

ACOUSTIC DESIGN REPORT

Plot 12, Phase 1B (South)
Condition 29.1

Brent Cross South Limited Partnership
October 2017

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Acoustic design report

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A	01 Sep 17	Draft	Philip Owen	Stephen Stringer
B	18 Sep 17	-	Philip Owen	Stephen Stringer
C	25 Sep 17	Updated buildings	Philip Owen	Andrew Long
D	26 Sep 17	Building height update	Philip Owen	Andrew Long
E	6 Oct 17	Final comments	Philip Owen	Stephen Stringer
F	12 Oct 17	Updated with comments	Philip Owen	Stephen Stringer

Summary

Sandy Brown have been commissioned by Sweco to provide acoustic design advice in relation to the proposed new mixed use development to be located on Plot 12 Brent Cross South (BXS) which forms part of the Brent Cross Cricklewood (BXC) regeneration, north-west London.

The BXC development received outline planning permission from the London Borough of Barnet on 23 July 2014 (planning permission ref. F/04687/13) (the 'S73 Permission'). An acoustic design report is required to be submitted prior to or alongside each Reserved Matters Application for residential uses, as required by Planning Condition 29.1. This report has been prepared to discharge Planning Condition 29.1 and describe the necessary design features required within Plot 12 in order to achieve appropriate internal ambient noise levels.

This report addresses the following:

- The criteria for compliance with Planning Condition 29.1
- The assessment of the external noise levels
- The acoustic design features required for compliance with the condition.

The acoustic design measures discussed within the report will be progressed as the building design develops.

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1 Introduction

The BXC development received outline planning permission from the London Borough of Barnet on 23 July 2014 (planning permission ref. F/04687/13), (the 'S73 Permission'). For each individual plot, a Reserved Matters Application is to be made, which in accordance with Condition 29.1 is to be accompanied by an Acoustic Design Report (ADR) that summarises the design measures that have been and will be adopted to meet the specified internal noise levels.

2 The development

Plot 12 is a mixed use development located towards the centre of BXC. It is surrounded by other predominantly residential plots including to the east and west, Plots 11 and 13, respectively.

The dominant existing environmental noise source at Plot 12 is road traffic from the A406, which is approximately 170 m to the north of the site. Less significant noise sources include the Midland Main Line railway, which is approximately 500 m to the west and other main roads (A5 and A41). New significant noise sources in the area will include the proposed new High Street South to the north and Claremont Park Road to the south.

Plot 12 comprises the following:

- Level B1 – Plant and car parking
- Ground level – Retail, cafe, offices, residential and external amenity space
- Upper floors – Residential.

3 Criteria

3.1 Planning Condition 29.1

Planning Condition 29.1 states the following:

Prior to, or coincident with the submission of each Reserved Matters Application for residential uses, an Acoustic Design Report shall be submitted to the LPA describing the design features that have been used to achieve good internal noise standards with reference to BS8233 as referred to in Paragraph 2.82 of the DSF. The report shall demonstrate that the following hierarchy of noise mitigation measures has been considered so that the use of noise insulation, whilst necessary in some areas, is minimised:

- a) Site layout to locate non-noise-sensitive buildings adjacent to road/rail noise sources to provide screening to residential units*
- b) Residential block layout design to locate non-sensitive uses on noisy facades*
- c) The provision of 'quiet facades' to residential units where practicable*
- d) Architectural features such as balconies and to provide local screening to windows to sensitive rooms*
- e) Resurfacing of roads with low noise surfaces, including the A406 running planes past the development*
- f) Opportunities for noise barriers adjacent to road and railway noise sources*
- g) Upgraded glazing and external building fabric to attenuate noise ingress, and where necessary, acoustic ventilation, passive wherever practicable (provided a positive flow of air, eg passive stack not trickle vents), to allow windows to remain closed where necessary.*

The Details submitted in connection with the relevant Reserved Matters Application shall be in accordance with the Acoustic Design Report to be approved in accordance with this Condition.

3.2 Noise ingress criteria

The control of noise ingress to residential accommodation will be based on the requirements of Section 7.7.2 of BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings*.

