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Premier House, Manchester

Environmental Noise Study

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CONTENTS

1.0 SUMMARY 2

2.0 INTRODUCTION 3

3.0 DESCRIPTION OF SITE AND PROPOSED DEVELOPMENT 5

4.0 RELEVANT GUIDANCE DOCUMENTS 9

5.0 ENVIRONMENTAL NOISE SURVEYS 14

6.0 NOISE INGRESS 17

7.0 EXTERNAL NOISE LEVELS DUE TO BUILDING SERVICES 19

8.0 NOISE EGRESS FROM COMMERCIAL UNITS 22

Table 1: BS4142: 2014+A1: 2019 Assessment Method 13
Table 2: Summary of expected environmental noise levels 16
Table 3: Minimum Recommended Sound Reduction Index of facades 18
Table 4: Maximum recommended internal noise level due to building services plant 18
Table 5: Environmental noise limits for non-emergency building services plant 20
Table 6: Maximum allowable external music noise levels due to commercial units at Premier House 22
Table 7: Maximum allowable daytime internal noise levels within the commercial units, doors closed 23
Table 8: Maximum allowable night time internal noise levels within the commercial units, doors closed 23
Table 9: Maximum allowable daytime internal noise levels within the commercial units, doors open 24
Table 10: Maximum allowable night time internal noise levels within the commercial units, doors open 24

Figure 1: Site location plan 6
Figure 2: Extrium (© 2019) Noise database (Daytime) - Proposed Renaissance site 14
Figure 3: Extrium (© 2019) Noise database (Night-time) - Proposed Renaissance site 15
Figure 4: Residential and hotel noise-sensitive buildings at and around the site 19

1.0 SUMMARY

Fisher Acoustics Ltd has been commissioned by Deansgate SOF Alliance LeaseCo Limited, a joint venture between Property Alliance Group (PAG) and an affiliate of Starwood Capital (SCG) to conduct an environmental noise study as part of a full planning application for the redevelopment and extension of Premier House, Deansgate, Manchester.

An assessment of environmental noise around the proposed site has determined the pre-existing environmental noise levels during the day and night at and around the site.

The recommended acoustic performance of facade elements to achieve the recommended internal noise levels within the proposed offices has been determined. In particular, it has been determined that double glazed units within a curtain wall that achieve a specific acoustic performance would be acoustically suitable.

Overall environmental noise limits have also been recommended for building services plant serving the Development.

Internal activity noise limits are given for the proposed commercial units on the ground floor of the Development.

2.0 INTRODUCTION

Fisher Acoustics Ltd has been commissioned by Deansgate SOF Alliance LeaseCo Limited, a joint venture between Property Alliance Group (PAG) and an affiliate of Starwood Capital (SCG) to conduct an environmental noise study as part of a full planning application for the redevelopment and extension of Premier House, Deansgate, Manchester.

This report examines the pre-existing environmental noise conditions at the site and advises on the recommended acoustic performance of the curtain wall to office spaces to achieve appropriate internal noise levels in the building.

Suitable environmental noise limits for buildings services plant and a proposed commercial unit are also given.

The steps undertaken in compiling this study are as follows:

- Assessment of daytime and night time external noise survey data to determine the typical levels of noise at the site during daytime and night time periods
- Calculation of the required sound reduction index of the curtain wall to the building façade to protect the proposed office areas from external noise.
- Determination of suitable environmental noise limits for any external building services plant to safeguard residential amenity.
- Calculation of noise egress from the proposed commercial units at ground floor of the Development.

Ordinarily an environmental noise assessment relating to a proposed office development would involve the carrying out of an external noise survey to determine the pre-existing noise levels at and around the development site due to typical external noise sources. However, due to reduced road traffic volumes and reduced levels of general activity in the area in line with government guidelines relating to the ongoing Coronavirus pandemic, it is not considered possible to obtain representative noise levels at noise sensitive receptors around the proposed development site at the current time.

Therefore, and in accordance with guidance published by the Association of Noise Consultants [ANC] and the Institute of Acoustics [IOA] 'Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments', in order to establish appropriate environmental noise limits for the proposed development, this report references the England

Noise and Air Quality Viewer published online by Extrium. The Noise Quality Viewer presents the results of the DEFRA strategic noise mapping study carried out in 2017 and can be accessed at http://www.extrium.co.uk/noiseviewer.html.

In addition, the results of previous environmental noise surveys undertaken by others around the development site have been reviewed with reference to reports published on the Manchester City Council Planning webpages.

