



1ST HORIZON

NOISE ASSESSMENT (REF: 8607-R02) REV G

Client: **Home Office**

Project: **Haslar IRC, Gosport**

Date: **09/04/2026**



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1.0 INTRODUCTION

- 1.1 1st Horizon were commissioned to prepare a noise assessment for the expansion of Haslar Immigration Removal Centre (IRC) located at Dolphin Way, Haslar, Hampshire PO12 2AW (herein referred to as 'the site') in Gosport. This report assesses the potential impact of operational noise associated with the expansion at the nearest noise-sensitive receptors.
- 1.2 The proposal comprises of the erection of up to four accommodation buildings and the erection of a single-storey dining hall and a single-storey care and separation unit (CASU) block.
- 1.3 Four air source heat pumps (ASHP's) are proposed as part of the new accommodation buildings. This assessment confirms whether the previously derived plant noise design limits remain appropriate and whether the cumulative plant noise impact at the nearest dwellings is acceptable.
- 1.4 The location of the Site is shown in **Figure 1**. The Site is bounded by Dolphin Way to the north, Fort Road to the west, the Solent Sea to the east, and vacant land to the south. The nearest dwellings are on the opposite side of Fort Road, approximately 20 metres to the west. There is an existing  barrier separating the expansion and existing dwellings.
- 1.5 The assessment has been based on the layout as provided by the client, (Ref: 323319-15207-ATR-000-GF-DR-A-0250-S2-D0100), as shown in **Figure 2**.
- 1.6 Emergency generators have also been proposed as part of the refurbishment, which are the subject of the planning application. However, as they are proposed to only be in operation during emergency scenarios (and hence will only operate very infrequently or, indeed, not at all), for example, in the event of a mains power failure, we have not included them as part of our assessment.
- 1.7 The noise assessment has therefore included:
 - An inspection of the Site and surrounding area.
 - Measurements of environmental noise levels during representative periods of the daytime and nighttime.
 - Assessment of the noise impact of the proposed new plant.
 - Assessment of the car park expansion.
- 1.8 The various noise units and indices referred to in this report are described in **Appendix A**. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 RELEVANT ACOUSTIC DESIGN GUIDANCE

2.1 National Planning Policy Framework: December 2024

2.1.1 Paragraph 198 of the National Planning Policy Framework (NPPF) 2024 states that planning policies and decisions should “ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Site or the wider area to impacts that could arise from the development. In doing so they should: a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.”

2.2 Noise Policy Statement for England: 2010

2.2.1 The Noise Policy Statement for England (NPSE) 2010, which is referred to in the NPPF, includes three aims:

- i. Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- ii. Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- iii. Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.3 British Standard 4142:2014+A1:2019

2.3.1 British Standard 4142:2014+A1:2019, ‘Methods for rating and assessing industrial and commercial sound’ is the appropriate guidance for determining appropriate environmental noise design limits at residential locations for any new mechanical services plant and equipment.

2.3.2 BS 4142 requires a ‘rating’ level ($L_{Ar,Tr}$) to be calculated outside residential locations from the operation of the noise source and compared with the background sound level (L_{A90}) which is measured in the absence of the noise source. The noise is evaluated over a 1-hour period for daytime operations.

2.3.3 The noise rating level ($L_{Ar,Tr}$) is based on the ‘specific’ sound level ($L_{Aeq,Tr}$) attributed to the operating noise source, with ‘character corrections’ added for sound sources where ‘certain acoustic features can increase the significance of impact’ at residential locations.

2.3.4 The acoustic character correction applied to the specific sound level to obtain the rating level can consider tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area.

2.3.5 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the rating level and the background sound level.

2.3.6 Regarding the outcome of the initial estimate, BS 4142 states that:

- Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context and,
- The lower the rating level is relative to the measured background level, the less likely it is that the operation 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 low impact, depending on the context.

2.3.7 BS 4142 also states, in respect of background sound levels, that “it is important that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.

2.3.8 BS 4142 states that all pertinent factors must be considered regarding the context in which the noise occurs, including but not limited to:

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

- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will incorporate design measures that ensure good internal and/or outdoor acoustic conditions, such as acoustic screening.

2.3.9 The initial numerical assessment and the context are then both considered when determining the potential noise impact.

3.0 NOISE SURVEY

- 3.1 A baseline noise survey was carried out to establish the existing background noise climate of the area as part of the refurbishment works.
- 3.2 The noise measurements were undertaken between 14:00 on Wednesday 10 January until 07:00 on 11 January 2024 using a NTi Audio XL2 ‘Class 1’ sound level meter (serial no. A2A-20228-E0) with environmental case and microphone environmental windshield. The measurements were taken as a series of consecutive 15-minute periods at a central location within the Site representative of the noise environment outside the nearest dwellings.
- 3.3 The calibration level of the meter was checked before and after the survey with no calibration deviation observed. The sound level meter microphone was mounted via a tripod at approximately 1.4m above ground level in free-field conditions. The measurement location is shown in Figure 1.
- 3.4 The weather conditions throughout the noise survey were mild (approx. 7°C in the daytime), dry and clear with low wind speeds. These were considered appropriate conditions for the survey.
- 3.5 Ongoing construction work associated with the Haslar IRC refurbishment works taking place during daytime hours (07:00–17:30) would adversely affect the accuracy of daytime noise measurements. Therefore, only evening and night-time measured noise levels have been used to inform this assessment.
- 3.6 The prevailing noise climate at the measurement location (and outside the dwellings) was found to be dictated by traffic noise from Fort Road with a secondary contribution from wave action. There was no significant noise associated with the Site including from the existing equipment.
- 3.7 Full results of the noise survey are shown in **Appendix B**, with representative background sound levels established as below:

