

Bedfont Cross Feltham

Noise Impact Assessment Report
Report 22355.NIA.01

Sheen Lane Developments Ltd

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22355.TH1, TH2, THA and THB	Environmental Noise Time History Graphs
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1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Silverline Architects to assess the suitability of the site at Bedfont Cross, Feltham, TW14 8NG for a residential development in accordance with Permitted Development rights as outlined in Class O (offices to dwelling/houses) of The Town and Country Planning (General Permitted Development) (England) Order 2015.

This report presents the results of internal noise surveys undertaken in order to measure the current internal noise climate for compliance with current guidance, and presents the results of the external environmental surveys undertaken in order to measure the prevailing background noise levels.

2.0 SITE SURVEYS

2.1 Site Description

The site is located within a commercial estate and bounded by commercial premises to the north and to the west, Stanwell Road to the south, and Great South-West Road (A30) to the east. A residential area is located approximately 65 metres south-east of the site on the opposite side of Great South-West Road (A30). Entrance to the site is located along Bedfont Cross.

At the time of the survey, the background noise climate was dominated by road and air traffic noise from the nearby road network and Heathrow Airport.

The development site is presented within the following images:

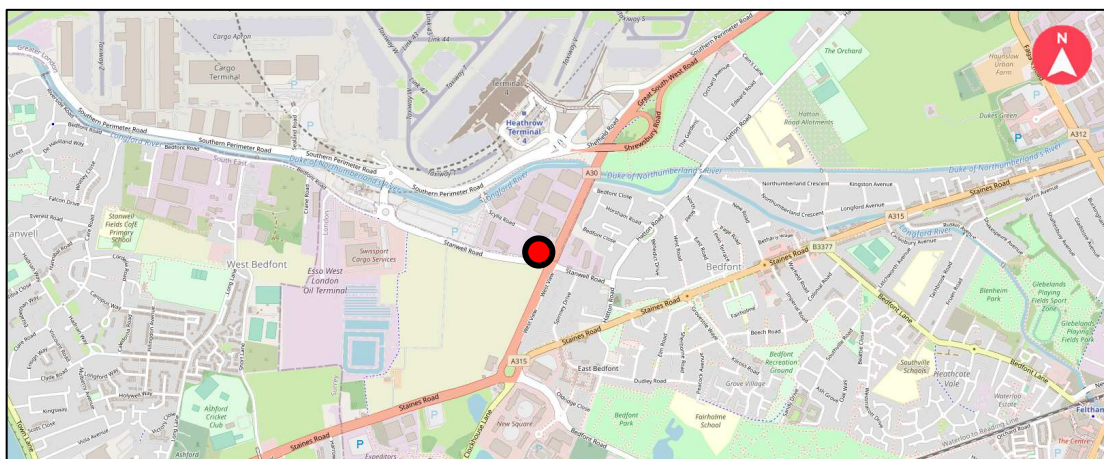


Figure 2.1: Site Location (© OpenStreetMap contributors)



Figure 2.2: Site Image (Image capture ©2021 Google)

2.2 Internal Noise Survey Procedure

Noise surveys were undertaken within internal areas of the building in order to assess worst-case levels with the current external building fabric configuration.

Continuous automated monitoring was undertaken for the duration of the survey between 10:30 on 23/03/2021 and 10:30 on 24/03/2021.

Microphones installed internally were positioned within the diffuse field of the room, ensuring the microphone was at least 1.5m from any reflective surface. Noise measurement positions are detailed in Table 2.1 and shown in Figure 2.4.

2.3 Environmental Noise Survey Procedure

External noise surveys were undertaken on the proposed site as shown in Figure 2.3. The locations were selected in order to collect data representative of the worst-case levels expected on the site due to all nearby sources.

Continuous automated monitoring was undertaken for the duration of the survey between 10:30 on 23/03/2021 and 10:30 on 24/03/2021.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.4 Measurement Positions

Measurement positions are as described within Table 2.1 and presented within Figures 2.3 and 2.4.

