



11 BURTON PLACE
NOISE LEVELS FOR LIVE-WORK USE
Acoustics Report A1834 R01
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Report for:

Q2 Architects
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1 Introduction

Ion Acoustics is appointed by Q2 Architects to assess noise levels for the proposed conversion of a ground floor office to a live-work unit which will feature a retained office at the front and a studio flat at the rear. The scheme has been granted planning permission subject to various conditions including Nos 3a and 3b which relate to internal and external noise levels in the living accommodation.

This report describes a noise survey carried out to determine existing noise levels in the rear of the unit and in the external amenity space.

2 Scheme Details

The proposed approved layout is shown in Figure 1 below together with the measurement positions used for the noise survey.

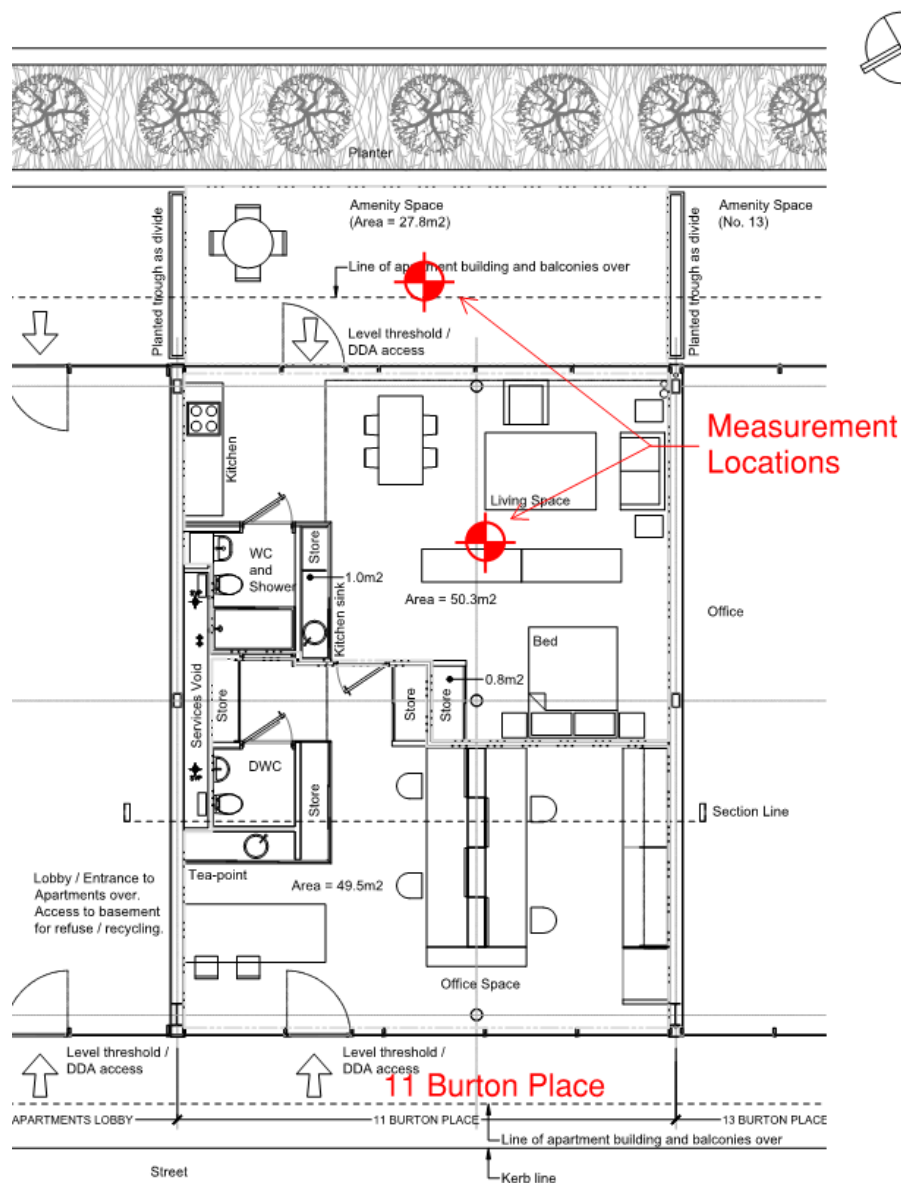


Figure 1 – Proposed Layout Showing Internal and External Measurement Positions

2.1 Planning Condition No 3.

Planning condition 3 addresses noise as follows:

3) a) Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise from the adjacent office and the basement car park shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises. The approved noise insulation scheme shall be completed before any of the dwelling units are first occupied.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB L_{Aeq} (individual noise events shall not exceed 45 dB $L_{Amax,F}$ by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB L_{Aeq}

Gardens and terraces (daytime) 55 dB L_{Aeq} .

b) Prior to first occupation of the residential units, a verification report to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report shall be submitted to and approved in writing by the City Council as local planning authority. The report shall include post completion testing to confirm that the internal 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 internal noise criteria. Those measures shall be implemented in full before any of the dwelling units are first occupied.

Reason - To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance.

Condition 3a requires a scheme to be submitted with details of the noise insulation measures which would be required to achieve the internal noise criteria stated in the condition, whereas condition 3b requires a post-completion verification report.

The noise limits are set in terms of the L_{Aeq} and L_{Amax} parameters. The L_{Aeq} is defined as the steady-state noise level with the same energy as the actual fluctuating noise. It is effectively the average noise level. The L_{Amax} is simply the highest noise level during the period and would relate to specific noise events.

In this case, the baseline measurements have shown that existing noise levels already meet the condition, such that no scheme of sound insulation measures or mitigation work is required. Therefore, this report seeks to address both conditions and can serve as the verification report.

3 Noise Survey

A noise survey was carried out from 2nd to 3rd November 2021 to measure baseline levels in the rear of the office space as shown in Figure 1. Short-term external noise measurements were made also on 2nd and 3rd November 2021.

3.1 Internal Noise Levels

Internal logging noise measurements were carried out using a Rion NL52 sound level meter calibrated by a Brüel & Kjær Type 4231 sound level calibrator. The microphone was set up in

the centre of the room on a tripod and set to log various noise indices in 10-minute periods. A 24-hour measurement was carried out from 2nd to 3rd November 2021 although some measurement samples were discarded due to the engineer's movements in the room. The room was not occupied except for the set up and collection. The meter was set up to record audio so that noise sources could be identified.