Table 1 - Summary of Representative Daytime and Evening Sound Levels (dB)

Location	Range of $L_{Aeq,T}$	Mean $L_{A90,15min}$	Mode $L_{A90,15min}$
1. Evening period (17:30 – 23:00)	41 - 47	40	40
2. Night-time period (23:00 – 07:00)	34 - 46	37	39

- 3.8 The existing background noise levels in **Table 1** are low in absolute terms and have been used as the basis for the plant noise design limits.

4.0 PLANT NOISE ASSESSMENT

4.1 Design Limits

- 4.1.1** We have determined suitable plant noise design limits based on the existing background noise levels shown in **Table 1**, in line with BS 4142 guidance. We recommend limiting plant noise levels to not exceed the existing representative Background Sound Levels.
- 4.1.2** Externally mounted plant equipment for this development consists of air handling units (AHUs) and condensers, which operate as needed 24/7, and kitchen extract equipment which we have assumed can operate at any time.
- 4.1.3** The background noise survey data covers the part of the evening period between 17:30 and 23:00 that was free of construction noise associated with current works on the Site.
- 4.1.4** The mean background sound level during this period was 40 dB $L_{A90,T}$, which has been adopted as the representative daytime/evening background sound level for the assessment, as it reflects the most noise-sensitive part of the day. The mean background noise level across the full night-time monitoring period, 37 dB $L_{A90,T}$, has been adopted as the representative night-time Background Sound Level for this assessment.
- 4.1.5** The plant noise design limits are shown in **Table 2**.

Table 2 - Plant Noise Design Limits

Evening (17:30 –23:00)	Night-time (23:00-07:00)
40 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$

- 4.1.6** Therefore, taking into account the results of the noise survey as summarised in **Table 1**, and accounting for the fact that the equipment could operate at night along with the above, we have adopted 40 dB $L_{A90,15min}$ and 37 dB $L_{A90,15min}$ as the representative background sound level for the purposes of this assessment for the day/evening and night respectively. These are the lowest of the mean and mode of the background noise levels measured during each period.
- 4.1.7** The plant noise design limits in **Table 2** apply to the Rating Level of the sound generated by the plant. The Rating Level is the Specific Sound Level (plant noise level at the nearest dwellings) plus corrections for the perceptibility of different acoustic characteristics at the assessment location.

4.2 Mechanical Ventilation

4.2.1 Manufacturer noise emission data for the proposed equipment have been provided by the client and are presented in **Table 3** for the existing IRC plant and **Table 4** for the plant proposed as part of the IRC expansion.

Table 3 - Octave Band Sound Power Levels for Proposed Plant (Existing IRC)

Description	Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
OU01 – Samsung AM080AXVGGR/EU	57	57	63	64	63	58	58	50	67
OU02 - Samsung AM040BXMDER/EU	62	59	58	58	57	48	42	37	60
OU03 - Samsung AM040BXMDER/EU	62	59	58	58	57	48	42	37	60
OU04 - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU4A - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU05 - Samsung AM050BXMDER/EU	62	61	59	59	58	50	44	42	61
OU06 - Samsung AM080AXVGGR/EU	57	57	63	64	63	58	58	50	67
OU07 - Samsung AM100AXVGGR/EU	64	64	64	66	66	59	61	54	70
OU08 - Samsung AM220AXVGGR/EU	67	67	70	75	75	68	60	54	78
OU09 - Samsung AM040BXMDER/EU	62	59	58	58	57	48	42	37	60
OU10 - Samsung AM180AXVGGR/EU	60	60	67	71	70	65	57	52	73
OU11 - Samsung AM080AXVGGR/EU	57	57	63	64	63	58	58	50	67
OU12 - Samsung AM050BXMDER/EU	62	61	59	59	58	50	44	42	61
OU13A - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU13B - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU14 - Samsung AM100AXVGGR/EU	64	64	64	66	66	59	61	54	70
OU15 - Samsung AM160AXVGGR/EU	59	59	67	70	70	64	56	52	73
OU17A - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU17B - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU18 - Samsung AM040BXMDER/EU	62	59	58	58	57	48	42	37	60
OU19A - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU19B - Samsung AC100RXADNG/EU	66	66	67	55	54	47	48	47	61
OU21 - Samsung AM260AXVGGR/EU	68	68	73	76	76	69	62	55	79
OU22 - Samsung AM120AXVGGH/EU	62	62	66	69	69	63	63	58	73
OU 23 AHU	67	58	68	57	53	42	35	26	61
External AHU (Multi-Faith)	67	58	68	57	53	42	35	26	61
Kitchen Extract Fan	77	85	74	72	64	62	59	47	74
ASHP	87	87	84	86	82	75	74	67	87

Table 4 - Octave Band Sound Power Levels for Anticipated Plant (Expansion of IRC)

Description	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
ASHP 001 - Mitsubishi Electric NX-N-G06/SL-CA/0904T	87	86	85	83	80	75	68	62	85
ASHP 002 - Mitsubishi Electric NX-N-G06/SL-CA/0904T	87	86	85	83	80	75	68	62	85
ASHP 003 - Mitsubishi Electric NX-N-G06/SL-CA/0904T	87	86	85	83	80	75	68	62	85

4.2.2 On this basis, resulting cumulative plant noise levels at the nearest dwellings have been calculated accounting for distance attenuation and screening. The predicted noise levels are set out in **Table 5**.

