – Stage 1 Overheating Risk Assessment

6.2.1 In January 2020, the Acoustics Ventilation and Overheating: Residential Design Guide (AVO) was published by the Association of Noise Consultants. Therefore, the risk of overheating within proposed dwellings can be considered in line with the AVO guide.

6.2.2 In accordance with AVO, the existing noise levels across the proposed development site should be compared to the Level 1 risk assessment shown in Table 3.2 of AVO, to establish the potential risk of an overheating condition.

6.2.3 The results of noise measurements carried out during the daytime and night-time periods are presented in Table 7 and have been compared to the information provided on Table 3.2 of AVO.

Table 7: Stage 1 Risk Assessment of Noise Levels in Accordance with AVO 2020.					
Monitoring Location	**Residential Property Location**	**Daytime Noise Level (Figures in dB L_{Aeq})**	**Risk of Adverse Effect (AVO)**	**Night-time Noise Level (Figures in dB L_{Aeq})**	**Risk of Adverse Effect (AVO)**
1	Proposed sensitive receptors in the northern part of the site closest to Ashford Road.	69	High	61	High
3	Proposed sensitive receptors in the southern part of the site closest to the M20 and railway line.	52	Negligible	50	Medium

6.2.4 Table 7 indicates that during the daytime, the site will be subject to a 'Negligible' risk in the southern part of the site and 'High' risk in the northern part of the site of an overheating condition. During the night-time, the site will be subject to a 'Medium' risk in the southern part of the site and 'High' risk in the northern part of the site of an overheating condition.

6.2.5 Dwellings across the remainder of the site which are subject to a negligible risk of noise effect will be able to keep windows open to control thermal comfort and will achieve ventilation requirements. However, where there is a requirement to keep windows closed for dwellings in the northern part of the site. These plots are subject to an increased risk of overheating, therefore, an overheating assessment should be undertaken at the detailed design stage.

7 NOISE IMPACT ASSESMENT

7.1 Construction Noise Assessment

Noise from Earthworks and Construction Phase Activities

7.1.1 The enabling and construction works are likely to be restricted to daytime hours. The appropriate category value has been determined for the sensitive receptor in the immediate vicinity of the site, based on the ambient noise levels measured during the daytime period.

7.1.2 The daytime measured noise levels, from the baseline noise survey, representative of the existing sensitive receptors, are provided below in Table 8.

Table 8: Construction Noise Assessment Criteria

Receptor	Representative Noise Monitoring Location	Measured Noise Levels (dB L_{Aeq})	Ambient Noise Level Rounded to the nearest 5dB(A) (dB L_{Aeq})	Appropriate Category Value A, B or C in accordance with BS5228-1	Noise Level above which activities of the Construction Phase may cause a significant impact at the Receptor (dB L_{Aeq})
CNSR1 & CNSR2	ML4	53	55	A	65

7.1.3 Based on the ambient noise levels measured during the daytime period, the appropriate category for this site has been determined as Category A. Therefore, the noise level above which activities from the construction phase might cause an impact is 65dB(A).

7.1.4 During the earthworks and construction phase, any work carried out at the proposed development is likely to generate noise that may propagate beyond the site boundary.

7.1.5 At this stage, detailed information regarding the nature and timescales of activities likely to take place during the earthworks and construction phase is not known. Activities on the site, which could give rise to construction noise impacts include (but are not limited to):

- Site preparation i.e. ground excavation, levelling of ground, trenching, trench filling, unloading and levelling of hardcore and compacting filling; and
- Construction of the proposed development including construction of access roads, fabrication processes e.g. planning, sanding, routing, cutting, drilling and laying foundations.

7.1.6 Construction vehicle movements to and from the proposed development have the potential to generate noise at existing sensitive receptors, in the immediate vicinity of the local road network.

7.1.7 At this stage, detailed traffic data relating to the likely numbers of construction vehicles is not available. However, the number of construction vehicles is not likely to be significant. It is therefore considered that the level of road traffic noise at sensitive receptor locations will not change significantly, due to construction vehicles, during the construction phases of the proposed development and this impact has not therefore been considered further.

7.1.8 The contractor undertaking the enabling and construction works has not yet been appointed. However, it is considered that the enabling and construction works are likely to be restricted to daytime hours, i.e. between 08:00 and 17:00 hours Monday to Friday and 09:00 to 12:00 hours on a Saturday, with no work on Sundays and Bank Holidays.

7.1.9 The earthworks and construction phase activities have the potential to generate short term increases in noise levels, above those recommended in BS5228-1. The levels of noise received at the receptors closest to the proposed development would depend on the sound power levels of the machines used, the distance to the properties, the presence of screening or reflecting surfaces and the ability of the intervening ground to absorb the propagating noise.

7.1.10 Proposed dwellings may become occupied before the completion of the construction phase of the proposed development. These may experience a similar noise impact depending on the phase of the proposed development under construction and given the potentially small distances between the construction activities and residential dwellings, noise levels at the receptors may occur above those detailed in Table 7. The noise generated by the earthworks and construction phases of the proposed development may therefore exceed Category A in BS5228, for short periods, at the existing and proposed sensitive receptors located in the immediate vicinity of the construction phases of the proposed development.

7.1.11 It is therefore recommended that mitigation measures are put in place that will reduce the scale of the potential effect. Details are set out in the Acoustic Design Statement of this report.

Vibration from Earthworks and Construction

7.1.12 WA's archives contain field trial measurements of ground vibration associated with types of plant likely to be used at the proposed development. The representative, measured levels, made by WA using a Vibrock B801 Digital Seismograph, are set out in Table 9.

Table 9: Measured Vibration Levels of Plant Under normal Operating Conditions

Plant Type	Distance from Source		
	10m (mm/s)	20m (mm/s)	30m (mm/s)
25-30 tonne excavator	0.175	0.075	Background
25 tonne dumptruck (Volvo A25)			
Loaded	1.000	0.150	Background
Empty	0.225	0.050	Background
Dozer	1.050	0.400	Background
Vibrating roller Drum			
Vibrator on	4.470	3.270	2.350
Vibrator off	0.500	0.150	0.050
Loading shovel	1.025	0.150	Background

7.1.13 The nearest sensitive receptors could include proposed dwellings which become occupied before the completion of the construction phase of the proposed development. As a worst-case scenario, earthworks and construction works may potentially take place at a distance of approximately 5 metres from existing residential properties.

7.1.14 At this distance, it is possible that vibration due to the operation of various construction plant, and in particular a vibratory roller, may be above the threshold of complaint. However, the vibration levels are highly unlikely to be above the threshold of structural damage. It is possible that residential properties would therefore potentially experience some adverse impact. However, these would be transient only and for very limited periods during the works, i.e. when activities take place at the proposed development boundaries.