The above approach has been discussed and agreed with Graeme Souter, Environmental Protection officer at Manchester City Council.

3.0 DESCRIPTION OF SITE AND PROPOSED DEVELOPMENT

General Site Description

The site forms part of the wider Renaissance Hotel complex which has been a longstanding strategic regeneration priority for Manchester City Council (MCC) and is the last remaining undeveloped site within the 1999 City Centre Masterplan.

The site is located at the junction of Deansgate and Blackfriars Street within Manchester's central business district. The site currently comprises a vacant 15-storey, 203 bedroom hotel building, a multi-storey car park, a restaurant and a former office building (Premier House) which has been vacant for many years.

The wider site is bounded to the north by Victoria Bridge Street, Blackfriars Street to the South, to the east by Deansgate and to the west by the River Irwell.

Further to the west, across the River Irwell are Travelodge and Premier Inn hotels. Further to the north-east, east and south are retail outlets and shopping malls, offices, restaurants and pubs. To the north of the site are the premise of a former nightclub, the Bijou Club. It is understood that the night club is now closed. A new commercial venture is understood to be proposed for the premises.

Deansgate is a major road within the City Centre that is heavily trafficked with HGV's, cars and vans accessing the city. Victoria Bridge Street and Blackfriars Street are also normally heavily trafficked with HGV's, cars and buses. Deansgate, Blackfriars Street and Victoria Bridge Street are bus routes.

Figure 1 shows the overall Renaissance Development site in the context of the surrounding roads and buildings. Figure 1 also identifies the proposed footprint of the refurbished Premier House.

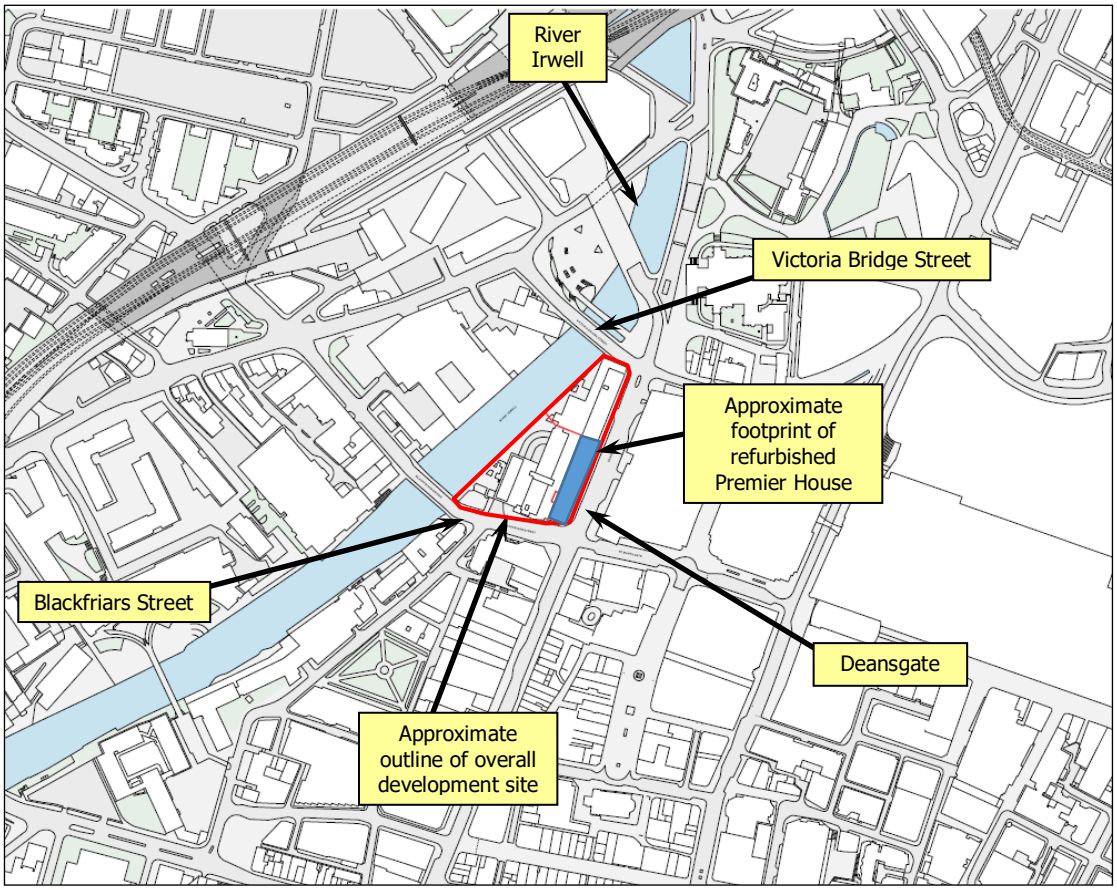

Figure 1: Site location plan

Formal Description of Development

Full planning application for the redevelopment and extension of Premier House to create new business space (Use Class E) with retail/ food and beverage floorspace (Class E/ Sui Generis) at ground floor level, a new servicing entrance from Deansgate, new public realm and landscaping, with supporting infrastructure and associated works.

