Noise Impact Assessment

Former Peacock Centre and Land at Pipewell Avenue, Gorton

Stantec

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Table of Contents

1 Introduction 1
1.1 Background 1
1.2 Objectives 1
1.3 Site Description and Location 1
2 Policy and Guidance 3
2.1 Local Authority Consultation 3
2.2 Local Authority Policy and Guidance 3
2.3 National Planning Policy 5
2.4 Building Regulations 7
2.5 Guidance and Standards 8
2.6 Proposed Assessment Criteria 16
3 Survey Methodology 18
3.1 Procedure 18
3.2 Measurement Locations 18
3.3 Meteorological Conditions 20
3.4 Assumptions/Limitations 20
3.5 Environmental Sound Climate 20
3.6 Sound Survey Results 21
4 External Noise Break-in Assessment (Windows Closed) 23
4.1 Overview 23
4.2 Ventilation 23
4.3 Internal Sound Levels (External Building Fabric Assessment) 24
5 External Noise Break-in Assessment (Windows Open) 27
5.1 Overview 27
5.2 Assumptions 27
5.3 Assessment 27
6 Noise levels in External Amenity Areas 28
7 Industrial Noise in External Amenity Areas 29
7.1 Site Substation 29
7.2 Easeserve Limited 30
7.3 Representative Background and Ambient Sound Levels 32
7.4 Activity Sound Level and Specific Sound Level 32
7.5 Acoustic Feature Corrections 32
7.6 Context and Mitigating Factors 34
7.7 Assessment Results 34
8 Conclusions 35

List of Tables

Table 1. Stage 1 ProPG Risk Assessment 9
Table 2. BS 8233 Guideline Internal Ambient Noise Levels for Dwellings 13
Table 3. External Noise Levels Above Which the Simplified Method Cannot be Used 16
Table 4. Proposed Assessment Criteria – Transportation Sound Sources 16
Table 5. Proposed Preliminary Effect Level Outcomes 17
Table 6. Description of Measurement Locations 20
Table 7. Meteorological Conditions 20
Table 8. Summary of Environmental Sound Climate at Survey Locations 21
Table 9. Summary of Measured Environmental Sound Survey Results 22
Table 10. Average Equivalent Acoustic Absorption Coefficients 24
Table 11. Assumed Building Envelope Construction Sound Reduction Performance 25
Table 12. Glazing and Trickle Ventilator Guidance Constructions 25
Table 13. Limiting Distances between Transformer and Nearest Dwelling for Brick built Substations 29
Table 14. Representative Daytime (07:00 – 23:00) Background and Ambient Sound Levels 32
Table 15. Noise Levels Associated with Easeserve Ltd Operation 32
Table 16. Calculated Sound Levels in Worst-case Private Amenity Spaces - Daytime (07:00 – 23:00). 32

Table 17.Preliminary Assessment of Easeserve Ltd. at Worst-case Private Outdoor Amenity Spaces – Daytime (07:00 – 23:00)..... 34
Table 18. Instrumentation 3
Table 19. Minimum Sound Reduction Indices of Glazing Systems 1
Table 20. Minimum Normalised Element Difference of Ventilation Systems for the Houses 2

List of Figures

Figure 1. Site Location 2
Figure 2. Environmental Sound Measurement Locations..... 19
Figure 3. Location of Proposed Site Substation..... 29
Figure 4. Location of Easeserve Limited..... 31
Figure 5. Façade Zone Plan – North Parcel 2

List of Appendices

Appendix A Acoustic Terminology
Appendix B Survey Instrumentation
Appendix C Façade Zone Plans
Appendix D External Building Fabric Acoustic Performance Specification
Appendix E Overheating Noise Constraints
Appendix F Noise Levels in External Amenity Spaces

1 Introduction

1.1 Background

Stantec UK Limited (Stantec) has been commissioned by Clarion Housing Association Limited and Clarion Housing Property Development Services Limited to undertake a noise impact assessment in relation to The Former Peacock Centre and Land at Pipewell Avenue, Gorton.

An environmental sound survey has been undertaken by Stantec to establish the existing environmental sound levels associated with transportation and industrial sources incident on the proposed development.

The results of the environmental sound survey have been used to establish façade incident sound levels for the proposed development which form the basis of our assessment of the acoustic requirements of the building façade.

This report presents the relevant results of the environmental sound surveys, details of our assessment and proposed acoustic specifications for windows, ventilators, external walls and roofs of the buildings.

An explanation of the acoustic terminology used in this report is included in Appendix A.

1.2 Objectives

The objectives of this report are to:

- Establish, by means of a 3-hour daytime, 1-hour evening and 2-hour night-time attended environmental sound survey, the existing environmental sound levels at selected accessible positions.
- Propose appropriate internal ambient noise level design criteria with respect to external noise ingress for habitable spaces, based on the requirements of Manchester City Council.
- Undertake an assessment of the likely airborne noise ingress into habitable spaces and determine the minimum acoustic performance required of the windows, ventilators and external walls of the building façade to achieve the proposed criteria with windows closed.
- Undertake assessment of airborne ingress to bedrooms at night, to determine likely compliance with the noise requirements of Approved Document O.

Advice and recommendations within this report will need to be integrated, coordinated and ratified by the principal designer and design team to ensure that all other design interfaces, buildability, workmanship and other requirements are considered. Any sketches or drawings provided illustrate acoustic principles only.

1.3 Site Description and Location

The proposed development is located at Peacock Close M18 8DA and falls within the jurisdiction of Manchester City Council. The description of the planned development is:

> *"Full planning application for the erection of 75 dwellings (Use Class C3), including a 25-unit apartment building and 27 dwellings on the Peacock Centre Site, and 23 dwellings on the Pipewell Avenue Site, with associated access, parking,*

landscaping, public open space, informal play provision, drainage infrastructure, and enhanced pedestrian and cycle connections."

The site consists of two parcels. The northern parcel is currently unoccupied land on the site of the recently demolished Peacock Centre. It is bound by residential dwellings on Peacock Close and Buttress Street to the east and south. It is bound by Taylor Street Playing Fields to the west and Bond Mark Industrial Estate to the north.

The southern parcel consists of currently unoccupied open land. It is bounded by residential development to the north, east and south, and by Taylor Street Playing Fields to the northwest.

The locations of the proposed site parcels are detailed in Figure 1.

Figure 1. Site Location



Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft

2 Policy and Guidance

2.1 Local Authority Consultation

Consultation with the Environmental Protection Officer at the Local Planning Authority was undertaken in June 2025 to outline and agree the sound survey methodology. It was noted by the Environmental Protection Officer (EPO) that there are "a number of industrial premises opposite the site and a couple of licensed premises along Gorton Lane which may have an impact" and should be considered within the assessment. It was further noted by the EPO that there is a railway line between Crossley Street and Taylor Street, which may or may not have impact, but should be considered during the assessment.

2.2 Local Authority Policy and Guidance

Manchester Core Strategy 2012 to 2027

The Core Strategy was adopted by Manchester City Council in 2012 and is the key document in Manchester's Local Development Framework. It provides planning policies which will be used to guide delivery of the Council's vision for Manchester up to 2027.

In relation to noise, Policy DM 1 *Development Management* states:

> *"All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-*
>
> *[…]*
>
> *Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.*
>
> *[…]"*

Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan

The Places for Everyone Joint Development Plan Document was adopted in March 2024. The document provides a spatial strategy and seeks to deliver sustainable, inclusive growth.

In relation to noise and the proposed development, there is no relevant policy or guidance within the document.