7.1.15 In addition to the earthworks and construction works described, it is possible that piling will be required. At this time, the type(s) of piling which would be used at various locations across the site is not known and it is likely that the contractor responsible for undertaking the works at the site would decide the method of piling.

7.1.16 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piling. The intensity of vibration disturbance, which may be registered at a receptor, will be a function of many factors. These are set out in BS5228-2 and include:

- Energy per blow or cycle;
- Distance between source and receptor;
- Soil structure interaction i.e. nature of connection between soil and structure being monitored; and
- Construction of structure and location of measuring points e.g. soil surface, building foundation and internal structural element.

7.1.17 As the responsible contractor has not yet been appointed, detailed information regarding the above is not known. It is not therefore possible to assess the potential impacts of vibration generated by piling.

7.1.18 The receptors likely to be affected by piling will vary depending on the phase of the proposed development under construction. Once the precise building locations, ground conditions for each location and type(s) of piling are confirmed, vibration levels could be estimated and recommendations for control made as appropriate. Mitigation measures are discussed within the Acoustic Design Statement of this report.

7.2 Assessment of Daytime Noise Levels in External Amenity Areas

7.2.1 The proposed development includes dwellings with private gardens. We have assumed that each garden will be surrounded by a 1.8 metre high fence. These fences are only required to protect the gardens of the plots nearest to the transportation sources.

7.2.2 The results of the noise modelling and noise monitoring, show that noise during the daytime is above the upper limit of 55dB(A) for external amenity areas at 4 of the proposed dwellings. The calculated free field noise levels for external amenity areas, during the daytime, are summarised in Drawing GM12932-002.

7.2.3 The majority of external amenity areas fall below the desirable 50dB(A) level. The noise levels within ten of the external amenity areas will fall between the desirable limit of 50dB(A) and the upper limit of 55dB(A).

7.2.4 The external amenity areas in which an exceedance is shown will need to be redesigned at the detailed planning stage subject to appropriate planning conditions.

7.3 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

7.3.1 SoundPLAN noise modelling has been used to calculate the noise levels at the façades of proposed dwellings during the daytime. The calculated levels are summarised in Drawing GM12932-003.

7.3.2 In accordance with BS8233, the internal noise level in living rooms and bedrooms during the daytime should be no more than 35dB(A) $L_{Aeq,16hour}$, and appropriate mitigation measures have been identified in Section 8 to achieve the guideline noise levels in living rooms and bedrooms during the daytime.

7.4 Assessment of Night-time Noise Levels Bedrooms

7.4.1 SoundPLAN noise modelling has been used to calculate the noise levels at proposed dwellings during the night-time. The calculated noise levels at the façades of the properties, during the night-time are summarised in Drawing GM12932-004.

7.4.2 In accordance with BS8233, the internal noise level in bedrooms at night should achieve 30dB(A) $L_{Aeq,8hour}$, and appropriate mitigation measures have been identified in Section 8 to achieve the guideline noise levels in bedrooms during the night-time.

7.5 Assessment of Maximum Night-time Noise Levels Bedrooms

7.5.1 SoundPLAN noise modelling has been used to calculate the noise levels at proposed dwellings during the night-time. The calculated noise levels at the façades of the properties, during the night-time are summarised in Drawing GM12932-005.

7.5.2 In accordance with BS8233, the internal noise level in bedrooms at night should not exceed 45dB(A) $L_{Af,Max}$, more than 10 times per night. Therefore, appropriate mitigation measures have been identified in Section 8 to achieve the guideline noise levels in bedrooms during the night-time.

8 NOISE ATTENUATION SCHEME

8.1 Introduction

8.1.1 This section of the assessment considers the mitigation measures required to achieve a good level of amenity in the residential areas of the proposed development.

8.2 Construction Phase

Noise from Earthworks and Construction

8.2.1 To reduce the potential impact of noise levels generated by the construction phase of the proposed development at existing receptor locations in the immediate vicinity of the site, mitigation measures will be required.

8.2.2 Best working practice will be implemented during each phase of the earthworks and construction works at the site. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction Sites, Parts 1 to 5, 2003.

8.2.3 The following measures will be put in place to minimise noise emissions:

- When works are taking place within close proximity to the sensitive receptors, screening of noise sources by temporary screen may be employed;
- All plant and machinery should be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers;
- Site staff should be aware that they are working adjacent to a residential area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios;
- A further measure to reduce noise levels at the sensitive receptors would include, as far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor;
- Adherence to any time limits imposed on noisy works by the local authority;
- Implement set working hours during the week and at weekends;
- Ensure engines are turned off when possible; and
- Should earthworks/earthworks and construction activities need to be carried out during night-time hours, the local authority could include a planning condition which requests advance notice and details of any night working to provided.

Noise from Construction Vehicles at Existing Sensitive Receptors

8.2.4 Mitigation measures will be required to reduce the noise and vibration impact of construction vehicles at existing sensitive receptors, this will consist of management of construction vehicles to minimise the noise and vibration impact.

8.2.5 The management is likely to include;

- Times of vehicle movements;
- Frequency of movements, (i.e. maximum HGVs permitted per hour); and,
- Site speed limit.

8.2.6 In addition, the maintenance of the road surface, including road sweeping and repair of potholes will also aid in reducing the likelihood of complaints at future existing sensitive receptors.

8.2.7 Mitigation requirements will be confirmed at the detailed design stage.

Vibration from Earthworks and Construction

8.2.8 It is considered that mitigation will not be required to control vibration from construction work. However, if piling is required, mitigation may need to be considered.

8.2.9 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piling.

8.2.10 To minimise the potential for vibration to be generated by any necessary piling it is recommended that careful consideration is given to the type of piling to be used. For example, auger bored piles would be preferable to driven piles with regards to a reduced potential for noise and vibration to be generated. However, it is recognised that the piling process will need to be selected on the basis of the strata to be encountered, the loads to be supported and the economics of the system.

8.2.11 The receptors likely to be affected by piling will vary depending of the phase of the proposed development under construction. Once the precise building locations, ground conditions for each location and type(s) of piling are confirmed, vibration levels could be estimated and recommendations for control made as appropriate.

8.2.12 To keep ground borne vibration to a minimum the following measures, as referred to in BS5228-2, should be put in place:

- Substitution: Where reasonably practicable, plant and or methods of work likely to cause significant levels of vibration at the receptors identified, should be replaced by less intrusive plant/methods of working; and
- Vibration Isolation of plant at source: This may prove a viable option where the plant is stationary (e.g. a compressor, generator) and located close to a receptor.

8.2.13 There are a number of measures which can be implemented, depending upon the type of piling chosen. BS5228-2 indicates that mitigation might include; use of alternative methods, removal of obstructions, provision of cut-off trenches, reduction of energy input per blow, reduction of resistance to penetration. Continuous flight auguring would cause minimal vibration even when very close to the sensitive receptor.

