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Our ref: P3191/L01/PJK

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21 October 2015

The New China Town, Phase3, Bazaar – Outline Noise Assessment

Further to the design team meeting at PHD1 offices on 12 October 2015, please find my comments below in relation to the proposed opening times of the Bazaar in Phase 3.

Introduction

Based on the discussions during the meeting, it is understood that, ideally, the Bazaar in Phase 3 would be open 24 hours a day for the majority of the week, if not all week. It is understood that the Bazaar will consist of small to medium size units and will be mainly located on Sub Level 2 of the main building, the only open area will be the 'main street'.

From the provided indicative drawings, including the section plan, it is understood that the Bazaar will be located at Sub Level 2 with access down a flight of stairs from St Georges Street to the east and St James Street to the west. The Bazaar will be 8 metres below the street level of St Georges Street, 4m below street level of St James Street and 6m below the street level of Duncan Street to the north.

The nearest noise sensitive properties to the Bazaar are the residential and hotel blocks included within Phase 3, the houses on Duncan Street and the houses on St Georges Street which would overlook the stairwell into the Bazaar.

It has been assumed that there are no night-clubs in the Bazaar and any amplified music would be for background only and would not be a dominant noise source at any point during the day or night.

Criterion

Liverpool City Council (LCC) has generally adopted a requirement that the glazing used for residential accommodation in the city centre is, as a minimum, 10mm glass/thermal cavity/6mm glass and that habitable rooms are provided with acoustically attenuated mechanical ventilation to remove the need to open windows.

These proposals are understood to be required to control internal noise levels in habitable rooms to typically no greater than those identified in the World Health Organisation (WHO) document '*Guidelines for Community Noise*'. WHO states that to avoid annoyance and sleep disturbance inside dwellings, the noise level should not exceed 30dB_{L_{Aeq}}, 8 hour and 45dB_{L_{Amax}} at night and between 35dB_{L_{Aeq}}, 16 hour during the day.

These levels are consistent with those presented in the updated BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*', therefore, the internal levels identified by WHO would appear to be appropriate for this type of development.

It should be noted that the hotel operator may potentially have a more stringent requirement, in relation to night-time maximum noise levels, however, at this time we have based the assessment of the Bazaar usage on achieving the internal noise levels presented in BS8233 and WHO.

Discussion

AEC has previously measured noise levels in Castle Square, Swansea during the day and night-time period. Castle square is a mixed road and pedestrian area with restaurants on all four sides which included external seating areas. At night the area was used by pedestrians waiting to get taxis and was extremely busy with the noise level dominated by pedestrians.

Based on the noise level data measured at Castle Square, it has been deemed that the free-field measured daytime ambient noise level of 61dBL_{Aeq} at 5m and night-time ambient and maximum noise levels of 66dBL_{Aeq} at 5m and 85dBL_{Amax} at 2m, respectively, would be representative of the potential noise level in the Bazaar. It should be noted that noise levels in the Bazaar could be higher if there are large areas of seating for patrons of bars and restaurants and this should be discussed with AEC if it is likely to occur. However, the noise levels discussed above would appear appropriate based on our initial discussions.

Noise break-in calculations have been undertaken based on the measured noise levels presented above, a glazed area of no greater than 35% of the external envelope (corner rooms require confirmation) and a reverberation time in the furnished room of 0.5 seconds which is typical for residential accommodation.

These calculations indicate that noise levels can be controlled within habitable rooms of the proposed residential and hotel blocks in Phase 3, to below 35dBL_{Aeq} during the daytime and 30dBL_{Aeq} and 45dBL_{Amax} at night, by using LCC stated requirement of 10/TC/6 glazing and mechanical ventilation.

It should be noted that the noise level limits in BS8233 generally relate to noise without significant character such as transportation noise. Therefore, LCC may request that internal noise levels due to noise break-in from people activity by 5dB lower, i.e. 30dBL_{Aeq}, in the day and 25dBL_{Aeq} and 40dBL_{Amax} at night. If this were the case, the glazing would need to achieve a sound insulation performance of 42dBR_w and 35dBR_w + C_{tr}. This will require confirmation with LCC.

In relation to the housing on Duncan Street and St Georges Street, based on the night-time noise levels measured by AEC in July 2015, the existing external ambient and maximum noise levels would be around 55dBL_{Aeq} and 64dBL_{Amax} at the rear of the properties on Duncan Street and 59dBL_{Aeq} and 72dBL_{Amax} at St Georges Street.

The properties on Duncan Street are currently being built, therefore, it is assumed that they will have been designed in accordance with LCC current requirement of 10/TC/6 glazing and mechanical ventilation. However, due to the external noise levels, even if a reduced glazing and ventilation strategy has been agreed with LCC, all habitable rooms will have been fitted acoustic trickle vents in order that windows can remain closed for to appropriately control external to internal noise levels.

In relation to the properties on St Georges Street, it has been assumed that, while the noise levels are such that alternative means of ventilation would be required, these dwellings may be served by openable windows.

The night-time ambient noise levels at the external elevations of Duncan Street and St Georges Street have been calculated, using our proprietary acoustic prediction software (CadnaA), based on an ambient noise level of 65dBL_{Aeq} in the Bazaar and a maximum noise level of 85dBL_{Amax} at the bottom of the stairs accessed from St Georges Street.

These calculations indicate that the ambient and maximum noise levels at Duncan Street would be in the order of 48dBL_{Aeq} and 51dBL_{Amax}, with levels of 42dBL_{Aeq} and 52dBL_{Amax} at the properties on St Georges Street. These levels are significantly below the existing noise levels at these locations due to road traffic noise and considering the existing assumed glazing and ventilation strategy discussed above for each location, the internal ambient and maximum noise levels due to the Bazaar would be below the required noise level limits in BS8233 and WHO guidance.

In summary, based on the above it would appear that the Bazaar could operate 24 hours a day without significantly adverse impact on the nearest noise sensitive properties. However, if required noise levels breaking out of the Bazaar could be reduced by limiting the amount of the Bazaar which is uncovered, installing acoustic absorption at high level to reduce noise reflections and providing a screen at the top of the stairs to eliminate the direct line of sight between the houses on St Georges Street and the Bazaar.

I trust the above is clear and of assistance at this stage, however, if you have any queries please give me a call.

Yours sincerely



Paul Knowles

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