# Whitbread Group PLC

# Premier Inn, Euston

# Noise Assessment

# July 2019

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| 3 | 04th July 2019 | Third Issue – Updated Annexe Layout + Guidance |
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## Appendix Contents

## Executive Summary

This report presents the findings of a noise assessment undertaken for a proposed two storey extension to the roof of the existing hotel and a proposed seven storey annexe extension to the existing Premier Inn located at 1 Duke's Road, London.

Glazing and ventilation with a minimum sound reduction of $R_w + C_{tr}$ 42 dB will feature for northern facades of the 2-storey roof extension and between $R_w + C_{tr}$ 32 - 39 dB will feature for other facades of the 7-storey annexe of the development. All areas will feature mechanical ventilation in order to meet both ventilation and internal ambient noise criteria.

An assessment of building services plant has shown that plant noise rating levels are expected to be more than 10 dB below background noise levels at nearby sensitive receptors and therefore expected to have a low impact.

Therefore, the proposed development will not have a 'significant adverse impact' on health, amenity or quality of life.

# 1.0 Introduction

## 1.1 Purpose of this Report

This report presents the findings of a noise assessment undertaken for a proposed two storey extension to the roof of the existing hotel and a proposed seven storey annexe extension to the existing Premier Inn located at 1 Duke's Road, London.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from the proposed development have been predicted, based on noise measurements at local representative receptors, using CADNA noise modelling software which incorporates ISO 9613 methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and sketches as visual aids to the assessment are presented in Appendix B. This version of the report incorporates an updated layout to the proposed seven storey annexe and updates to the National Planning Policy Framework (NPPF).

## 1.2 Legislative Context (England)

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in the National Planning Policy Framework (NPPF), published on 19th February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

*"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:*

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

A further 2 short statements are presented at paragraph 180, which state:

*"180. 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."*

Furthermore, paragraphs 182 and 183 state:

> *"182. 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.*
>
> *183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to, *'identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.'*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

**Table 1.1 Noise Exposure Hierarchy**

| Perception | Examples of Outcomes | Increasing Effect Level | Action |
|---|---|---|---|
| Not noticeable | No Effect | No Observed Effect | No Specific Measures Required |
| Noticeable and not intrusive | Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life. | No Observed Adverse Effect (NOEL) | No Specific Measures Required |
| Lowest Observed Adverse Effect Level (LOAEL) | | | |
| Noticeable and intrusive | Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life. | Observed Adverse Effect | Mitigate and reduce to a minimum |
| Significant Observed Adverse Effect Level (SOAEL) | | | |
| Noticeable and disruptive | The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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 |
| Noticeable and very disruptive | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory | Unacceptable Observed Adverse Effect | Prevent |

The NPPF, NSPE and PPG: Noise do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including the 'World Health Organisation Community Noise Guidelines' (1999) and 'BS 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings' (2014), Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG: Noise also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

## 1.3 Acoustic Consultants' Qualifications, Professional Memberships

The lead project Acoustic Consultant is Lewis Kelter. The report has been checked by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

| Name | Education | Institute of Acoustics Post Graduate Diploma in Acoustic and Noise Control (Pass Date) | Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics) | Attained Associate Membership of the Institute of Acoustics (date) | Attained Membership of the Institute of Acoustics (date) |
|---|---|---|---|---|---|
| Emma Aspinall | MGeol 2017 | - | Jul 2017 | - | |
| Lewis Kelter | BSc 2016 | Dec 2018 | Jun 2016 | Dec 2018 | - |
| Nigel Mann | BSc 1997<br>Msc 1999 | Nov 2001 | Nov 1998 | Nov 2001 | Jul 2005 |

# 2.0 Assessment Criteria

## 2.1 Internal Noise Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Tables 2.1 and 2.2 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

*BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings*'

*'World Health Organisation Community Noise Guidelines' (1999)*

*BS 4142: 2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound'*

**Table 2.1 Noise Level Criteria and Actions (Noise Intrusion & Proposed Plant Assessments)**

| Effect Level | Assessment | Noise Level Criteria |
|---|---|---|
| Lowest Observed Adverse Effect Level (LOAEL) | Building Services Plant | Noise Rating Level ($L_{Aeq,T}$) is greater than 10 dB below the background noise level ($L_{A90,T}$). |
| | Proposed Hotel Receptors | Bedrooms: 30 dB $L_{A10}$ / 45 dB $L_{A01}$ |
| Significant Observed Adverse Effect Level (SOAEL) | Building Services Plant | Noise Rating Level ($L_{Aeq,T}$) is 5 dB above the background noise level ($L_{A90,T}$). |
| | Proposed Hotel Receptors | Bedrooms: 35 dB $L_{A10}$ / 45 dB $L_{A01}$ |

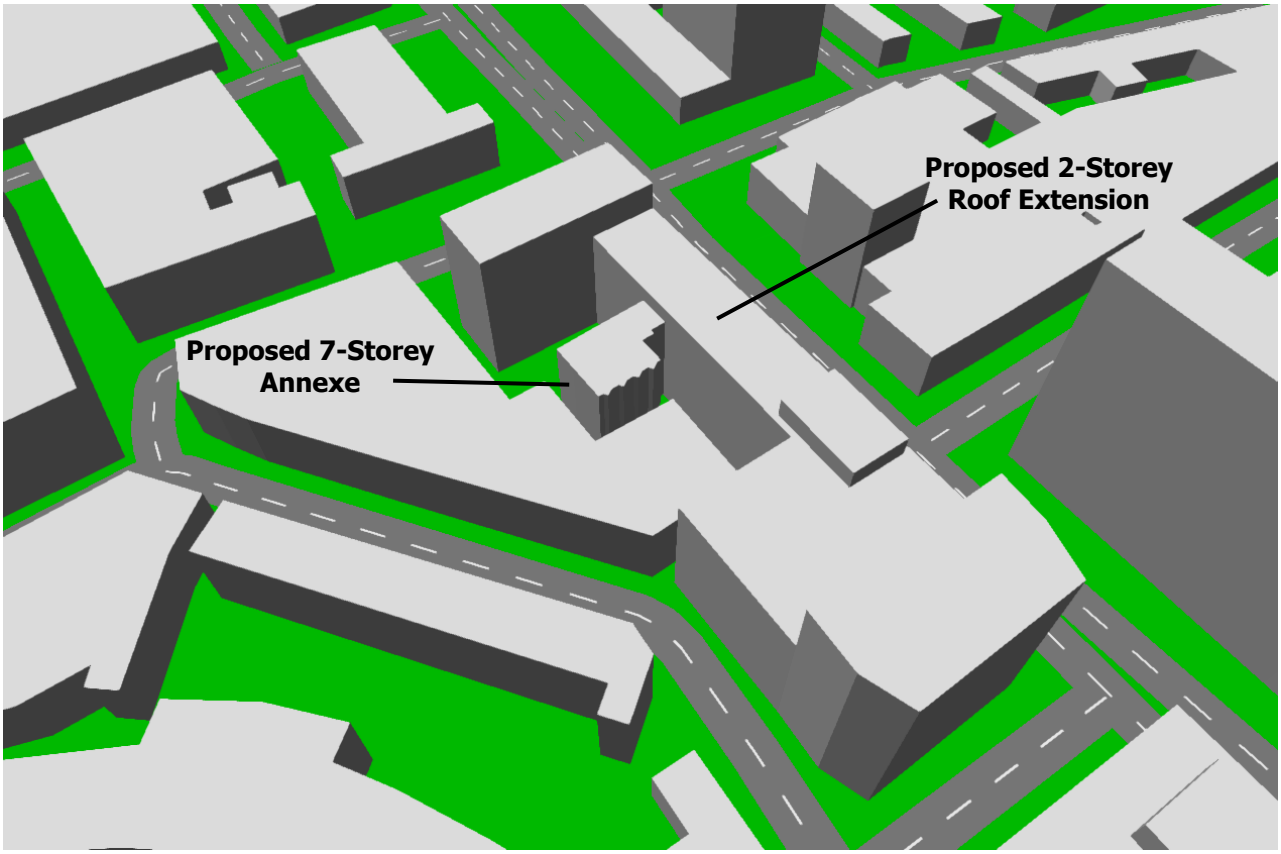
# 3.0 Assessment Methodology

## 3.1 Noise Modelling Methodology

Three dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations. The model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for several receptor points and different noise emission scenarios both horizontally and vertically.

The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in Table 3.1 below have been used.

**Figure 3.1 CADNA Noise Model**




The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.

