Cole Jarman

Maitland Park, Camden

Acoustic Review

Report 16/0565/R2 // Revision 4

Maitland Park, Camden

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London Borough Of Camden

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Attachments

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1 Introduction

1.1 This report considers the acoustic design of the construction of a residential led scheme at the Maitland Park Estate, Camden.

1.2 Cole Jarman have been instructed to undertake a design review with respect to the acoustic aspects of the scheme to support the new Minor Material Amendment (MMA) planning submission to the previously approved planning permission (ref: 2014/5840/P as amended by ref: 2015/6696/P).

1.3 The review has been conducted considering the original noise survey, planning assessment report and planning conditions imposed. Criteria for compliance with the 2015 amended edition of Approved Document E (2003), the Building Regulations 2010 and Home Quality Mark standards have been included.

2 Design Standards

2.1 Various design standards for the scheme in terms of internal noise levels, external noise levels and sound insulation are set out in attached Appendix A. The standards include the Building Regulations (Part E), planning conditions for the scheme, the Home Quality Mark as well as other recognised standards.

2.2 As part of this planning submission, proposals are included for the alteration of some conditions. With regards to condition 11, for example, we have advised on an alternative criterion, which is set out in more detail in Appendix A.

3 Noise Climate

3.1 As part of the original 2015 planning application a noise survey and assessment was prepared by Ramboll. Full details of the noise assessment are contained in report *61031879/NV/R02/B 'Noise and Vibration Impact Assessment' (7th May 2014)*.

3.2 The noise survey consisted of a single non-attended noise monitor (left for a period of 7 days) in addition to a number of spot checks at various positions around the site.

3.3 The noise levels at the long term logging position varied. Discounting the initial daytime period and final night time period, which did not cover the full durations, the average noise levels during all survey periods were:

- Daytime 51dB $L_{Aeq,16h}$
- Night time 45dB $L_{Aeq,8h}$

3.4 These apply for the Aspen Villas and Aspen Court blocks. For Grafton Terrace the only data available are two 15 minute periods (ST 5 and ST6 of Ramboll survey) which show noise levels

of 55dB $L_{Aeq,15min}$ and 57dB $L_{Aeq,15min}$. Maximum noise levels were noted to be 74dB L_{Amax} and 72dB L_{Amax}. These are elevated above the average at the logging position, although the notes suggest there was a contribution from construction noise present.

3.5 It is likely the maximum noise level is due to a vehicle pass-by. At night we would typically not expect a significant number of vehicles on such a road. However as there are no overnight data available for inspection it is not possible to confirm this.

3.6 Based upon the logger position, 1 credit would be available under the HQM standard, being marginally outside the criteria for 2 credits. If one was to consider the worst case at Grafton Terrace, then no credits would be available, but as this assessment is based upon a single measurement, it is possible that a complete 16 hour daytime period would reveal noise levels be within the 55dBA criterion and therefore 1 credit would be available.

3.7 With limited options to attenuate noise levels to balconies, we would suggest 1 credit would be available under the HQM scheme for external noise levels.

4 Plant Noise Limits

4.1 Based upon the requirements of existing planning condition 5 and the results of the survey, the following plant noise limits are suggested. These are based upon the lowest L_{A90} recorded from the long term logging position. Ideally the full, raw, survey data should be provided to us and a noise limit set based upon statistical analysis of the data to represent a 'typical' background noise level rather than the minimum or the arithmetic (or logarithmic) average; this would likely increase the limits as suggested below.

Noise Emission Limit, dB	
Daytime (0700-2300 only)	**Night time (2300-0700)**
33	30

T1 Plant noise emission limits at the nearest residential properties.

4.2 If any plant or equipment has specific acoustic 'character' (such as tonality or intermittency) then more stringent noise limits would apply under Camden policy.

4.3 It should be noted that the above noise limits apply to all plant associated with the development as a whole. At any given receptor, the noise limit would need to be divided amongst the different buildings or plant areas to ensure the overall noise limit is achieved due to all plant forming part of the scheme.

