hepworth acoustics

THE OLIVE SCHOOL, MANCHESTER

NOISE IMPACT ASSESSMENT

On behalf of:

Conlon Constuction

Report No: P22-461-R01v5
October 2024

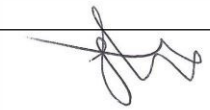
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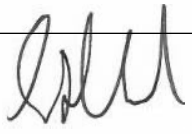
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1.0 INTRODUCTION

1.1 Hepworth Acoustics Ltd was commissioned by Conlon Construction to carry out a noise impact assessment in connection with a planning application for the construction of the Olive Manchester Primary School in Cheetham Hill, Manchester. The proposed layout and location of the site is shown in Figure 1.

1.2 It is proposed that the school will offer teaching accommodation for a 2 Form Entry (2FE) sized school for pupils aged 4 -11. The site is approximately 2.5 kilometres north of Manchester City Centre and is currently a public park (Bignor Street Park) with some areas of hardstanding used as a basketball court and multi use games area (MUGA).

1.3 The site is located in a residential area of northern Manchester and is bounded to the north by Brentfield Avenue, with Bellot Street Park on the other side of the road. Bordering the site to the south and west of the site is Tamerton Drive with Hillcity Day Nursey and residential properties on the road. The New Testament Church of God Faith Tabernacle is located to the south of the site. To the east, the site is bound by Heywood Street and residential properties on the opposite side of the road.

1.4 The proposals are for construction of the new building towards the north east corner of the site. Vehicular access will be from the north close to the junction with Brentfield Avenue and Heywood Road.

1.5 The newly constructed school will be two storey and will consist of Foundation Stage and Key Stage 1 provision on the ground floor and Key Stage 2 provision on the first floor. Ancillary spaces such as the kitchen and offices as well as one larger and one smaller double height halls will be located on the ground floor, predominantly along the northern elevation. All building services equipment will be on the northern elevation.

1.6 The noise assessment has included:

- An inspection of the site and surrounding area;
- Review of noise levels measured by others during the feasibility study and used to establish the noise climate at the site;
- Advice on the control of break-in of external noise to teaching areas in line with Building Bulletin 93, ‘Acoustic Design of Schools’ (BB93:2015).

- Assessment of noise from proposed external fixed plant and recommendation of any necessary outline mitigation measures.
- Assessment of noise from proposed MUGA, Grass Pitches and Cricket Batting Nets and recommendation of any necessary outline mitigation measures.

1.7 All recommendations are given for acoustic reasons only and compliance with other requirements (e.g. fire/structural) should be checked by others.

1.8 The various noise units and indices referred to in this report are described in Appendix II. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 NOISE SURVEY

2.1 Two environmental noise surveys were carried out on the site in November 2020 and March 2022 by others as part of the feasibility study for the school.

2.2 The results of the daytime noise surveys are summarised in Table 1 below. Full details of the noise survey are detailed in Report '-XX-XX-T-J-0001-001Acoustic_Survey-S5-P01'.

2.3 During each survey measurements were taken at three locations:

- A – 40m west from the edge of Heywood Road.
- B – 12m west from the edge of Heywood Road.
- C – 20m north from the edge of Tamerton Drive.

2.4 The surveys were carried out from 16:00-17:00 on Thursday 27th November 2020, 10:00-12:30 and on Monday 14th March 2022 and 19:00-21:00 on Thursday 17th March 2022 in terms of $L_{Aeq,T}$, $L_{A1,T}$ and $L_{A90,T}$ in 15-minute periods.

2.5 The measured daytime 15-minute values are considered to be representative of the corresponding 1-hour values in line with BS 4142 and the corresponding 30-minute values in line with BB93.

