

Koko

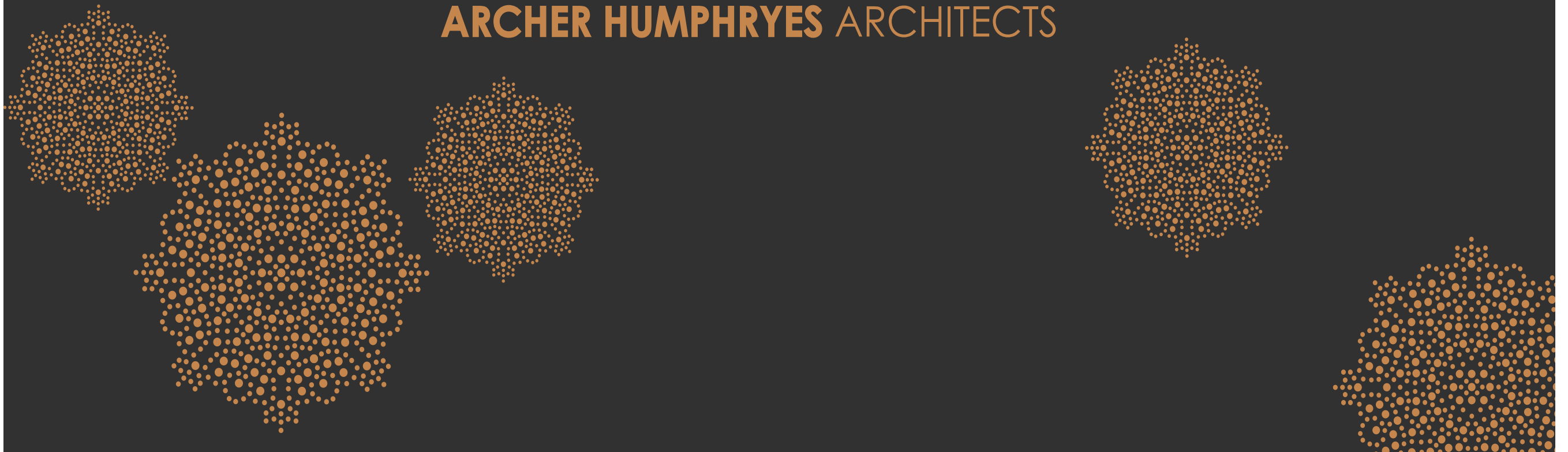
Dome Reinstatement

Acoustic Report
Scotch Partners LLP

Planning + Listed Building Submission
June 2020

“ a great space is performance in progress.”

ARCHER HUMPHRYES ARCHITECTS



Acoustic considerations for dome reinstatement

Criteria & design considerations

Planning Condition 20

Condition 20 of the planning application states the following:

The external noise level emitted from entertainment at the private members club and public house use hereby approved shall meet the minimum that can be achieved Amber noise criteria set in The Camden Local Plan, Table D at the nearest and/or most affected noise sensitive premises.

The Amber noise criteria are defined by Camden Council as between the Lowest Observed Adverse Effect Level and the Significant Observed Adverse Effect Level. The criteria referenced are summarised as follows:

Customer noise levels to not exceed the following at the noise-sensitive receptors:

- 60 dB $L_{Aeq,5min}$ during the daytime
- 55 dB $L_{Aeq,5min}$ during the evening
- 50 dB $L_{Aeq,5min}$ overnight
- A level 3 dB below the existing $L_{Aeq,5min}$ without entertainment noise, at any time

Licensing requirements

There are also expected to be licensing requirements relating to amplified noise, as have been applied to other parts of the KOKO development. The condition we understand may be applied can be summarised as follows:

- Music from KOKO to be inaudible 1m from any residential façade
- The $L_{Aeq,5min}$ to not increase by more than 3 dB as a result of entertainment noise from KOKO
- The $L_{eq,5min}$ in the 63 Hz octave band to not increase as a result of entertainment noise from KOKO

The first part of the licensing condition is subjective and exceptionally onerous. Were the licensing authority to try to enforce this it is unlikely that this criterion would be met for the current KOKO operations and those proposed. It has been agreed with the client and design team that the approach taken for the rest of the development has been to not design to this.

The second part of the licensing condition is potentially less onerous than the planning condition. The third part is more onerous than the planning condition; effectively requiring that noise from the 63 Hz octave band is at least 10 dB below the ambient noise level in the same octave, at the neighbouring property.

