SPRATT+HAMER

SPRATT+HAMER

Noise Impact Report

Project Details	
Client	Transport House Development Limited
Client Address	Transport House Uxbridge Road Uxbridge Hillingdon UB10 0LY
Site Address	Transport House Uxbridge Road Uxbridge Hillingdon UB10 0LY
Reference	21818

Quality Assurance	
Prepared by	Justyna Lubas MSc AMIOA
Reviewed by	Ben Bielicki BSc (Hons) MIOA
Authorised by	Ben Bielicki BSc (Hons) MIOA
Issue date	21/06/2024

Revision History			
Version	Date	Editor	Notes
V1	21/06/2024	Justyna Lubas	First issue
V2	24/06/2024	Justyna Lubas	Update to Appendix

Contents

1 Summary

A noise assessment has been conducted for a proposed residential development comprising 15 no. residential apartments at Transport House, Uxbridge Rd, Uxbridge UB10 0LY.

The assessment is to be submitted as part of a planning application for the development site to The Council of the London Borough of Hillingdon.

The assessment considers the impact of surrounding roads on the proposed residential development in comparison with BS 8233: 2014 and World Health Organisation guideline criteria.

All results and recommendations are within the BS 8233:2014 and WHO guidelines for noise within a residential dwelling and external areas provided the proposed mitigation is implemented, including glazing and ventilation.

2 Introduction

Transport House Development Limited has instructed Spratt and Hamer Limited to undertake an environmental noise survey in order to assess the impact from the nearby roads as well as other general noise within the local environment, which may have an impact on future residents of the proposed development.

The proposed development is an existing two-storey building currently undergoing construction for the addition of a new third floor. This third floor will house an additional three apartments, increasing the total number of units to fifteen (including the twelve already approved with conditions on the ground and first floors).

This report is prepared solely for Transport House Development Limited. Spratt and Hamer Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

2.1 Noise Impact Assessment

Spratt and Hamer Limited has undertaken an environmental noise impact assessment at the above site with noise levels measured externally over 24-hour period, consisting of 16-hour day (07:00 – 23:00) and eight-hour night (23:00 – 07:00). The measurements were carried out during weekdays (Tuesday – Wednesday).

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering Local Planning Authority guidance and conditions.

3 Assumptions, Limitations & Uncertainty

a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
b. It is assumed that the sound pressure levels measured on site during the environmental noise survey are typical of the site.
c. It is assumed that the technical data provided by glazing and ventilation manufacturers is up to date and correct.
d. It is assumed that drawings and information supplied by Transport House Development Limited are up to date and correct.
e. It should also be noted that building elements modelled in INSUL are only an approximation of the proposed specifications due to the limitation of materials available within the software. These models are shown in the appendix.

4 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the internal and external noise levels.

4.1 National Planning Policy

The National Planning Policy Framework (NPPF) December 2023 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

174. Planning policies and decisions should contribute to and 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.'

185. 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:

'*mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*'

NPPF previously characterised noise by grading and recommending actions and different effect levels as reproduced in Table 1.

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1: Noise exposure hierarchy based on likely average response

4.2 Criteria

4.2.1 Local Planning Authority Criteria

Application reference: 17502/APP/2021/1632

Change of use from offices (Use Class B1a) to residential use (Use Class C3) to create 8 x studio, 2 x 1 bed and 2 x 2 bed self-contained flats (Application for Prior Approval under Schedule 2, Part 3, Class O of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended))

The London Borough of Hillingdon has granted conditional planning for this application, the decision notice states:

The development must achieve the following internal noise levels:

- *Indoors 35 dB LAeq,16hrs daytime (07.00 to 23.00hrs);*
- *Inside bedrooms 30 dB LAeq,8hrs night-time (23.00 to 07.00hrs);*
- *Inside bedrooms 45 dB LAFmax to be exceeded no more than 15 times per night-time from sources other than emergency sirens.*

Prior to occupation of the first residential unit, a report must be submitted to the Council confirming that these standards (through appropriate acoustic mitigation if necessary) will be met unless otherwise agreed in writing with the Local Planning Authority. These levels (or alternative as agreed in writing with the ***Local*** *Planning Authority) must be maintained as a minimum within the development throughout its lifetime.*

Reason:
To ensure that an acceptable level of noise can be maintained within the development in accordance with Policy EM8 of the Hillingdon Local Plan Part 1 - Strategic Policies (November 2012), Policy DMHB 11 of the Hillingdon Local Plan: Part 2 - Development Management Policies (January 2020) and Policy D14 of the London Plan (2021).

Application reference: 17502/APP/2023/989

Removal of existing pitched roof and addition of a second floor to provide 2 x 1-bed and 1 x 2-bed residential units including alterations to existing rear ground and first floor windows, replacement windows throughout and amendment to roof overhang

The local authority has not provided any conditions related to noise, however, assumed to have same requirements for assessment.

4.2.2 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

The British Standard BS 8233:2014, Guidance on Sound Insulation and noise reduction for buildings, provides appropriate internal levels of noise within dwellings, flats and rooms in residential use when unoccupied.

Section 7.2.2 'Internal ambient noise levels in dwellings' of BS 8233: 2014 states that 'In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4'.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Table 2: Table 4 of BS 8233:2014 Indoor ambient levels for dwellings

Note 7 of section 7.7.2 states 'Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed up to 5 dB and reasonable internal conditions still achieved'.

In addition, Note 4 of section 7.7.2 states, '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 $L_{Amax,F}$ (SIC), depending on the character and number of events per night. Sporadic noise events could require separate values".

In the absence of a specific performance criterion within BS 8233 for short-term noise maxima, reference can be made to guidance published by the WHO. In particular, the WHO publication 'Guidelines for Community Noise' (1999), from which the guidance given in BS 8233: 2014 is itself derived, states that 'for a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than ten to fifteen times per night'.

The WHO publication 'Guidelines for Community Noise' (1999) has since been updated in 2018; however, it is widely accepted by Local Authorities that L_{AFmax} 45 dB is the target level for short-term noise maxima between 23:00-07:00.

4.2.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following internal noise levels are applicable within dwellings.

Specific Requirement	Critical Health Effect (s)	$L_{Aeq,T}$ (dB)	Time base,T (hours)	L_{AFmax} (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Table 3: A Summary of the Guidance Noise Levels

4.3 Criteria Summary

In order to meet the requirements of the London Borough of Hillingdon Council, the assessment and recommendations will be made in accordance with *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* and WHO *Guidelines for Community Noise*

5 Site Description

The proposed development at Transport House is an existing two storey building situated in the southeast part of Uxbridge, approximately 3km of the city centre. Uxbridge is a city lying between 2 major motorways, from the west M25 and from the south M40 which allow connection to London City and Heathrow Airport which is approximately 5.6km south from the proposed site. The site is located in a mixed residential with commercial environment. The front façade of the building faces south-west onto the Marlborough Parade, and Uxbridge Road, which is a main road consisting of a four lane, two-way traffic flowing form northwest to south-east and opposite direction. The east façade faces north-east onto land which is under construction and Star Road; the west façade faces north-west onto Butler Street which is a side road connecting Marlborough Parade to Alpha Road. To the rear of the development, facing north-east, are residential properties, approximately 11m from the rear façade of the site.

