HAMPTON POOL – ACOUSTIC NOTE - REV. C – GYM AND STUDIO ACTIVITY NOISE

30th October 2020

1 Introduction

This update (Rev. C) follows a request by Dr. Hedley Pugh, Senior Environmental Health officer at London Borough of Richmond upon Thames & Merton (LBRuT&M), on the 22nd October 2020 regarding the noise impact assessment of activity noise at Hampton Pool Gym and Studios at the nearest sensitive receivers: 132, 134 and 136 High Street.

Rev A., issued 28th November 2016, presented information and clarifications requested by Chris Hunt, Principal Environmental Health Officer at London Borough of Richmond upon Thames & Merton (LBRuT&M) on an email from the 1st November 2016 relative to 'Hampton Pool Acoustic Report', 18th August 2016. The information contained in Rev. Rev. B, issued 25th September 2020, presented a noise impact assessment associated with newly selected plant equipment.

Rev. C makes use of the noise survey data reported in the 18th August 2016 'Hampton Pool Acoustic Report'.

2 Information / Clarification on Raised Items

LBRuT&M – (22nd October 2020) - *The Gym and Studio rooms will be fully mechanically ventilated, which will allow windows to be closed while these spaces are being used. This allows reducing noise levels egressing from these spaces as compared to open window situation.*

Both the original report and addendum remain silent in respect of calculations relating to noise breakout. As such I am unable to determine if this element of the proposal would not lead to an unacceptable loss of amenity and recommend refusal on such grounds.

3 Targets

The proposed noise targets at the nearest sensitive receivers (NSR), 132, 134 and 136 High Street, are set as 5 dB below existing background levels. This is applicable to both overall noise levels and noise levels at low frequencies (63 Hz, 125Hz and 250Hz octave bands).

From the data collected in the 2016 noise survey the background noise levels are those shown in Table1 (LA90) and Table 2 (L90 @ 63 Hz, 125Hz and 250Hz octave bands):

	Noise level
Measured - LA90,15min, (07:00h-23:00h), dBA	51
Target at NSR - LAeq, 15 min, (07:00h-23:00h), dBA	**46**
Measured - LA90, 15min, (23:00h-07:00h), dBA	44
Target at NSR - LAeq, (23:00h-07:00h), dBA	**39**

Table 1 - Measured background noise levels (LA90) and target noise levels (LAeq) at Nearest Sensitive Receivers (NSR) for daytime period (07:00h-23:00h) and night time period (23:00h-07:00h).

	63 Hz	125Hz	250 Hz
Measured L90,15min,(07:00h-23:00h), dB	49	53	49
Target at NSR Leq, 15 min, (07:00h-23:00h), dB	**44**	**48**	**44**
Measured L90, (23:00h-07:00h), dB	43	53	48
Target at NSR Leq, (23:00h-07:00h),dB	**38**	**48**	**43**

Table 2 - Measured background noise levels (L90) and target noise levels (Leq) at Nearest Sensitive Receivers (NSR) for daytime period (07:00h-23:00h) and night time period (23:00h-07:00h), at 63Hz, 125Hz, 250Hz octave bands.

4 Nearest Sensitive Receivers

The nearest sensitive receivers to the Gym and Studios are the residential units at 132, 134 and 16 High Street. These are shown in Figure 1 along with the shortest distances between their facades and nearest Gym / Studio glazing elements (windows or rooflights).

The focus is on the glazing elements as these are, from an acoustic point of view, the weakest elements of the façade, therefore determining the overall sound insulation performance of the facade.