8.2.14 As the construction programme and methodologies become more defined it is suggested that any possible piling vibration be reconsidered and that a detailed strategy for control be implemented.

8.3 Operational Phase

Glazing Requirements for Living Rooms and Bedrooms

8.3.1 The results of the noise modelling indicate that the noise levels at the façades of the proposed dwellings comprise a combination of transportation noise from the local road network.

8.3.2 To ensure a good level of amenity, the internal noise guideline levels in noise sensitive rooms have been assessed in accordance with the internal noise guideline levels set out in BS8233.

8.3.3 The computer noise model has been used to determine the noise level at each façade of each plot. In addition, the measured spectral noise level at the development site has also been used to inform the calculations.

8.3.4 Noise break-in calculations have been carried out for the worst affected plots to determine the level of noise mitigation required, to achieve the internal noise guideline levels in BS8233, and are shown as figures attached to this report.

8.3.5 Therefore, with reference to the Façade Maps shown in Drawings GM10793-002 to 004, the glazing and ventilation requirements on each façade of the proposed development are shown in Table 11 below. Proposed mitigation for bedroom facades is shown on Drawings GM10793-006. Proposed mitigation for Living Rooms facades is shown on Drawings GM10793-007.

Table 10: Mitigation Strategy for the Proposed Development		
Façade Map Colour Key	**Glazing**	**Ventilation**
	Any	Open Window
	6/12/6	Greenwood 5000EA.AC1
	10/12/6	Mechanical Ventilation

8.3.6 Alternative glazing or ventilation methods to those shown in Table 10 can be used, but the performance should be equal to or superior to the glazing and ventilation specification described above. The performance of the glazing and ventilation shown is detailed in Appendix E.

8.3.7 Any acoustic ventilation proposed at the site should, as a minimum, comply with the applicable Building Regulations at the time. This may include both Building Regulations Approved Document F – Volume 1: Dwellings – Requirement F1: Means of ventilation and Building Regulations Approved Document O – Overheating.

8.3.8 Therefore, we would recommend that any proposed ventilation strategy is confirmed with a mechanical engineer prior to installation.

9 CONCLUSIONS

9.1.1 Wardell Armstrong has carried out a noise assessment for the proposed residential development on land off Ashford Road, Sellindge.

9.1.2 In policy terms there is no presumption against development in places with high noise levels, provided that the noise can be adequately mitigated taking into account the economic and social benefits of the proposed scheme.

9.1.3 During the construction phase of the development there is potential for adverse noise and vibration impacts on the existing residential dwellings in the vicinity of the proposed development. However, if the mitigation measures outlined in Section 5 of this report are implemented the impact can be minimised. As the construction programme and methodologies are finalised a detailed noise and vibration management plan will be implemented.

9.1.4 The existing noise sources which will potentially affect the residents of the proposed residential development are road traffic on Ashford Road and the M20.

9.1.5 Road traffic noise levels have been assessed against the guideline values suggested by ProPG and BS8233. The initial Site Noise Risk Assessment carried out in accordance with ProPG shows that proposed receptors in the northern part of the proposed development are at High risk of experiencing an adverse noise impact due to road traffic during the day and night-time periods respectively, with no mitigation in place and the proposed receptors in the southern part of the proposed development are at Low risk of experiencing an adverse noise impacts due to road traffic during the assessment periods.

9.1.6 In addition, the assessment has considered the potential risk of overheating in the proposed dwellings.

9.1.7 It should be remembered that the internal guideline values are health-based and are therefore relatively inflexible; however adequate noise mitigation is relatively straightforward to engineer.

9.1.8 The external guideline values are based on amenity and allow some flexibility for noise to be balanced against any benefits which arise from the proposed scheme. From the outline planning layout used in this report, the plots closest to the A1 will be required to be amended during the detailed planning stage subject to planning conditions.

9.1.9 The results of the computer noise model, and assessment described in this report, show that the proposed development will achieve the internal noise levels in all noise sensitive rooms, with the appropriate glazing and ventilation strategy in place. The results of the assessment show that alternative ventilation will be required on windows closest to the A20 during the daytime. However, all bedroom windows will require an alternative form of ventilation.

9.1.10 Appropriate glazing and ventilation options have been proposed for the development site, to control noise from nearby transportation noise sources, these are shown on Drawings GM11585-006 and GM11585-007.

9.1.11 Providing alternative ventilation to negate the need to open windows is in accordance with national planning and noise guidance. This allows a resident to choose to close windows while maintaining sufficient background ventilation.

9.1.12 Paragraph 191 of NPPF states that significant adverse impacts should be reduced to a minimum. The assessment shows that existing noise from the nearby noise sources can be adequately mitigated at the development, where required, so that the impact is not significant adverse.

9.1.13 With the proposed mitigation in place, the impact of existing sources of noise at the proposed dwellings will be reduced to below SOAEL levels.

9.1.14 Therefore, there are no planning policy or technical noise reasons not to recommend the application for approval, subject to appropriate conditions.

APPENDICES

APPENDIX A
POLICY, STANDARDS AND GUIDANCE

Policy, Standards and Guidance

Appendix A

National Planning Policy Framework

In December 2023 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England.

Paragraph 191 of the NPPF states:

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

a. Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impact on health and the quality of life;

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

Paragraph 193 of the NPPF states:

'Planning policies and decisions should ensure that new development can be integrated with existing business 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.'

Noise Policy Statement for England

With regard to 'significant adverse impacts on health and the quality of life' the NPPF refers to the 'Noise Policy Statement for England' (NPSE).

The Noise Policy Statement for England refers to the World Health Organisation when discussing noise impacts and introduces observed effect levels which are based on established concepts from toxicology that are applied to noise impacts by WHO.

Three levels are defined as follows:

'NOEL – No Observed Effect Level

- This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

- This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur'.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance – Noise

The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable, however it has no adverse effect as it does not cause any change in behaviour or attitude. Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused. At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. Table 1 summarises the noise exposure hierarchy.

Table 1 - National Planning Practice Guidance noise exposure hierarchy			
Perception	**Examples of Outcomes**	**Increasing Effect Level**	**Action**
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

> "Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separate from the economic, social and other environmental dimensions of proposed development"

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

Guidance on Assessment of Road Traffic Noise

The Department of Transport's memorandum, "Calculation of Road Traffic Noise" (CRTN), 1998 defines a shortened measurement procedure which is used to calculate the $L_{A10,18hour}$ noise level from a measured 3-hour period. The method requires the measurement of noise over 3 consecutive hours between 1000 and 1700 hours.

