MAX FORDHAM

The Postal Museum

Courtyard Events Noise Assessment

Issue 4

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1.0 INTRODUCTION

An events space is to be included as part of the planned Postal Museum located at Calthorpe House, on Pheonix Place, in the London Borough of Camden. The spaces that are intended to be used for events include a courtyard, reception space and the museum itself, will occasionally be used to host events between the hours of 6pm and 11pm. The courtyard and reception spaces are overlooked by the rear of 4 storey properties on Calthorpe Street.

The outdoor courtyard and internal spaces can be hired separately, or alternatively, the majority of the glazed partition separating them can be retracted, and the two spaces can be used as one.

This report assesses the likelihood of disturbance being caused by event noise from one or both of these spaces at neighbouring properties.

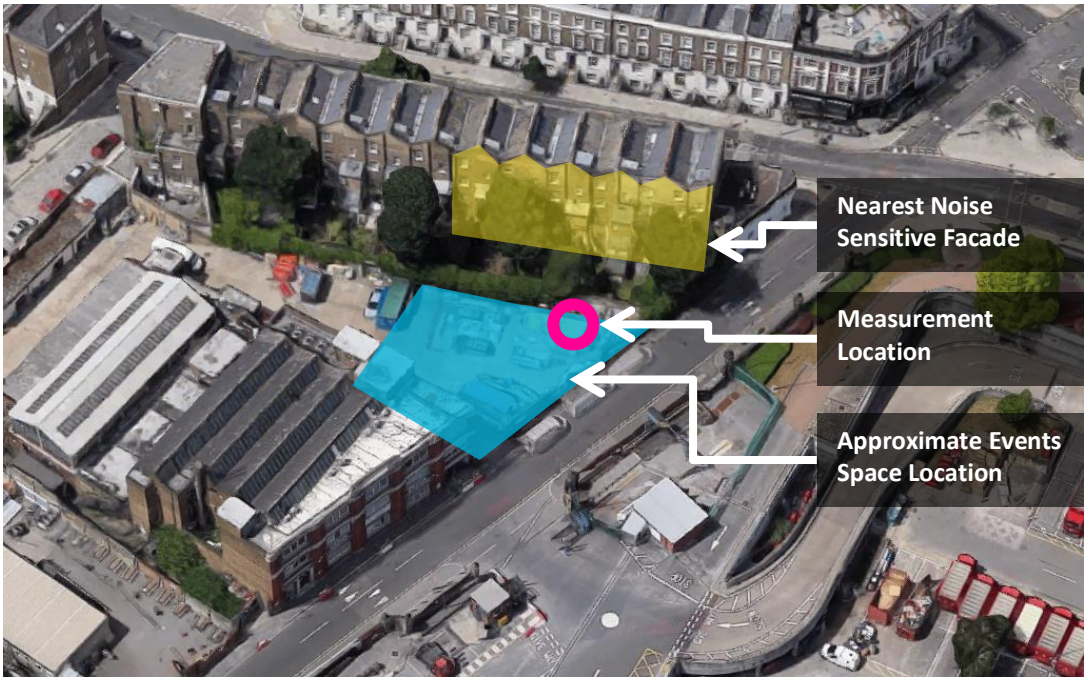

Figure 1: The proposed approximate location of the events space, shown relative to the nearest noise sensitive façade and both the 2012 and 2016 measurement position. Imagery courtesy of Google.

The events space is planned to be located within and to the north of Calthorpe House, extending to the northern boundary of the site, and the external portion is partially covered by a lightweight metal roof. At the northern edge of the courtyard, just in front of the site boundary wall, a 3m tall green wall is to be installed, standing upon a brick pedestal roughly 1.2 meters high. The green wall is proposed to run along the whole width of the courtyard, roughly 1.5m in front of the perimeter wall. This green wall is covered by a separate planning application as set out in the covering letter supplied by DP9.

The green wall will be the main source of both diffusion and absorption within the courtyard and is anticipated to contribute to attenuating the sound between the courtyard and the neighbouring properties. The internal reception area has no dedicated absorption.

Despite the partial cover of the metal roof and the wall, the closest points the neighbouring façade have line-of-sight down into much of the courtyard from the second floor. On the first floor and below, the perimeter wall blocks line-of-sight and provides much higher levels of attenuation.

2.0 DESIGN BASIS

Section 28 of the document *Camden Development Policies* contains the stipulations detailed in Figure 2 to be met for Event Noise from places of entertainment.

