

Noise Attenuation Statement

Discharge of Planning Condition 7

**Makki Masjid
125 Beresford Road
Manchester M13 0TA**

for

Makki Masjid Trust

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CONTENTS

	Page
1.0 Introduction	1
2.0 Form of Construction	1
3.0 The Building Usage & Activities	2
4.0 Internal Activity Noise Breakout	3
5.0 Assessment Criteria	3
6.0 Assessment	3
7.0 Mitigations	4
8.0 Plant & Equipment	6

1.0 INTRODUCTION

Condition 7 of the Planning Consent 118034/JO/2017 states;

Before the development hereby approved commences, the premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences.

2.0 FORM OF CONSTRUCTION

The airborne sound insulation of building elements is principally controlled by the mass of the element, although the stiffness of the element also influences sound insulation at low frequencies.

The table below shows values of the sound insulation of some typical building elements, expressed in terms of the weighted sound reduction index, R_w .

In a Mosque and in particular the prayer halls, impact sound is normally controlled by the use of soft floor coverings (carpet & underlay).

Element	R_w	Notes
Roof (Composite)	30 dB	Composite Flat/low pitch panel
Roof (Concrete)	50 to 55 dB	130mm steel-concrete composite with trapezoidal profile, normal density concrete and suspended ceiling tile below and 200mm thick (average) rigid insulation & membrane on top
Dome (GRP Outer & Inner)	35 dB	Composite - 200mm PU foam sprayed insulation
Dome (GRP Outer – GRG Inner)	38 dB	Composite - 200mm PU foam sprayed insulation
Dome (Metal Outer – GRG Inner)	40 dB	Composite with 200mm PU sprayed insulation
Walls (Cavity)	50 dB	102mm Outer brickwork, 100 to 125mm cavity with 75mm to 100mm insulation and 100mm block (medium density 140 kg/m ²) inner skin, plastered/rendered 12 mm.
Walls (Blockwork – 100/140mm)	45 to 50 dB	100mm block (medium density 140 kg/m ²) plastered/rendered 12 mm both sides
Floors (Concrete – 130mm)	50 to 55 dB	130mm steel-concrete composite with trapezoidal profile and normal density concrete, with suspended ceiling tile below and carpet on top
Glazing (Double 6-12-6) min	30 dB	6mm glass/12 mm air gap/6mm glass
Doors (Solid core) - 30 min FR and Doors Twin-Leaf (Solid core) 30 min FR	30 dB	All Doors are FD30, 44mm thick, solid core door-set, with a mass per unit area ≈ 27 kg/m ² and a thickness of ≈ 44 mm. Doors incorporating 900 mm x 175 mm vision panels comprising 7 mm fire resistant glass can typically meet this acoustic performance.

3.0 THE BUILDING USAGE & ACTIVITIES

The footprint & the internal layout of the building are governed by religious constraints and the orientation is set to point to Makka. The location of the individual rooms is also linked and governed by certain religious constraints.

On entering the Mosque & the Centre, shoes must be taken off and placed in the allocated place. ALL activities within the Mosque and Centre, walking, praying etc will be conducted “bare” footed.

Individuals accessing special areas such as the kitchen and plant room will wear a “rubber” type shoe to comply with Health & Safety.

There are no noisy activities within the Mosque or the prayer halls and other areas and none of the activities within the Mosque initiate any “music”.

Prayers

Prayers are conducted 5 times a day at sunrise, lunchtime, afternoon, sunset and evening. Each prayer lasts about 5-10 minutes and they are conducted in silence.

When the prayers are called (through an internal broadcast PA System) and the congregation are gathered for the prayers, ALL other rooms in the Mosque will be empty and the reverse is true i.e. when there are no prayers, the Mosque hall is generally empty, but other areas may be in use.

The main prayer of the week is on Friday lunchtime (like Sunday for a church) and lasts about 15 minutes followed by a short speech by the preacher/holy man. This is the busiest time and the highest attendances are on a Friday “lunch-time” main prayer session.

The Friday prayers is also conducted in silence and then followed by a short speech by the preacher/holy man for about 30 to 45 minutes. This speech is broadcast internally within the main halls via a PA system using a microphone and delivered through ceiling and/or wall mounted speakers.

Call to Prayers

Call to prayers is announced internally about 5 minutes before the actual prayer takes place and the call to prayer is broadcast through the internal PA system within the Mosque.