Manchester City Council Saved Unitary Development Policies (UDP)

The Core Strategy replaced much of the UDP, but some UDP policies are extant. This includes Development Control Policy DC26.1 to DC26.6, which states:

> *"[…]*
>
> *DC26.2 New noise-sensitive developments (including large-scale changes of existing land or buildings), such as housing, schools, hospitals or similar activities, will be permitted subject to their not being in locations which would expose them to high noise levels from existing uses or operations, unless the effects of noise can*

realistically be reduced. In giving effect to this policy, the Council will take account both of noise exposure at the time of receiving a planning application and of an increase that may reasonably be expected in the foreseeable future.

[…]

DC26.4 Where the Council believes that an existing noise source might result in an adverse impact upon a proposed new development, or where a new proposal might generate potentially unacceptable levels of noise, it will in either case require the applicant to provide assessment of the likely impact and of the measures he proposes to deal satisfactorily with it. Such measures might include the following:

Engineering solutions, including reduction of noise at source, improving sound insulation of sensitive buildings or screening by purpose-built barriers;

Layout solutions, including consideration of the distance between the source of the noise and the buildings or land affected by it and screening by natural barriers or other buildings or noncritical rooms within the building

[…]"

Manchester City Council Planning and Noise Technical Guidance

With regards to national policy, Section 3.7 "MCC assessment criteria" states:

"In the context of government policy, the Council require that developments aim for:

1. *A noise level between the No Observed Effect Level (this is the level of noise exposure below which no effect at all on health or quality of life can be detected) and the Lowest Observed Adverse Effect Level (this is the level of noise exposure above which adverse effects on health and quality of life can be detected). Conditions may be attached*

If point 1 cannot be achieved, then:

2. *If the assessment results in a level between the Lowest Observed Adverse Effect Level and the Significant Observed Adverse Effect Level (this is the level of noise exposure above which significant adverse effects on health and quality of life occur), mitigation will be necessary to reduce the level and thus conditions will be attached.*

If points 1 & 2 cannot be achieved, then:

3. *If the assessment results in a Significant Observed Adverse Effect Level after mitigation, the application will be recommended for refusal."*

Section 3.7.1.1 "Residential Developments" states:

"The Council has adopted the following noise limits for residential properties:

- *Bedrooms (night time -23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 $L_{Amax,F}$ by more than 10 times)*
- *Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}*
- *Gardens and terraces (daytime) 55dB L_{Aeq}*

With regard to noise from industrial and commercial sources, the document provides guidance on designing proposed industrial and commercial uses and minimising their impact on existing noise

sensitive premises, but it does not provide requirements for new noise sensitive premises being introduced near to existing industrial or commercial use.

2.3 National Planning Policy

National Planning Policy Framework

The revised National Planning Policy Framework (NPPF) was published in December 2024. In respect of noise, paragraph 187 states that in relation to conserving and enhancing the natural environment:

> *"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 … noise pollution..."*

In relation to ground conditions and pollution, paragraph 198 states that:

> *"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 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…"*

The NPPF indicates that the Noise Policy Statement for England (NPSE) should be used to define the "significant adverse impacts".

In relation to the integration of new development with existing premises and community facilities, paragraph 200 states that:

> *"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."*

Planning Practice Guidance: Noise

The Planning Practice Guide (PPG) was launched in 2014 (with the latest update to noise aspects being in 2019) and provides additional guidance and interpretation to the Government's strategic policies outlined within the NPPF in a regularly updated, web-based resource.

The PPG provides guidance on the effects of noise exposure, relating these to people's perception of noise, and linking them to the no observed effect level (NOEL) and, as exposure increases, the lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL).

As exposure increases above the LOAEL, the noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.

Exposure to noise above the LOAEL is described in PPG (Paragraph: 005 Reference ID: 30-005-20190722) as:

> *"…noise starts to cause small changes in behaviour and/or attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise)."*

Exposure to noise above SOAEL is described as:

> *"…noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused."*

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 and clarifies the underlying principles and aims of existing policy documents that relate to noise. It also sets out the long-term vision of Government noise policy which is: "*to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

The NPSE states that noise should not be considered in isolation of the wider benefits of a scheme or development, and that the intention is to minimise noise and its effects as far as is reasonably practicable having regard to the underlying principles of sustainable development.

Paragraphs 2.20 and 2.21 define 'significant adverse' and 'adverse' impacts as applied to noise as follows:

> *"There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:*
>
> *NOEL – No Observed Effect Level*
>
> *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*
>
> *LOAEL – Lowest Observed Adverse Effect Level*

> *This is the level above which adverse effects on health and quality of life can be detected.*
>
> *Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*
>
> *SOAEL – Significant Observed Adverse Effect Level*
>
> *This is the level above which significant adverse effects on health and quality of life occur."*

It is necessary to define the LOAEL and SOAEL for the potential source of noise so that the potential impact can be related to the aims and requirements of the NPSE.

2.4 Building Regulations

Approved Document O Overheating

Approved Document O of the Building Regulations 2010 *Overheating* was published in December 2021 and took effect in England on 15 June 2022.

Approved Document O gives guidance on how to comply with Part O of the Building Regulations and applies to residential buildings (excluding hotels) only.

Requirement O1(1) states that:

> *"Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel ("residences") to –*
>
> *(a) Limit unwanted solar gains in summer;*
>
> *(b) Provide an adequate means to remove heat from the indoor environment."*

Requirement O1(2) states that:

> *"In meeting the obligations in paragraph (1) –*
>
> *(a) Account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and*
>
> *(b) Mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it."*

Compliance with Requirement O1(1) can be demonstrated by using the 'simplified method' or by 'dynamic thermal modelling', as described in Approved Document O.

In relation to noise, Paragraphs 3.2 and 3.3 of Approved Document O state:

> *"3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

> *3.3 Windows are likely to be closed during sleeping hours if 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).”*

Based on the above, the ‘simplified method’ cannot be relied upon if either of the internal noise criteria are exceeded.

2.5 Guidance and Standards

Professional Practice Guidance on Planning and Noise

The Professional Practice Guidance on Planning and Noise (ProPG) was jointly published in 2017 by the Institute of Acoustics, the Chartered Institute of Environmental Health and the Association of Noise Consultants, and provides guidance on a recommended approach to the management of noise within the planning system in England.

The scope of ProPG is limited to new residential development that will be predominantly exposed to airborne noise from transport sources.

The guidance is mostly focused on new flats and houses, although there is some relevant content in regard to other types of residential units, such as care homes and residential institutions.

Noise sources other than airborne transport (i.e. industrial, commercial, entertainment, etc.) and ground-borne noise and vibration fall outside of the scope of ProPG.

ProPG details a two-stage approach to the consideration of noise issues including:

- Stage 1 – an initial noise risk assessment of the proposed development site.
- Stage 2 – a systematic consideration of four key elements.

Table 1 is a reproduction of Figure 1 within ProPG which summarises the noise risk categories for Stage 1 of the assessment process.

Table 1. Stage 1 ProPG Risk Assessment

Noise Risk Assessment			Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels $L_{Aeq,16hours}$		**Indicative Night-time Noise Levels $L_{Aeq,8hours}$**		
	High			High noise levels indicate that there is an increased risk that developments may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed Acoustic Design Statement (ADS). Applicants are strongly advised to seek expert advice.
70 dB		60 dB		
	Medium			As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimized and which clearly demonstrate that a significant adverse noise impact can be avoided in the finished development.
65 dB		55 dB	Increasing Risk of adverse effect	
60 dB		50 dB		
	Low			At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimized in the finished development.
55 dB		45 dB		
50 dB		40 dB		
	Negligible		No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Figure Notes:

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
c. $L_{Aeq,16hr}$ is for daytime 0700 - 2300, $L_{Aeq,8hours}$ is for night-time 2300 - 0700.

d. An indication that there may be more than 10 noise events at night (2300 – 0700) with L_{AFmax} > 60 dB means the site should not be regarded as negligible risk.