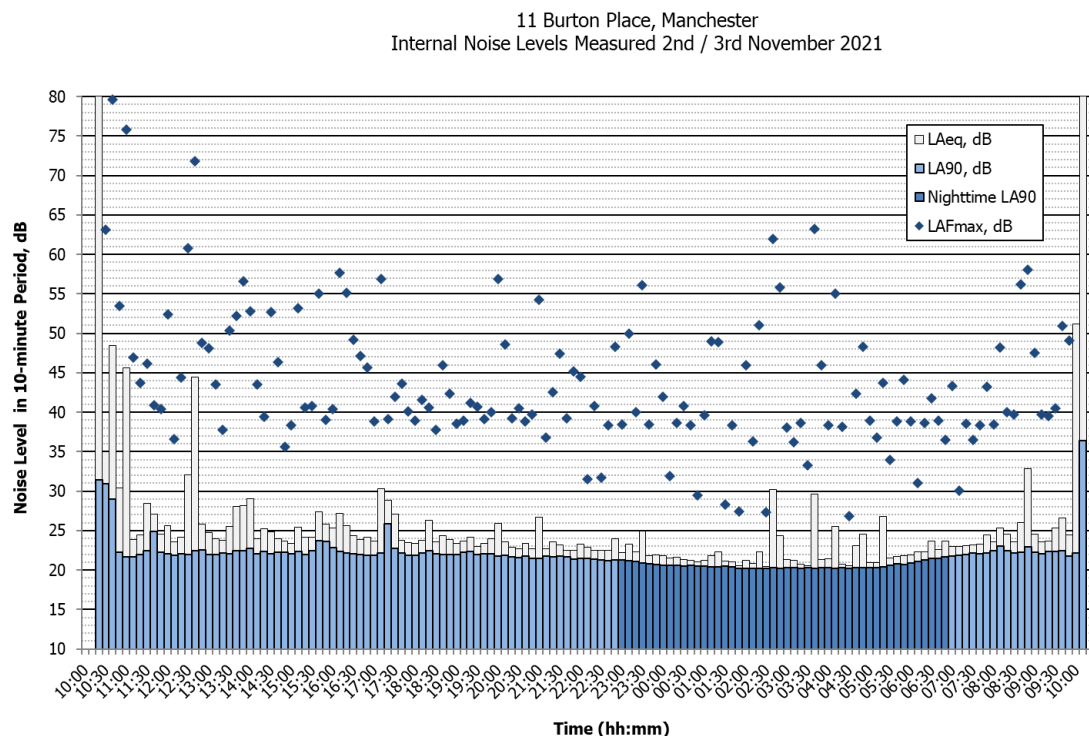
3.2 External Noise Levels

External noise levels were measured briefly on 2nd and 3rd November using a Norsonic 140 sound level meter. Two 10-minute samples were logged on both days. This was again calibrated by the Brüel & Kjær Type 4231 sound level calibrator.

4 Noise Results

4.1 Internal Noise Measurements

The internal noise levels are shown graphically below in Figure 2. Appendix A provides this data in tabular form.



It can be seen that L_{Aeq} and L_{A90} levels are very low in the existing building however there are various L_{Amax} events above 45 dB L_{Amax} . There are a total of 13 such periods with noise levels 45 dB L_{Amax} during the night period and therefore the Council's criterion of no more than 15 events is complied with. The source of these events is unknown, but from observations on site at set up and collection it is likely to be something within the unit itself such as a door closing or creaking or perhaps a valve closing or something else with the flat. The events are very short in duration and therefore do not unduly influence the L_{Aeq} noise levels for the night. The events exceeding 45 dB L_{Amax} do not relate to noise from the basement car park or external sources and therefore there is no mitigation required.

Ignoring the start and end periods where high noise levels occur from the engineer within the unit, the daytime and night-time averages are shown in Table 1 below in terms of the L_{Aeq} and L_{A90} noise indices. The latter relates to the background noise which is the steady underlying noise in the absence of short-term events. When the background noise and L_{Aeq} are very close (such as here) it indicates a stable noise climate without significant short-term events.

Table 1 – Daytime and Night-time Internal Noise Levels

Period	No of Samples	Noise Limit (dB L_{Aeq})	L_{Aeq} dB (logarithmic average)	L_{A90} dB (arithmetic average)
Daytime	91	35 dB L_{Aeq}	30.2	24.0
Night-time	48	30 dB L_{Aeq}	23.1	20.6

It can be seen that the Council's L_{Aeq} noise limits are complied with a good margin. The building envelope sound insulation is therefore adequate and there is no mitigation work required.

4.2 External Survey

The external survey results are shown below.

Table 2 External Noise Levels

Time	Duration (mins)	L_{Aeq} dB	L_{Amax} dB	L_{A90} dB
02/11/2021 10:26	10	47.3	57.5	44.7
02/11/2021 10:36	10	46.8	53.5	44.4
03/11/2021 10:21	10	47.3	65.2	43.2
03/11/2021 10:31	10	48.2	78.3	43.6

The amenity area is in a sheltered location which is removed from local roads and other sources. Noise from distant traffic could be heard. Trams and aircraft movements were also noted.

The planning condition sets a noise limit of 55 dB L_{Aeq} 16-hour. Although only a few samples were logged, the levels are well below the limit and noise levels were consistent across the two days. The measurements were made at what is expected to be a fairly busy time and noise levels will reduce during the evening. The 55 dB L_{Aeq} criterion will be met comfortably.

5 Conclusions

Baseline noise measurement survey has been carried out at 11 Burton Place to assess against numerical criteria stated in the planning condition.

The measurements have found that the noise levels in the unit already comply with the planning condition noise limits. As such there is no need to provide a mitigation scheme in terms of Condition 3a and the measurement can also serve as verification exercise in accordance with Planning condition 3b. In summary, the noise limits in the planning condition are already met, mitigation measures are not required and planning condition 3 can be discharged.

