

Noise Addendum.

Introduction

This document provides additional information as requested by the Environmental Health Officer in respect of the development known as Albert Bridge House, Manchester.

Comments received

Commercial Noise - Section 10 of the report includes assessment of noise breakout from the commercial receptors and a proposed internal noise level of 90dB has been suggested in order to comply with the criteria. The assessment doesn't confirm if this is with windows and doors to the commercial units open or closed but it is assumed closed. It is also likely that a lobbied door set will be required to ensure the criteria is not exceeded when doors open for access and egress. We will need confirmation that a lobbied door system will be installed and also details of the required acoustic performance of the door set. The assessment only considers breakout to the residential and doesn't include breakout to the upper floor adjoining office space. This will be required along with details of the separating floor / wall performance and recommendations for construction. Confirmation of how the internal noise levels will be set and subsequently controlled will be required.

Response

The assessment that was issued with the Hoare Lea Report REP-1013862-5A-BRD-20221202-Environmental Noise Survey-Rev02 is based on windows / doors being closed. It was also based on what is considered absolute worst case during a lively restaurant environment.

It is suggested that a lobbied door set is provided so that external criteria is not exceeded when doors open for access and egress – we concur with this statement. This may be provided by the landlord or perhaps as part of the tenant fit out.

The separating floor construction is formed of dense concrete with raised floor inside the office space above. This is expected to provide an acoustic performance of at least 65 dB R_w . Noise levels within the restaurant up to 90 dB(A) should not exceed 30 dB(A) inside the office space assuming there is not a dominance at low frequency i.e. below 250Hz. This seems unlikely given the expected restaurant use. Additional treatment such as a plasterboard ceiling could be installed as part of tenant fit out, should it be deemed necessary.

There are limited areas of walling providing separation between restaurant and commercial lobby with proposals including doors. The wall should provide minimum acoustic performance of 50 dB R_w and will readily be achieved using masonry or drywall constructions. The doors will providing lower levels of acoustic performance although can also be specified to maximum the acoustic performance and should include for perimeter and threshold seals. The doors should be specified as 45 dB R_w . This should result in noise transfer into the commercial lobby, during the very highest restaurant noise levels, not exceeding 45 dB(A). It is expected that during normal ambient levels in a restaurant of around 65-70 dB(A), doors providing acoustic performance of 45 dB R_w would result in noise levels below 30 dB(A).

Controlling of noise limits from amplified noise can be controlled by an appropriate noise limiter. Noise conditions setting maximum noise emission levels can also be provided ensuring suitable control for future noise sensitive receptors.

Comments received

Residential noise and overheating - Section 9.3 of the report refers to a relaxation of the above internal noise criteria by 5dB which isn't considered acceptable in this location so the assessment will need to be revised without reference to this relaxation and based on the above criteria and updated details regarding glazing and façade performance will be required. Additional comment is provided further in the report with regard to an additional 5dB relaxation to allow windows to be open for overheating purposes which again is not acceptable and the above condition criteria will need to be met. It is clear that the above criteria cannot be achieved with windows open so the design needs to ensure that occupiers of the residential building do not need to rely on openable windows for ventilation or cooling purposes and should only be assumed for rapid purge ventilation such as for removing stale or cooking odours for example.

A scheme of alternative ventilation will be required and it has been proposed MVHR will be adopted. The details of the system once confirmed will need to be provided to the consultant for review and assessment provided to confirm that when in full operation, including during any boost function if applicable will be designed so it does not exceed the internal noise criteria. An assessment of any façade penetrations such as ventilation louvres for example will be required and details of any acoustic insulation measures recommending in order to ensure that any penetrations do not compromise the acoustic integrity of the façade and lead to an exceedance of the internal noise criteria.

The report advises that an AVO assessment has been undertaken but the assessment report has not been provided. The full AVO assessment report will need to be submitted for review. Also, as stated in point 2 above, the AVO assessment will need to reflect the required internal noise criteria stated in the condition for residential criteria so will need to be updated to address this. It is assumed that the assessment has also been based on early design stage and may need to be updated further as the design develops in addition to the comments above. Assessment of noise from lift shaft areas will also be required and where lifts travel adjacent to habitable rooms such as bedrooms and living rooms details of the recommended acoustic treatment to walls in these areas will be required to ensure the internal noise criteria will be met. Once the revised report and AVO assessment has been submitted to address the above and as the design develops we may have additional comments.

Response

Section 9.3 of the Hoare Lea Report REP-1013862-5A-BRD-20221202-Environmental Noise Survey-Rev02 sets out criteria which is considered compliant with AVO (Acoustics, Ventilation and Overheating Guidance) which allows for a 5dB uplift on BS8233. BS8233 also references a 5 dB uplift. The project is being designed to achieve BS8233 and the report was setting out a proposal of a 5 dB uplift only during overheating. However, it is clear, the EHO does not consider this appropriate although a very common practice.

A further relaxation was suggested within the above report for consideration and given the EHO position as set out above, this will not be pursued further.

The proposal within the noise survey report is for future residents to have the choice to close windows and rely on a mechanical ventilation solution. Windows can be used for purge ventilation such as for removing stale or cooking odours. The ventilation will include an MVHR with additional tempered air to mitigate overheating with closed windows. These systems are fully ducted to the façade and have no ventilation louvres.

An AVO assessment has been undertaken and was included within the report. The estimated external noise levels outside the residential façade during the day and night-time are shown in Tables 1 and 2 below.