Approximately 13m from the west of the development is the first commercial property which is a Chummy Yummy Chinese takeaway restaurant. From the east, the closest commercial property is a Woodend Estates agency's office. Across Uxbridge Road, opposite the front façade of the building is Chicken Cottage takeaway restaurant, approximately 37m away.

The above-mentioned construction site next to the proposed development was not in operation during setup of the monitoring equipment, however, it is expected that noise from construction may have been captured therefore careful consideration was given during choosing representative LAeq for the daytime period.

5.1 Subjective Observations

During site attendance, subjectively the main source of noise was road traffic. Some noise from existing plant was audible and bird noises were also audible.

5.2 Weather

07-08/05/2024	Tuesday	Wednesday
Temperature (°C)	9.0 – 29.3	9.7 – 31.6
Wind Speed (m/s)	0.0 – 1.9	0.0 – 1.7
Wind Direction	ESE	SE
Precipitation (mm/h)	0.0 – 0.3	0.0
Damp road/ wet ground	Yes	No
Fog/snow/ice	None	None

Table 4: Measuring Weather Conditions

All weather data taken from wow.metoffice.gov.uk/ Weather data has been taken from the Hillingdon weather station, located at approximately 1.1km south of the proposed development.

6 Noise Measurement Procedure

6.1 Survey Date(s)

07/05/2024 - 08/05/2024

6.2 Personnel Present

Luke Owen BSc (Hons)

6.3 Survey Equipment Used

Manufacturer	Model	Serial No.	Description
Rion	NL-52	01032413	Integrating Sound Level Meter and Real Time Analyser
Rion	NL-52	00976149	Integrating Sound Level Meter and Real Time Analyser
Pulsar	Pulsar 105	86702	Acoustic Calibrator
Pulsar	Pulsar 105	93357	Acoustic Calibrator

Table 5: Survey Equipment Used

6.4 Calibration

The sound level meters were calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meters used during the survey are precision grade Class 1.

Calibration certificates are available on request.

6.5 External Ambient Sound Measurements

The measurement locations chosen during the survey were deemed suitable for the determination of the noise levels able to impact upon the façades of the proposed development.

The sound level meters were set to measure broadband and 1:1 octave centre frequency bands L_{Aeq}, L_{A90}, L_{A10} and L_{AFmax} in 5-minute periods.

6.5.1 Monitoring Position 1

A microphone was placed at first-floor level 1m from the front façade overlooking Uxbridge Road, situated further away from construction site. The sound level meter was set to record WAV file audio recordings for all maximum sound level events above 70 dBA. The meter was set to measure the complete 24-hour period.

6.5.2 Monitoring Position 2

A microphone was placed at first-floor level 1m from the rear façade overlooking residential properties, situated further away from construction site. The sound level meter was set to record WAV file audio recordings for all maximum sound level events above 70 dBA. The meter was set to measure the complete 24-hour period.

6.6 Location Plan of Measurement Positions

The location plan below shows the proposed development and positions of the monitoring equipment.

Figure 1: Image taken from www.openstreetmap.org.

7 Results and Analysis

7.1 External Ambient Sound Measurement Analysis in Accordance with BS 8233:2014

The following table presents the measured results from all monitoring positions.

The measurement results at positions 1 & 2 have had a façade correction of 3dB applied in order to adjust the result so that it is comparable to a free-field sound pressure level.

Monitoring position	Time Period	Time Base T (hours)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)
1	Daytime	16	69.4	73.2 - 98.9	57.3	70.6
	Night time	8	63.3	68.5 - 90.1	33.4	65.9
2	Daytime	16	54.5	56.6 - 89.7	46.3	56.8
	Night time	8	49.0	51.6 - 82.5	39.2	52.2

Table 6: Measurement Results

Data charts can be found in the appendix.

7.2 Night Time L_{AFmax} Analysis

The L_{AFmax} measured during the night time (23:00-07:00) has been analysed. WHO Community Noise Guidelines states "For a good night sleep it is believed that indoor sound pressure should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night (Vallet & Vernet 1991).

7.2.1 Night Time L_{AFmax} at Monitoring Position 1

The WAV file recordings and frequency spectrum data indicate that the L_{AFmax} 90.1 dB and subsequent events were from car pass-bys.

It has been found that the L_{AFmax} of 81.8 dB events has not been exceeded by more than 7 times on night throughout the survey. As such, it will be used for the assessment at this monitoring position as this is considered representative of other L_{AFmax} events during the night time period.

7.2.2 Night Time L_{AFmax} at Monitoring Position 2

The WAV file recordings and frequency spectrum data indicate that the L_{AFmax} 82.5 dB and subsequent events were from also from car pass-bys.

After analysis of data and sound recording, it has been found that the second highest L_{AFmax} 73.9 will be considered representative event, therefore it will be used in the assessment.

8 Recommendations

The estimated internal noise levels attributed by the external noise sources have been assessed over an average of $L_{Aeq,T}$ from the daytime and night time survey periods and L_{AFmax} values from the night time. Glazing Specification 1

8.1 Glazing Specification 1

The glazing specification in all habitable rooms on the ground and first floor on the front facade should consist of at least 10mm glass / 20mm argon filled void / 8.8mm Pilkington Optiphon glass double glazed unit; in well-sealed frames.

8.2 Glazing Specification 2

The glazing specification in all habitable rooms o nth rear facade should consist of at least 4mm glass / 12mm void / 4mm glass double glazed unit; in well-sealed frames.

8.3 Glazing Specification 3

The glazing specification in all habitable rooms on the second floor on the front façade should consist of at least 10mm glass / 12mm void / 6mm glass double glazed unit; in well-sealed frames.

8.4 Habitable Room Ceilings in Top Floor

All ceiling and roof in habitable rooms should be constructed with accordance to provided information by client that consist of felted roofing system, 140mm Kingspan thermaroof, vapour control layer with 12mm structural plywood deck on timber firring and joists with resilient bars and 15mm plasterboard.

8.5 Ventilation

The ventilation in all bedrooms at the front facade overlooking Uxbridge Road should be mechanically ventilated with MEV or MVHR or passive ventilated with an acoustic wall vent such as Greenwood MA3051. The rest of the development should be a quality mechanical system or a passive acoustic window vent such as Brookvent 2500mm^2 EA.

8.5.1 Notes on Ventilation

NOTE 5 in section 7.7.2 of BS 8233:2014 states “if relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.”

It is our understanding that all dwellings are to be ventilated either with passive vents or mechanically ventilated. Where mechanical ventilation is utilised, the system is to be designed by a suitably qualified engineer or M&E consultant. The system shall be designed so the sound levels from any external plant or inlet/outlets do not exceed the background noise level at any noise receptor, i.e., outside a neighbouring window. This may require further assessment once the type and location of system has been specified.

