

**PROPOSED RESIDENTIAL DEVELOPMENT
SORTING OFFICE, EASTLEIGH

NOISE ASSESSMENT**

Technical Report: R8762-1 Rev 0

Date: 12th October 2020

For: Eastleigh Borough Council
Eastleigh House
Upper Market Street
Eastleigh
SO50 9YN

24 Acoustics Document Control Sheet

Project Title: Proposed Residential Development, Sorting Office, Eastleigh- Noise Assessment

Report Ref: R8762-1 Rev 0

Date: 12th October 2020

	Name	Position	Signature	Date
Prepared by	Neil McLeod BA (Hons) MIOA	Senior Consultant		12/10/2020
Reviewed by	Stephen Gosling BEng MIOA	Principal Consultant		12/10/2020
Approved by	Stephen Gosling BEng MIOA	Principal Consultant		12/10/2020
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	Neil McLeod	Stephen Gosling	Stephen Gosling

DISCLAIMER

This report was completed by 24 Acoustics Ltd on the basis of a defined programme of work and terms and conditions agreed with the Client. The report has been prepared with all reasonable skill, care and diligence within the terms of the Contract with the Client and taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of resources allocated to the project.

24 Acoustics Ltd accepts no responsibility whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works.

This report is issued in confidence to the Client and 24 Acoustics Ltd has no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, 24 Acoustics Ltd retains all copyright and other intellectual property rights, on and over the report and its contents.

© 24 Acoustics Ltd 2020

CONTENTS	Page
1.0 INTRODUCTION	4
2.0 SITE DESCRIPTION	4
3.0 STANDARDS AND GUIDANCE	5
4.0 ENVIRONMENTAL NOISE SURVEY	8
5.0 CALCULATIONS AND RECOMMENDED MITIGATION MEASURES	12
6.0 INTERNAL SOUND INSULATION	13
7.0 CONCLUSIONS	13
REFERENCES	14
FIGURES	15
APPENDIX A – ACOUSTIC TERMINOLOGY	17
APPENDIX B – ENVIRONMENTAL NOISE MEASUREMENTS	18

1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been appointed by Eastleigh Borough Council to undertake a noise impact assessment for the proposed residential development on the site of the Sorting Office in Eastleigh.
- 1.2 The primary source of noise in the area is road traffic from local roads. The site backs on to a delivery yard and site visits identified building services plant serving nearby retail units. Accordingly, this noise impact assessment has included:
- Environmental noise monitoring
 - Consideration of noise arising from road traffic, deliveries and building services plant, affecting the site
 - Assessment of noise levels within the proposed dwellings
 - Consideration of noise mitigation measures
- 1.3 This report presents the results of the assessment, following environmental noise measurements undertaken between 22nd to 29th September 2020.
- 1.4 All sound pressure levels quoted in this report are in dB relative to 20 µPa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The site is located between Eastleigh High Street and Wells Road. The surrounding properties on the High Street are primarily retail units and there are several restaurants/pubs.
- 2.2 There are several houses north of the development site (behind No. 12 High Street) and apartments in Grayton House to the south.
- 2.3 Small items of building services plant are located on the rear of retail properties fronting Market Street to the east and Leigh Road to the north.
- 2.4 The existing site location is described in Figure 1.

- 2.5 The proposed development will provide two buildings, each providing ground floor lettable space and apartments above. The building nearest the high street will comprise four stories (10 apartments) and the building to the rear will comprise six stories (18 apartments). The typical proposed residential floor plans for each block are described in Figure 2.

3.0 STANDARDS AND GUIDANCE

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 The National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely effects of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
- Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development and avoid noise giving rise to significant adverse impacts on health and 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 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;
 - Where possible, contribute to the improvement of health and quality of life.
- 3.3 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'.

- 3.4 In 2019 the Planning Practice Guidance (PPG) [Reference 3] was updated. This is written to support the NPPF with more specific planning guidance. The PPG 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. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG 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.
- 3.5 The PPG 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.
- 3.6 None of the documents referred to above provide specific noise criteria. The following guidance documents are considered appropriate (technically and objectively) to assess noise impact on the proposed development.

