



GENR8 KAJIMA REGENERATION LIMITED

ST MICHAELS PLACE, HUYTON

NOISE IMPACT ASSESSMENT FOR PLANNING PURPOSES

24 October 2025

AEC REPORT: P5356/R02c/AGB

Acoustic & Engineering Consultants Limited

Suite 316, 3rd Floor, Broadstone Mill, Broadstone Road, Stockport, SK5 7DL
T: 0161 449 5900 mail@aecltd.co.uk www.aecltd.co.uk



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DOCUMENT STATUS

Prepared by: A G Burke BSc (Hons) MIOA (Dip)

Rev	Date	Document Details	Author	Check
--	25 June 2025	First issue for comment	AGB	DMT
a	01 July 2025	Updated to include further details on the Council HQ	AGB	DMT
b	02 July 2025	Updated relating to comments from Turley	AGB	DMT
c	24 October 2025	Updated traffic assessment and fixed typos.	AGB	DMT

1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Genr8 Kajima Regeneration Limited to undertake a noise impact assessment for planning purposes in relation to the proposed new development, 'St Michaels Place', Huyton.
- 1.2 The assessment is required to form part of a hybrid planning application for 'St Michaels Place' a mixed-use development within Huyton town centre comprising a new Council Headquarters, hotel, public realm, active travel hub, residential and commercial floorspace with associated works.
- 1.3 Included in the report is an assessment for new Council Headquarters and a 130-bedroom hotel. In addition, the implications of noise associated with seven other plots to be included in the outline and detailed application are also discussed.
- 1.4 This report details the baseline noise levels measured around the development site, presents the assessment criteria and discusses the implications of noise on the proposed uses and existing noise sensitive receivers.
- 1.5 Acoustic terminology is discussed in brief in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The site is located between Archway Road and Cavendish Walk, Huyton, as identified on the following Figure 2.1.

Figure 2.1 – Site Location Plan Showing Proposed Layout



- 2.2 As shown on Figure 2.1, the north western boundary of the site runs along Archway Road (B5199), which is in the form of a dual carriageway adjacent to the site. Existing houses are located north of Archway Road, directly opposite the site. To the west of the site is an existing Asda petrol filling station.
- 2.3 Cavendish Walk, which is a pedestrianised road serving a shopping area, runs along the northern section of the eastern site boundary and Westmorland Road, which is a relatively quiet road forms the southern section of the eastern boundary. To the east of Westmorland Road, directly opposite the site is the rear of commercial buildings.
- 2.4 Huyton library is located at the southern corner of the site and Poplar Bank Road forms the south western boundary of the site. This road is an access road to buildings currently on the site and to buildings located south of the development site.
- 2.5 The nearest residential properties to the site are located opposite to the north west on Archway Road and on Huyton Church Road some 65m to the east of Plot 9 (not shown on Figure 2.1). In addition, there are properties located some 125m to the south of the site.
- 2.6 As shown on Figure 2.1, there are 9 plots proposed as part of the overall development as described below.

Full Application

- Plot 1 – Council Headquarters.
- Plot 4 – 130 bedroom hotel.
- Plot 9 – Demolition of existing multi-storey car park and ground market hall with the creation of a surface level car park. This element is scoped out of the report because it is ultimately replacing one car park with another and any potential changes in noise levels will be negligible.

Outline Application

- Up to 420 no. residential units comprising a range of tenures (Plots 2a, 2b, 3, 5 and 6).
- Up to 5,600 no. sqm of commercial floorspace including active ground floor (Plots 2a, 2b, 3, 5 and 6).
- the ability to provide meanwhile uses on plot no. 2a including sport and recreation uses (e.g. padel court), pocket parks, community gardens, events space (e.g. pop-up markets).
- Uses comprising public realm and landscaping.

3.0 BASIS OF ASSESSMENT

General

- 3.1 In terms of noise, the elements to consider in relation to planning issues include:
- Noise from mechanical plant associated with commercial and to a lesser degree residential uses;
 - Noise break-out from commercial units;
 - Noise from potential sports activities.
 - Noise due to existing sources (mainly road traffic noise) affecting future residential and hotel developments;
- 3.2 To assess these elements, consideration is given to the following standards and guidance.

Local Policy

- 3.3 Although the local policy documents do not lay out specific noise criteria, noise is discussed in a broad sense in the Local Plan Core Strategy and the Unitary Development Plan.
- 3.4 The Knowsley Local Plan Core Strategy document (January 2016) sets out the strategic framework for the growth and development of Knowsley up to 2028 and beyond. Policy CS2 sets out development principles. Principle 4 states that development should recognise environmental limits, protect and enhance environmental assets, enhance local character and promote quality of play by:

...e) Mitigating potential negative impacts of traffic growth and road traffic on highway safety, air quality, noise and health;..'

'.....j) Minimising negative impact upon flood risk, air quality, water quality, land quality, soil quality, and noise or vibration levels and ensuring any negative impacts are appropriately mitigated...'

- 3.5 Policy CS8, Green Infrastructure, states that air, water and noise pollution should be mitigated.
- 3.6 In terms of protecting Local Amenity, paragraph 9.6 of policy CS19 states:
- '9.6 The design of new development should avoid unacceptable impacts which affect the amenity and living conditions of occupiers of buildings. Such effects can include generation of noise, light and air pollution and harmful overbearing and loss of privacy through overlooking.'*

- 3.7 Policy ENV2: Noise and Vibration of the Knowsley Unitary Development Plan (UDP), dated June 2006 states:

'1. Development that will either cause an unacceptable increase in noise or vibration levels or itself be subject to unacceptable noise or vibration from an existing source will not be permitted.'

2. Where developments are permitted, conditions may be attached to the planning permission to ensure effective noise insulation or other required mitigation measures are carried out.'

- 3.8 Furthermore, there are numerous mentions of noise throughout the UDP document but these do not provide specific criteria, only highlight that noise must be considered as part of planning applications for noise sensitive sources (e.g. residential) and for potential noise generating sources (e.g. businesses).

National Planning Policy Framework

3.9 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, dated March 2012, and revised most recently in December 2024.

3.10 The planning policies which relate specifically to or are considered relevant to noise, are presented in paragraphs 187, 198, 200 which are reproduced below:

“187. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;*

198. Planning policies and decisions should also 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:

- (a) 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;*
- (b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.

3.11 Further to the above, the Governments ‘Planning Practice Guidance’ (PPG) published on 6 March 2014 and most recently updated in September 2023 states:

‘Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.’

3.12 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

Atmospheric Plant Noise Emissions

- 3.13 To set an appropriate atmospheric noise limit for mechanical services plant associated with the development is appropriate to consider guidance presented in BS 4142:2014+A:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142).
- 3.14 BS4142 indicates that where the rating level ($L_{A,r,T,r}$) does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context. The rating level relates to the noise from the mechanical services plant with a noise character adjustment (where relevant).
- 3.15 Based on guidance in BS4142, it is proposed that the noise rating level due to building services plant associated with the development is controlled a level no greater than typical existing background noise level -5dB external to the nearest residential receptor during the period that the plant would be operational. This would represent either no adverse impact on residents or potentially a low impact.
- 3.16 The above relates to residential properties and for commercial properties a noise rating limit of 50dB(A) can be considered. Assuming windows are open for ventilation purposes, the internal noise level due to mechanical plant would be no greater than 40dBL_{Aeq} as a result of mechanical plant, which should be considered appropriate for all commercial uses, including cellular offices. Where the BS4142 assessment results in a noise limit higher than 50dB(A), this can be used instead.

Noise Break-out from Commercial Units

- 3.17 For residential units directly above commercial units, to comply with the 2010 Building Regulations, the separating walls and floors between these spaces and the adjacent apartments should comply with the minimum sound insulation performance requirements of Approved Document E (ADE) i.e. achieve a minimum on-site sound insulation performance of $45\text{dB}D_{nT,w} + C_{tr}$.
- 3.18 This acoustic performance should appropriately control noise levels between a shop, takeaway, office, café or quiet restaurant and residential properties, at least for periods up to 2300h.
- 3.19 After 2300h or for potentially for noisier uses, AEC would suggest that noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) are controlled to not exceed 47dB and 41dB ($L_{eq,5min}$) respectively within habitable rooms. This is approximately in line with the low frequency reference curve limits presented in Defra's '*Procedure for the assessment of low frequency noise complaints (NANR45) – Revision 1*' (2011). All other octave bands should be no greater than NR15-20.
- 3.20 The above should result in inaudible or barely audible noise levels.
- 3.21 In terms of music noise break-out via the building façade, L_{eq} noise levels should be controlled to no greater than the typical background (L_{90}) noise levels in each octave band centre frequency (OBCF) up to 500Hz. For voices, it is considered reasonable to limit the noise to be no greater than the typical L_{eq} noise levels in each OBCF.