Expanded Description of Development

The proposal is for the redevelopment and extension of Premier House to provide high quality business space with new retail/ leisure floorspace at ground floor level fronting Deansgate. Premier House in its existing form is significant in scale with a long frontage which does not allow for any interaction with Deansgate. The northern half of the building is proposed for demolition and a prior approval application has already been submitted for this work.

It is proposed that the part-retained building, which is the subject of the planning application of which this reports forms a part, is stripped back to its core structure as part of the redevelopment. The existing concrete facade will be removed on the south and east elevations and the floorplate extended towards Deansgate. A new improved entrance is proposed to the building at the corner of Deansgate and Blackfriars Street. Beyond the new office entrance, the rest of the business floorspace will be provided across the upper floors. The new retail/ leisure floorspace will be situated at ground floor level creating a new active frontage to the street.

As the building is being stripped back to its core, the proposal includes new facades across all elevations. Full details of the facades are provided within the submitted Design and Access Statement. The roof will also be reconfigured to include new landscaping and potentially dwell space for occupiers of the lower floor business space.

The proposed uses within the redeveloped Premier House are as follows:

- Lower Ground Floor: Office Amenity, Cycle Storage, Elec Switch room, Generator room, Boiler room, Refuse
- Ground floor: Retail/ Leisure Area, Retail units (4 number), Reception Office, Reception area, Electric Switch room
- Level 1: Comms room, WCs, Office space
- Level 2 : Office space, WCs
- Level 3/Roof: Plant

4.0 RELEVANT GUIDANCE DOCUMENTS

NATIONAL PLANNING POLICY

The National Planning Policy Framework (NPPF), published in February 2019 by the Ministry of Housing, Communities and Local Government 'sets out the Government's planning policies for England and how these should be applied'.

Clause 170 of the National Planning Policy Framework states that 'Planning policies and decisions should contribute to enhance the natural and local environment by:

> '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'.

Clause 180 of the National Planning Policy Framework states:

> "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; and
>
> c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

The National Planning Policy Framework document cross references the 'Explanatory Note to the Noise Policy Statement for England'. The 'Noise Policy Statement for England' (NPSE) was published by the Department for Environment Roof and Rural Affairs in March 2010.

The NPSE does not give suggested external noise criteria for commercial Developments. In the absence of specific criteria, reference shall be made in this document to established guidance and principles, as established in British Standards and the local Planning policy.

National Planning Practice Guidance – Noise

'Planning Practice Guidance – Noise' is a web-based resource provided by the Ministry of Housing, Communities and Local Government (last revision date 22 July 2019) which gives guidance on Planning considerations in relation to noise.

The document identifies the subjective grading of noise and the recommended actions and different effect levels. Again, as Planning Practice Guidance – Noise' does not refer to objective criteria, reference shall be made in this document to established guidance and principles, as established in British Standards and the local Planning policy

LOCAL PLANNING POLICY

Manchester City Council's Core Strategy was adopted on 11th July 2012 and is the key Development Plan Document in the Local Development Framework (LDF).

Section 13.6 'Development Management' of the Core Strategy states that 'all new developments should follow the 'Development Principles' and accord with the design guidance set out in the Supplementary Planning Documents.

Policy DM 1, 'Development Management' of the Core Strategy states that:

- 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 …..noise, vibration…. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.

'Planning & Noise, Technical Guidance', dated December 2015 has been issued by the Environmental Protection, Environmental Health and The Neighbourhoods Service sections of Manchester City Council. The document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development. Reference is also made in the document to the relevant supporting information

and guidance documents that Developers are expected to refer to when submitting a planning application.

With regard to external noise due to building services plant, Section 3.6.1.5.1 of 'Planning & Noise, Technical Guidance', issued by Manchester City Council states:

- 'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location'

Noise from Commercial Operations

Noise egress from the proposed commercial units at the development must be controlled to appropriate levels so as to avoid noise nuisance to existing sensitive receptors.