Table 5 - Predicted Plant Noise Levels Outside Nearest Dwelling

Location	$L_{Ar,1hr}$
Existing IRC	
OU01 – Samsung AM080AXVGGR/EU	5
OU02 - Samsung AM040BXMDER/EU	-2
OU03 - Samsung AM040BXMDER/EU	-2
OU04 - Samsung AC100RXADNG/EU	0
OU4A - Samsung AC100RXADNG/EU	0
OU05 - Samsung AM050BXMDER/EU	0
OU06 - Samsung AM080AXVGGR/EU	5
OU07 - Samsung AM100AXVGGR/EU	12
OU08 - Samsung AM220AXVGGR/EU	15
OU09 - Samsung AM040BXMDER/EU	-2
OU10 - Samsung AM180AXVGGR/EU	29
OU11 - Samsung AM080AXVGGR/EU	24
OU12 - Samsung AM050BXMDER/EU	10
OU13A - Samsung AC100RXADNG/EU	16
OU13B - Samsung AC100RXADNG/EU	16
OU14 - Samsung AM100AXVGGR/EU	16
OU15 - Samsung AM160AXVGGR/EU	15
OU17A - Samsung AC100RXADNG/EU	4
OU17B - Samsung AC100RXADNG/EU	4
OU18 - Samsung AM040BXMDER/EU	3
OU19A - Samsung AC100RXADNG/EU	2

OU19B - Samsung AC100RXADNG/EU	2
OU21 - Samsung AM260AXVGGR/EU	19
OU22 - Samsung AM120AXVGGH/EU	20
OU 23 AHU	9
External AHU (Multi-Faith)	16
Kitchen Extract Fan	21
ASHP	32
Expansion of IRC	
ASHP 001 - Mitsubishi NX-N-G06/SL-CA/0904T	28
ASHP 002 - Mitsubishi NX-N-G06/SL-CA/0904T	28
ASHP 003 - Mitsubishi NX-N-G06/SL-CA/0904T	27
Existing IRC & Expansion IRC – Cumulative Plant	37

4.2.3 It is not expected that the equipment will feature tonal or impulsive characteristics readily distinctive against the residual acoustic environment, and the noise will be steady throughout.

4.2.4 On this basis, no acoustic feature corrections are warranted in accordance with the guidance in BS 4142. Therefore, the plant rating sound level as defined in BS 4142 is 37 dB LAr, in the absence of any additional noise mitigation measures.

4.2.5 The calculated rating level of 37 dB LAr is 3 dB below the representative daytime/evening background sound level of 40 dB LA90 and is equal to the representative nighttime background sound level.

4.2.6 In accordance with BS 4142, where the rating level does not exceed the background sound level, this indicates a low impact -- depending on the context.

4.2.7 The calculated overall cumulative total (comprising of the existing IRC plant and plant proposed as part of the expansion) noise levels are also well below the existing residual noise climate. Taking the above into account, we consider that no modification of the initial BS 4142 numerical assessment is warranted and so we conclude that no unacceptable noise impact should result.

4.2.8 On this basis, no specific noise mitigation measures are necessary for plant as part of the IRC expansion.

5.0 CAR PARKING NOISE

- 5.1 The Site layout and proposed parking plan shows a total of [REDACTED] staff and 20 public parking spaces to the western part of the Site. The car park will be separated into two main blocks with additional single rows of spaces around the perimeter of the Site. The closest space will be approximately 20m from the nearest dwelling on Fort Road with the furthest away around 130m.
- 5.2 The number of on-site car parking spaces has been set to meet operational demand for staff at the IRC. Provision of sufficient on-site parking is intended to ensure that staff park within the Site rather than on local roads.
- 5.3 The Transport Assessment prepared by Stantec has been reviewed to establish the likely peak period of vehicle movements associated with the development. **Table 5.2** of the assessment presents a detailed staff vehicle trip generation profile, with arrivals and departures distributed across [REDACTED] intervals based on the proposed shift patterns.
- 5.4 Analysis of this data indicates that the worst-case hour occurs during the shift change periods, with a maximum of approximately [REDACTED] daytime vehicle movements within a single hour [REDACTED].
- 5.5 During the night-time period [REDACTED] activity is much lower, with a peak hour flow of [REDACTED] two-way vehicle movements occurring between [REDACTED] and [REDACTED] associated with the early shift arrival period.
- 5.6 This peak arises from a combination of overlapping arrivals and departures, therefore representing a robust and realistic assessment of peak traffic activity associated with the Site.
- 5.7 Cars manoeuvring at slow speeds in car parks generate relatively low levels of noise, but higher levels can be generated from car doors being closed and engines being started. To determine the likely car park noise levels outside the nearest dwellings, calculations have been undertaken based on typical Sound Exposure Levels (SEL) values from vehicle activities that have been previously measured in car parks, as shown in **Table 6**.

