

TECHNICAL NOTE

Yew Tree Care Home: Noise

Project	Yew Tree Care Home		
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1. INTRODUCTION

1.1 BWB Consulting Ltd was appointed by Liberty Care Developments Ltd to provide an assessment to support the discharge of Planning Condition 13 associated with planning permission 134207/FO/2022 which was varied under planning permission reference 136127/JO/2023. The planning permission relates to the erection of a part two, part three storey 59 bed care home facility including basement, access, landscaping and associated infrastructure following demolition of existing building at land to the north of Yew Tree Lane, Northern Moor. This technical note has been updated following the relocation of the Air Source Heat Pumps (ASHP). These have moved towards the northern boundary of site.

1.2 Planning Condition 13 states that:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A9c}) level at the nearest noise sensitive location. The scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site prior to the first occupation of the development and shall be implemented in full before the use commences.”

1.3 This note is intended to be read alongside the Noise Assessment (BWB Document Number: XXX-BWB-ZZ-ZZ-RP-YA-0001_NIA_S1_P02) dated June 2022.

2. BASELINE CONDITIONS

Noise Sensitive Receptors

2.1 The nearest existing Noise Sensitive Receptors (NSRs) as defined in the original noise assessment are detailed in **Table 2.1**.

Table 2.1: Existing Noise Sensitive Receptors

NSR No.	Description	Grid Reference		Bearing from Site	Distance from Site Boundary
		Easting	Northing		
1	Receptors off Barry Road	382151	390615	North	9m

- 2.2 An impact may be experienced at other receptors, however, given the greater distance, any impact is likely to be less than at those at the nearest NSR.

Baseline Noise Survey

- 2.3 A baseline noise survey was undertaken in April 2022 in support of the planning stage noise assessment works and is fully documented in the noise assessment, which accompanied the planning submission (BWB Document Number: XXX-BWB-ZZ-ZZ-RP-YA-0001_NIA_S1_P02 dated June 2022).
- 2.4 The measured background sound pressure levels (L_{A90}) at NSRs have been considered to inform Condition 13 criteria relating to fixed plant associated with the development.

3. NOISE ASSESSMENT

- 3.1 Planning Condition 13 requires that externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB below the typical background (L_{A90}) level at the nearest noise sensitive location.
- 3.2 Based on the environmental noise survey data and in accordance with the Planning Condition 13 requirements, maximum plant emission levels have been set in controlling fixed plant noise in **Table 3.1**.

Table 3.1: Planning Condition 13 Criteria - Plant Noise Emission Limits

Period	Typical Background Sound Level (L_{A90})	Criteria	Plant Noise Emission Limit (dB)
Daytime (07:00 – 23:00 hrs)	47	$= L_{A90} - 5\text{dB}$	42
Night-time (23:00 – 07:00 hrs)	39		34

- 3.3 Noise limits apply at a position 1m from the façade of the nearest noise sensitive properties and include the total contribution of noise from all plant items associated with the proposed plant scheme that may run during any particular period.
- 3.4 It is understood that the Client proposes to install:

- 6 no. ASHPs: sound pressure level of 51dBA @ 1m per unit; and,
- 3 no. VRFs: sound pressure level of 59dBA @ 1m per unit.

3.5 The location of this plant is shown in **Figure 3.1**.

Figure 3.1 Plant Location



Drawing ref: 23-2516(90)003-C03

Embedded Mitigation

- 3.6 A 2.1m high vertical high closed boarded timber fence is proposed. **Figure 3.2** shows the location of the standard fencing in yellow. The ASHP Acoustic Fencing is shown in Green.

Figure 3.2 Location of Barrier



Drawing ref: 23-2516(90)003-C03

Noise Model

3.7 In predicting the noise levels from the proposed development site at the NSRs, a detailed acoustic model of the Site has been generated using the PC based CadnaA® noise modelling package, applying the following prediction methodology:

- For industrial/commercial noise sources, the noise model was set to apply the noise prediction methodology set out in ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation¹;
- Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordinance Survey grid reference points;
- Indicative ground topography was approximated using Lidar data at 2m;
- Off-site buildings which would provide screening to the Site have been incorporated as reflective façades;
- To reflect the local ground cover, ground absorption was set to $G = 0.5$ (50% acoustically absorptive ground);
- The model was set to include second order reflected noise from solid structures; and
- The embedded barrier (location shown in **Figure 3.2**) has been included.

Noise from fixed plant

3.8 Proposed fixed plant units have been included within the model as point sources at a height of 1m, with no “On-time” correction applied i.e. the units are assumed to be operating at all times. As such, the noise inputs for daytime and night-time noise are identical.

3.9 The specific sound level at the NSR has been calculated at receiver points at 4m above ground to represent the closest first-floor bedrooms to the proposed fixed plant units.

3.10 The calculated specific sound level due to fixed plant is presented in **Table 3.2**.

Table 3.2: Predicted specific sound level at NSR, dB Ls

NSR	Daytime/Night-time
1	34

¹ International Organization for Standardization (1996), ISO 9613-2:1996, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- 3.11 The predicted specific sound level at the receiver points in the CadnaA® model have been included within the subsequent assessment.

Assessment in Accordance with Condition 13

- 3.12 The predicted noise level at the NSR is 34dB Ls at the closest first floor bedroom on Barry Road, which has been selected as the specific sound level.
- 3.13 In accordance with BS 4142: 2014+A1:2019², penalties are applied to the specific sound level in order to provide the rating level. These penalties relate to the acoustic features of the sound source. When considering the existing noise climate, and that noise from the fixed plant items is predicted to be 5 dB below the existing background noise level during the night-time, noise from the fixed plant items is unlikely to be perceptible with the implementation of new mitigatory measures. As such, the rating level would be equal to the specific sound level.
- 3.14 To ensure compliance with the Rating Level, installing acoustic fencing with an absorbent lining around the enclosure would avoid excessive build-up of sound reflections within the ASHP enclosure, which may cause the Rating Level to be breached. A mass of 10kg/m² is a typical acoustic fencing specification.
- 3.15 **Table 3.3** presents the assessment, which has been undertaken in accordance with Planning Condition 13.

Table 3.3: Assessment in accordance with Condition 13 criteria

Description	NSR 1	
	Daytime (0700 – 2300) dB	Night-time (2300 – 0700) dB
Rating level (L _{Ar,T})	34	34
Condition 13 criteria	42	34
Excess over criteria	-8	0
Criteria achieved	Yes	Yes

- 3.16 The predicted plant noise level shown in **Table 3.3** is predicted to achieve the requirements of Planning Condition 13 with the embedded mitigation in place. Furthermore, the daytime criterion of 42dB would also be achieved.
- 3.17 Therefore, based on the results of the assessment, Condition 13 should be discharged.

² British Standards Institute (2019), British Standard (BS) 4142: 2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound