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HIGH STREET
TONBRIDGE

NOISE IMPACT ASSESSMENT

Technical Report: R8833-1 Rev 0

Date: 7th May 2021

For: McCarthy & Stone Retirement Lifestyles Ltd
Prospect Place
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Hatfield
Hertfordshire
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24 Acoustics Document Control Sheet

Project Title: High Street, Tonbridge - Noise Impact Assessment

Report Ref: R8833-1 Rev 0

Date: 7th May 2021

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For and on behalf of 24 Acoustics Ltd				

Document Status and Approval Schedule

Revision	Description	Prepared By	Reviewed By	Approved By
0	Approved for issue	Kiel Edwards	Neil McLeod	Steve Gosling

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1.0 INTRODUCTION

1.1 24 Acoustics Ltd has been appointed by McCarthy & Stone Retirement Lifestyles Ltd, to provide a noise assessment at a site located on High Street, Tonbridge in connection with a proposed new development for residential use. Planning permission is sought for a new build development, to provide 36 retirement living apartments.

1.2 The site is affected by noise from road traffic on High Street to the east, New Warf Road to the north, River Walk to the west and Bradford Street to the south and there are retail premises nearby. Accordingly, this noise impact assessment has included:

- Environmental noise monitoring;
- Consideration of the noise arising from nearby sources affecting the site;
- Assessment of internal noise levels within the dwellings;
- Assessment of external noise levels within garden areas.

1.3 This report presents the results of the assessment, following site visits and ambient noise surveys undertaken in April 2021.

1.4 An explanation of acoustical terms used in this report is provided in Appendix A. All sound pressure levels in this report are given in dB re: 20 μPa.

2.0 SITE DESCRIPTION

2.1 The site is located on the rear of High Street, Tonbridge, and comprises a car park and retail building.

2.2 It is proposed to demolish the existing building and construct a new four-storey apartment block. The development will comprise 36 retirement accommodation apartments, with associated communal areas. Vehicular access off River Walk will be retained, with external areas to include car parking and a communal garden.

2.3 Retail properties on High Street bound the east of the site with office buildings to the south. An existing residential apartment complex lies to the west on River Walk with further residential properties to the north on New Wharf Road. Delivery access for retail properties on High Street are located to the rear of the buildings on New Wharf Road and Bradford Street.

2.4 The existing site and noise measurement locations are shown in Figure 1. The proposed site layout is shown in Figure 2.

3.0 CRITERIA

National Planning Policy Framework and Noise Policy Statement for England

3.1 The National Planning Policy Framework (NPPF) [Reference 1], revised in February 2019, states (paragraph 180) in relation to noise that planning policies and decisions should aim to:

- 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;
- Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

3.2 Paragraph 182 states "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."

3.3 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life.

3.4 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

> *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

3.5 The National Planning Practice Guidance (NPPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The NPPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. The NPPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.

3.6 The NPPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.

3.7 The NPPG also expands on the 'agent of change' principle and provides guidance on how the risk of conflict between new development and existing businesses can be addressed, including where mitigation is required.

3.8 The NPPF, NPSE and NPPG documents do not refer to specific noise criteria. For residential developments 24 Acoustics considers that the spirit of the requirements of the NPPF and NPSE will be complied with if criteria and guidance from British Standard 8233: 2014, the World Health Organisation and British Standard 4142: 2014 are adopted.

BS 8233: 2014 and World Health Organisation Criteria

3.9 BS 8233:2014 [Reference 4] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB $L_{Aeq,16\ hour}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq,\ 16\ hour}$ in dining rooms during the day and 30 dB $L_{Aeq,\ 8\ hour}$ in bedrooms at night.

3.10 The standard states that the above limits apply to steady external noise sources without specific character, and also states the following:

> *"Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."*

3.11 BS 8233 also notes that "*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,f}$, depending on the character and number of events per night."*

3.12 The World Health Organisation (WHO) [Reference 5] provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines suggest internal noise levels not exceeding 30 dB $L_{Aeq,8hr}$ or regularly exceeding 45 dB $L_{Amax,f}$ for 'a good night's sleep'.

Professional Practice Guidance on Planning & Noise (ProPG)

3.13 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 6] was published jointly by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health in May 2017. The guidance relates to the consideration of existing sources of transportation noise upon proposed new residential development and strives to:

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- Improve understanding of how to determine the extent of potential noise impact and effect; and
- Assist the delivery of sustainable development.

3.14 The guidance describes a recommended approach for new residential development, which includes four key elements of the assessment process, identified below:

(i) Good acoustic design process;
(ii) Internal noise level guidelines;
(iii) External amenity area noise assessment;
(iv) Assessment of other relevant issues.

3.15 It is important to note that the guidance in ProPG does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.

Summary of Noise Criteria

3.16 The impact of noise upon the site has been assessed using the following methodology:

- BS 8233: 2014 and the WHO Guidelines for recommended internal noise levels, inside the properties. An upper internal daytime level of 35 dB $L_{Aeq,\ 16\ hour}$ for bedrooms, living rooms and communal lounges should apply; and a night-time level for bedrooms of 30 dB $L_{Aeq,\ 8\ hour}$ should apply. Similarly, a maximum night-time internal level of 45 dB $L_{Amax,\ fast}$ should apply in bedrooms for regular events.

4.0 ENVIRONMENTAL NOISE MEASUREMENTS AND RESULTS

Measurement Instrumentation and Procedure

4.1 Environmental noise measurements were undertaken between 20th and 27th April 2021 in order to establish existing ambient noise levels at the site. Instrumentation was setup to measure noise arising from nearby sources. The noise measurement locations are described below and shown in Figure 1.

4.2 Long-term measurements were undertaken at two locations and are described as follows:

- Location 1: On the western site boundary overlooking High Street retail properties, at first floor level, free field conditions;
- Location 2: Towards the south of the site, overlooking Bradford Street and neighbouring rear access yard to building on High Street, at second floor level, free field conditions.

4.3 Additional noise measurements were undertaken at Locations 3 - 5 (as shown in Figure 1) during the daytime on 27th April 2021, all at a height of approximately 1.5 m above local ground level.

4.4 Noise measurements were undertaken with the following instrumentation:

- 2 Nº Rion NL52 Class 1 accuracy sound level meter;
- Rion NL32 Class 1 accuracy sound level meter;
- Bruel and Kjaer Type 4231 Class 1 accuracy acoustic calibrator.

4.5 The instrumentation's calibration was verified before and after the surveys in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Microphones were fitted with environmental weather shields during the measurement periods. Measurements were made in accordance with BS 7445: 1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 7].

4.6 The weather conditions during the survey period were generally fine and dry, with wind speeds below 5 m/s.

Results

4.7 The overall measured noise levels from Locations 1 and 2 are summarised in Table 1 and shown graphically in Appendix B.

Measured Noise Levels			
Location	**Daytime (07:00 – 23:00) Average dB $L_{Aeq\ 16\ hour}$**	**Night-time (23:00 – 07:00) Average dB $L_{Aeq\ 8\ hour}$**	**Night-time (23:00 – 07:00) Typical dB $L_{Amax,\ f}$**
1	52	47	66
2	56	49	68

Table 1: Overall Measured Noise Levels

4.8 24 Acoustics considers the typical maximum to be the 10th highest $L_{Amax,\ f}$ noise level during the relevant night-time period.

4.9 Local road traffic was found to be the dominant noise source at Locations 1 and 2 with periods of birdsong noted during early morning and evening periods.

4.10 The results of additional noise measurements at Locations 3 - 5 are shown in Table 2.

Location	Measured Ambient Noise Levels Average dB $L_{Aeq\ T}$
3	54
4	58
5	59

Table 2: Overall Measured Noise Levels

4.11 Measured noise levels at Locations 3 to 5 include contributions from commercial and road traffic noise sources. Noise from delivery movements to the north of Location 4 were noted during the measurements, within the rear access route to retail properties on High Street. The delivery comprised unloading of goods from a refrigerated van over a 20 minute period. Noise from delivery activity at the site is infrequent and was found to be below the measured ambient noise levels in the area. Noise impact from delivery activities is therefore considered low and very unlikely to cause unreasonable disturbance to residents of the proposed development.

4.12 Noise from local road traffic dominated the ambient noise levels during both the day and night-time periods. Fixed plant was noted in the area, associated with retail properties on High Street. Analysis of the measurement data indicates that noise from neighbouring plant is not significant at the site and hence is unlikely to cause unreasonable disturbance to residents of the proposed development.

5.0 CALCULATIONS AND ASSESSMENT

Assessment – Internal Noise Levels

5.1 Calculations have been undertaken using the noise measurement results to determine the glazing and ventilation requirements for the residential rooms, which will ensure that noise levels inside the rooms do not exceed 35 dB $L_{Aeq,\ 16\ hour}$ during the day and 30 dB $L_{Aeq,\ 8\ hour}$ at night (and also not regularly exceed 45 dB $L_{Amax.f}$ at night) from road traffic noise sources.

5.2 The calculations are based on the floor plans and elevations as shown on the latest drawings provided by McCarthy & Stone in April 2021. If there are any future changes to the site layout, room layouts, room volumes or elevations, these calculations should be revised accordingly.

5.3 The analysis given below has been based on 24 Acoustics' understanding of the envelope construction to be used for this scheme (based on a cavity masonry construction). It is understood that mechanical ventilation (MVHR) is to be provided to all habitable rooms with no trickle ventilators or passive ventilation openings in the façades of habitable rooms.

5.4 Calculations indicate that standard thermal glazing will be acceptable to all habitable rooms on all floor of the development. The glazing's minimum acoustic requirements are summarised in Table 3.

Minimum SRI (dB) per Octave Band Centre Frequency (Hz)					
125	**250**	**500**	**1k**	**2k**	**4k**
24	20	25	35	38	35

Table 3: Minimum Glazing Performance

5.5 In making a comparison with the values in Table 3, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole, including frames, seals, any insulated panels and not just the glass. The requirements also apply to any external glazed doors to habitable rooms (i.e. from balcony areas).

5.6 In order to assist with the selection process, the following glazing configuration, if installed correctly, would be capable of achieving the minimum sound reduction performance:

- Glazing Type A: 4 mm glass: 12 mm cavity: 4 mm glass
  (Minimum 31 dB R_w)

5.7 The above assessment demonstrates that the internal noise level criteria (outlined in section 3) would be readily achievable.

Noise Levels in External Amenity Areas

5.8 A communal garden is proposed for the apartments, to the south of the new building, as seen on the site plan in Figure 2. The garden area will be screened from local road traffic by the neighbouring buildings.

5.9 Based on the measured noise levels and significant screening provided by neighbouring and proposed buildings, noise levels in the external amenity space would be below 55 dB $L_{Aeq,\ 16\ hour}$, which is considered acceptable in planning terms.

6.0 CONCLUSIONS

6.1 McCarthy and Stone has instructed 24 Acoustics Ltd to undertake a noise impact assessment in relation to a new development for retirement living apartments at High Street, Tonbridge. This report has addressed the impact of noise from nearby sources on the proposed dwellings.

6.2 Ambient noise surveys have been undertaken at the site, to determine the level of noise from the existing sources, during daytime and night-time periods.

6.3 Calculations have been undertaken which indicate that standard thermal glazing, achieving a minimum acoustic requirement, will be acceptable to all habitable rooms within the development. It is concluded that with the recommended measures given, road traffic noise within habitable rooms would comply with maximum internal levels of 35 dB L_{Aeq} during the daytime, 30 dB L_{Aeq} at night and 45 dB $L_{Amax,\,f}$ at night for regular events.

6.4 On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed residential properties.

REFERENCES

1. Department for Communities and Local Government. The National Planning Policy Framework (NPPF), 2018.

2. DEFRA. Noise Policy Statement for England, 2010.

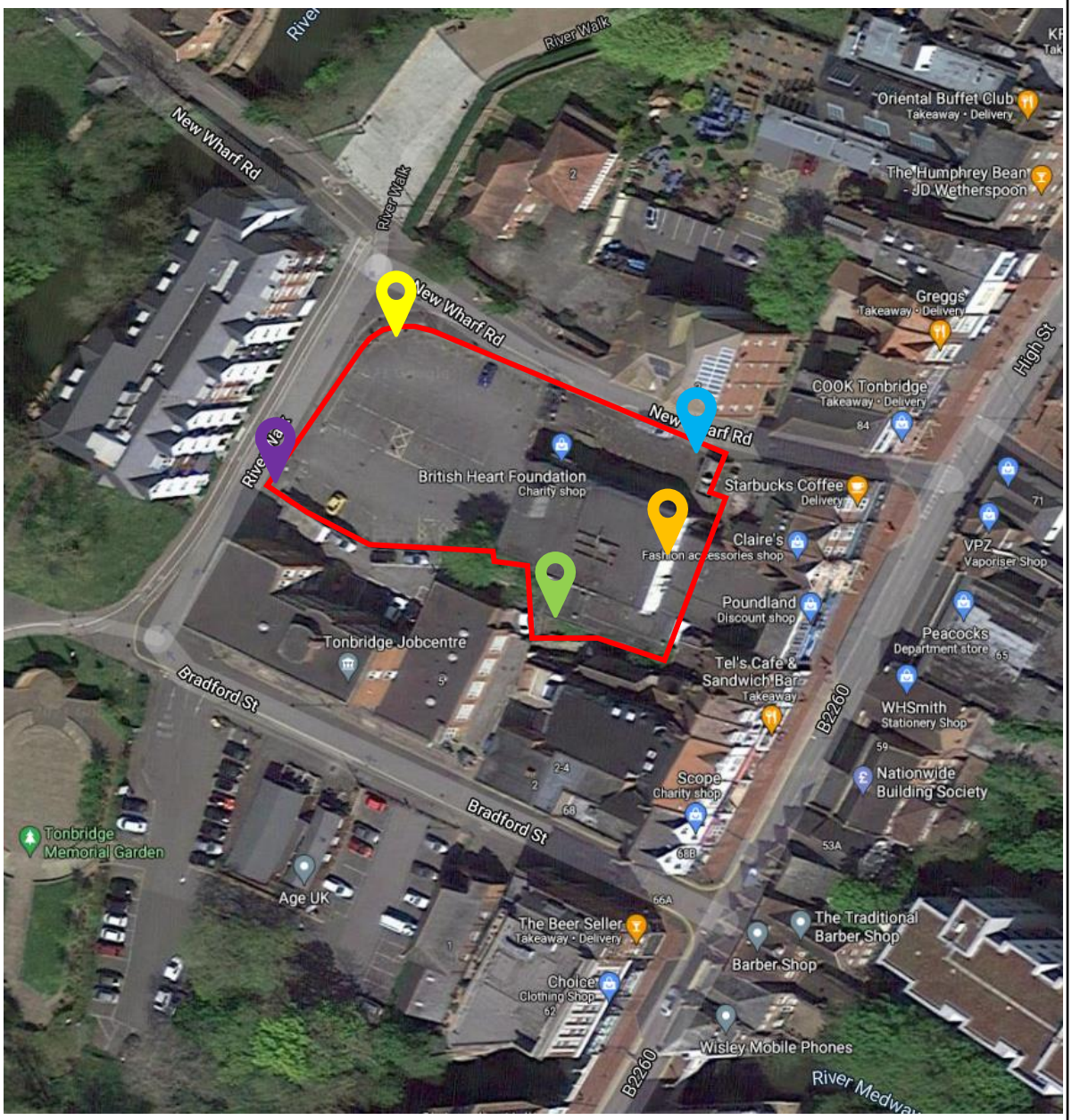
3. Department of Communities and Local Government. Planning Practice Guidance, March 2014.

4. British Standards Institution. British Standard 8233: Guidance on sound insulation and noise reduction for buildings, 2014.

5. World Health Organisation. Guidelines for Community Noise, 2000.

6. ProPG Professional Practice Guidance on Planning and Noise (ProPG), ANC, IOA, CIEH, May 2017.

7. British Standards Institution. BS 7445: 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use' 1991.



- Measurement Location 1
- Measurement Location 2
- Measurement Location 3
- Measurement Location 4
- Measurement Location 5

Project: High Street, Tonbridge	**Title:** Existing Site Layout and Noise Measurement Locations	
DWG No: Figure 1	**Scale:** N.T.S.	**Rev:** 0
Date: May 2021	**Drawn By:** KE	**Job No:** 8833-1

Project: High Street, Tonbridge	**Title:** Proposed Site Layout Plan	
DWG No: Figure 2	**Scale:** N.T.S.	**Rev:** 1
Date: May 2021	**Drawn By:** KE	**Job No:** 8833-1