11 BURTON PLACE Noise Levels for Live-Work Use



Appendix A – Tabulated Data

Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB	Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB
02/11/2021 10:20	80.8	111.5	31.4	02/11/2021 18:20	26.3	40.6	22.5
02/11/2021 10:30	35.0	63.1	30.9	02/11/2021 18:30	23.6	37.8	22.1
02/11/2021 10:40	48.5	79.6	29.0	02/11/2021 18:40	24.4	46.0	22.0
02/11/2021 10:50	30.4	53.5	22.3	02/11/2021 18:50	23.9	42.4	22.0
02/11/2021 11:00	45.6	75.8	21.7	02/11/2021 19:00	23.4	38.6	22.0
02/11/2021 11:10	23.9	46.9	21.7	02/11/2021 19:10	23.7	38.9	22.3
02/11/2021 11:20	24.5	43.7	22.0	02/11/2021 19:20	24.2	41.2	22.4
02/11/2021 11:30	28.5	46.2	22.5	02/11/2021 19:30	23.0	40.7	22.0
02/11/2021 11:40	27.1	40.9	24.9	02/11/2021 19:40	23.4	39.1	22.1
02/11/2021 11:50	24.6	40.4	22.3	02/11/2021 19:50	24.0	40.0	22.1
02/11/2021 12:00	25.6	52.4	22.1	02/11/2021 20:00	25.9	56.9	21.8
02/11/2021 12:10	23.6	36.6	21.9	02/11/2021 20:10	23.6	48.6	21.9
02/11/2021 12:20	24.2	44.4	22.1	02/11/2021 20:20	22.9	39.2	21.7
02/11/2021 12:30	32.1	60.8	22.0	02/11/2021 20:30	22.7	40.5	21.6
02/11/2021 12:40	44.5	71.8	22.5	02/11/2021 20:40	23.4	38.8	21.8
02/11/2021 12:50	25.8	48.8	22.6	02/11/2021 20:50	22.7	39.7	21.5
02/11/2021 13:00	24.7	48.1	22.0	02/11/2021 21:00	26.7	54.3	21.5
02/11/2021 13:10	24.0	43.5	22.0	02/11/2021 21:10	22.7	36.8	21.8
02/11/2021 13:20	23.8	37.8	22.2	02/11/2021 21:20	23.6	42.6	21.7
02/11/2021 13:30	25.5	50.4	22.1	02/11/2021 21:30	23.2	47.4	21.8
02/11/2021 13:40	28.1	52.2	22.5	02/11/2021 21:40	22.5	39.2	21.7
02/11/2021 13:50	28.2	56.6	22.5	02/11/2021 21:50	22.5	45.2	21.4
02/11/2021 14:00	29.0	52.8	22.7	02/11/2021 22:00	23.3	44.5	21.5
02/11/2021 14:10	24.0	43.5	22.1	02/11/2021 22:10	22.9	31.5	21.5
02/11/2021 14:20	25.2	39.4	22.4	02/11/2021 22:20	22.5	40.8	21.4
02/11/2021 14:30	24.8	52.7	22.1	02/11/2021 22:30	22.5	31.7	21.3
02/11/2021 14:40	24.0	46.4	22.3	02/11/2021 22:40	22.5	38.4	21.2
02/11/2021 14:50	23.7	35.6	22.3	02/11/2021 22:50	24.0	48.3	21.3
02/11/2021 15:00	23.4	38.4	22.1	02/11/2021 23:00	22.2	38.5	21.3
02/11/2021 15:10	25.4	53.2	22.4	02/11/2021 23:10	23.3	50.0	21.2
02/11/2021 15:20	24.2	40.6	22.0	02/11/2021 23:20	22.3	40.0	21.1
02/11/2021 15:30	24.2	40.8	22.5	02/11/2021 23:30	24.9	56.1	20.9
02/11/2021 15:40	27.4	55.0	23.7	02/11/2021 23:40	21.8	38.5	20.8
02/11/2021 15:50	25.8	39.0	23.6	02/11/2021 23:50	21.9	46.1	20.7
02/11/2021 16:00	25.3	40.4	22.8	03/11/2021 00:00	21.8	42.0	20.6
02/11/2021 16:10	27.2	57.7	22.4	03/11/2021 00:10	21.5	31.9	20.6
02/11/2021 16:20	25.6	55.1	22.2	03/11/2021 00:20	21.6	38.7	20.6
02/11/2021 16:30	24.4	49.2	22.1	03/11/2021 00:30	21.3	40.8	20.5
02/11/2021 16:40	23.9	47.1	22.0	03/11/2021 00:40	21.2	38.4	20.6
02/11/2021 16:50	24.2	45.7	21.9	03/11/2021 00:50	21.0	29.5	20.5
02/11/2021 17:00	23.7	38.8	21.9	03/11/2021 01:00	21.2	39.6	20.5
02/11/2021 17:10	30.3	56.9	22.2	03/11/2021 01:10	21.8	49.0	20.4
02/11/2021 17:20	28.8	39.1	25.9	03/11/2021 01:20	22.3	48.9	20.4
02/11/2021 17:30	27.1	42.0	22.7	03/11/2021 01:30	21.1	28.3	20.5
02/11/2021 17:40	23.8	43.6	22.2	03/11/2021 01:40	21.0	38.4	20.4
02/11/2021 17:50	23.5	40.1	21.9	03/11/2021 01:50	20.6	27.4	20.2
02/11/2021 18:00	23.4	38.9	21.9	03/11/2021 02:00	21.2	46.0	20.2
02/11/2021 18:10	23.8	41.6	22.2	03/11/2021 02:10	20.8	36.3	20.2