Professional Practice Guidance on Planning & Noise (ProPG)

- 3.7 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 4] 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
 - Assist the delivery of sustainable development

3.8 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

3.9 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.

BS 8233:2014 and WHO Guidelines

3.10 BS 8233:2014 [Reference 5] 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 $L_{Aeq,16 \text{ hour}}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq, 16 \text{ hour}}$ in dining rooms during the day and 30 dB $L_{Aeq, 8 \text{ hour}}$ in bedrooms at night.

3.11 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."

3.12 BS 8233:2014 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."

3.13 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 6] suggest internal night-time noise levels not exceeding 30 dB $L_{Aeq, 8 \text{ hour}}$ or regularly (10 – 15 times per night) exceeding 45 dB $L_{Amax,f}$ for 'a good night's sleep'.

Plant Noise and Delivery Noise

3.14 The proposed development is near existing services plant and a delivery yard. It is understood that there are no restrictions on delivery times, although the majority would take place during the daytime.

- 3.15 It is recommended that the building fabric be specified to ensure that internal noise levels, due to building services plant and deliveries do not exceed the following criteria:
- Not to exceed 30 dB $L_{Aeq, 1hr}$ in bedrooms during the daytime (07:00 to 23:00 hours)
 - Not to exceed 25 dB $L_{Aeq, 15min}$ in bedrooms at night (23:00 to 07:00 hours)
 - Not to regularly exceed 45 dB $L_{Amax, fast}$ in bedrooms at night (23:00 to 07:00 hours)
- 3.16 On the basis that these criteria are achieved, the resulting delivery and building services noise levels within the proposed development would be controlled to a level unlikely to cause unreasonable disturbance.

Summary

- 3.17 The impact of noise upon the site has been assessed using the following internal noise criteria:
- Road traffic noise (including the car park)
 - An upper internal daytime level of 35 dB $L_{Aeq, 16 \text{ hour}}$ for lounges or living rooms and a night-time level for bedrooms of 30 dB $L_{Aeq, 8 \text{ hour}}$ should apply
 - A maximum night-time internal level of 45 dB $L_{Amax, fast}$ should also apply in bedrooms for regular events
 - Noise from third-party building services and deliveries
 - Upper internal levels of 30 dB $L_{Aeq, 1hr}$ during the daytime and 25 dB $L_{Aeq, 15 \text{ min}}$ during the night time should apply.
 - Discrete events should not regularly exceed 45 dB $L_{Amax, 5 \text{ min}}$ in bedrooms at night

4.0 ENVIRONMENTAL NOISE SURVEY

- 4.1 Environmental noise measurements were undertaken at the site between Tuesday 22nd and Tuesday 29th September 2020 to determine the prevailing noise levels around the site. Measurements were undertaken using the following equipment:
- 2 No. Rion precision sound level meters Type NL-52
 - Brüel & Kjær acoustic calibrator Type 4231
- 4.2 Long-term noise monitoring equipment was located at the front (west) and rear (east) of the site. The measurement locations are described in Figure 1.

- 4.3 Noise measurements were undertaken in samples of 5 minutes in terms of the octave-band and free-field A-weighted L_{eq} , L_{90} and $L_{max,f}$ parameters. 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].
- 4.4 The instruments' calibration was verified before and after the surveys in accordance with the manufacturer's instructions and no significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards.
- 4.5 All instrumentation was fitted with environmental weather shields during the surveys. Weather conditions during the surveys included heavy rain on 23rd and 24th September and windy conditions on 25th September. Due consideration has been given to these periods in the following assessment.

Noise Measurements

- 4.6 The results of the long-term ambient noise surveys are shown graphically in Appendix B and summarised in Tables 1 and 2.