With regard to entertainment venues, 'Planning & Noise, Technical Guidance' issued by Manchester City Council states:

- 'When considering the potential impact of a proposal for an entertainment venue, consultants should consider the overall noise level (LAeq) and the 63 Hz and 125 Hz octave band noise levels (Leq). Music noise in the 63 Hz and 125 Hz octave bands, which is often described as "bass noise", is particularly difficult to contain and the impulsive character of this low frequency music noise is particularly disturbing for local residents exposed to it'.

- 'A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be 'audible' in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is:

  Entertainment noise (LAeq) should be controlled to 10dB below the background noise level (LA90) without the entertainment noise present, in each octave band at the nearest noise sensitive location'.

BRITISH STANDARDS AND GUIDANCE

Building Service Plant Noise

For noise of an industrial nature such as fixed building services plant, an assessment of the likely effects on people inside or outside residential buildings due to noise can be carried out using BS4142: 2014+A1: 2019 'Methods for rating and assessing industrial and commercial sound'.

The following acoustic parameters are described within BS4142: 2014: +A1: 2019

- Specific Noise Level – the equivalent continuous A-weighted sound pressure level measured over a specified time period, T_r, at the assessment position with the specific noise source contribution, $L_{Aeq, Tr}$ (i.e. the noise level due to the new noise source).
- Rating Level – the Specific Noise Level plus an adjustment for any characteristic noise features, $L_{Ar, Tr}$
- Residual Noise Level – the equivalent continuous A-weighted sound pressure level measured when the specific noise does not contribute to the ambient noise
- Background Noise level – measured for a specific duration, T, in the absence of the specific noise source, $L_{A90,T}$

To complete a BS4142 assessment of potential noise effects upon residential properties, it is necessary to obtain the Rating Level due to the sound source in question. The rating level is derived by adding corrections to the measured Specific Noise Level, if the noise source, at the noise sensitive receptors in question:

- is tonal (correction of 0dB to +6dB, depending on severity)
- contains distinct impulses (correction of 0dB to +9dB, depending on severity)
- is intermittent (correction of +3dB if applicable)
- is otherwise distinctive against the residual acoustic environment (correction of +3dB)

For instance, where the noise from a particular sound source is strongly tonal and impulsive at any noise sensitive receptor over the duration of the appropriate assessment period, a maximum correction of +15 dB may apply.

The rating level can then be used in order to ascertain the *likelihood of complaints* due to industrial noise disturbance by subtracting the measured background noise level. The greater the positive difference, the greater the likelihood of complaints.

Table 1 summarises the assessment method.

Difference between Rating Level and Measured Background Level	Assessment
+10 dB or greater	Significant adverse impact
+5 dB	Indication of adverse impact, depending on context
0 dB or less	Indication of low impact, depending on context

Table 1: BS4142: 2014+A1: 2019 Assessment Method

Where a new noise source has not yet been introduced, a recommended specific noise level can be determined based on a knowledge of the existing background noise level.

5.0 ENVIRONMENTAL NOISE SURVEYS

As discussed above, due to reduced road traffic volumes and reduced levels of general activity in the area in line with government guidelines relating to the ongoing Coronavirus pandemic, it is not considered possible to obtain representative noise levels at noise sensitive receptors around the proposed development site at the current time.

Therefore, in order to determine the typical environmental noise levels in the area, reference has been made to the England Noise and Air Quality Viewer published online by Extrium. The Noise Quality Viewer presents the results of the DEFRA strategic noise mapping study carried out in 2017 and can be accessed at http://www.extrium.co.uk/noiseviewer.html.

Figure 2 shows the calculated annual average daytime noise levels for the 16-hour period between 0700 hrs and 2300 hrs ($L_{Aeq,16\ hrs}$) at and around the proposed site.