Table 1: Summary of measured noise levels (dB)

Location	15:00-17:00 27th November 2020			10:00-12:30 14th March 2022			19:00-21:00 17th March 2022		
	L_{Aeq}	L_{A90}	L_{Amax}	L_{Aeq}	L_{A90}	L_{Amax}	L_{Aeq}	L_{A90}	L_{Amax}
A: Heywood Road/Brentfield Avenue	-	-	-	50	46	66-69	51	46	62
B: Heywood Road	54	43	65-68	54	47	69-70	-	-	-
C: Tamerton Drive	48	43	57-66	49	46	64-65	52	44	67-71

2.6 Following the restrictions following the COVID 19 pandemic the background (L_{A90}) measurements from the 2022 survey have been adopted for the purpose of this assessment as it was concluded that the results of 2022 survey are more representative than those measured during the associated lockdown in November 2020.

2.7 The results of the noise surveys have been considered in our recommendations set out in Section 3.0

3.0 PLANT NOISE ASSESSMENT

3.1 British Standard 4142:2014+A1:2019, '*Methods for rating and assessing industrial and commercial sound*' is appropriate guidance for assessing the potential noise impact from plant noise sources.

3.2 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the background sound level and the plant rating level at the nearest dwelling. The rating level is calculated from the L_{Aeq} at the nearest dwelling with the addition of appropriate character corrections to account for impulsivity, tonality, intermittency etc.

3.3 Regarding the outcome of the initial estimate, BS 4142 states that:

- Typically, the greater this difference, the greater the magnitude of impact;
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and,
- The lower the rating level is relative to the measured background level, the less likely it is that the operation will have an adverse impact or a significant adverse impact. Where the rating level is does not exceed the background sound level, this is an indication of the specific sound source having low impact, depending on the context.

3.4 An appropriate criteria for plant noise at this development would be to control the rating level from any externally mounted plant associated with the new buildings to 5 dB below the existing representative background noise levels (L_{A90}) at the nearest dwellings as per the requirements of Manchester City Council.

3.5 The proposed external plant is listed below in Table 2.

Table 2: Proposed Externally Mounted Plant (dB)

Description	Number of Units	SPL per Unit @1m
Mitsubishi CAHV R450YA-HPB (ASHP)	6	64
Mitsubishi PUZ-ZM35VKA	1	46

3.6 Assuming the simultaneous operation of the six heat pumps and single condenser we have calculated the worst-case noise levels from the proposed plant at the nearest dwellings which the residential properties on Heywood Street around 65m from the plant area. The calculations take into account the attenuation of sound over distance only and does not include any reduction for acoustic screening from fencing around the plant compound.

3.7 Based on the results of the baseline noise survey and the predicted worst-case noise levels from the development as above, a set of 'initial estimate' assessments of the potential noise impact of the external plant, as per BS 4142 guidelines, have been undertaken.

3.8 As the nature of the noise is expected to be generally steady, broadband no acoustic feature penalties are warranted in this case for tonality, intermittency or impulsivity. However, as the sound may be distinctive against the residual acoustic environment a penalty of 3 dB has been applied.

3.9 The results of our initial estimate are shown in Table 3 below.

Table 3: BS 4142 Assessment

Description	Heywood Street	
	School Day (08:00-17:00) $L_{Ar,Tr}$	Evening (19:00-07:00) $L_{Ar,Tr}$
Specific sound level [$L_{Aeq,T}$]	35	35
Character correction	+3	+3
Rating level [$L_{Ar,Tr}$]	38	38
Background sound level [$L_{A90,T}$]	46	43
Excess of rating over background	-8	**-5**
Potential impact	'Low'	'Low'

3.10 The results of our initial estimate show that, noise from the plant equipment units will be 8 dB below the representative background sound level during the day and 5 dB below during the evening outside the nearest dwellings.

3.11 In terms of BS 4142:2014, this indicates that any impact from the operation of the equipment would be low and achieves the requirements of Manchester City Council.

4.0 EXTERNAL NOISE BREAK-IN

4.1 BB93:2015 *'Acoustic Design of Schools: Performance Standards'*, applies to new schools and provides useful guidance on acoustic design of education buildings.

BB93:2015

4.2 The acoustic performance standards of BB93:2015 provide acoustic performance criteria for each room type and are determined by the room usage as defined in Table 1 of BB93:2015.

