

# SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



## Report 3

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**IBIS, Princess Street,  
Manchester**

Noise Assessment of fixed  
external plant

**Prepared by**

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**Date 13<sup>th</sup> July 2023**

**Project No 2221463**

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## **1.0 Introduction**

- 1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment of fixed plant equipment at the redeveloped IBIS hotel on Princess Street, Manchester.
- 1.2 The proposal is to install an external cooling and heating unit to serve 6 new bedrooms at the development. One of the Planning Conditions (Condition 5a) requires an assessment of the noise associated with the new plant which is to be located at Ground Floor on the southern façade of the existing hotel building. See Appendix C for the location of the proposed plant.
- 1.3 The objective of this assessment is to determine how noise that may be generated as a result of the proposed fixed plant equipment would affect the amenity of adjacent noise-sensitive premises.
- 1.4 Section 2 of this report contains a discussion of the methods of assessment and assessment criteria.
- 1.5 Section 3 of this report sets out the findings of an environmental noise survey and section 4 presents an assessment of noise from the proposed additional fixed plant equipment.
- 1.6 The assessment conclusions are contained in section 5 of this report.

## 2.0 Assessment methodology and criteria

2.1 An assessment of noise from new fixed plant is required to help with the discharge of Condition 5a of the consent for the scheme. The wording of Condition 5a is taken from the Decision Notice for the development (ref 126508/FO/2020, dated 6<sup>th</sup> July 2020):

- 5) a) Any externally mounted ancillary equipment, plant 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 ( $L_{A90}$ ) level at the nearest noise sensitive location.

Prior to the first occupation of the development a 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.

2.2 The use of the term “Rating Level” in the condition is taken to be a reference to the assessment being considered with regards to the methodology in BS 4142:2014+A1:2019.

2.3 A survey in the area around the application site has been done to determine the current noise climate. Details of the survey can be found in the following section of the report.

### Assessment using BS 4142:2014+A1:2019

2.4 As outlined, this British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The significance of sound impact is to be determined according to the following summary process:

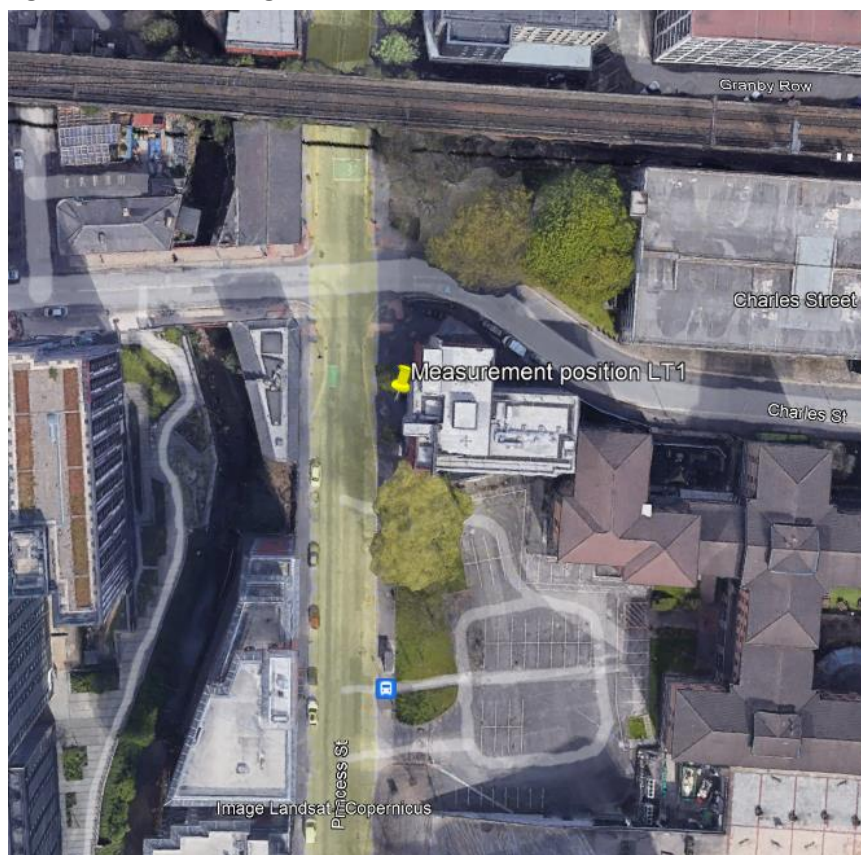
- i) Determine the background sound levels, in terms of the index  $L_{A90}$ , at the receptor locations of interest.
- ii) Determine the specific sound level of the source being assessed, in terms of its  $L_{AeqT}$  level ( $T = 1$  hour for day or 15 minutes for night), at the receptor location of interest.
- iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
- v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. 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 upon context.
- vi) The intent of the planning system is to ensure that a development does not result in “significant adverse impacts on health and quality of life.” BS 4142:2014 considers that the threshold of significant adverse impact is “a difference around +10 dB or more ... depending upon the context”.