The building envelope will be designed so that the recommended internal noise levels recommended in BS 8233 are achieved, as per the below:

- Living room - $L_{Aeq,16hr}$ 35 dB (0700-2300)
- Bedroom - $L_{Aeq,16hr}$ 35 dB (0700-2300)
- Bedroom - $L_{Aeq,8hr}$ 30 dB (2300-0700).

In addition to the above, consideration will be given to reducing night time maximum noise levels to be generally no greater than L_{AFmax} 45 dB.

4 Acoustic design

The internal noise level in apartments is determined by:

- The level of external noise from environmental sources
- The sound insulation performance of the facade.

On the above basis the following sections outline the level of external noise expected during the daytime and the facade sound insulation performance required for compliance with Planning Condition 29.1.

4.1 Hierarchy of noise mitigation

The hierarchy of noise mitigation, as described in Section 3.1, is to be followed for compliance with Planning Condition 29.1. Table 1 lists the hierarchical design requirements and describes how they have been addressed.

Table 1 Hierarchy of noise mitigation – condition 29.1

Hierarchy reference	Design requirement	How is it being addressed
a	Site layout to locate non-noise-sensitive buildings adjacent to road/rail noise sources to provide screening to residential units	Site layout has been addressed by the Section 73 Permission
b	Residential block layout design to locate non-sensitive uses on noisy facades	The Design Statement (DS) produced by Macreanor Lavington Architects (MLA), has provided strategies of reducing noise on the residential facades, providing quieter facades and introducing balconies to minimize the acoustic design required
c	The provision of ‘quiet facades’ to residential units where practicable	
d	Architectural features such as balconies and to provide local screening to windows to sensitive rooms	
e	Resurfacing of roads with low noise surfaces, including the A406 running planes past the development	Plot 12 is screened from nearby major noise sources by other buildings within the masterplan.
f	Opportunities for noise barriers adjacent to road and railway noise sources	Changes to road surfaces and erecting noise barriers would not be beneficial
g	Upgraded glazing and external building fabric to attenuate noise ingress, and where necessary, acoustic ventilation, passive wherever practicable (provided a positive flow of air, eg passive stack not trickle vents), to allow windows to remain closed where necessary	Addressed within this acoustic design report

4.2 Predicted noise levels

4.2.1 Predicted noise levels with the BXC development complete

The existing external noise climate around the site has been assessed at various locations via a combination of unattended continuous noise logging, attended sample measurements and modelling conducted by Waterman as part of the Environmental Impact Assessment (EIA) which formed the Environmental Statement supporting (‘the S73 Permission’).

The monitored long term ambient noise levels indicate that there is a reduction of 10 dBA between the day and night time at positions sheltered from Hendon Way, the railway and The North Circular, eg Prayle Grove South. A reduction of approximately 5 dBA can be expected along the north and south facades of the plot, due to the addition of a new local roads.

A detailed 3-dimensional acoustic model of the site has been created using CadnaA environmental prediction software. The model has been adapted by Sandy Brown to include the most recent information on the building massing. The model includes all existing surrounding buildings, the proposed new buildings on the site and local roads. Figure 1 and Figure 2 illustrate the results from the noise modelling when the BXC development is completed.

The external noise predictions have been made based on the EIA traffic flow data within the year 2031 and noise measurements from the railway line.