Table 6 - Car Parking Noise at 10m

Source	SEL (dB)
Vehicle engine starts and pull away	71
Door/Boot closure	69

- 5.8** For assessment purposes it has been assumed that shift changeovers may occur during the daytime and nighttime periods, and that most vehicle movements could occur within a one-hour changeover window.
- 5.9** It has also been assumed that the parking bays closest to the nearest dwellings would be in use, notwithstanding that in practice staff are likely to preferentially use spaces closer to the site entrance and building access points.
- 5.10** Considering distance attenuation from the car parking spaces and nominal screening provided by the existing garden fencing, the calculated noise levels ($L_{Aeq,1 \text{ hour}}$) associated with the car park are set out in **Table 7**.

Table 7 - Car Parking Noise Levels at Nearest Dwellings

Period	Noise level from Car Parking (dBA)	Background Noise Level (dB LA90)
Daytime	38	40
Night	37	37

- 5.11** The calculated car park noise levels are 2 dB below the existing daytime level and equal to the nighttime background, as shown in **Table 7**.
- 5.12** On this basis, use of the car park is unlikely to result in an adverse noise impact.
- 5.13** However, signs should be clearly displayed to remind staff of the nature of the residential area, including notices for the following:
- No slamming doors.
 - Turn engines off when parked.
 - Turn radios off while parked.
 - Avoid use of raised voices

6.0 SUMMARY

- 6.1 1st Horizon were commissioned to prepare a noise assessment for the expansion of the existing Haslar Immigration Removal Centre (the site) in Gosport. This report assesses the potential noise impact of operational noise associated with the expansion at the nearest noise-sensitive receptors.
- 6.2 The assessment is based on the baseline site inspection and background noise survey previously undertaken, together with a review of the updated layouts and manufacturer's noise emission data for the additional items of plant.
- 6.3 The assessment considers the cumulative impact of the plant.
- 6.4 Using the manufacturer's noise output data, predicted plant noise levels at the nearest noise-sensitive premises have been assessed in accordance with BS 4142 and against the previously adopted daytime/evening and nighttime design limits.
- 6.5 The assessment concludes that the cumulative plant noise impact from the existing IRC and expansion of the IRC plant remains acceptable, with no significant adverse effect anticipated at nearby dwellings and no resulting harm to residential amenity.

