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ELLERAY HALL COMMUNITY HALL

PLANNING CONDITION NS28

ACOUSTIC REVIEW

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1.0 Introduction

- 1.1 Applied Acoustic Design is instructed by Beard Construction to complete an acoustic assessment to address Condition NS28, which forms part of planning permission granted for the development of Elleray Hall Community Hall. Condition NS28 requires that the Community Centre building envelope controls sound break out to meet with a specified limit.
- 1.2 This assessment is based on:
- Architectural Drawing information issued by BDP Architects and Surveyors
 - Likely Community Hall activities information provided by McBain Project Managers
- 1.3 This report sets out a summary of the assessment completed and the results to demonstrate that the requirements of Condition NS28 can be satisfied.

2.0 Planning Condition NS28

- 2.1 The London Borough of Richmond Upon Thames granted planning permission for the development of Elleray Hall Community Centre on the 23rd June 2022. Conditions application to the development are set out in the Councils Decisions Notice document ref. DC/GRE/21/2533/FUL/FUL. Condition NS28: Noise Insulation is reproduced below:

U0130577 NS28: Noise insulation

Prior to the commencement of any superstructure works on the proposed Community Centre hereby permitted, details of the proposed sound insulation scheme shall be submitted to and approved by the Local Planning Authority. The sound insulation scheme shall be designed to ensure that noise from within the Multi-Purpose Hall and community hall when measured at one metre from the facade of the nearest noise sensitive premises should not exceed 10dB(A) below the typical LA90 1Hour day or LA90 5 min night. Details should include airborne sound insulation. The developer shall certify to the Local Planning Authority that the noise mitigation measures agreed have been installed. The approved scheme is to be completed prior to occupation of the development and shall be permanently maintained thereafter. (NS28 does not apply to amplified music, refer to NS29).

REASON: To safeguard the amenities of neighbouring residents.

- 2.2 Condition NS28 notes that sound break out of the building meet with a sound level of 10 dBA below background sound levels at residential properties. The condition also notes that it does not apply to amplified music.

3.0 Background Sound Levels

3.1 Applied Acoustic Design completed a noise survey at the proposed development site, as set out in AAD report ref. 20301/001/pc dated 22nd March 2021, with the survey itself completed March 2021. See Appendix 1 for survey details. Background sound levels were measured as part of the survey and assessed to determine typical levels for daytime and night-time periods. These are summarised in the table below.

Table 1: Background Sound Levels

Daytime, 07.00 hrs to 23.00 hrs, $L_{A90,1hr}$	Night-time, 23.00 hrs to 07.00 hrs, $L_{A90,15min}$
40 dB	31 dB

3.2 Condition NS28 specifies that sound breaking out of the community hall building should be limited to 10 dBA below the background sound levels in Table 1, hence applicable noise limits at housing are as follows:

Table 2: Break Out Noise Limits at Housing

Daytime, 07.00 hrs to 23.00 hrs, $L_{Aeq,1hr}$	Night-time, 23.00 hrs to 07.00 hrs, $L_{Aeq,15min}$
30 dBA	21 dBA

3.3 Currently scheduled activity information suggests that Elleray Community Hall will only be in use during daytime hours. Hence no assessment will be completed for the night time period

4.0 Community Hall Activities and Sound Levels

4.1 A schedule of proposed community hall activities is set out in Appendix 2. This identifies the activity type and number of people expected to be taking part in each, which suggests a maximum number of 30 people would be present for activities within the building. The schedule suggests that amplified speech and music may be used for a number of activities. However, condition NS28 notes that it does not apply to amplified music. Consequently, internal noise levels used for this assessment will be based on sound produced by the voices of people taking part in the activity.

4.2 Established sound power levels for human vocal effort are set out in the table below.

Table 3: Octave Band Sound Power Levels for Typical Vocal Effort

Vocal Effort	63	125	250	500	1k	2k	4k	8k	dBA
Normal	45	55	65	69	63	56	50	45	68
Raised	48	59	70	75	72	64	57	48	76
Loud	52	63	72	80	80	73	66	55	83
Shouted	52	63	73	84	89	82	75	64	91
Notes: Based on data from ANSI 3.5 [1]. The sound power levels at 63 and 125 Hz are from Rindel et al. 2012 [3].									

