



ST JAMES ESTATES LIMITED

11 ST JAMES SQUARE, MANCHESTER

INTERNAL NOISE VERIFICATION REPORT

OCTOBER 2022

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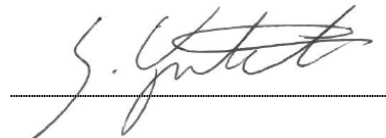


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EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) has carried out noise measurements to determine the internal sound level within the completed apartments at 11 St James Square, Manchester. This assessment has been prepared to accompany an application to discharge Condition 3b of the Prior Approval reference 122770/P3OPA/2019 and Condition 5b of the Planning Approval reference 123025/FO/2019, for the redevelopment of 11 St James Square, Manchester.

The internal noise measurements were undertaken within the studio apartments of the completed and partially occupied development. Therefore, the noise measurements included noise from both external noise sources and internal noise sources, which include all building services.

The internal sound levels have been measured in apartments during the daytime for a period of 30 minutes per apartment. With the exception of apartment 48, the measured sound level during the daytime, in apartments, is equal to or less than the guideline value of 35dB L_{Aeq} .

In addition, the internal sound level has been measured in apartments during the night-time for a period of 30 minutes per apartment. With the exception of apartments 24 and 60, the measured sound level, in apartments, during the night-time is equal to or less than the guideline value of 30dB L_{Aeq} .

The corresponding measurements carried out during the night-time in apartment 48 and the daytime in apartments 24 and 60 show that the façade of the building is providing a good level of sound attenuation. This indicates that the exceedances are likely to be caused by internal sound sources, such as from occupants, or electrical appliances, and not a failure in the design/build.

Further, there are 3 exceedances of the guideline level of 45dB $L_{Af,Max}$ in Apartment 6, 2 exceedances in Apartment 14, and one exceedance in Apartments 24 and 40. The noise level measurements were undertaken during the busiest part of the night-time, when then $L_{Af,Max}$ is likely to be highest.

In addition, it is generally regarded that 3dB is the limit of a perceived change in sound, therefore a change in the sound level of up to 3dB is not considered to be significant.

Therefore, on balance we would consider that the internal measured sound level is satisfactory in all apartments and noise mitigation measures are not required.

The noise and vibration impact assessment report, which was prepared at the planning stage by WA, dated January 2020, identified that vibration from the adjacent Metrolink line was very low, and significantly below any threshold for an adverse impact. Therefore, internal vibration measurements have not been undertaken, and the vibration level from passing Metrolink trams is anticipated to be very low.

1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP (WA) was instructed by St James Estates Limited to undertake noise measurements to accompany the application to discharge Condition 3b in the Prior Approval (ref: 122770/P3OPA/2019) and Condition 5b in the Planning Approval (ref: 123025/FO/2019), for the redevelopment of 11 St James Square, Manchester into residential accommodation.
- 1.1.2 To the north, the site is bordered by commercial office spaces, with a service yard associated with these offices, together with existing offices at the site and commercial businesses at ground floor level. To the east, the site is bordered by Four Yards (a narrow street), with a mixture of residential apartments and commercial properties beyond which lies the Metrolink tram line on Cross Street. To the south the site is bordered by John Dalton Street with a mixture of commercial and residential properties beyond. The Ape and Apple public house is located approximately 20m to the southwest of the site. To the west the site is bordered by St James Square with commercial properties beyond.
- 1.1.3 The development of 11 St James Square comprises the redevelopment of the upper floors of the former office building to a residential development comprising studio apartments over four floors.
- 1.1.4 Wardell Armstrong prepared a noise assessment report to support the discharge of Condition 5a in July 2019 which specified the glazing and ventilation required to meet internal noise levels. Conditions 3b and 5b require verification sound tests to be carried out, to confirm that the required criteria have been met.
- 1.1.5 Condition 3b states.

“3b) Notwithstanding condition 2 and part a, upon completion and prior to first occupation of the development, a verification report will be required to validate that all agreed mitigation and acoustic insulation measures such as glazing and ventilation recommendation and any building improvements have been implemented and complied with. Validation should include final sound testing to confirm that the internal noise criteria has not been exceeded during day or night time. Any instances of non-conformity with the above criteria shall be detailed along with any measures required to ensure compliance. The report and any necessary measures shall be submitted to and approved in writing by the City Council as Local Planning Authority and the development shall be

implemented in full in accordance with the approved details before the plant is first brought into use.”