DRAWINGS

Figure 1 – Site Location & Noise Measurement Position

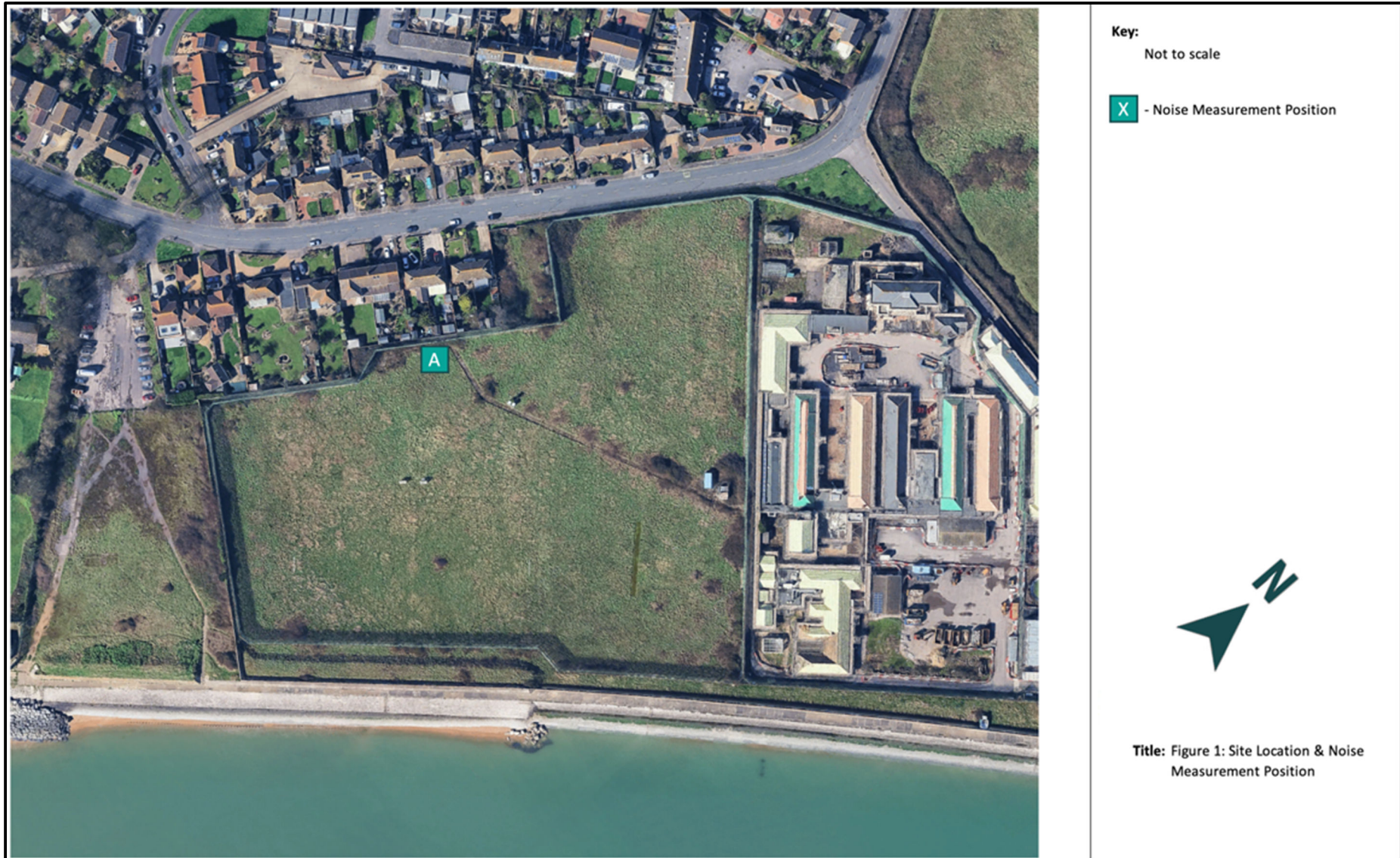
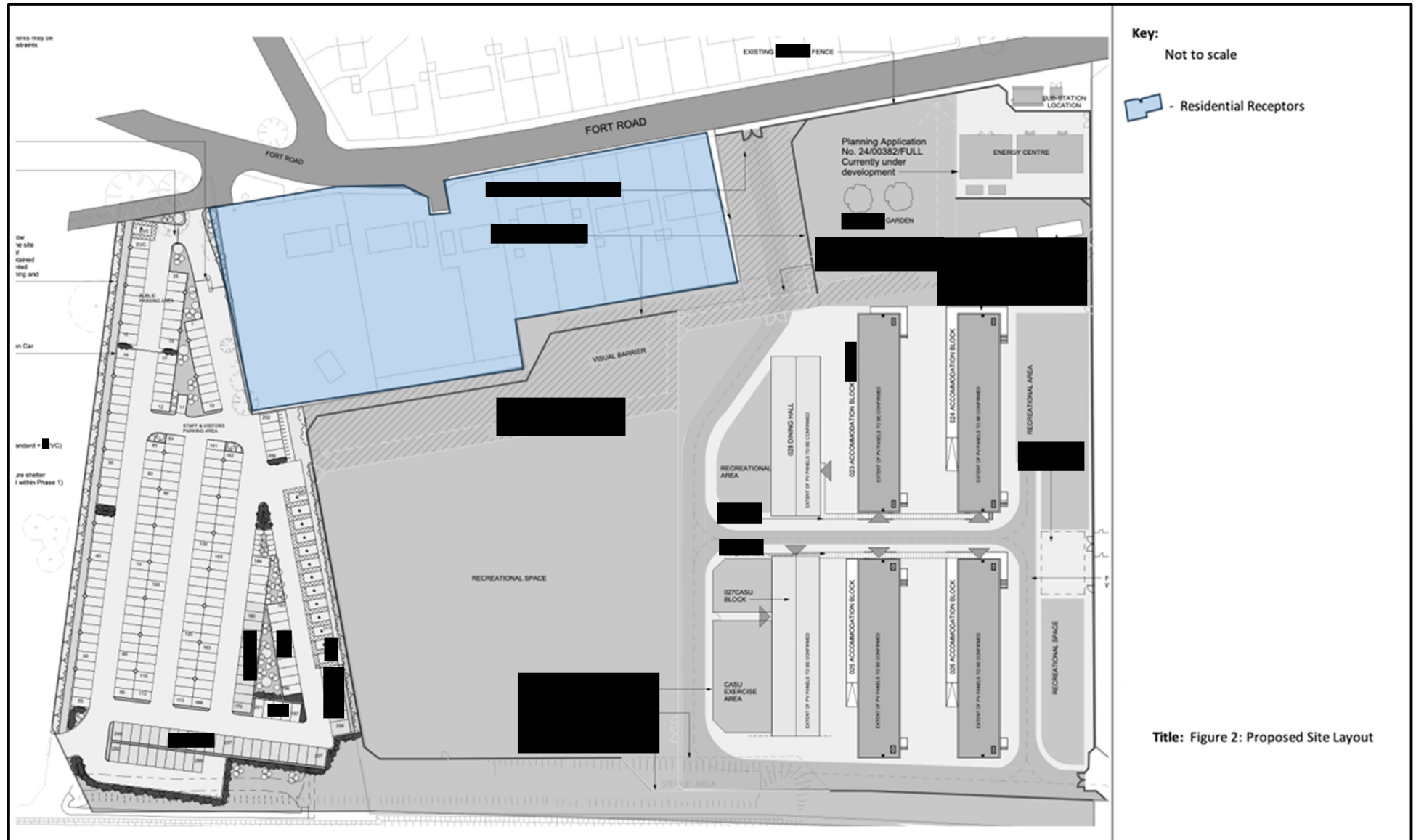