4.3 Sound power levels increase with vocal effort from normal talking to shouting. It is considered that in a group of 30 people that individuals are likely to speak with a raised voice level, hence sound power level data for that vocal effort is used for the assessment. It is considered that with up to 30 people then 15 simultaneous conversations may be taking place and that up to 15 people will be speaking at any given time. On this basis the raised voice data is increased by 12 dB per octave to take account of 15 people speaking simultaneously.

5.0 Building Envelope Sound Insulation

5.1 Current information on the building envelope design is shown on the BDG Architects drawings, those used for the assessment are listed in Appendix 3.

5.2 Sound insulation performance for building envelope elements has been determined using proprietary calculation software. The relevant building envelope elements and their assessed sound insulation performance are set out below.

Table 4: Building Envelope Elements Sound Insulation Performance

Building Envelope Element	Description	Sound Insulation Performance
Cavity Masonry Wall Facade	102.5mm brick 150mm cavity with Knauf Dritherm cavity slab insulation 100mm Celcon Hi-Strength Concrete Block 12.5mm plasterboard on dabs	R _w 48 dB ¹
Roof Type 1	Zinc roofing on 17.5mm plywood Timber joists and counter battens forming 300mm void with 200mm rigid insulation 12.5mm plasterboard with 25mm PIR insulation backing	R _w 46 dB ¹
Roof Type 3c	Zinc roofing on 180mm rigid insulation 17.5mm plywood deck 175mm timber joist 16mm Gyframe Resilient Bars 19mm Gyproc Wallboard 12.5mm Gyproc Fireline	R _w 54 dB ¹
Roof Windows/Windows	6.4mm laminated glass, 12mm Argon filled cavity, 3mm glass, 12mm Argon filled cavity, 4mm glass	R _w 35 dB ²
Notes:		
1) Performance determined using proprietary calculation software and include a -3 dB correction for calculation uncertainty		
2) Performance published by Velux for Glazing Type 69 triple glazed windows		

5.3 A glazing performance has not currently been confirmed for windows within the community hall. It is assumed that windows will be selected as a minimum to provide the same performance as roof windows.