Stage 2 comprises four key elements which are undertaken in parallel:

- Element 1 – demonstrating a 'Good Acoustic Design Process';
- Element 2 – observing internal 'Noise Level Guidelines';
- Element 3 – undertaking an 'External Amenity Area Noise Assessment'; and
- Element 4 – consideration of 'Other Relevant Issues'.

Following a good acoustic design process involves considering acoustics at an early stage in the design process; avoid 'unreasonable' acoustic conditions and prevent 'unacceptable' acoustic conditions; and achieve an integrated, optimum solution without overdesign.

Demonstration of good acoustic design should include:

- Checking the feasibility of relocating or reducing noise levels from relevant sources.
- Consider options for planning the site or building layout.
- Consider the orientation of proposed building(s).
- Select construction types and methods for meeting building performance requirements.
- Consider the effects of noise control measures on ventilation, fire regulation, health and safety, CDM, etc.
- Assess the viability of alternative solutions.
- Assess external amenity areas noise.

With respect to internal noise levels, ProPG recommends that noise levels set out in BS 8233 are used for residential development. However, an additional criterion is proposed by ProPG for night-time L_{Amax} levels as follows:

> *"[…] In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,\ F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events."*

With respect to external noise levels, ProPG again makes reference to the guideline levels detailed in BS 8233 stating that:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

The final element indicates that the assessment should consider 'Other Relevant Issues' which may include:

- Compliance with relevant national and local policy.
- Magnitude and extent of compliance with ProPG.
- Likely occupants of the development.
- Acoustic design versus unintended adverse consequences.
- Acoustic design versus wider planning objectives.

World Health Organization - Guidelines for Community Noise

The World Health Organization (WHO) 'Guidelines for Community Noise' details guidance on suitable internal and external sound levels in and around residential properties. The following internal sound levels are recommended by the WHO:

- 35 dB $L_{Aeq,16hours}$ in living rooms during the daytime (07:00 to 23:00 hours); and
- 30 dB $L_{Aeq,8hours}$ in bedrooms during the night-time (23:00 to 07:00 hours).

With respect to maximum sound levels during the night-time, the guidelines state:

> *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night."*

In addition to the above, the guidelines suggest that daytime sound levels of above 50 dB $L_{Aeq,16hours}$ are of 'moderate annoyance' in the community with daytime sound levels above 55 dB $L_{Aeq,16hours}$ of 'serious annoyance'.

The above levels are in-line with guidance detailed in BS 8233:2014 and ProPG Planning and Noise.

World Health Organization - Night Noise Guidelines for Europe

The introduction of the Directive on Environmental Noise obliges Member States to assess and manage noise levels. With the support of the European Commission, the World Health Organization (WHO) Regional Office for Europe has developed night noise guidelines for Europe to help Member States develop legislation to control noise exposure.

The guidelines are based on scientific evidence on the effects of noise and the thresholds above which these effects appear to harm human health.

There is limited evidence that night noise is related to hypertension, heart attacks, depression, changes in hormone levels, fatigue and accidents.

The WHO report summarised the threshold levels of night noise above which a negative effect starts to occur or above which the impact becomes dependent on the level of exposure. For example, the threshold level for waking in the night and/or too early in the morning was 42 dB.

It also established that there are differences in the intensity and frequency of noise depending on the source, which lead to different impacts. Road traffic is characterised by low levels of noise per event, but as there are a high number of events, on average it has a greater effect on awakenings than air traffic, which has high levels of noise per event but fewer events.

Integrating these findings, the report proposed a guideline target limit of outdoor night noise of 40 dB (annual average defined as 'L_{night}' in the Environmental Noise Directive). There is not sufficient evidence that the biological effects observed below this level are harmful to health but adverse effects are observed above 40 dB.

Member States can adopt this night noise guideline to reduce noise using measures such as house insulation, locating offices in noise-exposed areas and creating zones where a certain level of noise cannot be exceeded. It can also be used for health impact assessment of new projects such as roads, airports or residential areas.

World Health Organization - Environmental Noise Guidelines for the European Region

The World Health Organization (WHO) 'Environmental Noise Guidelines for the European Region' sets out guidance on suitable external noise levels from specific noise sources including road traffic railway, aircraft, wind turbine and leisure noise to inform policy makers.

The guidelines refer to L_{den} and L_{night} dB values for road traffic, railway, aircraft and railway noise. These are sound descriptors not commonly used within the UK. More commonly utilised descriptors are the daytime average ($L_{Aeq,16hours}$) and night-time average ($L_{Aeq,8\ hours}$) levels.

With respect to indoor noise levels, the guideline document states that "*the GDG recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid.*"

As such reference is made to the World Health Organization, Guidelines for Community Noise, 1999.

British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

BS 8233:2014, in relation to this development, sets out guideline values in habitable rooms, such as living rooms and bedrooms which should not be exceeded.

The guideline values relate to steady external noise without a specific character, previously termed 'anonymous noise'. According to the standard, noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate. Examples of noise with a character may include tonal/intermittent plant noise emissions, music playback, and workshop noise. Examples of external steady noise sources may include environmental noise sources such as busy road traffic.

The guideline internal ambient noise levels for dwellings are presented in Table 2.

Table 2. BS 8233 Guideline Internal Ambient Noise Levels for Dwellings

Activity	Location	Internal Ambient Noise Level	
		07:00 to 23:00 hours	**23:00 to 07:00 hours**
Resting	Living room	35 dB $L_{Aeq,16hours}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hours}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hours}$	30 dB $L_{Aeq,8hours}$
Note 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax}, depending on the character and number of events per night. Sporadic noise events could require separate values.			
Note 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative source of ventilation that does not compromise the façade insulation or the resulting noise levels.			
Note 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.			
*A selection of the available notes			

The standard also provides advice in relation to sound levels for external noise. It states that:

> *"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.*
>
> *In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*
>
> *Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate.*
>
> *Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation.*
>
> *In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."*

With respect to industrial noise, paragraph 6.5.2 states:

> *"Where industrial noise affects residential or mixed residential areas, the methods for rating the noise in BS 4142 should be applied. BS 4142 describes methods for determining, at the outside of a building:*
>
> *a) noise levels from factories, industrial premises or fixed installations, or sources of an industrial nature in commercial premises; and*
>
> *b) background noise level."*

British Standard 4142:2014 +A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

BS 4142:2014+A1:2019 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The standard is used to determine the rating levels for sources of sound of an industrial and/or commercial nature and the ambient, background and residual sound levels at outdoor locations. These levels could be used for the purposes of investigating complaints; assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and assessing sound at proposed new dwellings or premises used for residential purposes. However, the determination of noise amounting to a nuisance is beyond the scope of the standard.

The standard should not be used to assess sound from the passage of vehicles on public roads and railway systems; recreational activities; music and other entertainment; shooting grounds; construction and demolition; domestic animals; people; public address systems for speech and other sources falling within the scopes of other standards or guidance. The standard cannot be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

The procedure contained in BS 4142 assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur. It is noted that a BS 4142 assessment is reliant on measuring relevant background sound levels.

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

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

When considering the introduction of a new noise sensitive receptor Section 8.5 states:

> *"Measure the background sound at the intended location of any new noise-sensitive receptor(s) in the absence of any specific sound.*
>
> *NOTE Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."*

To consider the context, BS 4142 advises that the following factors should be considered:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:
  - Façade insulation treatment;
  - Ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation; and
  - Acoustic screening.

Approved Document O Noise Guide

The Approved Document O Noise Guide was jointly published by the Association of Noise Consultants and Institute of Acoustics in November 2024. This guide provides clarity for practitioners and regulators so that assessments can be carried out consistently, and the outcome is repeatable and reliable.

While the requirements of Approved Document O are succinct, there is some ambiguity regarding important details, some of which are addressed within the guide.

The guide makes the following clarifications:

- The noise requirements apply only to bedrooms at night.
- Natural sound sources (e.g. meteorological sounds, sounds from animals and water) should be excluded from contributing to the assessed noise level.