The glazing and ventilation suggestions have been calculated assuming the windows are tightly closed. However, it must be noted that windows are suggested to be openable to provide rapid or purge ventilation or means of escape.

It should be noted that it's the responsibility of Transport House Development Limited to ensure that the ventilation strategy is sufficient to meet the requirements of Building Regulations Parts F and O.

8.6 External Balconies and Terraces

The architect's drawings show balconies on south and north façade of the building on the top floor.

Section 7.7.3.2 of BS 8233:2014 states:

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.

As amenity space, such as gardens and patios cannot be provided on this development, balconies and terraces are an acceptable way of providing outdoor amenity space for residents. The measured levels at the west façade do not exceed $L_{Aeq,T}$ 50 dB, and the levels at the east façade do not exceed the upper guideline value of $L_{Aeq,T}$ 55 dB.

While consultant acknowledges higher external noise levels, they are also aware that an alternative option for external amenity in form of Connaught Recreation Ground is available within walking distance (3 minutes) from the proposed site, offering a tranquil space for residents to enjoy. Furthermore, BS8233:2014 recognizes that high noise levels in external amenity areas should not necessarily preclude development. The standard acknowledges that residents often value having a private outdoor space, even with slightly elevated noise levels, compared to having no private space at all. Therefore, considering the availability of Connaught Recreation Ground and the guidance from BS8233:2014, we believe the proposed external amenity noise levels will be suitable for their intended use.

8.7 Specification Guide

Below is a visual aid to identify the location of the glazing specifications as described above.