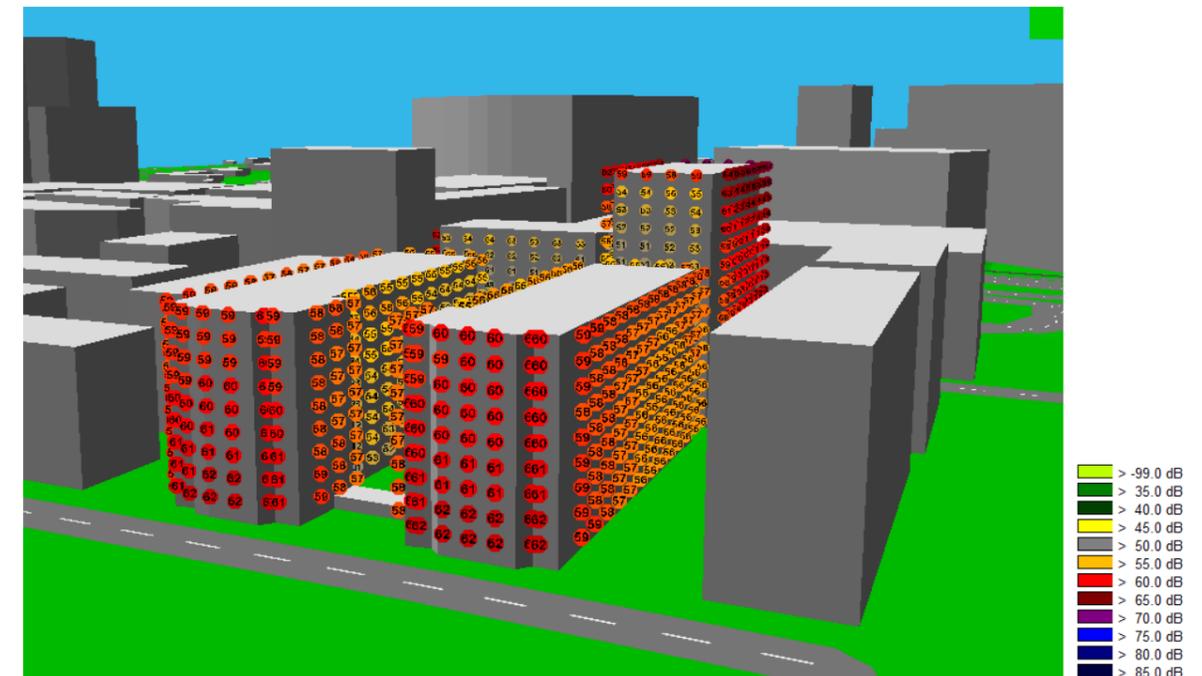


Figure 1 Aerial view of Plot 12 from south east

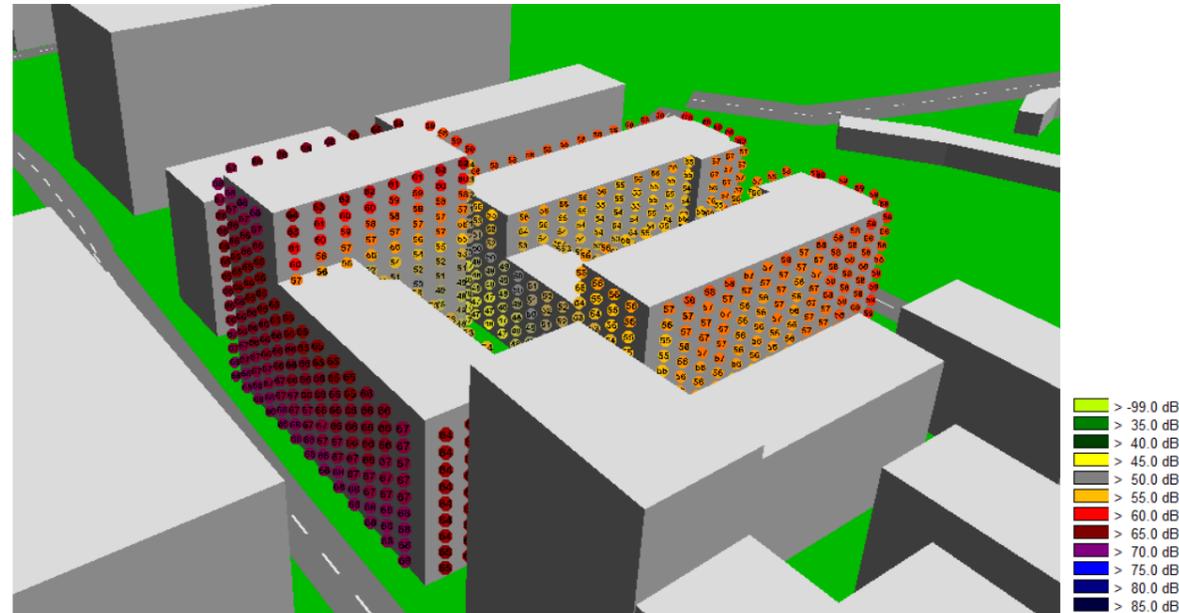


Figure 2 Aerial View of Plot 12 from north west

Table 2 lists the assessed facade sound pressure levels on the facade of Plot 12.