**Table 3.1 Modelling Parameters Sources and Input Data**

| Parameter | Source | Details |
|---|---|---|
| Horizontal distances – around site | Ordnance Survey | Ordnance Survey |
| Ground levels – around site | Ordnance Survey | Ordnance Survey |
| Building heights – around site | WYG Observations | 8 m height for two storey properties, 3m per additional storey |
| Reflections | WYG | First order reflections have been applied based on mirror image sources |
| Proposed Plans | CHQ Architects | Drawing Number: CHQ.15.11690-PL06<br>Dated: March 2019 |

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst case.

## 3.2 Model Input Data

### 3.2.1 Existing Building Services Plant Noise Data

Existing building services plant associated located on the roof and to the rear of the existing Premier Inn, which is understood to be retained, has been modelled as point sources in the model. The noise data presented in the table below was measured on site during the attended survey.

**Table 3.2 Plant Noise Data**

| Description | Frequency (Hz) | | | | | | | | | Total $L_{Aeq}$ dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| | 35 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Plant 1 (Rear of Premier Inn) | 71.9 | 72.6 | 70.9 | 67.7 | 70.7 | 71.1 | 65.6 | 61.1 | 52.6 | 74.2 |
| Condenser (Premier Inn Roof) | 61.9 | 61.4 | 57.1 | 54.6 | 50.5 | 45.4 | 40.3 | 35.9 | 33.7 | 52.2 |
| Breakout from Plant Room (Premier Inn Roof) | 74.4 | 72.8 | 64.4 | 60.2 | 55.8 | 56.6 | 51.9 | 45.9 | 33.7 | 60.6 |
| Plant 2 (Premier Inn Roof) | 71.2 | 69.7 | 61.9 | 62.1 | 57.1 | 56.7 | 53.7 | 51.8 | 49.2 | 61.9 |

### 3.2.2 Existing Car park / Service yard Noise Data

Area sources have been included in the model to represent noise from the existing car park / service yard area to the rear of the hotel. The following noise data has been included as an area source across the entire area of the car park/service yard within the model.

**Table 3.3 Car Park/Service Yard Noise**

| Description | dB(A) @ 1m |
|---|---|
| Car Park / Service Yard Noise | 69.3 dB $L_{Aeq}$<br>80.0 dB $L_{Amax}$ |

### 3.2.3 Model Verification (Existing Ambient Noise Climate)

The models were verified by representing the monitoring locations for the 'existing' scenario, including contributions from the surrounding road network. Worst-case daytime and night-time $L_{Aeq}$ and night time $L_{Amax}$ scenarios have been verified. The comparison between the monitoring and modelling results are shown in the tables below.

**Table 3.4 Modelled vs. Monitored Results $L_{Aeq;\ daytime\ 07:00 – 23:00}$**

| Location | Monitored $L_{Aeq}$ | Modelled $L_{Aeq}$ | Difference between Monitored and Modelled Results |
|---|---|---|---|
| LT1 | 72.1 | 72.1 | 0.0 |
| LT2 | 58.6 | 58.6 | 0.0 |
| ST1 | 72.4 | 75.1 | 2.7 |
| ST2 | 66.0 | 66.0 | 0.0 |
| ST3 | 58.9 | 58.9 | 0.0 |
| ST4 | 70.3 | 70.3 | 0.0 |
| ST5 | 58.5 | 58.5 | 0.0 |

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa

**Table 3.5 Modelled vs. Monitored Results $L_{Aeq;\ night\text{-}time\ 23:00– 07:00}$**

| Location | Monitored $L_{Aeq}$ | Modelled $L_{Aeq}$ | Difference between Monitored and Modelled Results |
|---|---|---|---|
| LT1 | 69.7 | 69.7 | 0.0 |
| LT2 | 53.9 | 53.9 | 0.0 |
| ST1 | 74.8 | 72.7 | -2.1 |
| ST2 | 62.9 | 62.9 | 0.0 |
| ST3 | 53.4 | 53.4 | 0.0 |
| ST4 | 62.0 | 62.0 | 0.0 |
| ST5 | 58.7 | 58.7 | 0.0 |

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa

**Table 3.6 Modelled vs. Monitored Results $L_{Amax;\ night\text{-}time\ 23:00\text{-}07:00}$**

| Location | Monitored $L_{Amax}$ | Modelled $L_{Amax}$ | Difference between Monitored and Modelled Results |
|---|---|---|---|
| LT1* | 87.5 | 87.5 | 0.0 |
| LT2 | 77.4 | 77.4 | 0.0 |

| Location | Monitored $L_{Amax}$ | Modelled $L_{Amax}$ | Difference between Monitored and Modelled Results |
|---|---|---|---|
| ST1 | 87.6 | 90.5 | 2.9 |
| ST2 | 80.7 | 80.7 | 0.0 |
| ST3 | 68.8 | 68.8 | 0.0 |
| ST4 | 76.9 | 76.9 | 0.0 |
| ST5 | 75.1 | 75.1 | 0.0 |

All values are sound pressure levels in dB re: 2x $10^{-5}$ Pa
*90th Percentile Verification used

The verification points show no divergence between monitored and modelled results at all monitoring locations during the Daytime $L_{Aeq}$, Night-time $L_{Aeq}$ and Night-time $L_{Amax}$ scenarios. This is with the exception of monitoring location ST1 which shows a divergence of up to +/- 2.9 across the scenarios. This is attributable to the stop/start nature of busy London traffic producing inconsistent results. However, greatest weight and confidence has been given to the long-term monitoring locations due to the longer exposure time.

Whilst the highest maximum noise level recorded at each monitoring location are presented in Table 4.3, following a review of the long-term monitoring data, the ninetieth percentile of the maximum noise levels recorded during each five-minute night-time measurement period of the survey has been used to represent $L_{Amax}$ noise levels from vehicle drive-bys and exclude extreme singular noise events such as emergency vehicle sirens which were identified in the audio files. Therefore, all models are considered to be suitably verified.

### 3.2.4 Proposed Building Services Plant (BSP) Noise Data

### 3.2.5 Building Services Plant Noise Data

Point sources have been plotted in the model to represent all proposed new external plant associated with the proposed extension. It is understood that the plant detailed below will be installed on the roof of the proposed 5th and 6th floor extension of the main building, the noise levels detailed in these tables have been used within the model. The locations of the proposed BSP can be seen in SK02 of Appendix B.

**Table 3.7 Roof Mounted Plant Noise Levels**

| Description | Sound Power Level (dBA) |
|---|---|
| 4x Mitsubishi PURY-P200-YLM-AL VRF Condenser Units | 58.0 @ 1m |
| 1 x Mitsubishi CAHV-P500-YA-HPB 'Heating Only' heat pump | 59.0 @ 1m |

## 3.3 Sensitive Receptors

Table 3.8 summarises receptor locations that have been selected to represent existing and proposed residential receptors with respect to noise from the development (BSP). The locations of the receptors are shown on SK02 in Appendix B.

For the purpose assessing the impact onto the proposed development from the existing surrounding environment, receptors have been positioned on all proposed facades, at all proposed levels. The locations of the receptors are shown on SK05 and SK06 in Appendix B.

**Table 3.8 Sensitive Receptor Locations**

| Ref. | Description | Height (m) |
|---|---|---|
| ER1 | 5th Floor Somerton House Eastern Facade | 15.0 |
| ER2 | 5th Floor Somerton House Eastern Facade | 15.0 |
| ER3 | 5th Floor Somerton House Eastern Facade | 15.0 |
| ER4 | 8th Floor Somerton House Eastern Facade | 26.0 |
| ER5 | 8th Floor Somerton House Eastern Facade | 26.0 |
| ER6 | 5$^{th}$ Floor Premier Inn Southern Facade | 15.0 |
| ER7 | 5$^{th}$ Floor Premier Inn Southern Facade | 15.0 |
| ER8 | 5$^{th}$ Floor Premier Inn Southern Facade | 15.0 |
| ER9 | 5$^{th}$ Floor Premier Inn Southern Facade | 15.0 |
| ER10 | 8$^{th}$ Floor Pullman Hotel Southern Facade | 26.0 |
| ER11 | 8$^{th}$ Floor Premier Inn Southern Facade | 26.0 |
| ER12 | Flaxman Court | 15.0 |
| ER13 | Flaxman Court | 15.0 |
| ER14 | Flaxman Court | 15.0 |
| ER15 | Flaxman Court | 15.0 |
| ER16 | 45 Burton Street | 12.0 |
| ER17 | 22 Dukes Road | 12.0 |
| ER18 | 22 Dukes Road | 12.0 |
| ER19 | 10 Dukes Road | 12.0 |
| PR1 | 6$^{th}$ Floor Proposed Annexe Eastern Facade | 16.5 |
| PR2 | 6$^{th}$ Floor Proposed Annexe Eastern Facade | 16.5 |
| PR3 | 7$^{th}$ Floor Proposed Roof Extension Northern Facade | 22.5 |
| PR4 | 7$^{th}$ Floor Proposed Roof Extension Northern Facade | 22.5 |
| PR5 | 7$^{th}$ Floor Proposed Roof Extension Northern Facade | 22.5 |