4.3 The Indoor Ambient Noise Level (IANL) is determined by combining the noise levels from all relevant sources including external noise sources such road traffic and aircraft as well as noise from mechanical ventilation, heating systems, lighting and other classroom building services. The internal ambient noise level within a room with partially open windows will be between 10-15 dB below the external noise level. Therefore, for naturally ventilated areas, where the external noise level exceeds the IANL criterion (with + 5 dB tolerance for natural ventilation) by more than 10 dB, then it is likely that some alternative means of ventilation will be necessary. This means that where external noise levels exceed 50–55 dB L_{Aeq} outside new build teaching areas, an alternative (acoustically treated) means of ventilation is likely to be required.

4.4 There is no statutory requirement to achieve the IANL or RT criteria in administration and ancillary spaces. As teaching spaces are to be ventilated by mechanical means, no relaxation of the IANL criteria is applicable.

4.5 The corresponding IANL tolerances are shown in Table 4 below.

Table 4: Summary of IANL Tolerance/Limits for Mechanical/Natural Ventilation System

Condition	Ventilation System	IANL Limit $L_{Aeq,30mins}$
Normal – Ventilation for normal teaching and learning activities	Mechanical Natural / Hybrid	Table 1 values Table 1 values + 5 dB
Summertime – ventilation under local control of teacher to prevent overheating allowable during the hottest 200 hrs of the year	Mechanical Natural / Hybrid	Table 1 values + 5 dB ≤55 dB
Intermittent Boost - ventilation under local control of teacher to provide dilution of fumes	Mechanical Natural	Table 1 value +5 dB ≤55 dB

4.12 The normal condition for a ventilation system with mechanical air supply is defined as when the system is operating to limit the daily average carbon dioxide concentration to no more than 1,000ppm with the maximum concentration not exceeding 1,500ppm for more than 20 consecutive minutes on any day during normal school operating hours. This would normally equate to a minimum ventilation rate of approximately 8l/s per person. Mechanical ventilation in this context refers to systems (or parts of systems) that use mechanical fans to mix or drive the air including those in mechanical, hybrid, mixed mode and natural ventilation systems. The upper limits for IANL under normal conditions for relevant spaces with natural ventilation are shown in Table 5 below including relevant relaxation of the IANL criteria where appropriate.

Table 5: IANL from Table 1 of BB93 for New Builds

Type of Room	Upper Limit for the indoor ambient noise level $L_{Aeq,30mins}$ dB
Primary school: classroom, class base, general teaching area, small group room, music room	35 natural ventilation (+5 if mechanically ventilated)
Open plan Teaching area Resource/breakout area	40 natural ventilation (+5 if mechanically ventilated)
Study room (individual study, withdrawal, remedial work, teacher preparation)	
Atrium, circulation space not intended for teaching and learning	
Meeting room, Interviewing/counselling room, video conference room	40 natural ventilation (+5 if mechanically ventilated)
Dining room	45
Administration and ancillary spaces: Kitchen Office, medical room, staff room Corridor, stairwell, coats and locker area Changing area	 50 40 45 50 50

(The +5 dB does not apply to teaching and learning spaces where the IANL is greater than or equal to 45 dB)

External Noise Ingress

4.13 The logarithmic mean of the ambient noise levels measured during the daytime at Location 1 is 50 dB $L_{Aeq,T}$ and 54 dB $L_{Aeq,T}$. at Location 2. For Location 3 the measured noise level was 49 dB $L_{Aeq,T}$

4.14 It is considered that Location 1 and 2 is representative of the proposed elevations (north and east) potentially most exposed to noise. The southern and western elevations will be partially shieled or fully shielded from noise from Heywood Road and Brentfield Avenue.

4.15 We understand that proposals for the ventilation strategy for the development are based on a natural ventilation for ancillary spaces with MVHR's proposed for classrooms. It is therefore assumed that for all outward facing classrooms, windows will remain closed. The exact specification of proposed mechanical ventilation has yet to be determined and will be reviewed at a later stage.