Residential Indoor Noise Level Limits

- 3.22 The allowable internal noise limits for residential differ depending on the ventilation condition and the required limits are discussed below.

Whole Dwelling (General) Ventilation Provision

- 3.23 Whole dwelling ventilation requirements are defined in Approved Document F '*Ventilation*' (2010) of the Building Regulations (ADF). It is normally continuous low-rate ventilation and is typically provided via a partially opened window, trickle ventilators or mechanical means.

- 3.24 Guidance on appropriate noise limits to be achieved whilst background ventilation is being provided is included in British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' (BS8233), WHO Guidelines for community noise and The Association of Noise Consultants (ANC) document Professional Practice Guidance on Planning and Noise 'New Residential Development' (2017) (ProPG).
- 3.25 The noise limits are presented in the following Table 3.1 and relate to the combination of external noise intrusion and, where relevant, noise from any mechanical plant serving the rooms to provide background ventilation.

Table 3.1 – Internal Noise Level Limits within Habitable Rooms

Activity	Location	Noise Level Limit, dB		
		Daytime 0700h – 2300h $L_{Aeq,16h}$	Night-Time 2300h – 0700h	
			$L_{Aeq,8h}$	$L_{Amax,F}$
Resting	Living Room	35	-	-
Dining	Dining Room/Area	40	-	-
Sleeping (daytime resting)	Bedroom	35	30	45
*Regular individual noise events (e.g. scheduled aircraft, passing trains or cars) should not normally exceed 45dB L_{Amax} more than around 10 times per night.				

- 3.26 Where noise sources have specific character, such as being intermittent in nature, containing a distinguishable, discrete, and continuous tone, is irregular enough to attract attention, or has a strong low-frequency content, BS8233 suggests that lower internal noise level limits may be appropriate.
- 3.27 The Association of Noise Consultants (ANC) document 'Professional Practice Guidance on Planning & Noise: New Residential Development' (ProPG), states that the attenuation of external to internal noise levels provided by a window partially open for ventilation is no more than -15dB. Therefore, for whole dwelling ventilation to be provided via a partially open window, the external noise levels presented in the following Table 3.2 should not be exceeded.

Table 3.2 – External Free-field Noise Levels, above which Opening Windows Cannot be Relied on for Background Ventilation Provision

Activity	Location	Noise Limit, dB		
		Daytime 0700h – 2300h $L_{Aeq,16h}$	Night-time 2300h – 0700h	
			$L_{Aeq,8h}$	$L_{Amax,F}$
Resting	Living Room	50	-	-
Dining	Dining Room/Area	55	-	-
Sleeping (daytime resting)	Bedroom	50	45	60

Control of Overheating Ventilation Provision

- 3.28 Residential buildings must comply with the requirements of Approved Document O of the Building Regulations 2010 'Requirement 01: Overheating Mitigation Regulations 40B' (ADO). ADO is concerned with limiting solar gains and providing adequate means of removing excess heat from habitable rooms.

3.29 In section 3, ADO states that occupants are likely to keep windows closed during sleeping hours if the noise within bedrooms exceeds the following limits:

- 'a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am);*
- b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).'*

3.30 An overheating assessment can be undertaken using a simplified method or by dynamic thermal modelling. The simplified method introduces categories for a residential building's overheating risk, determined by its location, as follows:

- High risk – London and parts of Manchester (M1, M2, M3, M5, M15, M16 and M50);
- Moderate risk – England, excluding the above.

3.31 For a simplified assessment, ADO indicates that the minimum free-areas to be assumed for ventilation openings is 13% and 4% of the floor area of the bedrooms for 'high' and 'medium' risk locations respectively. The resulting outside to inside level difference across these openings is expected to be approximately 5dB and 10dB for 'high' and 'medium' risk locations respectively.

3.32 Based on the above, the allowable free-field noise levels above which the simplified method can be used to demonstrate compliance are presented in the following Table 3.3.

Table 3.3 – Free-Field External Noise Limits for a Simplified Assessment

Parameter	Noise Limit, dB	
	High Risk Location	Moderate Risk Location
$L_{Aeq,8h}$	45	50
$L_{Amax,F}$ (More than 10 times per night)	60	65

3.33 Where the above levels are exceeded, ADO indicates that dynamic thermal modelling should be undertaken using guidance in CIBSE's TM59 '*Design methodology for the assessment of overheating risk in homes*'.

3.34 The output of the thermal modelling can be used to confirm whether or simple ventilation openings can be relied upon for the control of overheating. However, it is understood that the free area required will not normally be less 2-4% of the floor area and could be higher.

3.35 Where external noise levels will not allow the use of simple openings to control overheating, attenuated openings could be considered or mechanical means. Noise limits for mechanical systems are presented in the following Table 3.4.

Table 3.4 – Suggested Noise Limit for Mechanical Plant

Parameter	Noise Limit
Mechanical ventilation serving bedrooms for the control of overheating	35 dBL _{Aeq,T}

3.36 Noise levels up to 5dB higher than those above may be appropriate in some scenarios, likewise lower noise levels may be appropriate for some residential developments

3.37 ADO does not set daytime internal noise level limits. As such, to comply with any statutory requirements, opening windows can be relied upon for the control of overheating during the daytime periods. However, this approach must be agreed with Local Planning Authority as local requirements could override this.

Purge Ventilation

- 3.38 Purge ventilation is manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water.
- 3.39 As purge ventilation is only used occasionally and is under complete control of the occupant, there is no acoustic requirement and can simply be provided by opening windows (or other simple vent opening).

Council Headquarters

- 3.40 Although the internal acoustic conditions for the Council Headquarters building are not a planning issue, for completeness, a summary of the design guidance being considered is presented below. This information is laid out in the Stage 2 acoustic design report prepared by Hoare Lea:
- BS 8233 2014: 'Guidance on sound insulation and noise reduction for buildings'
 - British Council for Offices (BCO) 2014: 'Guide to specification'
- 3.41 Furthermore, BREEAM credits are being sought in relation to issue Hea 05 'Acoustic performance'.
- 3.42 The noise limits criteria set for the council offices are presented in the following Table 3.5.

Table 3.5 – Internal Noise Limits for Council HQ Building

Room Type	Design Range / Noise Limit, (dBL _{Aeq,T})
Conference & Democratic Centre	30
Training / Committee Room	35
Cellular Office	40
Meeting Room	35-45
Executive Office	35-40
Open plan office	45-50
Reception / Business Lounge	45

- 3.43 In terms of atmospheric mechanical plant noise, as discussed above, guidance in BS4142 will be considered. In addition, BREEAM credits for issue Pol 05 'Reduction of noise pollution' are being sought.

Road Traffic Noise

- 3.44 Chapter 3 of Volume 11, Chapter 3, Part 7 of the Design Manual for Roads and Bridges (DMRB) includes a method of assessing the impacts of road traffic noise.
- 3.45 A change in noise is perceived differently dependent on whether it is a relatively sudden change, or a change over a longer period of time. In the short-term (e.g. at the opening of the operational phase of a proposed development), a change in road traffic noise of 1dB L_{A10,18h} is considered the minimum required to cause a minor magnitude change. In the long-term (DMRB indicates this is

somewhere between the opening year and up to 15 years after that), a 3dB $L_{A10,18h}$ change is considered the minimum required to cause a minor magnitude change.

- 3.46 The short-term and long-term criteria has been adopted in this assessment and these changes in noise are classified as shown in Tables 3.6 and 3.7 below.

Table 3.6: Classification of Magnitude of Noise Changes

Short-term Noise Change – dB $L_{A10,18h}$	Long-term Noise Change – dB $L_{A10,18h}$	Magnitude of Change
0	0	No Change
0.1 to 0.9	0.1 to 2.9	Negligible
1.0 to 2.9	3.0 to 4.9	Minor Adverse/Beneficial
3.0 to 4.9	5.0 to 9.9	Moderate Adverse/Beneficial
5.0 +	10.0 +	Major Adverse/Beneficial

- 3.47 In Table 3.58 of DMRB LA111, guidance is provided regarding how to determine the significance of the predicted changes in operational road traffic noise at noise sensitive buildings. This guidance is set out in Table 13.5 below with the classification of significance used in this assessment.