During Eid and Ramadan (the month of fasting), the prayer times are different and during Eid, the main prayer is in the morning. During Ramadan there will be additional prayers during early evening and the time varies from year to year. It is not possible to give exact times as the days on which Eid and Ramadan fall vary, as the Islamic calendar is a lunar one.

There are 7 Eid days in the year and the Holy month of Ramadan lasts 30 days followed by Eid festivities (3 days).

Occupation

When the prayers are called and the congregation are gathered for the prayers, **ALL** other rooms in the Mosque will be empty and the reverse is true i.e. when there are no prayers main prayer halls will be empty.

4.0 INTERNAL ACTIVITY NOISE BREAK-OUT

As the prayers are conducted in silence, the only potential source for internal noise is the Friday sermon. The Friday sermon duration is between 30 and 45 minutes.

Based on past experience and various data from other Mosques, the internal noise levels during the Friday sermon vary between 75 - 80 dBA would be the loudest level that the amplification can reach inside the building.

The other source is the classroom, but this considered to be very quiet use and far less than the Friday sermon.

5.0 ASSESSMENT CRITERIA

We are unaware of any British Standards, Local Authority requirements or legislation documents which give criteria and methodologies for assessing the noise impact of a place of worship.

We therefore propose to assess activity noise break-out in comparison various published guidelines (WHO/IEMA/IOA) based on changes in noise levels.

The significance criteria shown in the table below;

Change in Noise Level

Noise Change (dBA)	Impact
-5.0 or less	Substantial Beneficial
-3.0 to -4.9	Moderate Beneficial
-1.0 to -2.9	Minor Beneficial
-0.9 to +0.9	Neutral/Negligible
+1.0 to +2.9	Minor Adverse
+3.0 to +4.9	Moderate Adverse
+5.0 or more	Substantial Adverse

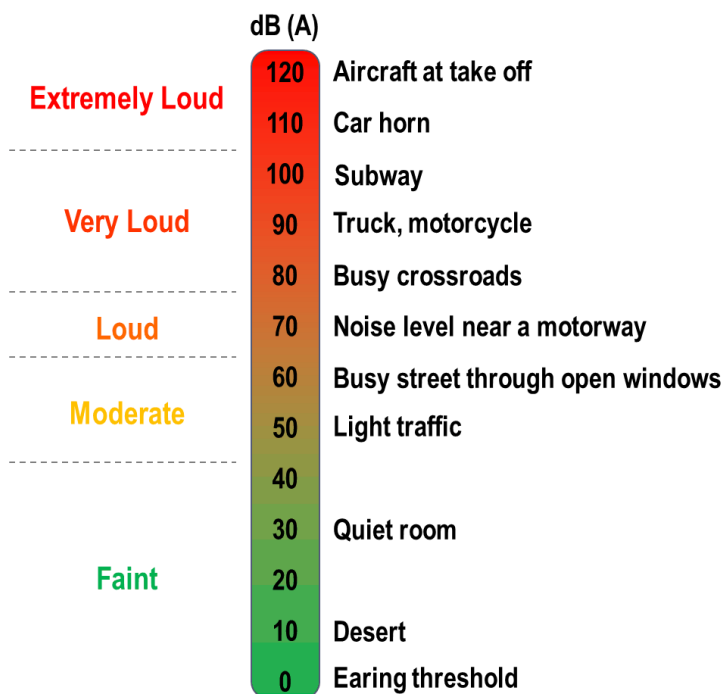
6.0 ASSESSMENT

The sound level at a distance “r” from a façade of area “S” can be obtained using the following formula;
$$\text{SPL outside in dB} = \text{SPL inside} - R_w - 6 + \log S (Q / 4\pi r^2)$$

The most sensitive locations are properties on Campbell Road; r = 9m

Sound Level at Distance "r" from a Façade of area "S"								
ELEMENT	Rw dB	Distance "r" (m)	Façade Width (m)	Façade Height (m)	Façade Area "S"	SPL inside	Q value	SPL outside
Dome (GRP)	35	9.00	7.00	8.50	60	80	2	30
Wall (Cavity)	50	9.00	20.00	9.00	180	80	2	19
Windows	30	9.00			33	80	2	32
Total Predictive Noise Level								34

The predicted noise level can be compared with loudness of various noises;



The predicted noise level can also be compared to the average noise levels measured in a recent acoustic survey by the applicant for a Section 73 application (under consideration by the LPA).