Environmental Protection Act

Separate to the issue of planning or licensing is the Environmental Protection Act 1990, the legal provision by which residents are protected from “statutory nuisance”. If the local authority were to determine that noise from KOKO represents a threat to the health or significant effect to the residents, they may serve a noise abatement notice requiring KOKO to cease the noise deemed to be a statutory nuisance.

It is important to appreciate that compliance or non-compliance with the local authority’s requirements does not preclude statutory legal action if a noise is considered to be a nuisance. There are no objective criteria that may be designed to that would ensure noise from KOKO does not result in a statutory nuisance, however it is believed that meeting the licensing and planning requirements will satisfactorily minimise the risk of a statutory noise nuisance action being upheld.

Design Criteria

Targets for noise emission have been based on the results of the external noise survey undertaken within Bayham Place as part of the original planning application for the development. The 10 minute L_{eq} data gathered can be expected to be similar to the 5 minute L_{eq} requested in the planning condition.

The targets in Table 1 are presented as night-time limits outside the neighbouring properties on Bayham Place. Slightly more relaxed targets may be adopted during the daytime and evening periods while still complying with the planning and licensing criteria.

Table 1 Lowest measured $L_{Zeq,10min}$ and proposed targets to achieve criteria

	Frequency (Hz)							
	63	125	250	500	1k	2k	4k	A
Lowest L_{Zeq} measured in Bayham Place	60	53	52	51	49	45	38	53
Target noise level at neighbour	50	50	49	58	46	42	35	50
Comparison to ambient sound level	-10	-3	-3	-3	-3	-3	-3	-3

Values are presented in dB L_{Zeq}

It is proposed that the dome be constructed to provide as much sound insulation as reasonably possible (within the architectural and heritage constraints) and compliance with the criteria will be based on noise limits set within the dome itself. The internal limits may be met using noise limiting devices and/or management controls.

Other considerations

Air source heat pumps are to be located around the dome to provide cooling and heating to the development. The proposed units are known to be relatively noisy, and so consideration has been given to the impact of this on the internal ambient noise levels within the dome. The employer’s requirement (as written in the Acoustic Stage 4 report) for building services noise within the dome is NR 40 L_{eq} , however considering the distracting nature of the noise from the air source heat pumps and the other building services equipment within the dome it would be preferable for noise from the air source heat pumps to be below this. Previous discussions with the client have resulted in a relaxation of the building services noise requirement within the dome.

Construction proposals

Base construction

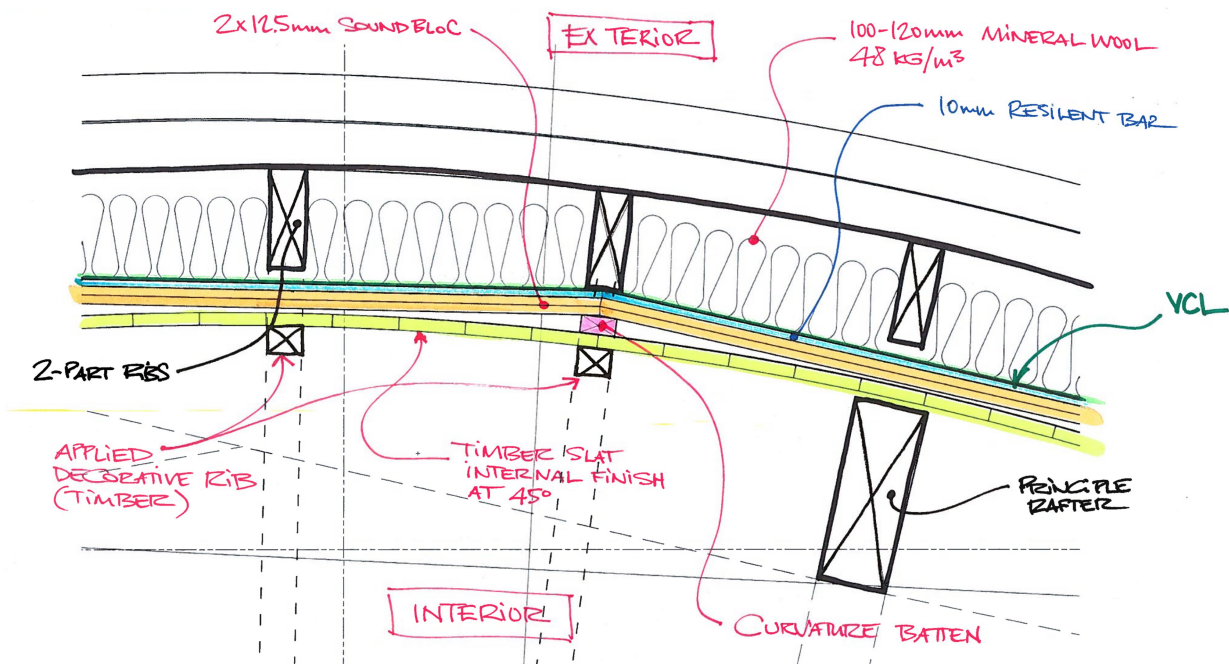
The base construction is to reinstate the original dome material. This is understood to have formed a 0.7mm thick copper flashing on a timber backing.