Table 3.7: Significance Criteria for Residential Receptors – Road Traffic Noise

Magnitude of Change	Significance Assessment
No Change	Not Significant
Negligible	Not Significant
Minor Adverse/Beneficial	Not Significant (subject to context)
Moderate Adverse/Beneficial	Potentially Significant (subject to context)
Major Adverse/Beneficial	Significant

Potential Sports Noise

- 3.48 Sport England has produced a design guide not that can be considered - '*Artificial Grass Pitch (AGP) Acoustics – Planning Implications.*'
- 3.49 The document indicates that there are no specific noise criteria for an AGP and suggests that the most relevant document to use would be The World Health Organisation's (WHO) '*Guidelines for Community Noise*' published in 1999. For noise levels internally and externally to dwellings, the WHO guidance states:

'To enable casual conversation indoors during the daytime, the sound level of interfering noise should not exceed 35dB $L_{Aeq,T}$ '

- 3.50 WHO guidance states that a partially open window should achieve a 15dB reduction in external to internal noise levels. Based on this, free-field external noise levels should be no greater than 50dB $L_{Aeq,T}$ in order that a limit of 35dB $L_{Aeq,T}$ is achieved internally.

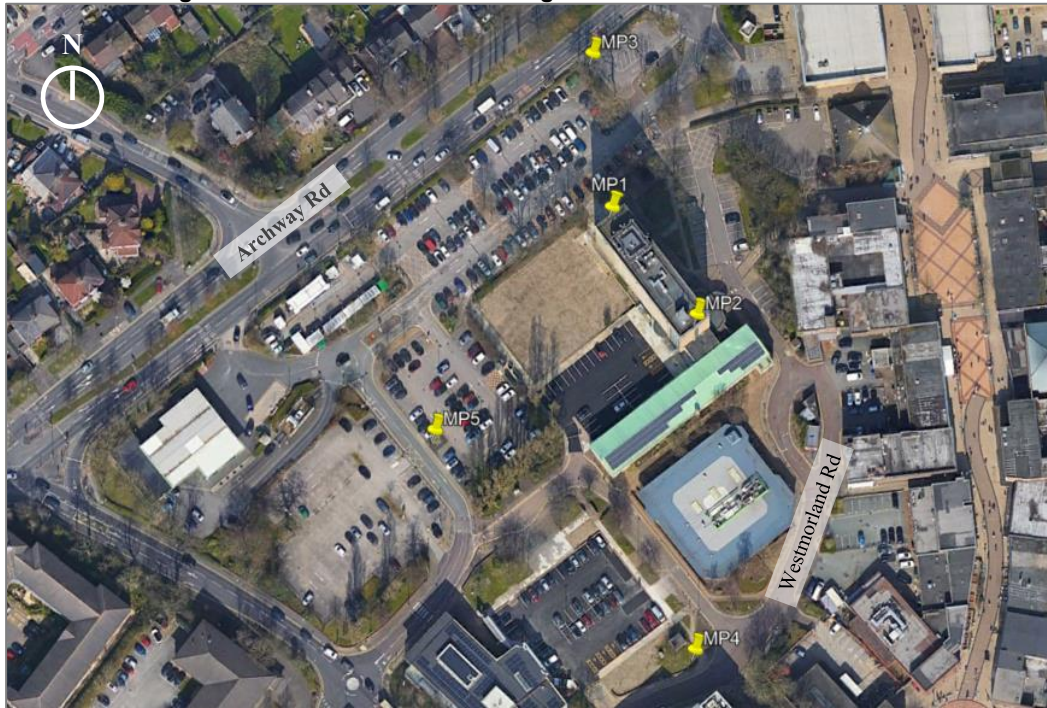
- 3.51 Furthermore, WHO guidance also states that to prevent most people from being moderately and seriously annoyed, noise levels in gardens should not exceed $50\text{dBL}_{\text{A,eq,16hr}}$ and $55\text{dBL}_{\text{Aeq,16h}}$, respectively, during the daytime period.
- 3.52 Based on the above, the Sport England Design Guide states that noise levels in gardens and external to residential windows should ideally be no greater than $50\text{dBL}_{\text{Aeq,1 hour}}$. Depending on the context, it is considered that achieving the above would represent a low adverse impact on any affected residential properties.

4.0 NOISE CLIMATE

Noise Surveys

- 4.1 An extended unattended noise survey was undertaken by AEC between 1345h on Friday 31 January to 1400h on Monday 3 February 2025. Measurements were taken at two positions on the roof of the existing Knowsley Borough Council building, indicated on Figure 4.1, below, as MP1 and MP2.

Figure 4.1 – Site Location Showing Noise Measurement Positions



- 4.2 Attended noise measurements were undertaken between approximately 1100h and 1330h on Monday 3 February 2025, at two positions indicated as MP3 and MP4 on Figure 1, above. These are both 5m back from the nearest carriageway of Archway Road and Westmorland Road, respectively, and at a height of 1.5m above ground.
- 4.3 Further attended noise measurements were undertaken between 1450h and 1556h on Wednesday 5 March at MP5, similarly 5m back from the nearest carriageway and 1.5m above ground level.
- 4.4 Full details of the measured noise levels are presented in Appendix B with the attended surveys measured data presented in Tables B1 and B2 of Appendix B. The extended survey data is presented in Graphs B1 and B2 of Appendix B.
- 4.5 Noise levels were largely due to road traffic on Archway Road and access roads around the site. At MP4, noise from mechanical plant associated with commercial properties was also affecting the noise climate.

Background Noise Levels

- 4.6 With reference to the measured noise levels the anticipated free-field background noise levels at existing residential receivers and affecting potential residential properties on the proposed new plots are presented in the following Table 4.1. The background noise levels presented are based on the on-site measured noise levels with acoustic screening and acoustic screening considered for the proposed new plots.

- 4.7 In terms of the plots close to the existing commercial units and for Huyton Church Road, background noise levels will be confirmed when detailed applications are submitted for the sites to the south and east of the development site.

Table 4.1 – Anticipated Typical Free-field Background Noise Levels

Location	dBLA ₉₀ , 15min	
	Day	Night
Archway Rd	55	42
Huyton Church Rd	45	38
Plot 1, Council	50	40
Plot 2a, 2b & 3	48	38
Plot 4 (Hotel), Plot 5 & 6	50	40
Plot 8	52	40
Plot 9	50	40

- 4.8 The anticipated ground floor ambient noise levels across the development site assuming just plots 1 and 4 (the full application) are constructed, are presented on the following Figures 4.2 and 4.3.

Figure 4.2 – Anticipated Noise Levels, Just Plots 1 & 2 Constructed, dBL_{Aeq,T} (Day 0700h to 2300h)

