CHANGING WORKPLACE LIMITED

1 – 3 BOLTRO ROAD, HAYWARDS HEATH, WEST SUSSEX RH16 1BY

Noise Impact Assessment

November 2022
(Reviewed March 2024)

eas ltd
Environmental Assessment Services Ltd

REPORT DATA SHEET

Requirement	Data
Report Ref	682/1–3 Boltro Road, Haywards Heath
Date	November 2022
Client	Changing Workplace Limited
Report type	Noise Impact Assessment
Purpose	Planning
Revisions	March 2024
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1. THE SITE AND BACKGROUND

1.1 The site comprises a three-storey office building on the east side of Boltro Road, adjacent to the Haywards Heath railway station. The site area is approximately 104 sqm. The Ordnance Survey (OS) map reference for the site is TQ 3297 2444. The site elevation is approximately +60 m OD, and Boltro Road slopes slightly from south to north. See Figure 1 for Site Location Plan and Figure 2 for the Existing Site Layout.

1.2 It is proposed to redevelop the site, converting the existing offices into a part office and part residential redevelopment. The ground floor and half of the first floor comprising offices and the second floor and half of the first floor comprising 2No. two-bedroom dwellings, with cycle parking and a refuse storage area. As the ground floor is to remain as existing (offices) this reports relates to the conversion and change of use relating to the first and second floor.

1.3 The surrounding land comprises a mix of residential and commercial uses. The property lies immediately west of the railway line serving Haywards Heath mainline station, close to the southern extent of the two platforms. Land between the building and the railway line is owned by Network Rail and occupied by a series of electricity transformers and rectifiers, presumably associated with operation of the railway. The building lies to the southeast of a one-way traffic junction merging Boltro Road, Market Place and Paddockhall Road. Land uses to the north, west and south are predominantly mixed retail and residential. There is a car servicing garage located approximately 25 m north of the site and a large multi-storey parking area on the opposite side of the railway further east.

1.4 The building currently comprises of two separate units, built c.1897, the northern portion of which was previously used as a bank. The building extends over three storeys and is constructed predominantly of brick with a partially rendered fascia and a slate roof with a series of gabled windows. Windows to the ground and first floor were previously sash windows but have been replaced with uPVC double glazed units. The main entrance is on the west façade onto Boltro Road with numerous window openings on the north and west façade. There are fewer windows on the east façade facing the railway and no door openings.

1.5 Outside amenity space is limited to the northern extent of the site where there is a small area of tarmac extending from the pavement. There is no amenity space to the east adjacent to the railway.

1.6 The building currently provides office space, some of which is vacant.

1.7 The principal noise concerns at the site are trains passing on the railway line to the east, plus associated noise from the platforms including, station announcements, audible train door closing bleeps etc. and noise from traffic on the adjoining roads and from various commercial activities in the vicinity. There is also a risk of noise impacts from nearby electricity transformers should they produce any dominant frequencies.

1.8 A noise impact assessment has been carried out to assess the likely impact of the existing noise climate at the site on the proposed future residents.

1.9 The noise impact assessment has been carried out in accordance with the recommendations given in the *National Planning Policy Framework* (NPPF) March 2012. Reference has been made to the Planning Noise Advice Document: Sussex (2015), ProPG: Planning & Noise (May 2017), and the recommendations given in the National Planning Policy Framework (NPPF), March 2012. Reference will also be made to the Noise Policy Statement for England (NPSE), the British Standard Guidance on Sound Insulation and Noise Reduction for Buildings (BS 8233:2014) and the World Health Organisation (WHO) Night Noise Guidelines for Europe 2009 and Community Noise Guidelines 1999.

1.10 Additional assessment has been carried out using the method given in *Calculation of Railway Noise* Department of Transport 1995.

2. DEFINITIONS

2.1 Noise assessment terms used in the report are defined and described below:

$dB_{(A)}$ – the unit of noise measurement that expresses the loudness in terms of decibels (dB) weighted by frequency for human sensitivity to sound (A).

$L_{(A)90}$ – A-weighted sound pressure level exceeded for 90 % of the measured time; defined as ‘background noise level’.

$L_{(A)eq}$ – equivalent continuous A-weighted sound pressure level over a given period of time; defined as ‘average noise level’.

$L_{(A)max}$ – equivalent maximum A-weighted sound pressure level over a given period of time; defined as ‘maximum sound level’.

$L_{(A)10}$ – A-weighted sound pressure level exceeded for 10 % of the measured time; a measure frequently referred to relating to traffic noise.

SEL - Sound Exposure Level; A-weighted sound energy predicted from individual railway vehicles or trains. May be used to determine $L_{(A)eq}$ for the total flow of trains over a given time period.

3. THE ASSESSMENT

3.1 The assessment comprised:

- The selection of suitable noise monitoring locations reasonably representative of the exposure of the proposed residential receptors.
- The installation of the noise monitoring apparatus for suitable monitoring periods.
- General observations of factors affecting noise around the site.
- A review of the results of the monitoring.
- Predicted noise levels based on the Calculation of Railway Noise method.
- Recommendations regarding noise attenuation options, where indicated.

3.2 In this case, the existing premises is exposed to noise from the railway to the east and to road and other commercial activity to the north and west elevations. A period of attended monitoring was carried out on the façade of the building facing the railway line and station platforms. The attended (short-term) monitoring was carried out at the site on Tuesday 8 November 2022. Further night-time and daytime continuous monitoring was carried between 8 to 15 November 2022 and 21 to 23 November 2022. Noise levels measured at the site were considered to be reasonably representative of the ambient noise climate at the site.

3.3 Short-term daytime noise monitoring was carried out at a location approximately 1 m from the eastern façade of the building at first floor level with the noise meter mounted on an area of flat roof. This position corresponds with the southern extent of the station platforms and has a clear line of site across both the north and southbound railway lines.

3.4 The continuous daytime and night-time measurements were taken in two locations. The first (8 – 14 November) was undertaken approximately 1 m from a second-floor window on the west elevation of the building facing Boltro Road. A further period of continuous monitoring was undertaken on the east elevation facing the railway between the 21 and 23 November 2022. For this monitoring period the noise meter was positioned on an area of flat roof approximately 1 m from the façade of the building at first floor level. The monitoring locations were selected to provide representative noise data for the main noise sources identified, but options for continuous unattended monitoring were limited to some extent by current use of the building and security considerations. See Figure 2 for monitoring locations.

3.5 The monitoring was carried out using a CEL (Casella) Type 490C Precision Sound Level Meter (SLM) and CEL-110/1 field calibrator (calibrated to

national standards on 9 March 2022 – see certificates in Appendix C). The SLM was field calibrated before and after each monitoring session and no measurable drift was observed. Calibration readings before and after the monitoring sessions were all 113.9 dB with no drift.

4. RESULTS OF THE MONITORING

4.1 The monitoring was carried out with the SLM mounted on a tripod 1.5 m above ground level, with no near façades.

4.2 The results of the noise monitoring are summarised in Tables 4.1, 4.2, 4.3 and 4.4 below:

TABLE 4.1
DAYTIME NOISE LEVELS
WEST ELEVATION FACING BOLTRO ROAD
8 – 14 NOVEMBER 2022

Date	Time (hrs)	$L_{(A)eq}$	$L_{(A)90}$
8/11/22	07:00 - 23:00	67.5	59.8
9/11/22	07:00 - 23:00	67.2	59.4
10/11/22	07:00 - 23:00	66.0	58.4
11/11/22	07:00 - 23:00	66.2	58.4
12/11/22	07:00 - 23:00	65.2	55.9
13/11/22	07:00 - 23:00	63.5	53.5
14/11/22	07:00 - 23:00	Insufficient data	

TABLE 4.2
NIGHT-TIME NOISE LEVELS
WEST ELEVATION FACING BOLTRO ROAD
8 – 14 NOVEMBER 2022

Date	Time (hrs)	$L_{(A)eq}$	$L_{(A)90}$	$L_{(A)max}$[1]
8/9 Nov	23:00 - 07:00	61.8	47.4	75.5
9/10 Nov	23:00 - 07:00	54.0	38.9	**77.2**
10/11 Nov	23:00 - 07:00	53.1	37.9	75.6
11/12 Nov	23:00 - 07:00	53.1	35.9	76.2
12/13 Nov	23:00 - 07:00	52.3	33.1	75.9
13/14 Nov	23:00 - 07:00	52.4	36.7	75.3

[1] $L(A)_{max}$ values represent threshold for > 8 exceedances (night-time period)

TABLE 4.3
DAYTIME NOISE LEVELS
EAST ELEVATION FACING RAILWAY LINE
CONTINUOUS MONITORING PERIOD 21/11/22 – 23/11/22

Date	Time (hrs)	$L_{(A)eq}$	$L_{(A)90}$
21/11/22	07:00 - 23:00	62.0	52.1
22/11/22	07:00 - 23:00	59.5	49.4

TABLE 4.4
NIGHT-TIME NOISE LEVELS
EAST ELEVATION FACING RAILWAY LINE
CONTINUOUS MONITORING PERIOD 21/11/22 – 23/11/22

Date	Time (hrs)	$L_{(A)eq}$	$L_{(A)90}$	$L_{(A)max}$[1]
21/22 Nov	23:00 – 07:00	52.5	39.9	46.0
22/23 Nov	23:00 - 07:00	52.3	39.9	46.5

[1] $L(A)_{max}$ values represent threshold for > 8 exceedances (night-time period)

TABLE 4.5
TRAIN MOVEMENTS DURING SHORT TERM
DAYTIME MONITORING $L(A)_{max}$
8 NOVEMBER 2022

Time (hrs)	Source	Direction	Stopping (S)/ Through train (T)	Sound Level $L_{(A)max}$
10:49	Passenger train	N	S	83.3
10:51	“	S	T	79.8
10:54	“	N	T	69.1
10:56	“	S	S	80.3
10:56	“	N	S	67.7
10:58	“	S	T	77.4
11:01	Platform announcement	-	-	66.0
11:02	Platform announcement	-	-	59.3
11:03	Passenger train	S	S	81.7
11:09	“	N	T	67.0
11:10	“	S	S	71.9
11:16	“	S	S	67.0
11:19	“	N	S	75.7
11:21	“	S	S	62.7
11:24	“	N	S	72.0
11:25	“	S	S	68.0
11:26	“	N	S	69.6

4.3 A summary of the noise monitoring data recorded, including the night-time and peak time noise traces, are given in Appendix D.

5. NOISE FROM RAILWAY

5.1 In terms of noise specifically from the railway line, it is the mainline route between Brighton and London Bridge/Victoria. Trains calling at Haywards Heath station are operated by Southern (East and West Coastway Lines), Thameslink (Brighton Mainline) and Gatwick Express.