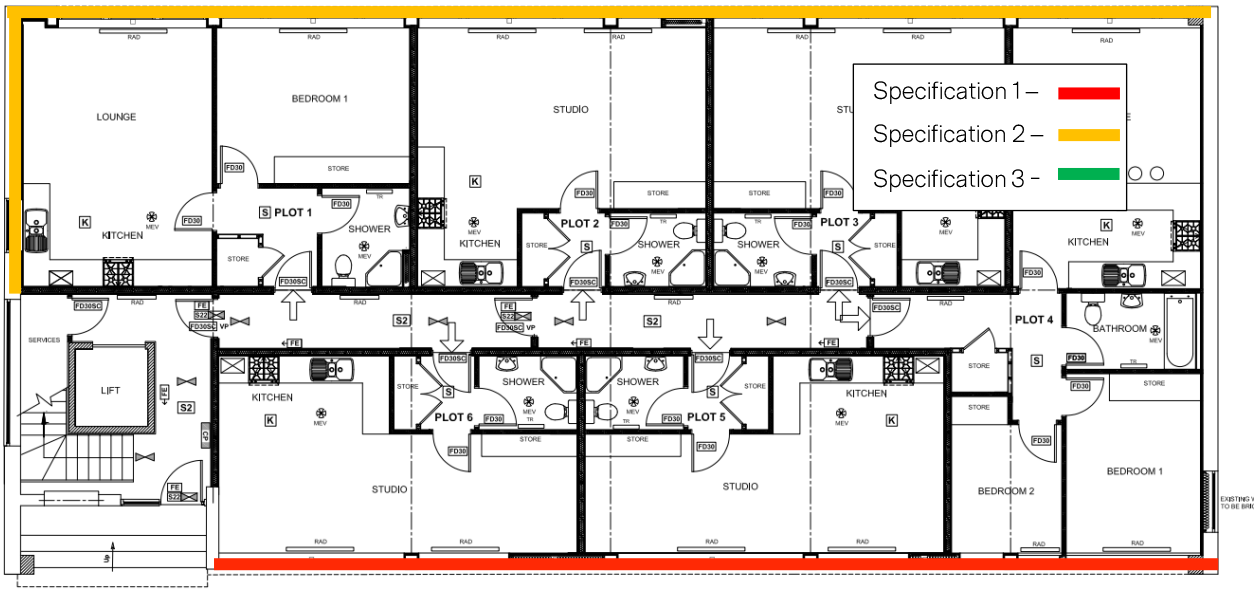


Figure 2: Glazing and ventilation specification for ground floor

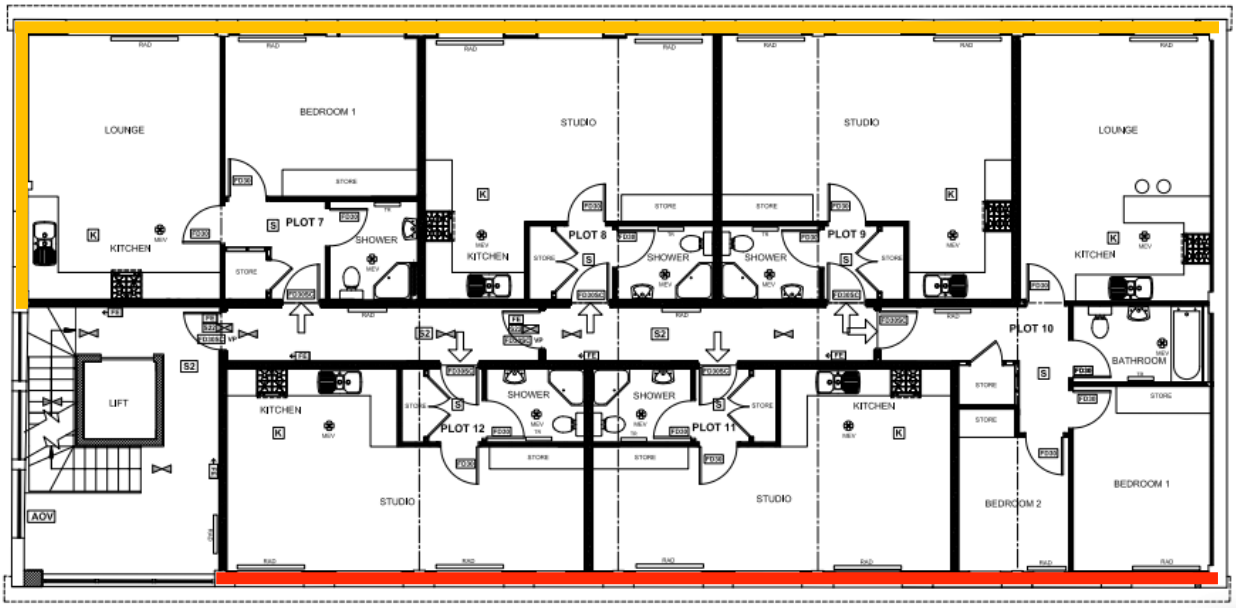


Figure 3: Glazing and ventilation specification for first floor

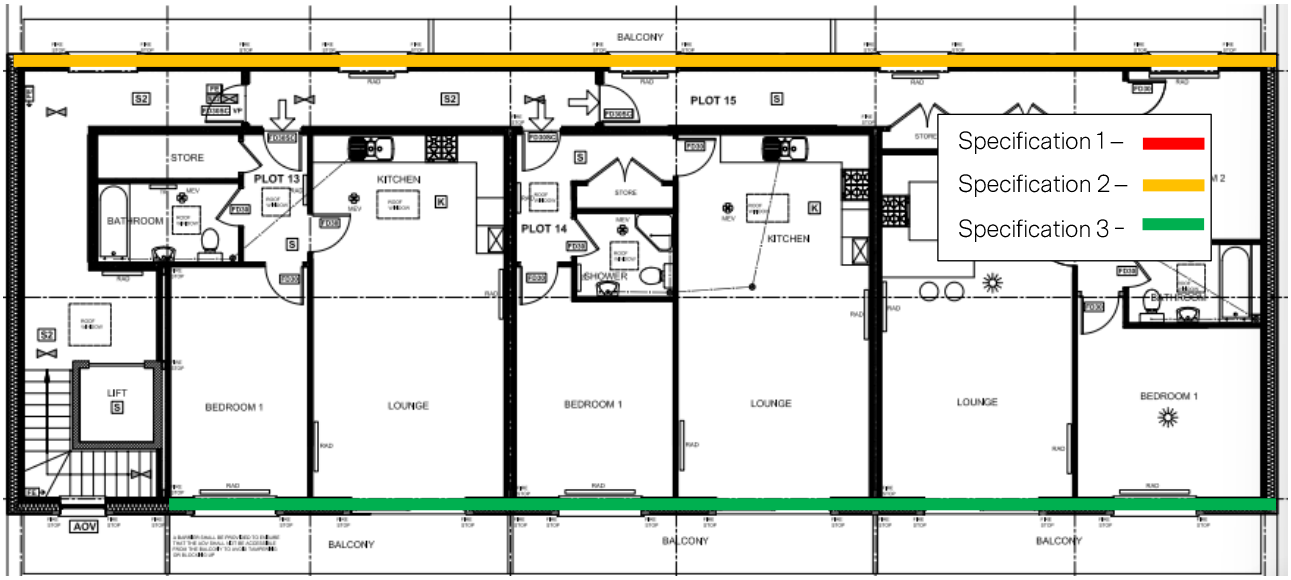


Figure 4: Glazing and ventilation specification for second floor

9 Calculation Methodology

Calculations for the BS 8233:2014 assessment have been based on the rigorous calculation method of BS 8233:2014 and BS EN 12354-3.

All building elements modelled in INSUL Acoustic Prediction Software have had a 3 dB correction applied to account for a margin of error within the software.

The calculations are based on one vent per room. If more ventilation is required, then further calculations will need be carried out.

All room dimensions used in calculations are based on drawings provided by the architect. See appendix - Site plans.

The wall and roof calculations utilises materials specified by the client.

The calculations assume each room has a reverberation time of 0.5 seconds in living rooms and 0.4 seconds in bedrooms.

The predictions also have been calculated assuming all windows are tightly closed.

9.1 Building Elements

The following table shows the expected performance of the glazing and ventilation.

Element	Description*	$R_w/D_{n,e,w}$ (C; C_{tr}) (dB)	Octave Centre Frequencies (Hz) SRI / $D_{n,e}$ (dB)					
			125	250	500	1k	2k	4k
Glazing	4mm (12) 4mm	32 (-1; -4)	21	20	26	38	37	39
	10mm (12) 6mm	40 ()	26	27	34	40	38	26
	10mm (20 argon) 8.8 Pilkington Optiphon	46 (-2; -6)	28	36	43	47	49	58
Ventilation	Brookvent 2500mm2 EA	40 (0: -2)	43.2	41	39	37.4	40.7	48.2
	Greenwood MA3051	55 (-1; -3)	46.5	45.9	49	55.5	66.2	68.6

Table 7: Table showing suggested Glazing & Ventilation

*The selected units or products described have been used as a guide to form part of the specification. Other similar units or products can be used provided they can achieve the given minimum acoustic performance.

10 Example of Estimated Performance

The following table compares the estimated performance values with the measured values at the most exposed habitable rooms.

Location	Time period	Measured Level		Estimated Internal	
		$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)
Front Facade	Daytime (07:00 – 23:00)	69.4	-	32.3	-
	Night time (23:00 – 07:00)	63.3	85.3	26.1	45.0
Rear Facade	Daytime (07:00 – 23:00)	54.5	-	29.4	-
	Night time (23:00 – 07:00)	49.0	73.9	22.9	44.2

Table 8: Estimated performance

11 Conclusion

When installing the glazing and ventilation detail as discussed in the recommendations section, as well as the external wall and/or roof specification upgrades, the noise levels described in BS 8233:2014 can be achieved in all habitable rooms, and external amenity spaces, therefore discharging the Local Authority conditions.

12 References

National Planning Policy Framework (NPPF)