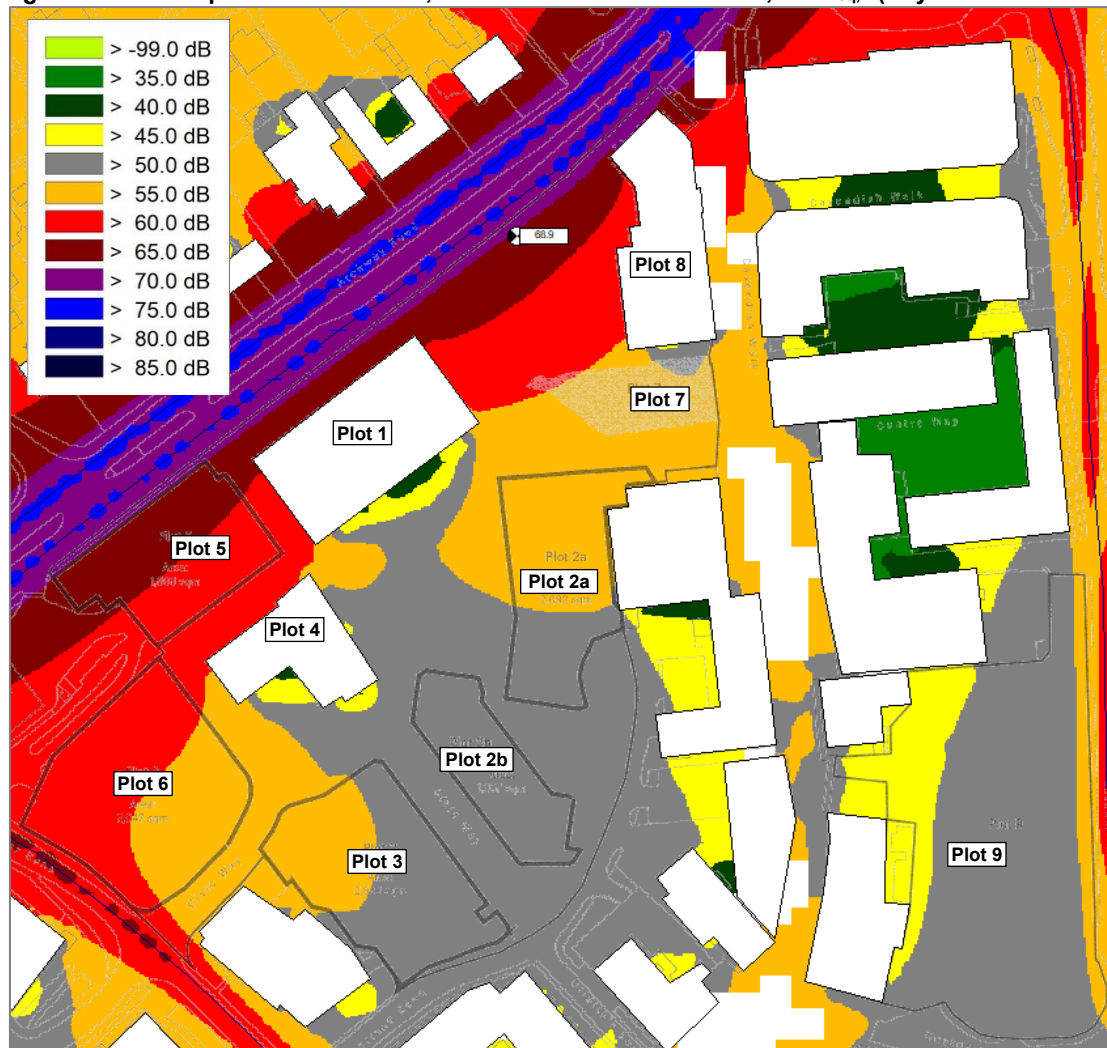
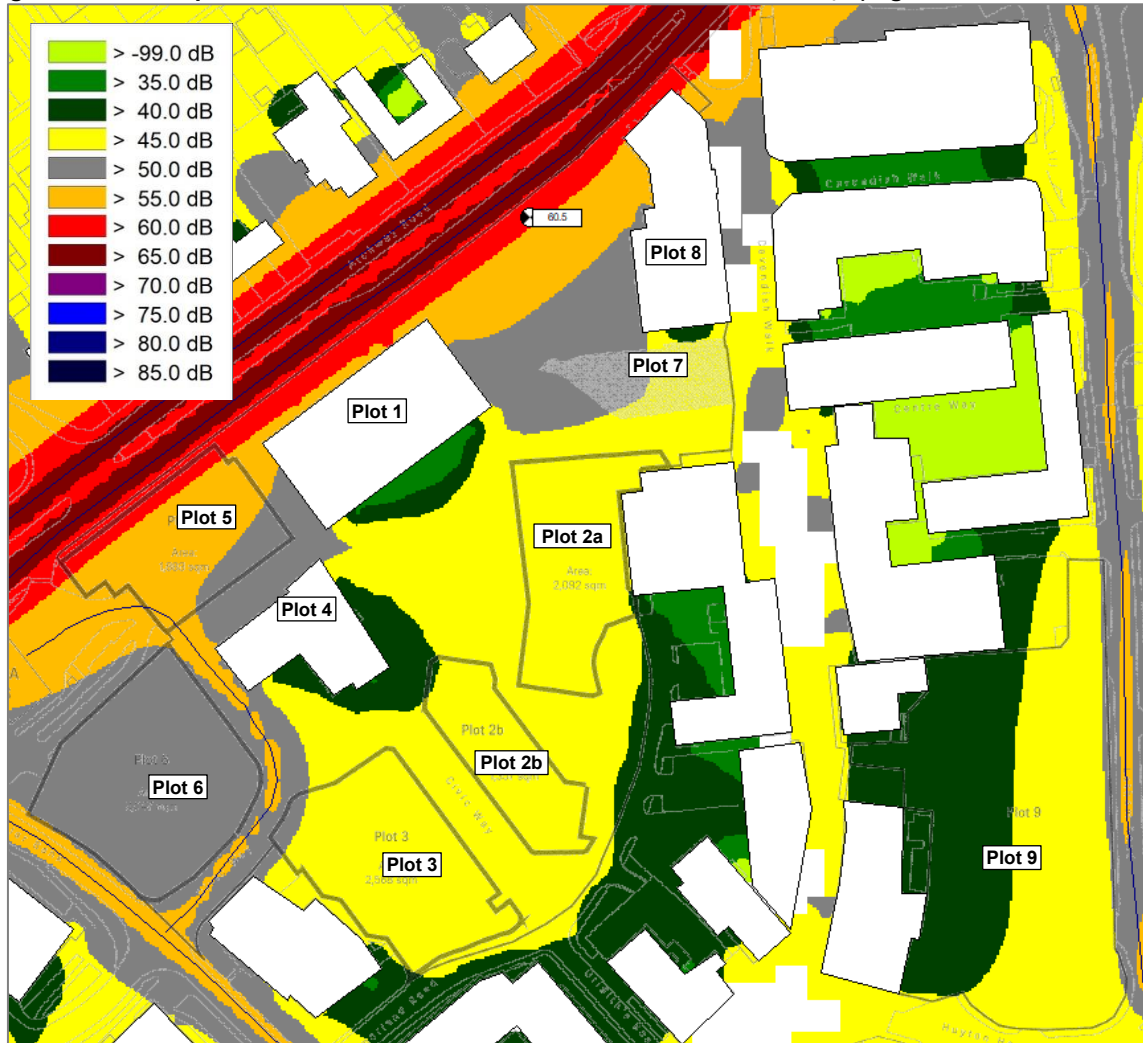


Figure 4.3 – Anticipated Noise Levels Just Plots 1 & 2 Constructed, dBL_{Aeq,T} (Night-time 2300h to 0700h)



- 4.9 The anticipated ground floor ambient noise levels across the development site assuming just pots 1 and 4 (the full application) are permitted, are presented on the following Figures 4.4 and 4.5.
- 4.10 The figures demonstrate the approximate noise reduction that will be achieve to plots at the rear/middle of the site due to the additional acoustic screening that will be provided by the buildings to the perimeter of the stie.

Figure 4.4 – Anticipated Noise Levels, All Plots Constructed, dBL_{Aeq,T} (Daytime 0700h to 2300h)

