Hydrock now Stantec

Technical design note

Project name	19 King Street, Manchester		
Design note title	Discharge of Condition 3b)		
Document reference	36953-HYD-XX-XX-TN-Y-1001		
Author	Ben Lee, BSc, MSc, AMIOA		
Revision	P02		
Date	11 June 2025	Approved	✓

1. Introduction

1.1 Overview

Hydrock were appointed by Cushman & Wakefield to carry out a Noise Impact Assessment, '36953-HYD-XX-XX-Y-RP-1001' (hereafter referred to as the 'NIA'), for the installation of two louvres and four new air conditioning units on the rear elevation of 19 King Street, Manchester, M2 6AW (the Site).

The NIA assessed the potential for noise impact associated with the proposals at the nearest Existing Sensitive Receptors (ESRs) in accordance with BS4142 and Manchester City Council (MCC) guidance. The NIA concluded that the combined rating level from the fixed plant and louvres would be 6 dB below the background sound level at the nearest ESR. A rating level of 6 dB less than the background sound level complies with MCC's requirement of the rating level being at least 5 dB below the background sound level at the nearest ESR.

Hydrock have now been appointed to carry out post-completion testing, in order to discharge Condition 3b) attached to the Decision Notice (140223/FO/2024). This report summarises a validation survey of specific sound levels associated with the installation in-situ, with a view to discharging Condition 3b).

Condition 3b) states:

> *3)...*
>
> *b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.*

1.2 Additional Survey and Revisions

An initial attended sound survey was conducted on 29th January 2025, with measurements taken between approximately 14:15hrs and 14:30hrs. At the time of the survey, only one of the four condenser units was operational. As a result, the predicted combined specific sound level at the nearest ESR was calculated based on the measured level from the single unit, with assumptions made to predict the contribution of the remaining units.

Following consultation with the Environmental Health Officer (EHO), it was requested that the specific sound level be directly measured at the ESR with all four condenser units operating simultaneously and confirmation be given that the plant installed aligns with the specification of the proposed plant set out in the NIA.

This document represents the second issue of the technical note and incorporates the necessary updates to discharge the Condition 3b), including an updated sound survey and assessment.

2. Specific Sound Survey

2.1 Survey Methodology

Two noise surveys have been carried out associated with the discharge of Condition 3b), as follows:

- 29th January 2025: Specific and residual noise measurements were taken in proximity to the condenser units, between approximately 1415-1430; and,
- 28th May 2025: Specific and residual noise measurements were taken in proximity to the condenser units and the nearest ESR, between approximately 1415 and 1545hrs.

Monitoring equipment was set up to measure A-weighted, time-equivalent, one-third octave band sound pressure levels for the duration of the survey. Sound measurements were carried out using a Class 1, integrating sound level meters.

Sound level meters were calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the sound survey. No significant drift in calibration was noted during the survey (≤ 0.5 dB).

All sound monitoring was carried out in suitable weather conditions, with wind speeds less than 5m/s and no precipitation, and in accordance with British Standard 7445-2 - *Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use*, where appropriate.

January Survey

As identified in the NIA, Mayo Street contains various fixed plant items, associated with other properties, which contribute significantly to the noise environment. Multiple fixed plant items are located on the façade opposite the new plant configuration for 19 King Street, in some cases less than one meter away.

Therefore, in order to obtain a reliable noise measurement of the condenser units, this validation survey involved the measurement of the source Sound Pressure Levels (SPLs) in close proximity to the unit located furthest from any existing fixed plant units at neighbouring properties, in order to minimise any interference.

One measurement was taken at a distance of 0.7m perpendicular from the centre of the unit whilst the single condenser unit was operating at a typical capacity, as instructed to the occupiers of the property. The three other fitted plant items were not in operation and were inaccessible due to the scaffolding installation.

Any anomalous events or transient noise sources were identified and eliminated from the dataset.

May Survey

During this survey, all four units were accessible and were confirmed to be operational with the premises representatives.

To obtain a representative measurement of the combined output from the new fixed plant installation at source, a microphone was positioned approximately 4 m above ground level, at a perpendicular distance of around 0.7 m from the front edge of the condenser units.

This location was selected to be as close as practicable to the overall centre of the four units. While the two central units were closer to the microphone than the outer units, the position intended to provide a balanced representation of the overall fixed plant sound level.

Measurements were taken over a 15-minute period with all four units operating simultaneously to obtain an ambient level, followed by a second 15-minute measurement in the same position with all units switched off to capture the residual sound level. To isolate the specific contribution of the new plant and determine the specific sound level, logarithmic subtraction of the residual level from the overall ambient level was carried out.

The microphone was then relocated to the nearest Existing Sensitive Receptor (ESR), where the same procedure was repeated i.e. 15 minutes with all units operating, followed by 15 minutes with all units switched off, to establish ambient and residual levels.