From the measured 3-hour period, the arithmetic average of the three $L_{A10,1Hour}$ measurements is taken. The $L_{A10,18Hour}$ noise level is then determined using the following calculation method;

- $L_{A10,18Hour} = L_{A10,3hour} - 1$

The document "*Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping"* by P G Abbott and P M Nelson (The TRL Method) provides a calculation method to convert the calculated $L_{A10,18Hour}$ into a daytime L_{Aeq} as described below.

- $L_{day} = 0.95 \times L_{A10,18hour} + 1.44dB$

The calculation for the night-time period is shown below.

- $L_{night} = 0.90 \times L_{A10,18hour} - 3.77$

British Standard 5228: 2014 - Code of Practice for noise and vibration control on construction and open sites

Noise from Construction Plant and Vehicles

The activities associated with the earthworks and construction phase of the proposed development will have the potential to generate noise and create an impact on the surrounding area.

Guidance on the assessment of noise from development sites is given in British Standard 5228-1:2009+A1:2014 "Code of Practice for noise and vibration control on construction and open Sites – Part 1: Noise" (BS5228-1), and BRE Controlling particles, vapour and noise pollution from construction Sites, Parts 1 to 5, 2003.

In addition to the guidance from the local authority, the Control of Pollution Act 1974 (COPA 1974) gives the local authority power to serve a notice under Section 60 imposing requirements as to the way in which works are to be carried out. This could specify times of operation, maximum levels of noise which may be emitted and the type of plant which should or should not be used.

However, it might be preferable for the chosen contractor to obtain prior consent under Section 61 of COPA 1974. Section 61 enables anyone who intends to carry out works to apply to the local authority for consent. Under Section 61 the local authorities and those responsible for construction work, have an opportunity to settle any problems, relating to the potential noise, before work starts.

In addition to COPA 1974, BS5228-1 provides guidance on significance criteria for assessing the potential noise impacts associated with the construction phase of large projects. For the purposes of this noise assessment, the noise likely to be generated by the earthworks and construction phase, have been assessed against significance criteria established, using the BS5228-1 ABC Method.

Table 2 - Thresholds of Significant Impact from Construction Noise at Residential Receptors in accordance with the ABC Method of BS5228-1			
Assessment Category and Threshold Value Period (L_{Aeq})	**Threshold Value, in decibels (dB)**		
	Category A *1	**Category B *2**	**Category C *3**
Daytime (0700 to 1900 hours) and Saturdays (0700 to 1300 hours)	65	70	75
*1 Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than this value			
*2 Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.			
*3 Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.			

The ABC method for determining significance criteria requires the ambient noise levels at existing sensitive receptors to be determined. The ambient noise levels at each existing receptor location are then rounded to the nearest 5dB(A) to determine the appropriate threshold value in accordance with the category value A, B or C, as detailed in Table 2.

The noise level likely to be generated at the receptor during the construction phase, i.e. the ambient noise level plus construction noise, is then compared to the appropriate category value. If the noise level is greater than the appropriate category value, a significant noise impact may be registered.

The noise assessment for the construction phase details baseline daytime noise levels measured at a representative sensitive receptor location and outlines the main construction activities that could give rise to noise impacts at receptors in the vicinity of the proposed development. It also sets out details of 'best practice' management and control measures to ensure that impacts are minimised as far as possible.

In addition to the earthworks and construction activities, construction vehicle movements to and from the proposed development have the potential to generate noise at existing sensitive receptors, in the immediate vicinity of the local road network. Where such noise is likely to be significant, its effect can be assessed with reference to the Calculation of Road Traffic Noise Memorandum (CRTN 1998).

British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

British Standard 8233 "Guidance on sound insulation and noise reduction for buildings" 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB $L_{Aeq\ (16\ hour)}$ during the day time in noise sensitive rooms
- 30 dB $L_{Aeq\ (8\ hour)}$ during the night time in bedrooms
- 45 dB $L_{Amax,F}$ during the night time in bedrooms
- 50 dB $L_{Aeq\ (16\ hour)}$ desirable external noise levels for amenity space such as gardens and patios
- 55 dB $L_{Aeq\ (16\ hour)}$ upper guideline value which would be acceptable in noisier environments.

In addition, for internal noise levels it states;

> "Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

Furthermore, with regard to external noise, the Standard states;

> "However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, 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".

British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142):

BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;

- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:

1) Investigating complaints;

2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

3) Assessing sound at proposed new dwellings or premises used for residential purposes.

The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.

BS4142 refers to noise from the industrial source as the 'specific noise' and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with industrial noise. The 'specific noise' sources, of the existing industrial premises that have been observed are detailed in Section 3 of this report.

BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). Section 3 of this report provides details of the background noise survey undertaken.

Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular, BS4142 identifies that the absolute level of sound, the character, and the residual sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains

a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.

The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the 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.

During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.

Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and,
- 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.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

APPENDIX B
NOISE MONITORING RESULTS

Appendix B
Noise Monitoring Results

Monitoring Location 1 – In the northern part of the site approximately 5m from Ashford Road.						
Time	**L_{Aeq} (dB)**	**L_{min} (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
02/10/19 – Night-time						
2218-2300	61.0	40.6	82.7	44.5	62.9	
02/10/19 - 03/10/19 – Night-time						
2300-2315	61.1	39.6	81.3	42.5	62.8	Partially attended Noise from road traffic on Ashford Road and the M20
2315-2330	61.8	40.5	80.6	44.9	62.7	
2330-2345	61.2	41.0	79.9	43.2	62.5	
2345-0000	56.2	44.5	79.8	46.1	51.1	
0000-0015	57.9	42.0	79.2	44.4	52.2	
0015-0030	55.0	41.9	75.0	44.1	51.0	
0030-0045	52.3	39.5	75.2	44.2	49.6	
0045-0100	54.8	44.6	75.5	47.0	51.5	
0100-0115	51.8	43.4	73.9	46.8	52.0	
0115-0130	56.6	44.0	79.7	47.2	52.7	
0130-0145	55.3	41.7	78.8	45.9	51.4	
0145-0200	51.9	38.6	73.5	43.7	50.5	
0200-0215	55.8	40.1	77.9	44.4	51.0	
0215-0230	56.1	43.1	81.7	45.4	51.7	
0230-0245	56.6	40.9	81.7	46.1	52.0	
0245-0300	57.1	42.0	80.8	45.0	53.2	
0300-0315	55.4	42.7	77.1	46.8	54.5	
0315-0330	52.2	40.5	74.2	43.7	51.9	
0330-0345	52.9	42.4	77.5	45.4	52.0	
0345-0400	55.5	46.6	76.7	49.7	54.4	
0400-0415	57.4	48.7	79.4	50.3	54.1	
0415-0430	60.7	45.5	83.2	47.6	54.9	
0430-0445	56.7	46.4	79.1	48.1	52.9	
0445-0500	61.6	45.9	81.4	47.8	58.4	
0500-0515	62.0	49.8	82.2	51.9	62.0	
0515-0530	61.7	50.1	82.0	52.1	61.0	
0530-0545	63.3	48.5	83.2	49.9	65.4	
0545-0600	63.4	48.5	80.5	49.9	66.1	
0600-0615	64.4	49.6	85.8	51.7	67.3	
0615-0630	64.4	51.8	78.9	53.2	69.0	
0630-0645	65.2	53.1	79.4	54.7	69.9	
0645-0700	68.0	54.4	84.7	56.7	73.1	
Overall	60.5	38.6	85.8	45.9	59.2	
03/10/19 – Daytime						
0700-0800	69.5	53.3	83.6	56.3	74.0	Attended Noise from road traffic on Ashford Road and the M20
0800-0900	70.0	53.6	83.0	57.5	74.1	
0900-1000	68.3	47.4	82.0	53.8	72.8	
1000-1100	67.4	43.2	83.3	48.0	71.9	
1100-1200	66.7	43.2	78.5	48.4	71.7	
1200-1300	67.0	46.6	82.2	52.0	71.6	