5.2 The station lies on a quadruple track including passing loops which allows fast services to overtake stopping services. There are four platforms. Platforms 1 and 2 are used for southbound services and platforms 3 and 4 for northbound services. Maximum off-peak frequency of trains passing through Haywards Heath is approximately twelve trains per hour rising to twenty trains per hour during peak periods. During the overnight period (23.00 to 07.00 weekdays), the current timetable shows a total of 54 trains passing through Haywards Heath station. No passenger trains pass through the station between 02:14 and 04:25.

5.2 The majority of trains stop at the station. At the noise monitoring location, the northbound trains were slowing to stop at the station and the southbound trains were picking up speed as they left the station. The trains take around 15 seconds to pass and the noise sequence comprises an initial "hiss" from the rails followed by the whine/whirr of the power unit and wheel noise. The noise impacts of the passing trains may be identified on the SLM traces in Appendix D.

5.3 The building façade at 1 – 3 Boltro Road forms the site boundary with the railway land and the railway lines and platforms are unobstructed. Ancillary noise associated with operation of the train station included platform announcements and the sound of audible alerts for train doors closing which comprise a beeping noise. Both noise sources were audible at the monitoring location on the east elevation.

5.4 **Results from the Calculation of Railway Noise (1995)**

5.4.1 The noise impacts from the passing trains were also predicted using the method given in *Calculation of Railway Noise* 1995. This is somewhat redundant where actual measured data is available but has been included for comparison purposes. It has been necessary to make some assumptions about the types of rolling stock operated on the railway line, although these assumptions are based on observations at the site and examination of the train timetables.

5.4.2 Passenger trains on the network are all electric powered with carriage driving units (EMUs) and are assumed to be disc braked passenger coaches (4 axles). The track is a continuously welded rail on ballast. From *Calculation of Railway Noise* 1995, the critical segment of the railway is the section where the train carriages become visible on the railway lines to the south of the site, to the station platforms which lie to the north of the site.

5.4.3 There are no significant barrier effects associated with the existing building on site or from neighbouring buildings. However, the multi-storey station car park on the opposite side of the railway line is likely to reflect some noise from the railway and a correction for reflection effects has been incorporated into the calculation.

5.4.4 The distance from the reception point (R) to each of the four tracks has been calculated and two separate train types identified, one for stopping trains (Type 1 - lower speed) and the other for non-stopping trains (Type 2 - high speed). As the trains passing through the station are predominantly electric powered, the nearside railhead represents the effective source position for each track.

5.4.5 The noise impact has been calculated at 1.0 m away from the nearest first floor bedroom of the proposed apartments.

5.4.6 The noise levels in Table 4.5 show the $L_{(A)max}$ values for trains passing the site including both stopping and through trains. By observation, trains stopping at and departing from the station passed the site at speeds of <30 kilometres per hour. Through trains passed at > 70 kph. For stopping trains an average speed of 20 kph has been used for the calculations to take account of acceleration/deceleration.

5.4.7 From Appendix A1 and Chart A1.1 of *Calculation of Railway Noise* 1995, the Sound Exposure Level (SEL) at 25 m distant from the railhead for a single railway carriage (Class 465 or 466 EMU) is 57 + 8.4 = 65.4 $dB_{(A)}$ for Type 1 train (stopping train) and 68 + 8.4 = 76.4 $dB_{(A)}$ for Type 2 train (through train).

5.4.8 The following correction factors have been added to the above SELs:

Concrete sleepers on ballast (Table 1): correction = 0 $dB_{(A)}$
For a 6-coach passenger train (Chart 2): correction = +8.0 $dB_{(A)}$
Correction for distance to 1 m from 1st floor bedroom = from +2 $dB_{(A)}$ (Track 1) to -1 $dB_{(A)}$ (Track 4)
Air absorption correction (Chart 4) = from +0.2 $dB_{(A)}$ (Track 1) to -0.1 $dB_{(A)}$ Track 4).
Ground correction = 0 (Concrete surface between reception point and source).
Reflection effects:
Façade correction = +2.5 $dB_{(A)}$
Opposite façade correction = +1.0 $dB_{(A)}$

5.4.9 From the above:

Passenger train SEL (stopping train): track 1 = 79.1 $dB_{(A)}$,, track 2 = 77.5 $dB_{(A)}$, track 3 = 76.7 $dB_{(A)}$, track 4 = 75.8 $dB_{(A)}$.
Passenger train SEL (through train): track 1 = 90.1 $dB_{(A)}$, track 2 = 88.5 $dB_{(A)}$, track 3 = 87.7 $dB_{(A)}$, track 4 = 86.8 $dB_{(A)}$.

5.4.10 Converting SEL to $L_{(A)eq}$

$$L_{(A)eq,\ 6hr} = SEL - 43.3 + 10 \log_{10} Q_{NIGHT}$$

$L_{(A)eq,\ 18hr} = SEL - 43.3 + 10 \log_{10} Q_{DAY}$

Where Q is the number of trains passing the reception point during the relevant period.

Q_{NIGHT} = 40 stopping trains and 14 through trains
Q_{DAY} = 270 stopping trains and 90 through trains

Overall $L_{(A)eq,\ 6hr}$ (night-time 00:00 hrs - 06:00 hrs) = 64.0 $dB_{(A)}$.
Overall $L_{(A)eq,\ 18hr}$ (daytime 06:00 hrs - 24:00 hrs) = 67.0 $dB_{(A)}$.

6. INTERPRETATION OF THE RESULTS

6.1 Meteorological Conditions

6.1.1 The meteorological conditions at the site throughout the two monitoring periods were generally quiescent, mainly dry (apart from a short period of rain on Monday 21 November between approximately 09:30 and 12:00). The temperature ranged between a minimum of 4˚C and a maximum of 17˚C and therefore no allowance for weather conditions was considered necessary.

6.2 Noise Climate at the Site

6.2.1 The results confirm that background noise levels at the site are as would be expected for a town centre location, with daytime background noise levels around 49 - 58 dB, falling to <40 $dB_{(A)}$ during night-time periods. The most continuous noise source was from traffic passing through the junction of Boltro Road, Paddockhall Road and Market Place, immediately adjacent to the site, and from the railway line and station to the north and east.

6.2.2 Night-time noise parameters were generally some 10 - 12 $dB_{(A)}$ lower than the daytime values.

6.2.3 Based on the indicative Daytime $L_{(A)eq,16hr}$ and Night-time $L_{(A)eq,8hr}$ results, the location would be considered Medium Risk under the Stage 1: Initial Site Noise Risk Assessment given in the Professional Practice Guidance: Planning & Noise (ProPg: Planning and Noise).

6.3 Noise impacts from the railway

6.3.1 The Calculation of Railway Noise method gave a daytime $L_{(A)eq.18h}$ of 67 $dB_{(A)}$ and a night-time $L_{(A)eq,6h}$ of 64 $dB_{(A)}$. The measured noise levels, based on the WHO reference time periods of 07:00 – 23:00 (daytime) and 23:00 – 07:00 (night-time), were lower, with daytime $L_{(A)eq.16h}$ of 62 $dB_{(A)}$ and night-time $L_{(A)eq,8h}$ of 52.5 $dB_{(A)}$. The disparity between the calculated noise levels and the measured noise levels from the railway would appear to be due to pessimistic assumptions in *Calculation of Railway Noise*, in particular the sound exposure levels for individual railway vehicles may not accurately reflect reduced noise emissions from more modern locomotives and coaches introduced since the

guidance was issued. It may also be attributable to an over-estimation of train speed through the station, particularly at night. The calculated value does not take into account the period where no trains pass the site between 02:14 and 04:25 or the different reference periods for the night-time period.

6.3.2 Given that noise measurements from the railway were taken on site for a representative time period both daytime and night-time, it is argued that the measured data forms a more accurate representation of the impact of the railway on the proposed living accommodation. On this basis, a daytime $L_{(A)eq,16h}$ of 62 $dB_{(A)}$ and a night-time $L_{(A)eq,8h}$ of 52.5 $dB_{(A)}$ has been used for calculation of any necessary acoustic attenuation for habitable rooms on the east elevation facing the railway.

6.3.3 Frequency data for the continuous monitoring periods at both locations did not indicate any dominant frequencies.

6.4 Noise Impact from traffic sources.

6.4.1 Noise from the road network near the site predominantly affects the north and west elevations of the building. The north elevation will also be impacted by the railway. Noise measurements were taken with the microphone extended 1 m from the second-floor window on the west elevation of the building.

6.4.2 The average daytime $L_{(A)eq,16h}$ in this position was 65.9 $dB_{(A)}$. The average night-time $L_{(A)eq,8h}$ was 54.5 $dB_{(A)}$. The measurements were taken at second floor level (due to security considerations for unattended monitoring) and therefore an adjustment for noise levels for the lower floor levels is required. At ground floor window level, the calculated daytime $L_{(A)eq,16h}$ is calculated as 74.1 $dB_{(A)}$ and at first floor level it is 69.3 $dB_{(A)}$.

6.4.3 The ground floor night-time $L_{(A)eq,8h}$ is calculated at 62.7 $dB_{(A)}$ and 57.9 $dB_{(A)}$ at the first-floor window.

6.5 Other significant noise sources

6.5.1 There are some commercial activities in the vicinity of the site, including a vehicle repair and servicing workshop, approximately 30 m north of the site (Owen Garages), which has been identified as a potential noise source. The garage was in operation on all occasions monitoring was undertaken but no noise from the garage was audible at the site, and the orientation of the main workshop doors suggest that noise would be screened to some extent should noisy activities ever take place with the workshop doors open.

6.5.2 On the west elevation the main noise source affecting the site is traffic noise from the one-way merging junction immediately west of the site at Boltro Road, Market Place and Paddockhall Road.

6.5.3 During the site visit on the 8 November 2022, an intermittent drilling noise was just audible at the site and appeared to be coming from the other side of the

railway line. It did not influence recorded noise levels and was considered to be a temporary activity. No other significant noise sources were identified.

6.6 Internal Noise Level Guidelines (Stage 2, Element 2)

6.6.1 The World Health Organisation (WHO) recommends no more than 30 $dB_{(A)}$ $L_{(A)eq}$ inside a bedroom to permit restful sleep. The same night-time guideline is given in BS 8233:2014. Night-time is classed as 23:00 - 07:00 hours. The permitted maximum daytime internal $L_{(A)eq}$ is given as 35 $dB_{(A)}$ in BS 8233.