# 4.0 Noise Survey

## 4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

| | | | |
|---|---|---|---|
| Rion NL-32 | Environmental Noise Analyser (WYG11) | s/n | 1021257 |
| Rion NL-52 | Environmental Noise Analyser (WYG15) | s/n | 620858 |
| Rion NL-52 | Environmental Noise Analyser (WYG16) | s/n | 1221576 |
| Rion NC-74 | Sound Calibrator | s/n | 35046823 |

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice and no drift was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A baseline monitoring survey was undertaken at seven locations (as specified in the following table and shown in SK01 of Appendix B) from Thursday 12th October 2017 to Tuesday 17rd October 2017. Attended short term measurements were undertaken at five locations during day, evening and night-time periods with two additional locations being measured unattended over a 120-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry and generally clear. Anemometer readings confirmed that wind speeds were less than 5 $ms^{-1}$ at all times during the survey, with a predominant south-westerly wind direction, during the survey.

**Table 4.1 Noise Monitoring Locations**

| Ref | Description | Grid Reference | |
|---|---|---|---|
| | | X | Y |
| LT1 | Roof of Premier Inn overlooking A501 | 529900 | 182660 |
| LT2 | Roof of Premier Inn overlooking rear car park | 529908 | 182648 |
| ST1 | Junction of A501 and Chalton Street | 529916 | 182702 |
| ST2 | Duke's Road | 529859 | 182585 |
| ST3 | Flaxman Terrace | 529928 | 182599 |
| ST4 | Junction of Bidborough Street and Mabledon Place | 529994 | 182672 |
| ST5 | Cartwright Gardens | 529990 | 182571 |

## 4.2 Noise Survey Results

The predominant noise source around the site is traffic noise from the A501 and road traffic noise from other surrounding roads; Bidborough Street, Duke's Road, Flaxman Terrace and Mabledon Place. Additional contributions from aircraft and localised plant noise were also observed during the survey.

Ambient and background noise levels are usually described using the $L_{Aeq}$ index (a form of energy average) and the $L_{A90}$ index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the $L_{A10}$ index (i.e. the level exceeded for 10% of the measurement period).

**Table 4.2 Meteorological Conditions during the Survey**

| Survey Location | Date & Time | Temperature (ºC) | Wind Speed (m/s) | Wind Direction | Cloud Cover (Oktas) | Dominant Noise Source |
|---|---|---|---|---|---|---|
| Day ST1 | 12/10/2017 13:28 | 16.0 | 1-2 | SW | 2 | Traffic on A501 which is sometimes stationary because of congestion. Pedestrians, often with wheeled suitcases |
| Day ST2 | 12/10/2017 14:18 | 16.0 | 0-1 | - | 5 | Traffic on A501. Pedestrians on Duke's Road |
| Day ST3 | 12/10/2017 15:11 | 14.0 | 0-1 | - | 3 | Traffic on A501 and occasional traffic on Flaxman Terrace. |
| Day ST4 | 12/10/2017 14:38 | 15.0 | 2-3 | SW | 6 | Traffic on A501, Bidborough Street and Mabledon Place. Pedestrians |
| Day ST5 | 12/10/2017 14:54 | 14.0 | 2-3 | SW | 4 | Traffic on Mabledon Place and A501. Wind in trees. Tennis being played |
| Evening ST1 | 12/10/2017 21:16 | 14.0 | 1-2 | W | 2 | Traffic on A501 |
| Evening ST2 | 12/10/2017 21:35 | 14.0 | 0-1 | - | 2 | Traffic on A501 |
| Evening ST3 | 12/10/2017 21:52 | 14.0 | 0-1 | - | 2 | Traffic on A501. Pedestrians |
| Evening ST4 | 12/10/2017 22:09 | 14.0 | 1-2 | NW | 0 | Traffic on A501, Bidborough Street and Mabledon Place. Pedestrians |
| Evening ST5 | 12/10/2017 22:25 | 13.0 | 0-1 | - | 2 | Traffic on A501 and Mabledon Place. Pedestrians |
| Night ST1 | 13/10/2017 00:34 | 13.0 | 0-1 | - | 2 | Traffic on A501 |
| Night ST2 | 12/10/2017 23:02 | 13.0 | 1-2 | N | 2 | Traffic on A501 |
| Night ST3 | 12/10/2017 23:22 | 13.0 | 0-1 | - | 2 | Traffic on A501 |
| Night ST4 | 13/10/2017 00:11 | 13.0 | 0-1 | - | 2 | Traffic on A501 |
| Night ST5 | 12/10/2017 23:52 | 13.0 | 0-1 | - | 2 | Traffic on A501 and Mabledon Place. Pedestrians on surrounding roads |

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2 x $10^{-5}$ Pa). For the long-

term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the $L_{A90}$ is the modal noise level of each 5 minute measurement over the stated survey period.

**Table 4.3 Results of Baseline Noise Monitoring Survey (Average Levels)**

| Period | Duration (T) | Monitoring Date and Times | Location | $L_{Aeq,T}$ (dB) | $L_{Amax,T}$ (dB) | $L_{Amin,T}$ (dB) | $L_{A10,T}$ (dB) | $L_{A90,T}$ (dB) |
|---|---|---|---|---|---|---|---|---|
| Weekday Daytime 07:00 - 23:00 | 48 Hours | 12/10/2017 - 17/10/2017 12:52 - 12:32 | LT1 | 72.1 | 102.4 | 55.5 | 72.4 | 66.0 |
| Weekday Night-time 23:00 – 07:00 | 24 Hours | 12/10/2017 - 17/10/2017 23:00 - 07:00 | | 69.5 | 100.1 | 48.9 | 72.0 | 56.0 |
| Weekend Daytime 07:00 - 23:00 | 32 Hours | 14/10/2017 - 15/10/2017 07:00 - 23:00 | | 70.3 | 100.5 | 52.7 | 71.6 | 64.0 |
| Weekend Night-time 23:00 – 07:00 | 16 hours | 14/10/2017 - 15/10/2017 00:00 - 23:59 | | 69.7 | 100.2 | 50.0 | 72.2 | 60.0 |
| Weekday Daytime 07:00 - 23:00 | 47 Hours | 12/10/2017 - 17/10/2017 13:00 - 12:00 | LT2 | 58.6 | 98.0 | 49.2 | 59.5 | 54.0 |
| Weekday Night-time 23:00 – 07:00 | 24 Hours | 12/10/2017 - 17/10/2017 23:00 - 07:00 | | 53.7 | 77.4 | 46.1 | 55.2 | 49.0 |
| Weekend Daytime 07:00 - 23:00 | 32 Hours | 14/10/2017 - 15/10/2017 07:00 - 23:00 | | 57.2 | 85.9 | 48.0 | 58.4 | 52.0 |
| Weekend Night-time 23:00 – 07:00 | 16 hours | 14/10/2017 - 15/10/2017 00:00 - 23:59 | | 53.9 | 76.5 | 46.0 | 55.7 | 50.0 |
| Daytime 07:00 - 19:00 | 15 Mins | 12/10/2017 13:28 | ST1 | 72.4 | 83.1 | 65.7 | 75.0 | 68.5 |
| | 15 Mins | 12/10/2017 14:18 | ST2 | 66.0 | 86.1 | 55.9 | 66.5 | 58.8 |
| | 15 Mins | 12/10/2017 15:11 | ST3 | 58.9 | 78.1 | 50.8 | 59.6 | 53.4 |
| | 15 Mins | 12/10/2017 14:38 | ST4 | 70.3 | 89.2 | 55.9 | 69.8 | 59.9 |
| | 15 Mins | 12/10/2017 14:54 | ST5 | 58.5 | 77.0 | 49.5 | 60.5 | 52.1 |
| | 15 Mins | 17/10/2017 12:21 | ST6 | 60.7 | 77.3 | 52.9 | 62.4 | 57.5 |
| Evening 19:00 - 23:00 | 15 Mins | 12/10/2017 21:16 | ST1 | 73.0 | 93.3 | 61.6 | 75.5 | 65.9 |
| | 15 Mins | 12/10/2017 21:35 | ST2 | 62.0 | 77.6 | 52.9 | 63.1 | 55.6 |
| | 15 Mins | 12/10/2017 21:52 | ST3 | 56.3 | 73.1 | 49.4 | 59.1 | 51.5 |
| | 15 Mins | 12/10/2017 22:09 | ST4 | 64.9 | 85.8 | 52.4 | 66.7 | 56.7 |
| | 15 Mins | 12/10/2017 22:25 | ST5 | 57.4 | 82.5 | 47.1 | 56.6 | 49.7 |
| Night-time 23:00 - 07:00 | 15 Mins | 13/10/2017 00:34 | ST1 | 74.8 | 87.6 | 57.2 | 77.0 | 63.5 |
| | 15 Mins | 12/10/2017 23:02 | ST2 | 62.9 | 80.7 | 52.0 | 63.6 | 55.6 |
| | 15 Mins | 12/10/2017 23:22 | ST3 | 53.4 | 68.8 | 48.9 | 54.2 | 50.3 |
| | 15 Mins | 13/10/2017 00:11 | ST4 | 62.0 | 76.9 | 50.8 | 64.7 | 54.1 |
| | 15 Mins | 12/10/2017 23:52 | ST5 | 58.7 | 86.1 | 44.6 | 55.2 | 46.9 |