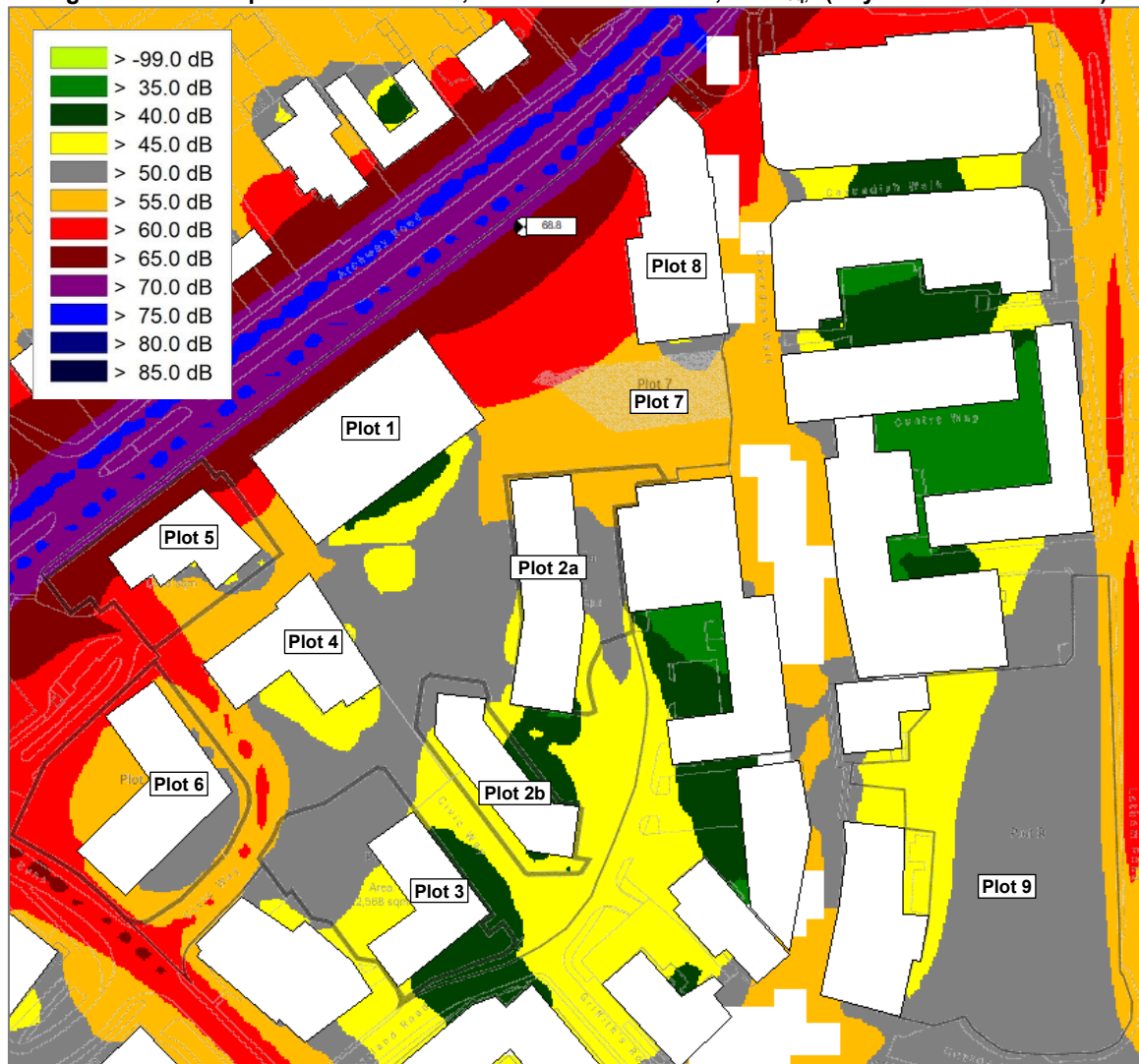
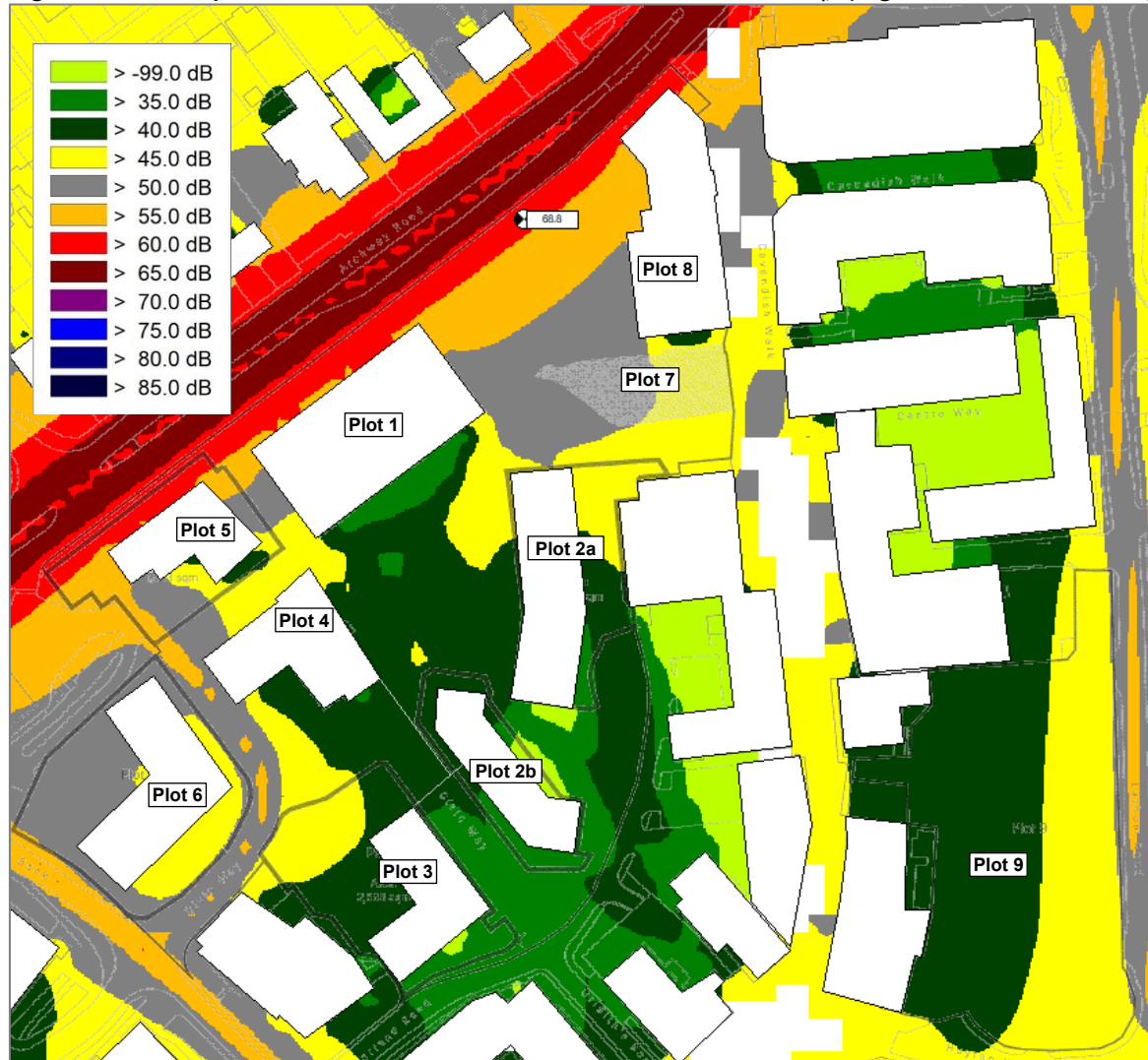


Figure 4.5 – Anticipated Noise Levels All Plots 1 & 2 Constructed, $dB_{Leq,T}$ (Night-time 2300h to 0700h)



5.0 ASSESSMENT OF OVERALL SITE

Mechanical Plant Noise Limits

- 5.1 The proposals are only at an early stage meaning that details of any potential mechanical plant are unknown. As such only noise limits can be set at this stage. The plant noise limits for each location are presented in Table 5.1 below. The limits are based on the typical background noise levels minus 5dB and relate to a noise rating level, which should include and noise character correction associated with the plant.

Table 5.1 – Free-Field Atmospheric Plant Noise Limits

Location	dBL _{Ar,Tr}	
	Day	Night
Archway Rd	50	37
Huyton Church Rd	40	33
Plot 1, Council	50	50
Plot 2a, 2b & 3	43	33
Plot 4 (Hotel), Plot 5 & 6	45	35
Plot 8	47	35
Plot 9	45	35

- 5.2 The above limits relate to the combined mechanical plant noise from all developments. At this stage each plot should be designed to comply with the above limits minus 2dB for the existing residential receivers.
- 5.3 The above noise limits assume that there is no acoustic character associated with the mechanical services plant (e.g. tonality or intermittency).
- 5.4 These overall noise limits would apply to the total plant noise from all plant associated with the building combined. Once further details relating to plant operation are confirmed, a noise limit can be determined for each item of plant.
- 5.5 In terms of emergency plant, at this stage, a limit of 10-15dB higher than those presented in Table 5.3 would be appropriate assuming this is tested no more than approximately 1-2 hours per month on a weekday between 0900h and 1700h

Noise Break-out from Commercial Units

Residential Above Commercial

- 5.6 As identified above, the floor construction between any ground floor commercial unit and first floor residential property will need to achieve the on-site sound insulation performance requirement of Approved Document E i.e. at least 45dBD_{nT,w}+C_{tr}.
- 5.7 Based on AEC's experience the floors between these areas are likely to be concrete. Therefore, assuming the construction has a surface mass of at least 350kg/m² i.e. equivalent to 150mm normal weight concrete, ADE requirements would be achieved.
- 5.8 Furthermore, calculations demonstrate that assuming flanking noise transmission paths are controlled, typical noise levels from a busy restaurant will be controlled to no greater than NR15 L_{eq} in the rooms above. This would be inaudible or barely audible and should therefore be considered acceptable.

- 5.9 The above construction would therefore allow for most uses at ground floor level and the resultant noise levels would have no adverse impacts on residents in first floor properties. However, should there be a desire to operate a pub or other noisy use (e.g. gym) in the ground floor units, the soffit may need to be underdrawn using a mass barrier ceiling. Details of such a construction would be developed at the design stage of each plot. However, this would allow for complete flexibility for potential uses for the ground floor units.

Break-out Via the External Envelope

- 5.10 For uses such as a shop, café or restaurant provided that the external façade has a sound insulation performance of at least 36dBR_w (e.g. 8mm glazing) internal noise levels of around 70-75dBL_{Aeq} (e.g. for a busy restaurant) would be appropriately controlled.
- 5.11 Where noisier uses are proposed, noise breakout would be controlled by installing lobbied doors (where necessary) and an improved glazing. Furthermore, appropriate noise limits would be written into any tenancy agreement.