Icon	Descriptor	Location Description
	Position 1 (External)	The microphone was positioned at roof level and protruded outwards from the north-western corner of the development overlooking a commercial development's loading bay and car park. The microphone was positioned less than 1.5 metres from the nearest reflective surface and therefore includes local reflections.
	Position 2 (External)	The microphone was positioned at roof level and protruded outwards from the south-eastern corner of the site overlooking the intersection between Great South-West Road (A30) and Stanwell Road. The microphone was positioned less than 1.5 metres from the nearest reflective surface and therefore includes local reflections.
	Position A (Internal)	The microphone was positioned internally on Level 2 at the north-western corner of the development. The microphone was attached to a tripod at approximately 1.5 metres from the nearest reflective surface.
	Position B (Internal)	The microphone was positioned internally on Level 1 at the south-eastern corner of the development. The microphone was attached to a tripod at approximately 1.5 metres from the nearest reflective surface.

Table 2.1 Measurement positions and descriptions

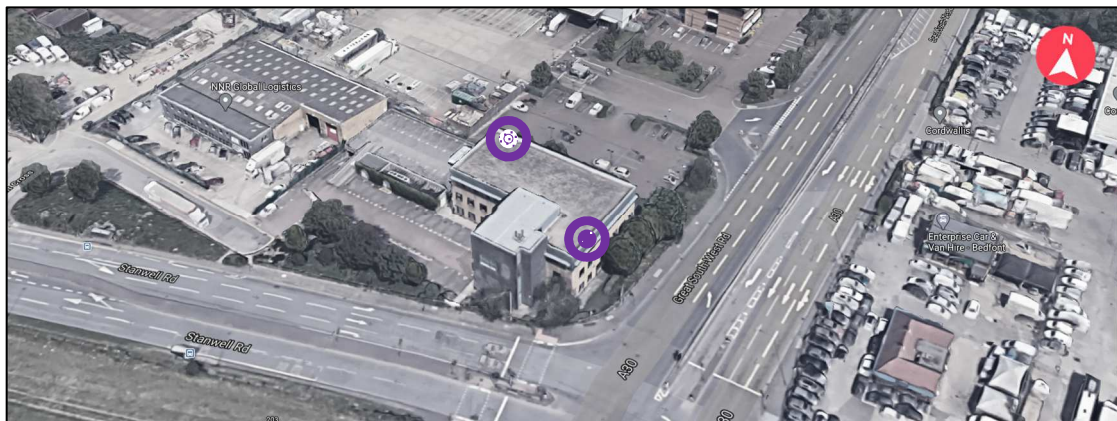


Figure 2.3 Site measurement positions (Image Source: Google Maps)