4.16 Standard well-sealed thermal double glazing (4mm glass - 4mm glass) has a typical sound reduction performance of 25 dB $R_w + C_{tr}$.

4.17 As such, resulting internal noise levels in classrooms and other spaces with the windows closed should be no more than 29 dB $L_{Aeq,T}$, which is below the lowest relevant internal ambient noise limit from BB93 for any room type. Therefore, standard double glazing will be suitable for this development.

4.18 In order to maintain the sound insulation of the building envelope, we recommend that any non-glazed elements should be designed such that they provide a minimum sound insulation of at least 40 dB R_w. This will be straight-forward to achieve with standard building materials.

Control of Internal Noise Egress

4.19 The primary source of noise from the school is anticipated to be from the main hall during assemblies or performances where music is likely to be played during assemblies or school events.

4.20 We consider that noise levels in classroom will be controlled by teaching staff to maintain an environment conducive to learning and noise levels within the classroom would be no more than 50-60 dB and therefore the focus of the assessment is on potential noise from the main hall.

4.21 As previously discussed, the ventilation strategy for the school employs a MVHR system, allowing windows to remain closed during operation. This design choice helps limits potential noise breakout.

4.22 The construction of the external wall is as follows (internal to external):

- 2No. Layer 12.5mm Plasterboard - 180mm SFS with 180mm slab insulation - 12mm cement board - 100mm Rocksilk Insulation with 50mm air gap - 102mm Brickwork.

4.23 This construction is capable of controlling the break out of external noise levels such that only the breakout from external glazed elements needs to be considered.

4.24 For the purposes of this assessment, we have assumed a noise level of 95 dB L_{Aeq} as a representative music noise level in the school hall although this level is more in line with a busy bar featuring loud music and is significantly higher than the expected maximum activity and music noise levels anticipated within the school hall but nevertheless forms the basis of a robust assessment.

4.25 The nearest dwelling to the school hall with a direct line of site to the school hall are those on Heywood Street, just north of the junction with Bignor Street. These dwellings are more than 65m from the school hall itself.

4.26 Accounting for noise breakout through the windows, with an assumed R_w value of 31 dB for a 6mm glass - 16mm cavity - 6mm glass configuration, and including distance attenuation to the nearest dwellings, the calculated music noise level outside of these residences is 32 dB L_{Aeq}. This level is more than 10 dB below the measured background noise level of 43 dB L_{A90}.

4.27 The above calculations demonstrate that noise levels from the school hall would be well below established thresholds even at the highest levels, ensuring no adverse impact on nearby residential properties.

5.0 PLAYGROUND NOISE

5.1 Figure 1 shows the position of two proposed playgrounds as part of the development. The KS1 playground is located to the southeastern corner of the site. The KS2 playground is located on the western elevation of the building.

5.2 There is no government recommended objective method of assessing noise levels from external playground areas. The approach adopted assesses predicted noise levels outside the nearest residences to determine any influence from the proposed playground areas and to assess the impact of any change in existing noise levels.

5.3 We have predicted noise levels from the proposed playground areas outside the nearest existing residences. The assessment has been undertaken using reference noise levels measured by Hepworth Acoustics at a similar school playground at a 1FE school and whilst KS2 children were playing, as shown in Table 6 below.

Table 6: Summary of Measured Play Area Noise Levels (dB)

Date	Description	Noise level
January 2022	1FE KS2 Playground @ 10m	59 dB L_{Aeq}

5.4 There is likely to be a staggered lunch/playtime schedule at the school. We have therefore based our assessment on the predicted noise level at the nearest residential windows assuming 100 children in each playground at any one time as shown in Tables 7 and 8.