Date (September 2020)	Daytime Level (07:00 - 23:00), dB	Night Time Level (23:00 - 07:00), dB	
	$L_{Aeq, 16 \text{ hour}}$	$L_{Aeq, 8 \text{ hour}}$	Typical $L_{Amax, f}$
Tuesday 22 nd	52	53	67
Wednesday 23 rd	54	53	68
Thursday 24 th	53	54	67
Friday 25 th	57	48	59
Saturday 26 th	58	46	66
Sunday 27 th	54	58	77
Monday 28 th	53	54	73
Tuesday 29 th	54	-	-
Representative	54	52	68

Table 1 - Measured Noise Levels at Location 1 (High Street)

Date (September 2020)	Daytime Level (07:00 - 23:00), dB	Night Time Level (23:00 - 07:00), dB	
	L _{Aeq} , 16 hour	L _{Aeq} , 8 hour	Typical L _{Amax} , f
Tuesday 22 nd	50	51	67
Wednesday 23 rd	53	53	70
Thursday 24 th	52	48	66
Friday 25 th	56	45	61
Saturday 26 th	54	48	67
Sunday 27 th	52	48	68
Monday 28 th	49	44	64
Tuesday 29 th	51	-	-
Representative	52	48	66

Table 2 - Measured Noise Levels at Location 2 (Wells Road)

4.7 24 Acoustics determines the typical maximum noise event to be the tenth highest value during the measurement period.

4.8 The prevailing noise levels at each location were determined by distant road traffic.

Noise from Existing Building Services Plant

4.9 Noise from building services plant was not noticeable during the daytime site visits but the measurements demonstrate that building services noise levels at the façade of the proposed building on Wells Road would be in the region of 45 dB L_{Aeq}. The plant appears to operate on demand on a 24-hour basis.

Delivery Source Term Data

4.10 To consider potential delivery noise levels, reference is made to measured noise levels of retail deliveries from 24 Acoustics' database. The measurements were undertaken at a retail delivery yard in Southampton, which included cage trolleys and a non-articulated lorry. The following typical noise levels were measured at an average distance of 5 metres:

- 66 dB L_{Aeq}, 15 min
- 86 dB L_{Amax}, fast, 5min

4.11 The likely delivery noise levels outside the nearest windows in the proposed development (at a distance of 10 metres) are therefore:

- 60 dB L_{Aeq}, 15 min
- 80 dB L_{Amax}, fast, 5min

- 4.12 These predicted values tie closely with delivery events identified in the survey data at 08:50 hours on 23rd September, 06:30 hours on 28th September and 06:05 on 29th September.

Noise Conditions During Covid-19

- 4.13 At the time of the survey Eastleigh was subject to the national restrictions on movement due to Covid-19. Southampton Airport was operating significantly fewer than its permitted number of flights due to the collapse of Flybe and Covid-19 (reportedly 94% fewer passengers in August 2020 compared to August 2019).
- 4.14 According to the Southampton International Airport Noise Action Plan 2018 – 2023, the site falls just outside the 2016 average summer day 54 dB $L_{Aeq, 16\text{hour}}$ contour and just outside the 55 dB L_{den} regulation contour.
- 4.15 Eastleigh High Street and Market Street were both closed to all cars in June 2020 as part of the council's Covid-19 safety measures. Both roads were closed to cars for the duration of the survey.
- 4.16 The nearest road traffic counts available from the Department for Transport are on Leigh Road (junction with Newtown Road, count point 38203) and on Desborough Road (between Grantham Road and Blehnheim Road, count point 945372). Neither of these roads are considered representative of the one-way high street. A study of recent planning applications on Eastleigh High Street did not present any representative noise data that could be considered.
- 4.17 With reference to similar high street locations and with consideration to the aircraft noise contours, it is considered that ambient (L_{Aeq}) and typical maximum (L_{Amax}) noise levels on the high street are likely to be up to 7 dBA higher when the covid-19 restrictions are lifted and the airport returns to more usual operations.
- 4.18 General ambient and maximum noise levels to the rear of the proposed development are considered likely to increase by up to 3 dBA.
- 4.19 The following assessment allows for the anticipated increased noise levels as described above.

