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VA2339 45 NEW COMPTON STREET, LONDON

Condition 15 - Lift Noise

Planning approval has been granted for a refurbishment and extension of the building at 45 New Compton Street, WC2H 8DF, including a lift shaft extension to the front elevation.

Condition 15 attached to the permission requires:

> *"Prior to the commencement of development, design details that demonstrate 5 that the lift motor and associated equipment will achieve the following shall be submitted for approval by the Local Planning Authority:*
>
> *a.) LOAEAL (green) noise levels for 'inside a bedroom' for night time as set out in Table B of Appendix 3 of the Camden Local Plan.*
>
> *b.) 'vibration inside dwellings' standard for night time operation as set out in Table A of Appendix 3 of the Camden Local Plan.*
>
> *Reason: To prevent the transmission of noise and vibration throughout the building and / or into any neighbouring premises in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017."*

Table A and Table B of Appendix 3 of the Camden Local Plan provide the following criteria:

Vibration description and location of measurement	Period	Time	Vibration Levels (Vibration Dose Values)
Vibration inside dwellings	Day and evening	07:00-23:00	0.2 to 0.4 VDV $ms^{-1.75}$
Vibration inside dwellings	Night	23:00-07:00	0.13 VDV $ms^{-1.75}$

Table 1.1 – Excerpt from Table A, Appendix 3 of the Camden Local Plan

These values are based on the "low probability of adverse comment" limits in BS6472-1:2008 *Guide to evaluation of human exposure to vibration in buildings.*

Assessment Location	Design Period	LOAEL (Green)
Inside a Bedroom	Day	<35dB $L_{Aeq,16hr}$
	Night	<30dB $L_{Aeq,8hr}$ 42dB $L_{Amax,fast}$

Table 1.2 - Excerpt from Table B, Appendix 3 of the Camden Local Plan

These values are based on the recommendations in BS8233: 2014 *Guidance on sound Insulation and noise reduction for buildings* and WHO.

For lift noise, the <42dB $L_{Amax, fast}$ criterion would be the most relevant.

A.1 Lift Shaft Details

The lift shaft is to be located towards the southeast corner of the building, protruding from the front of the building.

It is understood that at first to fourth floor the new lift shaft will be on the external wall of existing bedrooms. A new lobby will be formed on the new fifth floor supported off steels independent of the existing roof slab.

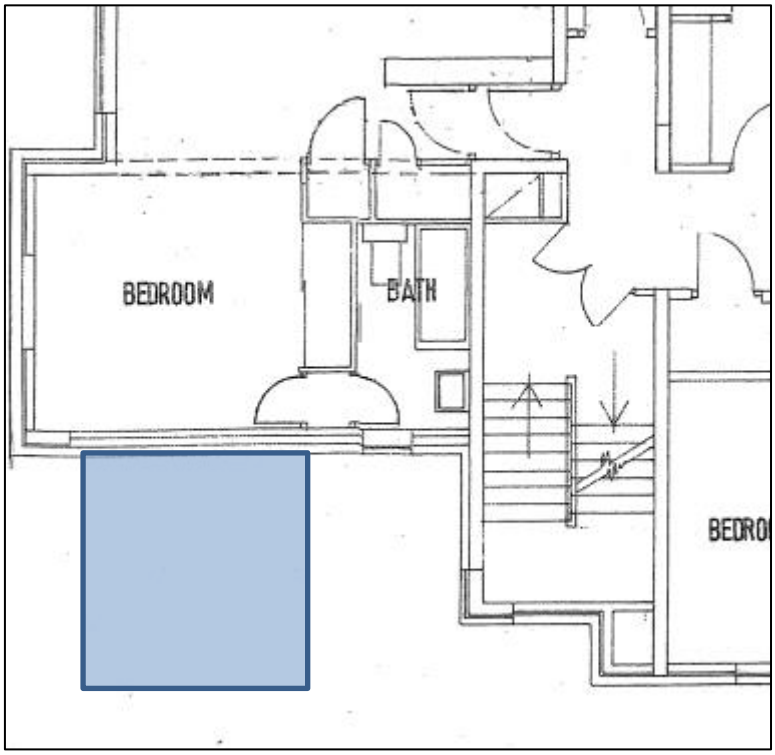

Figure 1.2 – Illustration of approximate lift shaft position relative to existing dwelling

It is understood that the shaft will be formed of an independent concrete structure set against the existing external wall and tied in with steel bars at every floor level. The existing external wall is a 250mm cavity wall.

Within the independent lift shaft the lift will run on guide rails mounted to the concrete structure (not in contact with the cavity wall adjacent to the bedrooms).

A.2 Lift Details

The Kone Mono 500 lift system is proposed for use. The supplier has provided the following technical details for this system:

- Noise level on lift lobbies - 52 dBA
- Max Acceleration - 0.5m/s^2
- Max Jerk – 2.0m/s^3
- Max Lateral Vibration – 12 Gal
- Max Vertical Vibration – 15 Gal
- Max Noise in Car – 55dBA

A.3 Airborne Sound Transmission

The maximum in car noise levels are 55dB(A). Noise levels in the shaft may be slightly higher than this. VDI 2566-2:2004 specifies a maximum sound pressure level in the lift shaft of 75 dB(A) although, based on the in car noise levels, the in-shaft noise levels are likely to be significantly lower than this.

The wall between the lift shaft and bedroom is understood to be a 250mm cavity wall (100mm brick, 50mm cavity, 100mm block). This type of construction generally provides a sound reduction index of at least R_w 50dB (BS8233:2014 example), although significantly higher performances (around $D_{nt,w}$ 60dB) are commonly achieved by masonry walls with insulation in the capacity.

Under the above robust scenario (Source noise - L_{Amax}75dB, External wall sound reduction - R_w50dB), the internal noise due to airborne sound transmission is not expected to exceed L_{Amax} 32dB. In practice, significantly lower sound from airborne transmission is expected.

Therefore, airborne sound transfer is not expected to exceed the set criteria.

A.4 Vibration

Structural noise is usually the more important path of noise from lifts. This is usually dominated by vibration caused at the lift motor suspended above the lift shaft. A secondary source of vibration is from the lift movement along the guide rails.

The Kone Mono 500 system does not employ a machine room and is driven by a motor within the shaft.

No equipment or structures (guide rails etc) will be connected directly to the external wall of the existing dwellings. All connections would be via the lift shaft support structure.

The levels of vibration in the lift car does not exceed 15Gal, equivalent to 0.15m/s^2. Assuming a loss factor through the connection between the guide rails, concrete shaft and cavity wall, structural borne noise is expected to be well controlled in the bedrooms.

The vibration levels would be expected to result in a Vibration Dose Value well below 0.13 $ms^{-1.75}$.

A.5 Conclusion

The new lift shaft at 45 New Compton Street London is to be formed of an independent concrete shaft supported against the external cavity wall of the existing dwellings.

The proposed lift system will run on guide rails within this shaft utilising a motor that is contained in the shaft without the need to a machine room.

The airborne sound and vibration transmission expected from the lift shaft into the adjacent bedrooms have been considered on the basis of information provided.

The proposal is expected to meet the requirements of Condition 15 in terms of noise and vibration values.

Yours sincerely
on behalf of Venta Acoustics

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