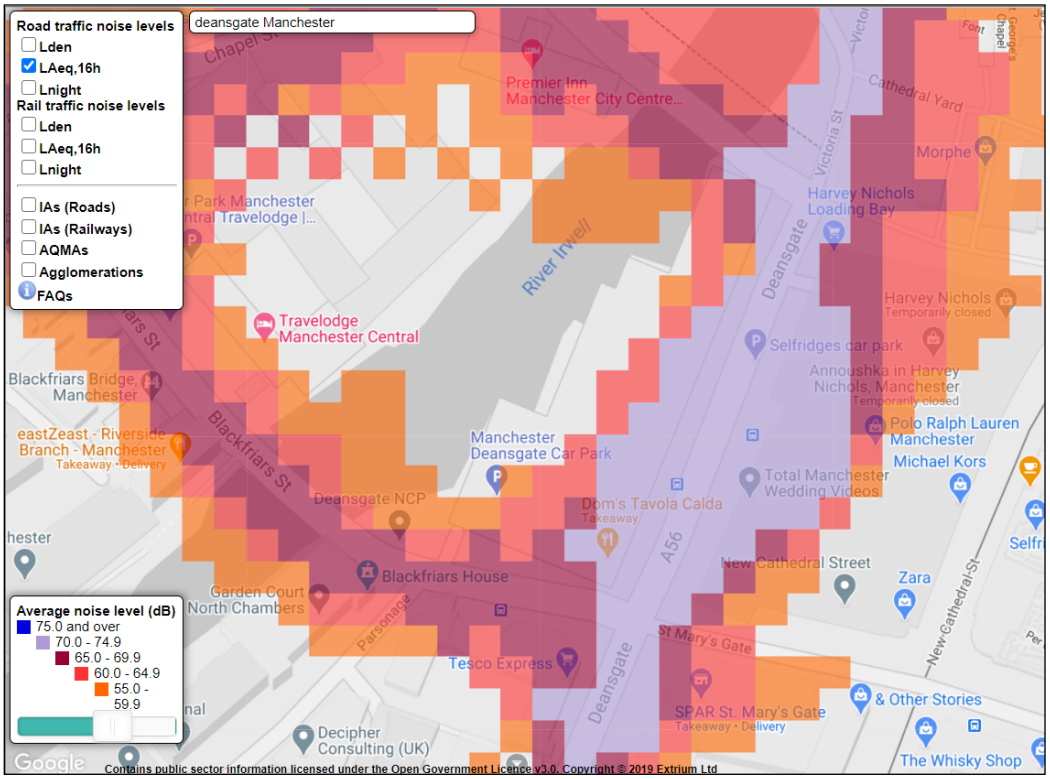

Figure 2: Extrium (© 2019) Noise database (Daytime) - Proposed Renaissance site

Figure 3 shows the calculated annual average night time noise levels for the 8-hour period between 2300 hrs and 0700 hrs ($L_{Aeq,8\ hrs}$) at and around the proposed site.

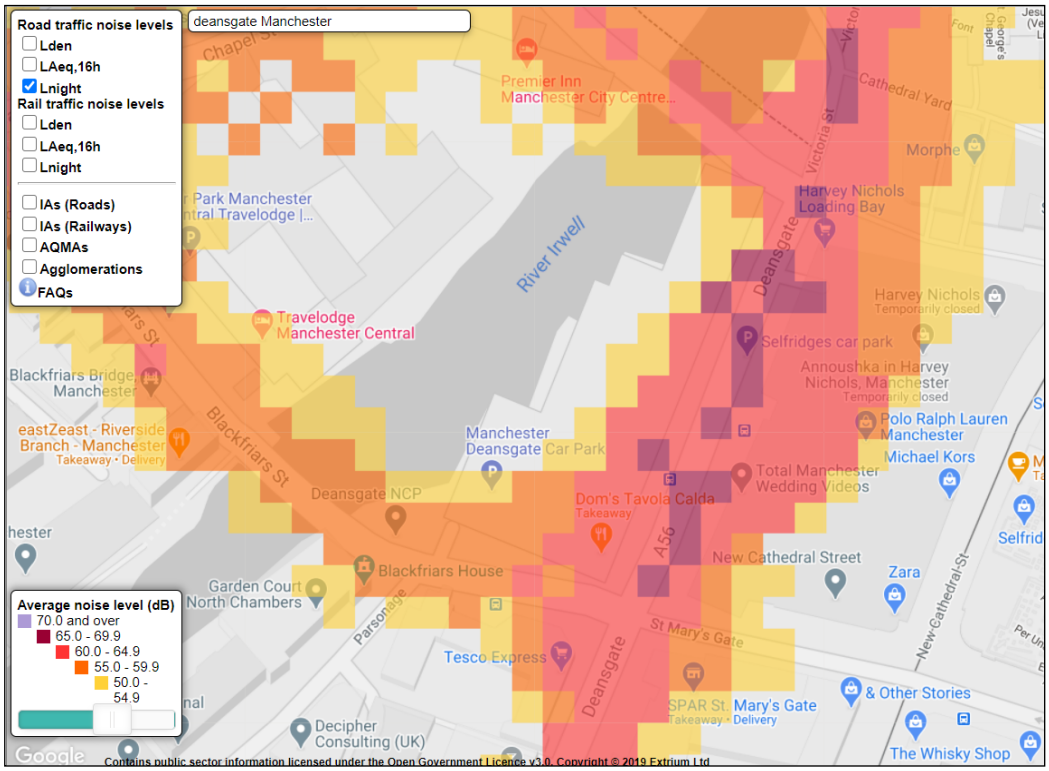

Figure 3: Extrium (© 2019) Noise database (Night-time) - Proposed Renaissance site