6.6.2 Allowing for the 15 $dB_{(A)}$ sound attenuation for an open window, it is apparent that the World Health Organisation (WHO) threshold of 30 dB $L_{(A)eq}$ for restful sleep will not be achieved on any façade of the building where open windows are relied on for room cooling.

6.6.3 The WHO guidance states that the number of individual night-time noise events ($L_{(A)max}$) exceeding 45 $dB_{(A)}$ within a bedroom should be limited. This is generally taken as not more than eight exceedances during a single night, based on a 5-minute average monitoring period. From the continuous monitoring, it is apparent that the maximum threshold for these exceedances on the west elevation facing Boltro Road was 84.2 $dB_{(A)}$ at the ground floor level, 79.4 $dB_{(A)}$ at first floor and 76.0 at second floor level. For the east elevation facing the railway line, the ($L_{(A)max}$) threshold for exceedance was 79.5 $dB_{(A)}$. The higher value may be applied to the north elevation as this is exposed to both the road junction and the railway.

6.7 External Noise Level Guidelines and Amenity Area Assessment (Stage 2, Element 3)

6.7.1 The WHO recommendations for external noise indicates 55 $dB_{(A)}$ $L_{(A)eq}$ as the threshold for annoyance and suggests <50 $dB_{(A)}$ as ideal. In this case, the daytime external $L_{(A)eq}$ results measured above 55 $dB_{(A)}$ on the northern, eastern and western facades.

6.7.2 Due to the constraints of the site, no external recreation spaces are included in the proposed development and there is, therefore, no necessity to provide noise attenuation to meet this guideline value.

6.8 Parameters for Acoustic Design (Stage 2: Element 1)

6.8.1 It is not within the power of the promoter of the conversion of the building at 1 – 3 Boltro Road to alter the external noise impacts of the location, for example to divert/slow or remove traffic, or affect the operations of the railway line. The options are limited to improving the acoustic performance of the building envelope, and possibly redistributing habitable rooms within the proposed residences.

6.8.2 In terms of the layout of the habitable rooms, there is limited scope because all three external elevations of the building are exposed to noise sources. Window openings on the east elevation facing the railway are more limited

than on the west elevation, particularly on the ground floor, but there is limited scope for re-design of the layout as this would have a negative impact on availability of natural lighting to habitable rooms.

6.8.3 The acoustic attenuation indicated for each façade of the building is summarised in Table 6.1 below:

TABLE 6.1
ACOUSTIC ATTENUATION INDICATED

Facade	$L_{(A)eq}$ Daytime	$L_{(A)eq}$ Night-time	$L_{(A)max}$ Night-time threshold	Attenuation indicated ($dB_{(A)}$)
Threshold value	35 dB	30 dB	45 dB	
East (Railway)	62.0	52.5	79.5	35
West ground floor (Boltro Road)	74.1 (To remain as existing - offices)	62.7 (To remain as existing - offices)	84.2 (To remain as existing - offices)	39 (To remain as existing - offices)
West first floor (Boltro Road)	69.3	57.9	79.4	35
West second floor (Boltro Road)	65.9	54.5	76.0	31

6.8.3 Fenestration and (acoustic) ventilation serving habitable rooms on the northern and western facades will need to provide at least 39 dB of attenuation on the ground floor, (however, this is to remain as existing for use as offices, so the change of use does not apply here), 35 dB of attenuation on the first floor and 31 dB of attenuation on the second floor. For habitable rooms on the eastern façade facing the railway, fenestration and (acoustic) ventilation will need to provide 35 dB of attenuation. Both the first and second floor flats have bedroom windows that open onto the eastern façade. Windows should remain openable to allow resident choice and emergency provision.

6.9 The Existing Building Envelope

6.9.1 As far as can be reasonably ascertained, the building is constructed of 13” (330 mm) brickwork in English bond with rendered external panels and internal wet plaster finish on the walls. The attenuation of sound transmission through this type of wall (approximate mass 630 kg/m^2) would be anticipated to exceed 50 dB.

6.9.2 The existing building extends over three storeys with the third storey constructed within the roof space. The roof is slate covered with dormer windows to the north, west and east elevations.

6.9.3 The nature of the walls behind the slate cladding in the third-floor roof space is not known. The noise exposure of rooms within the roof space will be reduced

to some extent by distance from traffic on the Boltro Road and the railway at ground floor level.

6.9.4 Existing fenestration appears to be replacement thermal uPVC double glazing. The original double solid timber doors are positioned on the west elevation in the centre of No.1 Boltro Road (original bank building), with a further single entrance door serving the existing building at No. 3 Boltro Road. The position of the doors and windows in both buildings is to remain as existing within the proposed scheme. The door openings would be considered to be robust in noise attenuation terms. There are no new doorways or windows proposed.

7. MITIGATION MEASURES

7.1 Based on the monitoring data, fenestration specified for the new residential units will need to provide at least, 35 dB of attenuation for the first-floor eastern elevation bedroom and on the north and west facades and 31dB for rooms on the second floor north and west façade, in order to comply with the WHO guideline values.

7.2 The sound reduction provided by glazing is represented in the UK by the Weighted Reduction (R_w) index. This measure incorporates a correction for the ear's varying sensitivity at different frequencies. The windows to be provided to the residential units at 1 -3 Boltro Road will require windows to be fitted with acoustic glass (e.g. acoustic Poly-vinyl Butyral interlayer laminated) or be standard insulating glass units of 4/16/4 plus secondary glazing of 6 mm thickness to provide a weighted sound reduction (R_w) + C_{tr} of 40 dB. See Appendix B for sample Insulation Glazing Unit specification (Dual Seal Glass).

7.3 Based on the noise assessments carried out at the site, the internal target noise levels ($L_{Aeq,}$ $L_{A(max)}$) can only be practically achieved with the windows to habitable rooms being closed. This means that an alternative to opening windows for room cooling will have to be provided in the form of mechanical ventilation. Windows should, however, remain openable to allow resident choice and emergency provision.

7.4 A suitable mechanical ventilation with heat recovery (MVHR) system should be specified, based on room and window dimensions in the final scheme design to ensure adequate ventilation rates. Ventilation intake points for the MVHR system should be positioned away from the road to minimise the risk of air pollutants from traffic emissions being introduced into the accommodation space.

7.5 The following noise mitigation methods should also be incorporated into the design and installation of any ventilation systems:

- Ventilation inlets should be, as far as is practicable, located sensitively to minimise noise and air quality impacts on the neighbouring dwellings.
- The ventilation unit should be specified on the basis of acoustic performance. The unit should not be undersized, a larger unit run at a

lower speed will be significantly quieter than a smaller unit running at a higher speed.

- Fan units to be installed on appropriate anti-vibration mounts. There should be no rigid connection between the unit and the building structure.
- Duct layouts should be designed to minimise bends and duct size and shape should be maintained throughout the system, where possible.
- Rigid ducting should be used in preference to flexible ducting. Joints between ducting should be mechanically fixed and sealed to ensure it is airtight.
- Where ducting penetrates walls, the hole should be as small as possible, and any gaps sealed with a non-setting mastic to ensure it is airtight.
- In order to comply with the night-time internal noise limit of 30 dB $LA_{eq,}$ T, the ventilation system should be designed so that air flow does not exceed 7.5 m/s (rectangular duct) or 10 m/s (circular duct). The air inlet velocity should not exceed 1.5 m/s and return air speed should not exceed 2 m/s.
- Manufacturer's cleaning and maintenance recommendations to be followed to ensure continued efficiency and noise control.

8. NOISE DURING THE PROPOSED REDEVELOPMENT

8.1 The proposed redevelopment work will generate some noise. The most likely affected residences will be the first and second floor accommodation in the adjoining building to the south (No. 5 Boltro Road) and the residential properties on the opposite side of Boltro Road at Charter Gate. As most of the work will be internal, the construction noise is unlikely to significantly impact other residences further from the site.

8.2 Construction noise impacts are best mitigated by confining the work to normal business hours and enclosing the working area as much as is practicable. The principal mitigation will be the limited period in which the impacts from construction will occur.

8.3 The building contractor should adopt a good neighbour policy to minimise noise impacts on neighbouring residents.

9. CONCLUSIONS

9.1 The National Planning Policy Framework (NPPF) states that sustainable development should:

i. Avoid noise from giving rise to significant adverse impacts on health and quality of life.

ii. Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise, including through the use of conditions attached to planning consents.

iii. Recognise that development will often create some noise and existing businesses, wanting to develop in continuance of their business, should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.

iv. Identify and protect areas of tranquillity, which have remained relatively undisturbed by noise and are prized for their recreational and amenity value.

9.2 The site is in a mixed residential/commercial area in the centre of Haywards Heath town centre. The main sources of noise at the site is from traffic on Boltro Road to the west, the one way merging junction of Boltro Road, Market Place and Paddockhall Road to the north and the main Brighton to London railway and station to the north and east of the site.

9.3 Nearby commercial uses to the north of the site do not appear to have any significant impact on the site in terms of noise, based on evidence from a series of site visits and noise monitoring.

9.4 Monitoring carried out at the site between 8 to 14 November and 21 to 23 November 2022 provided daytime, night-time and peak hour noise data at two locations at the site and identified the key noise sources likely to impact on future residents. These were trains on the railway line and associated station activities and noise from the adjoining roads.

9.5 Based on the monitoring data obtained at the site, it is predicted that noise from the railway and road would result in exceedance of the World Health Organisation recommendation for night-time (23:00 - 07:00 hours) of no more than 30 $dB_{(A)}$ $L_{(A)eq}$ to permit restful sleep (with closed windows). The permitted maximum daytime internal $L_{(A)eq}$ of 35 $dB_{(A)}$ as given in the British Standard, would also be exceeded.

9.6 It is recommended that windows serving living rooms and bedrooms on the first and second floors should be fitted with acoustic glass (e.g. acoustic Poly-vinyl Butyral interlayer laminated) or be standard insulating glass units of 4/16/4 plus secondary glazing of 6 mm thickness to provide a weighted sound reduction (R_w) + C_{tr} of 40 dB.

9.7 Powered extract ventilation, to provide an alternative to opening bedroom windows for cooling, should be provided. A suitable mechanical ventilation with heat recovery (MVHR) system should be specified, based on room and window dimensions in the final scheme design to ensure adequate ventilation rates. Ventilation intake points for the MVHR system should be positioned away from the road to minimise the risk of air pollutants from traffic emissions being introduced into the accommodation.

9.8 The proposed development of the site should not have significant adverse noise impacts on adjacent residential receptors, provided that work is restricted to normal hours and any ancillary noise on site is minimised.