5.0 CALCULATIONS AND RECOMMENDED MITIGATION MEASURES

- 5.1 Calculations have been undertaken to determine the acoustic requirements for glazing and ventilation to the proposed building, which will ensure that the internal noise levels meet the criteria described in Section 3. The calculations are based on the floorplans and elevations provided to 24 Acoustics in September 2020.
- 5.2 Due to the commercial noise sources on Wells road and the nature of noise from a high street, Mechanical Ventilation and Heat Recovery (MVHR) units are recommended to all of the proposed apartments.

Glazing

- 5.3 The development has been allocated two acoustic zones for glazing sound insulation performance, as described in Figure 2.
- 5.4 The required sound insulation performance for each glazing type is described in Table 3.

Glazing Type	Minimum Octave (Hz) Band Sound Reduction Index, dB					
	125	250	500	1k	2k	4k
GL1 (bedrooms on Wells Road)	24	25	31	42	44	49
GL2 (all other habitable rooms)	24	20	25	35	38	35

Table 3 - Glazing Sound Insulation Specification

- 5.1 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. The quoted minimum sound reduction specifications must be achieved 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 doors to habitable rooms.
- 5.2 For guidance, the following glazing configuration would be capable of achieving the required sound reduction performance if installed properly (ie, with appropriate frames and seals, etc.):

Glazing Type GL1 (36 dB Rw):

6 mm glass / 12 mm air cavity / 6.4 mm Stadip Silence

Glazing Type GL2 (33 dB Rw):

4 mm glass / 12 mm air cavity / 4 mm glass

Non-Glazed Elements

- 5.3 The external wall constructions to apartments shall be designed and specified to achieve a minimum sound insulation performance of 50 dB R_w . This performance is to be met by the entire external wall system as a whole, including frames, seals, any insulated panels, opaque glazed elements, louvres, etc.
- 5.4 Traditional cavity masonry constructions would readily achieve a performance of 50 dB R_w . For lightweight façade elements and roof constructions, it is recommended that provision be made for an inner leaf of plasterboard comprising two layers 12.5mm standard density plasterboard and mineral wool insulation in the cavity in addition to any rigid PIR thermal insulation.