APPENDIX A: NOISE UNITS

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in important by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB(A) is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB(A). The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB(A) corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

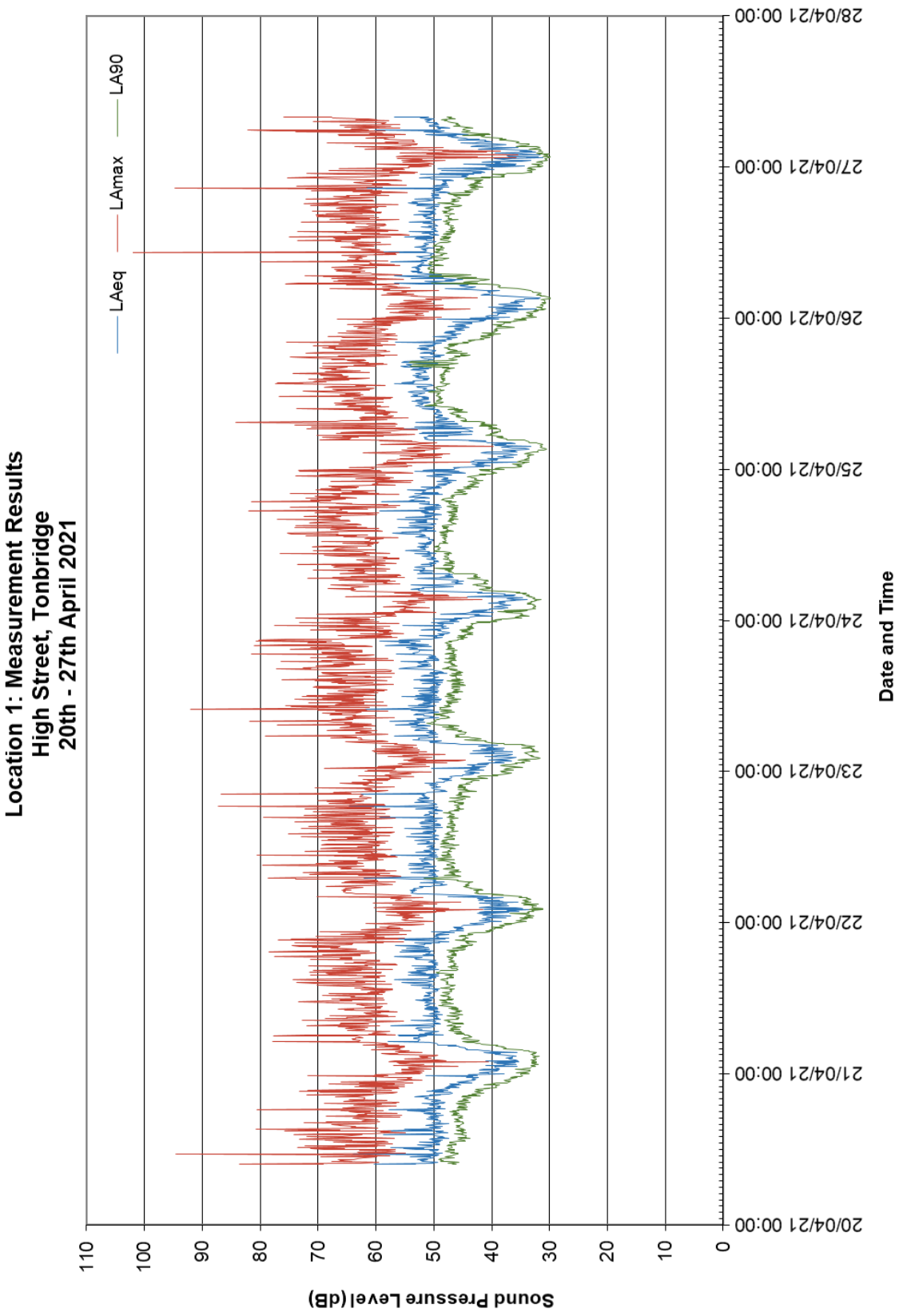
This is the maximum noise level recorded over the measurement period.