Table 7: Predicted Worst-Case Noise Levels from Proposed KS1 Playground Area (dB)

Parameter	Predicted noise level, dB L_{Aeq}
1FE KS2 Playground @ 10m	59
Distance attenuation of 41 metres from a central playground location to nearest window on Heywood Road	-12
Noise level at receiver	**47**

5.5 The calculated worst-case noise from children in the KS1 playground will be 47 dB L_{Aeq} which is below the existing measured prevailing noise levels of 54 dB L_{Aeq}.

Table 8: Predicted Worst-Case Noise Levels from Proposed KS2 Playground Area (dB)

Parameter	Predicted noise level, dB L_{Aeq}
1FE KS2 Playground @ 10m	59
Distance attenuation of 100 metres from a central playground location to nearest window on Tamerton Drive	-20
Noise level at receiver	**39**

5.6 The calculated worst-case noise from children in the KS2 playground will be 39 dB L_{Aeq} which is below the existing measured prevailing noise levels at Tamerton Drive of 49 dB L_{Aeq}.

5.7 It is also important to note the following:

- The playground noise occurs on weekdays only - there being no noise from the school on Saturdays or Sundays;
- Formal team ball games will be prohibited on both the KS1 and KS2 Playgrounds;
- The noise occurs in the daytime only and not in the evenings or at night - therefore for this daytime noise it is considered that only ground floor habitable rooms and gardens need to be considered; and
- The noise occurs for only parts of the school day, particularly during lunchtime use of the school playground.

5.8 We therefore conclude that the new playground will not result in any unacceptable noise impact.

6.0 OUTDOOR SPORTING PROVISION

6.1 The proposals are to construct a multi-use games area (MUGA) to the eastern side of the site and two cricket practice nets to the south west corner as part of the school development.

6.2 We understand that both the MUGA and grass pitch can be used during the daytime and evening. The MUGA will only be used on occasions where the grass pitch cannot be used due to inclement weather, there will be no occasions where both the MUGA and grass pitch will be in simultaneous usage.

6.3 There are no floodlights proposed for either area therefore use will be limited to daylight hours only and will only be available for community use until 21:00 during midsummer and much earlier than this during other parts of the year, in line with sunset.

6.4 The MUGA will be available for community usage as part of a Community Use Agreement Plan, however the MUGA will only be available for junior groups and no adult hire will be permitted. The grass pitch will only be available for hire for Under 11's.

Multi-use Games Area (MUGA)

6.5 The nearest residences are the houses on Tamerton Drive. houses are around 85 metres from the proposed MUGA.

6.6 There are currently no specific noise criteria for outdoor sports grounds. The 2021 *National Planning Policy Framework* (NPPF) provides some general guidance to local authorities on taking noise into account in planning policies and decisions. This includes guidance that local authorities should '*ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*'.

6.7 However, there is as yet no specific guidance on numerical acoustic assessment/design criteria for proposed new developments provided in the NPPF, accompanying Technical Guidance document, National Planning Practice Guidance 'Noise', nor the *Noise Policy Statement for England* (NPSE) 2010.

6.8 British Standard 4142: 2014 '*Methods for rating and assessing industrial and commercial sound*' describes methods for rating and assessing sound of an industrial and/or commercial nature. This

standard explicitly excludes recreational noise, so it is not applicable to outdoor sports areas such as this.

World Health Organisation Guidelines for Community Noise (1999)

6.9 Guidance that has been used for similar developments includes the World Health Organisation Guidelines for Community Noise (1999). This states the following for outdoor living areas:

> *Annoyance to community noise varies with the type of activity producing the noise. Speech communication, relaxation, listening to the radio and TV are all examples of noise-producing activities. During the daytime, few people are seriously annoyed by activities with L_{Aeq} level below 55 dB; or moderately annoyed with L_{Aeq} levels below 50 dB.*

6.10 The WHO criteria were reviewed in a report by the National Physical Laboratory (reference CMAM16) which states:

> *Exceedance of the WHO guideline values does not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher levels of noise exposure are reached.*

6.11 Therefore, it is not necessarily the case that where these levels are exceeded, the noise will adversely affect nearby residential properties.