6.0 INTERNAL SOUND INSULATION

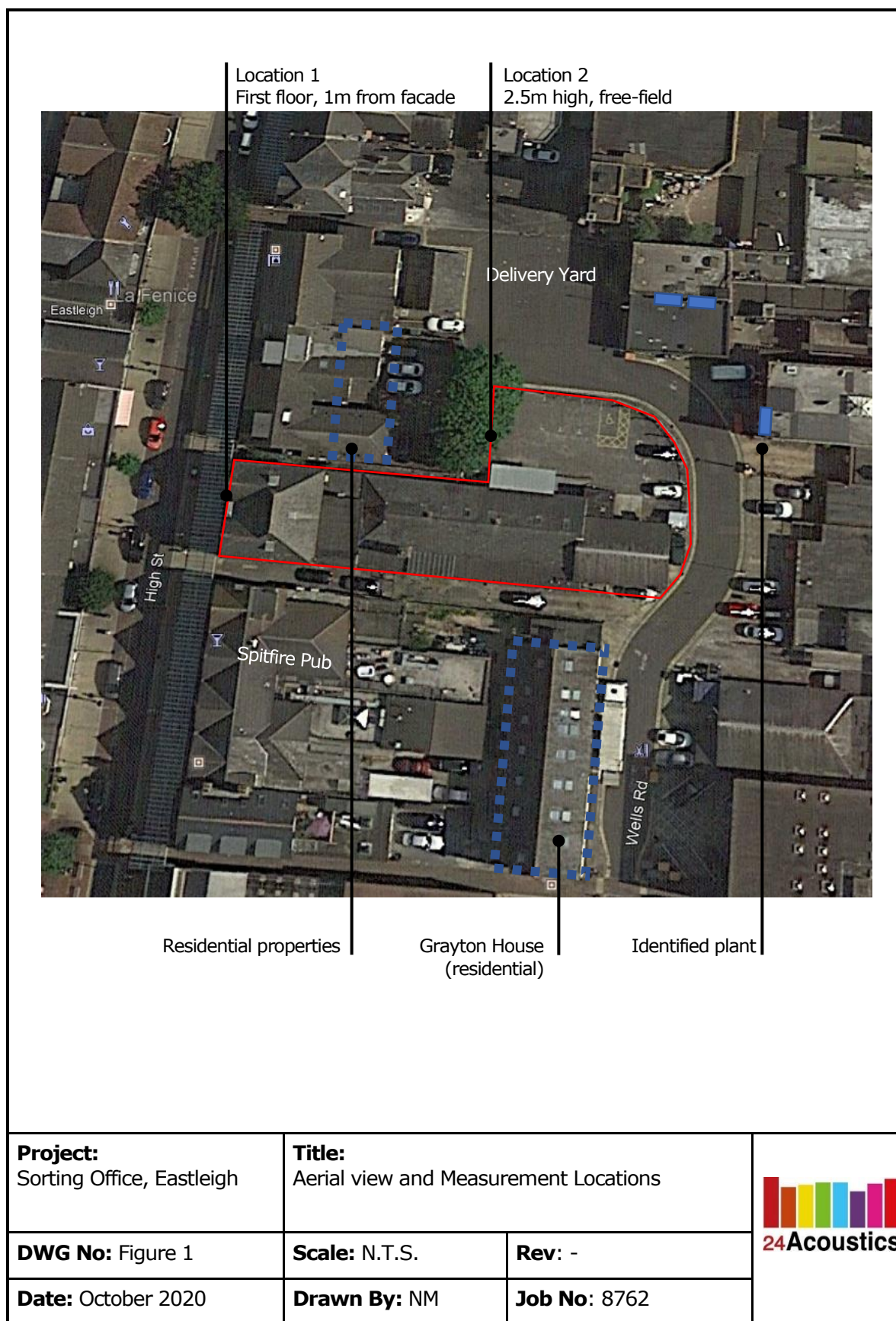
- 6.1 To minimise the risk of disturbance to residents, it is recommended that the sound insulation of floors separating residential properties from the ground floor lettable units (which are understood not to include cafes/restaurants) be enhanced. These party walls and floors should be specified and built to achieve a minimum sound insulation performance of 55 dB $D_{nT,w}$.

7.0 CONCLUSIONS

- 7.1 24 Acoustics Ltd has been instructed by Eastleigh Borough Council to undertake a noise assessment for the proposed mixed-use development at the site of the Sorting Office, Eastleigh. This report has addressed the impact of noise from road traffic, building services plant and deliveries on the proposed development.
- 7.2 An enhanced sound insulation performance has been recommended between ground floor commercial units and adjacent dwellings to minimise the risk of disturbance to residents.
- 7.3 Environmental noise measurements have been undertaken at the site to determine existing noise levels during daytime and night-time periods. Calculations have been undertaken to determine the acoustic requirements for the façade, glazing and ventilation to the proposed building.
- 7.4 It is concluded that, with the recommended measures given above, noise within habitable rooms would comply with the recommended maximum noise levels for each of the identified noise sources.

REFERENCES

1. Department for Communities and Local Government. National Planning Policy Framework, 2012.
2. DEFRA. Noise Policy Statement for England, 2010.
3. Department of Communities and Local Government. Planning Practice Guidance, March 2014.
4. Professional Practice Guidance on Planning & Noise (ProPG), 2017
5. British Standards Institution. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings, 2014.
6. World Health Organisation. Guidelines for Community Noise, 2000.
7. British Standards Institution. British Standard 7445:1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use, 1991.





— GL1 Glazing to all bedrooms on all floors

All other areas GL2 Glazing to all habitable rooms

Project: Sorting Office, Eastleigh	Title: Typical Floor Plan and Glazing Types		 24Acoustics
DWG No: Figure 2	Scale: N.T.S.	Rev: -	
Date: October 2020	Drawn By: NM	Job No: 8762	

APPENDIX A – ACOUSTIC TERMINOLOGY

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 importance 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 dBA weighting. This is an internationally accepted standard for noise measurements.