# 5.0 Assessment of Key Effects

## 5.1 Building Services Plant Noise Assessment

This assessment has been undertaken in order to establish the effect of noise levels from the proposed building services plant. The assessment compares the predicted worst-case breakout noise levels from proposed plant with the existing measured average background noise ($L_{A90}$) at the closest proposed and existing residential receptors. As the proposed plant noise could contain a tonal elements and intermittency, a +5 dB correction to account for potential acoustic features of the noise sources (specified in 9.2 and 10 of BS 4142) has been added to create the Plant 'Rating Level at Receptor'.

**Table 5.1 BS 4142 Assessment for Potential Building Services Plant (Existing Receptors)**

| Ref | Existing Measured Average Background $L_{A90}$ | | Specific Noise Levels $L_{Aeq}$ | | Noise rating level from plant (with +5 dB Correction) | | BS 4142 Score | |
|---|---|---|---|---|---|---|---|---|
| | Daytime | Night-time | Daytime | Night-time | Daytime | Night-time | Daytime | Night-time |
| ER1 | 52 | 49 | 18 | 18 | 23 | 23 | -29 | -26 |
| ER2 | 52 | 49 | 17 | 17 | 22 | 22 | -30 | -27 |
| ER3 | 52 | 49 | 17 | 17 | 22 | 22 | -31 | -28 |
| ER4 | 64 | 60 | 24 | 24 | 29 | 29 | -35 | -31 |
| ER5 | 64 | 60 | 24 | 24 | 29 | 29 | -35 | -31 |
| ER6 | 52 | 49 | 14 | 14 | 19 | 19 | -33 | -30 |
| ER7 | 52 | 49 | 20 | 20 | 25 | 25 | -27 | -24 |
| ER8 | 52 | 49 | 22 | 22 | 27 | 27 | -25 | -22 |
| ER9 | 52 | 49 | 24 | 24 | 29 | 29 | -23 | -20 |
| ER10 | 64 | 60 | 27 | 27 | 32 | 32 | -32 | -28 |
| ER11 | 64 | 60 | 24 | 24 | 29 | 29 | -36 | -32 |
| ER12 | 53 | 50 | 19 | 19 | 24 | 24 | -29 | -26 |
| ER13 | 53 | 50 | 22 | 22 | 27 | 27 | -26 | -23 |
| ER14 | 53 | 50 | 21 | 21 | 26 | 26 | -28 | -24 |
| ER15 | 53 | 50 | 19 | 19 | 24 | 24 | -29 | -26 |
| ER16 | 53 | 50 | 18 | 18 | 23 | 23 | -31 | -27 |
| ER17 | 53 | 50 | 20 | 20 | 25 | 25 | -28 | -25 |
| ER18 | 53 | 50 | 13 | 13 | 18 | 18 | -35 | -32 |
| ER19 | 59 | 56 | 14 | 14 | 19 | 19 | -40 | -37 |
| PR1 | 52 | 49 | 23 | 23 | 28 | 28 | -24 | -21 |
| PR2 | 52 | 49 | 13 | 13 | 18 | 18 | -34 | -31 |
| PR3 | 64 | 60 | 26 | 26 | 31 | 31 | -33 | -29 |
| PR4 | 64 | 60 | 26 | 26 | 31 | 31 | -33 | -29 |
| PR5 | 64 | 60 | 27 | 27 | 32 | 32 | -33 | -29 |

All values are sound pressure levels in dBA re: 2x $10^{-5}$ Pa.

The assessment above shows that plant noise rating levels are predicted to be more than 10 dB below background noise levels at all sensitive receptor locations during the daytime and night-time, as such the proposed plant noise falls within the No Observed Adverse Effect Level and is predicted to have no impact at surrounding sensitive receptors.

## 5.2 Hotel Noise Intrusion Assessment

Internal noise levels, at all the hotel bedrooms/living of the proposed development, based on the existing ambient noise climate, have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of a glazing with a sound reduction of 32 dB has been used unless stated otherwise. It is understood that windows may be openable however, mechanical supply and extract ventilation will be used.

For the purposes of the assessment, noise sources including the service yard to the hotel and car parking to the rear of the site have been included.

Where the relevant internal ambient noise level criteria are not met with double-glazing ($R_w$ + $C_{tr}$ 32 dB) then the requirement for higher glazing specifications have been established. Enhanced glazing will be required for certain facades in order to achieve internal noise levels of 35/30 dB $L_{Aeq}$ for bedrooms during daytime and night-time and night-time $L_{Amax}$ of 45 dB. Details of the glazing types are presented in Appendix D.

**2-Storey Roof Extension**

Enhanced glazing with a minimum sound reduction of $R_w$ + $C_{tr}$ 42 dB will feature on the northern side of the proposed 6$^{th}$ and 7$^{th}$ floor extension facing Euston Road (A501) which is considered achievable with Premier Inn's bespoke urban Type B Triple Glazing provided by Abbey Glass (6mm/14mm/8.8mm/14mm/44mm). All other facades associated with the proposed extension will feature standard double glazing with a minimum sound reduction of $R_w$ + $C_{tr}$ 32 dB which would be achieved with Premier Inn's Standard Glazing Type D Double Glazing (8.8mm/20mm/6mm). Mechanical ventilation with a sound reduction equal to, or greater than the glazing will also feature in all areas of the proposed extension in order to achieve ventilation and internal ambient noise criteria.

**7-Storey Annexe**

Enhanced glazing with a minimum sound reduction of $R_w$ + $C_{tr}$ 39 dB will feature on the western side of the proposed annexe extension facing the hotel service yard which is considered achievable with Premier Inn's bespoke urban Type B Triple Glazing provided by Abbey Glass (6mm/14mm/8.8mm/14mm/44mm). All other facades associated with the proposed annexe will feature glazing with a minimum sound reduction of $R_w$ +

$C_{tr}$ 32 dB which would be achieved with Premier Inn's Standard Glazing Type D Double Glazing (8.8mm/20mm/6mm). Mechanical ventilation with a sound reduction equal to, or greater than the glazing will also feature in all areas of the proposed extension in order to achieve ventilation and internal ambient noise criteria.

The full assessment results are presented in Tables C1 and C2 in Appendix C; receptor locations and glazing specifications for all floors are shown on SK05 and SK06a-c of Appendix B.

# 6.0 Conclusions

This report presents the findings of a noise assessment undertaken for a proposed two storey extension to the roof of the existing hotel and a proposed seven storey annexe extension to the existing Premier Inn located at 1 Duke's Road, London.

*NPPF 170 (e) and 180 (a)*

In considering the NPPF test in Section 170 (e), the proposed development is not expected to have an 'adverse impact' on health or quality of life. Similarly, with regard to NPPF Section 180, point A, it is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by the use of the following mitigation:

A glazing and ventilation strategy has been provided which achieves both ventilation and internal ambient noise level requirements of $L_{Aeq\ daytime}$ 35 dB, $L_{Aeq\ night\text{-}time}$ of 30 dB and $L_{Amax\ night\text{-}time}$ of 45 dB in all spaces of the proposed development. For the proposed 2-storey roof extension, both floors will feature enhanced glazing with a sound reduction up to $R_w + C_{tr}$ 42 dB along the northern facade. For the proposed 7-storey annexe all floors will feature enhanced glazing with a sound reduction up to $R_w + C_{tr}$ 39 dB along the western facade. All areas of the proposed development will feature mechanical ventilation. The suggested glazing recommendations are achievable.