9.9 The evidence of this assessment is that, subject to implementing the mitigation and attenuation measures recommended above, the proposed development should not expose the proposed future residents to significant adverse noise impacts on health and quality of life.

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APPENDIX A
Figure 1: Site Location
Figure 2: Site Layout and Monitoring Locations

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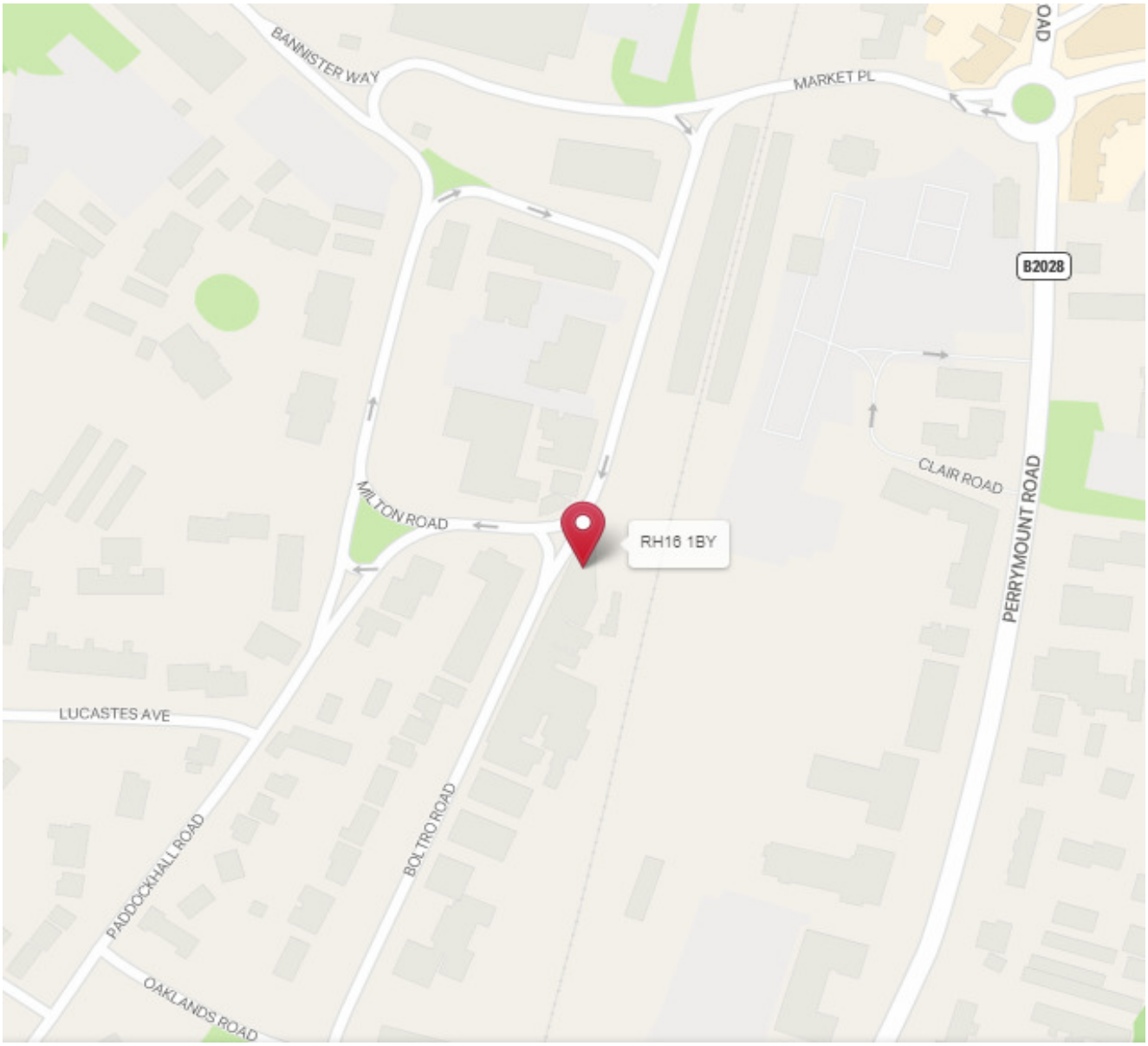

CHANGING WORKLACE LTD

1 - 3 BOLTRO ROAD, HAYWARDS HEATH

WEST SUSSEX RH16 1BY

Figure 1: Site Location Plan

November 2022

KEY: Monitoring Locations

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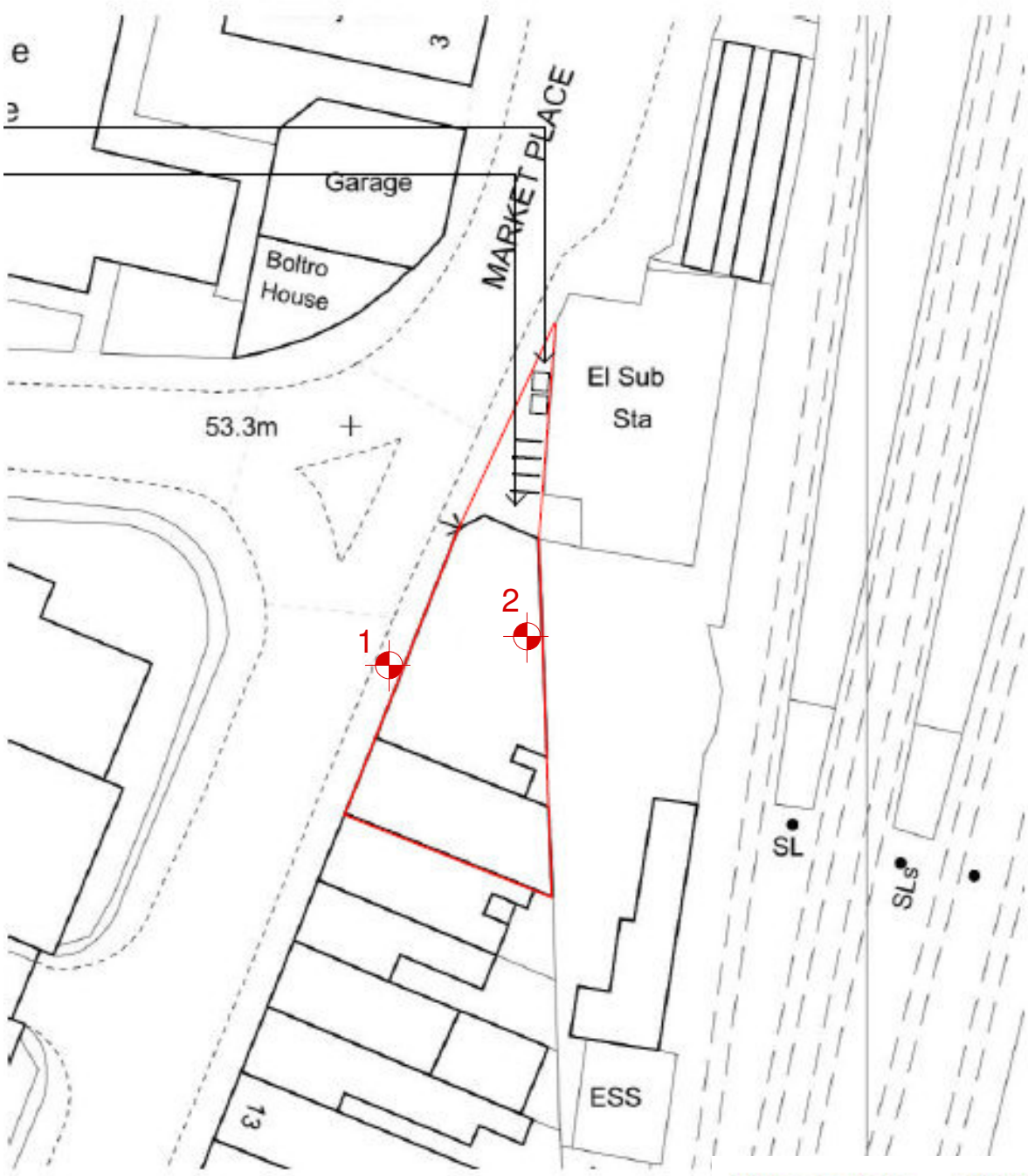