Figure 2 – Proposed Site Layout



Title: Figure 2: Proposed Site Layout

NOTE: THIS IS A CONCEPT DESIGN ONLY

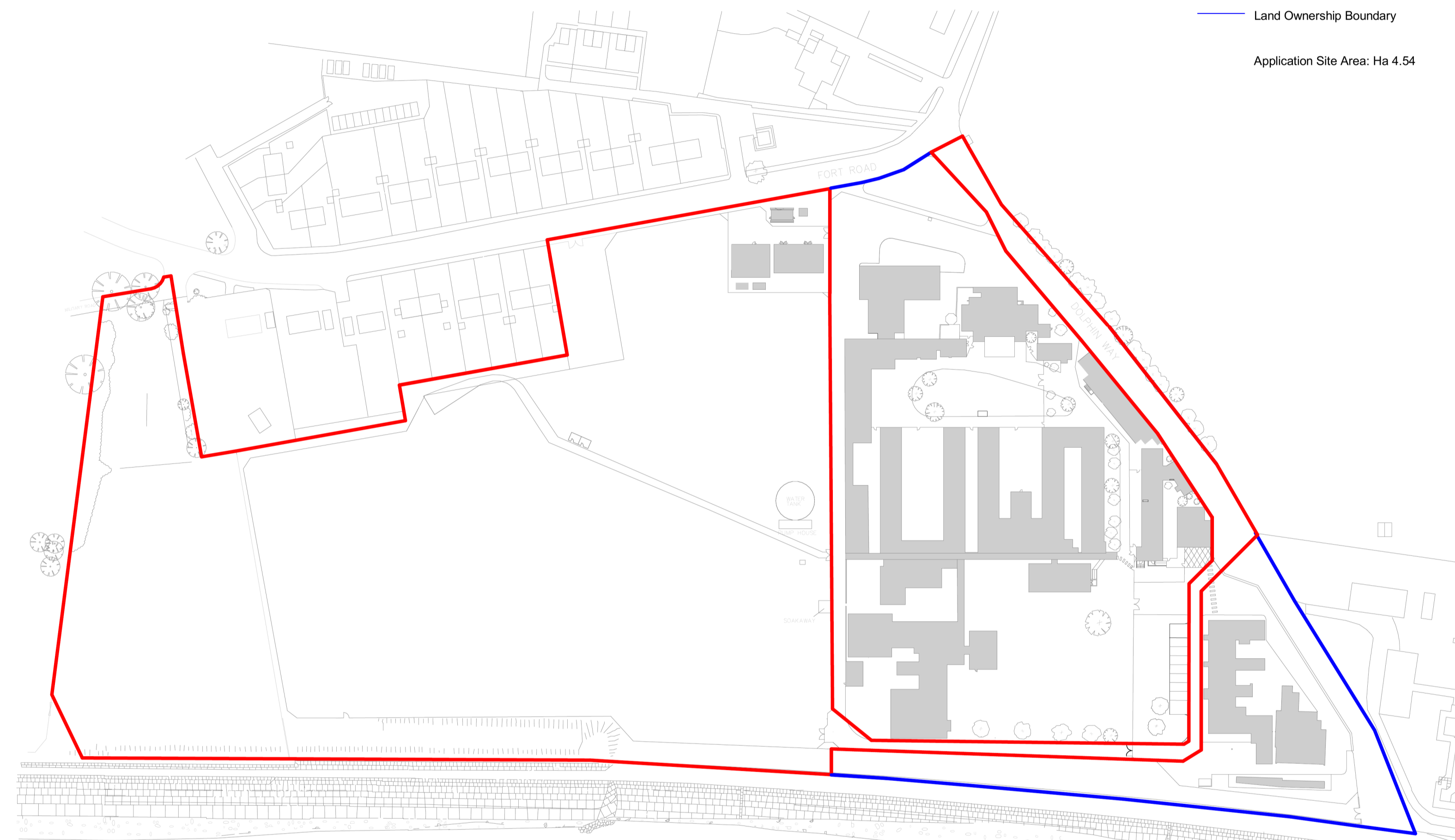
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 Verify all dimensions on site prior to construction. This drawing is to be read in conjunction with all relevant documents and drawings. Report all discrepancies to MoJ immediately.
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Notes

1. AtkinsRealis have not been provided with the complete site measured survey. This site plan is only indicative and should not be used for measuring purposes.
2. Total sanitary provisions will need to be confirmed.
3. Approx. total areas (subject to confirmation by measured building surveys):

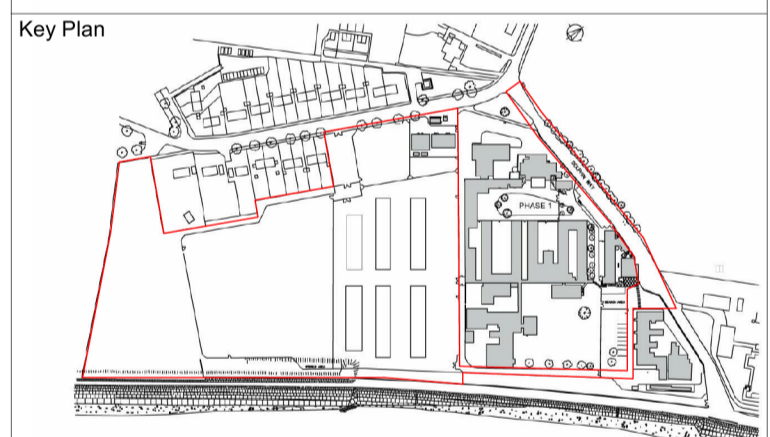
LEGEND

- Application Site Boundary
 - Land Ownership Boundary
- Application Site Area: Ha 4.54