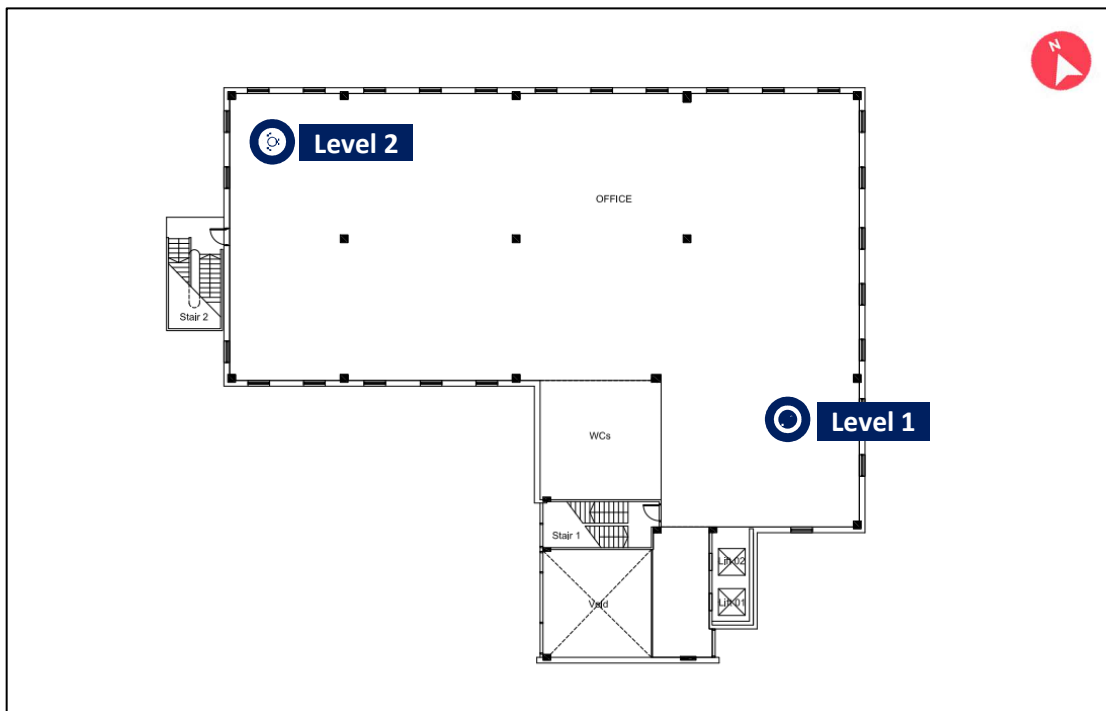


Figure 2.4 Typical floor plan presenting internal measurement positions (Image courtesy of Orbit Architects)

2.5 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed (no more than 0.1dB). The equipment used is described within Table 2.2.

Measurement instrumentation		Serial no.	Date	Cert no.
External Position 1	Svantek Type 958A Class 1 Sound Level Meter	36655	28/01/2020	14014834-1
	Free-field microphone MTG MK250	10877		
	Preamp Svantek 2v12L	33695		
	Svantek External windshield	-		
External Position 2	Svantek Type 958 Class 1 Sound Level Meter	59558	04/10/2019	14012955
	Free-field microphone PCB 377B02	159386		
	Preamp Svantek 2v12L	72191		
	Svantek External windshield	-		
Internal Position A	Svantek Type 958A Class 1 Sound Level Meter	59559	26/09/2019	14012947
	MTG MK250 Free-field microphone	10904		
	Preamp Svantek SV12L	33619		
	Svantek External windshield	-		

Measurement instrumentation		Serial no.	Date	Cert no.
Internal Position B	Svantek Type 958A Class 1 Sound Level Meter	45579	03/09/2020	14012949-02
	Free-field microphone MTG MK255	11697		
	Preamp Svantek 2v12L	41535		
	Svantek External windshield	-	-	-

Table 2.2 Measurement instrumentation

3.0 RESULTS

3.1 Noise Survey

The $L_{Aeq}(5min)$, $L_{Amax}(5min)$, $L_{A10}(5min)$ and $L_{A90}(5min)$ acoustic parameters were measured throughout the duration of the surveys. Measured levels are shown as time histories in Figures 22355.TH1, TH2, THA and THB.

Measured noise levels are representative of noise exposure levels expected to be experienced by all facades of the proposed development, and are shown in Table 3.1.

Time Period	Noise Levels at Measurement Positions			
	External Positions		Internal Positions	
	Position 1 (Measured Noise Level – dBA)	Position 2 (Measured Noise Level – dBA)	Position A (Measured Noise Level – dBA)	Position B (Measured Noise Level – dBA)
Daytime $L_{Aeq,16hour}$	64	70	38	37
Night-time $L_{Aeq,8hour}$	60	65	28	27

Table 3.1 Site average noise levels for daytime and night time

4.0 NOISE ASSESSMENT GUIDANCE

4.1 Permitted Development Rights

It is understood that the office development would be converted into residential units under the Permitted Development Rights. Therefore, this assessment would be targeted to demonstrate the noise requirement as per Citation 7.1.c *“Amendments in relation to change of use of offices to dwelling houses”* of The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016:

“Development under Class O is permitted subject to the condition that before beginning the development, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to—

(a) transport and highways impacts of the development,

(b) contamination risks on the site,

(c) flooding risks on the site, and

(d) impacts of noise from commercial premises on the intended occupiers of the development”

The measurements undertaken on site would not only encompass noise generated by any nearby commercial units, but it would also encompass the full spectrum of noise sources in the area affecting the premises.

In order to demonstrate if the current external building fabric of the site would be sufficient to protect the future residents, the measured internal noise levels would be assessed against the recommendations of the British Standard BS8233:2014 *“Sound insulation and noise reduction for buildings”*.