The guidance document provides anticipated level differences through window openings which are necessary to satisfy the 'simplified method' of Approved Document O, based on typical assumptions. For 'high' risk locations (as described as areas in London and Manchester in Approved Document O) this is 5 dB, and for 'medium' risk locations (as described as other areas outside London and Manchester in England in Approved Document O) this is 10 dB.

Paragraph 4.1.7 states that if external sound levels exceed the limiting external free-field levels outlined in Table 3 the 'simplified method' cannot be used, and 'dynamic thermal modelling' should be used to demonstrate compliance:

Table 3. External Noise Levels Above Which the Simplified Method Cannot be Used

Parameter	High Risk Location	Moderate Risk Location
$L_{Aeq,8hours}$ averaged over 8 hours (between 11pm and 7am)	45 dB	50 dB
L_{AFmax} more than 10 times a night (between 11pm and 7am)	60 dB	65 dB
Note: Several assumptions have been used to determine the outside-to-inside level difference. These are: 2.4m bedroom height, 0.5s bedroom RT, simple hole in the façade of area sufficient to provide the required Equivalent Area, no sound transmission other than via the opening. Calculation according to Equation G.1 of BS 8233:2014.		

Paragraph 6.1.2 of the guide states:

> *"Given the uncertainty of measuring noise levels internally and the complexity of remedial work to adapt a completed building to remove excess heat by means other than opening a window, it is recommended that determination of compliance with AD-O is completed at the design stage only."*

2.6 Proposed Assessment Criteria

Based on policies and guidance provided by the Local Planning Authority, relevant guidance and standards, the proposed criteria for this assessment are presented in Table 4. The criteria apply to the assessment of transportation sound sources only.

Table 4. Proposed Assessment Criteria – Transportation Sound Sources

Parameter	Daytime (07:00 – 23:00)		Night-time (23:00 – 07:00)	
	Private amenity areas $L_{Aeq,16hour}$	**Internal living areas $L_{Aeq,16hour}$**	**Internal bedroom $L_{Aeq,8hour}$**	**Typical Internal Maximum Sound Level L_{AFMax}**
MCC Limit sound levels, dB	55	35	30	45

It is considered that sound level limits set out by MCC are established based on minimising adverse impact. These internal limits have therefore been interpreted as the LOAEL. However, the external amenity limit has been interpreted as the SOAEL, with 50 dB $L_{Aeq,16hour}$ as the LOAEL, based on relevant standards and guidance referred to in this section.

For sound of an industrial or commercial nature, the proposed assessment criteria are presented in Table 5. As BS 4142:2014+A1:2019 cannot be applied to the assessment of indoor sound levels, these criteria are applied to the assessment of impact in private outdoor amenity spaces only.

Table 5. Proposed Preliminary Effect Level Outcomes

BS4142 Effect Level	**Difference Between Rating Level ($L_{Ar,Tr}$) and Background Sound Level ($L_{A90,T}$), dB**	**Planning Effect Level**
Significant adverse impact, depending on the context	“around +10 dB or more”	SOAEL
Adverse impact, depending on the context	“around +5 dB”	LOAEL
Low impact, depending on the context	“does not exceed the background”	-

3 Survey Methodology

3.1 Procedure

An attended sound survey was undertaken between approximately the following dates and times:

- 05:00 – 07:00 on Wednesday 6 August 2025
- 19:00 – 20:00 on Wednesday 20 August 2025
- 13:00 – 16:00 on Thursday 21 August 2025

While it would have been preferable to undertake an unattended sound survey over a longer period, at the time of the survey the site was not secure so equipment could not be left unattended. The survey periods were chosen to capture typical worst-case future façade incident levels.

Measurements were made of the L_{Aeq}, L_{A90} and L_{AFmax} sound levels.

The sound level meter was located on a tripod, 1.5 m above local ground level. The microphone was fitted with the manufacturer's windshield.

The instrumentation used in the survey (including calibration information) is listed in Appendix B. Calibration certificates are available upon request.

Field calibrations were performed before and after the measurements with no significant fluctuations recorded (< 0.5 dB).

3.2 Measurement Locations

Sound measurements were undertaken at five positions around the site, considered representative of the sound levels incident on the future development. The measurement positions are detailed in Figure 2 and Table 6.

Figure 2. Environmental Sound Measurement Locations



Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft

Table 6. Description of Measurement Locations

Position	Description
ST1	The microphone was located approximately 17 m south of Gorton Lane, on Burston Street. The microphone was in free-field conditions.
ST2	The microphone was located on the pavement at the northern end of the site along Gorton Lane. The microphone was in free-field conditions.
ST3	The microphone was located approximately 65 m south of Gorton Lane, on Burston Street. The microphone was in free-field conditions.
ST4	The microphone was located in the existing grassy area in the location of the southern part of the site. The microphone was in free-field conditions.
ST5	The microphone was located approximately 8 m south of Gorton Lane, on the grassy area to the west of the site. The microphone was in free-field conditions.

3.3 Meteorological Conditions

Based on observations and on-site measurements, the meteorological conditions during the survey are detailed in Table 7.

Table 7. Meteorological Conditions

Date	Average Temperature (°C)	Total Precipitation (mm)	Wind Speed Range (m/s)	Average Wind Direction
6 August 2025	11-21	0	<4	WSW
20 August 2025	13-18	0	<4	NNE
21 August 2025	12-20	0	<3	NNE

These conditions are considered suitable for obtaining representative sound level measurements.

3.4 Assumptions/Limitations

The engineer noticed nothing unusual in terms of the sound climate at the time of the survey. This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary. No warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

3.5 Environmental Sound Climate

The sound sources noted during the survey at each location respectively, are noted in Table 8.

Table 8. Summary of Environmental Sound Climate at Survey Locations

Position	Description
ST1	Between approximately 05:00 and 05:15, and 05:30 and 05:45 on 6 August 2025 The sound climate consisted primarily of noise from seagulls, as well as occasional cars and HGVs passing on Gorton Lane. Sound from a distant train pass was audible, but did not significantly contribute to the sound environment. Between approximately 19:30 and 20:15 on 20 August 2025 Sound climate consisted primarily of noise from vehicle movements on Gorton Lane. No industrial activity noise was audible, and no noise from The Vulcan was audible.
ST2	At approximately 05:20 on 6 August 2025 Sound from a fan serving Easeserve was audible but not intrusive.
ST3	Between approximately 05:45 and 06:00 on 6 August 2025 Similar conditions to those at ST1 were observed, although there were reduced sound levels from vehicles passing on Gorton Lane due to greater separation distance.
ST4	Between approximately 06:05 and 06:20 on 6 August 2025 Generally consisted of birdsong, aircraft flyovers and traffic on the road to the west. Between approximately 20:15 and 20:30 on 20 August 2025 Similar conditions to those observed at ST4 on 6 August 2025.
ST5	Between approximately 06:25 and 07:00 on 6 August 2025 Similar conditions to those at ST1, although general intensification of traffic as the morning progressed. Between approximately 12:40 and 16:00 on 21 August 2025 Sound climate consisted primarily of noise from vehicle movements on Gorton Lane. During lulls in traffic, noise from operations within the outside yard at Easeserve was audible. This included the sound of metal goods being loaded/unloaded to/from a vehicle.

During the survey, noise from the railway line to the west was occasionally audible during lulls in traffic, however it did not dominate the sound climate when trains were passing.

Noise from licensed venues was not audible during the evening survey, and it is considered that the operations of nearby venues would not influence the sound climate or result in adverse impact on the site.

3.6 Sound Survey Results

The results of the survey are presented in Table 9.

Typical L_{AFMax} is determined based on the highest L_{AFMax} observed during the survey periods, with the exclusion of a single outlier during daytime measurements at ST5.