Monitoring Location 1 – In the northern part of the site approximately 5m from Ashford Road.						
Time	**L_{Aeq} (dB)**	**L_{min} (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
1300-1400	67.4	47.4	80.3	52.4	72.0	Occasional aircraft also audible
1400-1500	67.7	50.4	79.2	54.6	72.1	
1500-1554	68.6	54.4	83.7	57.0	72.6	

Monitoring Location 2 – In the western part of the site approximately 80m from the agricultural premises.						
Time	**L_{Aeq} (dB)**	**L_{min} (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
18/09/19 – Night-time						
0015-0030	42.4	35.8	52.3	38.3	44.7	Partially attended No noise from the agricultural premises during the night-time period.
0030-0045	42.9	34.9	54.1	38.4	45.3	
0045-0100	43.3	33.6	58.6	36.7	45.5	
0100-0115	42.3	35.0	51.9	38.0	44.6	
0115-0130	44.8	33.9	71.3	37.5	46.0	
0130-0145	41.7	33.3	58.5	36.4	42.7	
0145-0200	44.5	31.7	56.9	39.1	46.4	
0200-0215	43.6	32.6	50.6	38.2	46.1	
0215-0230	43.3	35.1	53.7	39.4	45.2	
0230-0245	43.8	33.3	52.1	38.7	46.6	
0245-0300	45.0	36.3	60.2	39.3	48.0	
0300-0315	46.8	36.3	60.1	39.6	49.4	
0315-0330	45.3	37.3	57.5	40.5	47.2	
0330-0345	44.2	34.2	56.6	37.5	47.0	
0345-0400	44.2	37.8	53.9	40.6	46.2	
0400-0415	49.4	38.8	57.3	43.5	52.0	
0415-0430	46.1	40.3	58.4	42.2	48.4	
0430-0445	48.6	42.2	56.5	44.5	51.5	
0445-0500	52.6	43.1	60.5	46.3	55.6	
0500-0515	51.5	47.6	57.3	49.3	52.8	
0515-0530	51.6	45.3	57.5	48.4	53.6	
0530-0545	51.7	47.4	58.2	49.2	53.5	
0545-0600	50.5	46.1	59.4	48.2	52.1	
0600-0615	49.8	44.4	75.9	46.6	51.5	
0615-0630	50.7	44.9	72.2	47.0	52.4	
0630-0645	51.2	46.2	65.5	48.1	53.6	
0645-0700	52.6	45.5	65.9	48.4	55.3	
Overall	48.3	31.7	75.9	39.3	52.0	
18/09/19 – Daytime						
0700-0800	53.0	46.7	69.9	49.2	54.5	Attended Some noise from tractor movements. Distant noise from the agricultural premises. Road traffic noise from the M20 was audible.
0800-0900	48.9	42.5	59.9	45.6	50.7	
0900-1000	48.1	39.9	61.4	43.9	50.3	
1000-1100	48.1	38.9	71.0	42.5	49.9	
1100-1200	46.2	38.8	62.1	42.1	48.4	
1200-1300	48.4	37.3	66.5	42.7	49.9	
Overall	49.4	37.3	71.0	43.2	52.0	

Monitoring Location 3 – In the southern part of the site approximately 275m away from the M20 and Ashford to Folkstone Railway Line.						
Time	**L_{Aeq} (dB)**	**L_{min} (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
18/09/19 – Night-time						
0030-0045	44.8	34.4	54.1	38.4	47.5	Partially attended Noise from road traffic on the M20 and Ashford Road dominant.
0045-0100	43.6	30.9	55.1	36.6	47.1	
0100-0115	44.5	35.2	51.4	38.7	47.5	
0115-0130	44.1	35.3	53.9	38.4	46.9	
0130-0145	42.0	32.5	56.3	37.3	43.9	
0145-0200	45.6	30.9	57.7	40.0	48.1	
0200-0215	45.0	33.9	52.6	37.8	47.9	
0215-0230	46.2	34.4	56.8	40.5	49.4	
0230-0245	45.8	33.1	57.4	39.3	49.4	
0245-0300	47.0	36.6	59.6	39.7	50.5	
0300-0315	48.3	34.6	58.8	39.8	52.0	
0315-0330	46.9	34.9	58.0	40.4	49.5	
0330-0345	45.2	32.6	55.2	36.5	48.4	
0345-0400	47.4	38.1	54.4	41.6	50.2	
0400-0415	51.5	38.3	59.1	44.6	54.3	
0415-0430	47.3	40.3	58.1	43.4	49.7	
0430-0445	50.9	42.9	58.9	46.5	53.9	
0445-0500	54.3	43.0	63.1	46.8	57.4	
0500-0515	52.0	46.2	57.5	49.1	53.8	
0515-0530	52.7	46.0	60.4	49.4	54.7	
0530-0545	53.1	47.1	59.8	50.6	54.8	
0545-0600	54.2	46.1	61.8	51.1	56.2	
0600-0615	51.1	45.6	62.5	48.2	53.0	
0615-0630	50.9	46.4	63.8	48.2	53.0	
0630-0645	52.2	47.9	58.8	49.7	54.1	
0645-0700	52.4	46.9	60.0	49.7	54.1	
Overall	49.9	30.9	63.8	40.2	53.5	
18/09/19 – Daytime						
0700-0800	53.2	47.5	64.5	50.2	55.0	Attended Noise from road traffic on the M20 and Ashford Road dominant. Occasional noise from aircraft.
0800-0900	51.3	43.3	70.3	45.7	51.7	
0900-1000	49.1	42.1	61.1	45.1	51.4	
1000-1100	47.6	40.7	57.9	43.4	50.1	
1100-1200	47.4	39.3	62.0	43.4	49.6	
1200-1300	48.0	40.3	60.8	43.9	50.2	
Overall	50.0	39.3	70.3	44.4	52.7	
19/09/19 – Night-time						
0015-0030	48.3	36.1	56.8	41.3	51.6	Unattended Noise from road traffic on the M20 and Ashford Road dominant.
0030-0045	49.3	33.5	58.5	41.2	52.7	
0045-0100	50.3	36.0	59.2	42.1	54.1	
0100-0115	53.1	36.8	63.3	42.9	56.6	
0115-0130	52.3	38.3	59.1	46.0	55.1	
0130-0145	51.1	34.7	59.2	44.4	54.0	