4.2 BS8233:2014

BS8233:2014 *‘Sound insulation and noise reduction for buildings’* describes recommended internal noise levels for residential spaces. These levels are shown in Table 4.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB(A)	-
Dining	Dining Room/area	40 dB(A)	-
Sleeping (daytime resting)	Bedrooms	35 dB(A)	30 dB(A)

Table 4.1 BS8233 recommended internal background noise levels

It should be noted that the recommended internal noise levels outlined above are not applicable under “purge ventilation” conditions as defined by Approved Document F of the Building Regulations, as this should only occur occasionally (E.G. to remove odour from painting or burnt food). However, the levels above should be achieved whilst providing sufficient background ventilation, either via passive or mechanical methods.

The external building fabric would need to be carefully designed to achieve these recommended internal levels.

5.0 EXTERNAL BUILDING FABRIC SPECIFICATION

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed and non-glazed elements in order to achieve the recommended internal noise levels shown in Table 4.1, taking into account the daytime and night-time $L_{Aeq,T}$ noise levels monitored during the environmental noise survey.

The worst-case dwellings were selected to form the basis of our assessment, as labelled R1, R2 and R3 in the following site plan.



Typical floor plan presenting room proposals and worst-case assessment locations (Image courtesy of Orbit Architects)

5.1 Non-Glazed Elements

It is currently understood that the non-glazed building façade is comprises 300mm blockwork. The anticipated sound reduction index would be expected to provide the minimum figures shown in Table 5.1 when tested in accordance with BS EN ISO, 140-3:1995.

Element	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
300mm Concrete Blockwork	40	45	52	55	55	55

Table 5.1 Assumed sound reduction performance for non-glazed elements

5.2 Glazed Elements

The measured $L_{Aeq,T}$ internal noise levels exceed the guideline values as presented within BS8233:2014 during daytime periods (>35dBA). We therefore understand that provision for secondary glazing has been proposed.

We have recommended the minimum octave band sound reduction index (SRI) values required for all glazed elements to be installed within Table 5.2. The performance is specified for the whole window system, including the frames and other design features. Manufacturer and/or suppliers would need to demonstrate compliance with this specification.

Elevation	Octave band centre frequency SRI, dB						$R_w(C;C_{tr})$, dB
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
All Elevations	26	34	44	56	53	52	45 (-2; -7)

Table 5.2 Required glazing performance

Note: Glazing performance calculations have been based on both the daytime and night-time $L_{Aeq,T}$ noise levels.

As changes to the external building fabric cannot be made under permitted development rights, the existing windows would need to be upgraded internally to meet the recommended internal noise levels stipulated in BS8233:2014 and meet the minimum octave band sound reduction values outlined in Table 5.2.

We would therefore recommend that a secondary glazing system is installed, such as those provided by SelectaGlaze, who provide several systems which would achieve the project requirements:

- S40 Lift Out System comprising 100mm cavity from the existing window system, with 4-6.4mm standard glass (Provides 45dB R_w with primary window)
- S41 Fixed Panel System comprising 100mm cavity from the existing window system, 4-6.4mm standard glass (Provides 45dB R_w with primary window)

- S10 Horizontal Sliding System comprising 150mm cavity from the existing window system, 4-6.4mm standard glass (Provides 45dB R_w with primary window)

5.3 Ventilation Strategy

Further to discussions with the project architect, it is understood that a mechanical ventilation system would be installed, as per Approved Document F System 4, shown in Table 5.3.

Ventilation System	Whole Dwelling Ventilation	Extract Ventilation
ADF System 4	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)

Table 5.3 Ventilation systems

In the case of mechanical ventilation, systems should be designed to meet the internal noise levels as defined in CIBSE Guide A (2015), as shown in Table 5.4.

Room Type	L_{Aeq} , dB	NR
Bedrooms	30	25
Living Rooms	35	30
Kitchen	45-50	40-45

Table 5.4 CIBSE Guide A 2015 guidance levels for mechanical building services

In all cases, purge ventilation would be provided by openable windows. As outlined in Section 4.3, the internal noise level requirement would not be applicable during purge conditions as this would only occur occasionally.