4.4 We note that current Camden policy regarding plant noise has changed since condition 5 was originally drafted, to be 5dB more stringent. Given the existing noise climate is relatively low,

with daytime external noise limits currently derived to be lower than BS8233 internal guidance levels, a level of 5dB below background as noted in the current condition is still deemed suitable to minimise risk of potential complaints regarding plant equipment in the future from existing or proposed noise sensitive receivers.

5 Façade, Glazing and Ventilation

5.1 Taking the Ramboll data in good faith, and applying a typical spectrum for road traffic noise (as spectral data are not available in the Ramboll report), basic thermal double glazing (in line with the Ramboll initial suggestion) would be sufficient to the Aspen Court and Aspen Villas buildings to all facades. For completeness the following spectral performance would be required:

Element	SRI (dB) @ Octave Band Centre Frequency (Hz)					
	125	**250**	**500**	**1k**	**2k**	**4k**
Standard thermal double glazing	20	18	26	33	33	30

T2 Glazing requirements

5.2 As noted, natural ventilation by openable windows would not be suitable for background ventilation, however a non-acoustic trickle vent is acceptable.

5.3 To Grafton Terrace there is a lack of data to fully assess noise ingress. On the assumption that the 57dBA recorded at ST6 is the worst case daytime noise levels and that the night time is lower to the same extent measured at the logging position (i.e. 6dB) then the same glazing and ventilation specifications as for the other buildings would also apply.

5.4 With only modest noise levels present, the remaining areas of façade that are not glazed only need to provide a relatively basic level of sound insulation for noise break-in purposes. Any façade with solid full brick outer skin would be acceptable for noise break in. If a light weight system with a superficial external cladding were to be utilised, then the external sheathing board should have a mass equivalent to 10mm cement bonded particle board (i.e. $\geq$11.5kg/m^2).

6 Sound Insulation

6.1 The residential elements of the scheme will be designed to at least the minimum standards as set out in Part E of the Building Regulations. This includes sound insulation between dwellings, sound insulation inside individual dwellings and reverberation in common areas.

6.2 If required, the standards may be enhanced beyond the minimum Building Regulations criteria in order to meet other recognised standards (such as the Home Quality Mark scheme). The various criteria set out in these documents is included in attached Appendix A.

6.3 In addition, the party floor and wall from the TRA hall to the residential apartments above and adjacent will have a further enhancement. This is discussed in section 7 below.

7 TRA Hall

7.1 Description

7.1.1 The TRA hall building is to comprise a small café area, some small cellular office / meeting rooms and a main hall space (separated into 2 sections with an operable partition).

7.1.2 The facility shares one section of party wall with the adjacent flats at ground floor level where a small meeting room and office are next to a bedroom, bathroom and utility cupboard. Above all the TRA accommodation are apartments. We understand the party floor is to be a 400mm thick flat solid concrete slab with thicker down stand sections (over 1,000mm depth) to provide the structural support for the building above.

7.1.3 The small meeting rooms and office are not expected to be significantly noise generating and nor is the general café area (assuming no significant amplified music is to be played); however, the main hall has the potential to be a significant noise generating venue.

7.1.4 Discussions have been had with the client and they have been in communication with the proposed operators of the community hall. We have been informed that the TRA hall is envisaged to be used akin to a "village hall" and that the main space is expected to be used for the following types of activities:

- youth club (up to 9.30pm)
- Duke of Edinburgh training
- yoga classes
- crèche
- aerobics
- meetings and lectures
- Children's parties, lunches, christening parties, wakes etc.

7.1.5 Although the possibility of some live or amplified music has not been ruled out, due to the planning restrictions on the opening times of the facility, it is highly unlikely that an adult 'party' type event with particularly loud amplified music would occur in the hall. We note that any music for aerobics or fitness type activity would likely be with a small portable stereo system and not a large professional system.