- 2.5 BS 4142:2014 introduces the concept of 'context' to the process of identifying noise impact. Section 11 of BS 4142:2014 explains *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs (our emphasis). An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context"* (our emphasis).
- 2.6 There are many *context* points to consider when undertaking an assessment of sound impact including:
- The absolute level of sound;
  - The character and level of the specific sound in the context of the existing noise climate; for example is the sound to occur in a location already characterised by similar activities as those proposed?
  - The sensitivity of the receptors;
  - The time and duration that the specific sound is to occur;
  - The conclusions of assessments undertaken using alternative assessment methods, for example WHO guidelines noise values or change in noise level;
- 2.7 It is therefore entirely possible that whilst the numerical outcome of a BS 4142:2014+A1:2019 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in *context* the significance of the impact is reduced to an acceptable level.

### 3.0 Ambient Noise Survey

- 3.1 A noise survey was undertaken at the site to determine the noise levels that will be incident on the proposed bedrooms. Due to the ingoing construction work to replace the external cladding, the selection of a suitable, secure location was not straightforward.
- 3.2 The important noise sources that needed to be considered were road traffic on Princess Street, and the FAC251 nightclub on the corner of Princess Street and Charles Street. The selected location was at Ground Floor level within the scaffold zone on the Princess Street façade. This was selected due to access issues with other relevant locations.
- 3.3 The monitoring location is shown in Figure 3.1. Measurements were taken using unattended noise logging equipment. Observations during the afternoon and late evening provided confirmation of the noise environment and sources.

**Figure 3.1: Monitoring Location**



- 3.4 Noise measurements were taken using Type 1 sound level meter which was calibrated at the start and end of the survey.
- 3.5 Measurements were taken from 15:40hrs on the 28<sup>th</sup> November through to 09:50hrs on the 29<sup>th</sup> November.
- 3.6 The weather conditions during the survey based on site observations were cool with a slight south easterly wind. The equipment used, and the measurement procedures employed (including weather parameters), complied with the requirements of BS 7445.

- 3.7 The noise levels resulting from the survey are summarised in Table 3.1 below.

**Table 3.1: Noise data collected on site**

| Position | Time Period               | Noise level            |                         |                        |
|----------|---------------------------|------------------------|-------------------------|------------------------|
|          |                           | L <sub>Aeq,10min</sub> | L <sub>Amax,10min</sub> | L <sub>A90,10min</sub> |
| LT1      | Daytime 07:00-22:00hrs    | 63.3-75.5 dB           | 64.8-98.6 dB            | 52.7-63.8 dB           |
|          | Night Time 22:00–07:00hrs | 59.9-73.9 dB           | 75-98 dB                | 51.4-63.6              |

- 3.8 The measurement period was selected as 10 minutes for other design reasons. This is less than the 15 minute period required by BS 4142:2014+A1:2019 but is considered to provide additional robustness to the assessment.

## 4.0 Assessment of Fixed Plant

- 4.1 In order to assess the noise level of the proposed fixed plant at the nearest noise-sensitive property, reliable data is required for the assessment.
- 4.2 For this scheme, the prior installation of the VRV Heat Recovery Unit is beneficial as it is possible to measure the noise of the unit on site. The location of the plant is shown in the drawing in Appendix C.
- 4.3 A visit was made to site on the evening of 15<sup>th</sup> June 2023. This allowed for various measurements at different locations around the unit. The highest measured level of the unit without contribution from other sources was  $L_{Aeq}$  55 dB at 1m.
- 4.4 The horizontal distance from the top of the VRV unit to the nearest window in the adjacent building is 5m Using accepted acoustic theory with regards to distance attenuation, the assessment is as follows:

$$\text{Noise level outside window} = 55 \text{ dB(A)} - 20\text{Log}(5/1) = 41 \text{ dB(A)}.$$

- 4.5 Reference is then made to Table 3.1 of this report that provides relevant ambient noise data without contribution from the VRV unit. As can be seen, the lowest background noise level ( $L_{A90}$ ) even at night is 51.4dB(A). As the calculated noise level from the VRV unit is significantly lower than the lowest ambient noise level ( $L_{Aeq}$ ) of 59.9 dB it is not considered appropriate to introduce the penalties for the character of the noise (tonality, intermittency etc.) as these are not likely to be noticeable over the noise from traffic on Princess Street.
- 4.6 Based on this assessment, the Rating Level is 41 dB(A) which is 10 dB(A) below the measured background noise level. This is considered to be a strong indicator that noise from the VRV unit will not cause disturbance to the occupiers of the building that is adjacent to the hotel.