Residential Glazing and Ventilation Requirements

- 5.12 As stated in Section 3.0, for habitable rooms to have whole dwelling ventilation provided via a window partially open, external noise levels should not exceed 50dBL_{Aeq,T} during the daytime and 45dBL_{Aeq,T} and 60dBL_{Amax,F} at night.
- 5.13 A comparison between these levels and the anticipated noise levels presented in Figures 4.2 and 4.3 above indicates that in most instances, partially open windows cannot be relied upon to habitable rooms to provide whole dwelling ventilation. However, it is AEC's understanding that all residential habitable rooms in the development will be fitted with trickle vents and these should suffice to provide appropriate levels of whole dwelling (background) ventilation as per the requirements of ADF.
- 5.14 It is not possible to confirm the acoustic performance requirements of the external facades until full details of the proposed buildings are known, including window sizes and room dimensions. However, it will be the glazing and trickle vents that are the weakest elements acoustically and indicative acoustic performance requirements are presented in the following Table 5.2 for the plots affected by the highest noise levels i.e. plots 5 and 8, closest to Archway Road.
- 5.15 The calculations undertaken are in line with guidance presented in BS8233 and are based on the following:
- Typical lounge and bedroom dimensions;
 - Glazing area of no greater than 60% of the room façade (the smaller façade only for corner rooms);
 - the nearest façade to Archway Rd is 5m;
 - reverberation time in habitable rooms is 0.5s as identified in BS8233;
 - single trickle vent to the habitable room.

**Table 5.2 – Example Glazing and Ventilation Requirements
 For Plots 5 and 8 Close to Archway Road.**

Sound Insulation Performance			
Daytime (Living rooms etc.)		Night-time (Bedrooms only)	
Glazing	Ventilator	Glazing	Ventilator
42dBR _w / 35dBR _w + C _{tr}	41dBD _{n,e,w}	44dBR _w / 37dBR _w + C _{tr}	41dBD _{n,e,w}

- 5.16 Although the above requirements are for a high acoustic performance from the glazing and vents, it represents the worst-case situation and the acoustic requirements for the majority of other facades and plots will be significantly lower. Furthermore, for plots located away from the roads, it is likely that standard thermal glazing and a moderate acoustic trickle vent will suffice. These will be confirmed during the detailed design stages for each plot and this requirement can be conditioned where necessary.

Purge Ventilation

- 5.17 Windows can be openable for purge ventilation provided that they are effectively acoustically sealed when closed, and it is important that any frames and seals do not downgrade the sound insulation performance of the glazing.

External Envelope

- 5.18 To maintain the sound insulation performance of the external envelope the remainder of the façade construction should have a sound insulation performance of at least 10dB higher than the glazing.

Control of Overheating

- 5.19 As identified above, the site is in moderate risk location in terms of overheating. Based on this, the maximum free-field external noise levels that are acceptable to allow for opening windows to be used for the control of overheating in bedrooms at night are 50dB_{LAeq} and 65dB_{LAmax}.
- 5.20 Comparing the above noise levels to those anticipated across the site during the night (Figure 4.3 above) demonstrates that it should be possible to control overheating using opening windows to bedrooms on at least some facades for Plots 2a, 2b, 3 and 9.
- 5.21 For plots 5 and 8, it is likely that alternative means of controlling overheating will be required e.g. mechanical ventilation or attenuated openings. This will be developed during the detailed design stages for each plot.
- 5.22 During the daytime, there is no statutory noise limit that needs to be achieved as such, opening windows can be used to all lounges for the control of overheating, assuming there are no additional local requirements. However, where the external free-field noise levels exceed 65dB_{LAeq,T} at the building facades, consideration may want to be given to incorporating alternative means of controlling overheating.

Road Traffic

- 5.23 A traffic flow assessment has been undertaken, which includes a 2030 baseline without the development and a 2030 baseline with the development. As highlighted by Astute, the scheme does not alter the amount of traffic in the area but alters the flow in local areas.
- 5.24 Typically, the increase in road traffic is no greater than 10% which is approximately 0.4dB which is a negligible increase and therefore the changes are not significant.
- 5.25 In terms the increases on Lathom Road, around the proposed multi-storey car park, the increase in traffic could be up to approximately 40%. This represents an increase in noise levels due to road traffic of approximately 1.5dB which, over a short-term change represents a minor adverse effect depending on the context.
- 5.26 In terms of context, given that the nearest residential properties are some 50m from the road and that there is already a multi-storey car park in approximately the same location as that proposed, it is considered that the effect is not significant and therefore acceptable.

Potential Meanwhile Uses

- 5.27 It is considered that the worst-case potential impact for meanwhile uses would be from padel courts. As identified above, for residential gardens and windows, noise levels from sports should be controlled to no greater than $50\text{dBL}_{\text{Aeq,T}}$.
- 5.28 With reference to extensive noise data held on file by AEC in relation to padel tennis, noise levels from padel courts could be $50\text{dBL}_{\text{Aeq,T}}$ at a distance of up to 40m from a padel court.
- 5.29 Based on this, provided that Plot 2b isn't developed before 2a or provided that the court is not located within 40m of 2b, in all instances, noise from padel court use should be considered acceptable. This would of course apply to a greater extent should the court only be temporary.

6.0 ASSESSMENT OF PLOT 4 (HOTEL)

Ventilation

- 6.1 It is understood that all rooms will be mechanically ventilated and, as such, there is no requirements to open windows for ventilation purposes. Windows can be openable provided they are effectively sealed when closed and any frames and seals must not downgrade the acoustic performance requirements laid out below.

Windows - Hotel Guestrooms

- 6.2 With reference to the noise levels presented on the above Figures 4.2 and 4.2 and the latest GA plans from KKA, assuming that glazing accounts for no more than 50% of the façade of each guest room (and there is only glazing on the smaller façade of corner rooms), the windows should achieve a minimum sound insulation performance of $35R_w$ and $30R_w+C_{tr}$. If trickle vents are fitted, these should achieve a minimum acoustic performance of $38dB_{D_{n,e,w}}$ (assuming one vent per room).
- 6.3 The above would be achieved using a moderate acoustic performance double-glazed window e.g. 10mm glass / thermal cavity (typically 8mm to 16mm) / 4mm glass.

Windows – GF Areas

- 6.4 At this stage, windows to all GF spaces should also have a minimum acoustic performance rating of $32R_w$ and $28R_w+C_{tr}$. This will require final confirmation when the glazed areas to the GF rooms are confirmed.
- 6.5 This will appropriately control noise break-out from a typical hotel bar (circa $70-75dB_{LAeq,T}$ with low level background music).

External Walls

- 6.6 External walls must achieve a sound insulation performance that is at least 10dB higher than the windows. As such, all walls should achieve a minimum acoustic performance of $45R_w$ and $40R_w+C_{tr}$. This is not a significant acoustic requirement and will be achieved with any wall incorporating a masonry layer or a rainscreen cladding with a plasterboard internal lining and mineral wool insulation.

Roof

- 6.7 It is noted that the roof is concrete to all guest rooms and noise sensitive rooms. As such, noise break-in through the roof and noise due to rainfall will be appropriately controlled.

Ancillary Spaces to Guestrooms

- 6.8 The Hilton brand standards document requires a robust acoustic performance from the ground floor areas to achieve appropriate noise limits in the rooms above, in line with the limits suggested in Section 3. Based on this, noise between ancillary spaces and guestrooms will be appropriately controlled.

- 6.9 Atmospheric plant noise emissions affecting the nearest noise sensitive receivers should be controlled to no greater than the limits presented in Table 6.1, below. These limits also apply to the Hotel windows.

Table 6.1 – External Plant Noise Limits

Maximum Rating noise level (dB L _{A,r,Tr})	
Daytime (0700 to 2300h)	Night time (0700 to 2300h)
43	33

- 6.10 For emergency plant, a relaxation of 10 to 15dB on the limits presented below would be acceptable assuming testing is limited to around 2 hours per month between 0900 and 1700h on a weekday.
- 6.11 Furthermore, a higher limit could potentially be acceptable if the emergency plant is tested less frequently and/or for shorter periods.

7.0 ASSESSMENT OF THE COUNCIL HEADQUARTERS

External Noise Intrusion

- 7.1 Hoare Lea undertook further noise survey was carried out by Hoare Lea on 10 April 2025. This was carried out to validate the measurement results received from AEC and also carry out a subjective assessment to ensure that all potential noise impacts have been considered.
- 7.2 The primary noise source affecting the Council HQ building was due to road traffic along Archway Road. An 3D environmental noise model of the site has been creased based on the survey results. Based on this, external noise levels of up to 68 dBL_{Aeq} are predicted to be incident on the worst affected façade overlooking Archway Road. Lower noise levels are predicted to the sides and rear of the building due to screening. These levels are in line with those measured by AEC.
- 7.3 To achieve appropriate internal noise levels in line with guidance laid out above, Hoare Lea has specified glazing with an acoustic performance of 32dBR_w+C_{tr} for windows on the façade directly overlooking Archway Road and 28dBR_w+C_{tr} for other windows.
- 7.4 All non-glazed façade elements will achieve a minimum acoustic performance of 42dBR_w+C_{tr} for other windows.