7.1.6 The design of the scheme will be based upon the noise levels expected with the above assumptions.

7.2 Party Floor

Main Hall: Expected Activities

7.2.1 We would advise that an upgrade beyond standard building regulations requirements in terms of sound insulation is provided to the party floor. As set out in Appendix A, **we would advise achieving levels of 47dB $L_{eq,1min}$ at 63Hz and 41dB $L_{eq,1min}$ at 125Hzinside any residential habitable room and propose that planning condition 11 is amended to reflect this**. The remaining assessment considered in this report is based on achieving this new criterion.

7.2.2 The current intended floor build-up is to be a concrete transfer slab of 400mm thickness with deeper downstand beams. Although impact sound insulation from the first floor residences to the ground floor community hall space below is not required for Building Regulation purposes, we would advise that some impact treatment is included to the upper surface of the floor above the hall (as to other residential floors) as this will provide an important sound insulation function.

7.2.3 With the 400mm slab and floor treatment to above, the party floor will give sound insulation comfortably beyond the minimum building regulations. The expected performance of the concrete slab are detailed in table T3 below.

Party floor construction	**SRI (dB) @ Octave Band Centred Frequency (Hz)**							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Without ceiling	44	48	54	58	63	66	67	68

T3 Sound insulation of proposed party floor without ceiling

7.2.4 To achieve the proposed noise limits in any residences above via the party floor, the limiting noise levels noted in table T4 below would apply. The activities noted by the client in section 7.1.4 above (without significant amplified or live music) should be adequately accommodated within such limits without any further sound insulation treatment.

Limiting Level	**Nosie Level (dB, L_{Aeq}) @ Octave Band Centred Frequency (Hz)**							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Without Ceiling	91	89	85	82	83	83	81	81

T4 Limiting reverberant noise level within community space

Main Hall: Amplified Music

7.2.5 If the use of the hall (even for limited occasions) for live or amplified music cannot be ruled out, the use of a solid plasterboard ceiling suspended below the slab would be expected to improve the sound insulation performance, which is particularly beneficial at lower frequencies (typically associated with amplified music).

7.2.6 The following construction is proposed for the scheme, which should allow for higher activity noise levels to be generated inside the hall:

- 2 layers of 15mm SoundBloc on CasoLine MF grid (with acoustic hangers) with 100mm Isover APR1200 in the void, minimum void depth 400mm. The expected performance with the ceiling is shown in the table below.

Party floor construction	**SRI (dB) @ Octave Band Centred Frequency (Hz)**							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
With Ceiling	48	55	74	>80	>80	>80	>80	>80

T5 Sound insulation of proposed party floor with ceiling

7.2.7 The ceiling could be installed between the deep downstand beams but the 400mm void depth is critical to providing low frequency sound insulation. We note that a secondary ceiling might also be required for absorption purposes.

7.2.8 In order to achieve the proposed levels, the following limiting noise levels would apply inside the hall with the ceiling installed:

Party floor construction	**Nosie Level (dB, L_{Aeq}) @ Octave Band Centred Frequency (Hz)**							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
With Ceiling	95	96	105	104	>100	>97	>94	>93

T6 Limiting reverberant noise level of amplified music within community space

7.2.9 The limiting noise levels in table T6 above show that relatively loud activity could occur in the hall and the residents directly above still be protected to acceptable levels via the party floor / ceiling construction. This is not to say that those levels will be reached, but shows that adequate protection can be provided for not only the example activities expected to be used, but potentially for noisier events as well, if they happen to occur on occasion.

7.2.10 To demonstrate the types of noise levels that the above construction can accommodate, table T7 below shows noise levels previously measured in similar "village hall" type spaces when undertaking live or amplified music, with substantial sound systems generating high levels of low frequency (bass) noise.

