

Project name	2 Waterloo Street, Manchester		
Design note title	Post-Completion Acoustic Validation Note		
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Revision	Revision One		
Date	24 March 2021	Approved	✓

1. INTRODUCTION

1.1 Overview

Hydrock have been appointed to provide acoustic engineering services to support the discharge of Planning Conditions associated with the application for the 'change of use and internal/external works to building to create apartments (11x1 bed and 4x2 bed) (use class C3)', at 2 Waterloo Street Manchester (ref: 111747/FO/2016/C2).

The Conditions associated with the application are set out below:

Condition 11

'The proposed development shall be carried out in accordance with the recommendations in PDA's Acoustic Report (sic) dated 07-09-16 and subject to the following:

Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed in the residential accommodation shall be submitted to and agreed in writing by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation.

Reason - To safeguard the amenities of the occupiers of nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.'

1.2 Context

A noise assessment report has been prepared by Philip Dunbavin Acoustics (PDA), date August 2015, to accompany the planning application. The report sets out a scheme for acoustically insulating the residential accommodation so as to achieve the guideline noise levels set out in British Standard BS8233.

This technical note sets out the results of the post-completion survey at the site, and assess the noise levels for validation purposes.

2. METHODOLOGY

2.1 Survey Methodology

Details for the survey methodology are set out below and are based on our previous experience in carrying out acoustic surveys to validate schemes of sound insulation prior to occupation.

- Ambient daytime and night time noise level measurements within 10% of apartments (No. 3 apartments), covering a full weekday 16-hour daytime and 8-hour night time period, with MVHR units switched off; and,
- Ambient measurement inside apartments with MVHR units turned on at typical capacity, for approximately 30-minutes during the quiet daytime, to establish the specific level of the HVAC noise within each room.

Due to the Government imposed restrictions on travel caused from Coronavirus, a tolerance/correction factor may be considered for the noise levels to account for the reduction in the volume of road traffic. However, the development is located away, and not in direct line of sight from the main road, with only Waterloo Street and Harter Street located adjacent to the development. The change in the volume of road traffic on only these roads will be insignificant, and therefore the change in noise level will be negligible.

2.2 Internal Noise Levels

The scheme for acoustically insulating the scheme, as set out in PDA's Acoustic Report, is based on British Standard BS8233: 2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'.

- 35dB $L_{Aeq,16hour}$ within living Rooms and bedrooms (daytime 23.00 – 07.00)
- 30dB $L_{Aeq,8hour}$ within bedrooms (night-time 23.00 – 07.00)
- 45dB $L_{A_{Max,F}}$ within bedrooms (night-time 23.00 – 07.00)

Individual maximum noise events should not normally exceed 45dB $L_{A_{Max,F}}$ more than 15 times)

3. NOISE SURVEY

3.1 Survey Procedure

Noise surveys have been carried out at the development site by Hydrock between the 2nd and 3rd March 2021, and a total of three monitoring locations (MLs) were carried out.

In accordance with British Standard 7445, the A-weighted, time-equivalent, one-third octave band sound pressure levels have been measured, together with the L_{min} , L_{Fmax} , L_{10} and L_{90} indices. The measurements were carried out with Class 1 integrating sound level meters with the microphone placed vertically on a tripod.

The sound level meters were calibrated both before and on completion of the noise surveys. No drift in calibration occurred greater than 0.5dB.

The monitoring locations are illustrated on **Figure 1** and are detailed in **Table 1**.

Table 1: Noise Monitoring Locations

Monitoring No.	Location	Time Period	
		Start	End
ML1	Located within studio room 101, adjacent to Harter Street, and on the first-floor.	02/03/2021 1630hrs	03/03/2021 1915hrs
ML2	Located within a bedroom of room 102, adjacent to Waterloo Street, and on the first-floor.	02/03/2021 1600hrs	03/03/2021 1915hrs
ML3	Located within the living rooms of room 202, on the corner of both Harter Street and Waterloo Street, and on the second-floor.	02/03/2021 1600hrs	03/03/2021 1930hrs

3.2 Existing Noise Levels

The measured ambient noise levels during the daytime and night-time, together with the maximum measured noise level during the night-time, within each room, are set out in full in **Appendix A** and are summarised in **Table 2**.