Table 1: Predicted external daytime (07.00-23.00) noise levels – Residential building

Location	Ground – 5 th floor	6 th – 20 th floor	21 st – 45 th floor
South / Southeast	65–67 dB L _{Aeq} , 16 hour	60–64 dB L _{Aeq} , 16 hour	57–59 dB L _{Aeq} , 16 hour
North / Northwest	55–58 dB L _{Aeq} , 16 hour	57–58 dB L _{Aeq} , 16 hour	57–58 dB L _{Aeq} , 16 hour

Table 2: Predicted external night-time (23.00-07.00) noise levels – Residential building

Location	1 st – 5 th floor	6 th – 20 th floor	21 st – 45 th floor
South / Southeast	61–63 dB L _{Aeq, 8 hour}	56–60 dB L _{Aeq, 8 hour}	52–54 dB L _{Aeq, 8 hour}
North / Northwest	52–55 dB L _{Aeq, 8 hour}	52–54 dB L _{Aeq, 8 hour}	52–54 dB L _{Aeq, 8 hour}

It is our opinion that the AVO Level 1 Risk Assessment indicates noise levels during the day exceeding of 53 dB L_{Aeq, 16hour} and during the night of 48 dB L_{Aeq, 8hour} requires a Level 2 assessment. Given the external noise levels we considered a Level 2 assessment was necessary and therefore provided the assessment and subsequent outcome. A level 2 assessment considers the expected internal noise levels when windows are open.

According to the AVO guide, the Level 2 assessment indicates increasing likelihood of impact on reliable speech communication during the day and sleep disturbance at night once internal noise levels during the day exceed 35 dB L_{Aeq, 16hour} and during the night of 30 dB L_{Aeq, 8hour} and do not regularly exceed 45 dB L_{AF,max} more than 10 times at night. It does however state at levels just above these values might have limited behavioural change unless conditions are prevalent for most of the time. It also suggests daytime noise levels above 50 dB L_{Aeq, 16hour} and during the night of 30 dB L_{Aeq, 8hour} and regularly exceed 65 dB L_{AF,max} should be avoided.

Our assessment of internal noise levels, as presented in Hoare Lea Report REP-1013862-5A-BRD-20221202-Environmental Noise Survey-Rev02, stated the following internal noise levels.

Table 3: Predicted internal daytime (07.00-23.00) noise levels with partially opened windows – Residential building

Location	Ground – 5 th floor	6 th – 20 th floor	21 st – 45 th floor
South / Southeast	52–54 dB L _{Aeq, 16 hour}	47–51 dB L _{Aeq, 16 hour}	44–46 dB L _{Aeq, 16 hour}
North / Northwest	42–45 dB L _{Aeq, 16 hour}	44–45 dB L _{Aeq, 16 hour}	44–45 dB L _{Aeq, 16 hour}

Table 4: Predicted internal night-time (23.00-07.00) noise levels with partially opened windows – Residential building

Location	1 st – 5 th floor	6 th – 20 th floor	21 st – 45 th floor
South / Southeast	48–50 dB L _{Aeq, 8 hour}	43–47 dB L _{Aeq, 8 hour}	39–41 dB L _{Aeq, 8 hour}
North / Northwest	39–42 dB L _{Aeq, 8 hour}	39–41 dB L _{Aeq, 8 hour}	39–41 dB L _{Aeq, 8 hour}

It can be seen the daytime internal noise levels vary between 42–54 dB L_{Aeq, 16hour} depending on façade location is higher than the 35 dB L_{Aeq, 16hour} required by the EHO. It can also be seen that the night-time internal noise levels vary between 39–50 dB L_{Aeq, 8hour} depending on façade location is higher than the 30 dB L_{Aeq, 8hour} required by the EHO.

The conclusion provided within the acoustic report is clear in that a mechanical ventilation solution is to be provided to allow residents to close windows if they choose to do so.

The acoustic performance of the façade has been specified to achieve BS8233 within habitable rooms. This is provided within the acoustic report submitted.

Comments received

Plant - The Hoare Lea assessment includes the recommended plant noise limits in table 18 of section 5.7 based on the background noise levels which we can accept (45dB Daytime and 39dB Night time). Brief details of some of the plant has been provided and it has been indicated that the ASHP will be selected with the acoustic pack to attenuate the noise. A full assessment will be required as the design develops and all the plant has been selected and any additional mitigation measures confirming. The assessment will also need to consider noise from any louvred extraction units from the basement car park extraction and ventilation louvres for example and any kitchen extraction equipment. A cumulative assessment will be required to demonstrate that the agreed limits will not be exceeded when all the plant and equipment is in operation. The basement and ground level plant may also require their own noise rating at the receptors as they may not be reflective of the contribution of noise from roof mounted plant and equipment. We will need an assessment of any emergency plant to be installed. We can look to agree a relaxation of the criteria for the emergency plant but we will need to agree an emergency plant testing schedule in such case. It is understood that further assessment is proposed as the design develops and plant is confirmed and we may have additional comment once the revised assessment has been submitted.

Response

We acknowledge acceptance of the external noise criteria as set out in Hoare Lea Report REP-1013862-5A-BRD-20221202-Environmental Noise Survey-Rev02.

As noted, a full assessment will be provided as the design develops and becomes fully representative. This will include all other plant items including those mentioned.

Consideration for a relaxation of the criteria for emergency plant noise emission levels is well received and look forward to that discussion. Agreement on testing is also sensible and would consider this to only take place during normal working hours, possibly weekdays only, so to avoid weekend periods when residents more likely to be at home.