Noise Source	L_{eq} (dB) @ Octave Band Centred Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	dB(A)
Church band	90	94	95	99	92	87	85	81	98
Social club on dancefloor	87	92	92	89	88	86	81	69	93
Event space dancefloor	95	91	91	90	88	85	83	82	93

T7 Database live and amplified music noise levels (L_{eq})

7.2.11 It can be seen that the majority of the events measured exceed the design parameters for the slab alone; but with the suspended ceiling installed, they meet the design parameters at all frequencies. As previously noted, such activity at those volumes in unlikely to occur regularly, if at all.

7.2.12 With the potential to have events with amplified music in the hall, we would suggest that in addition to the specified ceiling, a noise limiter system should be considered to be installed inside the hall. In addition, consideration will need to be given to the façade make up in order to achieve suitable sound insulation via this transmission route.

7.2.13 The design noise levels are based upon achieving the proposed noise limit purely in relation to noise transmission via the party floor. Consideration should also be given to the potential noise break-out from the hall to existing residents via the façade and windows.

7.2.14 A suitable façade and glazing system to accommodate the noise limits noted in tables T4 and T6 would require acoustic glazing (substantial in the amplified music scenario, which may possibly be practically or economically prohibitive). However, as noted above the type of activity expected to generate these noise levels is unlikely to occur. Noise break out via the façade may be the defining factor in determining appropriate internal noise limits rather than noise transmission via the floor build up.

7.2.15 The glazing to the hall is discussed in more detail in section 7.3 below.

Café

7.2.16 As noted above, under normal daytime use, the café space is unlikely to be significantly noise generating (assuming controlled background music). Typical noise data for a restaurant would suggest that no ceiling is required in order to meet the same proposed noise limits as for the hall, to the apartments above; only if the hall was to be used for amplified or live music, where

noise from the hall as the potential to spill out into the café area, we would suggest that some form of basic sound insulation ceiling is used in the café.

7.2.17 The same ceiling system as to the hall, but with a single layer of 15mm SoundBloc would be appropriate (but surface applied acoustic treatment or a secondary absorptive ceiling beneath will be of benefit for reverberation treatment).

7.2.18 It might alternatively be possible to utilise perforated plasterboard with 100mm thick dense ($\geq$100kg/m^3) mineral wool insulation above to provide both some enhancement to sound insulation and sound absorption. This option would need further review during the next design stage.

Meeting rooms

7.2.19 On the basis that the meeting rooms and offices will only be used for non-amplified, natural speech, no ceiling would be required for sound insulation purposes to these rooms.

7.3 Façade and Glazing

7.3.1 To avoid noise breakout from the hall (which will be mechanically ventilated including air conditioning) affecting existing and new residences, the façade and glazing of the hall will provide certain levels of sound insulation. The new residences forming part of this development will be provided with alternative mechanical ventilation, and would be able to keep windows closed for periods when the hall is in use. To existing residences, this expectation could not reasonably be applied and one must assume that windows will be openable for ventilation purposes.

7.3.2 In the case of the new residences their basic double glazing will provide significant attenuation, compared to an open window which can only be expected to give up to 15dB reduction as a maximum.

Main Hall: Expected Activities

7.3.3 For the expected scenarios with activities suggested by the client, with limiting noise levels as specified in table T4 above, in order to achieve the noise limit set internally to receivers, glazing of the following specification would be necessary:

Element	SRI (dB) @ Octave Band Centre Frequency (Hz)							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Glazing	18	21	27	31	36	39	39	42

T8 Glazing sound insulation performance requirements

7.3.4 This performance is expected to be achieved with acoustic grade double glazing that is regularly available. An indicative example specification likely to achieve such a performance would be within 10mm float glass, 12-24mm airgap, 6mm float glass.