Monitoring Location 3 – In the southern part of the site approximately 275m away from the M20 and Ashford to Folkstone Railway Line.						
Time	**L_{Aeq} (dB)**	**L_{min} (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
0145-0200	54.4	40.3	63.5	47.3	57.3	
0200-0215	52.6	40.6	62.1	46.1	55.6	
0215-0230	50.1	33.6	59.1	42.0	53.4	
0230-0245	48.4	29.5	59.3	39.5	52.1	
0245-0300	53.1	42.1	62.1	47.1	55.8	
0300-0315	53.1	37.2	59.2	47.7	55.7	
0315-0330	53.2	38.3	61.2	48.2	55.6	
0330-0345	52.4	43.0	58.4	47.8	54.9	
0345-0400	55.3	44.4	61.7	51.5	57.5	
0400-0415	53.0	39.4	64.9	46.8	56.1	
0415-0430	51.7	39.9	59.4	46.7	54.3	
0430-0445	52.0	43.4	58.7	47.7	54.2	
0445-0500	53.9	45.2	60.9	50.5	55.9	
0500-0515	55.0	46.4	59.8	52.4	56.6	
0515-0530	56.1	47.6	62.6	52.8	58.1	
0530-0545	55.4	46.7	62.1	51.6	57.6	
0545-0600	55.0	47.9	68.6	51.9	56.6	
0600-0615	54.2	46.4	67.4	51.3	55.9	
0615-0630	54.7	47.4	79.2	51.3	56.1	
0630-0645	55.0	48.4	76.3	50.8	55.7	
0645-0700	53.9	48.9	61.0	51.6	55.5	
Overall	53.3	29.5	79.2	45.7	56.1	
19/09/19 –Daytime						
0700-0800	54.8	48.5	69.4	52.1	56.4	Unattended Noise from road traffic on the M20 and Ashford Road dominant. Occasional noise from aircraft.
0800-0900	49.5	42.7	63.1	46.0	51.5	
0900-1000	48.7	40.1	70.5	44.3	50.9	
1000-1100	49.7	41.2	71.6	44.7	51.5	
1100-1200	49.7	40.1	74.8	43.8	51.0	
1200-1300	53.9	41.0	73.2	45.6	56.8	
Overall	51.8	40.1	74.8	45.0	55.2	

APPENDIX C
STAGE 2 OVERHEATING RISK ASSESSMENT

GM12932	Ashford Road, Sellindge			27/11/2023
Proposed Dwellings at the Southern Site Boundary				
Period	**External free-field noise level (dB)**	**Level 1 Risk Assessment (AVO Table 3-2)**	**Calculated Internal Noise Levels with open windows (-13dB)**	**Good Homes Alliance Tool Value**
Daytime LAeq,16hr	52	Low	39	10
Night-time LAeq,8hr	50	Low	37	
Night-time LAFmax	62	Low Does Not Exceed 78dB	49	

Notes on Overheating Mitigation and Requirements for Level 2 Assessment

Southern Elevations - Living Rooms and Bedrooms

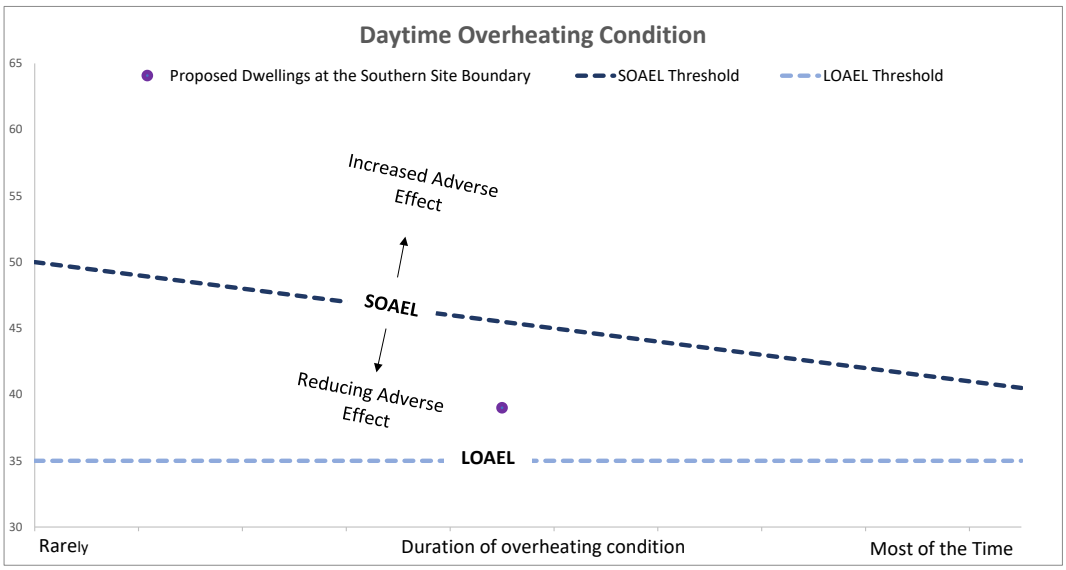
The overheating assessment indicates that the proposed development is at a Low risk of overheating during the daytime and High risk of overheating during the night-time.