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Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB	Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB
03/11/2021 02:20	22.3	51.0	20.2				
03/11/2021 02:30	20.5	27.3	20.2				
03/11/2021 02:40	30.2	62.0	20.3				
03/11/2021 02:50	24.4	55.8	20.2				
03/11/2021 03:00	21.3	38.1	20.3				
03/11/2021 03:10	21.2	36.2	20.3				
03/11/2021 03:20	20.7	38.7	20.2				
03/11/2021 03:30	20.6	33.3	20.3				
03/11/2021 03:40	29.6	63.2	20.2				
03/11/2021 03:50	21.3	46.0	20.3				
03/11/2021 04:00	21.4	38.4	20.3				
03/11/2021 04:10	25.5	55.0	20.2				
03/11/2021 04:20	20.7	38.2	20.3				
03/11/2021 04:30	20.6	26.8	20.2				
03/11/2021 04:40	23.1	42.4	20.3				
03/11/2021 04:50	24.6	48.3	20.3				
03/11/2021 05:00	20.9	38.9	20.3				
03/11/2021 05:10	20.9	36.8	20.3				
03/11/2021 05:20	26.8	43.7	20.4				
03/11/2021 05:30	21.5	34.0	20.6				
03/11/2021 05:40	21.7	38.8	20.8				
03/11/2021 05:50	21.8	44.1	20.7				
03/11/2021 06:00	21.9	38.8	20.9				
03/11/2021 06:10	22.3	31.0	21.1				
03/11/2021 06:20	22.3	38.7	21.3				
03/11/2021 06:30	23.7	41.8	21.5				
03/11/2021 06:40	22.6	38.9	21.5				
03/11/2021 06:50	23.7	36.5	21.7				
03/11/2021 07:00	23.0	43.3	21.8				
03/11/2021 07:10	23.0	30.1	21.9				
03/11/2021 07:20	23.1	38.6	22.0				
03/11/2021 07:30	23.2	36.5	22.2				
03/11/2021 07:40	23.3	38.4	22.1				
03/11/2021 07:50	24.5	43.2	22.2				
03/11/2021 08:00	23.6	38.5	22.5				
03/11/2021 08:10	25.3	48.2	23.0				
03/11/2021 08:20	24.6	40.0	22.5				
03/11/2021 08:30	23.6	39.7	22.2				
03/11/2021 08:40	26.0	56.2	22.3				
03/11/2021 08:50	32.8	58.1	22.9				
03/11/2021 09:00	24.6	47.5	22.3				
03/11/2021 09:10	23.6	39.7	22.1				
03/11/2021 09:20	23.7	39.5	22.4				
03/11/2021 09:30	25.3	40.5	22.4				
03/11/2021 09:40	26.6	50.9	22.5				
03/11/2021 09:50	24.5	49.1	21.8				
03/11/2021 10:00	51.2	80.4	22.2				
03/11/2021 10:10	87.2	115.9	36.4				