The assessment of the maximum noise levels is based on the typical and representative maximum noise level as specified by both The World Health Organisation's 'Guidelines for Community Noise, 1999' (WHO), and 'Professional Practice Guidance: Planning and Noise, 2017 (ProPG)', which state that an allowance can be made for up to the 10th highest maximum measured noise level. Therefore, a typical and representative maximum noise level has been set out in **Table 2** below.

Table 2: Measured Ambient Noise Levels within Rooms

Monitoring Location	Daytime Noise Levels, dB LAeq,16hour	Night-time Noise Levels dB LAeq,8hour	Night-time Max Noise Levels dB LAmax,F
ML1 i.e., room 101	31	29	40
ML2 i.e., room 102	30	24	41
ML3 i.e., room 202	31	28	41

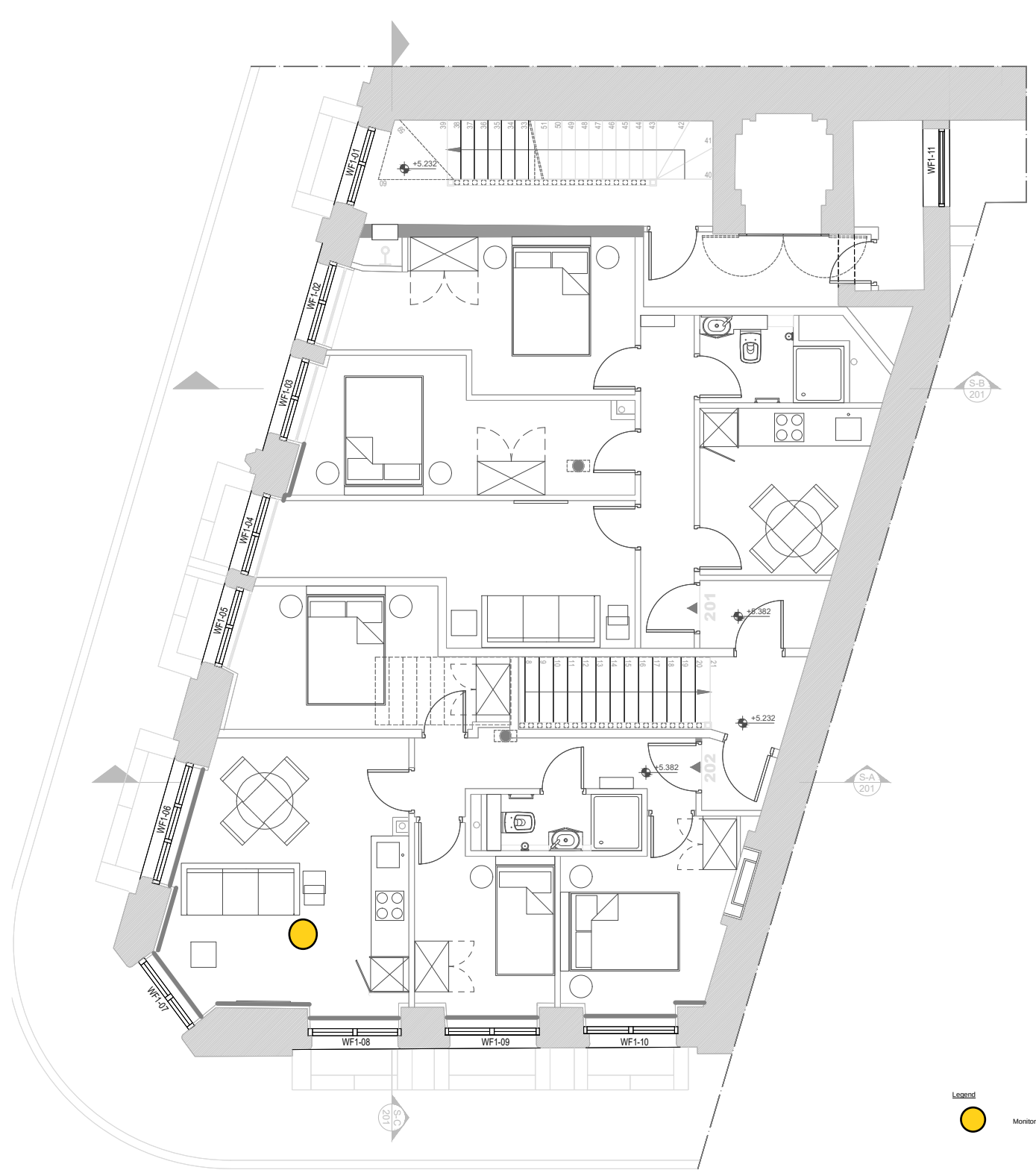
The measured noise level with the MVHR turned on in each of the rooms is set out in **Table 3**.