Noise rating levels from the proposed building services plant have been predicted which shows noise emissions from the plant will result in predicted noise levels more than 10 dB below the background noise level at nearby existing noise sensitive receptors during the daytime and night-time. External noise levels during the daytime and night-time are predicted to be below the NOAEL criteria at all sensitive receptor locations. Therefore, the proposed development will not have a 'significant adverse impact' on health, amenity or quality of life.

*NPPF 180 (b), 182 and 183*

The site is not highly prized for its tranquillity and recreational value in terms of noise. It is considered that the mitigation measures outlined within this report and suitable to reduce any noticeable and intrusive noise from the surrounding environment within proposed dwellings and therefore it is considered that existing businesses, which are surrounded by similarly sensitive residential properties, would not be restricted by the proposed development.

*Planning Practice Guidance*

It is considered that the noise mitigation in Section 5.0 of this report is sufficient to reduce the effects of any noticeable and disruptive noise being currently emitted from the surrounding environment by helping to prevent noise levels exceeding the BS 8233 criteria for daytime $L_{Aeq}$ within all areas of the proposed development.

# Appendices

# Appendix A – Acoustic Terminology & Abbreviations

Acoustic Terminology

dB — Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) — Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

$L_{Aeq}$ — Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00 - 23:00}$ for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the $L_{pA}$ at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00 - 23:00}$.

$L_{Amin}$ — The $L_{Amin}$ is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

$L_{Amax}$ — The $L_{Amax}$ is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

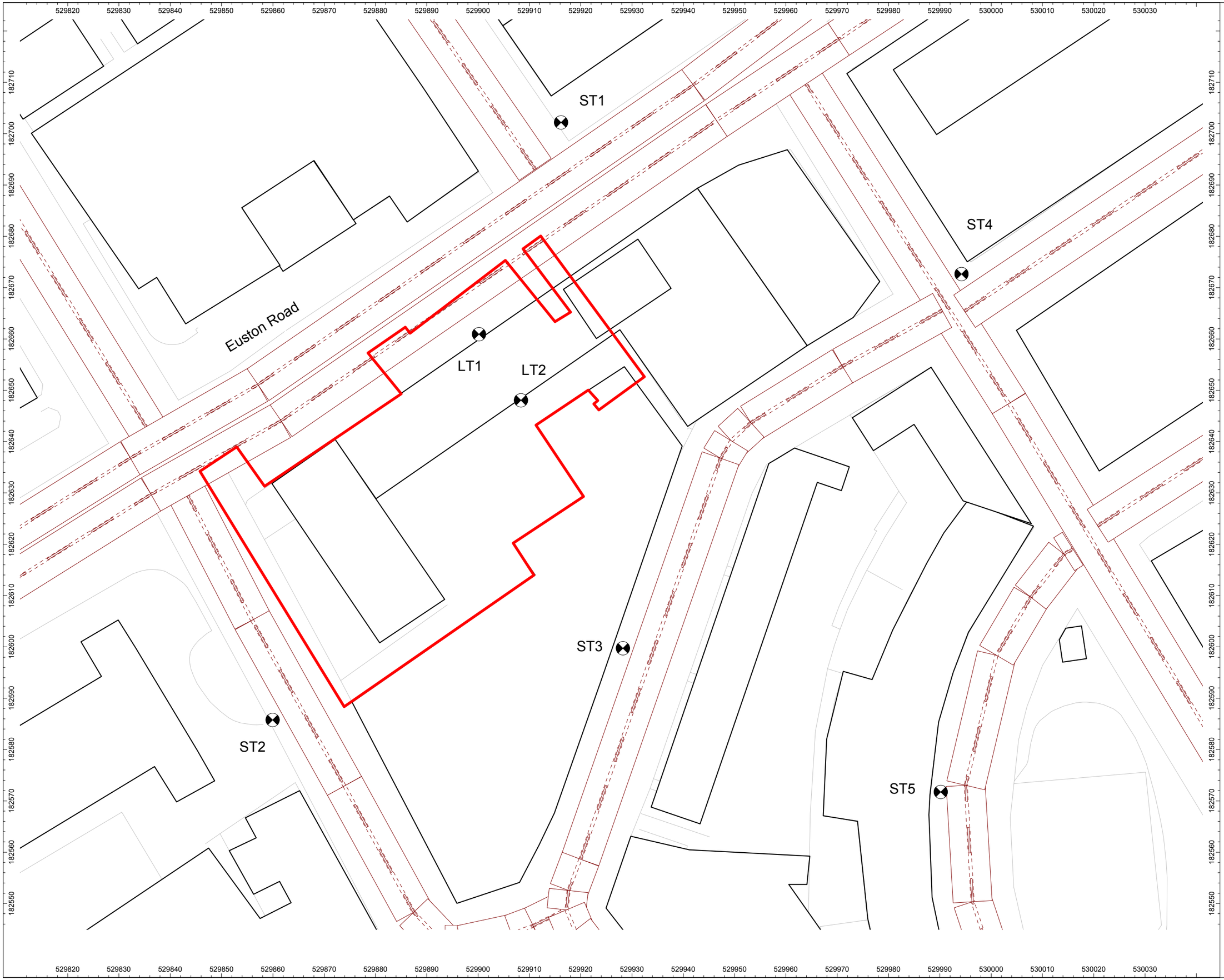
$L_n$ — Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The $L_{A10}$ index is often used in the description of road traffic noise, whilst the $L_{A90}$, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. $L_{A1}$ and $L_{Amax}$ are common descriptors of construction noise.

$R_w$ — The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

# Appendix B – Sketches

| | |
|---|---|
| SK01 | Noise Monitoring Location Plan |
| SK02 | Building Service Plant Sensitive Receptors |
| SK03 | Existing Daytime $L_{Aeq}$ Noise Contour |
| SK04 | Existing Night-time $L_{Aeq}$ Noise Contour |
| SK05 | Proposed Receptor Locations for 2-Storey Extension 6$^{th}$ and 7th Floors Including Glazing Recommendations |
| SK06a | Proposed Receptor Locations for 7-Storey Annexe Lower Ground Floor Including Glazing Recommendations |
| SK06b | Proposed Receptor Locations for 7-Storey Annexe Ground Floor Including Glazing Recommendations |
| SK06c | Proposed Receptor Locations for 7-Storey Annexe First – Fifth Floor Including Glazing Recommendations |




Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Noise Monitoring Locations

Drawing Number:
SK01

Key:

Site Boundary:

Scale : Not to scale

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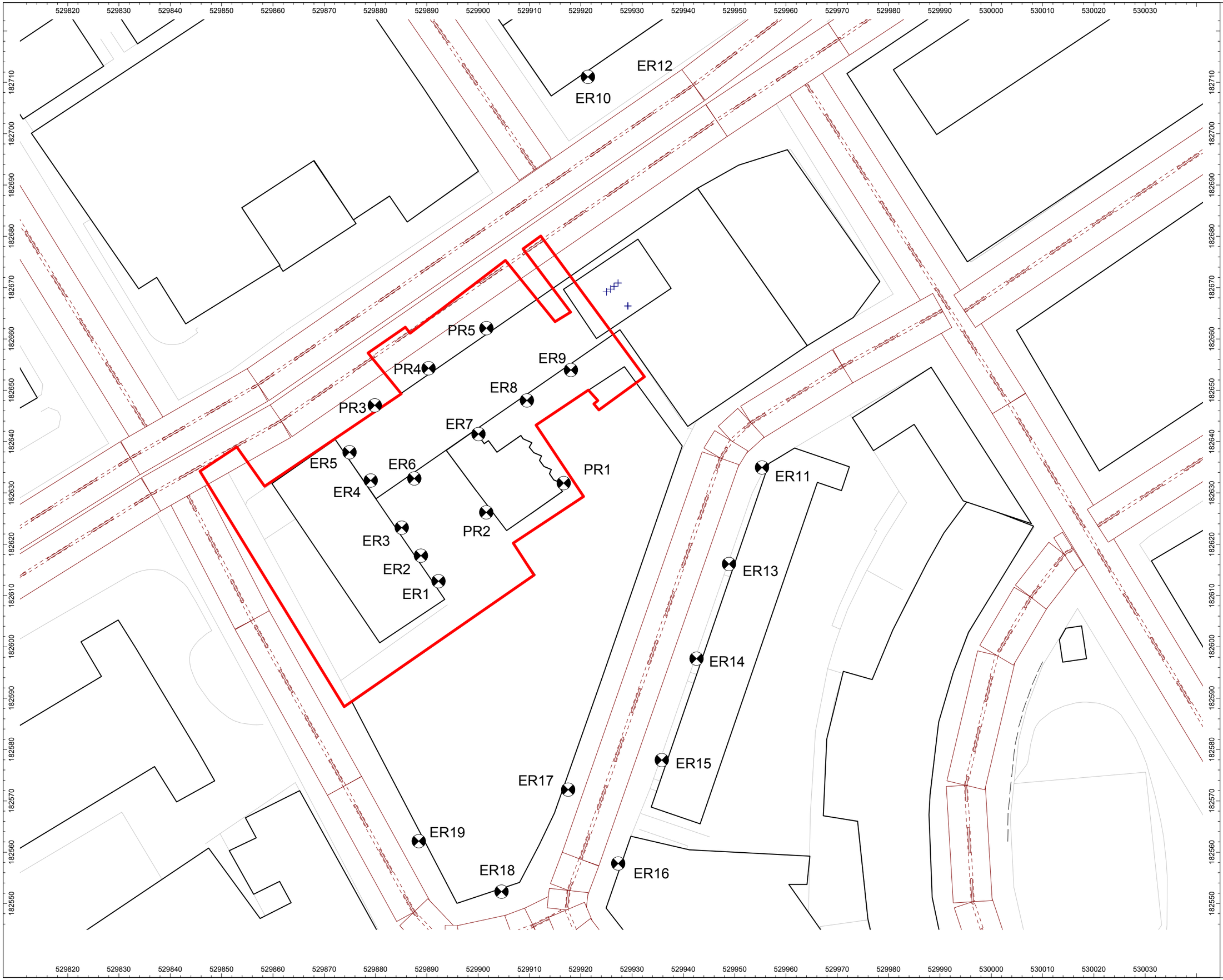
Licence Number AL 553611

Executive Park
Avalon Way
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000




Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Building Services Plant
Sensitive Receptor Locations

Drawing Number:
SK02

Key:

Site Boundary:

Proposed BSP
Location:

Scale : Not to scale

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Leicestershire
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Tel 0116 234 8000


Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Existing Daytime
LAeq, 16hr Noise Levels

Drawing Number:
SK03

Key:

Site Boundary:

- 0.0 - 40.0 dB
- 40.0 - 50.0 dB
- 50.0 - 60.0 dB
- >60.0 dB

Scale : Not to scale

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Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000

Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Existing Night-time
LAeq, 8hr Noise Levels

Drawing Number:
SK04

Key:

Site Boundary:

- 0.0 - 40.0 dB
- 40.0 - 50.0 dB
- 50.0 - 60.0 dB
- >60.0 dB

Scale : Not to scale

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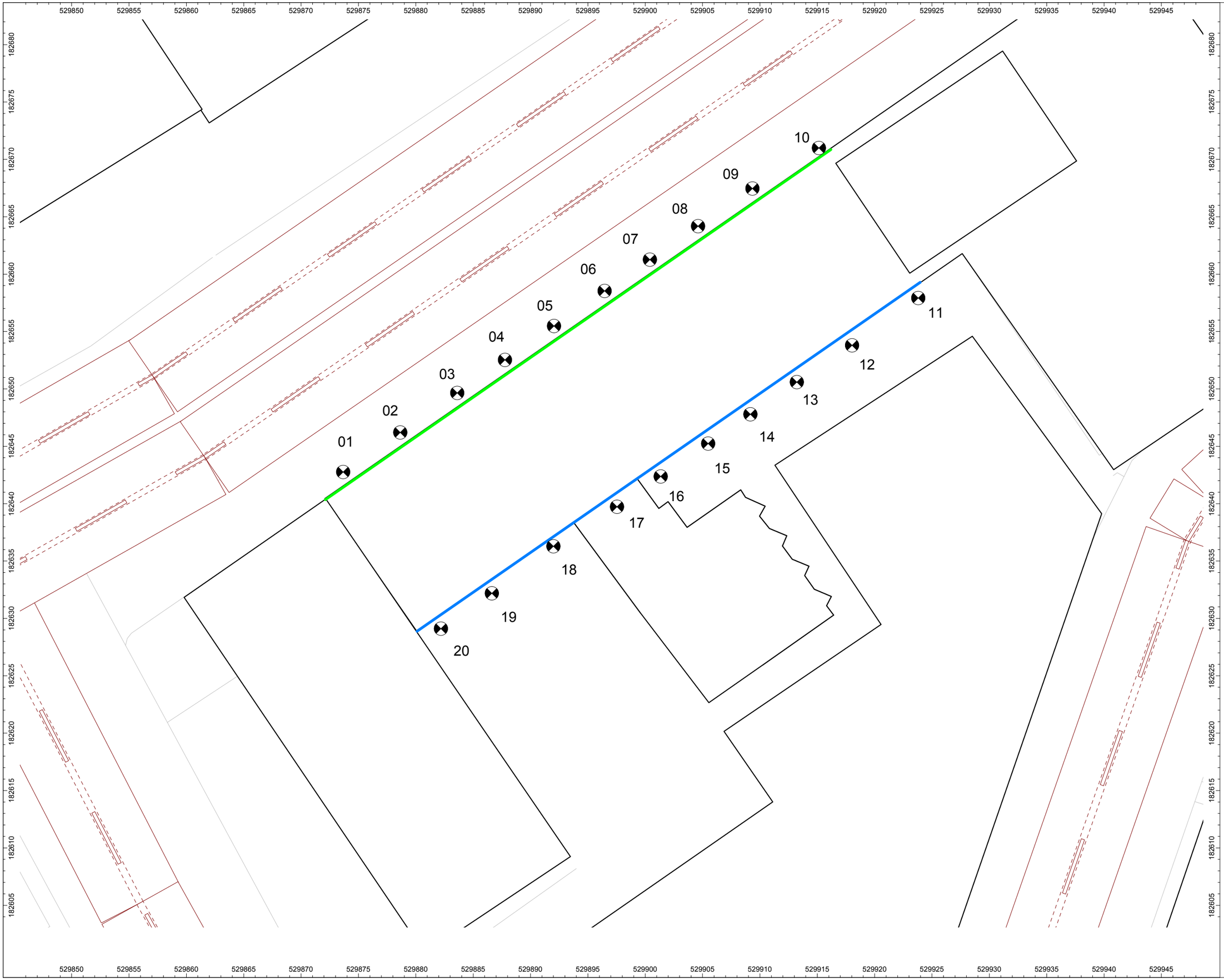
Leicestershire
LE7 7GR
Tel 0116 234 8000




Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Receptor Locations
for 2-Storey Roof Extension
6th - 7th Floors

Drawing Number:
SK05

Enhance Glazing and Ventilation (Minimum Sound Reduction Rw + Ctr 42 dB):

Enhance Glazing and Ventilation Minimum Sound Reduction Rw + Ctr 32 dB):

Scale : Not to scale

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Leicestershire
LE7 7GR
Tel 0116 234 8000


Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Receptor Locations
for 7-Storey Annexe
Lower Ground Floor