Table 9. Summary of Measured Environmental Sound Survey Results

Location	Date	Time Period, *T*	Measured Sound Level (dB)		
			Logarithmic Average, $L_{Aeq,T}$	**Typical Maximum,** L_{AFmax}	**Minimum** $L_{A90,15minutes}$
ST1	06/08/2025	05:03 – 05:20	55	74	44
		05:29 – 05:44	56	73	46
	20/08/2025	19:28 – 20:07	57	83	42
ST2	06/08/2025	05:23 – 05:27	61	79	-
ST3	06/08/2025	05:47 – 06:01	49	67	44
ST4	06/08/2025	06:06 – 06:20	47	65	41
	20/08/2025	20:14 – 20:29	41	63	38
ST5	06/08/2025	06:25 – 06:55	60	74	41
	21/08/2025	12:41 – 15:56	63	90	49

4 External Noise Break-in Assessment (Windows Closed)

4.1 Overview

Analysis of the proposed external building fabric has been undertaken to determine the required acoustic performance of glazing and ventilation elements to achieve the criteria detailed in Table 4 with windows closed. A computational acoustic model of the site has been constructed based on the results of the environmental sound survey, with future sound levels across the site having been predicted using methodology from ISO 9613-2:2024. Compliance with the acoustic performance specification detailed herein is expected to result in compliance with the proposed acoustic criteria, subject to the assumptions in section 4.3 being valid.

4.2 Ventilation

The requirements for building ventilation in new dwellings are detailed in Approved Document F (ADF) and include provision for ‘whole dwelling ventilation’, ‘extract ventilation’ and ‘purge ventilation’, as described below.

Whole Dwelling Ventilation

Nominally continuous ventilation of rooms or spaces at a relatively low rate to provide fresh air to the building and dilute, disperse and remove water vapour and pollutants not removed by extract ventilation.

Extract Ventilation

The extraction of air where water vapour or pollutants are likely to be released (e.g. bathrooms and kitchens). Fans may be either intermittent or continuous operation.

Purge Ventilation

Manually controlled ventilation at a relatively high rate to remove pollutants and/or water vapour (e.g. fumes from painting). Purge ventilation is typically provided by means of openable windows. Due to the temporary nature of purge ventilation, significant noise impacts are not normally expected.

Types of Ventilation System

ADF provides three ‘template’ systems which comply with the ventilation requirements, formed of whole dwelling ventilation and extract ventilation, and can be adopted to demonstrate compliance. These are:

- Natural ventilation (applicable to less airtight dwellings) - incorporating background ventilators and intermittent extract fans
- Continuous mechanical extract ventilation - incorporating background ventilators and continuous extract fans
- Mechanical ventilation with heat recovery (MVHR) - incorporating continuous ventilation fans

Each system has different noise implications, however in the context of this assessment external noise ingress via the ventilation system is the primary consideration. Generally, for natural ventilation and continuous mechanical extract ventilation, this is via the ventilators. For MVHRs, this is via the inlet and exhaust grilles within the dwelling associated with the MVHR system.

Selected System

It is understood that ventilation for apartments in the north of the proposed development is to be provided with MVHR units located within each dwelling. MVHR systems generally have a sealed façade and therefore there is no direct path for external noise to enter the internal spaces via the ducted ventilation route specifically (instead external noise enters the MVHR directly before air is then distributed via a fan into the external spaces, such that the fan noise dominates). External noise ingress via the MVHR system is not considered to be a contributing source on this basis for the northern parcel.

It is understood that ventilation to the houses and southern parcel dwellings is to be provided by trickle ventilators located in the facade. In this case, there is a direct air path from external to internal, which also allows direct noise ingress and therefore needs to be controlled through selection of trickle ventilators that provide a sufficient sound reduction performance.

4.3 Internal Sound Levels (External Building Fabric Assessment)

The external building fabric analysis has assumed the following:

Room Absorption

It has been assumed that the bedrooms and living rooms are to be acoustically ‘hard with hard flooring, curtains and other soft furnishings. For the purposes of our analysis we have assumed the average equivalent absorption coefficients detailed in Table 10.

Table 10. Average Equivalent Acoustic Absorption Coefficients

Room	Average Equivalent Acoustic Absorption Coefficient ($\bar{\alpha}$) at Octave-band Centre Frequency (Hz)				
	125 Hz	250 Hz	500 Hz	1kHz	2kHz
Living Rooms	0.11	0.13	0.14	0.14	0.16
Bedrooms	0.12	0.15	0.15	0.16	0.2

Proposed External Building Fabric

The assessment has been based on a typical brick/block cavity wall build-up and two assumed roof constructions: a typical flat concrete roof for the apartments in the north of the site, and a typical tiled roof for the houses elsewhere on the site.

Please note that assessment of internal sound transfer falls outside the scope of this report.

Table 11 details typical sound reduction indices associated with the assumed external building fabric constructions.

Table 11. Assumed Building Envelope Construction Sound Reduction Performance

Construction	Sound Reduction Index (*R*) at Octave-band Centre Frequency (Hz)					R_w
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	
External Wall	41	45	45	54	58	52
External Roof (Houses)	21	26	33	33	35	34
External Roof (Apartments)	37	39	45	52	55	50

Our calculations have been based on building and window dimensions obtained from drawings produced by PRP provided to Stantec on 20/03/2026.

Glazing and Ventilation Acoustic Specification and Guidance on Construction

Glazing specifications have been developed on the basis of controlling external noise ingress to the design criteria proposed in Table 4. Acoustic performance requirements have been consolidated so that a minimum number of different specifications are provided. Glazing zones are presented in Appendix C.

The glazing performance specifications apply to the glazing package as a whole, inclusive of glazing, louvres, spandrel panels, framing, opening lights, doors, seal etc. The performance of the glazing system will depend on many factors such as the glazing configuration, size of window panels, quality of framing, quality of sealing etc.

The proposed windows should be tested in accordance with BS EN ISO 10140-2:2021 and the quoted minimum sound reduction specifications should be met by the system as a whole, including frames etc. as appropriate, and not just the glass.

For guidance purposes we would suggest that a construction based around the following configurations is likely to prove commensurate with achieving the sound insulation performance specifications detailed within Appendix D.

Table 12. Glazing and Trickle Ventilator Guidance Constructions

Zone	Glazing Type	Ventilation Type	Guidance Glazing and Ventilator Construction
Zone 1	G1	V1	Typical double-glazing, typical trickle ventilators
Zone 2	G1	V2	Typical double-glazing, acoustically uprated trickle ventilators
Zone 3	G2	-	Acoustically uprated double-glazing, no trickle vents (i.e. fully sealed façade with MVHR providing ventilation)

The guidance constructions above are provided for indicative costing purposes only. Selected glazing and ventilation systems should be capable of meeting the minimum performance specifications shown in Appendix D, with laboratory test certificates being made available in support of the quoted performance. Glazing proposals which simply reflect the guidance constructions indicated in this report will not, in isolation, be sufficient evidence that a glazing configuration will meet the minimum performance specification.

The acoustic specifications will need to be integrated, coordinated and ratified by the principal designer and design team to ensure that all other design interfaces, buildability, workmanship and other requirements are considered.

It should be noted that the acoustic specifications are intended to demonstrate the ability of the scheme to comply with planning requirements and are not intended to be used as detailed acoustic design specifications. All acoustic specifications should be reviewed and confirmed during the detailed design stage. Recommendations are subject to change if relative dimensions, constructions or assumptions differ from those reviewed under the current assessment.

Based on the results of the external building fabric assessment, the internal ambient sound levels are expected to meet the proposed criteria during daytime and night-time periods.

5 External Noise Break-in Assessment (Windows Open)

5.1 Overview

Analysis of external sound levels around the development has been undertaken to determine the likely compliance with the noise requirements outlined within Approved Document O Overheating.