Site Plan - 1:500

5 0 5 10 15 20 25

SCALE 1: 500 m

Scale as shown

CHANGING WORKLACE LTD

1 - 3 BOLTRO ROAD, HAYWARDS HEATH

WEST SUSSEX RH16 1BY

Figure 2: Existing Site Layout & Monitoring Locations

November 2022

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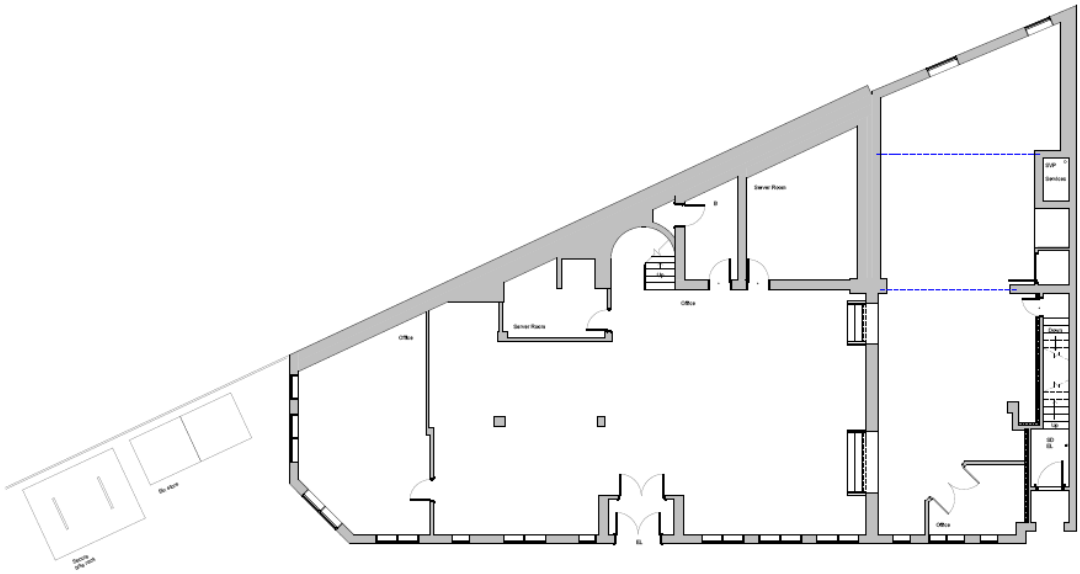
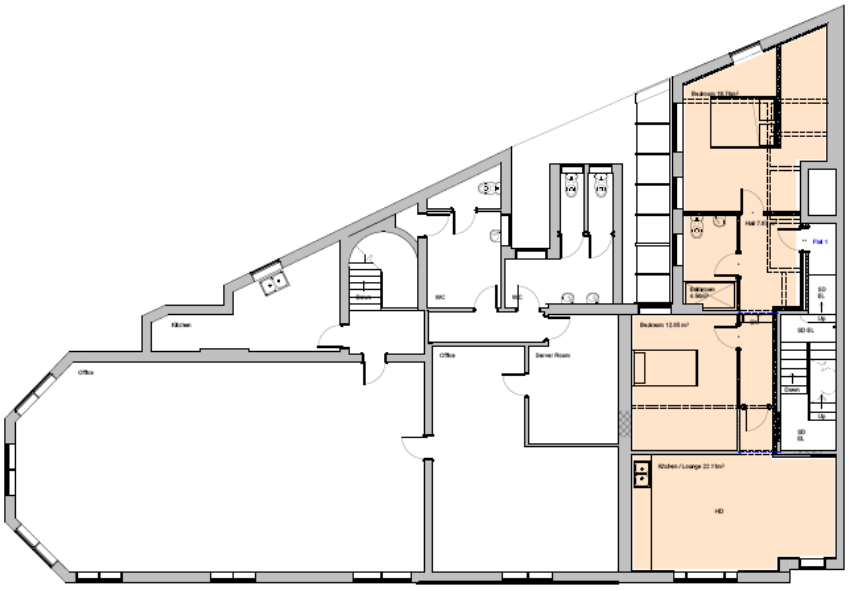
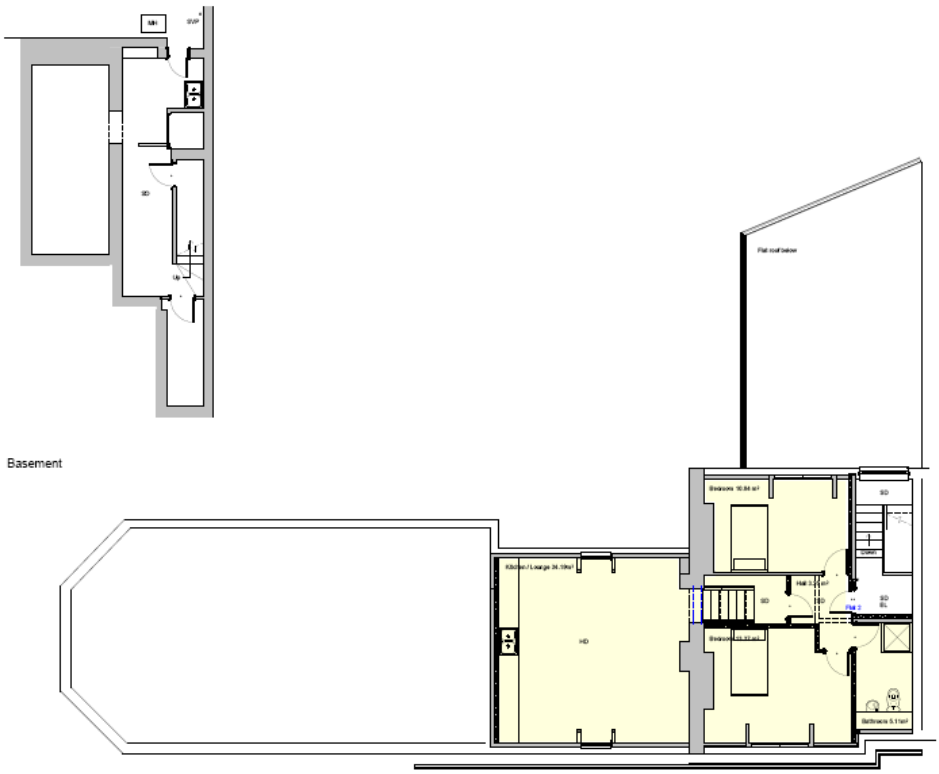
APPENDIX B
Architect's Drawings



Ground Floor

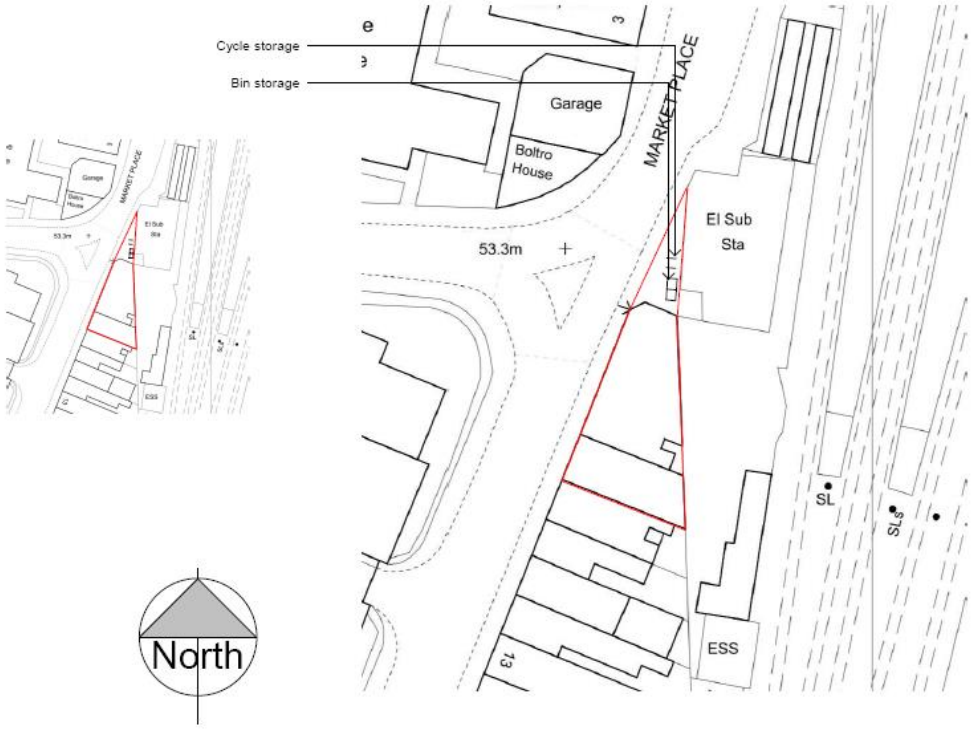


First Floor



Basement

Second Floor



APPENDIX C
Noise Monitor Calibration Certificates

Acoustic Calibration Services Limited
Unit 6H Diamond Industrial Centre
Works Road Letchworth Garden City
Hertfordshire SG6 1LW
Tel: 01462 677 197 Mobile: 0771 886 4944
Email: trevjohnlewis@aol.com

ACSL
Acoustic Calibration Services Limited

CERTIFICATE OF CALIBRATION

Model: CEL-490.C1 Serial Number: 129580

Organisation: Environmental Assessment Services Limited, Enterprise House London Road, Hickstead, Haywards Heath, W Sussex RH17 5LZ

Job Number: 2889 **Customer Order Reference:** SLM Calibration

The Sound Level Meter was assessed for conformance with International Standards IEC 60651 and IEC 60804 using test procedures described in BS 7580 Part 1. The meter claims Type 1 accuracy conformance and it was against these requirements that all the results were evaluated.

The sound level meter was fitted with a **GRAS 40AE** measurement microphone Serial No. **100742** and a **CEL-495** preamplifier Serial No. **001597**. The microphone was replaced with a suitable input device in order to apply electrical signals to the preamplifier.

A **CEL-110/1** Acoustic Calibrator Serial No: **119427** was supplied with the meter and was utilised in establishing the initial acoustic calibration setting.

The sound level meter passed all applied tests with no deviations from Type 1 specification, in accordance with IEC 60651 and IEC 60804. Accordingly, the meter meets the requirements of BS 7580 Part 1.

The sound level meter should be set to read **113.9dB** when used with the associated acoustic calibrator, microphone and preamplifier, as detailed above at reference atmospheric pressure.

All ACSL's calibration instrumentation is fully traceable to National Standards. The acoustic references are calibrated by laboratories which are UKAS accredited for the purpose.

Certificate No: **16012** ***Signature:***
Date of Issue: **9th March 2022** ***Print Name:*** **Trevor Lewis**

Robert Lewis Accountants, Head Office: 4 Capricorn Centre Cranes Farm Road Basildon SS14 3JJ
Registered No: 4143457 VAT No: GB 770505441 Directors: Trevor J Lewis, G Parry BSc CPhys MInstP AMIOA, O R Clingan MIOA

Acoustic Calibration Services Limited
Unit 6H Diamond Industrial Centre
Works Road Letchworth Garden City
Hertfordshire SG6 1LW
Tel: 01462-677 197 Mobile: 0771 886 4944
Email: trevjohnlewis@aol.com

ACSL
Acoustic Calibration Services Limited

CERTIFICATE OF CALIBRATION

Model: CEL-110/1 **Serial Number:** 119427

Organisation: Environmental Assessment Services Limited, Enterprise House London Road, Hickstead, Haywards Heath, W Sussex RH17 5LZ

Job Number: 2889 **Customer Order Reference:** SLM Calibration

The acoustic calibrator was run for a period of time until a stable level was achieved. The output level was compared to the certified level of the laboratory measurement references. The calibrator was applied to the meter, removed, then reapplied to provide five separate readings, with the average value of these measurements recorded and certified.

The ambient temperature during calibration was **24.1** ± 1°C.
The barometric pressure was **100.8** to **100.9** kPa.
The relative humidity was **30** to **40** %

The sound pressure level output from the Acoustic Calibrator was measured in its half inch configuration using a B&K 4134 microphone. The mean level output of the acoustic calibrator was 114.0 dB at the reference setting and 94.1 dB at the -20dB setting.

The output frequency signal of the acoustic calibrator is 1000Hz.

All ACSL's calibration instrumentation is fully traceable to National Standards. The acoustic references are calibrated by laboratories which are UKAS accredited for the purpose.