Drawing Number:
SK06a

Glazing and
Ventilation
(Minimum Sound
Reduction Rw
+ Ctr 32 dB): —

Scale : Not to scale

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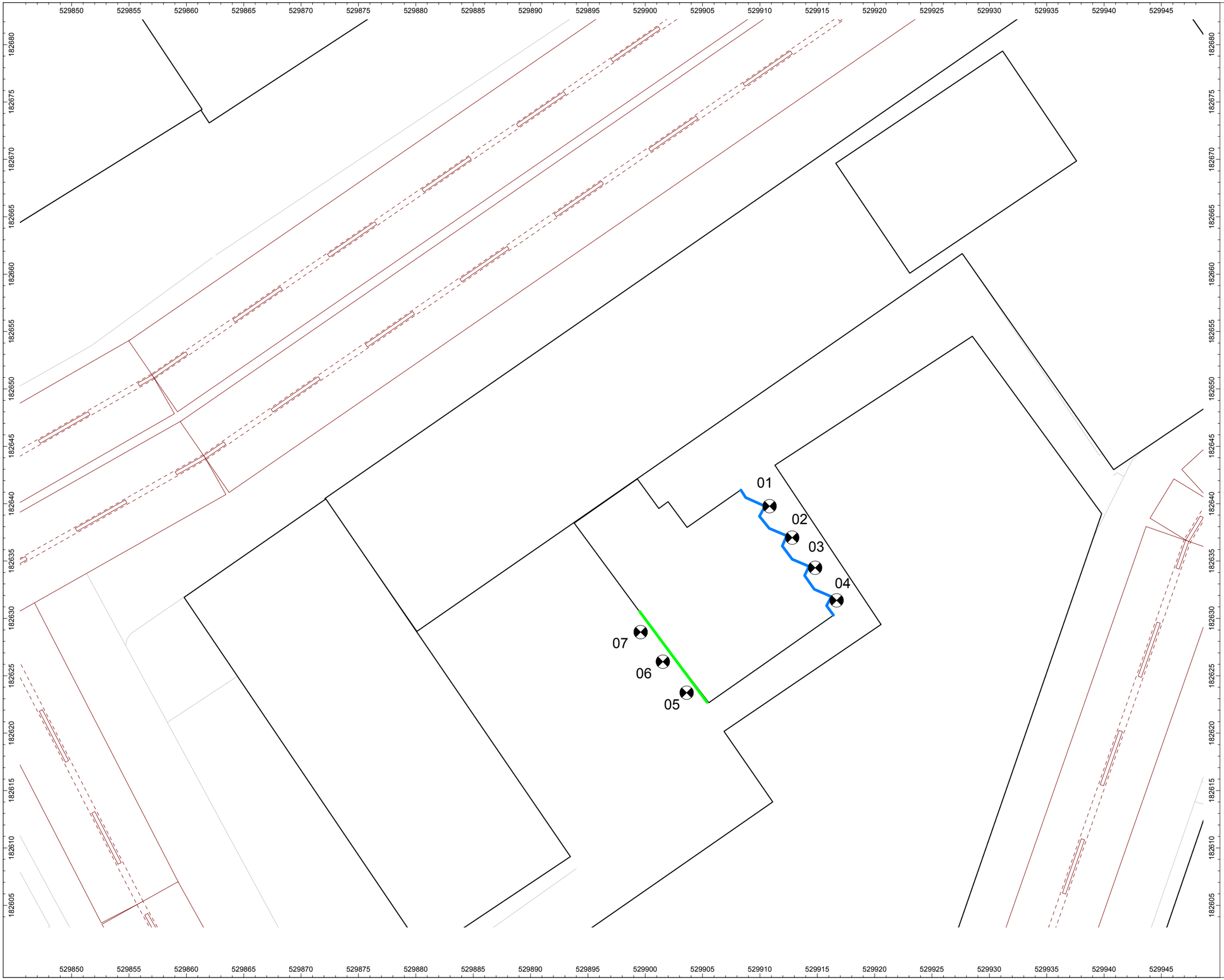
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000




Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Receptor Locations for 7-Storey Annexe Ground Floor

Drawing Number:
SK06b

Enhance Glazing and Ventilation (Minimum Sound Reduction Rw + Ctr 39 dB):

Enhance Glazing and Ventilation (Minimum Sound Reduction Rw + Ctr 32 dB):

Scale : Not to scale

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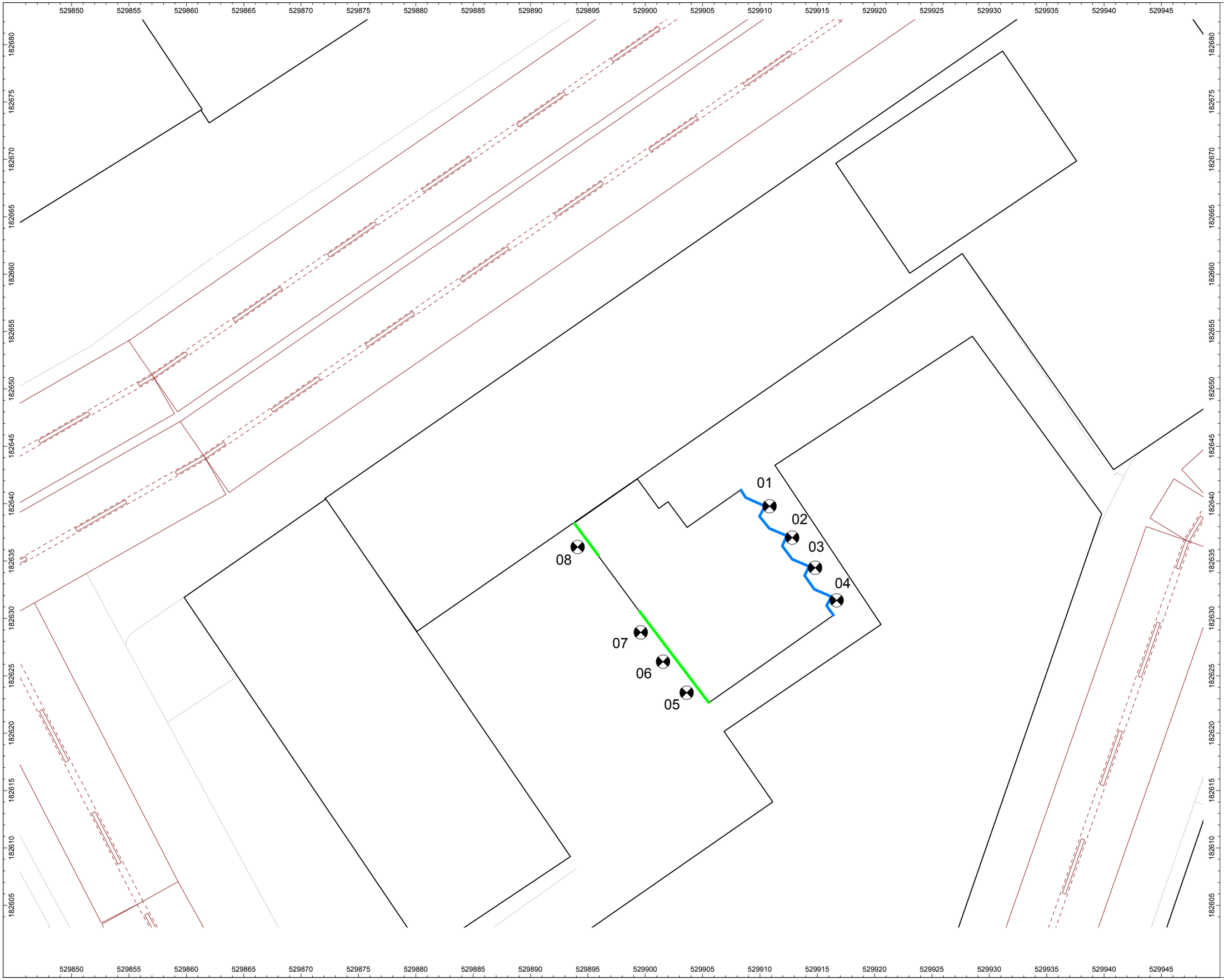
Avalon Way
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000




Client:
Whitbread Group PLC

Project:
Premier Inn,
Euston

Project Number:
A114274

Drawing Title / Scenario:
Receptor Locations
for 7-Storey Annexe
First - Fifth Floors

Drawing Number:
SK06c

Enhance Glazing
and Ventilation
(Minimum Sound
Reduction Rw
+ Ctr 39 dB):

Enhance Glazing
and Ventilation
(Minimum Sound
Reduction Rw
+ Ctr 32 dB):

Scale : Not to scale

WYGE Leicester 29.07.19

Licence Number AL 553611

Executive Park
Avalon Way
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000