1.1.6 Condition 5b states.

“5b) Upon completion of the development and before the new residential use becomes operational, a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the acoustic consultant's report, as will be approved under part a) of this condition. The report shall also undertake post completion testing to confirm that above criteria is 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 noise criteria. The report and any necessary measures shall be approved in writing by the City Council as Local Planning Authority and the development shall be implemented in full in accordance with the approved details before the new use becomes operational.”

1.1.7 The prior approval condition and planning condition both set out the same requirements. Therefore, this report has been prepared to accompany the application to discharge both conditions.

2 ASSESSMENT METHODOLOGY

2.1 Summary of January 2020 Noise and Vibration Assessment Report

- 2.1.1 A noise assessment report was prepared by Wardell Armstrong LLP, dated February 2019 (Report reference GM10442-001), to support the prior approval application for the conversion of the upper floors of the former office building into residential accommodation.
- 2.1.2 The assessment included the measurement of noise at the northern, eastern, and southern facades of the building between 31st January and 5th February 2019. These measured noise levels were used to determine the façade attenuation which would be needed to ensure the following internal noise guideline levels would be achieved.
- Daytime noise levels within living rooms and bedrooms should not exceed 35dB $L_{Aeq,T}$.
 - Night-time noise levels within bedrooms should not exceed 30dB $L_{Aeq,T}$, and 45dB L_{AFmax} more than 15 times (typically).
- 2.1.3 The report identified that vibration from the adjacent Metrolink line was very low, and significantly below any threshold for an adverse impact.

2.2 In-Situ Noise Survey

- 2.2.1 As part of this assessment, Wardell Armstrong LLP has carried out an attended noise survey to assess the current ambient noise levels both internally and externally at the proposed development.
- 2.2.2 Vibration levels were found to be very low, and so internal vibration measurements have not been undertaken.

3 NOISE MEASUREMENT SURVEY

3.1 Introduction

3.1.1 This section of the report details the site conditions, observations, and noise measurements undertaken to show that the as-built development meets the noise guideline levels set-out in in Section 2 above.

3.2 Site Conditions & Observations

3.2.1 All the internal noise measurements were undertaken in studio apartments (combined living and bedroom).

3.2.2 During the noise measurements the studio apartments were furnished and occupied, although there were no residents present in the studio apartments being tested.

3.2.3 All building services were operational at the time of the survey, and any noise from the equipment is included into the noise measurements.

3.2.4 Short periods of noise from internal pipe systems were also observed. Occasional low-level clicking noises from kitchen appliances (e.g. fridge compressors) and door of adjacent apartments were observed for a short duration in the majority of apartments. Low level noise from general activities in adjacent apartments was observed and included movements in adjacent corridors.

3.2.5 Road traffic noise together with pedestrian noise on John Dalton Street was observed internally within the facades facing to the south. External plant (fan) located in the car park area to the north was observed but was barely audible internally with windows closed.

3.2.6 Our site observation indicate that both internal and external sources of noise were contributing to the measured internal sound levels during the measurements.

3.3 Details of Noise Measurements

3.3.1 The noise measurements were undertaken on the 7th and 8th September 2022 during the daytime (1652hrs to 2300hrs) and night-time (2300hrs to 0208hrs)

3.3.2 Wardell Armstrong LLP carried out simultaneous noise monitoring, both internally and externally, at the development to assess the sound attenuation provided by the 'as-built' facade. Details of the surveys undertaken are described in detail in this Section of the report.

- 3.3.3 The internal and external noise measurements were undertaken at the northern, eastern and southern facades.
- 3.3.4 The internal and external noise measurements were taken simultaneously so that the measured noise levels could be directly compared. Internal noise measurements were undertaken within the apartments in three locations and for a period of approximately 10 minutes in each location.
- 3.3.5 The noise measurements were made using five Class 1, integrating sound level meters. For the internal noise measurements, the microphone was mounted vertically on a tripod and more than 1.5 metres from the walls and floor. External noise measurements were undertaken on a boom protruding from an open window of an adjoining apartment on the façade under consideration. The microphone was located between 0.5m and 1.0m from the façade.
- 3.3.6 The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No significant drift in calibration was measured during the survey.