1 SITE PLAN
 SCALE 1 : 1250

Rev	Issued by	Issued to	Date	Description
P07	ATR		08/12/2025	Trees updated as for Arboicultural survey
P06	ATR		24/11/2025	Issued for Planning
P05	ATR		12/09/2025	Red Line updated
P04	ATR		31/07/2025	Issued for Pre-Application
P03	ATR		13/03/2025	Phase 2 Revised Design Final Submission - BPRN updated
P02	ATR		29/11/2024	Revised Stage 2 package
P01	ATK	MoJ	29/09/2023	Phase 2 RIBA Stage 2 Final Submission



Project Status
 Outline Planning Application

Client Ministry of Justice	Project Haslar IRC
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Ministry of Justice, 102 Petty France, London, SW1H 9AJ

Project Description / Site

Indicative New Buildings

Project Address
 Dolphin Way,
 Gosport,
 Hampshire
 PO12 2AW

Building Type
 SITE PLAN

Drawing Title
 SITE LOCATION PLAN

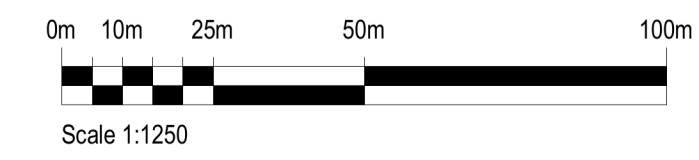
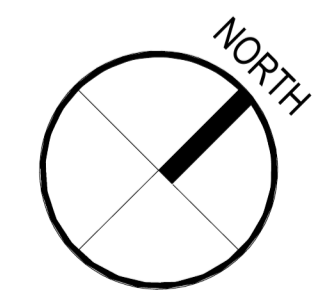
Originator Logo 	Drawn By: AT
	Checked By: AP
	Approved By: TC

Drawing Number
 323319-15207-ATR-000-GF-DR-A-0100-S2-D0100

Sheet No.	Scale	Orig. Sheet Size	Rev.
1 of 1	1 : 1250	@ A1	P07

Data Security Classification
 OFFICIAL

Suitability
 S2



Scale 1:1250

NOTE: THIS IS A CONCEPT DESIGN ONLY

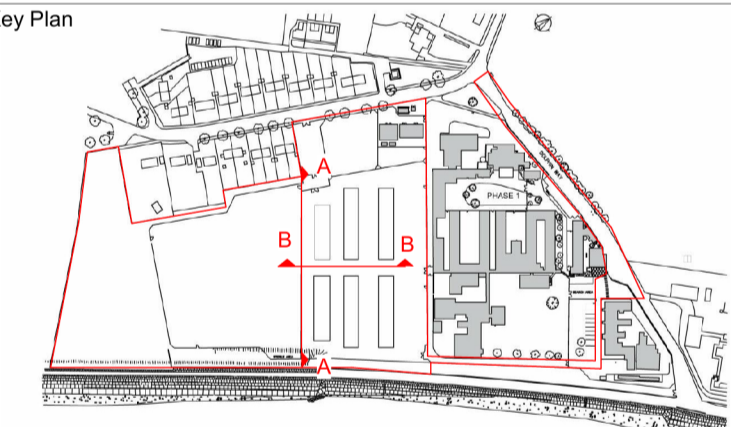
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Notes

LEGEND

- Site Application Boundary
- Existing Fence
- New Fence
- Existing Fence to be removed
- ▲ Main Entrance to the Units
- 3-Storey Accommodation Units
- 1-Storey Units

Rev	Issued by	Issued to	Date	Description
P08	ATR		02/04/2026	For information
P07	ATR		18/03/2026	Car park updated
P06	ATR		08/12/2025	Trees updated as for Arboicultural survey
P05	ATR		29/09/2025	Trees removed
P04	ATR		13/03/2025	Phase 2 Revised Design Final Submission - BPRN updated
P03	ATR		07/02/2025	Car Parking amended
P02	ATR		29/11/2024	Revised Stage 2 packages
P01	ATK	MoJ	29/09/2023	Phase 2 RIBA Stage 2 Final Submission



Project Status
 Outline Planning Application

Client Project
 Ministry of Justice Haslar IRC
 Ministry of Justice, 102 Petty France, London, SW1H 9AJ

Project Description / Site
 Indicative New Buildings

Project Address
 Dolphin Way,
 Gosport,
 Hampshire
 PO12 2AW

Building Type
 SITE PLAN

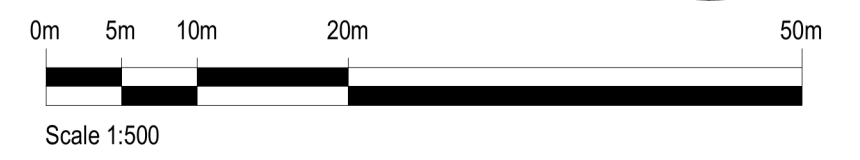
Drawing Title
 INDICATIVE PROPOSED SITE PLAN

Originator Logo Drawn By: MG
 AtkinsRéalis Checked By: AP
 Approved By: TC

Drawing Number
 323319-15207-ATR-000-GF-DR-A-0250-S2-D0100

Sheet No. 1 of 1 **Scale** 1:500 **Orig. Sheet Size** @ A1 **Rev.** P08

Data Security Classification OFFICIAL **Suitability** S2



APPENDIX A: Noise Units & Indices

Appendix A: Noise Units & Indices

Sound And The Decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. To cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