5.2 Assumptions

The assessment is based on the following assumptions:

- Based on guidance provided within the ADO Noise Guide, considering the equivalent area as the geometric open area, is expected to result in the same level of attenuation as experienced in practice through an open window.
- Bedrooms have an average height of 2.5 m, a reverberation time of 0.5 seconds, a simple hole in the façade of area sufficient to provide the required equivalent area and no other sound transmission other than via the opening.

5.3 Assessment

Calculations have been undertaken to determine the minimum level of sound attenuation required if open windows were to be used to mitigate overheating. Based on typical bedroom dimensions of 2.5 m x 2.7 m, with a ceiling height of 2.5 m, the maximum allowable equivalent areas to comply with the noise requirements of Approved Document O have been calculated across the site.

Along Gorton Road, it is unlikely that open windows could be used to meet the internal noise criteria. However, further south within the site, the maximum allowable open area to meet noise requirements of Approved Document O increases, as external levels decrease. The results of the calculations are presented in Appendix E.

The acoustic specifications will need to be integrated, coordinated and ratified by the principal designer and overheating engineer to ensure that all other design factors are considered.

6 Noise levels in External Amenity Areas

The proposals are understood to include private external amenity space in the form of private gardens. Although garden fences are included in plans for the proposed site, these have not been included in the acoustic model.

Predicted noise levels in external amenity spaces are presented in Appendix F.

Model predictions indicate that sound levels in external amenity spaces in the northern parcel of the site are anticipated to fall between 55 dB $L_{Aeq,16hour}$ and 40 dB $L_{Aeq,16hour}$. Therefore, some external amenity areas in this parcel fall between the LOAEL and the SOAEL, and the rest below the LOAEL.

Calculations indicate that sound levels in external amenity spaces in the southern parcel of the site are anticipated to fall below 45 dB $L_{Aeq,16hour}$. Therefore, external amenity areas in this parcel fall below the LOAEL.

7 Industrial Noise in External Amenity Areas

7.1 Site Substation

As part of the proposed development, a substation is to be installed near the west boundary of the proposed site as indicated in Figure 3, approximately 5 m to the west of the nearest dwelling.

Figure 3. Location of Proposed Site Substation



Image courtesy of PRP

It is understood that the substation is to be designed to Electricity North-West's "*Electricity Specification 352 – Design of Distribution Substations and Transforming Points*". This document presents "*the distance between a dwelling and a transformer at which complaints should not arise*", for two types of transformer: GRP and brick-built. Table 14.3 of the specification is reproduced here as Table 13.

Table 13. Limiting Distances between Transformer and Nearest Dwelling for Brick built Substations

Transformer Rating (kVA)	**200 and 315**	**500**	**800**	**1000**
Limiting Distance (m): Rural/Residential Location	5	5	5	5
Limiting Distance (m): Sub-urban Location	5	5	5	5

The guidance states that these distances are calculated with reference to BS4142, and in relation to example background levels described in Section 14.4 – Noise Assessment:

> *"Noise is liable to provoke complaints whenever its level exceeds the existing background noise by a certain margin; or when it attains a certain absolute level. The method of noise*

> *assessment depends on comparing the specific noise, corrected to take account of its character, with the measured background noise level.*
>
> *British Standard 4142 provides a method for predicting whether a noise is likely to give rise to a complaint based upon this concept. The background levels are to be measured using the method described in BS 4142. For general guidance, the figures for background levels used within Electricity North West are:*
>
> *For general guidance, the figures for background levels used within Electricity North West are:*
>
> *(a) Rural (Residential) area = 30dB(A)*
>
> *(b) Sub-Urban area = 35dB(A)*
>
> *(c) Urban area = 40dB(A)"*

As the transformer is to be installed at its limiting distance to the nearest dwelling and relative background noise levels are higher at the proposed development site than those stated above, the proposed transformer installation is expected to result in no adverse impact on the future residents, and has not been considered further.

Existing residences are further away from transformer than the newly proposed houses and therefore the relative impact at these receptors will be further reduced, such that the transformer is also not expected to adversely affect these residents.

7.2 Easeserve Limited

Immediately north of Gorton Lane is Easeserve Limited, which fabricates gates and railings, and consists of several industrial units and a service yard. The location of Easeserve Limited is outlined in Figure 4.

Figure 4. Location of Easeserve Limited



Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft

During the daytime sound survey, noise generated within the service yard was occasionally audible during lulls in traffic along Gorton Lane and also while metal items were being loaded onto goods vehicles. Noise from Easeserve Ltd. therefore has the potential to cause impact at the proposed site.

The overheating strategy has been designed such that windows in the northern apartment overlooking Gorton Road are not required to be open to mitigate overheating and façade performance specifications have been developed to control external noise intrusion from this and other sources to the design criteria in Table 4.

The following assessment considers the impact of Easeserve Limited operation on the amenity of private outdoor spaces.

7.3 Representative Background and Ambient Sound Levels

Representative background and ambient sound levels are presented in Table 14. It is understood that Easeserve Ltd. only operates during the daytime. Typical background sound levels have been taken from the evening sound survey, when Easeserve Ltd. was not in operation, as these levels are likely to be worst-case compared to levels typical during Easeserve Ltd.'s hours of operation.

Table 14. Representative Daytime (07:00 – 23:00) Background and Ambient Sound Levels

Receptor	Daytime Background Sound Level (dB L_{A90})	Daytime Ambient Sound Level (dB $L_{Aeq,16hour}$)
Northern Parcel	42	57
Southern Parcel	38	41

7.4 Activity Sound Level and Specific Sound Level

During the daytime, operations at Easeserve Ltd. were audible at location ST5. The specific sound level of activities at Easeserve Limited has been calculated using the single event level of a measured loading event, assessed on the basis of the typical number of events observed within a one-hour period during the attended Site survey.

Table 15. Noise Levels Associated with Easeserve Ltd Operation

Activity Description	Single Event Level SEL (dB)	Measurement Distance (m)	Number of Events During Typical 1 Hour Period
Loading vehicle with goods	72	62	10

Calculated specific sound levels in the worst-affected private outdoor amenity space at each parcel, are presented in Table 16.

Table 16. Calculated Sound Levels in Worst-case Private Amenity Spaces - Daytime (07:00 – 23:00)

Receptor	Calculated Daytime (07:00 – 23:00) Specific Sound Level $L_{Aeq,1hour}$	Calculated Maximum Sound Level L_{AFmax}
Northern Parcel	32	59
Southern Parcel	33	60

7.5 Acoustic Feature Corrections

Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound levels and the background sound level. The calculated specific sound level should therefore be modified in accordance with the following guidance. Due to the type of assessment, the subjective method has been used to determine the type and level of acoustic feature corrections applied to each source.

Note 2 within Paragraph 9.2 of BS 4142:2014 + A1 2019 states:

> *"If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics."*

BS 4142 offers the following guidance on the subjective assessment of acoustic feature corrections.

> *"Tonality*
>
> *For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0 dB and + 6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.*
>
> *Impulsivity*
>
> *A correction of up to + 9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.*
>
> *Other Sound Characteristics*
>
> *Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment a penalty of 3 dB can be applied.*
>
> *Intermittency*
>
> *When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time… If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."*

During measurements at ST5, the source was noted to be impulsive and intermittent, but not tonal.

In private outdoor amenity spaces across the site, activities at Easeserve Ltd. are expected to result in short-term L_{AMax} levels being more than 20 dB above representative background sound levels and 2 dB and 9 dB above ambient sound levels in the worst-affected gardens of the northern parcel and southern parcels, respectively.

It is therefore expected that the intermittency of the source will be readily distinguishable against the environment, and that the impulsive nature of the source will be perceptible. Therefore a +3 dB rating correction has been applied for intermittency, and a +6 dB rating correction has been applied for impulsivity. On the basis of this, the relative impact assessment of this source is presented in Table 17.