## **5.0 Assessment conclusions**

- 5.1 This assessment considers noise from a new item of plant associated with the redeveloped Ibis hotel on Princess Street, Manchester.
- 5.2 Calculated noise from the plant is 10dB(A) below the lowest measured background noise level and is therefore compliant with the level required in the Planning Consent for the scheme.

## **APPENDIX A**

### **DETAILS OF AMBIENT NOISE SURVEY**

## **Survey details**

### Time and date of survey

Approx. 15:40hrs on the 28<sup>th</sup> November through to 09:50hrs on the 29<sup>th</sup> November 2022.

### Personnel

Ian Harley - Sharps Redmore

### Weather conditions

Weather conditions were cool and dry with a slight south-easterly wind.

### Equipment used for the survey

Rion NL-52 Sound Level Meter

The sound level meter was calibrated before and after the survey and showed no drift during that time.

## **APPENDIX B**

### **AMBIENT NOISE SURVEY DATA**

| Start Time          | Measurement Time | L <sub>Aeq</sub> | L <sub>Amax</sub> | L <sub>A90</sub> |
|---------------------|------------------|------------------|-------------------|------------------|
| 28/11/2022 15:40:00 | 00d 00:10:00.0   | 73.3             | 95.2              | 58.9             |
| 28/11/2022 15:50:00 | 00d 00:10:00.0   | 71.5             | 88.9              | 59.9             |
| 28/11/2022 16:00:00 | 00d 00:10:00.0   | 70               | 83.9              | 59.2             |
| 28/11/2022 16:10:00 | 00d 00:10:00.0   | 69.9             | 86.4              | 57.8             |
| 28/11/2022 16:20:00 | 00d 00:10:00.0   | 70.6             | 87.3              | 58.5             |
| 28/11/2022 16:30:00 | 00d 00:10:00.0   | 69.9             | 86.9              | 58.6             |
| 28/11/2022 16:40:00 | 00d 00:10:00.0   | 75.5             | 98.6              | 60.7             |
| 28/11/2022 16:50:00 | 00d 00:10:00.0   | 73.2             | 86.1              | 61.9             |
| 28/11/2022 17:00:00 | 00d 00:10:00.0   | 71.8             | 84.1              | 60.6             |
| 28/11/2022 17:10:00 | 00d 00:10:00.0   | 72.6             | 83.7              | 63.8             |
| 28/11/2022 17:20:00 | 00d 00:10:00.0   | 73.5             | 91.3              | 57.9             |
| 28/11/2022 17:30:00 | 00d 00:10:00.0   | 69.6             | 81.8              | 58.9             |
| 28/11/2022 17:40:00 | 00d 00:10:00.0   | 71.4             | 90.9              | 60               |
| 28/11/2022 17:50:00 | 00d 00:10:00.0   | 70.4             | 92                | 58.5             |
| 28/11/2022 18:00:00 | 00d 00:10:00.0   | 69.5             | 80.4              | 60.1             |
| 28/11/2022 18:10:00 | 00d 00:10:00.0   | 70.1             | 81                | 58.5             |
| 28/11/2022 18:20:00 | 00d 00:10:00.0   | 70.4             | 92.9              | 58.7             |
| 28/11/2022 18:30:00 | 00d 00:10:00.0   | 69               | 83.8              | 57.5             |
| 28/11/2022 18:40:00 | 00d 00:10:00.0   | 69.5             | 82.6              | 58.1             |
| 28/11/2022 18:50:00 | 00d 00:10:00.0   | 69.5             | 82.2              | 57.7             |
| 28/11/2022 19:00:00 | 00d 00:10:00.0   | 70               | 90.5              | 57.4             |
| 28/11/2022 19:10:00 | 00d 00:10:00.0   | 69.7             | 82.4              | 63.1             |
| 28/11/2022 19:20:00 | 00d 00:10:00.0   | 69.3             | 82.3              | 60.1             |
| 28/11/2022 19:30:00 | 00d 00:10:00.0   | 70.2             | 84.5              | 59.1             |
| 28/11/2022 19:40:00 | 00d 00:10:00.0   | 69.6             | 81.7              | 57.4             |
| 28/11/2022 19:50:00 | 00d 00:10:00.0   | 70.5             | 87.4              | 56.7             |
| 28/11/2022 20:00:00 | 00d 00:10:00.0   | 69.1             | 94.7              | 57.9             |
| 28/11/2022 20:10:00 | 00d 00:10:00.0   | 69.2             | 83.8              | 56.8             |
| 28/11/2022 20:20:00 | 00d 00:10:00.0   | 67.5             | 81                | 56.2             |
| 28/11/2022 20:30:00 | 00d 00:10:00.0   | 68.6             | 79                | 56.3             |
| 28/11/2022 20:40:00 | 00d 00:10:00.0   | 67.5             | 80.5              | 55.9             |
| 28/11/2022 20:50:00 | 00d 00:10:00.0   | 68.5             | 80.2              | 57               |
| 28/11/2022 21:00:00 | 00d 00:10:00.0   | 69               | 85.7              | 56.5             |
| 28/11/2022 21:10:00 | 00d 00:10:00.0   | 69.6             | 82.5              | 58.1             |
| 28/11/2022 21:20:00 | 00d 00:10:00.0   | 68.1             | 83.7              | 55.1             |
| 28/11/2022 21:30:00 | 00d 00:10:00.0   | 68.4             | 80.3              | 56               |
| 28/11/2022 21:40:00 | 00d 00:10:00.0   | 68.7             | 82.3              | 57.4             |
| 28/11/2022 21:50:00 | 00d 00:10:00.0   | 69.1             | 85.6              | 56.7             |
| 28/11/2022 22:00:00 | 00d 00:10:00.0   | 69.3             | 81.3              | 57               |
| 28/11/2022 22:10:00 | 00d 00:10:00.0   | 67.2             | 80.3              | 55.2             |
| 28/11/2022 22:20:00 | 00d 00:10:00.0   | 70.1             | 92                | 56.5             |
| 28/11/2022 22:30:00 | 00d 00:10:00.0   | 68.7             | 81.6              | 56.9             |
| 28/11/2022 22:40:00 | 00d 00:10:00.0   | 69.6             | 90.6              | 57.4             |
| 28/11/2022 22:50:00 | 00d 00:10:00.0   | 66.7             | 83.4              | 54.6             |
| 28/11/2022 23:00:00 | 00d 00:10:00.0   | 69.1             | 83.1              | 55.8             |
| 28/11/2022 23:10:00 | 00d 00:10:00.0   | 71.3             | 95.5              | 55.2             |