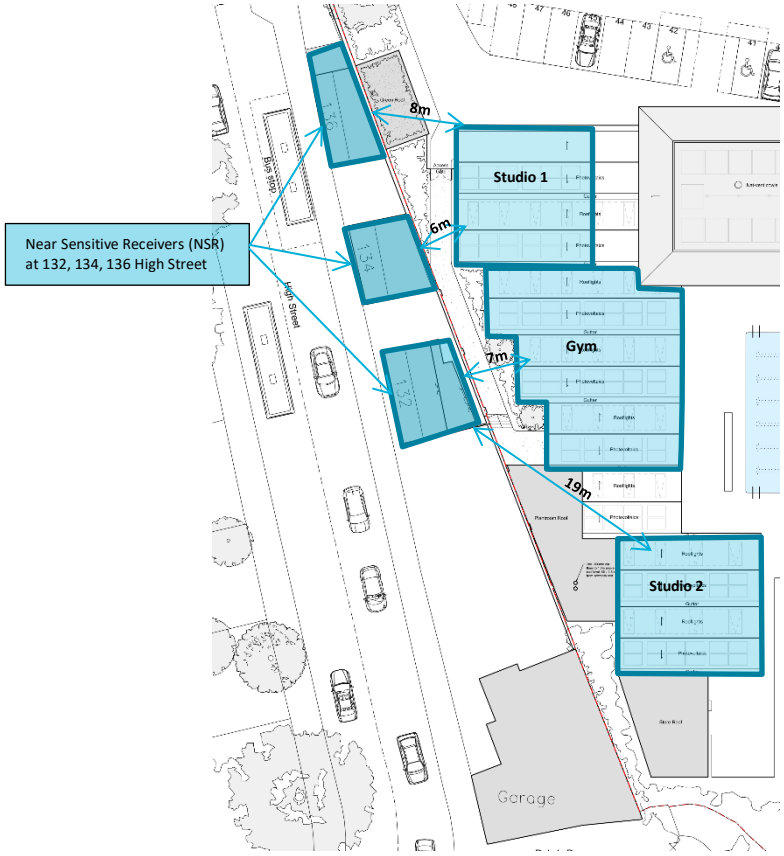

Figure 1 - Site layout showing the location of Hampton Pool Gym and Studios and nearest Sensitive Receivers (NSRs), 132, 134 and 136 High Street.

5 Noise Impact Assessment

All glazing, windows and roof lights, are specified to achieve 37 dB Rw (for example 4mm glass - 26mm gap - 6mm glass - 36mm window frame - Velfac).

The sound insulation performance of the non-glazing elements will be in excess of 47 dB Rw, which in practice renders negligible the contribution of noise transmitted to outside through these elements. This performance can be achieved, for example, with a build-up where plasterboard on studs line 100mm CLT.

The calculations make use of the minimum distance of the Gym / Studios glazing elements to the façade of the NSR, therefore adopting a conservative approach.

Contributions of noise egressing from Gym and Studio 2 windows have a negligible impact on the total noise levels at the NSR due to their occlusion and further distance to NSR (i.e., their contribution is at least 10 dB below the contribution by the glazing elements, windows or rooflights, with direct line of sight to the NSR).

The calculations make use of the following maximum music levels inside the Gym and Studios:

Maximum Music Level Inside Studio / Gym – Daytime	
LAeq,15min, dBA	90 dB LAeq

Table 3 – Maximum music level, LAeq, inside Studio/Gym, daytime (07:00h-23:00h).

Maximum Music Level Inside Studio / Gym – Night time	
LAeq,15min, dBA	83 dB LAeq

Table 4 – Maximum music level, LAeq, inside Studio/Gym, night time (23:00h-07:00h).

Maximum Music Level Inside Studio / Gym – Daytime	**63 Hz**	**125Hz**	**250 Hz**
Leq,15 min, dB	81	81	85

Table 5 – Maximum music level, Leq @ 63Hz, 125Hz, 250Hz octave bands inside Studio/Gym, daytime (07:00h-23:00h).

Maximum Music Level Inside Studio / Gym – Night time	**63 Hz**	**125Hz**	**250 Hz**
Leq,15 min, dB	75	81	84

Table 6 – Maximum music level, Leq @ 63Hz, 125Hz, 250Hz octave bands inside Studio/Gym, night time (23:00h-07:00h).

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136 High Street

136 High Street is directly exposed to Studio 1 glazing, which is at a minimum distance of approximately 8m (calculations use 7m as the target is at 1m from façade).

Total Noise Level	Day time	Night time
LAeq,15min, dBA - Music Level Inside Studio	90 dB LAeq	83 dB LAeq
Windows (37 dB Rw)	- 31 dB	- 31 dB
Distance (7 m)	- 17 dB	- 17 dB
LAeq @ 1m from 136 High Street (target)	**42 dB LAeq**	**35 dB LAeq**
Target (maximum level)	46 dB LAeq	39 dB LAeq

Table 7 - Noise levels, LAeq, for daytime (07:00h-23:00h) and night time period (23:00h-07:00h) at 136 High Street.