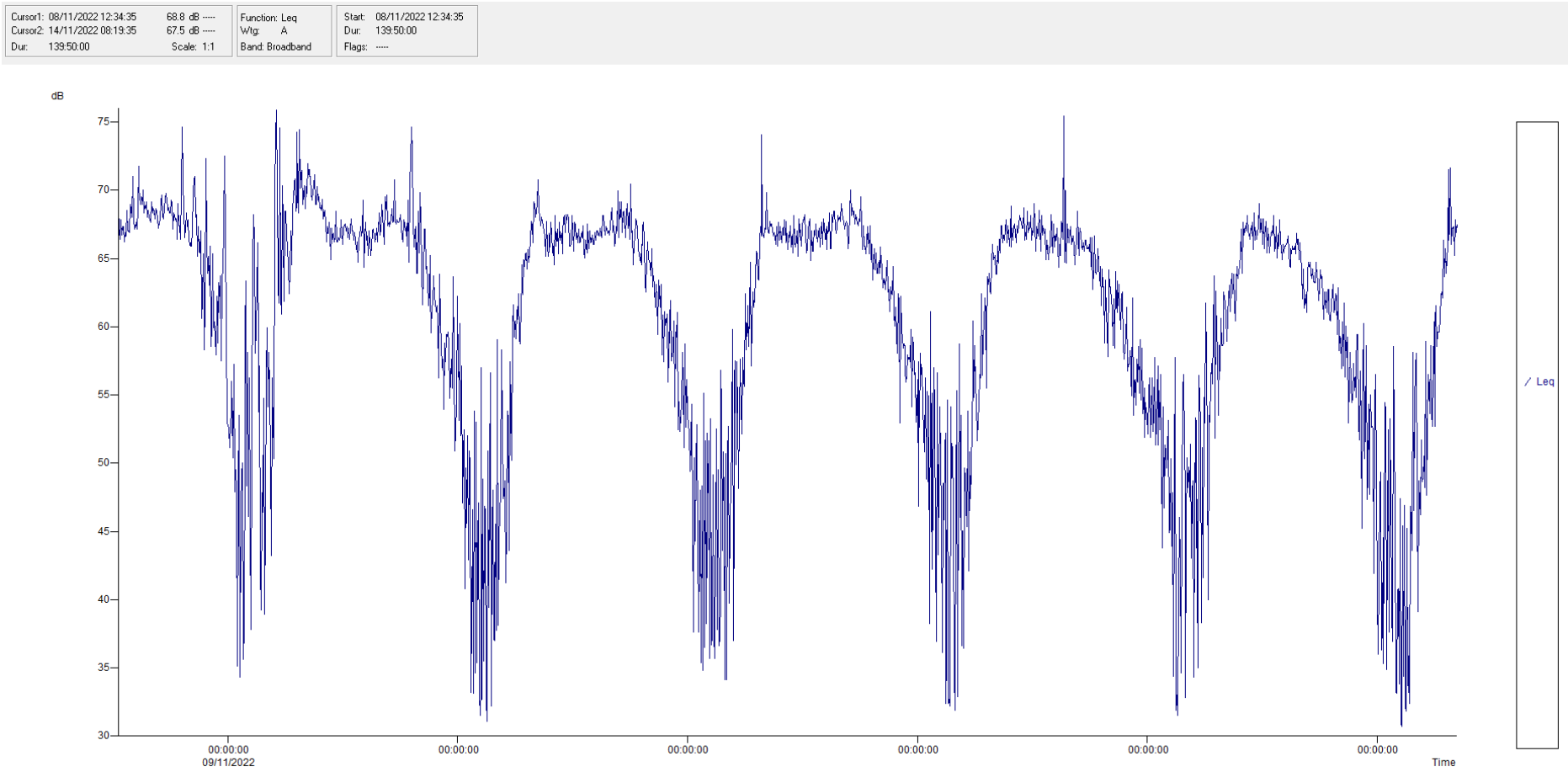
Certificate No: 16010
Date of Issue: 8th March 2022

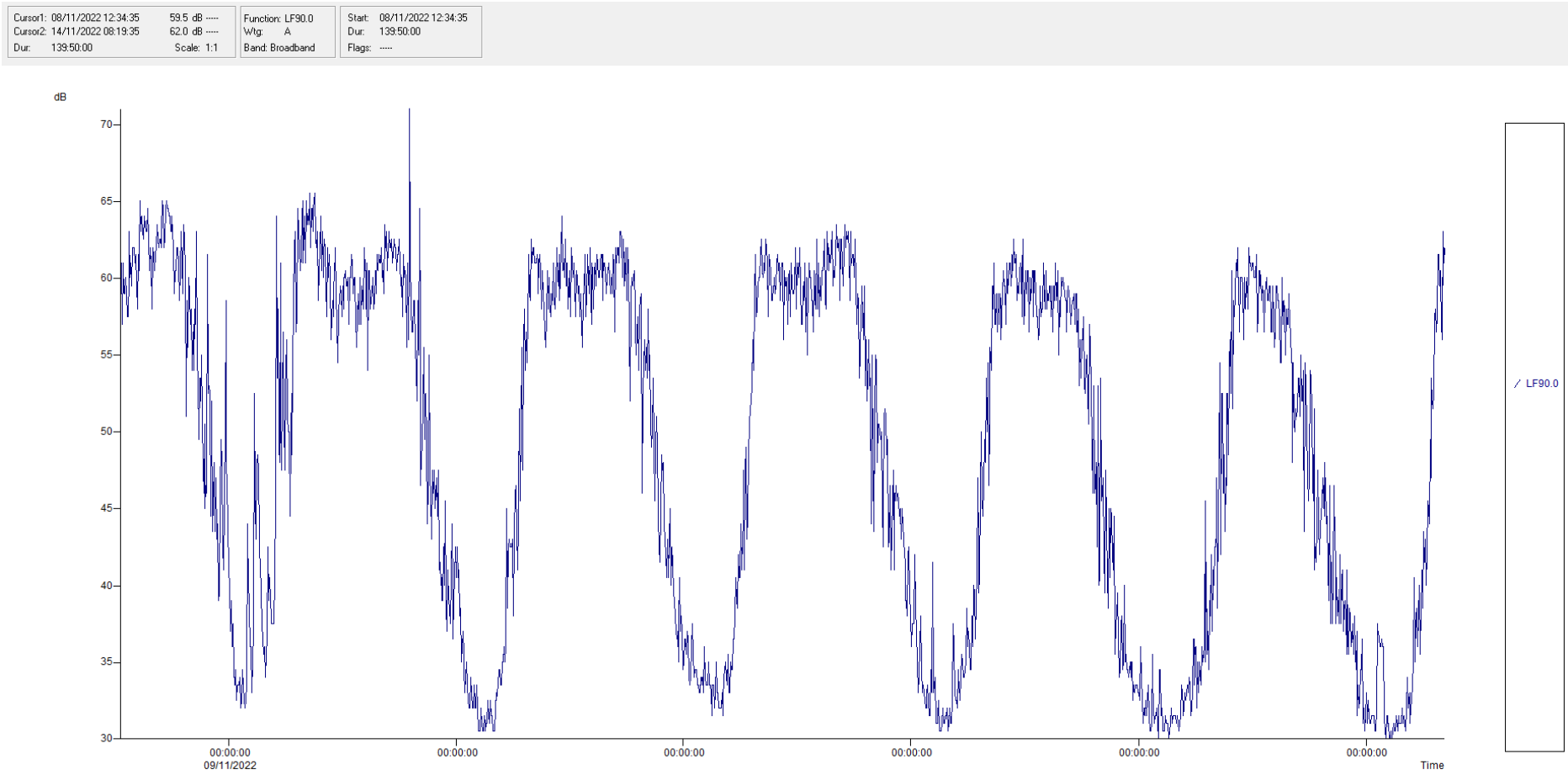
Signature:
Print Name: Trevor Lewis

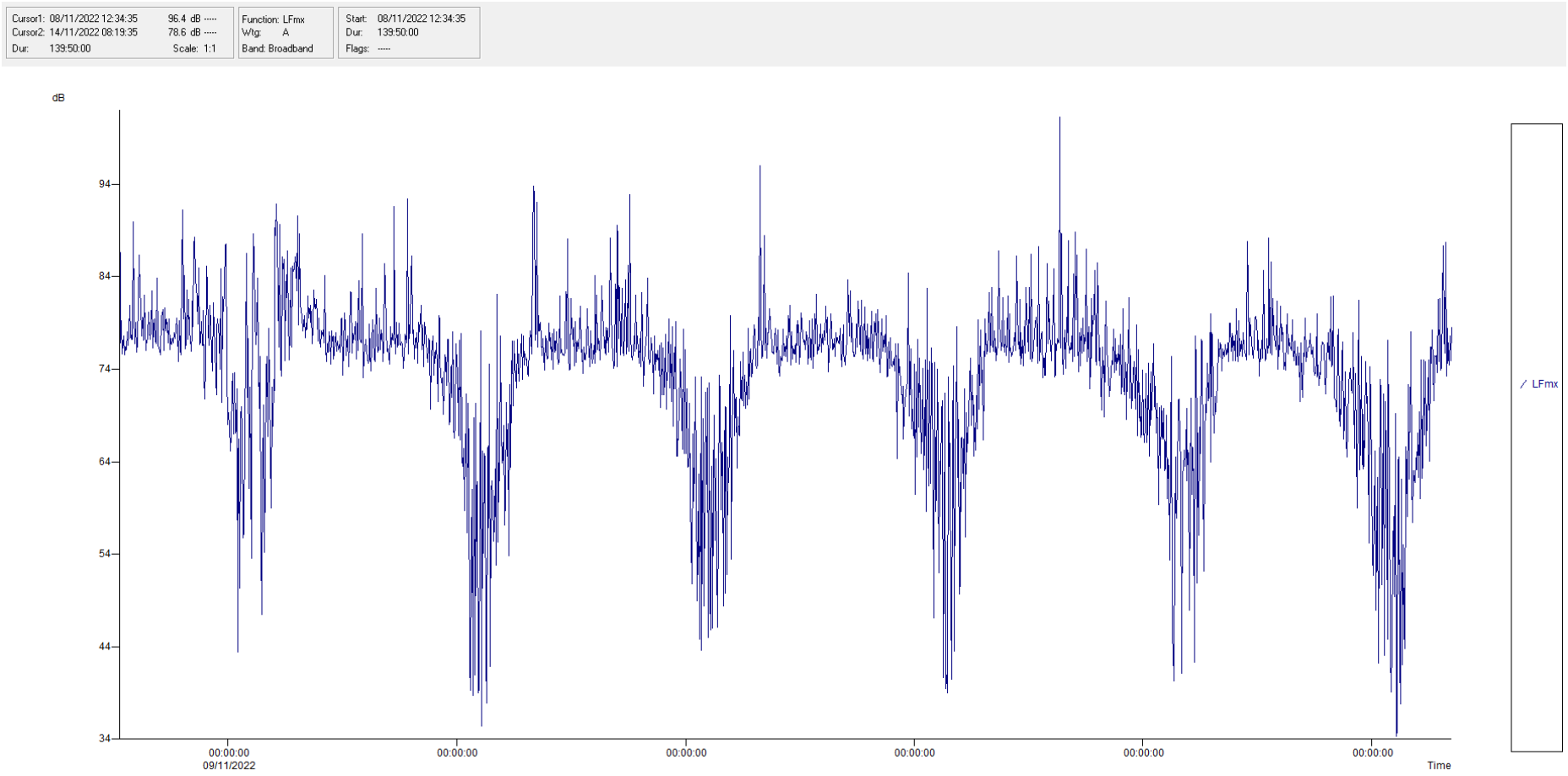
Robert Lewis Accountants, Head Office: 4 Capricorn Centre Cranes Farm Road Basildon SS14 3JJ
Registered No: 4143457 VAT No: GB 770505441 Directors: Trevor J Lewis, G Perry BSc CPhys MInstP AMIOA, O R Clingan MIOA