|                     |                |      |      |      |
|---------------------|----------------|------|------|------|
| 28/11/2022 23:20:00 | 00d 00:10:00.0 | 67.8 | 83.3 | 57.2 |
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| 28/11/2022 23:50:00 | 00d 00:10:00.0 | 67.9 | 78.7 | 58.3 |
| 29/11/2022 00:00:00 | 00d 00:10:00.0 | 67.2 | 85.3 | 58.1 |
| 29/11/2022 00:10:00 | 00d 00:10:00.0 | 72   | 98   | 56.9 |
| 29/11/2022 00:20:00 | 00d 00:10:00.0 | 68   | 90.3 | 59.4 |
| 29/11/2022 00:30:00 | 00d 00:10:00.0 | 65.4 | 80.5 | 57.9 |
| 29/11/2022 00:40:00 | 00d 00:10:00.0 | 68.7 | 88.7 | 62.4 |
| 29/11/2022 00:50:00 | 00d 00:10:00.0 | 66.4 | 80.1 | 60.2 |
| 29/11/2022 01:00:00 | 00d 00:10:00.0 | 68.3 | 81.3 | 63.6 |
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| 29/11/2022 01:40:00 | 00d 00:10:00.0 | 66.8 | 82.6 | 60.2 |
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| 29/11/2022 02:20:00 | 00d 00:10:00.0 | 64.9 | 78.9 | 59.1 |
| 29/11/2022 02:30:00 | 00d 00:10:00.0 | 64.2 | 77.9 | 59   |
| 29/11/2022 02:40:00 | 00d 00:10:00.0 | 63.7 | 81.2 | 58   |
| 29/11/2022 02:50:00 | 00d 00:10:00.0 | 64.3 | 78.7 | 59.1 |
| 29/11/2022 03:00:00 | 00d 00:10:00.0 | 64   | 81.3 | 58.1 |
| 29/11/2022 03:10:00 | 00d 00:10:00.0 | 64.6 | 82.5 | 58   |
| 29/11/2022 03:20:00 | 00d 00:10:00.0 | 65.7 | 86.4 | 57.5 |
| 29/11/2022 03:30:00 | 00d 00:10:00.0 | 69.2 | 91.2 | 58.8 |
| 29/11/2022 03:40:00 | 00d 00:10:00.0 | 73.9 | 97.7 | 57.4 |
| 29/11/2022 03:50:00 | 00d 00:10:00.0 | 63.6 | 84.4 | 57.8 |
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| 29/11/2022 04:10:00 | 00d 00:10:00.0 | 65.9 | 82.1 | 57   |
| 29/11/2022 04:20:00 | 00d 00:10:00.0 | 65   | 79.5 | 57.1 |
| 29/11/2022 04:30:00 | 00d 00:10:00.0 | 65.1 | 85   | 56.3 |
| 29/11/2022 04:40:00 | 00d 00:10:00.0 | 61.9 | 79.6 | 52.2 |
| 29/11/2022 04:50:00 | 00d 00:10:00.0 | 62.1 | 75   | 53.4 |
| 29/11/2022 05:00:00 | 00d 00:10:00.0 | 62.2 | 79.1 | 51.9 |
| 29/11/2022 05:10:00 | 00d 00:10:00.0 | 63.4 | 76.2 | 52.7 |
| 29/11/2022 05:20:00 | 00d 00:10:00.0 | 61.2 | 79.4 | 51.7 |
| 29/11/2022 05:30:00 | 00d 00:10:00.0 | 61.5 | 78.2 | 51.6 |
| 29/11/2022 05:40:00 | 00d 00:10:00.0 | 59.9 | 76   | 51.6 |
| 29/11/2022 05:50:00 | 00d 00:10:00.0 | 66   | 92.8 | 51.4 |
| 29/11/2022 06:00:00 | 00d 00:10:00.0 | 62.3 | 79.4 | 51.8 |
| 29/11/2022 06:10:00 | 00d 00:10:00.0 | 67.6 | 91.9 | 51.5 |
| 29/11/2022 06:20:00 | 00d 00:10:00.0 | 65.4 | 81.4 | 52.1 |
| 29/11/2022 06:30:00 | 00d 00:10:00.0 | 61   | 75.4 | 52.4 |
| 29/11/2022 06:40:00 | 00d 00:10:00.0 | 63.9 | 84.5 | 52.8 |
| 29/11/2022 06:50:00 | 00d 00:10:00.0 | 65   | 84.1 | 52.7 |
| 29/11/2022 07:00:00 | 00d 00:10:00.0 | 64.8 | 80.8 | 52.7 |