In addition, reference has been made to the results of relatively recent environmental noise surveys undertaken by others in support of planning application 126328/FO/2020 - Speakers House, 39 Deansgate, Manchester, planning application 121979/ FO/ 2018 - Blackfriars House, Parsonage, Manchester, M3 2JA and planning application 117864/FO/2017 – No.1 Deansgate, as published on the Manchester City Council Planning web pages.

The long-term noise environment at and around the Application Site is determined by road traffic on Deansgate, Blackfriars and Victoria Bridge Street.

With reference to the above-noted sources of information, the external noise levels expected upon the full lifting of restrictions relating to the coronavirus pandemic and the general return to pre-pandemic levels of daytime and night time activity have been estimated. The expected typical free-field noise levels are summarised in Table 2.

Location	Measured Noise Level			
	Daytime (7 am to 11 pm)		Night time (11 pm to 7 am)	
	dB, L_{Aeq}	dB L_{A90}	dB, L_{Aeq}	dB L_{A90}
Deansgate	70	60	65	53
Blackfriars Street	65-70	55	60-65	50
Victoria Bridge Street	65-70	55	60-65	50
River Irwell	57	50	54	47

Table 2: Summary of expected environmental noise levels

6.0 NOISE INGRESS

Design Criteria

BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings' recommends the following indoor ambient levels in offices

- Open plan offices: 45 dB LAeq to 50 dB LAeq
- Executive office: 35 dB LAeq to 40 dB LAeq

The 'indoor ambient noise level' is the total noise level due to both external noise ingress and internal building services systems.

The principal determinant of the internal noise level within the proposed office areas due to external noise will be the sound reduction index of the curtain wall. By taking into account the expected levels of external noise at the site, the areas of façade elements and the dimensions of the noise sensitive receiving spaces, the required sound reduction index of the curtain wall can be determined.

Calculations of noise ingress have been carried out to determine the minimum recommended sound insulation of the office façades to achieve the internal noise criteria identified above. These calculations are based upon the curtain wall areas and room sizes and layouts shown on the drawings submitted for Planning purposes.

Curtain Wall

It has been determined that a curtain wall that achieves the weighted sound reduction index identified in Table 3 would allow compliance with the recommended internal noise levels.

The recommended performance in Table 3 relates to the composite performance of the glazing, curtain wall, seals, cavity closers and any non-vision panels within the curtain wall.

Façade Type	Weighted Sound Reduction Index, R_w
TYPE A	37 dB

Table 3: Minimum Recommended Sound Reduction Index of facades

INTERNAL NOISE DUE TO MECHANICAL VENTILATION

In order to maintain the required internal noise levels, it is recommended that the building services noise level within the proposed office space does not exceed the value given in Table 4.

Room Type	Spatially averaged noise level (Leq)
Open plan office space	NR 40

Table 4: Maximum recommended internal noise level due to building services plant

7.0 EXTERNAL NOISE LEVELS DUE TO BUILDING SERVICES

As identified in Section 4 above, an assessment of the likely effects on people inside or outside residential buildings due to noise can be carried out using BS4142: 2014+A1: 2019 'Methods for rating and assessing industrial and commercial sound'.

The expected background noise levels around the site can be used to establish the acceptable level of noise at nearby residential buildings from plant serving the proposed office building. Building services plant is to be located on the roof of Premier House within a dedicated existing plant room and within external plant compounds. Although plant selections and sound power levels of the equipment are not known at this stage, overall plant noise limits can be advised.

Figure 4 identifies the location of the residential buildings and hotels around the proposed development site. Figure 4 also identifies a notional outline for the proposed residential element of the Renaissance development masterplan.