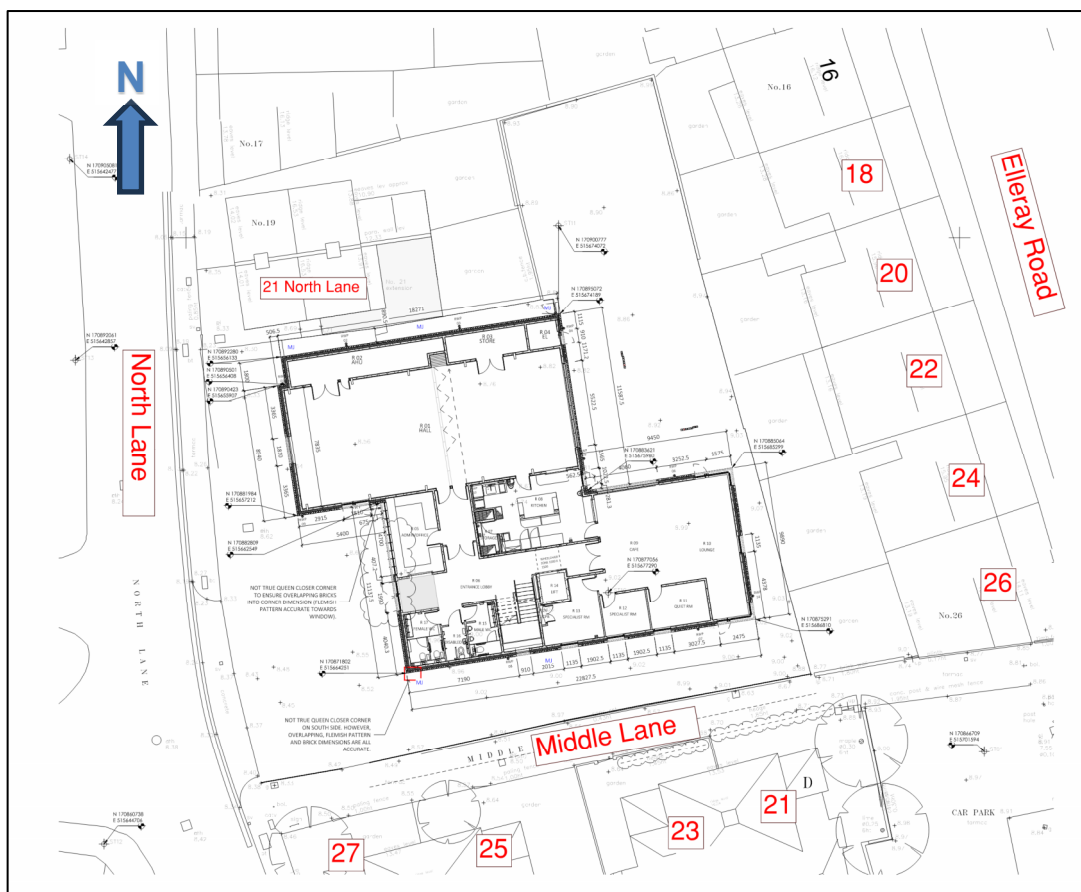
6.0 Assessment

6.1 Calculations have been completed to determine the likely levels of sound breaking out of the Community Hall building to nearby residential amenity. With respect to the proposed site, the nearest noise sensitive premises have been identified as follows:

- No. 21 North Lane located to the North of the Community Hall building
- Nos. 20 to 24 Elleray Road located to the east of the Community Hall building.
- No. 21 Middle Lane Located to the south of the Community Hall

6.2 The housing listed above is shown in the BPG drawing extract below.

Figure 1: Proposed Elleray Hall and nearest noise sensitive premises



6.3 The worst case scenarios for sound break out from the Community Hall Building to the residential locations are as follows.

- Elleray Hall multipurpose Hall to No.21 North Lane
- Elleray Hall multipurpose Hall and Lounge/Café Area to Nos. 16 – 26 Elleray Road
- Elleray Hall Lounge/Café to Nos 21 to 27 Middle Lane

6.4 Calculations of break out sound levels from the Community Centre to nearby noise sensitive premises have been completed using the information summarised above with the following results.

Table 5: Community Hall Sound Levels Arising at Noise Sensitive Premises

Receiver(s)	Sound Level	Daytime Noise Limit
No.21 North Lane	22 dB $L_{Aeq,1hr}$	30 dB $L_{Aeq,1hr}$
No. 20 - 26 Elleray Road	26 dB $L_{Aeq,1hr}$	
No. 21 Middle Lane	16 dB $L_{Aeq,1hr}$	

6.5 With respect to Table 5, it can be seen that levels of sound breaking out from the Community Hall building during its proposed use are likely to meet with noise limit at nearby housing. On this basis the requirements of planning condition NS28 are likely to be satisfied.

7.0 Conclusion

7.1 This report sets out an assessment of sound levels arising from the proposed use of Elleray Hall Community Centre. Level of sound breaking out of the Hall when under typical use has been assessed at nearby noise sensitive premises with regard to the requirements of planning condition NS28.

7.2 The results of calculations indicate that sound levels arising at nearby noise sensitive premises due to the use of the Community Hall are likely to meet with noise criteria set by Condition 28. The assessment assumes that building envelope elements provide the sound insulation performances set out in this report.