Table 2 Predicted facade sound pressure level when masterplan is completed (dB)

Building	Facade	Facade sound pressure level ($L_{Aeq,16hr}$ dB)
North	North	65 – 68
North	East	58 – 66
North	South	46 – 59
North	West	62 – 65
South	North	47 – 56
South	East	56 – 59
South	South	59 – 62
South	West	54 – 59
South	Courtyard	48 – 56

4.2.2 Night time maximum noise events

The maximum night time noise events are expected to be due to local road traffic along future roads associated with the development. There is not enough information available at the moment to assess the potential impact of maximum noise levels, though maximum noise levels from car pass bys are expected to be in the region of L_{AFmax} 75-80 dB on the facades.

On the above basis, a facade sound insulation of R_w 33-38 dB is recommended on the north and south facades adjacent to the road to control typical night time maximum events.

If these roads are used by heavy goods vehicles during the night time (eg deliveries or refuse collections) then higher sound insulation requirements will need to be adopted.

4.2.3 Noise generation from Clitterhouse Playing Fields

Assessment of the noise impact caused by the use of Clitterhouse Playing Fields is provided in the noise and vibration chapter for Phase 1A¹. The assessments (as concluded in Figure 9.8) indicate sound pressure levels below $L_{Aeq,16hr}$ 55 dB at the south facade of Plot 12.

The assessments conducted as part of the Environmental Statement are based on all sports pitches being used concurrently and during daylight hours only, which is considered to be the worst-case operation.

The traffic noise prediction of $L_{Aeq,16hr}$ 63 dB on the south facade is not expected to increase due to the use of the playing fields.

¹ Brent Cross Cricklewood: Phase 1A (North) RMAs, Volume 1: Environmental Statement Further Information Report, Chapter 9 Noise and Vibration

4.3 Sound insulation requirements

The daytime noise level criteria are determining the facade sound insulation requirements due to the likely drop off in noise level expected during the night time.

Indicative overall facade sound insulation requirements are presented in Table 3.

Table 3 Recommended minimum facade sound insulation requirements

Building	Facade	Facade sound insulation requirements ($R'_w + C_{tr}$ dB)
North	North	35
North	East	33
North	South	26
North	West	32
North	North	23
South	East	26
South	South	29
South	West	26
South	Courtyard	23

The R_w requirement to control night time maximum noise events are expected to be met inherently when the $R_w + C_{tr}$ values are complied with.

4.4 Guidance on facade construction, glazing and ventilation strategy

Table 4 sets out some examples of glazing build-ups and ventilation strategies that could be employed to achieve the required sound insulation performance for the various elevations.

Table 4 Example glazing configurations and ventilation strategies

Sound insulation $R_w + C_{tr}$ (dB)	Example glazing configuration	Ventilation Strategy
15-29	6 mm/12 mm/6 mm	Attenuated passive ventilation (eg, trickle vents)
30-32	6.4 mm/12 mm/6 mm	Attenuated passive ventilation
33-35	6.4 mm/12 mm/10 mm	High performance acoustically attenuated passive ventilation
36-38	12.8 mm/12 mm/10 mm	Mechanical ventilation (eg, whole house ventilation)

As the design progresses, a more detailed facade sound insulation assessment will need to be performed to ensure that the overall performance requirements will be met.