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

World Health Organisation Guidelines for Community Noise

BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

BS EN 12758:2011 Glass in building – Glazing and airborne sound insulation

openstreetmap.org

INSUL

12.1 Drawing References

1134-01_Transport House_Location and Block Plan

1134-03F_Transport House_Proposed South and West Elevations

1134-04F_Transport House_Proposed North and East Elevations

1134-06D_Transport House_Proposed Site Plan

1134-13G_Transport House_Ground Floor Plan GA

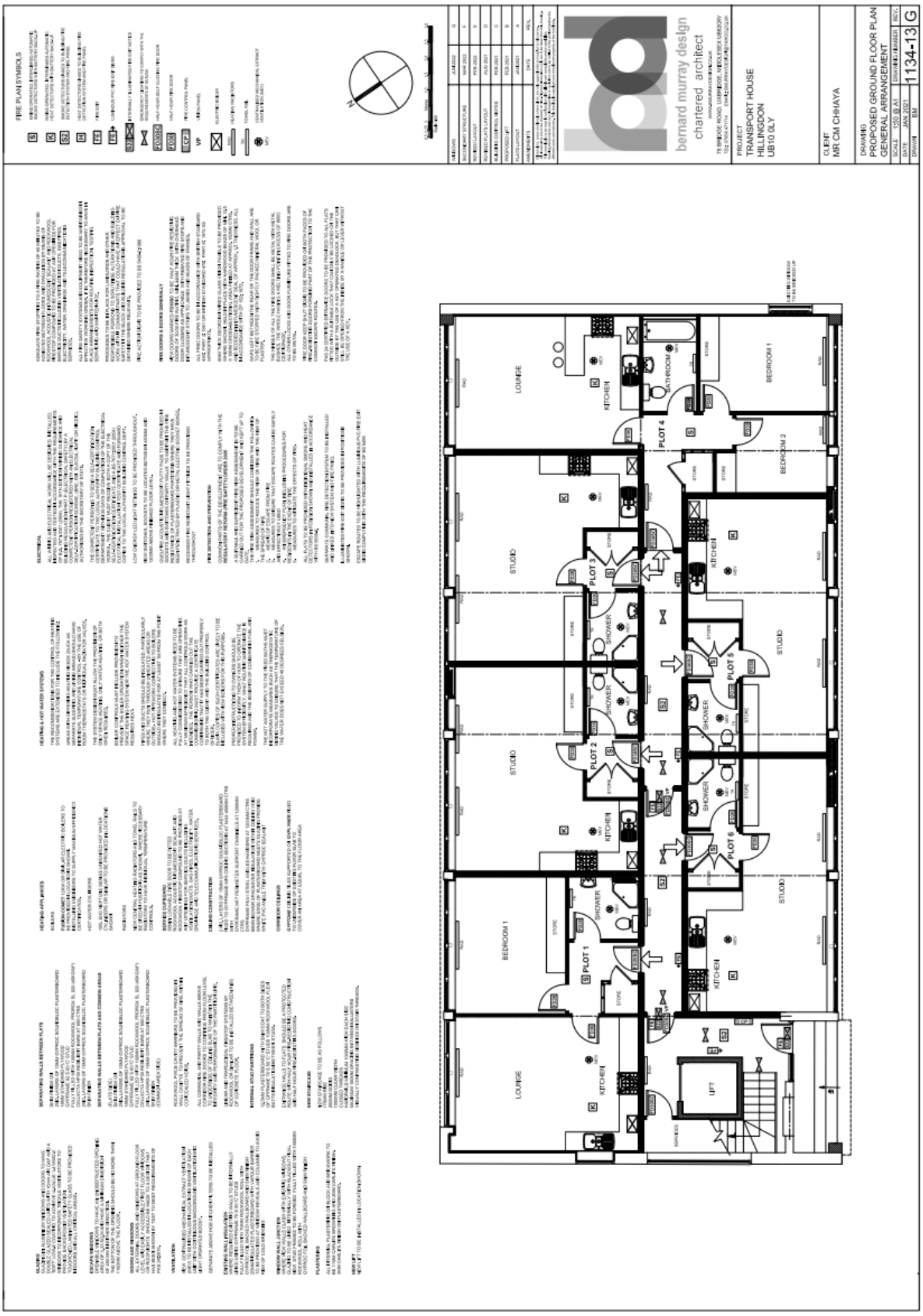
1134-14G_Transport House_ First Floor Plan GA

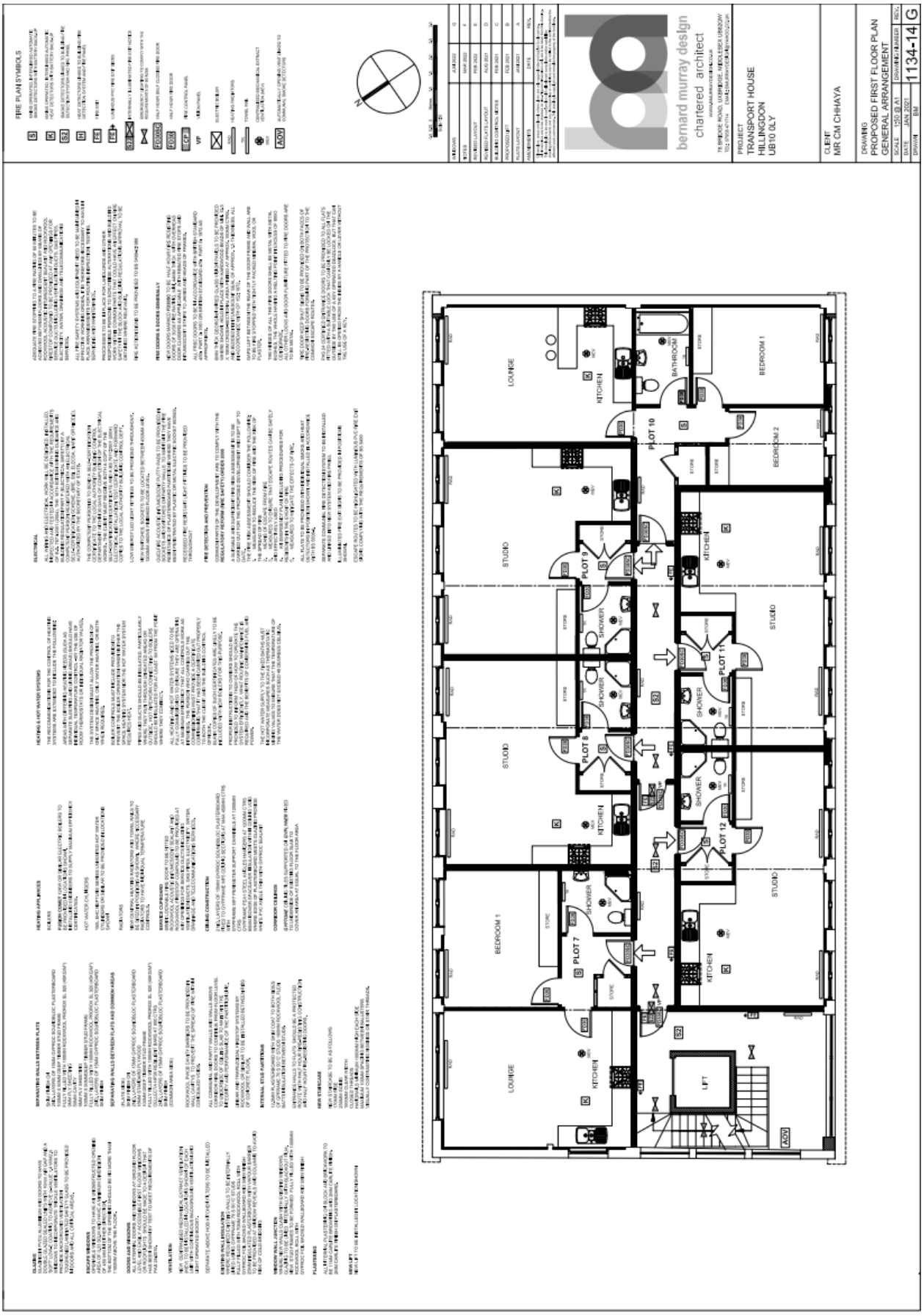
1134-20F_Transport House_Proposed Second Floor Plan GA