APPENDIX D
Summary of Noise Monitoring Data

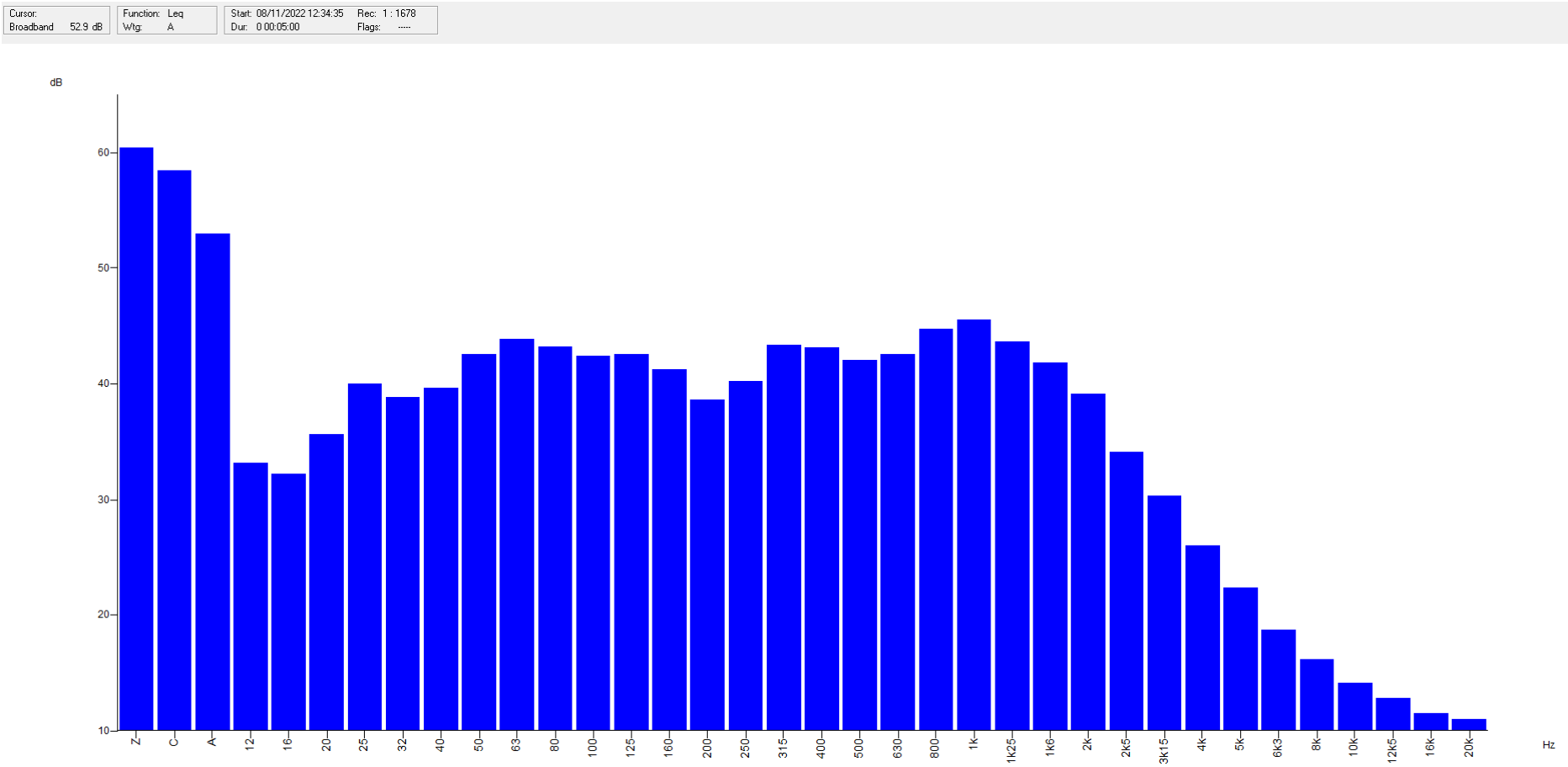
Location 1: Boltro Road (West elevation)