Sport England Design Guidance Note 'Artificial Grass Pitch (AGP) Acoustics – Planning Implications'

6.12 The 2015 Sport England Design Guidance Note provides guidance on the acoustics related planning implications of AGPs (also known AWPs). The aims of the Note are as follows:

- Increase awareness of good design in sports facilities;
- Help key building professions, clients, user representatives and other stakeholders to follow best practice;
- Encourage well designed sports facilities that meet the needs of sports and are a pleasure to use.

6.13 The Sport England Design Guidance Note states that *"The determining noise criteria for AGPs proximity to residential properties, to avoid moderate annoyance in the daytime and evenings, as set by The*

World Health Organisation's 'Guidelines for Community Noise' 50 dB $L_{Aeq,1hr}$ upper noise limit external to residential properties and within external living areas"

6.14 Page 7 of the document has the following guidance on typical noise levels:

Noise level measurements were taken at a distance of 10 metres behind the mid-way points along goal lines and sidelines. They were found to be highest behind the sideline halfway line. The most significant noise levels were found to be generally derived from the voices of players, with the exception of hockey where impact noises of balls hitting perimeter strike boards and goal back boards were more noticeable. Such impact noises can be mitigated by incorporating shock absorbing noise reduction measures. Assuming such mitigation measures, the most significant noise source from typical AGP sports sessions is therefore voice and as such, a typical noise level can be determined.

From the measurement data, a typical free-field noise level of 58 dB $L_{Aeq(1\ hour)}$ at a distance of 10 metres from the sideline halfway marking has been determined as representative for noise from an AGP.

6.15 We note that this noise level is based on a receiver height above ground of 1.5 metres.

6.16 Therefore, for assessment purposes, we have used as a source noise level the value of 58 dB $L_{Aeq,1hour}$ taken from the Sport England Design Guidance for artificial grass pitches. This value was measured at 10 metres laterally from the halfway line. For this assessment, we will use this value at 10 metres from the goal-line nearest to the adjacent residences, to follow a cautious approach and also to consider the geometry of the proposed MUGA.

6.17 For the purposes of determining the resulting noise levels outside the nearest dwellings, we have assumed that for average noise levels (i.e. L_{Aeq} values), the pitch acts as an area sound source. Since the pitch is 15 metres wide, the nearest dwellings are within the near-field (i.e. at a distance from the noise source that is less than three times the largest dimension). This means that distance attenuation is equivalent to 3 dB per doubling of distance, which is the same as would be the case for a line source.

Table 9: Prediction of Noise Impact from MUGA Usage

Description	dB(A)
Typical pitch noise levels @ 10 metres, dB L_{Aeq}	59
Distance attenuation, 85 metres hemispherical propagation	19
Resultant noise level at nearest residence on Tamerton Drive, dB L_{Aeq}	40

6.18 As can be seen from Table 9, the predicted L_{Aeq} levels are below the WHO recommended daytime limit of 50 dB.

6.19 The predicted pitch noise levels are also 9 dB below the existing L_{Aeq} ambient noise levels of 49 dB L_{Aeq} measured on site during the school day close to Tamerton Drive.

6.20 AEC measured background noise levels of 46, 43 and 44 dB L_{A90} during the during the school day (10:30-12:00), afternoon (15:00-17:00) and evening periods (19:00-21:00) respectively.

6.21 The projected noise levels from activities from the MUGA, are therefore calculated to be 3 dB lower than the lowest background noise level. Therefore, the MUGA would not be anticipated to contribute to any noticeable increase in overall sound levels, and the risk of disturbance to local residents, even during evening usage is low.

6.22 Based on this, no specific noise mitigation measures are required, however the general good practice recommendations given below should be observed.

6.23 Sport England's *Artificial Grass Pitch (AGP) Acoustics – Planning Implications (2015)* has the following general recommendations for outdoor pitches, which we endorse:

6.24 Weldmesh fencing is commonly used to enclose the MUGA and the panels should be securely clamped with resilient fixings to avoid vibrations. Sheet metal signs or hoardings can make a clattering noise when hit by a ball and these should be avoided in proximity to the playing surface or replaced by soft vinyl signs.