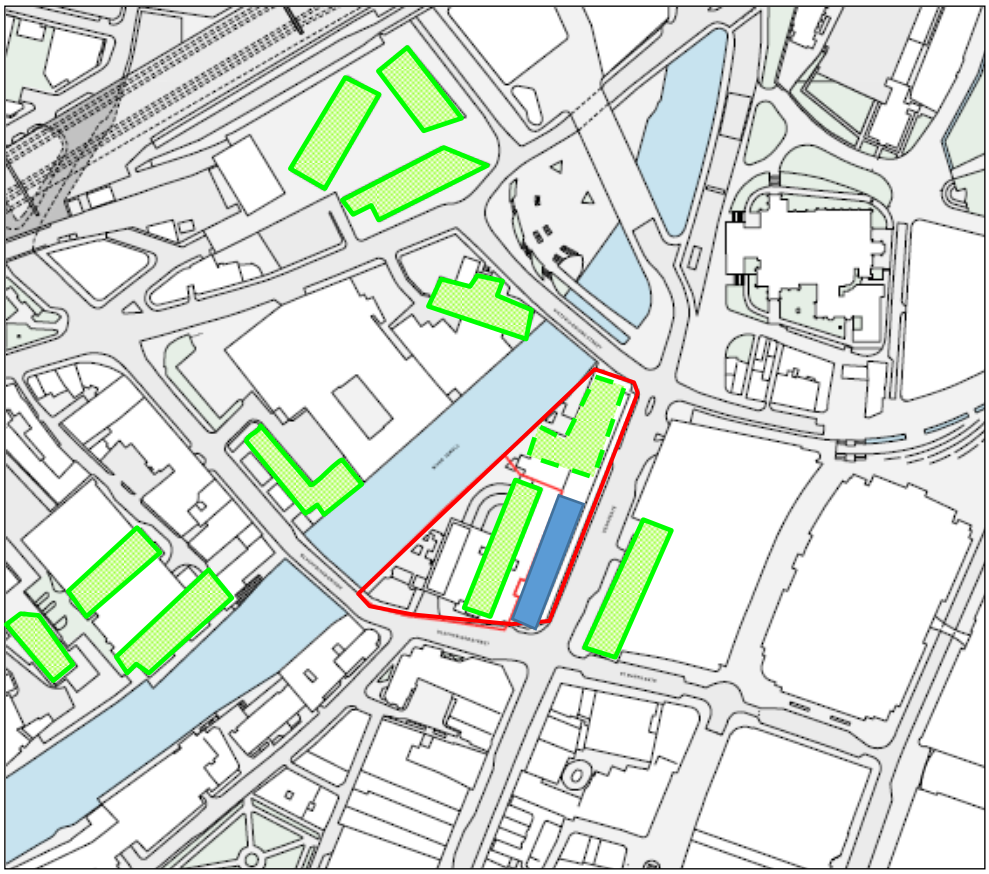

Figure 4: Residential and hotel noise-sensitive buildings at and around the site

Non-Emergency Plant

It is recommended that the daytime and night time rating level at the nearest residential receptors to the site due to all non-emergency plant serving all elements of the Renaissance development is at least 5dB lower than the pre-existing background noise levels. As there are three separate proposed buildings within the Renaissance overall development, it is recommended that, to allow for the cumulative effect of multiple noise sources, plant that serves each building achieves a rating level that is 10dB lower than the pre-existing background noise level at each receptor.

The closest existing and proposed noise-sensitive buildings to Premier House are No 1 Deansgate and the residential and hotel elements of the Renaissance development masterplan. Compliance with the appropriate noise limits at these properties would allow compliance with noise limits at other noise-sensitive properties in the area due to the greater distance to these other receptors.

Table 5 identifies the recommended maximum allowable combined noise level at the nearest noise-sensitive receptors to the Development, due to all simultaneously-operating non-emergency building services plant and equipment serving Premier House.

Location	**Rating noise level (dB L_{Aeq})**	
	Daytime (07:00 hrs to 23:00 hrs)	**Night time (23:00 hrs to 07:00 hrs)**
Deansgate	50	43
Blackfriars Street	47	42
Renaissance residential River Irwell elevation	40	37
Renaissance hotel elevation	45	40
Renaissance residential, south elevation	45	40

Table 5: Environmental noise limits for non-emergency building services plant

The above noise limits for non-emergency must be forwarded to the project's Mechanical Engineer to allow the selection of appropriate equipment and any associated noise control hardware. Building services equipment must also be provided with appropriate vibration isolation to minimise the risk of disturbance to the building occupants by structureborne noise.

8.0 NOISE EGRESS FROM COMMERCIAL UNITS

In order to avoid potential noise nuisance to the existing and proposed noise-sensitive buildings around the site, activity noise egress from the proposed commercial units within Premier House must be controlled. As the proposed Planning Class for the commercial units includes food & beverage, it is recommended that environmental noise limits for the commercial units are established.