Main Hall: Amplified Music

7.3.5 Only if the option of amplified or live music is pursued and if one was to consider the noise levels recorded noted in table T7 above for the "social club dance floor" then the following performance would be required of the glazing to the TRA hall:

Element	SRI (dB) @ Octave Band Centre Frequency (Hz)							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Glazing	19	24	34	38	41	42	42	42

T9 Glazing sound insulation performance requirements

7.3.6 The above performance would require significant acoustic double glazing, wide airspace double glazing or windows with separate secondary glazing. The weight of windows will be significant with acoustically laminated glass likely required.

7.3.7 If a noise limiter is installed or agreement is entered into not have live or amplified music with such high noise levels, then more typical commercial double glazing might be suitable.

7.3.8 At detailed design stage the glazing will be selected in order to meet any planning noise limits imposed, based upon the noise emission levels of the activities to be held in the hall. Based upon the final glazing selections, limiting noise levels for the hall could be assessed. If any events with live or amplified music were proposed, a limiter system could be installed to ensure the limiting noise levels are not exceeded.

7.3.9 We would not suggest use of new planning conditions requiring a noise limiter system be installed or that specific glazing specifications be imposed. However, if an internal noise limit is included as an amended or new planning condition, the design specification of the facility and the subsequent permitted activity would need to be managed to adhere to the condition.

7.3.10 The remaining façade at ground level to the TRA hall should be of a masonry construction to maintain the high levels of sound insulation. A traditional brick outer skin with blockwork ($\geq$1,350kg/m^3) inner leaf is recommended for noise egress. Flanking via the façade should also be considered carefully to avoid noise passing into the upper floors and it is likely that a further independent lining to the inner masonry leaf would be required inside the hall to address this.

7.3.11 Any external doors to the hall (currently 2 sets of fire escape doors shown) must be acoustically rated to at least the same performance as the glazing or otherwise a lobbied configuration utilised.

7.3.12 If the specification is prohibitive, then the limiting noise levels inside the hall would need to be revised.

7.3.13 The hall has also been designed to provide all ventilation with windows closed (and without standard non-acoustic trickle ventilators). This does not mean windows cannot be openable, as the majority of the time it is unlikely that noise from activity would warrant it, but there are likely to be times when the windows will need to be kept closed for potentially noisy periods.

7.4 Party Wall

7.4.1 With the use adjacent to the residence being a meeting room, we would not expect significant noise levels to be generated beyond that in a typical dwelling. Therefore, a party wall to the same standards as elsewhere in the scheme (for residential to residential adjacencies) should be constructed.

8 Plant Equipment

8.1 Apart from minor electrical switch rooms (which do not typically generate significant noise levels), there are 2 main internal plant rooms proposed; at Aspen Villas ground floor and Grafton Terrace ground floor. There will be a number of Air Source Heat Pump (ASHP) units on the roof of Grafton Terrace as well as Aspen Villas. The units on Aspen Villas will serve both the Villas and adjacent Aspen Court. In addition to the Grafton Terrace ASHPs, some limited air handling plant and other ancillary plant will also be installed on this roof.

8.2 The plant noise limits set out in section 4 will be divided amongst the various plant areas to ensure the overall noise limit is not exceeded by the emissions from all the plant combined.

8.3 Acoustically rated screens are to be located around these external plant areas to ensure acoustic screening is provided to reduce noise levels from the plant equipment to surrounding buildings. Any air intake or discharge to internal plant rooms will be made via attenuated paths (e.g. acoustic louvres or force ventilated louvre grills) where the plant equipment warrants such measures.

8.4 Any plant rooms that share a party wall or floor with residences will be reviewed once details of the plant are fully known and the sound insulation of the elements enhanced if and as necessary the ensure the amenity of the residences is maintained.

8.5 All plant equipment will be installed with the necessary degree of anti-vibration mountings or fixings to ensure structure borne noise is not generated inside any residential accommodation.

9 Conclusions

9.1 An acoustic design review has been completed by Cole Jarman. Performance requirements have been provided that set out the basic minimum requirements of the sound insulation performance by the 2015 amended Edition of Approved Document E (2003) to the Building Regulations 2010 as well as HQM enhanced criteria.