Noise description and measurement location	Period	Time	Sites adjoining places of entertainment
Noise at 1 metre external to a sensitive façade	Day and Evening	0700-2300	$L_{Aeq,5min}$ shall not increase by more the 5dB*
Noise at 1 metre external to a sensitive façade	Night	2300-0700	$L_{Aeq,5min}$ shall not increase by more the 3dB*
Noise inside any living room of any noise sensitive premises, with the windows open or closed	Night	2300-0700	$L_{Aeq,5min}$ (in the 63Hz octave band measured using the "fast" time constant) should show no increase in dB*
**As compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place*			

Figure 2: A reproduction of London Borough of Camden's table *DP28 - Noise Levels from Places of Entertainment on Adjoining Residential Sites at which Planning Permission will not be Granted*

The third condition of the table, relating to the 63Hz octave band, is relatively easy to meet; speech contains little energy at this frequency, and applying a filter to the PA system to attenuate this octave band should help ensure that little noise in this range is produced by the events within the space.

3.0 CURRENT NOISE LEVEL

A 48-hour noise survey was undertaken by Max Fordham engineers from 8th – 10th February 2012 at a location on the roof of Calthorpe House, just to the south of the site of the courtyard. This survey formed the basis of the noise impact assessment of the main portion of this application. As these measurements are now more than 4 years old, a 24 hour survey was undertaken on 22nd December 2016.

It should be noted that the location used for the 2012 survey was inaccessible for the 2016 survey, due to continuing building work. The 2016 survey was taken in a location within the footprint of the planned courtyard, which was more shielded from road noise than the rooftop location than the 2012 survey, but was also only a few meters from the noise sensitive façade. It can be assumed that the level measured at the 2016 survey location will be approximately equal to the level at 1m from the noise sensitive façade.

The noise levels measured between 6pm and 11pm were typically within 5dB of those measured during the 2012 survey. As the levels were consistently lower than the 2012 levels, the 2016 survey shall be used as a basis for assessing the events noise in this instance.

In order to set a representative noise limit across the evening period, the minimum measured $L_{Aeq,15min}$ of each hour was taken. These levels will be used to set individual noise limits within the courtyard for each hour of the evening, to reflect the changing suitability of the sections of the space across time.

As per Figure 2, the maximum allowable level will be defined as 5dB above the representative ambient noise level for each hour throughout the evening. The representative ambient level, as well as the corresponding maximum permissible level at the façade is shown in Figure 3.

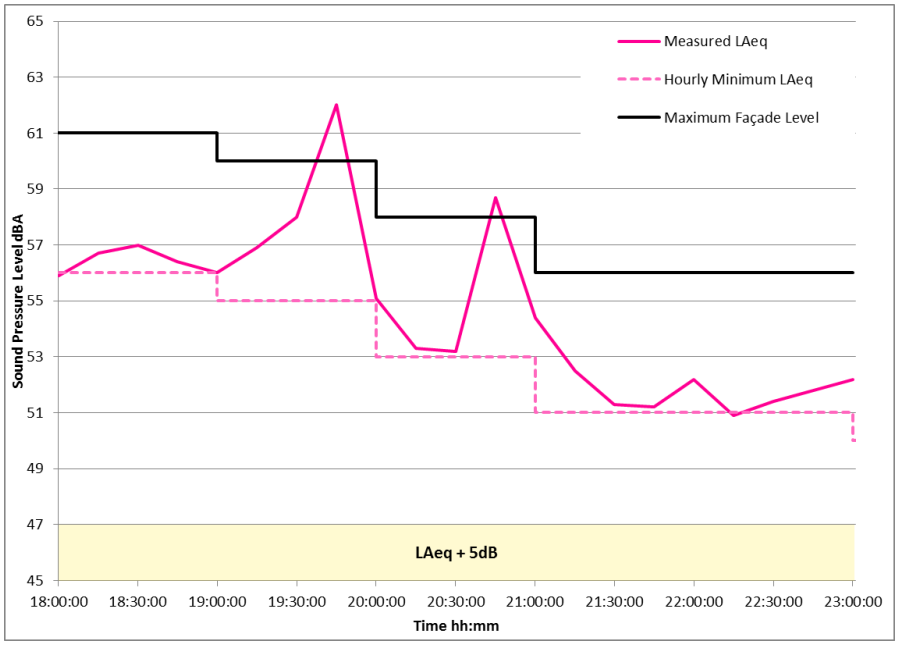

Figure 3: The hourly minimum LAeq, which has been used to calculate the hourly noise limits at the facade, following the limit detailed in Figure 2 which is shown at the bottom of the graph.

4.0 MODELLING LEVEL DIFFERENCE

An acoustic model of the events space and the neighbouring properties was built, so that the level difference between the courtyard and the overlooking façade could be calculated.

Noise sources were placed in locations indicative of both small, permanent speakers located at high level against the southern wall of the courtyard – underneath the metal covering, and near the eastern wall of the courtyard where it has been suggested that external functions may set up temporary PA systems for music-focused events.

The most noise sensitive area on the neighbouring façade was, as expected, found to be on the second floor of the residences, where a direct line-of-sight down into the courtyard was possible. In particular, the most susceptible point was found to be at the point marked “A” in Figure 4, as, due to the shape of the courtyard, this point had line-of-sight to the largest area of event space. It is this “worst case” point that shall be used to provide an assessment of the events space.