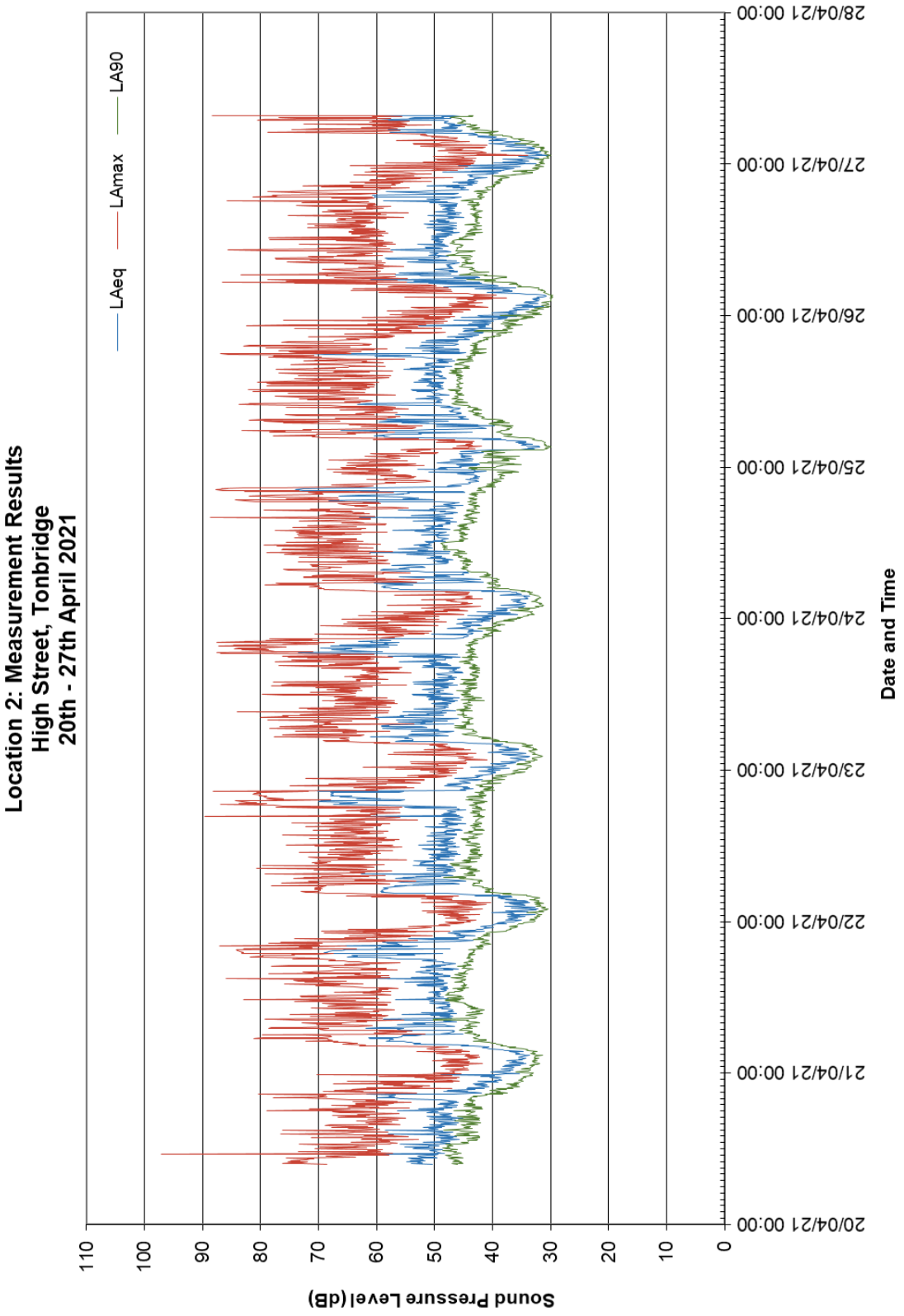
ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

APPENDIX B: NOISE MEASUREMENT RESULTS




Location 2: Measurement Results
High Street, Tonbridge
20th - 27th April 2021
LAeq
LAmax
LA90
Sound Pressure Level (dB)
110
100
90
80
70
60
50
40
30
20
10
0
20/04/21 00:00
21/04/21 00:00
22/04/21 00:00
23/04/21 00:00
24/04/21 00:00
25/04/21 00:00
26/04/21 00:00
27/04/21 00:00
28/04/21 00:00
Date and Time