6.0 CONCLUSION

An environmental noise survey has been undertaken at Bedfont Cross, Feltham allowing the assessment of daytime and night-time levels likely to be experienced by the proposed development.

Noise levels measured internally demonstrate that the existing external building fabric would be insufficient in providing internal noise levels commensurate to the design criteria of BS8233:2014.

Mitigation measures have been provided to meet the recommended internal noise levels provided in BS8233 and to protect the proposed habitable spaces from external noise intrusion.

Bedfont Cross, Feltham - External Position 1
Environmental Noise Time History
From 23 March 2021 To 24 March 2021

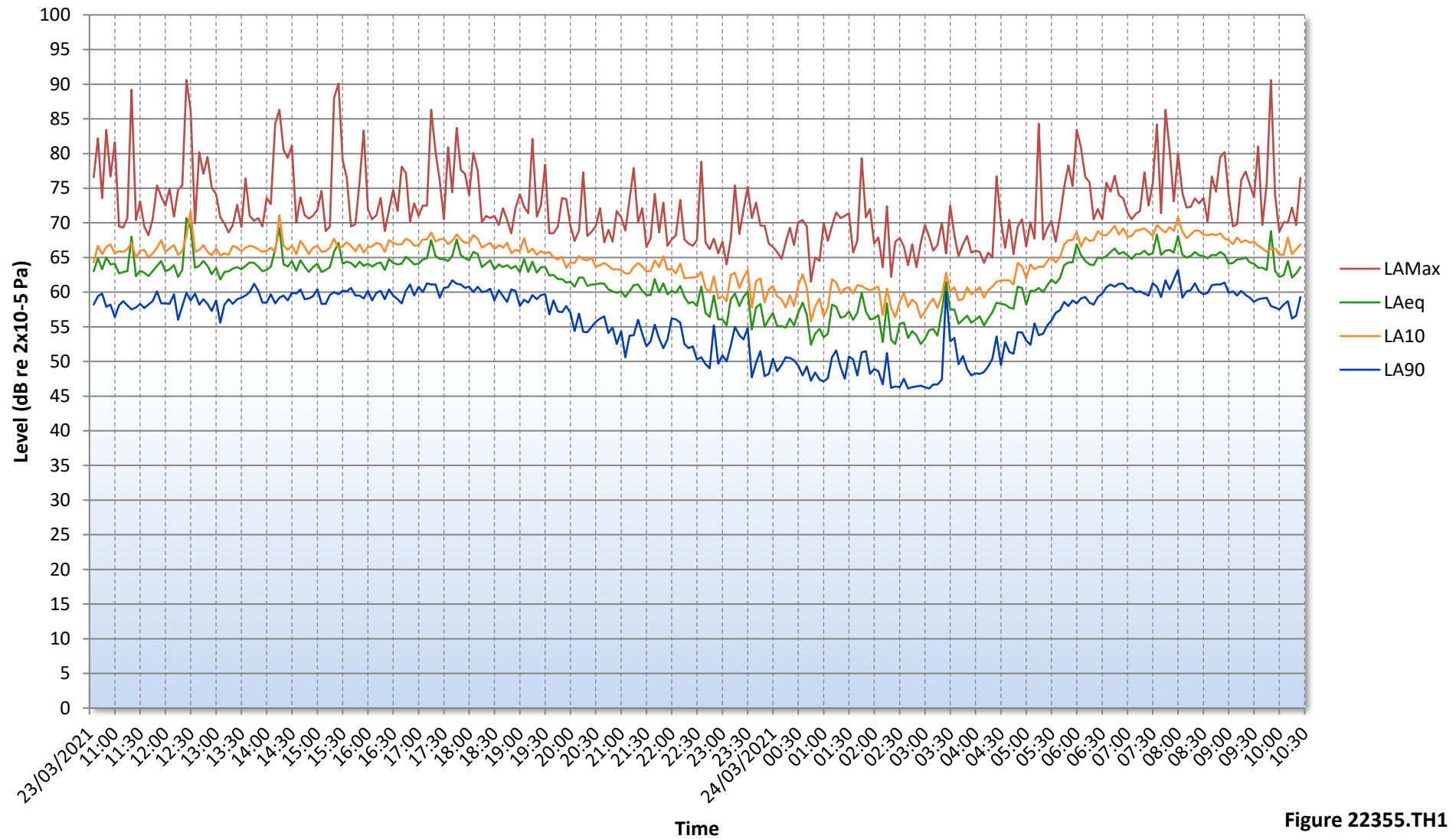


Figure 22355.TH1

Bedfont Cross, Feltham - External Position 2
Environmental Noise Time History
From 23 March 2021 To 24 March 2021