9.2 Advice has been given regarding acoustic mitigation measures (such as glazing performances) and limiting noise levels have been suggested, based upon the given constructions.

9.3 We suggest that the existing planning condition 11 is amended to provide a more specific noise limit, which would need to be accommodated by the design. We would not suggest that any further conditions are required specifically prescribing the mitigation measures as there are different options that can be pursued, depending on the agreed use of the TRA hall facility.

End of Section

Glossary of Acoustic Terms

L_{Aeq}:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq}.

L_{Amax}:

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the "fast" sound level meter response.

NR

Noise rating level (NR) is a graphical method for assigning a single number rating to a noise spectrum. It can be used to specify the maximum acceptable level in each octave band of a frequency spectrum, or to assess the acceptability of a noise spectrum for a particular application. The method was originally proposed for use in assessing environmental noise, but it is now used in the UK mainly for describing noise from mechanical ventilation systems in buildings.

$D_{nT,w}$

This is the level difference achieved from one room to another normalised to a 'standard' reverberation time of 0.5 seconds, and weighted to provide a single figure value.

$L'_{nT,w}$

This is the noise level within one room when the floor in the room above is excited by a calibrated tapping machine or similar, and normalised to a 'standard' reverberation time of 0.5 seconds, and weighted to provide a single figure value.

R_w

This is the sound reduction index, weighted to provide a single figure value, of a particular construction as measured under laboratory conditions, where there is no flanking sound transmission and where the test sample is constructed exactly in accordance with manufacturers details.

End of Section

Cole Jarman

Appendix A

Subject:	**Design Criteria**		
Project:	**Maitland Park, Camden**		
Date:	**11 February 2020**	**Prepared:**	**LM**
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A1 Building Regulations

A1.1 The 2015 amended edition of Approved Document E (2003), 'Resistance to the passage of sound' (ADE03) forms part of the Building Regulations and sets out the minimum site requirements for acoustic separation between a dwelling and any other adjoining part of a development, as summarised in table T1 below:

New Build or Conversion	Separating Element	Airborne Sound Insulation dB ($D_{nT,w} + C_{tr}$) (Minimum Value)	Impact Sound Insulation dB ($L'_{nT,w}$) (Maximum Value)
New Build	Party Walls	45	N/A
New Build	Party Floors	45	62

T1 Performance requirements for party walls and floors

A1.2 ADE03 requires that internal walls separating a bedroom or room containing a WC from any other room, together with all internal floors, should provide a laboratory sound insulation performance as outlined in Table T2 below. The internal wall and floor performances do not need to be verified by testing on site.

Internal Element	Airborne Sound Insulation dB (R_w) Minimum value
Internal Walls around bedrooms & WC's	40
Internal Floors	40

T2 Performance requirements for internal walls and floors

A1.3 We are not currently aware of any specific Employer's Requirements; however, we understand that there is an agreed approach to adopt the Home Quality Mark scheme. The acoustic

related criteria of this scheme are set out in section A1.3 below, some of which go beyond the minimum Building Regulations requirements.

A1.4 Although the Code for Sustainable Homes was noted in the 2015 planning conditions, we understand that HQM standards are the agreed alternative.

A2 Planning Conditions

A2.1 Planning permission (application ref 2014/5840/P) for the development was granted subject to conditions. Acoustic related conditions are as follows:

Condition 5

Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant equipment (or any part of it) is in operation unless the plant/equipment hereby permitted will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps), then the noise levels from that piece of plant/equipment at any sensitive facade shall be at least 10dB(A) below the LA90, expressed in dB(A).

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policy CS5 of the London Borough of Camden Local Development Framework Core Strategy and policies DP26 and DP28 of the London Borough of Camden Local Development Framework Development Policies.

Condition 6

The development shall be carried out in accordance with the noise mitigation measures set out in the Noise and Vibration impact assessment by Ramboll dated July 2014, hereby approved.