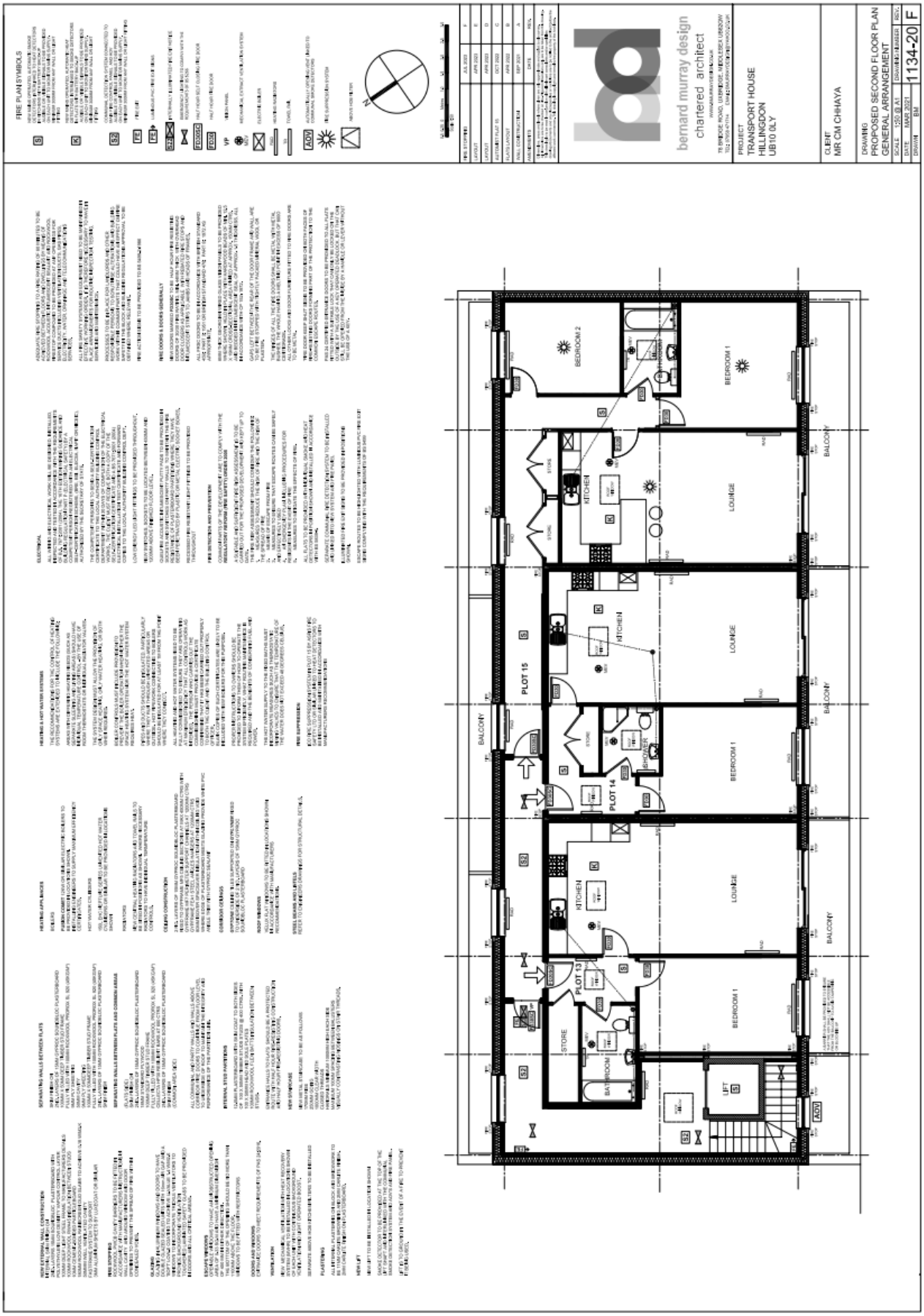
1134-47A_Transport House_Proposed Second Floor Plan_Cladding Layout

Appendix

Proposed Site Plans



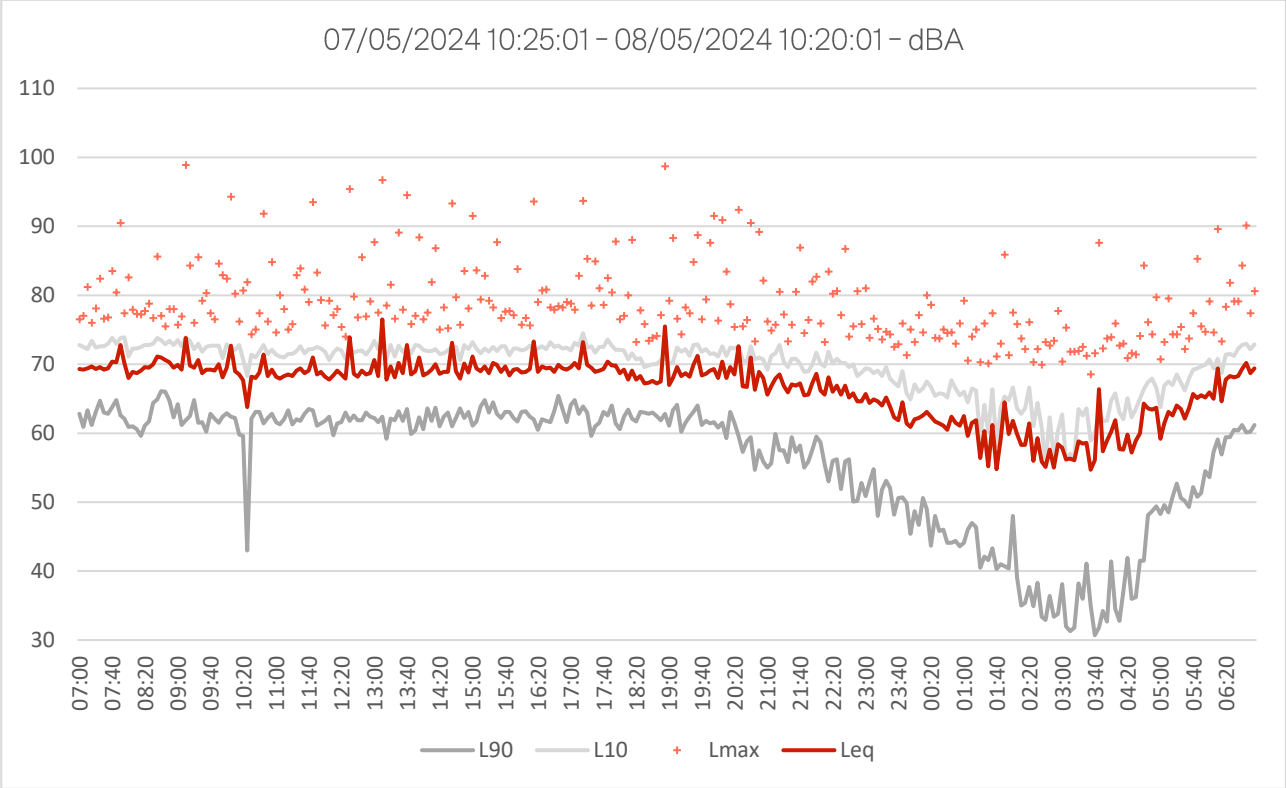

FIRE PLAN SYMBOLS
PROPOSED FIRST FLOOR PLAN
GENERAL ARRANGEMENT
bernard murray design
chartered architect
PROJECT
TRANSPORT HOUSE
HILLINGDON
UB10 0LY
CLIENT
MR CM CHHAYA
1134-14 G
LOUNGE
KITCHEN
BEDROOM 1
BEDROOM 2
STUDIO
BATHROOM
SHOWER
STORE
LIFT
PLOT 7
PLOT 8
PLOT 9
PLOT 10
PLOT 11
PLOT 12