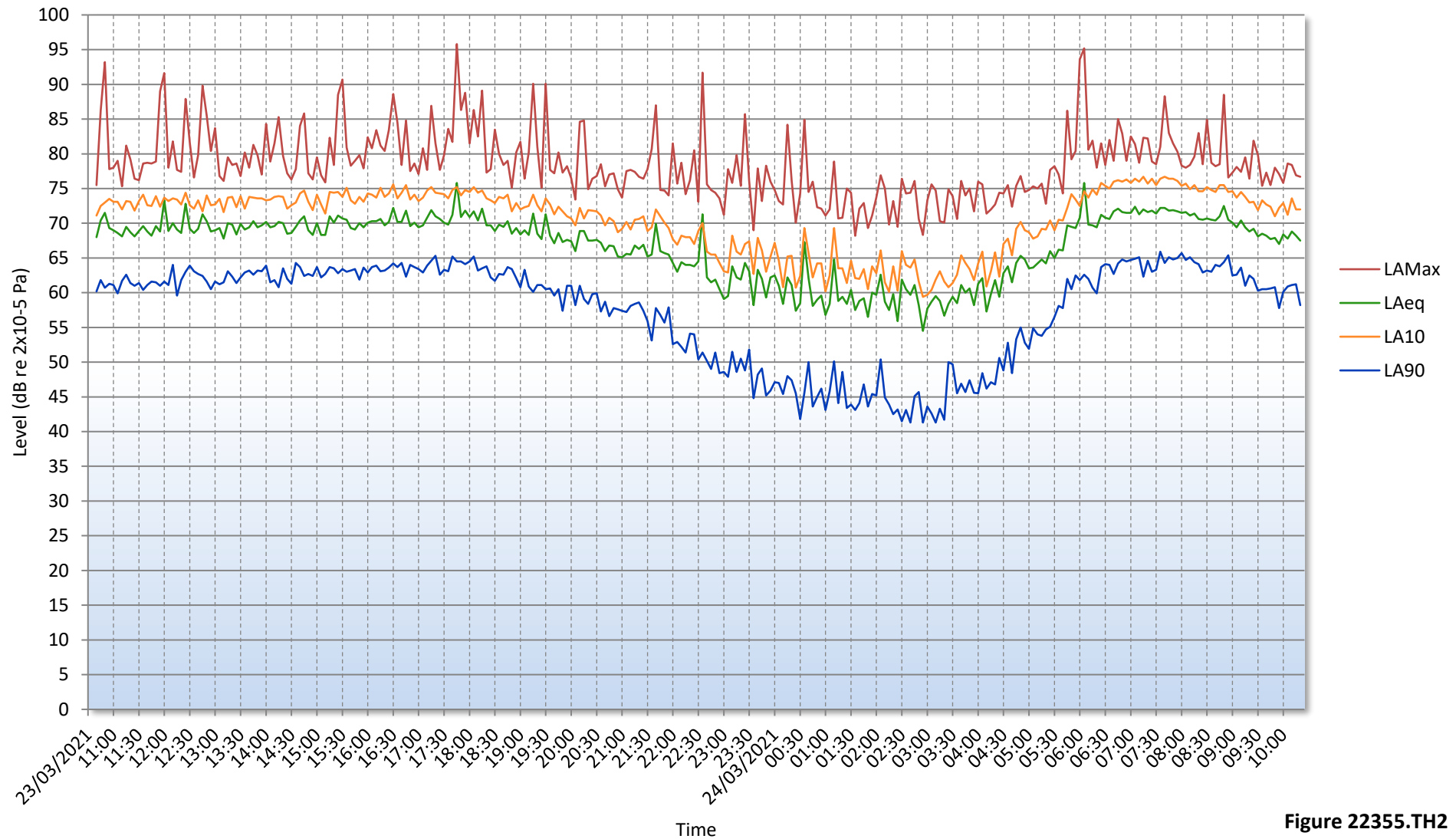


Figure 22355.TH2

Bedfont Cross, Feltham - Internal Position A
Environmental Noise Time History
From 23 March 2021 To 24 March 2021