3.4 Details of the Internal Noise Measurements

3.4.1 A summary of the external noise measurements are described in Table 1 below.

Table 1: Details of Internal Measured Sound Levels					
Facade	Floor Level	Apartment	Time Period	Start Time (hrs)	End Time (hrs)
Northern (Facing the Back Court Yard)	2 nd Floor	No.17	Daytime	07/09/2022 1916	07/09/2022 1950
			Night-time	07/09/2022 2344	08/09/2022 0020
Eastern (Facing Four Yards)	3 rd Floor	No.37	Daytime	07/09/2022 2032	07/09/2022 2105
			Night-time	08/09/2022 0028	08/09/2022 0105
Southern (Facing John Dalton Street)	2 nd Floor	No.24	Daytime	07/09/2022 1952	07/09/2022 2027
			Night-time	07/09/2022 2346	08/09/2022 0020
	3 rd Floor	No.41	Daytime	07/09/2022 2001	07/09/2022 2034
			Night-time	08/09/2022 0027	08/09/2022 0104
	2 nd Floor	No.14	Daytime	07/09/2022 1817	07/09/2022 1855
			Night-time	07/09/2022 2300	07/09/2022 2335
	4 th Floor	No.60	Daytime	07/09/2022 2038	07/09/2022 2115
			Night-time	08/09/2022 0116	08/09/2022 0155
	1 st Floor	No.6	Daytime	07/09/2022 1907	07/09/2022 1954
			Night-time	07/09/2022 2301	07/09/2022 2335
	4 th Floor	No.48	Daytime	07/09/2022 2110	07/09/2022 2145
			Night-time	08/09/2022 0116	08/09/2022 0200

3.5 Measured Internal Daytime Sound Levels

3.5.1 The following $L_{Aeq,T}$ sound levels were measured in each apartment, during the daytime as shown in Table 2.

Table 2: Details of Daytime Measured Noise Levels (Figures in dB)					
Apartment	Measured External Sound Level ($L_{Aeq,T}$)	Measured Internal Sound Level ($L_{Aeq,T}$)			
No.6	67	32			
No.14	69	34			
No.17	53	30			
No.24	66	35			
No.37	61	31			
No.40	66	32			
No.48	55	38			
No.60	66	32			

3.5.2 The measured internal noise levels shown in Table 2 above show a good correlation with the noise guideline level for living rooms and bedrooms of 35dB(A) during the daytime.

3.5.3 The results show that, with the exception of apartment 48, the measured sound level in apartments is equal to or less than the guideline value of 35dB L_{Aeq} . The measured sound level in Apartment 48, during the measurement period, exceeds 35dB(A) by 3dB. It is generally regarded that 3dB is the limit of a perceived change in sound, and a change in the sound level of 3dB is not considered to be significant.

3.5.4 In addition, the measured external sound level at the time of the exceedance is low, which supports the opinion that noise from occupants, and electrical appliances was contributing towards the measured sound level.

3.5.5 Therefore, on balance we would consider that the internal measured daytime L_{Aeq} level is satisfactory.

3.6 Measured Internal Night-time Noise Levels

3.6.1 The following $L_{Aeq,T}$ sound levels were measured in each apartment, during the night-time as shown in Table 3.

Table 3: Details of Night-time Measured Sound Levels (Figures in dB)					
Apartment	Measured External Sound Level ($L_{Aeq,T}$)	Measured Internal Sound Level ($L_{Aeq,T}$)			
No.6	64	30			
No.14	64	29			
No.17	50	27			
No.24	62	32			
No.37	56	30			
No.40	63	30			
No.48	59	22			
No.60	59	32			

- 3.6.2 The measured internal noise levels shown in Table 3 above show a good correlation with the noise guideline level for bedrooms of 30dB(A) during the night-time.
- 3.6.3 The results show that, with the exception of apartments 24 and 60, the measured sound level in apartments is equal to or less than the guideline value of 30dB L_{Aeq} .
- 3.6.4 It is important to note that the sound level within apartments 24 and 60 meet with the daytime guideline level. Further, the apartment building was occupied, and therefore sound from residents was contributing towards the measured sound levels.
- 3.6.5 The measured sound level in apartments 24 and 60, during the measurement period exceeds 30dB(A) by 2dB. It is generally regarded that 3dB is the limit of a perceived change in sound, therefore a change in the sound level of 2dB is not considered to be significant. Taking into account our site observations, on balance, we consider that the night-time internal measured sound levels in apartments 24 and 60 are likely impacted by internal noise levels from occupants and electrical appliances during the testing. Therefore, this slight exceedance is not considered significant.