Day Time - Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	81	81	85
Windows (37 dB Rw)	-24	-20	-28
Distance (7 m)	-17	-17	-17
Leq @ 1m from 136 High Street (target)	**40**	**44**	**40**
Target (maximum level)	44	48	44

Table 8 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for daytime (07:00h-23:00h) at 136 High Street.

Night Time – Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	75	81	84
Windows (37 dB Rw)	-24	-20	-28
Distance (7 m)	-17	-17	-17
Leq @ 1m from 136 High Street (target)	**34**	**44**	**39**
Target (maximum level)	38	48	43

Table 9 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for night time (23:00h-07:00h) at 136 High Street.

134 High Street

134 High Street is directly exposed to noise coming out of the rooflights, which are at a minimum distance of 6m (calculations use 5m as the target is at 1m from façade).

Total Noise Level	Music level Day time	Music level Night time
LAeq,15min, dBA - Music Level Inside Studio	90 dB LAeq	83 dB LAeq
Windows (37 dB Rw)	- 31 dB	- 31 dB
Distance (5 m)	- 14 dB	- 14 dB
LAeq @ 1m from 134 High Street	**45 dB LAeq**	**38 dB LAeq**
Target (maximum level)	46 dB LAeq	39 dB LAeq

Table 10 - Noise levels, LAeq, for daytime (07:00h-23:00h) and night time period (23:00h-07:00h) at 134 High Street.

Day Time - Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	81	81	85
Windows (37 dB Rw)	-24	-20	-28
Distance (5 m)	-14	-14	-14
Leq @ 1m from 134 High Street	**43**	**47**	**43**
Target (maximum level)	44	48	44

Table 11 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for daytime (07:00h-23:00h) at 134 High Street.

Night Time – Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	75	81	84
Windows (37 dB Rw)	-24	-20	-28
Distance (5 m)	-14	-14	-14
Leq @ 1m from 134 High Street	**37**	**47**	**42**
Target (maximum level)	38	48	43

Table 12 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for night time (23:00h-07:00h) at 134 High Street.

132 High Street

132 High Street is directly exposed to noise coming out of the rooflights, which are at a minimum distance of 7m (calculations use 6m as the target is at 1m from façade).

Total Noise Level	Music level Day time	Music level Night time
LAeq,15min, dBA - Music Level Inside Studio	90 dB LAeq	83 dB LAeq
Windows (37 dB Rw)	- 31 dB	- 31 dB
Distance (6 m)	- 16 dB	- 16 dB
LAeq @ 1m from 132 High Street	**43 dB LAeq**	**36 dB LAeq**
Target (maximum level)	46 dB LAeq	39 dB LAeq

Table 13 - Noise levels, LAeq, for daytime (07:00h-23:00h) and night time period (23:00h-07:00h) at 132 High Street.

Day Time - Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	81	81	85
Windows (37 dB Rw)	-24	-20	-28
Distance (6 m)	-16	-16	-16
Leq @ 1m from 132 High Street	**41**	**45**	**41**
Target (maximum level)	44	48	44

Table 14 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for daytime (07:00h-23:00h) at 132 High Street.

Night Time – Low Frequency Noise Level	63 Hz	125Hz	250 Hz
Leq,15 min, dB - Music Level Inside Studio	75	81	84
Windows (37 dB Rw)	-24	-20	-28
Distance (6 m)	-16	-16	-16
Leq @ 1m from 132 High Street	**35**	**45**	**40**
Target (maximum level)	38	48	43

Table 15 - Noise levels, Leq, at 63Hz, 125Hz, 250Hz octave bands for night time (23:00h-07:00h) at 132 High Street.

6 Conclusions

A noise impact assessment of activity noise expected to be generated at Hampton Pool Gym and Studios was undertaken at the nearest sensitive receivers (NSR) located at 132, 134 and 136 High Street.

The maximum noise levels as generated by activity noise have been proposed to be set at 5 dB below background noise levels for day time and night time and for total level (LAeq) and low frequency (Leq, at 63Hz, 125Hz, 250Hz octave bands).

Maximum music levels were set (total and low frequency) inside the Gym and Studios for day time and night time periods.

The minimum performance of glazing elements (windows and Roof lights) and non-glazing elements was set.

The total and low frequency noise levels were calculated at the NSRs for day and night time.

It was concluded that the targets are met at all NSR.

A music level limiter will be installed to ensure that the noise levels at the Gym and Studios do not exceed the proposed maximum music sound levels at the Gym and Studios.