Enhanced construction

Improving the sound insulation performance of the dome will have the following benefits:

- Allows for increased internal noise levels while remaining compliant with the planning and expected licensing criteria.
- Reduces the noise break-in from the air source heat pumps surrounding the dome

The proposal is to add an acoustic lining to the underside of the dome. The lining will be formed of acoustic plasterboard hung from the structure using resilient bar, with mineral wool in the interstitial cavity. This is shown in the sketch below:



Calculations of the sound insulation performances of the base and existing construction have been made using INSUL, and checked against laboratory test data for similar constructions. The calculated sound insulation performances are shown below:

Table 2 Calculated sound insulation performance of dome materials

	Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Base construction	9	12	16	21	26	32	37
Enhanced construction	16	25	41	54	64	60	57
Improvement of lining	+7	+13	+25	+33	+38	+28	+20

Values are presented in dB R

Calculation of noise limits

Indicative internal noise limits have been calculated for both the base and enhanced construction, based on achieving the target values in Table 1.

The values consider the attenuation effects of geometric divergence over the c.25m distance between the dome and the nearest facing residential window on Bayham Place. Other noise-sensitive receptors are either better screened or further away than these neighbours, and so the level of noise emitted to them can be expected to be lower.

The highest neighbours of Bayham Place will be able to see much of the dome, and so no corrections for screening have been applied.

The following noise emission limits have been calculated. Provided they are not exceeded, it is expected that the proposed constructions will provide enough sound insulation that the planning and licensing criteria will be met:

Table 3 Indicative internal noise limits to meet criteria

	Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Base construction	73	77	80	83	87	89	86
Enhanced construction	79	85	94	93	107	103	96
Improvement of lining	+6	+8	+14	+10	+20	+14	+10

Values are presented in dB $L_{Zeq,5min}$

The limits in Table 3 also consider the noise path through the cupola ventilation system.

Assessment of results

Entertainment noise within dome

The results show that the addition of an acoustic lining allows for greater noise levels within the dome while still meeting the criteria from the local authority. To put the calculated noise limits in context, data presented within the DEFRA report NANR 92 on *Noise from Pubs and Clubs* – as well as the consultation draft of the Institute of Acoustics and Institute of Licensing *Good Practice Guide on the Control of Noise from Places of Entertainment* is given below:

Table 4 Typical maximum noise data for similar establishments

	Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Busy Restaurant	60	70	75	75	75	75	70
Busy Pub/Bar	80	85	85	85	85	80	70
Music Bar	110	110	100	100	95	90	85

Values are presented in dB L_{Zeq}

The largest differences in noise level between the Music Bar and the Busy Pub/Bar and restaurant uses are in the 63-500 Hz range. This is because these low frequencies are more present in amplified music than they are in speech.

The calculations show that:

- Without the lining, noise levels within the dome may not be able to reach the typical maximum noise data for a “Busy Pub/Bar”.
- With the lining, noise limits may be relaxed to a level between the “Busy Pub/Bar” use and the “Music Bar” use. Considering that the space is relatively small and the KOKO development has several other areas more specifically designed for a “Music Bar” use, it is considered that the required noise limits are not likely to significantly affect the proposed use of the space.

Although some relaxation to the limits may be acceptable during the daytime and evening, this is likely only to be of the magnitude of c.5 dB and so will not change the overall assessment.

Noise from building services plant to dome

Without the proposed lining, noise from building services within the dome is predicted to reach up to NR 59 dB L_{eq} , 19 dB above the preferred target. Adding the lining reduces this to NR 44 dB L_{eq} , still above the preferred target but may be low enough to be satisfactorily masked by the amplified music.

Summary

The addition of the proposed lining will enable the dome to be used as a Pub/Bar with a reasonable level of background music, and it will be possible to ensure these levels are met using a limiter if necessary. The lining will also reduce noise from building services within the dome, resulting in a more pleasant environment for the guests.

Scriptor Court,
157 Farringdon Road,
London, EC1R 3AD

T 0203 544 5400