No residential unit shall be occupied until the mitigation measures relevant to all units have been installed.

Reason: To safeguard the amenities of the future occupants of the development in accordance with the requirements of policy CS6 of the London Borough of Camden Local Development Framework Core Strategy and policies DP26 and DP28 of the London Borough of Camden Local Development Framework Development Policies.

Condition 11

No music shall be played in the community hall in such a way as to be audible within any adjoining premises or on the adjoining highway.

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies CS5 of the London Borough of Camden Local

Development Framework Core Strategy and policy DP26 of the London Borough of Camden Local Development Framework Development Policies.

A3 Home Quality Mark

A3.1 We understand the project will be registered under Home Quality Mark (HQM), where a 'Star' rating system applies. As part of the scheme credits are available for achieving specific internal and external noise levels and for providing enhanced sound insulation within and between dwellings. This forms part of the 'Comfort' section of HQM. The below criteria are taken from the HQM ONE Technical Manual SD239 England (08/2018).

A3.2 Two credits are available for meeting the internal noise levels shown within the table below:

Time of day	Habitable rooms $L_{Aeq,T}$	Non-habitable rooms $L_{Aeq,T}$	Open plan rooms that a kitchen is part of $L_{Aeq,T}$
Day (07:00-23:00)	35dB	35dB	Lower target: 35dB Upper target: 45dB
Night (23:00-07:00)	30dB (Bedrooms only)	35dB	35dB

T3 Table 20 "Internal Noise Levels"

A3.3 Up to two credits are available for meeting the external noise levels shown within the table below:

Time of day	Credits	Requirements $L_{Aeq,T}$
Day (07:00-23:00)	1	55dB
Day (07:00-23:00)	2	50dB

T4 Table 21 "Noise levels of external functional space"

A3.4 Up to 5 credits are available for increasing the sound insulation levels for separating walls and floors beyond the requirements of Approved Document E. These credits are shown below:

Credits	Airborne sound insulation Req 1 $D_{nT,w} + C_{tr}$ / (dB) (min values) Separating walls and floors between homes	Airborne sound insulation Req 2 $D_{nT,w}$ (dB) (min values) Separating walls and floors between homes	Impact sound insulation $L'_{nT,w}$ (dB) (max values) Separating floors only between homes
1	48	56	56
3	50	58	54
5	53	60	52

T5 Table 22 "Sound insulation levels for separating walls and floors"

A3.5 Up to 4 credits are available for increasing the sound insulation levels for internal walls and floors beyond the requirements of Approved Document E. These credits are shown below:

Credits	Airborne sound insulation R_w (dB) (minimum values)
2	44
3	45
4	48

T6 Table 23 "Sound insulation levels for internal walls and floors"

A3.6 In total, a maximum of up to 13 credits could be attainable to go towards a Star rating. Some of these credits are easily achievable without additional mitigation measures, however the sound insulation credits for both party walls/floors and internal walls/floors would require addition material and variations of the construction otherwise required to meet the minimum Building Regulations requirements.

A3.7 The report sets out a review of internal and external noise levels where the 2 credits for internal levels should be achieved by default (as the planning conditions are more onerous) and also 1 credit should also be available for external noise levels.

A4 Commercial / Community Areas

A4.1 The majority of the scheme is residential in nature with Aspen Court and Aspen Villas being entirely residential; however, at Grafton Terrace there is a community element at ground floor known as the TRA Hall. This is to comprise a community space and associated ancillary accommodation (such as café and meeting rooms). Residential flats will be constructed to the floors directly above.

Design Criteria

A4.2 Although there are no statutory requirements beyond those of the Building Regulations, the performance of the floor between commercial areas and residential accommodation above should be carefully considered to avoid potential complaints in the future and planning condition 11 was set to account for this.

A4.3 The 2015 Ramboll planning report recommended that the 'Good' standard of 30dBA inside the residences (with a 5 dB margin, i.e. 25dBA) should apply to noise from the community centre to the apartments above. Planning condition 11 states a separate criterion, much more stringent, where inaudibility is noted.