Table 3: Specific Noise Levels of HVAC within Rooms

Room 101, dB(A)	Room 102, dB(A)	Room 202, dB(A)
30	25	29



Ground floor



1st Floor Plan

Legend
Monitoring Location

NOTES:

1. ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS' AND SERVICE ENGINEERS' DRAWINGS AND SPECIFICATIONS. THIS DRAWING IS COPYRIGHT.

P01	29/01/2020	1st Floor Monitoring Locations	EG	JS
Rev	Date	Description	By	Ckd

Client :
Beech Design and Build

Architect :

Project Title:
2 Waterloo Street, Manchester

Drawing Title:
Noise Monitoring Locations

AS BUILT

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Hydrock Job No:
18860

Drawn: JS	Checked: LS	Scale @ A1: NTS	Date: March 2021	Issue Date: 24/03/2021
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Drawing Number: Figure 1	Revision: P01
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4. NOISE ASSESSMENT

4.1 Assessment of Internal Noise Levels

The recommended internal noise level within living rooms and bedrooms during the daytime is 35dB $L_{Aeq,16hour}$, and the recommended level within bedrooms during the night-time is 30dB $L_{Aeq,8hour}$ and 45dB $L_{Amax,F}$, as set out by BS8233.

Measurements were carried out in one studio apartment, one bedroom and one living room. All assessment criteria therefore apply for the studio apartment (R101) and bedroom (R201), however, only the daytime criteria apply for the living room (R202).

The results in **Table 2** show that the daytime $L_{Aeq,16hour}$, night-time $L_{Aeq,8hour}$ and $L_{Amax,F}$ noise levels are below the respective guideline levels in each of the apartments.

The results of the assessment have shown the daytime and night-time noise levels within noise sensitive rooms satisfy national guidance. Therefore, the installed scheme of insulation is sufficient in mitigating internal noise ingress, discharging Condition 11.

4.1.1 Internal Noise from Building Services

The measured noise levels in **Table 3** indicate that noise from the building services, in each apartment, are below the BS8233 night-time guideline level, indicating a low noise impact.