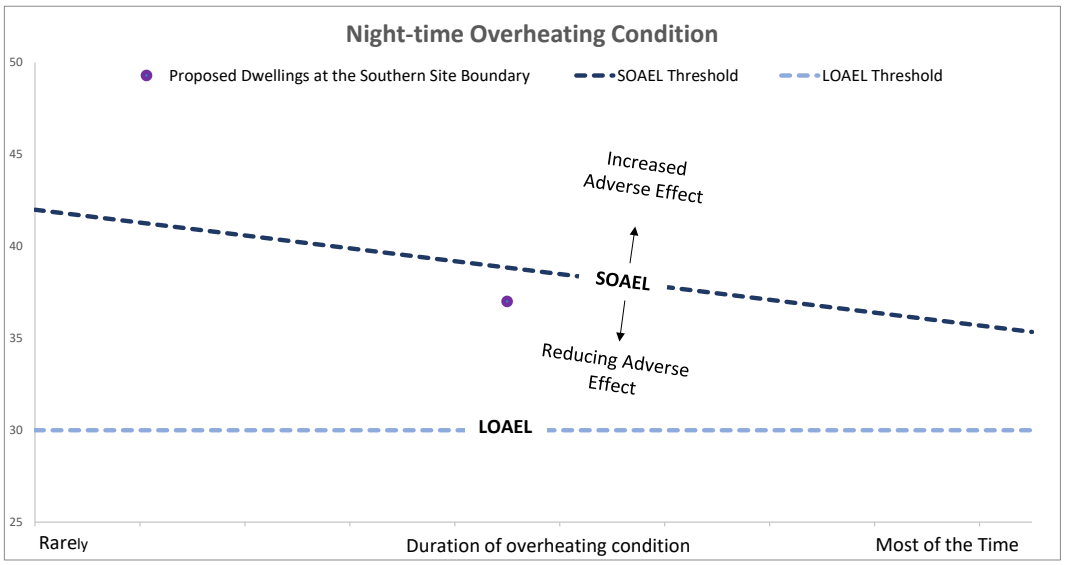
The anticipated internal noise levels, in living rooms and bedrooms with a partially open window (13dB attenuation), located on the facades closest to and facing M20, would be 39dB during the daytime and 37dB during the night-time, with the maximum level not normally exceeded more than 10 time per night being 49dB.

When considering the overheating conditions on the AVO diagrams below, the level is below the SOAEL level during the daytime and night-time.

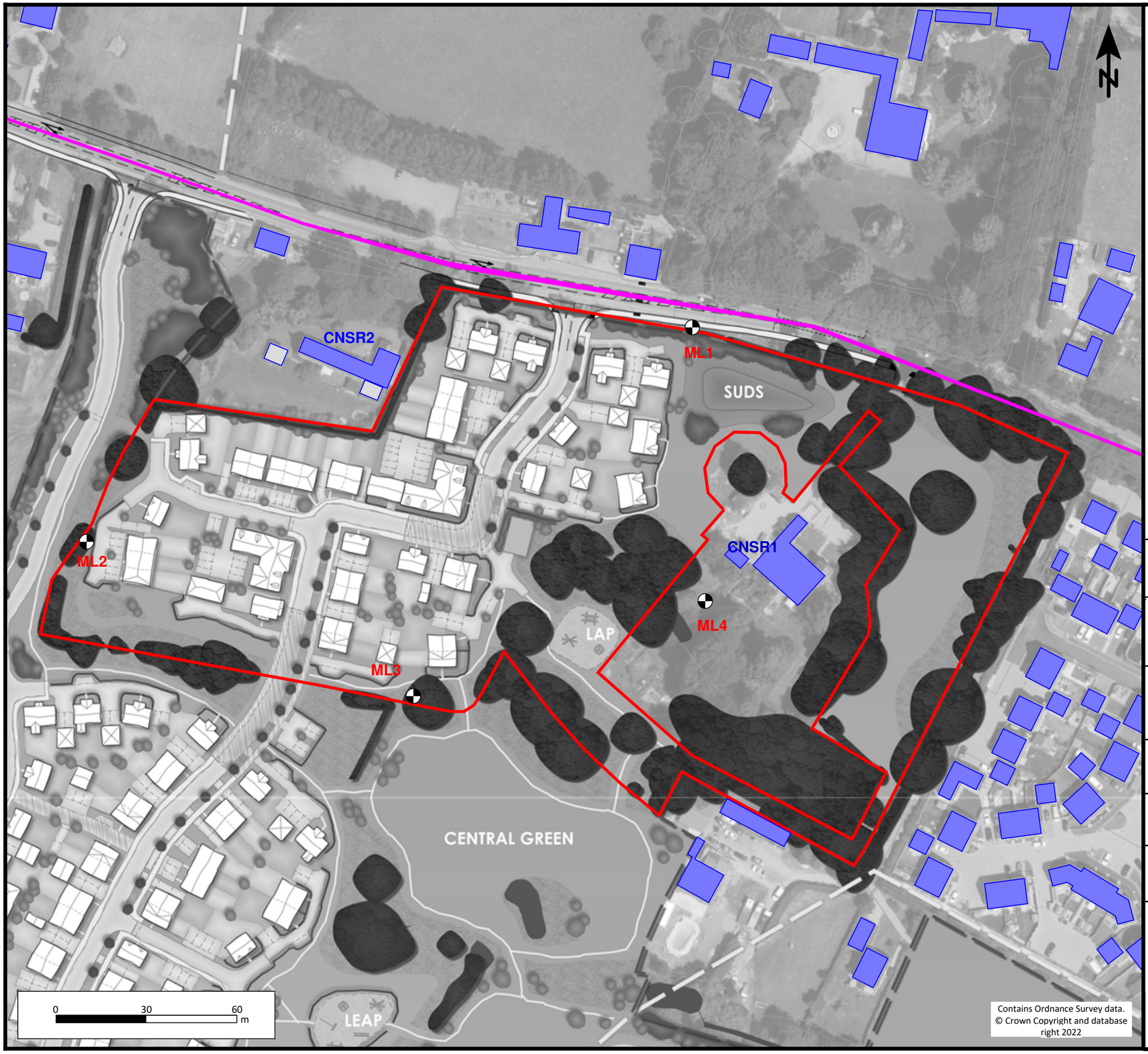
Level 2 Assessment (in line with Table 3-3, with mitigation)

During the daytime and night-time there is an increasing likelihood of an adverse impact due to overheating, but for a limited duration. This is below the significant adverse effect level, when considering the noise level and duration of the overheating condition.