Appendix 1: Background Sound Survey

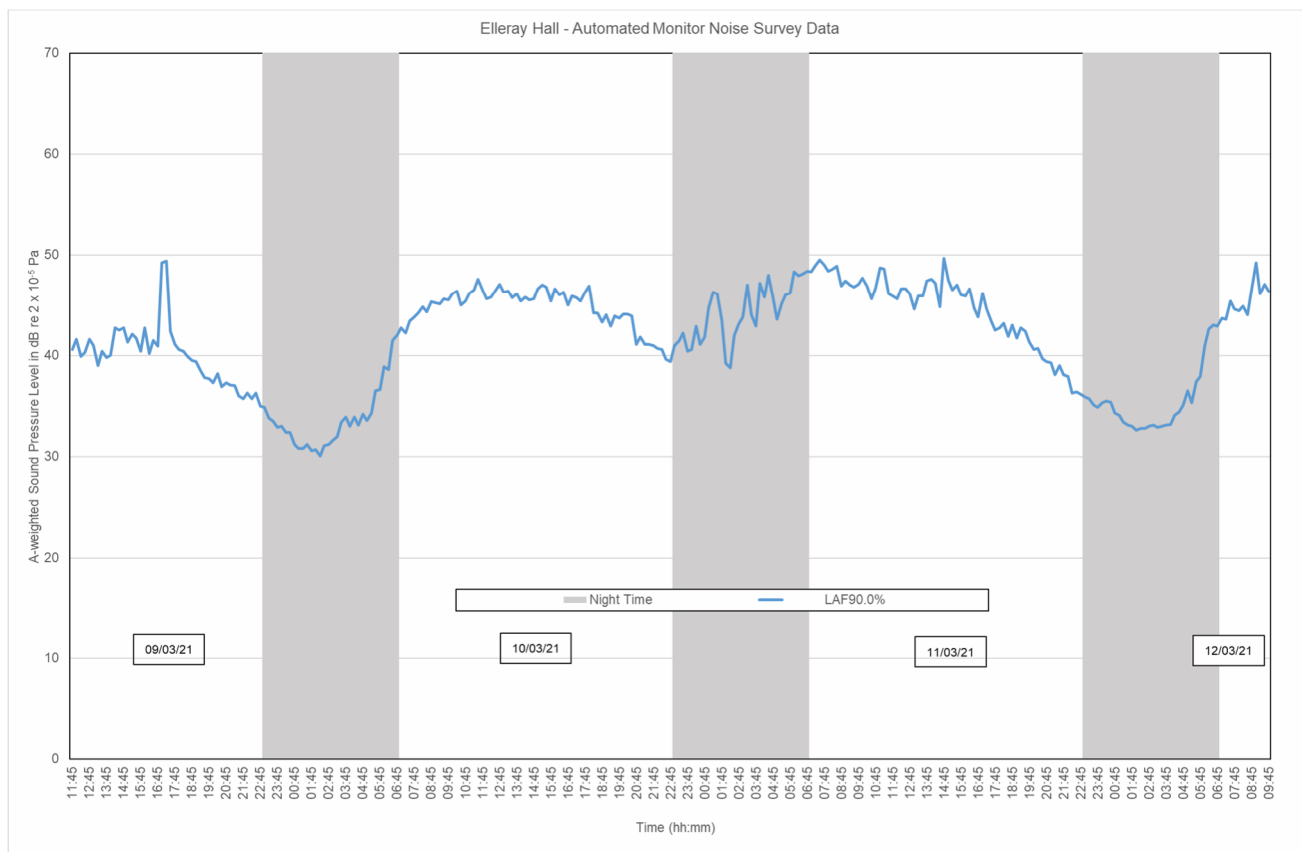
- A1.1 The survey consisted of manual short-term measurements around the site and long-term unattended surveying using an automated environmental sound monitor, as detailed below.
- A1.2 Instrumentation: The following instrument was field checked for correct calibration prior and subsequent to use, with no calibration drift recorded: NTI XL2 Type 1 real time analyser s/n A2A-08108-E0
- A1.3 Period: Manual measurements were completed between 11:30 hrs and 12:30 hrs on the 9th March 2021. The unattended sound monitor operated continuously between 09:30 hrs on the 9th March 2021 to 09:45 hrs on the 12th March 2021.
- A1.4 Weather: The prevailing weather conditions during the manual survey period were dry and settled. Weather conditions during the automated sound monitoring period were also dry and settled initially on the 9th through to the 10th March. Historical weather data indicates from 19.00 hrs on the 10th March wind speeds were elevated to more than 5 m/s and remained significantly unsettled through to approximately 05.00 hrs on the 11th March. Weather conditions then appear to have calmed but remained relatively unsettled until approximately the 18:00 on the 11th March.
- A1.5 Site Sound Characteristics: The ambient and background sound levels at the site are influenced by local road traffic movements, and included the influence on nearby construction sites. During periods of unsettled weather, sound levels were elevated at the site. These periods were discarded in the assessment of typical site sound levels.
- A1.6 Location: Long-term unattended sound monitoring was completed within a hoarded area on the site. The measurement locations is shown below.



A1.7 **Results:** Full measurement data is shown graphically below. Measurements of background sound were assessed to determine typical daytime and night time sound levels. These are set out in Table A1.