A photograph of the manufacturer's information attached to the installed condenser units was also taken, in order to provide supporting evidence.

Following analysis of the survey data it's apparent that the four units were not operating at full duty, which discussed further in Section 2.2.

Any anomalous events or transient noise sources were identified and eliminated from the dataset.

2.2 Survey Data Limitations

Despite confirmation with the premises that the four condenser units were operating at full duty during the May survey, analysis of the measured data indicated that the measured ambient levels were significantly lower than measured of a single unit during the January survey. This highlighted that, by comparison with the measured ambient noise levels during the January survey, the units were not operating at full duty.

It's considered that, while the units were not operating at full duty, they were operating at a typical level, which is dependant upon ambient temperature, since the system is used for heating and cooling of the premises.

Measurements were carried out in the vicinity of the ESR at the request of the EHO, however it's not possible to determine a comparison of specific level from condenser units to background level when measuring ambient and/or residual levels at a receptor location, as required for the discharge of Condition 3b). Results are presented herein to be complete.

Subsequently, this assessment is mostly based on the data established during the January sound survey, as these levels represent a reliable sound level associated with each condenser unit, as discussed further in Section 3.

2.3 Summary of Measured Specific Sound

A summary of the specific level associated with an individual condenser unit, measured during the January survey, is set out in **Table 1**.

Table 1: Summary of Measured Source Sound Levels from Condenser Units

Description	Sound Level, dB L_{Aeq}
Ambient Level at 0.7m	61
Residual Level at 0.7m	55
Specific Level at 0.7m of single unit	60

Table 1 demonstrates that the measured specific sound level associated with a single condenser unit is 60dB(A).

Ambient and residual sound levels measured in the vicinity of the nearest ESR during the May survey, is set out in **Table 2**.

Table 2: Summary of Measured Sound Levels in the Vicinity of the Nearest ESR

Description	Sound Level, dB L_{Aeq}
Ambient level at ESR	52
Residual Level at ESR	51
Specific Level at ESR	45*

* A reliable specific level at the ESR cannot be established in accordance with BS4142 because there is <3dB difference between ambient and residual levels.

Table 2 provides a specific level from the condenser units when in operation during the survey derived from the measured ambient and residual levels. Given that there is less than 3dB level difference between ambient and residual it's not possible to establish a reliable specific level at this location, in accordance with BS4142.

Therefore, specific levels must be established at another location or by other means must be used, as recommended by BS4142, in in this case, the specific levels in **Table 1** provide a more reliable specific level, and form the basis for this assessment.

3. Noise Impact Assessment

3.1 Summary of Prescribed Rating Level Limit

A summary of the calculated rating level based on manufacturers data sheets, together with measured background sound level and associated rating level limit, as defined by the requirements of MCC, which were presented in the NIA, are set out in **Table 3**.

Table 3: Summary of Sound Levels Stated in NIA

Description	Sound Level, dB L_{Aeq}
Calculated Rating Level of Fixed Plant at ESR	46
Background Sound Level at ESR	52
Rating Level Limit	47

3.2 Comparison of Measured and Manufacturer Plant Noise Levels

The SWL of each plant unit has been derived from the level of a single plant unit measured during the January survey. A comparison of measured SWLs and SWLs published by the manufacturer is presented in **Table 4.**

Table 4: Comparison of Proposed and Measured Cumulative Sound Power Levels

Description	SWL from Manufacturer Data Sheet, dB(A)	SWL derived from Measured Data, dB(A)	Level Difference, dB
SWL of single plant unit	67	65	-2

Table 4 shows that the measured specific sound level from the condenser units is 2dB lower than the manufacturer's specifications for the units. This is considered verifies that the sound emissions from each unit accords with the published data sheets.

3.3 Summary of Noise Level Validation

The client has confirmed that the installed plant matches the specification outlined in the NIA, which has been verified to be Toshiba RAV-GP1101AT-E on site. A photograph of the manufacturer's information attached to the installed condenser units was also taken, provided as supporting evidence in **Appendix A**.

Therefore, it's considered that these survey results provide a reliable representation of the typical sound levels emitted from each condenser unit. This provides sufficient verification that the results of the NIA represent a robust assessment and demonstrate that the combined rating level from the installed condenser units does not exceed the rating level limit of 47dB(A) in situ.

This is considered to provide sufficient evidence for the discharge of Condition 3b).