As detailed in Section 4 above, Manchester City Council suggests that external music noise levels (measured as an L_{eq} noise level) external to a residential property due to an entertainment venue should be 10dB lower than the prevailing background noise level in each octave band.

In the absence of new noise survey data around the site due to the ongoing coronavirus pandemic, octave band noise limits have been determined by reference to previous noise survey data in the area.

Table 6 identifies the recommended maximum allowable cumulative daytime and night time free-field noise levels at the closest residential façades due to music noise from the proposed commercial units at Premier House to comply with the guidance of Manchester City Council.

Location/period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
No 1 Deansgate (0700 to 2300)	49	46	44	42	43	37	27
No 1 Deansgate (2300 to 0700)	44	41	39	37	38	32	22
Renaissance residential, Deansgate elevation (0700 to 2300)	49	46	44	42	43	37	27
Renaissance residential, Deansgate elevation (2300 to 0700)	44	41	39	37	38	32	22

Table 6: Maximum allowable external music noise levels due to commercial units at Premier House

At this stage, operational noise levels for the proposed commercial unit are not known. However, guidance can be given based on the potential acoustic performance of façade elements. The façades of the proposed commercial unit are to be fully glazed. The principal determinant of noise egress from the development will therefore be the sound reduction index of the glazed curtain wall.

Given the size of the glazing units to the commercial unit, the glazed shop fronts to the commercial units are expected to comprise as a minimum the following double glazed units:

- 10 mm float glass/ 16 mm cavity/ 10 mm float glass, sound reduction index 37dB Rw

In addition, the recommended weighted sound reduction of the external doors to the Commercial units is 30dB Rw. To achieve this performance, acoustic/weather seals to the full perimeter of each door would be required.

Environmental noise egress calculations have been carried out in order to determine the expected external noise levels due to internal noise within the commercial unit. The calculations have initially assumed that the outer entrance door to the commercial units are closed or that door lobbies are installed, such that during access and egress of patrons, one of the doors of the lobby is closed to prevent intermittent increases in external noise.

Table 7 identifies the noise levels that could be generated in each commercial unit without exceeding the daytime external noise limits given in Table 6.

Location	**Spatially averaged sound pressure level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Commercial Unit	82	81	84	87	89	82	77

Table 7: Maximum allowable daytime internal noise levels within the commercial units, doors closed

Table 8 identifies the noise levels that could be generated in each commercial unit without exceeding the night time external noise limits given in Table 6.

Location	**Spatially averaged sound pressure level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Commercial Unit	77	76	79	82	84	77	72

Table 8: Maximum allowable night time internal noise levels within the commercial units, doors closed

The noise levels detailed in Table 7 and Table 8 would allow typical retail outlets or a 'lively' restaurant with background music replay to be accommodated.

If the external doors to the commercial units are opened without the benefit of an internal lobby, then the sound insulation of the facade will be reduced. Therefore, the maximum allowable noise levels in the units would be reduced.

Table 9 identifies the noise levels that could be generated in the commercial units without exceeding the daytime external noise limits given in Table 6 if the entrance doors to the units are open.

Location	**Spatially averaged sound pressure level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Commercial Unit	76	73	72	70	71	65	55

Table 9: Maximum allowable daytime internal noise levels within the commercial units, doors open

Table 10 identifies the noise levels that could be generated in the commercial units without exceeding the night time external noise limits given in Table 6 if the entrance doors to the units are open.

Location	**Spatially averaged sound pressure level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Commercial Unit	71	68	67	65	66	60	50

Table 10: Maximum allowable night time internal noise levels within the commercial units, doors open

The noise levels detailed in Table 9 and Table 10 would allow a typical retail outlet or relatively quiet restaurant with low-level background music replay to be accommodated.

However, a lively restaurant with music replay is likely to exceed the allowable internal noise levels given in Table 9 and Table 10, particularly at night time. It is therefore expected that a lively restaurant or similar operation whose opening hours extend beyond 11pm would need to introduce a door lobby in order to comply with the requirements of Manchester City Council.

Given the above, it is expected that the proposed commercial unit within the development will be able to operate within the proposed Planning Class without causing disturbance to existing and proposed residential receptors.

It is also recommended that the proposals for acoustic treatment and the noise levels to be generated within the commercial units be formally submitted by any potential tenant by way of an application to discharge relevant conditions that may be attached to the planning permission.