6.25 People tend to congregate around the entrance to the MUGA and as such, it is advisable that the entrance and access route should be located away from housing where possible.

6.26 By following the recommendations in this report, we predict that the noise impact due to the proposed MUGA will be within reasonable limits.

Outdoor Batting area

6.27 We understand that the batting nets are constructed from a fully enclosed tunnel fabric netting system, this construction ensures there will be no impact noise from balls hitting the fencing and the fabric absorbs the impact. It is also understood that he nets will predominantly be used by junior groups in these cases it is standard practice that lightweight tennis/rubber or plastic balls are typically used instead of traditional cricket balls, the use of which is formally prohibited, this results in a much softer

impact from the bat striking the ball.

6.28 Therefore, our assessment focuses on the impact of noise from players and coaches using the area. The calculations are based upon source noise measurements gathered by Hepworth Acoustics during a coaching/practice session at a local sports club. A noise level of 59 dB $L_{Aeq(5\ mins)}$ was measured at a distance of 3 metres away from the side of the pitch. The measured noise level includes direction by coaches and children playing sports (laughing and shouting).

6.29 We have calculated the resulting noise levels outside the nearest dwellings in each direction taking into account distance attenuation only. The calculated L_{Aeq} noise levels without any specific noise mitigation measures have been calculated at 1.5m above ground level outside the dwellings at the junction of Tamerton Drive and Heywood Street. The results are shown in Table 10 below.

Table 10: Prediction of Noise Impact from Batting Enclosure Usage

Description	dB(A)
Typical coaching noise level @ 3 metres, dB L_{Aeq}	59
Distance attenuation, 20 metres hemispherical propagation	16
Resultant noise level at nearest residence on junction of Tamerton Drive and Heywood Street , dB L_{Aeq}	43

6.30 The predicted noise levels are 6 dB below the existing L_{Aeq} ambient noise levels of 49 dB L_{Aeq} measured on site during the school day close to Tamerton Drive, and 5 dB below the measured ambient noise level of 49 dB L_{Aeq} during the after-school period (15:00-17:00)

6.31 The projected noise levels from activities from the cricket pitches, are therefore calculated to be at or lower than the representative background noise levels. Therefore, the usage of the pitches is not anticipated to contribute to any noticeable increase in overall sound levels, and the risk of disturbance to local residents, even during evening usage is low.

6.32 Therefore, subject to the adherence to a suitable noise management plan we consider the construction of the batting enclosures is not anticipated to result in any demonstrable harm to the amenity of neighbouring residents by reason of noise.

7.0 SUMMARY & CONCLUSION

7.1 Hepworth Acoustics was commissioned by Conlon Construction to carry out a noise assessment in connection with a proposed planning application for a new school building at land in Cheetham Hill, Manchester.

7.2 A plant noise assessment has been carried out in line with the requirements of BS 4142:2014+A1:2019 guidance and Manchester City Council.

7.3 Potential noise ingress to the new buildings has been assessed against the prevailing ambient noise levels in the area in the context of achieving the BB93 criteria for internal ambient noise levels.

7.4 Potential noise egress from the new buildings has been assessed against the prevailing ambient noise levels in the area.

7.5 Noise from use of the proposed playgrounds and outdoor sporting provision has also been evaluated and we have concluded that there will be no unacceptable impact.

Key:
Not to scale

North

hepworthacoustics

Title: Figure 1: Proposed Site Layout

Project: P22-461



Appendix I: Noise Units & Indices Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

$L_{Aeq,T}$ This is the A–weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a continuous noise which has the same total (A–weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

L_{AFmax} This is the maximum A–weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.

$L_{A1,T}$ This is the A–weighted noise level exceeded for 1% of the time period. $L_{A1,T}$ is usually used as a measure of peak noise in the assessment of noise break-in in BB93.

$L_{A90,T}$ This is the A–weighted noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.