Table 17.Preliminary Assessment of Easeserve Ltd. at Worst-case Private Outdoor Amenity Spaces – Daytime (07:00 – 23:00)

Description	Northern parcel	Southern Parcel
Specific Sound Level $L_{Aeq,T}$	34	26
Acoustic Feature Corrections	+9	+9
Combined Rating Level at Receptor (dB $L_{Ar,Tr}$)	43	35
Background Sound Level ($L_{A90,15\ minutes}$)	42	38
Excess of Rating over Background Sound Level	+1	-2
Preliminary Assessment of Impact	Indication of having low impact, depending on context	Indication of having low impact, depending on context

7.6 Context and Mitigating Factors

Various factors influence the context of the assessment, as follows.

Absolute Sound Level

The absolute level of the sound in the assessment is not noted to be particularly high relative to the ambient sound levels and British Standard BS 8233 guidance on acceptable noise levels in amenity areas, and therefore, it is considered that this has no impact on context.

Character of the Residual Sound and Specific Sound

The area surrounding Easeserve Ltd. is suburban with other industrial facilities located on the adjacent Froxmer Industrial Estate. As industrial noise makes up part of the acoustic character of the area, the character of noise from Easeserve Ltd. specifically, is not considered to alter the relative impact expected.

Sensitivity of Receptors

The sensitivity of proposed receptors on the site is considered to be high, as they are residential dwellings.

Uncertainty

Care has been taken to reduce uncertainty as far as reasonably possible. However, it should be recognised that in any environmental sound survey and assessment process uncertainty exists. In this case, the survey captures activity noise for a sample of the typical operation only and operating conditions and resulting impacts may vary at other times.

7.7 Assessment Results

Considering context, it is expected that the noise contribution from industrial sources in worst-case external amenity spaces in both parcels is considered to have a low impact, according to BS4142:2014+A1:2019. It is therefore expected that noise contribution from industrial sources in worst-case external amenity spaces in both parcels of the site is considered to fall below the LOAEL.

8 Conclusions

Stantec has been commissioned by Clarion Housing Association Limited and Clarion Housing Property Development Services Limited to undertake a noise impact assessment in relation to The Former Peacock Centre and Land at Pipewell Avenue, Gorton.

An environmental sound survey has been undertaken by Stantec, to establish the existing environmental sound levels associated with local sound sources incident on the proposed development.

The results of the environmental sound survey have been used to establish likely future façade incident noise levels and to determine minimum acoustic performance requirements for the building façade constructions to meet the requirements of Manchester City Council and applicable best practice guidance documents.

Compliance with the acoustic performance specification detailed herein is expected to result in compliance with the proposed acoustic criteria for internal spaces.

An assessment against the requirements of Approved Document O has been undertaken. The results of the assessment indicate that it is unlikely that open windows can be used to mitigate overheating in the apartments in the northernmost extent of site, and in some parts of adjacent buildings. In the rest of the site, the results indicate it is likely that open windows can be used to mitigate overheating.

Assessment of contributions from nearby industrial sources in external amenity areas has been undertaken, with contributions in external amenity areas across the site falling below the LOAEL.

Assessment of noise levels within external amenity areas has been undertaken, with levels in some private amenity spaces in the north parcel of the site between the LOAEL and the SOAEL, and levels in the rest of the site falling below the LOAEL.

The acoustic specifications will need to be integrated, coordinated and ratified by the principal designer and design team to ensure that all design interfaces, buildability, workmanship and other requirements are considered.

Appendices

Appendix A Acoustic Terminology

Parameter	Description
Ambient Sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. Comprises of the residual sound and the specific sound when present.
Ambient Sound Level ($La = L_{Aeq,T}$)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, *T*.
A-Weighted Decibel (dBA)	A decibel level that has been corrected for the A-Weighting curve.
A-Weighting	Octave band and 1/3 octave band filters that correlate to the response of the human hearing system to sound pressure levels at different frequencies.
Background Sound	The level of sound measured in the absence of extraneous noise sources.
Background Sound Level ($L_{A90,T}$)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, *T*, measured using a fast time-weighting and quoted to the nearest whole number of decibels.
Decibel (dB)	A logarithmic unit used to describe the ratio between the measured level and a reference level of 0 dB. The ratio can be sound pressure, intensity or power. The reference value for sound pressure is 20 µPa and for sound power is 1 ρW.
Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$)	Value of the time-averaged A-weighted sound pressure level, in decibels (dB), of a continuous steady sound for the duration of the specified time interval, *T*.
Façade Level	The sound pressure level at a distance of 1 metre from the façade
Fast Time Weighted	The speed at which the instrument responds to changes in amplitude of the measured signal. The response time of a fast time-weighted instrument is 0.125 seconds.
Free-Field Level	The sound pressure level measured away from any reflective surfaces.
Frequency (f)	The number of cycles of pressure fluctuations within a given period of time. Measured in Hertz.
Hertz (Hz)	The unit of frequency or pitch of a sound. One hertz is equal to one cycle per second.
L_{Amax}	The maximum A-weighted level measured during a given time period.
Octave Band	Band of frequencies where the upper limit of the band is twice the frequency of the lower limit. E.g., the 1000 Hz band contains noise energy at all frequencies from 707 to 1414 Hz.
Percentile Level ($L_{AN,T}$)	The A-Weighted Sound Pressure Level which is exceeded for N% of the specified time interval. E.g., the $L_{A90,1hour}$ is the A-weighted sound level exceeded for 90% of 1 hour/
Sound Pressure	The difference between the pressure caused by a sound wave and the ambient pressure of the medium the sound wave is passing through. Measured in Pascals.
Sound Pressure Level (L_p)	The logarithm of the ratio of a given sound pressure (p) to the reference sound pressure (p0). The reference value for sound pressure is 20 µPa. Defined as: $L_p = 20log\left(\frac{p}{p_0}\right)$

Appendix B Survey Instrumentation

The instrumentation used in the survey is listed in Table 18.

Table 18. Instrumentation

Description	Manufacturer	Type	Serial Number	Laboratory Calibration Date
Sound Level Meter	RION	NL-52	510142	17/01/2024
½" Pre-polarised microphone		UC-59	31928	17/01/2024
Pre-amplifier		NH-25	2847	17/01/2024
Sound Level Meter	Brüel & Kjær	2250	2626232	25/01/2024
½" Pre-polarised microphone		4189	3148083	25/01/2024
Pre-amplifier		ZC0032	32767	25/01/2024
Sound Calibrator	Brüel & Kjær	4231	2619373	07/01/2025

Appendix C Façade Zone Plans

Figure 5 presents the façade zone plan for the northern parcel of the site.

All proposed buildings within the southern parcel fall within Façade Zone 1.

Figure 5. Façade Zone Plan – North Parcel



Appendix D External Building Fabric Acoustic Performance Specification

The project criteria are expressed in terms of an overall A-weighted dB sound level. Alternative frequency specific performance levels may therefore be acceptable subject to confirmation from Stantec.

Fully detailed test reports from independent acoustic test authorities shall be supplied. All test reports shall be in English or, a full English translation.

Test data should include the 1/3 octave band results from 100 Hz to 3150 Hz inclusive, together with the corresponding octave band results from 125 Hz to 4000 Hz inclusive.

As a result of wind or other atmospheric effects, external building elements should not give rise to noise e.g. via rattling, creaking, whistling or aeolian tone generation.

Glazing Sound Insulation Performance

The complete glazing system (including frames, joints, seals, spandrel panels and opening lights and trickle vents (as appropriate)) shall achieve the following minimum sound reduction indices when tested in accordance with BS EN ISO 10140-2:2021.