External Plant Noise Emissions

- 7.5 To comply with the plant noise limits laid out above, atmospheric noise due to mechanical plant.

Table 7.1 – Atmospheric Plant Noise Emission Limits for Council HQ

Location	Free-field Noise Limit L _{Ar,Tr} , dB		
	Day	Night	Late Eve (After 2000h)
Archway Road	49	36	42
Plot 5 & Hotel	45	35	40
Other Plots	43	33	38

8.0 SUMMARY & CONCLUSIONS

- 8.1 A noise impact assessment has been undertaken in relation to the proposed St Michaels Place development, Huyton. The assessment considers the overall application for 9 plots, one to be developed for new Council Headquarters (Plot 1) and one for a Hotel (Plot 4). The remaining plots are proposed for residential with ground floor commercial units. Plot 7 is proposed for public space and Plot 9 a surface level car park in the location of an existing multi-storey car park with ground floor market hall.
- 8.2 An extended unattended noise survey was undertaken by AEC in January 2025 together with attended daytime measurements. The surveys demonstrated that noise levels vary significantly across the development site with traffic on Archway Road the main source.
- 8.3 Combined mechanical plant noise limits have been set for the existing residential properties and for the future residential properties which would result in no adverse impact or, as a worst-case situation a low adverse impact. It is likely that the most onerous requirement will be to control plant noise levels affecting the buildings associated with the development rather than existing residential properties.
- 8.4 Appropriate means of controlling noise break-out from the commercial units has been identified based on standard building constructions and these will be developed during the detailed design stages of the various plots.
- 8.5 Residential properties close to Archway Road will require a high standard of acoustic glazing and trickle vents in order that appropriate internal noise levels are achieved. However, for the remaining plots (and facades not overlooking the road) a good standard or normal standard of thermal glazing and trickle vents will appropriately control external to internal noise levels.
- 8.6 For residential developments on the plots closest to the surrounding roads, appropriate internal noise limits will not be achieved via windows that are open for ventilation purposes meaning that alternative means (e.g. mechanical ventilation) will be required to bedrooms. This will be reviewed in detail during the detailed design stages.
- 8.7 For the full Plot 4, hotel application, the assessment demonstrates that appropriate internal noise levels will be achieved based on a moderate acoustic performance standard for glazing and trickle vents.
- 8.8 An assessment for the Council HQ building has demonstrated that a good standard of acoustic glazing will be required to the façade fronting onto Archway Road.
- 8.9 In terms of the meanwhile uses potentially associated with Plot 2a, an assessment based on padel demonstrated noise has demonstrated that the potential noise levels generated will be in line with available guidance, unless the court is directly adjacent to Plot 2b and this Plot has been developed for residential first.
- 8.10 Based on this assessment, noise should not be considered a determining factor in relation to any planning permission being sought.

APPENDIX A – Acoustic Terminology in Brief

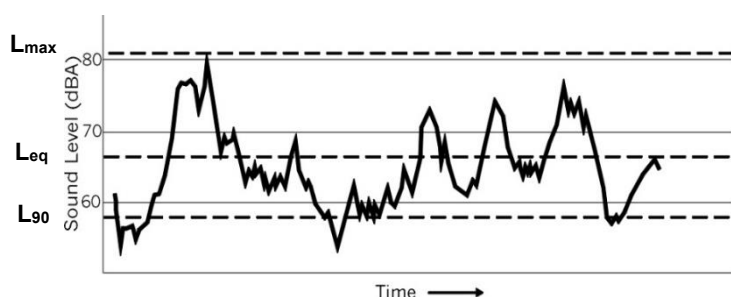
General

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The dBA weighting emphasizes or reduces the importance of certain frequencies within the audible range

Sound / Noise Units

The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below.



Commonly Used Descriptors for Sound / Noise

L_{Amax,F/S}	The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.
L_{Aeq,T}	The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises. It can be considered as the "ambient" noise level.
L_{A90,T}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe the "background" noise.
L_{A10,T}	The (A-weighted) sound level exceeded for 10% of a measurement period. It is the value often used to describe traffic noise.
L_{A1,T}	The (A-weighted) sound level exceeded for 1% of a measurement period. It is the value generally used to indicate a 'typical' maximum noise level.
L_{AE}	The sound exposure level is a notional noise level and describes the average L _{Aeq} noise level of an event over a given time period as if it occurred during a one second period. This allows the L _{Aeq} to be determined over a time period with a number of distinct events
Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
Façade Level	This refers to the sound level measured outside, at 1m from a hard-reflecting surface, typically 3dB greater than the free-field level.

Other Common Acoustics Descriptors

NR	Noise rating – a graphical method for assigning a single number rating to a noise spectrum and is often use to specify noise level limits for mechanical services.
R_w	Single number rating used to describe the <u>laboratory</u> airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.

R'_w	Apparent sound reduction index - Single number rating used to describe the sound reduction index of an on-site construction over a range of frequencies, typically 100-3150Hz.
D_w	Single number rating used to describe the on-site airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
D_{nT,w}	Weighted standardized level difference. A single number rating used to describe the on-site airborne sound insulation performance properties of a material or building element over a range of frequencies, typically 100-3150Hz. Standardized to a reference reverberation time of 0.5s (unless otherwise stated).
D_{n,e,w}	Element normalised level difference. Single number rating used to describe the sound insulation performance of small elements
D_{n,f,w}	Flanking normalised level difference. Single number rating used to describe the sound insulation performance.
C_{tr}	A road traffic spectrum adaptation term which is used to describe the low frequency sound insulation performance of building elements.
L'_{nT,w}	Single number rating used to describe the on-site impact sound insulation performance properties of a floor over a range of frequencies, typically 100-3150Hz.
RT	Reverberation Time. Time (in seconds) required for the sound pressure level in a room to decrease by 60dB after the sound source has stopped
Rating Level, L_{A,r,Tr}	Specific sound level plus any adjustment for the characteristic features of the sound

APPENDIX B – Noise Survey Details

Date & Time of Survey:	Unattended: 1345h on Friday 31 January to 1400h Monday 3 February Attended: 1124h to 1334h on Monday 3 February 2025 and 1450h to 1556h on Wednesday 5 March 2025.					
Personnel:	Liam Harrison (AEC).					
Equipment Used:	Cirrus CR:171B Real Time Analyser (AEC Kit 3). B&K 2250 light Real Time Analyser (AEC Kit 4). Cirrus CR:171B Real Time Analyser (AEC Kit 5).					
Calibration:	The sound level analysers, which conform to BS EN 61672-1: 2013 ' <i>Electroacoustics – Sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	31.01.25	Day	Dry	8°C	Negligible	70%
	31.01.25 to 01.02.25	Night	Dry	5°C	Negligible	70%
	01.02.25	Day	Dry	6°C	Negligible	70%
	01.02.25 to 02.02.25	Night	Dry	6°C	Negligible	70%
	02.02.25	Day	Dry	7°C	Negligible	70%
	02.02.25 to 03.02.25	Night	Dry	6°C	Negligible	70%
	03.02.25	Day	Dry	10°C	Negligible	30%
Measurement Locations:	Unattended measurements were undertaken at two locations on top of the existing council building. The microphone was connected via an extension cable and fixed externally at a location 1.5m back and 2m above the top floor level from the front and rear elevations of the Knowsley Borough Council building, at roof level, identified as locations MP1 & MP2 on the following Figure B1. Additional daytime manned measurements were undertaken at two further locations around the development site, Identified as MP3, MP4 and MP5 on the following Figure B1, above. The measurement positions were both 5m from the nearest carriageway. MP3 – 5m from nearest carriageway. MP4 – 5m from nearest carriageway. MP5 – 5m from nearest carriageway.					
Façade / Free-field	All measurements were undertaken in free-field conditions.					
Data Obtained:	Measurements were undertaken over various periods in terms of L_{eq}, L_{10}, L_{90}, and L_{max}. Unattended measurements were logged continuously over 1s for post processing and assessment. Full 1/3rd octave and/or octave band centre frequency data was obtained for all measurements.					
Notes for unattended measurements:	MP1 was in full view of Archway Road but partially screened from the car park. MP2 was affected by a high frequency, low level tonal plant noise contribution from an item of nearby equipment on the roof. As such, the night-time L_{90} noise level measured at this location should not be considered representative.					
Measured Data:	The measured data is presented in the following tables B1 and B2 and graphs B1 and B2.					