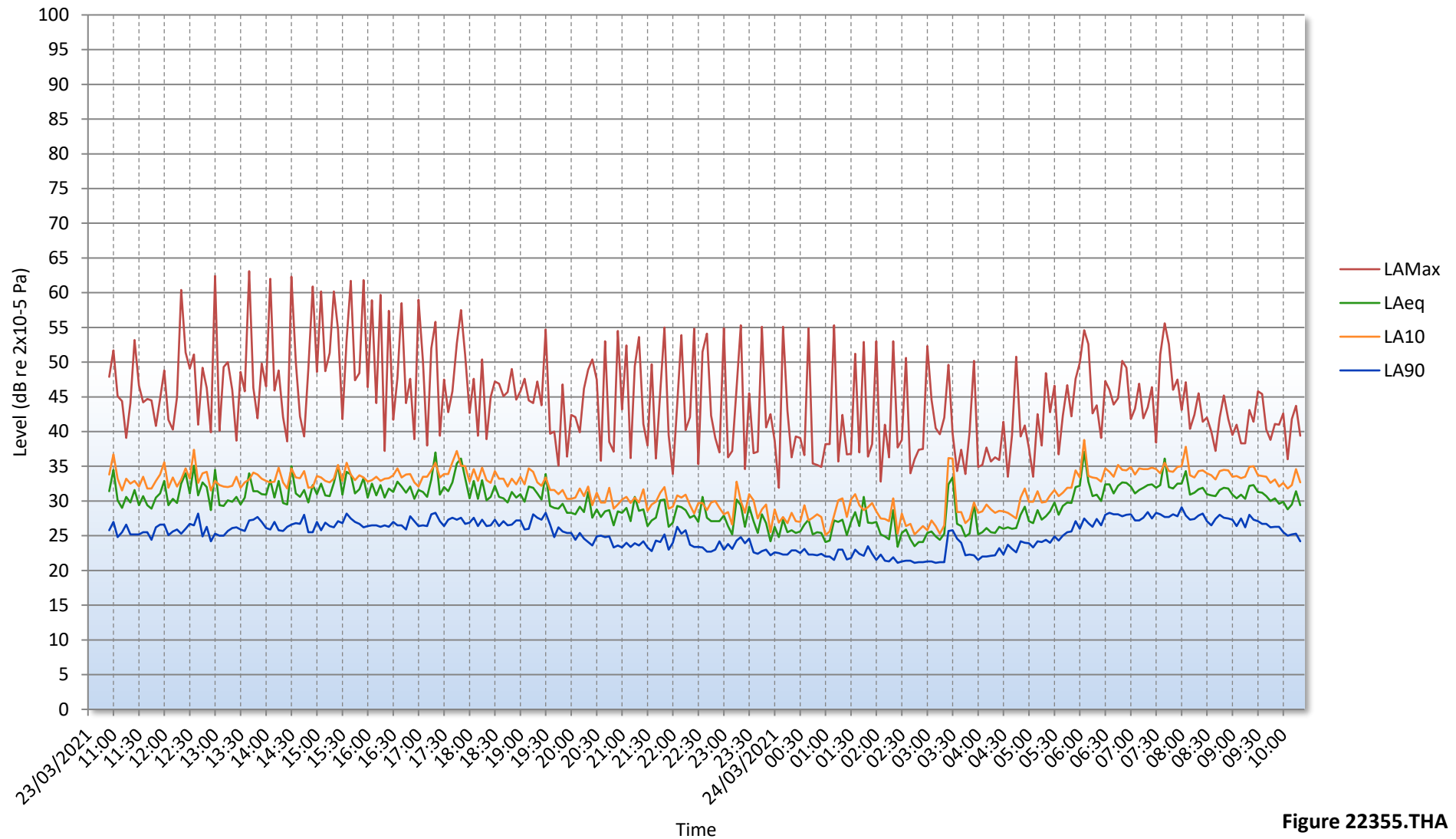


Figure 22355.THA

Bedfont Cross, Feltham - Internal Position B
Environmental Noise Time History
From 23 March 2021 To 24 March 2021

