

TECHNICAL MEMORANDUM

To: Dan Failes, Chalk Construct

Date: 27 February 2026

CC: Environmental Health, Havant District Council

From: Andy Officer, checked by Peter Rogers FIOA CEng. Ref: 26-0031-0 TM01 Report AOPR Issue 1

SUBJECT: ASHP Validation - 1 'Trevanion' Beech Road, Emsworth PO10 7JS

1 INTRODUCTION

This technical memorandum is intended to set out the results from an acoustic validation exercise for an Air Source Heat Pump, and additional Condenser Units against planning condition to application APP/25/00359, which states in condition 1 :

"Within 2 months of the date of this permission, the existing screening shall be upgraded in accordance with the recommended specification detailed in the Sound Advice Acoustics Report (Ref: SA-8074).

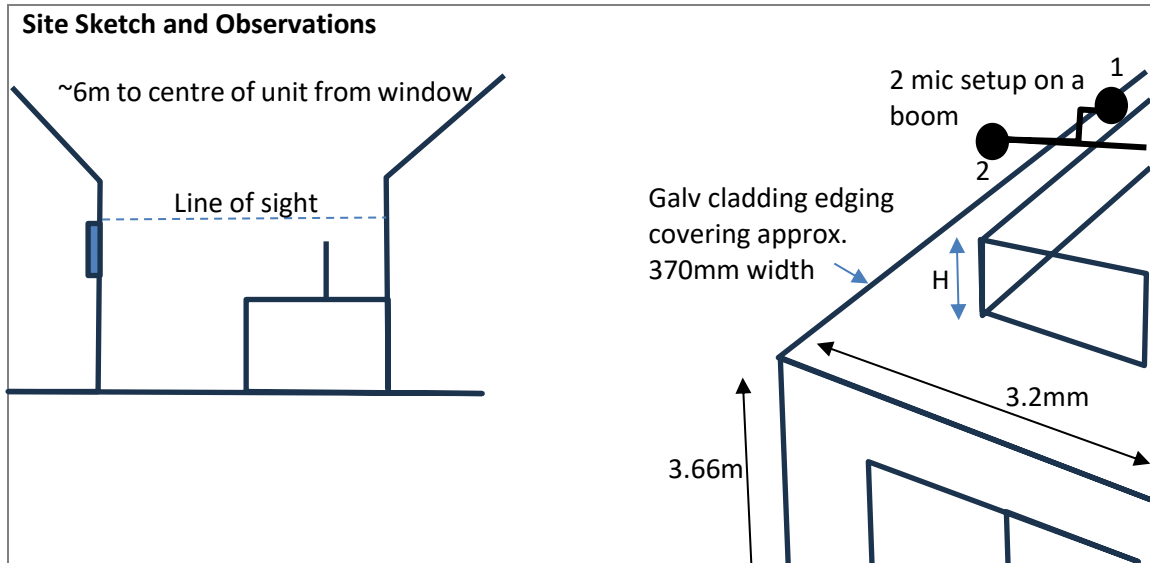
A post-completion noise validation survey shall also be undertaken by a suitably qualified acoustic consultant and submitted to the Local Planning Authority for approval within 2 months of the date of this permission. The survey shall:

- *Confirm that the plant installed corresponds to the models and sound power levels detailed in the Sound Advice Acoustics Report (Ref: SA8074).*
- *Verify that the acoustic screen has been installed to the recommended specification, including:*
- *Minimum height of 1.6 metres,*
- *Minimum surface mass of 14 kg/m²,*
- *Continuous construction with no gaps and sealed to the floor.*
- *Demonstrate that the rating level of noise from the plant at the nearest noise-sensitive receptor does not exceed 37 dB L_{Ar},T_r, as predicted in the report. Where the survey identifies that the rating level exceeds 37 dB or that the installed mitigation does not meet the required specification, further mitigation measures shall be agreed with the Local Planning Authority and further implemented on site to an agreed timetable, and further verified to achieve compliance before continued operation of the plant.*

The final mitigation measures shall thereafter be maintained on site to the satisfaction of the Local Planning Authority for the duration of the life of the equipment".



2 SITE CHECKS (CLOMPLAINCE WITH CONDITION 1)

Site Sketch and Observations 	
Photographic evidence of each unit (See Photos of Specification Labels in Appendix A)	Measured details of actual units installed: Samsung AE160 RXYDEG SWL 61dB(A) x1 <u>YES</u> Size: h1440 w940 d380 (mm) Daikin RXM50A5V1B SWL 58dB(A) x 1 <u>YES</u> Size: h740 w880 d380 (mm) Daikin RXM50A5V1B SWL 58dB(A) x 1 <u>NO (50r2v1b)</u> Size: h740 w 880 d380 (mm) Daikin RZASG100M7V1B SWL 70dB(A) x 1 <u>YES</u> Size: h1000 w930 d330 (mm)
Photographic evidence of Screen (See Photos 1 in Appendix A)	Screen Construction: C-shape <u>Yes</u> H = 1.6m high = 1.65m high as measured : <u>Yes</u> Internally lined with absorptive material <u>Yes</u> No gaps to bottom: <u>Corrected</u> Additional absorption to side of house <u>Yes</u>