3.7 Measured Internal Maximum Sound Levels Night-time

- 3.7.1 Further, an assessment of the internally measured $L_{Af,Max}$ sound level has been undertaken. This has been carried out by reviewing the audio recording to determine the source of the measured $L_{Af,Max}$ where it exceeds the guideline value of 45dB.
- 3.7.2 It should be noted that guidance accepts that the $L_{Af,Max}$ in a bedroom can exceed 45dB up to 10 times per night. However, the February 2019 noise assessment report, which the planning condition is based, assumed up to 15 exceedances per night. This would be equivalent to approximately one exceedance per 30mins over an 8 hour night-time period.
- 3.7.3 Further, the noise level during the beginning and end of the night is generally regarded as being higher than that during the middle part of the night. It is therefore reasonable to suggest that there is likely to be a higher number of $L_{Af,Max}$ exceedances between 2300 and 0100hrs than would be expected between 0100hrs and 0500hrs.
- 3.7.4 The internal noise measurements have been undertaken in periods of 30 minutes between 2300hrs and 0200hrs.
- 3.7.5 An assessment of the highest measured $L_{Af,Max}$ values, the time of the occurrence, and a description of the sound source is shown in Table 4 below.

Table 4: Assessment of the Highest Measured $L_{Af,Max}$ Levels			
Apartment	Date / Time of the Measurement	Measured $L_{Af,Max}$ (Highest Measured Values)	Description of measured Level
No.6	07/09/2022 23:07	47	External source - e.g. Vehicle Passing
	07/09/2022 23:18	47	External source - e.g. Vehicle Passing
	07/09/2022 23:12	46	External source - e.g. Vehicle Passing
	07/09/2022 23:08	44	Below 45dB
No.14	07/09/2022 23:00	52	Internal sound, door closure etc
	07/09/2022 23:08	50	External source - e.g. Vehicle Passing
	07/09/2022 23:03	49	Internal sound, door closure etc
	07/09/2022 23:07	47	External source - e.g. Vehicle Passing
	07/09/2022 23:35	42	Below 45dB
No.17	07/09/2022 23:56	47	Internal sound, door closure etc
	07/09/2022 23:57	46	Internal sound, door closure etc
	07/09/2022 23:45	43	Below 45dB

Table 4: Assessment of the Highest Measured $L_{Af,Max}$ Levels			
Apartment	Date / Time of the Measurement	Measured $L_{Af,Max}$ (Highest Measured Values)	Description of measured Level
No.24	08/09/2022 00:03	53	Internal sound, door closure etc
	08/09/2022 00:01	47	Internal sound, door closure etc
	07/09/2022 23:56	46	External source - e.g. Vehicle Passing
	08/09/2022 00:08	45	Internal sound, door closure etc
	07/09/2022 23:52	44	Below 45dB
No.37	08/09/2022 00:58	52	Internal sound, door closure etc
	08/09/2022 00:31	45	Internal sound, door closure etc
	08/09/2022 00:28	44	Below 45dB
No.40	08/09/2022 00:42	48	Internal sound, door closure etc
	08/09/2022 00:45	48	Car/vehicle horn
	08/09/2022 00:50	44	Below 45dB
No.48	08/09/2022 01:27	39.5	Below 45dB
	08/09/2022 01:26	34.8	Below 45dB
No.60	08/09/2022 02:06	52.9	Internal sound, door closure etc
	08/09/2022 01:28	52.5	Internal sound, door closure etc
	08/09/2022 01:14	51.8	Internal sound, door closure etc
	08/09/2022 01:48	50.3	Internal sound, door closure etc
	08/09/2022 01:19	40	Below 45dB

3.7.6 As shown in Table 6 above, there are 3 exceedances of the guideline level of 45dB $L_{Af,Max}$ in Apartment 6, 2 exceedances in Apartment 14, and one exceedance in Apartments 24 and 40.

3.7.7 As stated, it is generally regarded that there should be no more than 10 exceedance of 45dB $L_{Af,Max}$ during the 8 hour night-time period (2300hrs to 0700hrs). The internal noise measurements were undertaken for 30 minutes, and so 45dB $L_{Af,Max}$ would be expected to be exceeded at least once. This condition is met in every apartment, with the exception of apartments 14 and apartment 6.

3.7.8 It is important to note that the sound level within apartments 14 and 6 meet with the daytime and night-time $L_{Aeq,T}$ noise guideline level.

3.7.9 Measurements within apartments 6 and 14 were carried out during the busiest time of the night, and so the frequency of exceedance would be expected to be higher than once per hour during this time.

3.7.10 Further, three of the exceedances in Apartment 6, and one of the exceedances in Apartment 14 are within 2dB of the 45dB(A) noise guideline level.

3.7.11 Therefore, on balance we would consider that the internal measured $L_{Af,Max}$ level is satisfactory.

3.8 Summary of the Measured Internal Levels

3.8.1 With the exception of apartment 48, the measured sound level during the daytime in apartments meets with or is equal to or less than the guideline value of 35dB $L_{Aeq,T}$. During the noise measurement in Apartment 48, the external sound level is low, and the measured internal level is 38dB(A) this indicates that the measured internal level is affected by internal activities. In addition, the sound level measurements during the night-time, show that the façade of apartment 48 is performing well in terms of noise attenuation.