5. CONCLUSION

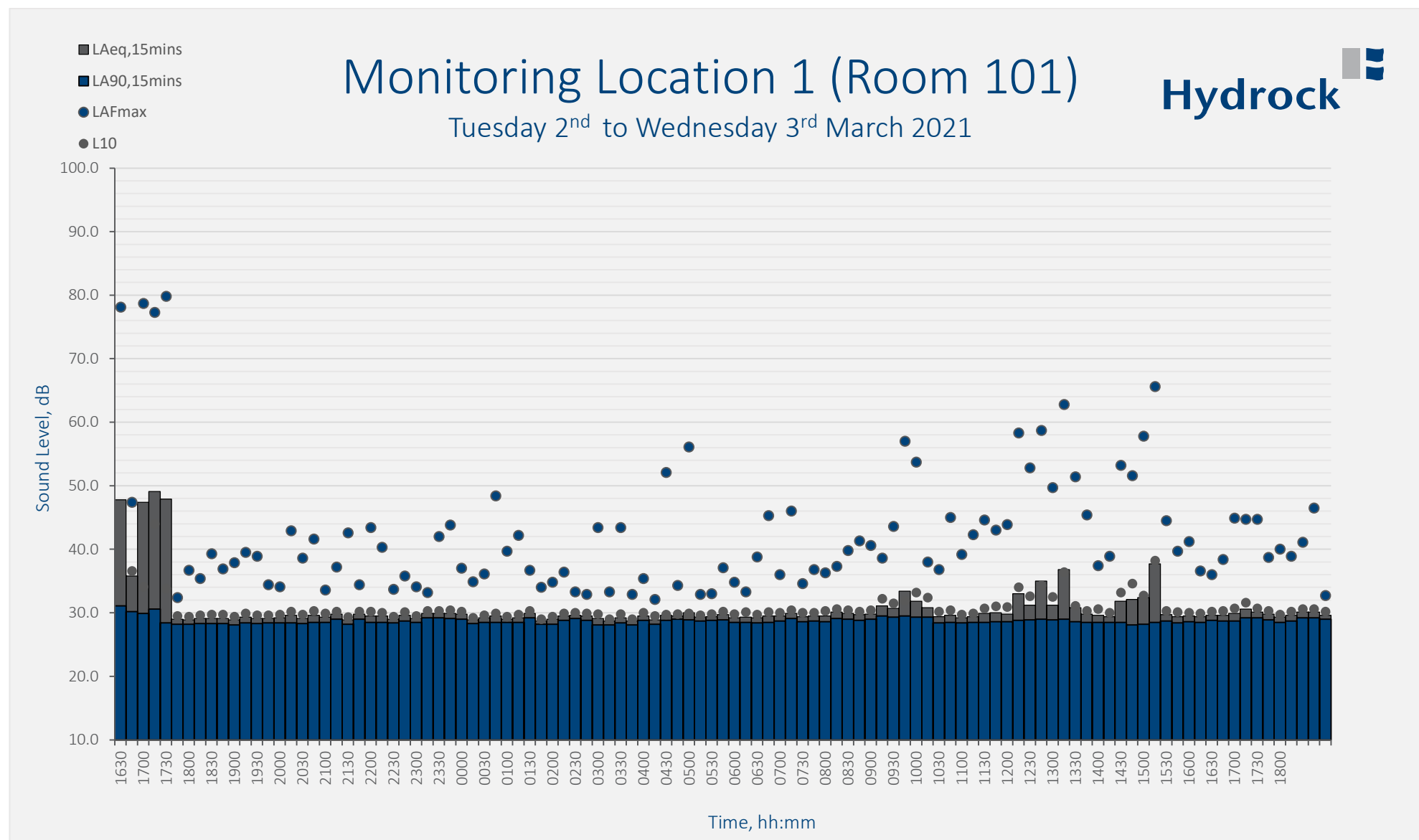
Hydrock has carried out a post-completion noise survey at 2 Waterloo Street, Manchester to validate the scheme of insulation and to show the noise levels achieve their criteria, thereby discharging the associated planning conditions relating to noise.

Measurements were taken within 10% of the constructed apartments, and the internal noise levels have been assessed against the criteria set out in BS8233.