PLOT 13
PLOT 14
PLOT 15
BEDROOM 1
BEDROOM 2
LOUNGE
KITCHEN
BALCONY
BATHROOM
STORE
LIFT
bernard murray design
chartered architect
PROJECT
TRANSPORT HOUSE
HILLINGDON
UB10 0LY
CLIENT
MR CM CHHAYA
DRAWING
PROPOSED SECOND FLOOR PLAN
GENERAL ARRANGEMENT
1134-20 F

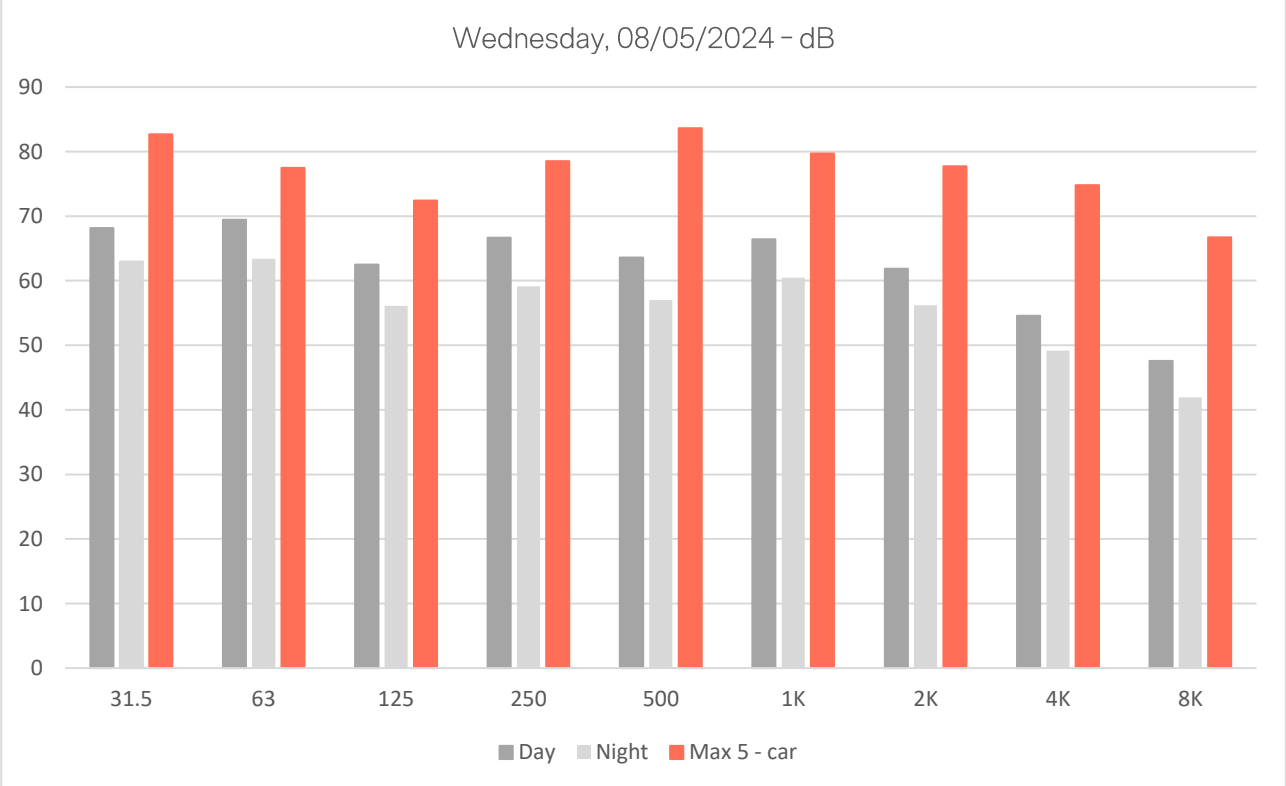

PROPOSED MATERIALS
WALLS: GREY METAL WALL CLADDING
ROOF: GREY SINGLE PLY MEMBRANE
WINDOWS: GREY ALUMINIUM FRAMES
DOORS: GREY ALUMINIUM FRAMES
0 0.5 1 Metres 3 4
Scale 1:100
bernard murray design
chartered architect
PROJECT
TRANSPORT HOUSE
HILLINGDON
UB10 0LY
CLIENT
MR CM CHHAYA
DRAWING
PROPOSED ELEVATIONS
SCALE 1:100 @ A3
DATE JUL 2020
DRAWN BR
DRAWING NUMBER 1134-03
REV. F
Transport House
SOUTH ELEVATION
WEST ELEVATION
REDUCTION IN ROOF OVERHANG DEPTH
REDUCTION IN ROOF OVERHANG DEPTH