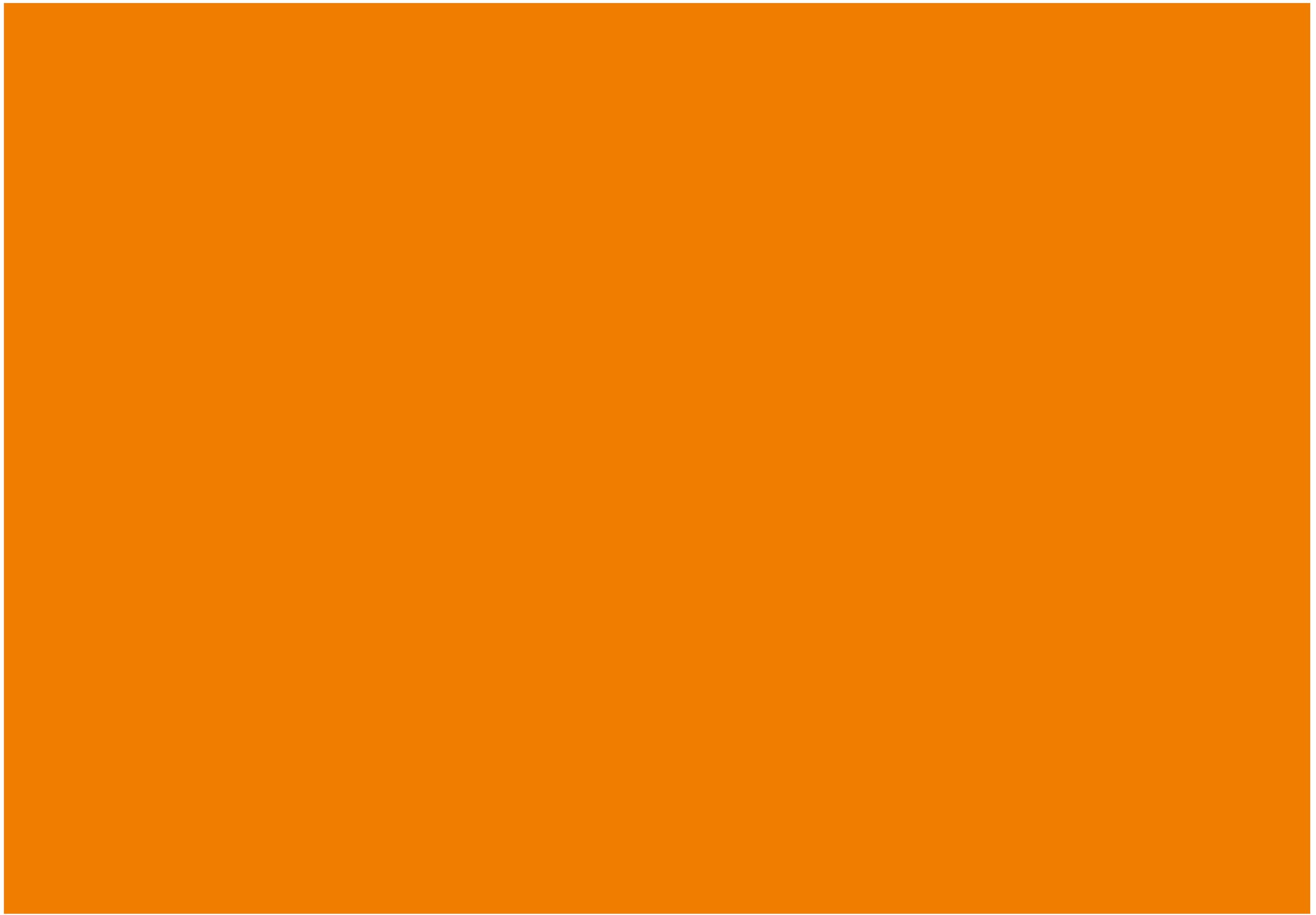
5 Conclusion

Sandy Brown has been commissioned by Sweco to provide acoustic design advice in relation to the proposed new mixed use development to be located on Plot 12 of the Brent Cross South (BXS) which forms part of the Brent Cross Cricklewood regeneration (BXC), north-west London.

This report documents the relevant design measures that have been adopted for compliance with Planning Conditions 29.1 of ('the S73 Permission'), which requires an Acoustic Design Report (ADR) to be submitted prior to or alongside the Reserved Matters Application. The purpose of the ADR is to document how appropriate internal noise levels in accordance with BS 8233:2014 will be achieved within the residential-use buildings.

The internal noise level is determined by the external noise level and the sound insulation provided by the facade. This report illustrates that the internal noise criteria will be achieved with the adoption of acoustically rated glazing and either high performance acoustic passive ventilation or mechanical ventilation.

The design measures detailed in the report will be suitably developed as the design progresses.



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