3.8.2 With the exception of apartments 24 and 60, the measured sound level in apartments during the night-time meets with or is equal to or less than the guideline value of 30dB $L_{Aeq,T}$. The measured sound level in Apartments 24 and 60 is only 2dB above the night-time guideline level, and, the sound level measurements during the daytime, show that the façade of apartments 24 and 60 are performing well in terms of noise attenuation.

3.8.3 There are 3 exceedances of the night-time noise guideline level of 45dB $L_{Af,Max}$ in Apartment 6, 2 exceedances in Apartment 14, and one exceedance in Apartments 24 and 40.

3.8.4 It is generally regarded that 3dB is the limit of a perceived change in sound, therefore a change in the sound level of up to 3dB is not considered to be significant.

3.8.5 Therefore, on balance we would consider that the internal measured sound level is satisfactory in all apartments and noise mitigation measures are not required.

4 LIMITATIONS AND UNCERTAINTY

4.1 Introduction

4.1.1 The assessment is affected by the following limitations, and the measures detailed below have been undertaken to minimise uncertainty.

4.2 Limitations

4.2.1 Noise from internal noise sources is a contributor to the measured internal noise level, thereby limiting the increasing the measured internal sound level.

4.3 Uncertainty

4.3.1 To reduce the level of uncertainty within the assessment, the following steps have been taken:

- In accordance with guidance, the microphone was mounted vertically on a tripod and 1.5m away from internal walls and floors
- The noise measurements were undertaken during suitable weather conditions.
- The results of each measurement period were reported to the nearest 0.1dB.
- Noise measurements were made using Class 1, integrating sound level meters.

4.3.2 The sound level meters were calibrated prior to and following the noise survey, no significant drift in calibration was recorded.

5 CONCLUSIONS

- 5.1.1 Wardell Armstrong LLP (WA) was instructed by St James Estates Limited to undertake noise measurements to accompany the application to discharge of Condition 3b in the Prior Approval (ref: 122770/P3OPA/2019) and Condition 5b in the Planning Approval (ref: 123025/FO/2019), for the redevelopment of 11 St James Square, Manchester into residential accommodation.
- 5.1.2 The internal noise measurements were undertaken within the studio apartments of the completed development. Therefore, the noise measurements included noise from both external noise sources and internal noise sources, such as occupants and electrical appliances.
- 5.1.3 All building services were operational at the time of the survey, and any noise from the equipment is included into the noise measurements.
- 5.1.4 The internal sound level has been measured in apartment during the daytime for a period of 30 minutes per apartment. With the exception of apartment 48, the measured sound level during the daytime in apartments is equal to or less than the guideline value of 35dB $L_{Aeq,T}$. The measured sound level in apartment 48 is 38dB(A) which is only 3dB higher than the guideline value.
- 5.1.5 The internal sound level has been measured in apartment during the night-time for a period of 30 minutes per apartment. With the exception of apartments 24 and 60, the measured sound level in apartments during the night-time meets with or is equal to or less than the guideline value of 30dB $L_{Aeq,T}$. The measured sound level in apartments 24 and 60 is 32dB(A) which is only 2dB higher than the guideline value.
- 5.1.6 The corresponding measurements carried out during the night-time in apartment 48 and the daytime in apartments 24 and 60 show that the façade of the building is providing a good level of sound attenuation. This indicates that the exceedances are caused by internal sound sources, such as from occupants, or electrical appliances, and not a failure in the design/build.
- 5.1.7 Further, there are 3 exceedances of the guideline level of 45dB $L_{Af,Max}$ in Apartment 6, 2 exceedances in Apartment 14, and one exceedance in Apartments 24 and 40. The noise level measurements were undertaken during the busiest part of the night-time, when then $L_{Af,Max}$ is likely to be highest.
- 5.1.8 In addition, it is generally regarded that 3dB is the limit of a perceived change in sound, therefore a change in the sound level of up to 3dB is not considered to be significant.

- 5.1.9 Therefore, on balance we would consider that the internal measured sound level is satisfactory in all apartments and noise mitigation measures are not required.
- 5.1.10 The noise and vibration impact assessment report, which was prepared at the planning stage by WA, dated January 2020, identified that vibration from the adjacent Metrolink line was very low, and significantly below any threshold for an adverse impact. Therefore, internal vibration measurements have not been undertaken, and the vibration level from passing Metrolink trams is anticipated to be very low.

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