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

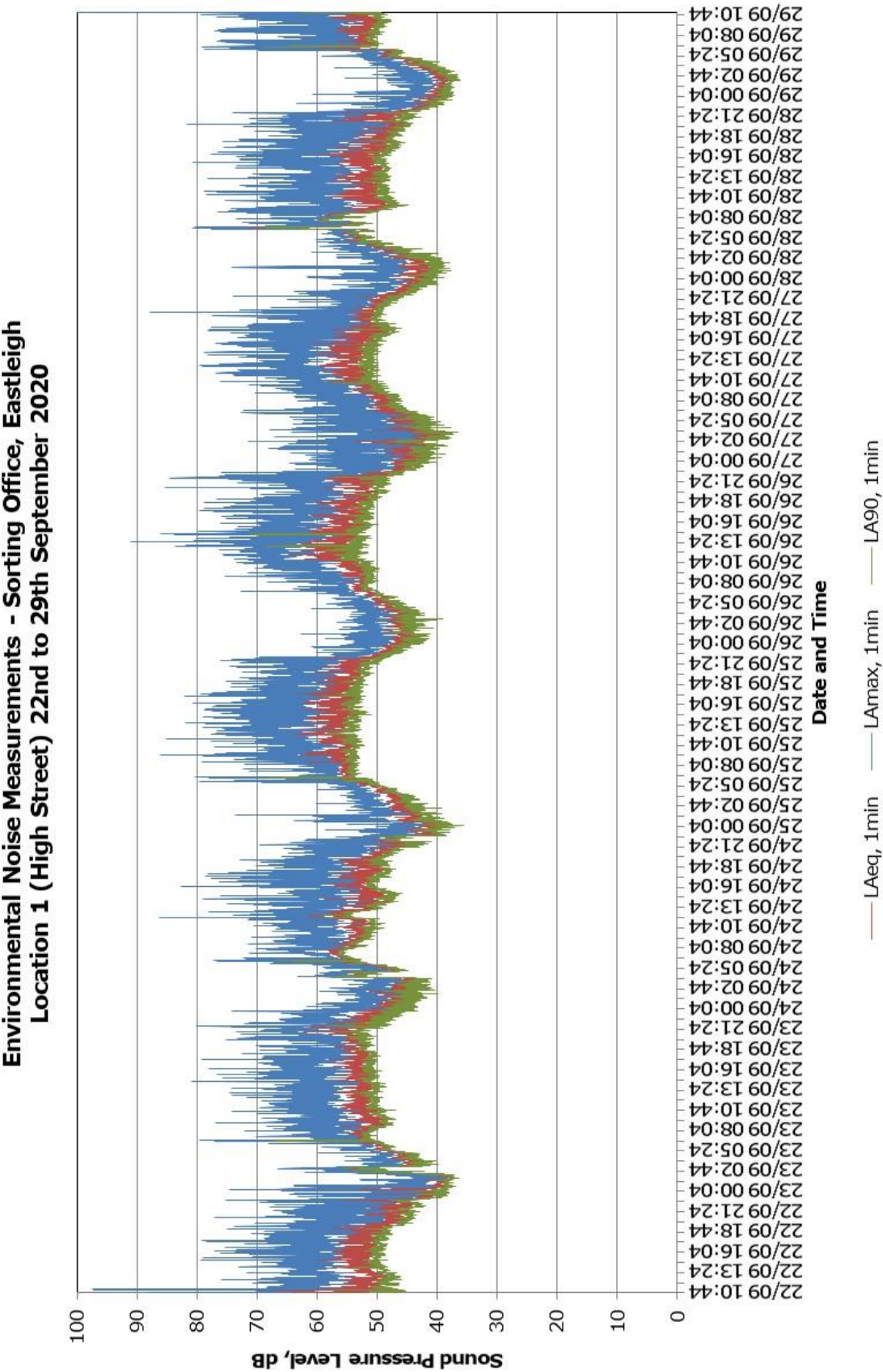
iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – ENVIRONMENTAL NOISE MEASUREMENTS



**Environmental Noise Measurements - Sorting Office, Eastleigh
Location 2 (Wells Road) 22nd to 29th September 2020**