# Appendix C – Noise Intrusion Assessment Tables

**Table C1 Daytime and Night-time $L_{Aeq}$ and Night-time $L_{Amax}$ Noise Levels & Glazing and Required Ventilation Specifications (2-Storey Extension)**

| Receptor No | Daytime External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Amax}$ 1 m from façade | Glazing Specification ($R_w$ + $C_{tr}$ dB) to Achieve BS 8233 $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB Target Levels | Ventilation Specification Required ($D_{,n,e,w}$ + $C_{tr}$ dB) |
|---|---|---|---|---|---|
| **6th Floor** | | | | | |
| 01 | 72.0 | 69.6 | 87.4 | **42.0** | **42.0** |
| 02 | 72.0 | 69.6 | 87.4 | **42.0** | **42.0** |
| 03 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 04 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 05 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 06 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 07 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 08 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 09 | 72.1 | 69.6 | 87.4 | **42.0** | **42.0** |
| 10 | 72.0 | 69.6 | 87.4 | **42.0** | **42.0** |
| 11 | 52.9 | 49.1 | 58.3 | 32.0 | 32.0 |
| 12 | 53.0 | 49.2 | 58.9 | 32.0 | 32.0 |
| 13 | 53.1 | 49.2 | 59.8 | 32.0 | 32.0 |
| 14 | 53.1 | 49.3 | 60.4 | 32.0 | 32.0 |
| 15 | 53.1 | 49.2 | 61.3 | 32.0 | 32.0 |
| 16 | 53.3 | 49.2 | 63.9 | 32.0 | 32.0 |
| 17 | 54.1 | 49.6 | 68.8 | 32.0 | 32.0 |
| 18 | 57.4 | 51.7 | 76.1 | 32.0 | 32.0 |
| 19 | 57.6 | 51.9 | 76.5 | 32.0 | 32.0 |
| 20 | 57.4 | 51.7 | 76.2 | 32.0 | 32.0 |
| **7Th Floor** | | | | | |
| 01 | 71.5 | 69.1 | 86.9 | **42.0** | **42.0** |
| 02 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 03 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 04 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 05 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 06 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 07 | 71.6 | 69.1 | 86.9 | **42.0** | **42.0** |
| 08 | 71.6 | 69.1 | 87.0 | **42.0** | **42.0** |
| 09 | 71.6 | 69.1 | 87.0 | **42.0** | **42.0** |
| 10 | 71.5 | 69.1 | 86.9 | **42.0** | **42.0** |

| Receptor No | Daytime External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Amax}$ 1 m from façade | Glazing Specification ($R_w$ + $C_{tr}$ dB) to Achieve BS 8233 $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB Target Levels | Ventilation Specification Required ($D_{,n,e,w}$ + $C_{tr}$ dB) |
|---|---|---|---|---|---|
| 11 | 53.3 | 49.5 | 59.8 | 32.0 | 32.0 |
| 12 | 53.5 | 49.9 | 60.9 | 32.0 | 32.0 |
| 13 | 53.7 | 50.3 | 61.4 | 32.0 | 32.0 |
| 14 | 53.6 | 50.1 | 62.1 | 32.0 | 32.0 |
| 15 | 53.6 | 49.8 | 63.4 | 32.0 | 32.0 |
| 16 | 53.9 | 49.8 | 66.6 | 32.0 | 32.0 |
| 17 | 54.7 | 50.2 | 70.5 | 32.0 | 32.0 |
| 18 | 57 | 51.5 | 75.2 | 32.0 | 32.0 |
| 19 | 57.1 | 51.6 | 75.6 | 32.0 | 32.0 |
| 20 | 56.9 | 51.5 | 75.3 | 32.0 | 32.0 |

**Table C2 Daytime and Night-time $L_{Aeq}$ and Night-time $L_{Amax}$ Noise Levels & Glazing and Required Ventilation Specifications (7-Storey Annexe)**

| Receptor No | Daytime External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Amax}$ 1 m from façade | Glazing Specification ($R_w$ + $C_{tr}$ dB) to Achieve BS 8233 $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB Target Levels | Ventilation Specification Required ($D_{,n,e,w}$ + $C_{tr}$ dB) |
|---|---|---|---|---|---|
| **Lower Ground Floor** | | | | | |
| 01 | 52.7 | 48.7 | 60.9 | 32.0 | 32.0 |
| 02 | 52.7 | 48.7 | 60.7 | 32.0 | 32.0 |
| 03 | 52.7 | 48.7 | 61.0 | 32.0 | 32.0 |
| 04 | 52.9 | 48.8 | 63.9 | 32.0 | 32.0 |
| **Ground Floor** | | | | | |
| 01 | 52.7 | 48.8 | 60.8 | 32.0 | 32.0 |
| 02 | 52.7 | 48.7 | 60.7 | 32.0 | 32.0 |
| 03 | 52.7 | 48.7 | 61.0 | 32.0 | 32.0 |
| 04 | 53.0 | 48.8 | 63.9 | 32.0 | 32.0 |
| 05 | 64.1 | 57.0 | 83.8 | **39.0** | **39.0** |
| 06 | 64.2 | 57.1 | 84.0 | **39.0** | **39.0** |
| 07 | 64.2 | 57.1 | 83.9 | **39.0** | **39.0** |
| **1st Floor** | | | | | |
| 01 | 52.8 | 48.8 | 60.7 | 32.0 | 32.0 |
| 02 | 52.8 | 48.8 | 60.6 | 32.0 | 32.0 |
| 03 | 52.8 | 48.8 | 60.9 | 32.0 | 32.0 |
| 04 | 53.0 | 48.9 | 63.7 | 32.0 | 32.0 |
| 05 | 62.3 | 55.5 | 82.2 | **39.0** | **39.0** |

| Receptor No | Daytime External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Amax}$ 1 m from façade | Glazing Specification ($R_w$ + $C_{tr}$ dB) to Achieve BS 8233 $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB Target Levels | Ventilation Specification Required ($D_{,n,e,w}$ + $C_{tr}$ dB) |
|---|---|---|---|---|---|
| 06 | 62.4 | 55.6 | 82.3 | **39.0** | **39.0** |
| 07 | 62.4 | 55.6 | 82.2 | **39.0** | **39.0** |
| 08 | 61.2 | 54.6 | 80.8 | **39.0** | **39.0** |
| **2nd Floor** | | | | | |
| 01 | 52.8 | 48.9 | 60.6 | 32.0 | 32.0 |
| 02 | 52.8 | 48.8 | 60.4 | 32.0 | 32.0 |
| 03 | 52.8 | 48.8 | 60.7 | 32.0 | 32.0 |
| 04 | 53.0 | 48.9 | 63.7 | 32.0 | 32.0 |
| 05 | 60.9 | 54.4 | 80.7 | **39.0** | **39.0** |
| 06 | 61.0 | 54.4 | 80.7 | **39.0** | **39.0** |
| 07 | 61.0 | 54.4 | 80.7 | **39.0** | **39.0** |
| 08 | 59.9 | 53.5 | 79.4 | **39.0** | **39.0** |
| **3rd Floor** | | | | | |
| 01 | 52.9 | 48.9 | 60.5 | 32.0 | 32.0 |
| 02 | 52.9 | 48.9 | 60.3 | 32.0 | 32.0 |
| 03 | 52.9 | 48.9 | 60.6 | 32.0 | 32.0 |
| 04 | 53.1 | 49.0 | 63.5 | 32.0 | 32.0 |
| 05 | 59.7 | 53.4 | 79.3 | **39.0** | **39.0** |
| 06 | 59.8 | 53.5 | 79.4 | **39.0** | **39.0** |
| 07 | 59.8 | 53.4 | 79.3 | **39.0** | **39.0** |
| 08 | 58.9 | 52.8 | 78.2 | **39.0** | **39.0** |
| **4th Floor** | | | | | |
| 01 | 53.0 | 49.0 | 60.4 | 32.0 | 32.0 |
| 02 | 53.0 | 49.0 | 60.3 | 32.0 | 32.0 |
| 03 | 53.0 | 49.0 | 60.5 | 32.0 | 32.0 |
| 04 | 53.3 | 49.1 | 63.3 | 32.0 | 32.0 |
| 05 | 59.0 | 52.7 | 78.1 | **39.0** | **39.0** |
| 06 | 58.8 | 52.7 | 78.2 | **39.0** | **39.0** |
| 07 | 57.0 | 52.7 | 78.1 | **39.0** | **39.0** |
| 08 | 58.1 | 52.2 | 77.1 | **39.0** | **39.0** |
| **5th Floor** | | | | | |
| 01 | 53.2 | 49.3 | 60.8 | 32.0 | 32.0 |
| 02 | 53.1 | 49.2 | 60.6 | 32.0 | 32.0 |
| 03 | 53.2 | 49.2 | 60.8 | 32.0 | 32.0 |
| 04 | 53.6 | 49.3 | 63.3 | 32.0 | 32.0 |
| 05 | 58.0 | 52.1 | 77.0 | **39.0** | **39.0** |
| 06 | 58 | 52.1 | 77.0 | **39.0** | **39.0** |

| Receptor No | Daytime External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Aeq}$ 1 m from façade | Night-Time External $L_{Amax}$ 1 m from façade | Glazing Specification ($R_w$ + $C_{tr}$ dB) to Achieve BS 8233 $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB Target Levels | Ventilation Specification Required ($D_{,n,e,w}$ + $C_{tr}$ dB) |
|---|---|---|---|---|---|
| 07 | 58 | 52.1 | 77.0 | **39.0** | **39.0** |
| 08 | 57.4 | 51.7 | 76.1 | **39.0** | **39.0** |

# Appendix D – Premier Inn Glazing Configurations

# Appendix E – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of [Whitbread Group PLC] ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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