A4.4 The Ramboll criterion does not align with the planning condition, although we consider the latter is too vague and onerous (as there is no set definition of inaudibility) and therefore not in accordance with paragraph 206 of the National Planning Policy Framework. This notes that planning conditions should only be imposed where they are necessary, relevant to planning and to the development to be permitted, enforceable, precise and reasonable in all other respects.

A4.2 Taking account of the above, we suggest the condition fails the above test on the ground that it is not precise, difficult to enforce and is not reasonable.

A4.5 The performance sought should be based upon the intended use of the commercial unit. Within the assessment, we have considered the clients expected uses and have also commented on the implications if the space was to potentially be utilised for amplified music; however as per the current planning conditions for the scheme, this activity would not occur beyond 22:30 hours.

A4.6 Based upon our experience of such use, previous planning decision and appeals, and considering the currently permitted hours of operation and the nature and character of the noise source, we propose specific noise limits should be applied at particular frequencies in order to establish an appropriate and tangible noise limit.

A4.7 Specifically, we suggest noise limits for music of 47dB and 41dB $L_{eq,1min}$ at 63Hz and 125Hz respectively.

A4.8 Such an approach is slightly more restrictive than that set out by Ramboll because it sets limits at specific frequencies. The proposal is precise, enforceable and reasonable. It is in line with guidance from other Local Authorities such as Manchester City Council.

A4.9 It should be noted that this proposed criterion is not as stringent as planning condition 11 in that music, entertainment or other activity noise at this level in a private residence is likely to be audible when background noise levels are low. However, given the operating hours restriction imposed on the TRA Hall, it is considered to be capable of providing good protection for future residents.

A4.10 An example wording for such a condition for consideration is as follows:

No music shall be played in the community hall in such a way as to exceed levels of 47dB $L_{eq,1min}$ at 63Hz and 41dB $L_{eq,1min}$ at 125Hz inside any habitable room of any residential dwelling (including those forming part of the development itself).

Dwellings forming part of the scheme should be considered with windows closed and adequate background ventilation provided.

A4.11 Section 7 of the report sets out advice for the TRA hall in more detail.

A5 Internal Noise Levels

A5.1 As required by planning condition 6, the noise mitigation measures set out in the Ramboll report were in order to achieve the BS8233:1999 'Good' standard in terms of internal noise levels, including the 45dB L_{Amax} criterion. This document was superseded by the 2014 edition in February 2014 before the revision B of the Ramboll report was issued; but it appears the 'Good' criteria was noted by the Environmental Health department to be required in February 2014.

A5.2 As per the requirements of planning condition 6 and BS8233 / WHO guidance set out in the Ramboll report, the following noise levels are applicable for internal accommodation:

Activity	**Location**	**07:00 to 23:00**	**23:00 to 07:00**
Resting	Living room	30 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	30 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB L_{Amax}

T7 BS 8233:1999 'Good' criteria

A5.3 By meeting these internal noise levels 2 credits under the HQM standard should be achieved.

A5.4 In addition, noise levels to external amenity spaces such as gardens and balconies should not exceed 55dB $L_{Aeq,16h}$ as the upper limit, in accordance with BS8233:1999 and WHO guidance. We note that BS8233 was updated in 2014 where paragraph 7.7.3.2 states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation,

development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

A5.5 It goes on to say that for flats and apartments where balconies, roof gardens and terraces can be used, *"…specification of noise limits is not necessarily appropriate."* For small balconies it suggests that *"noise limits should not be necessary."*

A5.6 We would therefore suggest that noise limits to external amenity spaces need not strictly apply in this instance, although the interpretation of planning condition 6 and reference to the Ramboll report might require the upper limit of 55dBA being met.

A5.7 It is likely that the level will be met and 1 credit would be achieved under the HQM scheme for external noise levels.

End of Section

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