3 SITE MEASUREMENT CHECKS

Instrumentation: RION NA-28 (sn 170246) – 1m from Screen (Red Channel identifier) – Position 1 RION NL-53 (sn 941347) – 2m from Screen (Yellow Channel identifier) – Position 2	Validating Sound Power Level (use NL-53) <ul style="list-style-type: none">• Sweep as L_{Aeq} over 1 min at 250mm distance using NL-53• Note distance of sweep with distance reference.• Checked 6dB between adjacent 1/3 Octaves
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<p>Effective Sound Power Measurement Results</p> <p>(TEST 1)</p> <p><i>(Sweep at 250mm from front, sides and top of casing)</i></p> <p>“Normal duty”</p> <p>Samsung AE160 – NL53 File No. 200 -0045</p> <p>dB L_{Aeq} : 59.0 Meas Time: 15:11 (start)</p> <p>1st Daikin RXM50A - NL53 File No. 0053</p> <p>dB L_{Aeq} : 57.2 Meas Time: 15:53</p> <p>2nd Daikin RXM50A - NL53 File No. 0059</p> <p>dB L_{Aeq} : 57.9 Meas Time: 15:50</p> <p>Daikin RZASG100M- NL53 File No. None</p> <p>*Did not operate – measurement not possible.</p> <p>“Max duty”</p> <p>Samsung AE160 – NL53 File No. 0048</p> <p>dB L_{Aeq} : 62.5 Meas Time: 15:18</p> <p>1st Daikin RXM50A - NL53 File No. 0054</p> <p>dB L_{Aeq} : 58.3 Meas Time: 15:55</p> <p>2nd Daikin RXM50A - NL53 File No. 0051</p> <p>dB L_{Aeq} : 58.8 Meas Time: 15:32</p> <p>Daikin RZASG100M- NL53 File No. 0052</p> <p>dB L_{Aeq} : 67.4 Meas Time: 15:43</p>	<p>Notes</p> <p>Heating turned to 20 degrees to prompt normal conditions.</p> <p>Very slight tonal component noticeable near the 1st Daikin unit (+3dB). Increased to 26 degrees C setting of the thermostat. Low fan speed occurring.</p> <p>With heating and hot water on and hot taps running.</p> <p>Set to “Fast” fan speed – thermostat set to 30 degrees C.</p> <p>2nd Daikin unit had a distinctive tonal rattle at high load</p>
<p><u>Screen Attenuation/Propagation Test</u></p> <p><u>(TEST 2)</u></p> <p>Calculation demonstration check of L_{Artr}</p> <p>With ‘All’ Plant Units running YES/NO*</p> <p>*Not under normal duty, but under Max duty yes.</p> <p>Run Time Start: 16:35</p> <p>Duration of test: 5 minutes at 1 min intervals.</p> <p>On Auto2 store. NL-53 used to make ambient measurements after tests complete.</p>	<p><u>Comment on any other characteristics:</u></p> <p>Ambient soundscape : Birdsong, distant traffic, odd passby on Beech Road.</p> <p>Character correction: at 2m Posn. (NL-53) at edge of roof (SHP just noticeable) – suggest a +3 dB penalty appropriate to apply to rating level similar under normal or .</p>



Calculations:

Based on $L_2 = L_1 - R + 10 \log S - 20 \log r - 14\text{dB}$ (where the roof surface is assumed reflective and wall is not due to absorption and R is the SRI of the barrier).

$$L_{ArTr}(\text{1min sample}) = L_p \text{ at } 250\text{mm} + 10 \log S - 20 \log r - 14\text{dB}$$

Normal duty

- Effective area S of all facing sides (4) of units:
- Samsung AE160 , $S = (1440 + (2 \times 250)) \times (940 + (2 \times 250)) + (2 \times (1440 + 500) \times (380 + 500)) + (1 \times (940 + 250)) = 7115.2 \text{ mm}^2$, $10 \log S = 8.5\text{dB}$, $L'w = (59.0 + 8.5) = 67.5\text{dB}$. Screening conservatively is -10dB so $L_{ArTr} = 59 - 10 + 8.5 - 15.6 - 14 = 27.96\text{dB} + 3\text{dB penalty} = \mathbf{30.1dB}$
- Daikin 2 and 3 = $4763 \text{ mm}^2 \rightarrow 24.4\text{dB} + 3 = \mathbf{27.4dB}$
- Daikin 4 = $5579 \text{ mm}^2 \rightarrow 25.1\text{dB} + 3 = \mathbf{28.1dB}$
- Total $L_{ArTr}(\text{normal operation}) = \mathbf{33.9dB}$, 3dB below planning target of 37.

Max duty

- Samsung AE160 , $S = (1440 + (2 \times 250)) \times (940 + (2 \times 250)) + (2 \times (1440 + 500) \times (380 + 500)) + (1 \times (940 + 250)) = 7115.2 \text{ mm}^2$, $10 \log S = 8.5\text{dB}$, $L'w = (59.0 + 8.5) = 67.5\text{dB}$. Screening conservatively is -10dB so $L_{ArTr} = 31.46 + 3\text{dB penalty} = \mathbf{34.5dB}$
- Daikin 2 and 3 = $4763 \text{ mm}^2 \rightarrow 25.5\text{dB} + 3 = \mathbf{28.4dB}$
- Daikin 4 = $5579 \text{ mm}^2 \rightarrow 26.0\text{dB} + 3 = \mathbf{29.0dB}$
- Total $L_{ArTr}(\text{max operation}) = \mathbf{36.3dB}$, 0.7dB below planning target of 37.

Conclusion:

The intend of condition 1 has been verified to have been achieved by measurement and calculation to the nearest residential window, with a result of L_{ArTr} **34 to 36dB**.



APPENDIX A

SUPPORTING PHOTOS



Photo 1: 4 units in enclosure (blue lining to house façade)



Photo 2: ASHP Spec plate (unit 1)



Photo 3: Daikin RXM Spec plate (unit 2)



Photo 4: Daikin Spec plate (unit 3)



Photo 5: Daikin Spec plate (unit 4)



Photo 6: Inner face of barrier (Techsound in place)