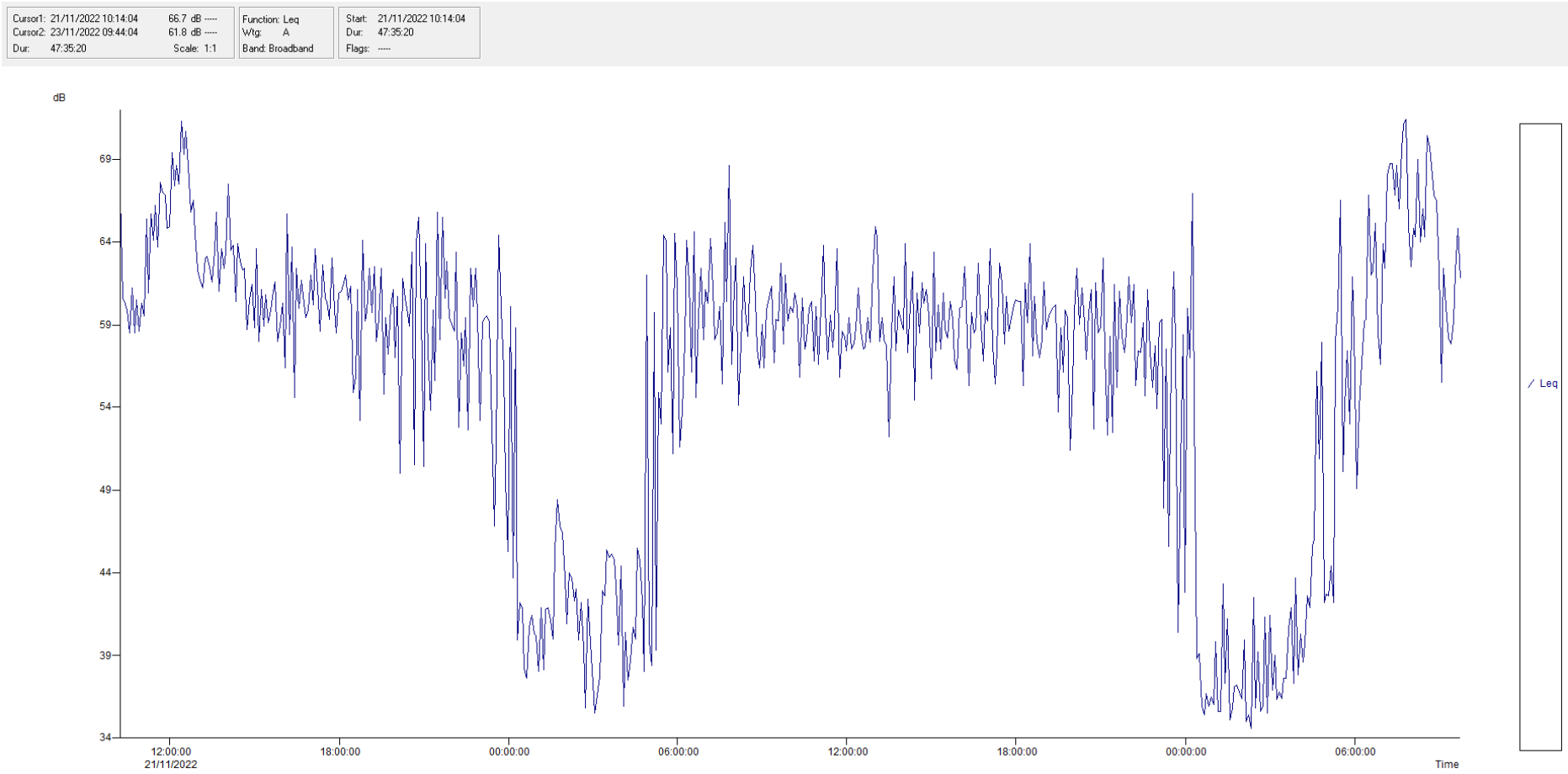


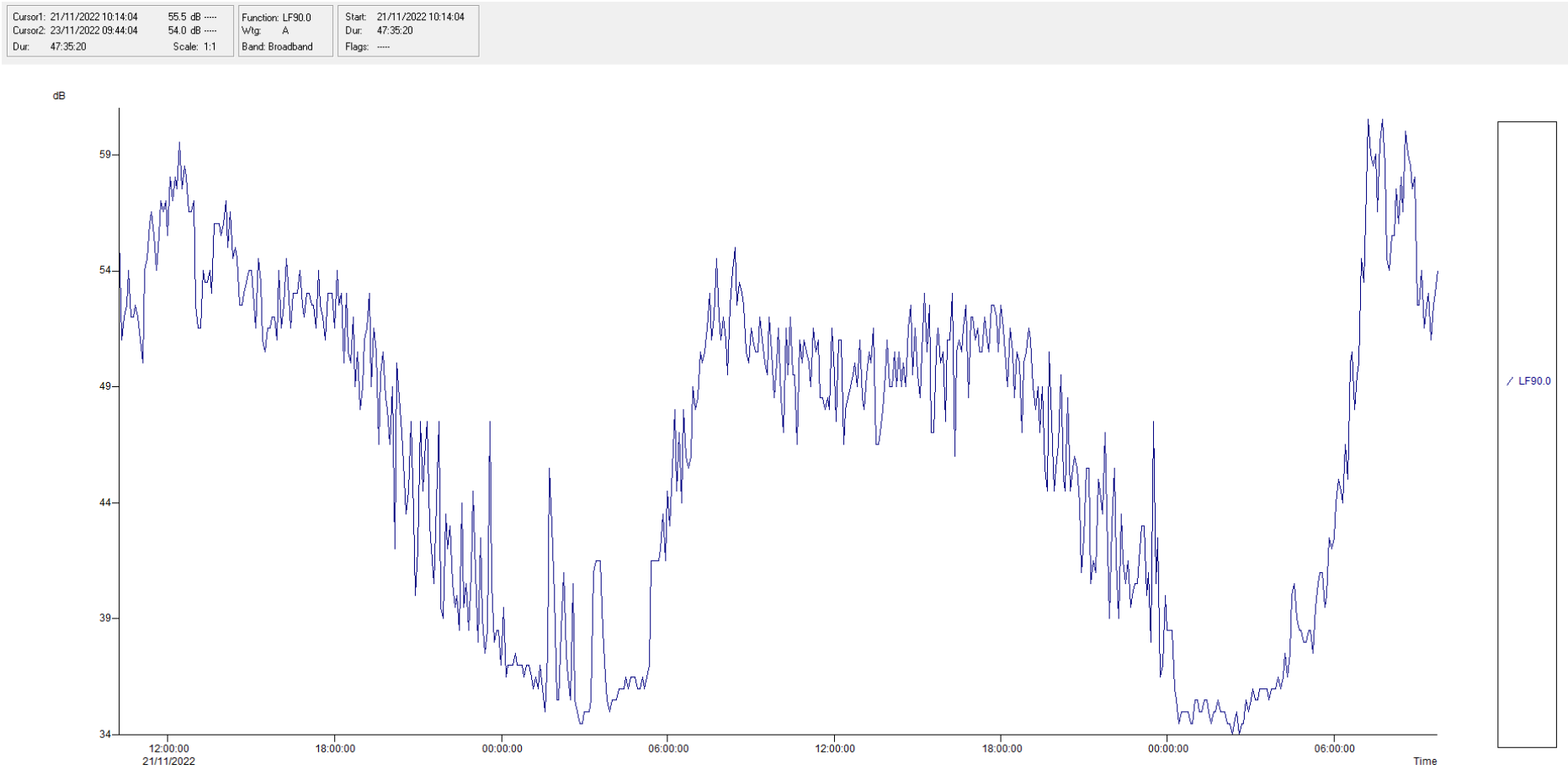


Boltro Road – Frequency profile



Location 2: Railway and station (East elevation)

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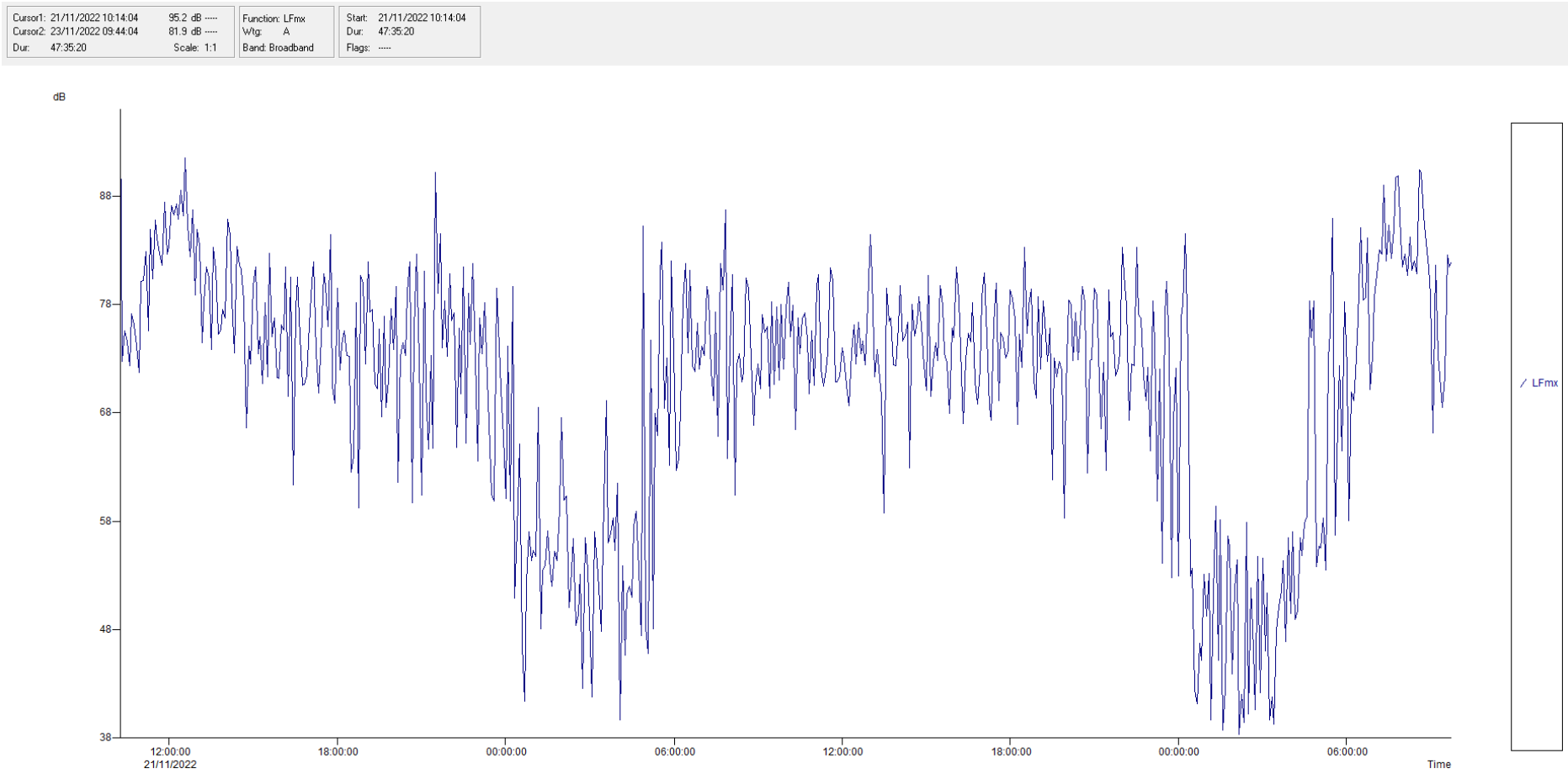
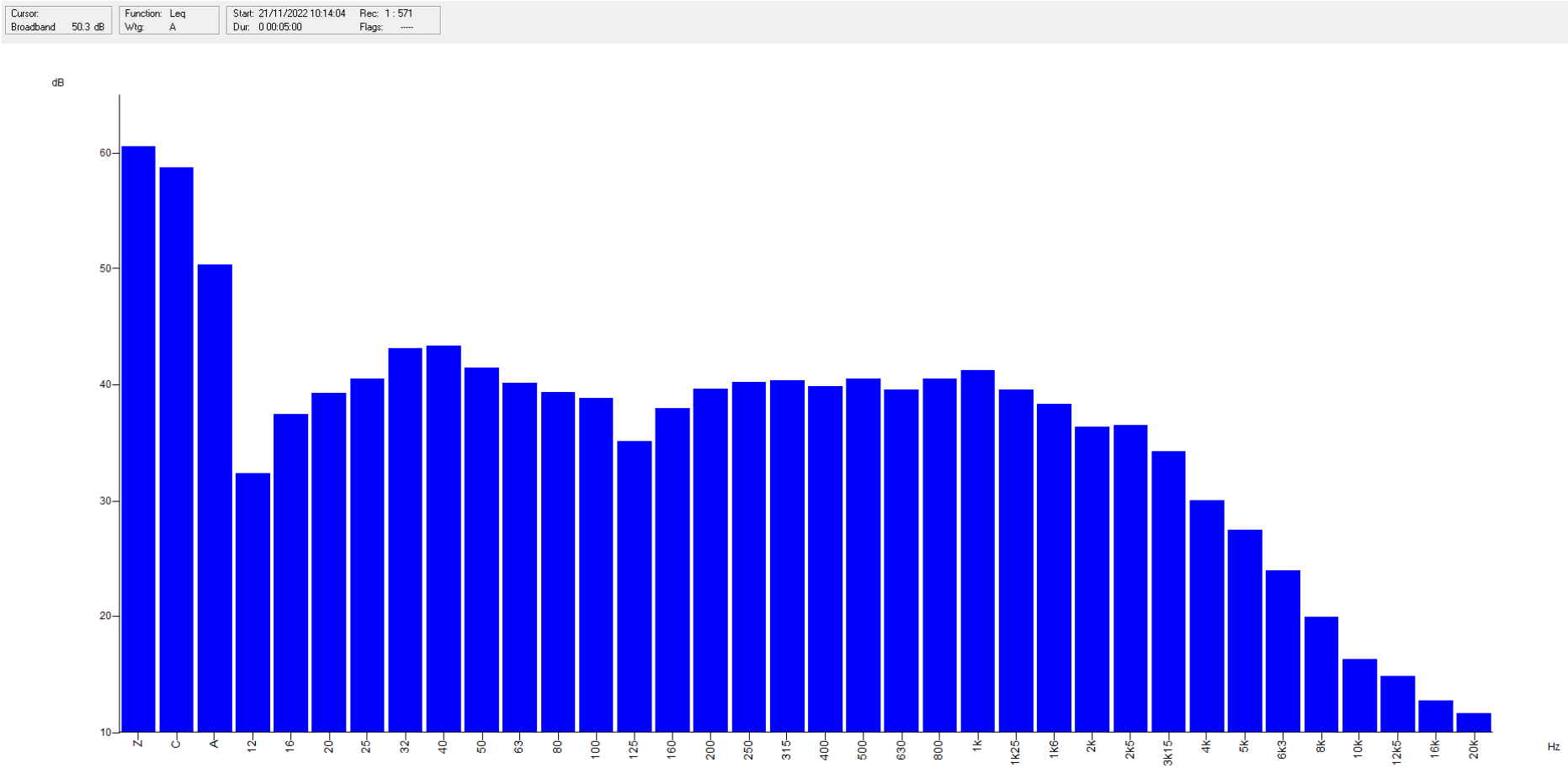
Cursor2: 23/11/2022 09:44:04 54.0 dB
Dur: 47:35:20 Scale: 1:1
Function: LF90.0
Wtg: A
Band: Broadband
Start: 21/11/2022 10:14:04
Dur: 47:35:20
Flags: -----
dB
59
54
49
44
39
34
12:00:00
21/11/2022
18:00:00
00:00:00
06:00:00
12:00:00
18:00:00
00:00:00
06:00:00
Time
LF90.0



East elevation (railway) – Frequency profile



APPENDIX E:

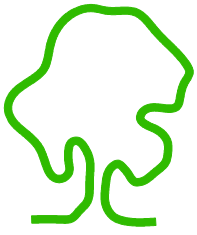
Site Photographs

Photograph 1:

Monitoring location 1 – West elevation onto Boltro Road.

Photograph 2:

Monitoring location 2 – East elevation onto Railway.



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