The average noise level for Weekday, Sunday and Saturday afternoons was 43 LA90 to represent weekday, and 41 LA90 to represent weekend background noise levels at the façades of nearby residential properties.

7.0 MITIGATIONS

The sound insulation performance of the Mosque external building envelope (walls, roof, etc.) has been specified in detail to ensure the appropriate level of inside-to-outside attenuation is provided and the selected constructions details will be reviewed to ensure they comply with the specifications.

Attention has also been paid during the design stage to any potential “weak points” in the external building envelope (e.g. glazing, doors) and any flanking sound transmission routes (e.g. building services ducts).

Appropriate measures will and has been specified to ensure that these paths do not compromise the overall sound insulation performance of the external building envelope.

In addition, the following additional mitigation measures will be and are included in the design of the Mosque.

BUILDING LAYOUT

The internal layout is arranged to minimise the internally generated noise. Other design provisions include the following: -

1. The prayer halls on both the ground and first floor are separated and isolated from the external walls by corridors.
2. There are no windows directly facing any of the adjacent residential properties.
3. The main circulation activities are set at the corners of the building.
4. The toilet cisterns within each cubicle of the ablution area are concealed and set in purpose made enclosures.
5. All the internal circulation areas are provided with acoustic and fire separation compartments in the form of lobbies.
6. Street furniture such as seating and benches will not be provided around the site in the interest of minimizing and eliminating noise levels from group gatherings etc.

BUILDING ELEMENTS

1. The walls, floors and roofs (including the stairs) are constructed from solid and dense material. The walls are of cavity wall construction comprising of 100mm facing masonry; 125mm to 150mm insulated cavity (100mm of insulation) and 100mm of solid blockwork and finished with 12.5mm thick solid plasterboard and skim.
2. All floors including the roof are constructed from solid concrete of 130mm thick with a void of 100mm to 400mm to the underside of the false ceiling which has acoustic properties.

Roof & Ceilings

1. Using false tiles as well as Gypsum tiles with high specification for acoustic performance.
2. Closing / sealing of eaves around the perimeter.
3. All voids between the concrete floor and the ceilings are to be insulated.
4. Acoustic attenuation for vents through roof.

Windows

1. All the windows and external doors are to be in aluminium, double-glazed or triple glazed with a minimum of 16mm to 18mm gas filled gap.
2. Double glazing units comprising 6-18-6mm or 6-14-6mm sealed double glazed unit (Argon filled gas).
3. Acoustic requirements for all window frames.

3. All the windows (and external fire doors) are fitted with acoustic/thermal sealant to the edges of the frame.

Walls

1. All solid masonry internal walls with plaster finish.
2. Acoustic attenuation for exhaust vents through wall.

Floors

1. All floors are solid concrete construction (130mm minimum depth).
2. All floors, with the exception of the ablution/toilets, will be carpeted using heavy-duty tufted carpets to absorb sound generated from the PA system.
3. All carpets will be laid over a heavy-duty underlay.

Doors

1. All internal and external doors have acoustic requirements.
2. Doorframes are sealed against the walls using acoustic sealer
3. All internal doors are fitted with mechanical door closers to reduce the speed of impact and are at least 35mm to 44mm thick of solid wood core with acoustics and fire seals.

M & E SERVICES

1. The internal public address system will be designed to achieve high levels of speech intelligibility within the building and in turn generate lower levels of noise overall. This will involve the use of a greater number of smaller, lower level speakers, which will result in lower internal noise levels. Lower internal noise levels should result in correspondingly lower levels of noise break-out.
2. PA system speakers are isolated from the perimeter walls and are well away from any ceiling mounted ducts services etc.
3. The speakers are mounted within the acoustic false ceiling tiles in order to reduce transmission into the main building structure.
4. In conjunction with a specially-designed public address system, the surface finishes within the mosque will be selected to reduce reverberation, which will reduce the overall internal noise level, which will result in correspondingly lower levels of noise break-out.
5. Any ventilation grilles will be fitted with fire dampers and noise baffles to comply with Parts B and E of the current Building Regulations. There are no ventilation grilles etc in close proximity of any of the adjoining properties.
6. All the service runs are contained within the insulated ceiling void and are to be lagged.

8.0 PLANT AND EQUIPMENT

LZC technologies considered as part of the sustainability design are silent in operation with the exception of wind turbines and CHP installations. However, Wind turbine and CHP are not used for the development. In addition, the building will also be naturally ventilated.