- $L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period, T. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.
- $L_{Amax,f}$ This is the maximum A-weighted noise level that was recorded during the monitoring period with the sound level meter set to 'fast'.
- $L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.
- L_W This is the Sound Power Level and is a Logarithmic measure of the sound power as a relation to the threshold of hearing.
- L_{WA} This is the A-weighted 'Sound Power Level' and is a Logarithmic measure of the sound power as a relation to the threshold of hearing.
- L_{AE} This is the A-weighted 'Sound Exposure Level' which is used for measuring discrete noise events. Essentially it is a measure of the sound energy of the whole noise event normalised to a period of 1 second. The SEL value can be used to calculate the actual L_{Aeq} value for a given time period if the number of noise events is known.

APPENDIX B: Noise Survey Results

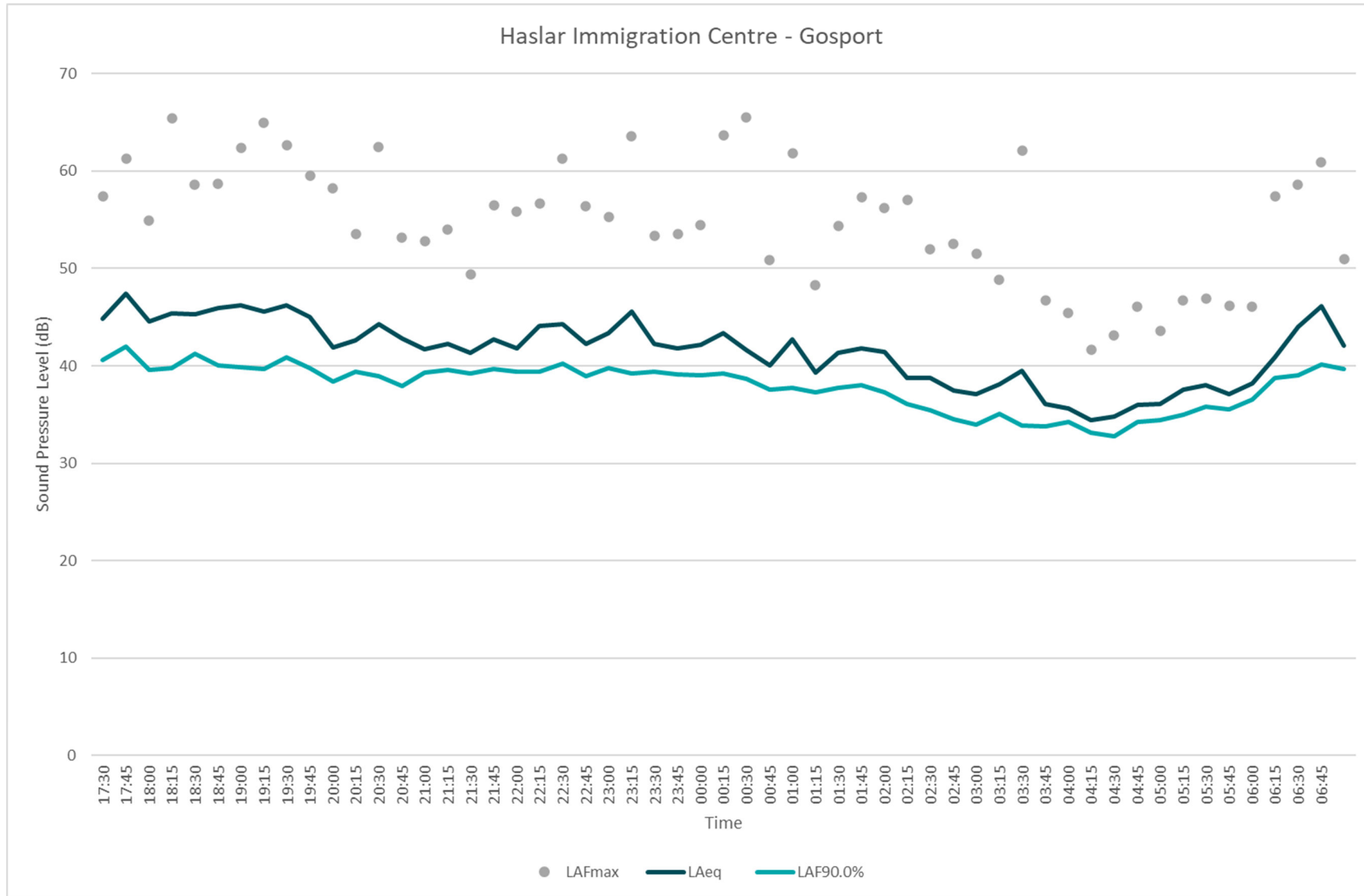
Appendix B: Noise Survey Results

Date(s): Daytime – Wednesday 10 January 2024
Nighttime – Wednesday 10 January 2024

Equipment: NTi XL2 'Class 1' sound level meters (s/n: A2A-20361-E0 & A2A-20228-E0) with associated calibrator and environmental outdoor monitoring kit

Weather: Daytime – Dry, ~7°C, clear skies and calm <3 m/s
Night-time – Dry, ~4°C, clear skies and calm <3 m/s

Please see chart overleaf





1ST HORIZON

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