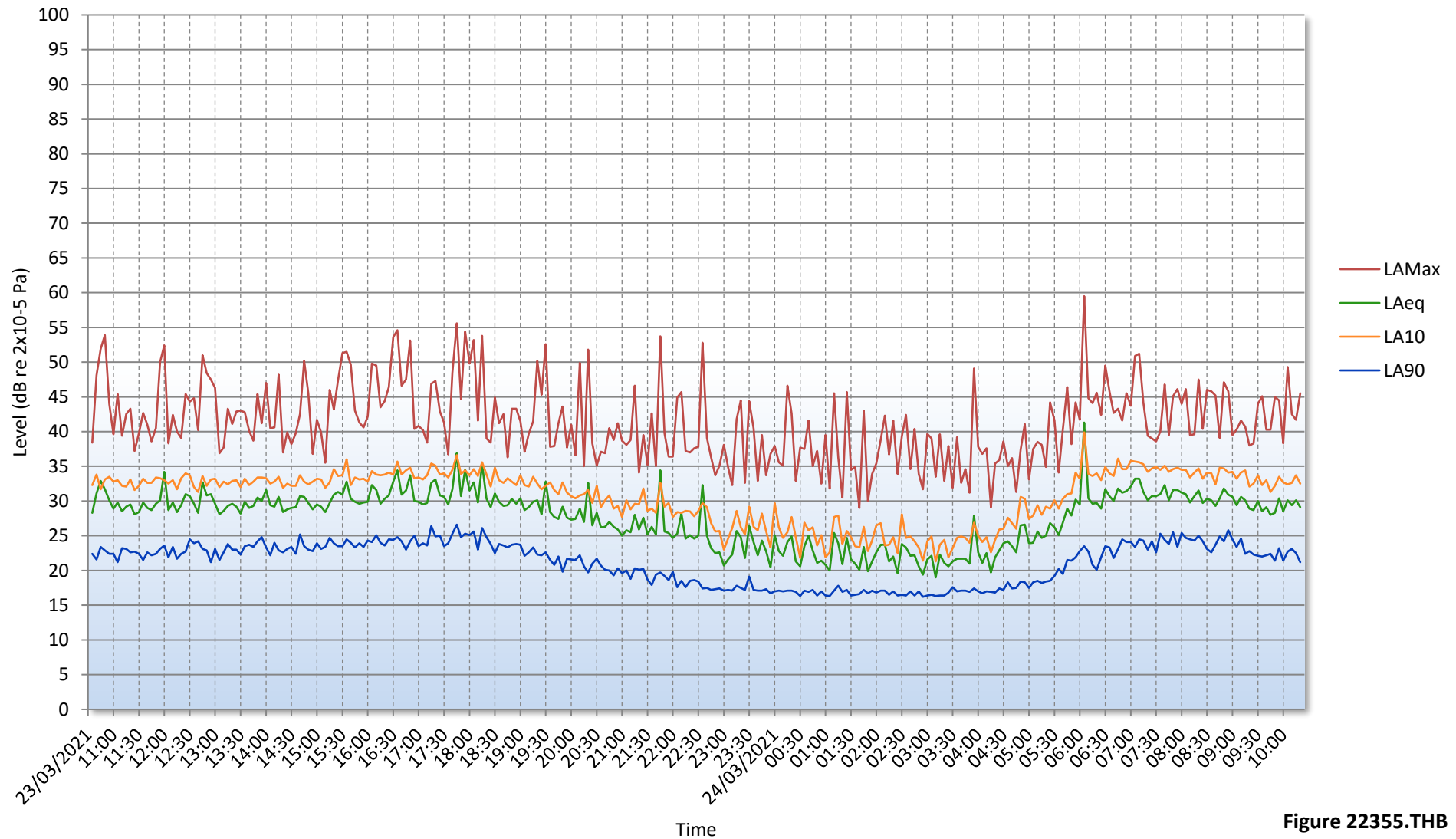


Figure 22355.THB