Table A1: Typical Background Noise Levels

Daytime, 07.00 hrs to 23.00 hrs, L_{A90}	Night time, 23.00 hrs to 07.00 hrs, L_{A90}
40 dB	31 dB



Appendix 2: Proposed Community Hall Activities

Activity Type	Time occurs	Days occurs	Location within premises	No of participants	Anticipated sources of sounds	Use of any electronically amplified voice and or music equipment
Ballet School / Classes	17:00 til 19:00	Monday - Weekly	Inside	5 to 25	Teacher / Instructor directing, amplified instruction and music to suit	Yes
Kaizen Martial Arts School: Japanese Jui Jitsu Traditional MMA	19.00 till 20.30	Tuesday - Weekly	Inside	5 to 25	Teacher / Instructor directing, amplified instruction and music to suit	Yes
KD Fairs Antiques, Collectable, Retro & vintage items - Dealers	09:30 - 15:00	Every Saturday of the month	Outside	100+	General conversation	Yes
Pensioner Morning Tea	11:00 - 12:00	Monthly - Tuesday	Inside	5 to 25	General conversation	No
Volunteering - Pensioner assisting with reception / organising activities	09:300 - 11:00	Monthly	Inside	5 to 25	General conversation	No
Christmas Fair	11:00 - 14:00	Yearly - First Week of December	Outside	5 to 100	General conversation	Yes
Pensioner Bingo	11:00 - 12:00	Weekly - Monday	Inside	5 to 30	General conversation	No
Pensioner - Friday Fun Weekly Eve	13:00 - 14:00	Weekly - Friday	Inside	5 to 30	General conversation	No
Zumba - Fitness Class	11:00 - 12:00	Tri Monthly - Wednesday	Inside	5 to 30	Teacher / Instructor directing, amplified instruction and music to suit	Yes
Chair Based Yoga / Pilates	09:45 - 10:45	Weekly - Monday once very 3 months	Inside	5 to 30	Teacher / Instructor directing, amplified instruction and music to suit	Yes
Quiz Events		Weekly - Wednesday once very 3 months	Inside	5 to 30	General conversation	Yes
Musicals	11:00 - 12:00	once - twice a year on a Friday	Inside	5 to 30	Amplified Music / Singing to suite	Yes
Crazy Golf	13:00 - 14:00	Tri Monthly - Friday	Inside	5 to 15	General conversation	
Singer / Band / Pianist	13:00 - 14:00	Tri Monthly - Friday	Inside	5 to 30	Amplified Music	Yes
Public Community Engagements	12:00 - 14:00 18:30 - 20:30	Monthly	Inside	5 to 30	Speaker / General conversation	Yes

Appendix 3: Drawing Information

- 4422-BPG-XX-00-DR-A-4130-C02-TYPICAL EXTERNAL-INTERNAL WALL TO GROUND FL
- 4422-BPG-XX-RF-DR-A-1102-C02-PROPOSED ROOF PLAN
- 4422-BPG-XX-XX-DR-A-5005-C01-ROOFLIGHT SCHEDULE
- 4422-BPG-XX-XX-DR-A-4002-C01-PROPOSED ROOF TYPES
- 4422-BPG-XX-RF-DR-A-1104-C02-PROPOSED ROOF PLAN - FLAT ROOFS.PDF"
- 4422-BPG-XX-XX-DR-A-4405-C02-PARTIAL SECTIONS 06
- 4422-BPG-XX-XX-DR-A-4406-C02-PARTIAL SECTIONS 07
- 4422-BPG-XX-XX-DR-A-4404-C03-PARTIAL SECTIONS 05
- 4422-BPG-XX-XX-DR-A-4403-C02-PARTIAL SECTIONS 04
- 4422-BPG-XX-XX-DR-A-4402-C02-PARTIAL SECTIONS 03
- 4422-BPG-XX-XX-DR-A-4401-C02-PARTIAL SECTIONS 02
- 4422-BPG-XX-XX-DR-A-4400-C02-PARTIAL SECTIONS 01
- 4422-BPG-XX-XX-DR-A-3003-C02-SECTIONS E-E & F-F
- 4422-BPG-XX-XX-DR-A-3002-C03-SECTIONS C-C & D-D
- 4422-BPG-XX-XX-DR-A-3001-C03-SECTIONS A-A & B-B