|                     |                |      |      |      |
|---------------------|----------------|------|------|------|
| 29/11/2022 07:10:00 | 00d 00:10:00.0 | 66.6 | 82.2 | 53.5 |
| 29/11/2022 07:20:00 | 00d 00:10:00.0 | 65.4 | 82.2 | 53.3 |
| 29/11/2022 07:30:00 | 00d 00:10:00.0 | 65.2 | 84.8 | 54.6 |
| 29/11/2022 07:40:00 | 00d 00:10:00.0 | 67.6 | 83.8 | 55.6 |
| 29/11/2022 07:50:00 | 00d 00:10:00.0 | 67.6 | 83.6 | 55.2 |
| 29/11/2022 08:00:00 | 00d 00:10:00.0 | 67.4 | 83   | 56.2 |
| 29/11/2022 08:10:00 | 00d 00:10:00.0 | 68.2 | 83.4 | 57   |
| 29/11/2022 08:20:00 | 00d 00:10:00.0 | 68   | 83.3 | 57.7 |
| 29/11/2022 08:30:00 | 00d 00:10:00.0 | 68.1 | 85.5 | 56.8 |
| 29/11/2022 08:40:00 | 00d 00:10:00.0 | 71.2 | 91.3 | 59.4 |
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| 29/11/2022 09:00:00 | 00d 00:10:00.0 | 68.4 | 81   | 58.2 |
| 29/11/2022 09:10:00 | 00d 00:10:00.0 | 69.3 | 85.9 | 59   |
| 29/11/2022 09:20:00 | 00d 00:10:00.0 | 68.7 | 81.4 | 59   |
| 29/11/2022 09:30:00 | 00d 00:10:00.0 | 70.3 | 84.4 | 61.1 |
| 29/11/2022 09:40:00 | 00d 00:00:02.6 | 63.3 | 64.8 | 62.6 |

## **APPENDIX C**

### **PLANT LAYOUT DRAWING**