Measurement Results

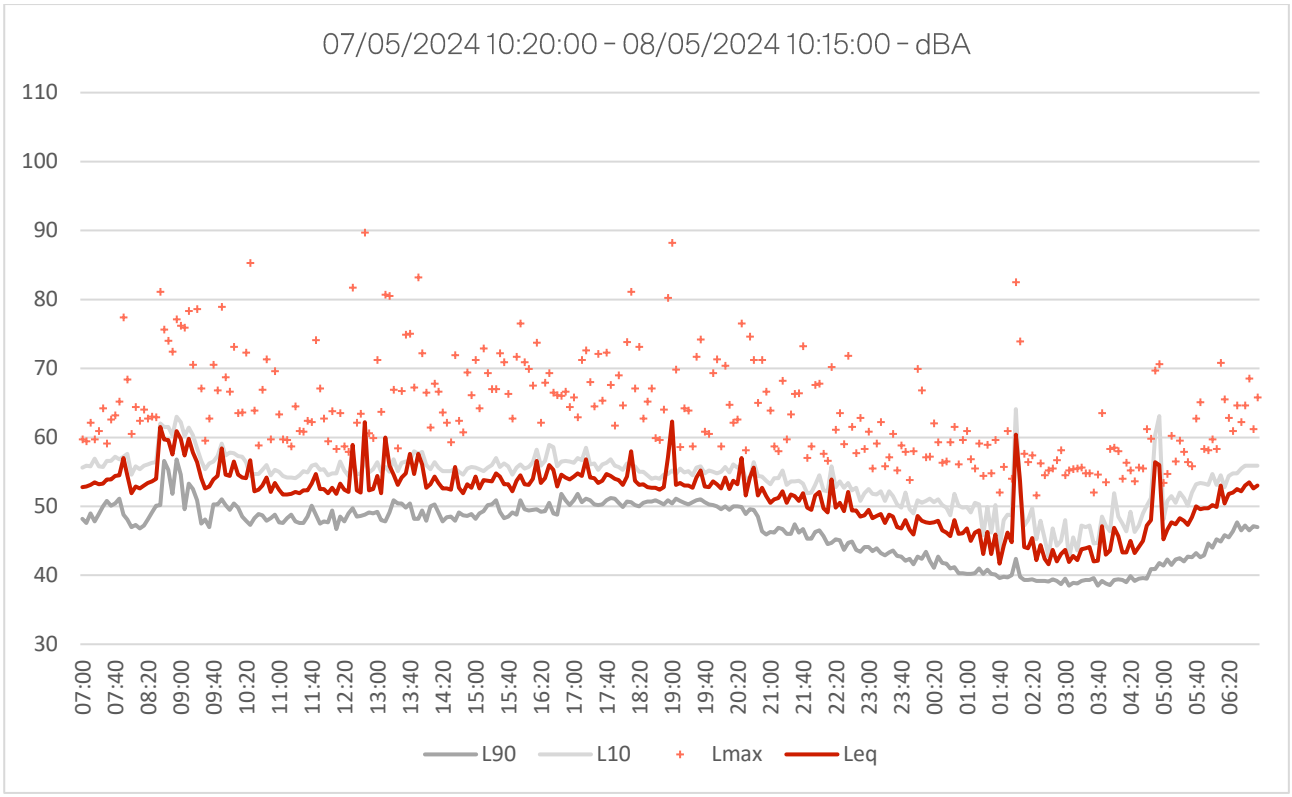
Monitoring Position 1



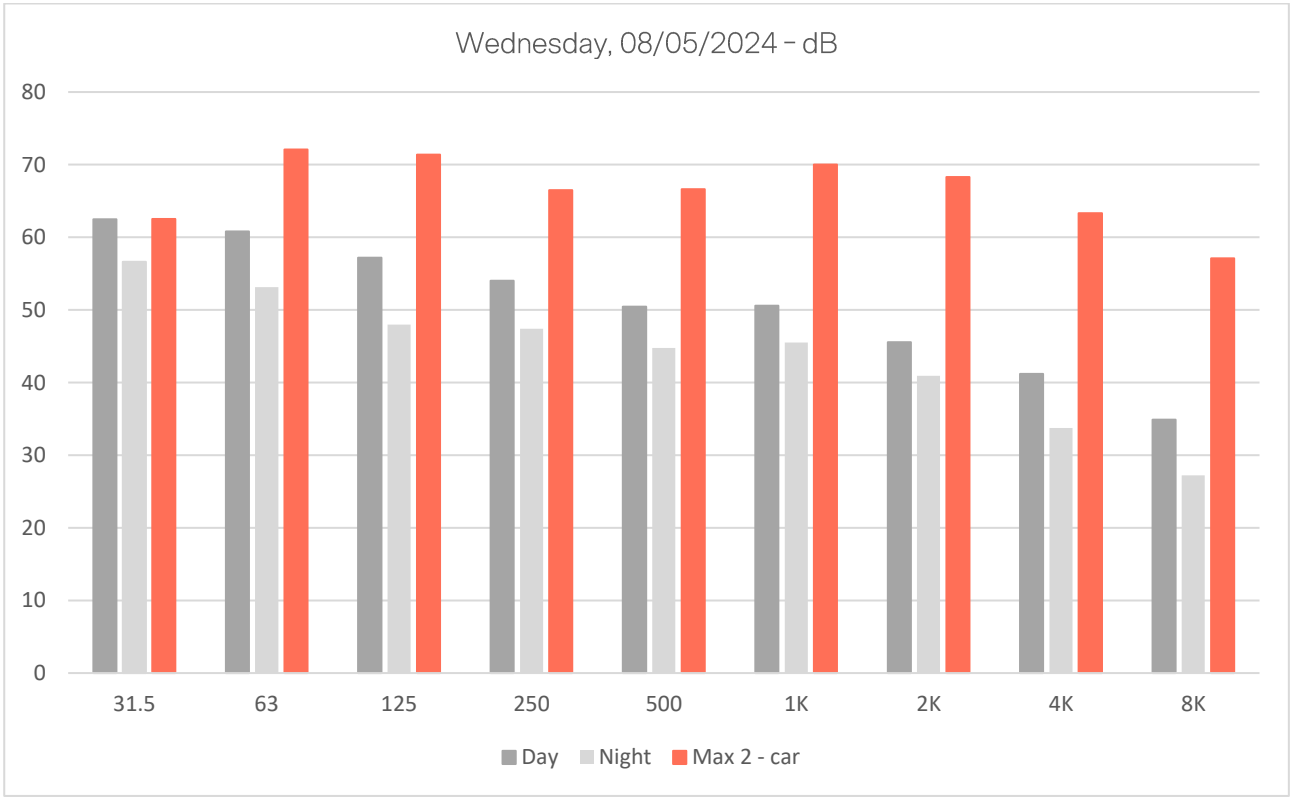
Un-weighted 1:1 Octave Results



Monitoring Position 2



Un-weighted 1:1 Octave Results



Glossary of Acoustical Terms

A-weighting

Noise levels are corrected to represent human response to sound.

L_{Aeq}

This is a continuous equivalent of time varying noise, or effectively the average measured (A weighted) noise level over a defined period of time.

$L_{Aeq,16hour}$

A 16 hour long measurement of the L_{Aeq} over the period between 07:00 and 23:00, also known as a daytime measurement.

$L_{Aeq,8hour}$

An 8 hour long measurement of the L_{Aeq} over the period between 23:00 and 07:00, also known as a night time measurement.

L_{AFmax}

The highest, or maximum A-weighted sound pressure level measured over a specified time period. The 'F' defines a time weighting in Fast.

L_{A90}

The A-weighted noise level or average level which is exceeded for 90 percent of the measured time period. Also known as a background level.

L_{A10}

The A-weighted noise level or average level which is exceeded for 10 percent of the measured time period.

1:1 & 1:3 octave spectrum analysis

A single measurement that is separated into frequency bands to allow for a more detailed analysis of the noise source in question.

R_w

The weighted sound reduction index of a partition or facade. A single number value based on the performance of a partition between two rooms across the frequency range 100Hz to 3150Hz. The level is adjusted for the effects of reverberation and background noise.

$D_{n,e,w}$

The weighted level difference of a partition or façade which takes into account a small element such as a grill or vent.

SEL (sound exposure level)

A measure of A-weighted sound energy used to describe a particular event, such as a train pass. It is the sound energy, which, if occurring over one second would contain the same energy as the event.

Free field sound pressure

Is where the radiation or spread of sound is completely unaffected by the presence of any reflecting surfaces or boundaries.

Low Frequency Noise

A term generally used for sound below a frequency of 100 to 150Hz.

SPRATT+HAMER

Online
sprattandhamer.co.uk

Email
info@sprattandhamer.co.uk

Birmingham
Lewis Building, Bull Street
Birmingham, B4 6AF
0121 828 3120

London
100 Borough High Street,
London, SE1 1LB
0203 286 2019

Liverpool
23 Roscoe Street, Liverpool
L1 2SX
0151 933 6186

Manchester
Peter House, Oxford Street
Manchester, M1 5AN
0161 521 9383