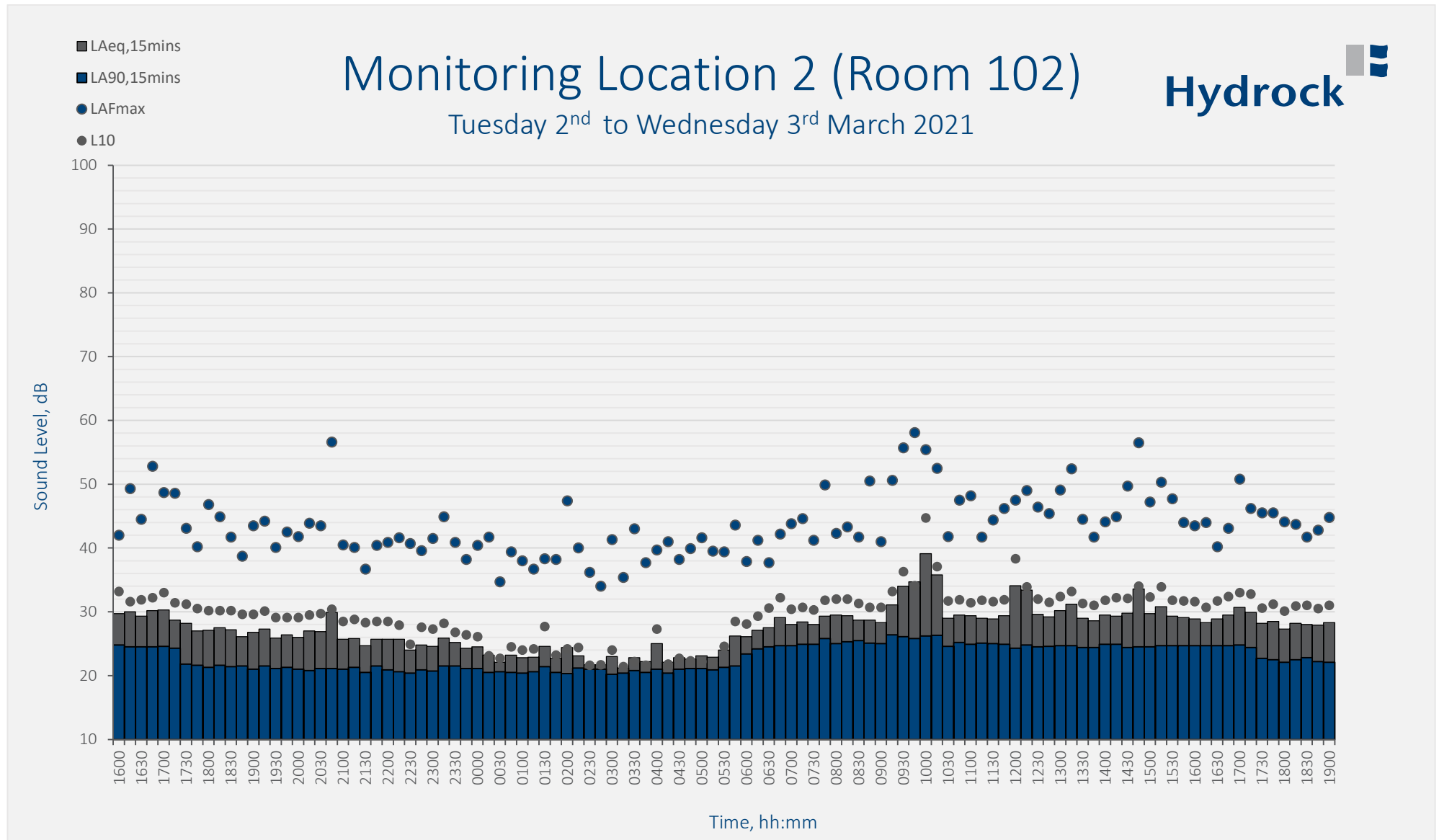
The results of the assessment show that the daytime and night-time noise levels are below the recommended guideline criteria, indicating a low noise impact. The scheme of insulation for the apartments is therefore sufficient, discharging Condition 11.

Appendix A – Noise Monitoring Results

TECHNICAL NOTE



TECHNICAL NOTE



TECHNICAL NOTE