Table 19. Minimum Sound Reduction Indices of Glazing Systems

Glazing Type	**Minimum Sound Reduction Index (*R*) value (dB) at Octave Band Frequency (Hz)**					***R*w***
	125	**250**	**500**	**1k**	**2k**	
G1	19	22	25	33	33	30
G2	26	29	33	39	39	37

*The overall R_W figure is provided for guidance purposes only. The octave-band specification should be referred to check compliance with the requirements.

Trickle Ventilator Sound Insulation Performance Requirements for Houses

Trickle ventilators for the houses should achieve the following minimum element normalised level differences when tested in accordance with BS EN ISO 10140-2:2021.

Table 20. Minimum Normalised Element Difference of Ventilation Systems for the Houses

Ventilator Type	**Minimum Sound Reduction Index ($D_{n,e}$) value (dB) at Octave Band Frequency (Hz)**					**$D_{n,e,w}$***
	125	**250**	**500**	**1k**	**2k**	
V1	26	27	28	30	30	30
V2	32	32	31	34	31	33

*The overall $D_{n,e,W}$ figure is provided for guidance purposes only. The octave-band specification should be referred to check compliance with the requirements.

It should be noted that the acoustic specification for trickle ventilators is based on a single ventilator within the room providing an equivalent area of 8000 mm^2. If the total equivalent area provided by the trickle ventilator/s is different to this, or the acoustic performance for a given trickle ventilator is provided based on a different equivalent area, then the specification of the ventilator/s should be correctly adjusted.

Please refer to a suitably qualified acoustician to determine the appropriate performance correction.

Apartments are understood to have fully sealed facades and therefore no trickle ventilators will be installed to spaces within this block.

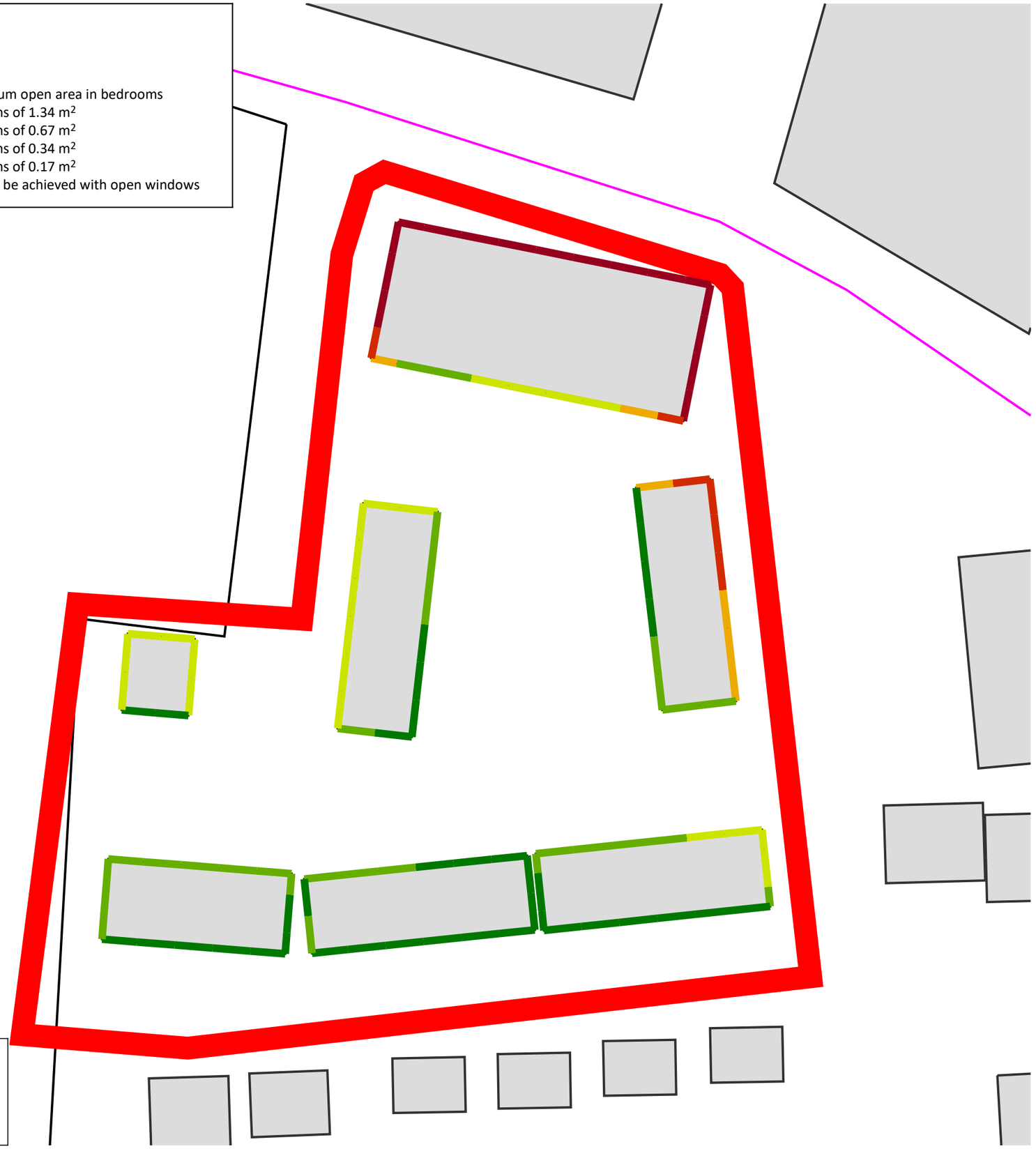
Appendix E Overheating Noise Constraints

The calculated maximum equivalent area for proposed buildings in the north parcel of the site can be found in Figure 6.

Noise is not a limitation on allowable open area in bedrooms of any of the proposed buildings on the southern parcel of the site.

Noise Level Reduction Required
Night-time

- Noise not a limitation on maximum open area in bedrooms
- Maximum open area in bedrooms of 1.34 m^2
- Maximum open area in bedrooms of 0.67 m^2
- Maximum open area in bedrooms of 0.34 m^2
- Maximum open area in bedrooms of 0.17 m^2
- Internal noise criteria unlikely to be achieved with open windows



Signs and symbols
- Line source
- Main building

This figure has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this figure is addressed ('Client') in connection with the project described and takes into account the Client's particular instructions and requirements. This figure was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This figure is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this figure.

Assumptions:
The equivalent area is considered to be the same as the geometric open area.

The assumed bedroom dimensions are 2.5 m x 2.7 m, with a height of 2.5 m. Bedrooms have a reverberation time of 0.5 seconds, a simple hole in the facade is sufficient to provide the required equivalent area with no other sound transmission than via the opening.

Bedrooms with larger volumes will have a lower minimum attenuation requirement to achieve the internal noise criteria in Approved Document O.

ADO Night-time Overheating Noise Constraints

Client: Clarion Housing Association Limited and Clarion Housing Property Development Services Limited
Project: Former Peacock Centre and Land at Pipewell Avenue, Gorton
Project Number: 33102268
Project Engineer: GW
Processed with SoundPLAN 9.1

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Figure not to scale. Do not scale.

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Appendix F Noise Levels in External Amenity Spaces

Noise levels predicted in external amenity spaces are presented in Figure 7 and Figure 8.



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Figure 7
Daytime External Sound Levels Northern Parcel

Client: Clarion Housing Association Limited and Clarion Housing Property Development Services Limited
Project: Former Peacock Centre and Land at Pipewell Avenue, Gorton
Project Number: 33102268
Project Engineer: GW
Calculation at 1.5 m above ground
Processed with SoundPLAN 9.1

Figure not to scale. Do not scale.

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Figure 8
Daytime External Sound Levels Southern Parcel

Client: Clarion Housing Association Limited and Clarion Housing Property Development Services Limited
Project: Former Peacock Centre and Land at Pipewell Avenue, Gorton
Project Number: 33102268
Project Engineer: GW
Calculation at 1.5 m above ground
Processed with SoundPLAN 9.1

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