Figure B1 – Site Location Showing Noise Measurement Positions

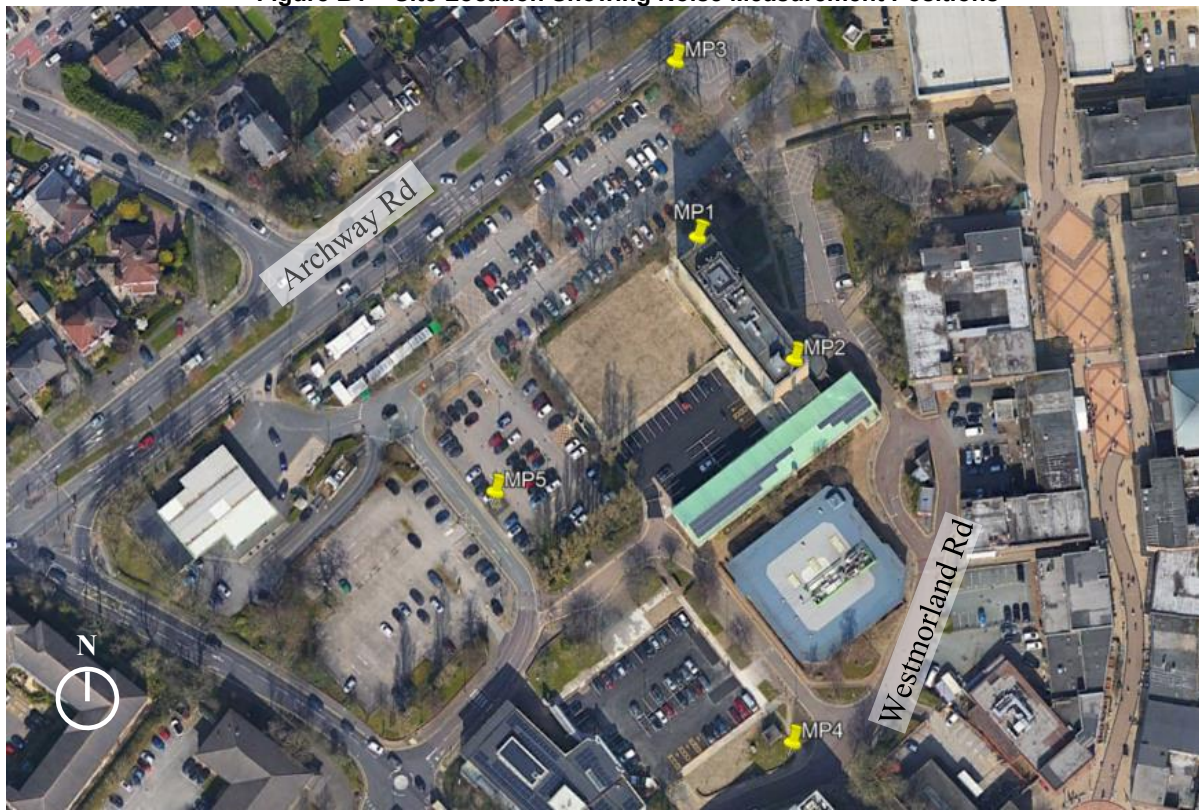


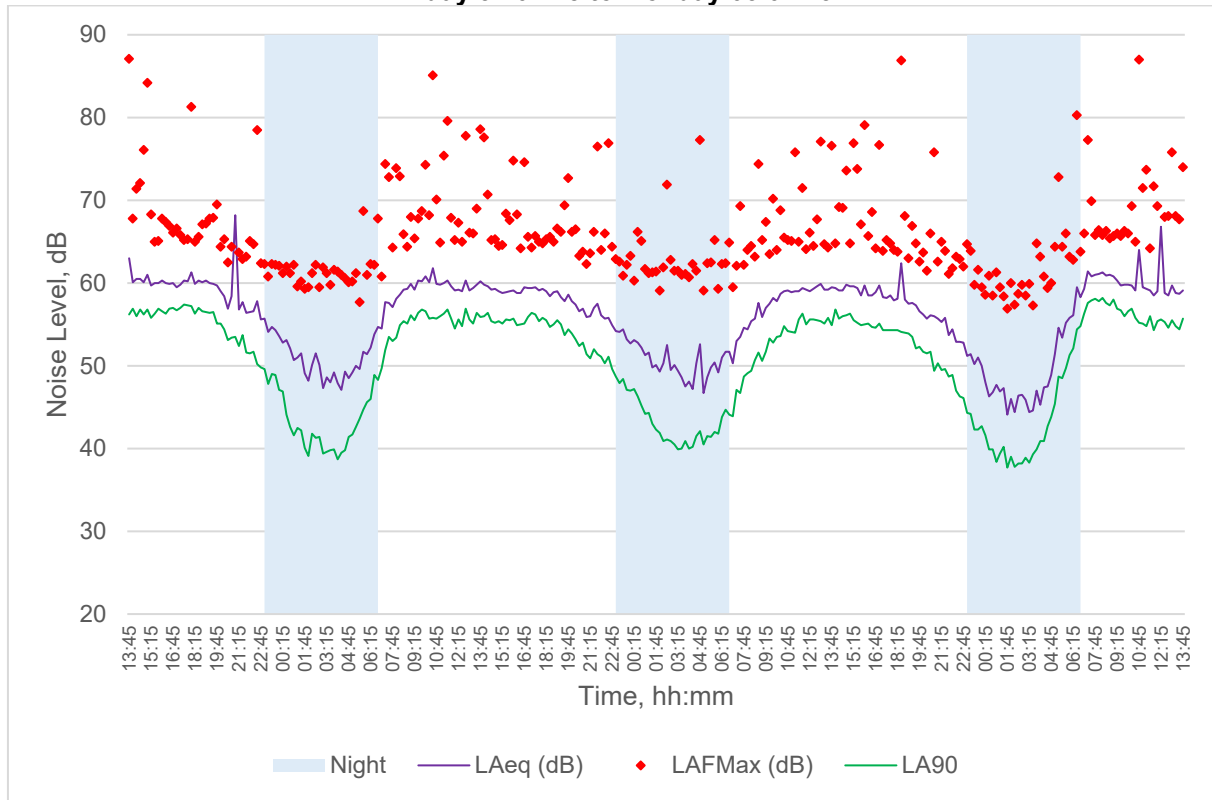
Table B1 – Summary of Unattended Noise Survey Data (MP1 and MP2)

Period	Time, h	Noise Level, dB					
		MP1			MP2		
		L _{Aeq}	L _{A90}	L _{A10}	L _{Aeq}	L _{A90}	L _{A10}
Friday 31.01.25	1345 – 2300	60	56	62	54	50	53
Friday 31.01.25 to Saturday 01.02.25	2300 – 0700	51	44	55	50	48	51
Saturday 01.02.25	0700 – 2300	59	55	61	55	53	56
Saturday 01.02.25 to Sunday 02.02.25	2300 – 0700	51	44	55	50	48	52
Sunday 02.02.25	0700 – 2300	58	54	60	54	52	55
Sunday 02.02.25 to Monday 03.02.25	2300 – 0700	52	47	55	51	49	52
03.02.25	0700 – 1400	61	56	62	57	55	57

Table B1 – Measured Noise Levels (Attended, Monday 03.02.25)

Location	Period, h	Noise Level, dB				Comments
		L _{Aeq}	L _{A10}	L _{A90}	L _{Amax, F}	
MP3	1124 – 1139	70.1	73.9	60.0	80.1	5m from Archway Road. A busy main road and is the dominant noise source within the area.
	1225 – 1240	69.7	73.4	58.4	79.4	
	1301 – 1316	69.8	73.6	58.3	79.0	
MP4	1143 – 1158	58.0	62.3	49.7	70.0	5m from Westmorland Road, road traffic noise on nearby and surrounding roads dominant.
	1243 – 1258	54.0	57.6	48.4	70.2	
	1319 – 1334	56.6	60.3	49.7	72.1	
MP5	1451 - 1521	55.1	58.7	49.3	70.0	5m from Civic Way, dominated by road traffic, including those accessing the existing Archway Road carpark and ASDA Petrol Station. Occasional noise from ASDA station drive-thru car wash facility.

**Graph B1 – Noise Levels Measured at MP1 (Overlooking Archway Road)
 Friday 31.01.25 to Monday 03.02.23**



**Graph B2 – Noise Levels Measured at MP2 (Overlooking Westmorland Road)
 Friday 31.01.25 to Monday 03.02.23**