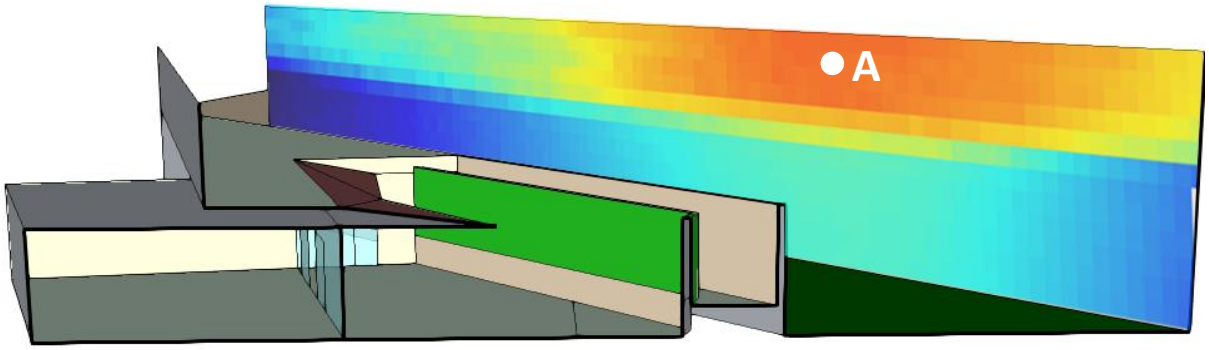

Figure 4: A section through the 3D model of the courtyard space and neighbouring facades, showing the relative sound pressure level across the neighbouring facade when sound is played within the courtyard (bottom). The most sensitive point on the façade has been marked with an “A”.

It was noted that the both areas of the events space were relatively reverberant, and therefore that the location of the noise sources within the courtyard had a relatively small affect on the levels measured at point A. The level difference between point A and the events space was found to vary between 16 and 21dB, depending on the location within the courtyard, with an average level difference of 19dB.

The level difference from the interior areas to the neighbouring façade have also been calculated. With all openable sections of glass retracted, mean level difference between the interior section of the events space and the neighbouring façades is estimated to be 22dB. The small difference between the internal and external level difference is due to the low levels of absorption within the reception space.

When all openings between the reception and the courtyard are closed, the façade can be expected to provide a level difference of no less than 25dB. The level provided by the façade will be significantly lower than this at lower frequencies, and so the bass frequencies of any music played as part of any events should be attenuated in the same way as they would be for an external event.

5.0 EVENT NOISE LEVEL

The level difference calculated above can be used to find a maximum permissible Events Noise Level within the each area for each time period.

Time Period	Maximum Allowable Events Noise Level at Nearest Façade	Maximum Allowable Events Noise Level within courtyard	Maximum Allowable Events Noise Level in Reception Area (Doors Open)	Maximum Allowable Events Noise Level in Reception Area (Doors Closed)
1800 – 1900	61dB $L_{Aeq,15min}$	80dB $L_{Aeq,15min}$	83dB $L_{Aeq,15min}$	105dB $L_{Aeq,15min}$
1900 – 2000	60dB $L_{Aeq,15min}$	79dB $L_{Aeq,15min}$	82dB $L_{Aeq,15min}$	104dB $L_{Aeq,15min}$
2000 – 2100	58dB $L_{Aeq,15min}$	77dB $L_{Aeq,15min}$	80dB $L_{Aeq,15min}$	102dB $L_{Aeq,15min}$
2100 – 2300	56dB $L_{Aeq,15min}$	75dB $L_{Aeq,15min}$	78dB $L_{Aeq,15min}$	100dB $L_{Aeq,15min}$

Figure 5: The maximum allowable level at the neighbouring facade, presented alongside the restrictions that should be placed on Speech and Music dominated events

A management plan will be needed, to ensure that events are controlled in such a way as to ensure these levels are met.

6.0 SUMMARY

- A semi-covered courtyard forming part of the Postal Museum is planned to occasionally be used to host events, between the hours of 6pm and 11pm. The space is overlooked by the rear of 4 storey properties on Calthorpe Street.
- The requirements stipulated in the DP28 table give a maximum increase to noise levels for noise from entertainment venues, relative to existing ambient noise levels.
- A 24 hour noise survey was taken, so as to ascertain the ambient noise levels during the expected period of operation (18:00-23:00), which were found to be largely consistent with a previous long term survey on the site.
- An acoustic model was constructed to estimate the difference between the level within the courtyard and the level at the façade of the neighbouring properties.
- Using this level difference and the maximum level permissible at the neighbouring façade, a maximum level within the courtyard was calculated.
- For context, restrictions for two types of events that may be held within the courtyard were calculated for four time periods through the evening. In addition, it is suggested that the PA system be filtered so as to attenuate the 63Hz octave band.