DRAWINGS



Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Road source

CLIENT: Gladman Developments		
PROJECT: Grove House Sellindge		
TITLE: GM12932-001 - Noise Monitoring Locations		
DRG NO: GM12932-002		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 23/10/2023
DRAWN BY: YY	CHECKED BY:	APPROVED BY:

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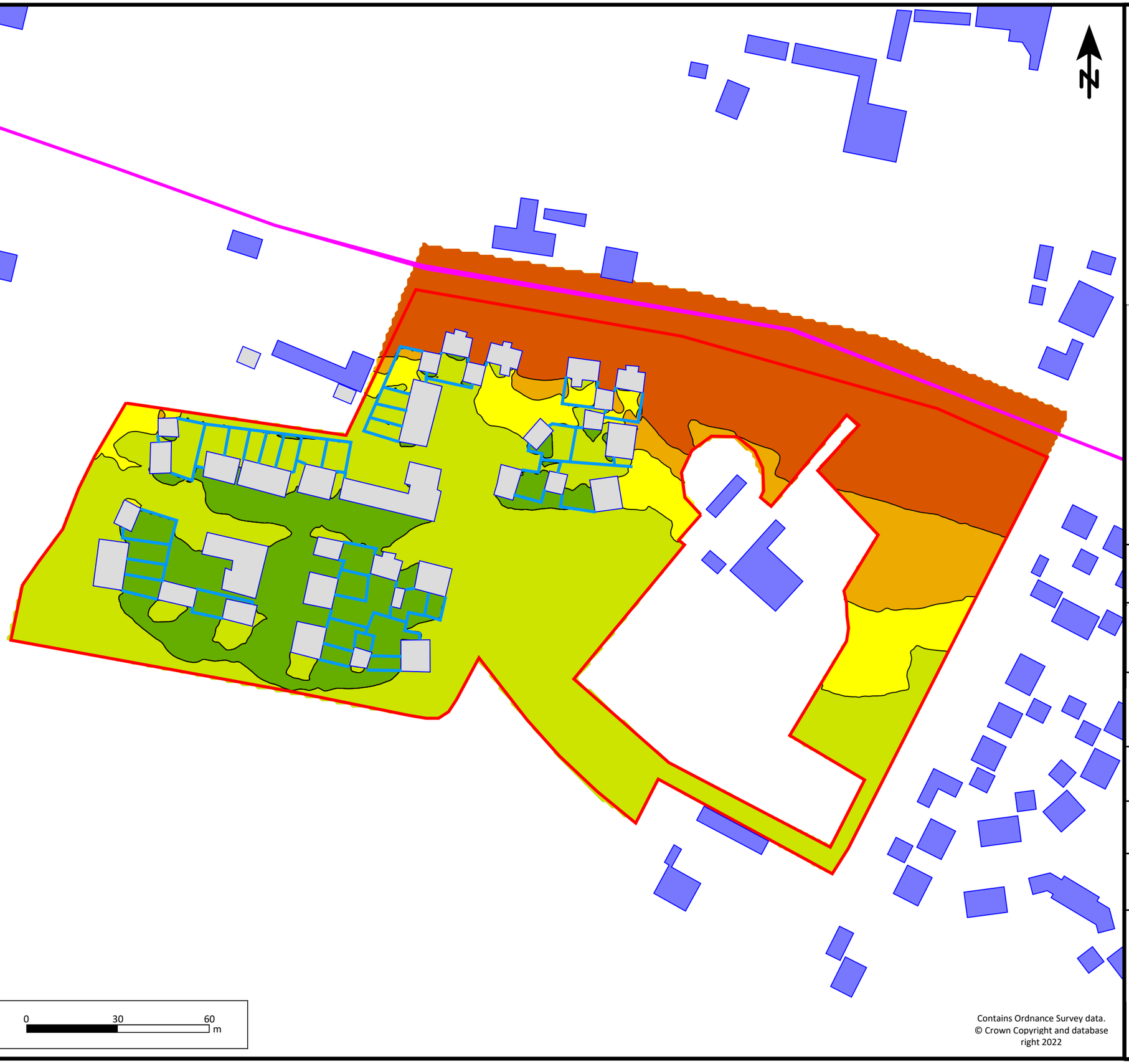

Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Daytime $L_{Aeq\ 16hour}$ dB

	<=	50.0
50.0	-	55.0
55.0	-	57.5
57.5	-	60.0
	>	60.0

CLIENT: Gladman Developments		
PROJECT: Grove House Sellindge		
TITLE: GM12932-002 - Daytime Noise Contour Plot		
DRG NO: GM12932-002		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 23/10/2023
DRAWN BY: YY	CHECKED BY:	APPROVED BY:

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Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Daytime $L_{Aeq\ 16hour}$ dB

	<=	45.0
45.0	-	50.0
50.0	-	55.0
55.0	-	60.0
60.0	-	65.0
	>	65.0

0 30 60 m

CLIENT:	Gladman Developments
PROJECT:	Grove House Sellindge
TITLE:	GM12932-003 - Daytime $L_{Aeq\ ,16hour}$ Facade Noise Levels

DRG NO: GM12932-003		REV: A
DRG SIZE: A3	SCALE: 1:1250	DATE: 16/10/2023
DRAWN BY: YY	CHECKED BY:	APPROVED BY:

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Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Daytime $L_{Aeq\ 8hour}$ dB

	<=	45.0
45.0	-	50.0
50.0	-	55.0
55.0	-	60.0
60.0	-	65.0
	>	65.0

CLIENT: Gladman Developments

PROJECT: Grove House Sellindge

TITLE: GM12932-004 - Night-time $L_{Aeq\ ,8hour}$ Facade Noise Levels

DRG NO:		REV:
GM12932-004		A
DRG SIZE: A3	SCALE: 1:1250	DATE: 16/10/2023
DRAWN BY: YY	CHECKED BY:	APPROVED BY:

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Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Daytime $L_{Af,Max}$ dB

	<=	45.0
45.0	-	50.0
50.0	-	55.0
55.0	-	60.0
60.0	-	65.0
	>	65.0

CLIENT: Gladman Developments

PROJECT: Grove House Sellindge

TITLE: GM12932-005 - Night-time $L_{Af,Max}$ Facade Noise Levels

DRG NO:		REV:
GM12932-005		A
DRG SIZE: A3	SCALE: 1:1250	DATE: 16/10/2023
DRAWN BY: YY	CHECKED BY:	APPROVED BY:

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Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Glazing and Ventilation

<=	48.0	Any with Openable Window
<=	60.0	6/12/6 with Greenwood 2500EAW.AC:
>	60.0	10/12/6 with Mechanical Ventilation

CLIENT:	Gladman Developments
PROJECT:	Grove House Sellindge
TITLE:	GM12932-006 - Facade Mitigation - Living Rooms

DRG NO:	REV:
GM12932-006	A

DRG SIZE:	SCALE:	DATE:
A3	1:1250	17/10/2023

DRAWN BY	CHECKED BY	APPROVED BY
YY		

0 30 60 m

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Key

- Site Boundary
- Existing Buildings
- Proposed Dwellings
- Line source
- Garden Fence - 1.8m

Glazing and Ventilation

<=	43.0	Any with Openable Window
<=	52.0	6/12/6 with Greenwood 2500EAW.AC:
>	52.0	10/12/6 with Mechanical Ventilation

0 30 60 m

CLIENT:	Gladman Developments
PROJECT:	Grove House Sellindge
TITLE:	GM12932-007 - Facade Mitigation - Bedrooms

DRG NO:		REV:
GM12932-007		A
DRG SIZE: A3	**SCALE:** 1:1250	**DATE:** 17/10/2023
DRAWN BY YY	**CHECKED BY**	**APPROVED BY**

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