4. Conclusion

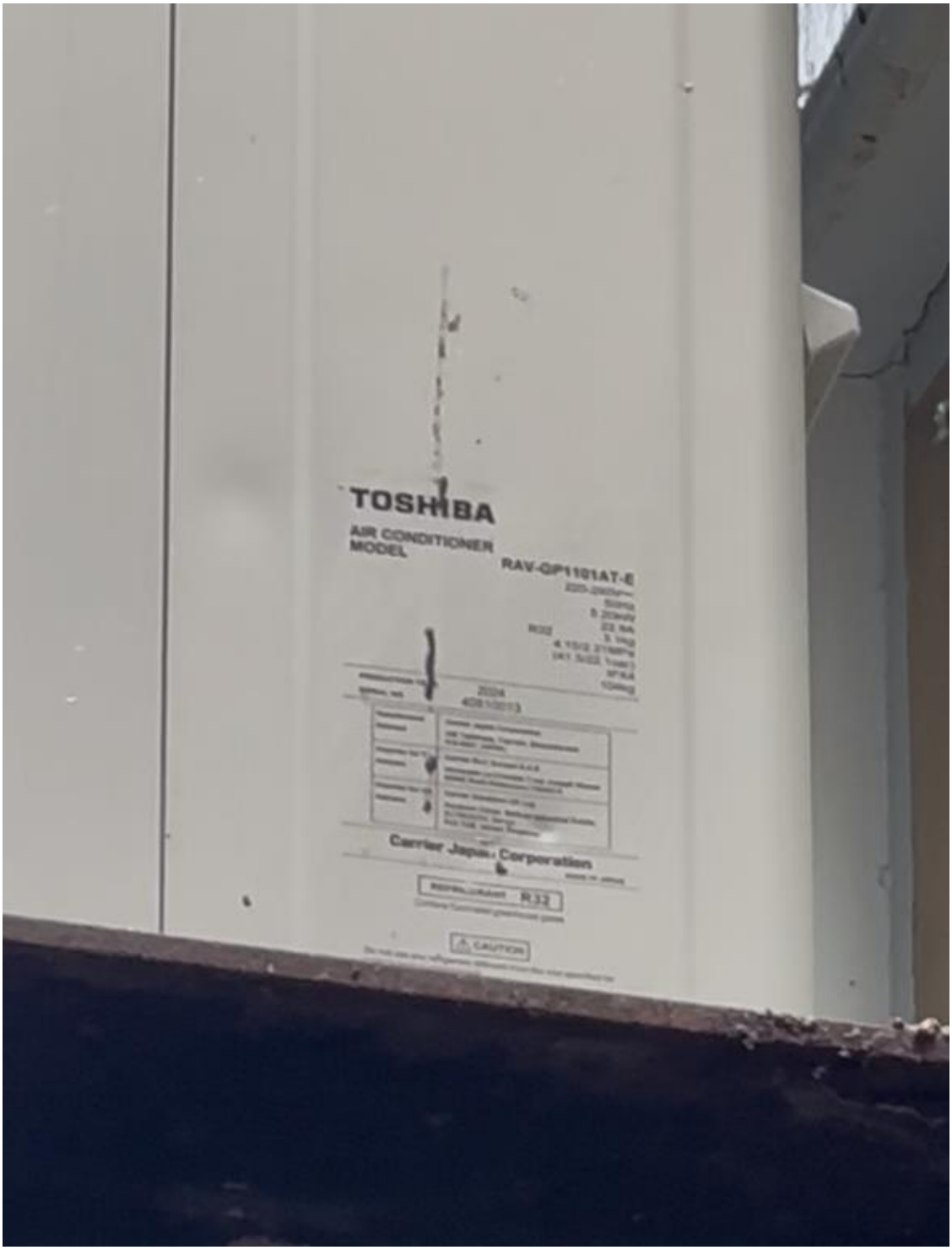
Hydrock have been appointed to carry out a validation survey of the plant installation at 19 King Street, Manchester, M2 6AW in order to discharge Condition 3b) attached to the Decision Notice.

Two validation surveys have been carried out to measure the specific sound level of the fixed plant configuration, in order to validate the ensure that noise emissions do not exceed 47dB(A) at the nearest Existing Sensitive Receptor and subsequently the requirements of Manchester City Council are achieved.

It has been confirmed that the installed condenser units at the premises correspond with the units considered in the Noise Impact Assessment, as verified by the client and photograph provided in this report. Specific sound levels measured from a condenser unit operating at typical capacity during the survey demonstrates that the in-situ levels are lower than those published by the manufacturer, as considered in the Noise Impact Assessment

This assessment provides sufficient evidence to validate the findings of the Noise Impact Assessment and demonstrates the rating level associated with the installed condenser units is below the 47dB(A) limit, which corresponds to the requirements of Manchester City Council, thus providing sufficient evidence to discharge Condition 3b).

Appendix A – Condenser Unit Picture


TOSHIBA
AIR CONDITIONER
MODEL
RAV-GP1101AT-E
Carrier Japan Corporation
R32
CAUTION