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**Residential Development,  
224 Sheffield Road, Penistone**

**Noise Assessment Report**

**Doc ref: 03557-870100**

**13/04/2021**

**On behalf of  
Erodatools Ltd**

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## 1.0 INTRODUCTION

- 1.1 Blue Tree Acoustics has been appointed by Erodatools Ltd to carry out a noise assessment for a proposed residential development at 224 Sheffield Road, Penistone.
- 1.2 The development site is situated on land between dwellings on Sheffield Road and the Erodatools premises in Penistone. The existing property at 224 Sheffield Road is currently partly residential and partly a store, with the proposal being to create 5no apartments, of which 2no apartments at ground floor level and 3no apartments at 1<sup>st</sup> floor level. There are already living rooms and bedrooms with windows in the front elevation, and bedrooms with windows in the rear elevation.
- 1.3 The surrounding area is a mixture of residential to the north and commercial to the south.
- 1.4 Planning permission has been applied for, but the application has been deemed invalid (ref. 2021/0014/INVALID), with Barnsley MBC stating the following response to the application:
- “Given the proximity to surrounding industrial/commercial uses we will need a noise assessment”*
- 1.5 The noise impact assessment has included:
- a) Inspection of the site and surroundings.
  - b) Review of outline architectural plans of the proposed development provided by the Client/Design Team.
  - c) Noise monitoring surveys undertaken at locations onsite.
  - d) Consideration of noise control measures required to maintain acceptable noise levels within the proposed bedrooms and living rooms with reference to *British Standard 8233: 2014, ‘Guidance on sound insulation and noise reduction for buildings’* (BS8233:2014).
- 1.6 A glossary of technical terminology and parameters used in this report is provided in Appendix 1.

## 2.0 EXISTING NOISE SOURCES

### Road

- 2.1 The site is situated in Penistone and fronts onto Sheffield Road (B6462). This is a busy road accommodating HGVs and buses, as well as cars and other light vehicles.

### Commercial units

- 2.2 There are various commercial units to the rear of the development site. The closest of these units are Erodatools Ltd (who own 224 Sheffield Road); a spraying firm, a joinery firm, and a flooring firm. These businesses were all contacted to explain that the noise survey was being undertaken, with all businesses understanding that redevelopment was proposed at 224 Sheffield Road. There are some items of plant to the rear of the flooring firm's unit that were confirmed by the manager of the business to be operational. They were witnessed to be operational during the noise survey.
- 2.3 Occupied dwellings immediately abut 224 Sheffield Road, and the site itself is partially a dwelling currently. It is therefore not the case that the adjacent businesses currently run with no noise-sensitive units in the vicinity. The proposals at 224 Sheffield Road do not fundamentally change the character or context of the area.

### Environmental noise climate during COVID-19 pandemic

- 2.4 As this assessment was being undertaken while COVID-19 pandemic restrictions were in force in the UK, the potential for environmental noise levels to be lower than usual has been considered.
- 2.5 The Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA) have provided a guidance document '*Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments*' (Version 6 dated 12/01/2021 was in place at the time of the survey). This document provides guidance on working practices in the production of acoustic assessments and reports during COVID-19 pandemic restrictions, in order to help maintain the flow of acoustic reporting in a timely manner to assist planning applications, discharge of planning conditions, and the implementation of building regulations, etc.

- 2.6 The guidance aims to help minimise uncertainties when determining baseline conditions. In this regard, it advocates use of the following examples (although the most appropriate options to use must be determined on a case-by-case basis):
- Wherever possible, a site visit should be undertaken to understand the sound environment and the sources contributing to the sound environment.
  - Site survey data can be supplemented by data from other sources such as using existing data (for example, from previous local surveys and noise maps) or undertaking baseline sound predictions to establish an appropriate robust estimate of baseline conditions.
  - For transport schemes, there may still need to be some reliance on predicted sound levels to describe the baseline conditions, with a corresponding need to source flow/activity data. References to online noise mapping resources are provided in the guidance.
  - Use of online government statistics on transport use during the pandemic.
  - Liaison with regulators and decision-makers.
- 2.7 These factors have been considered in the preparation of this report. Advance consultation with Barnsley MBC was undertaken via email on 22/03/2021, with acceptance of our proposed methodology being received from Adam Cattell EHO on 23/03/2021.
- 2.8 COVID-19 pandemic partial lockdown restrictions were in force at the time of the noise survey between Friday 26/03/2021 and Wednesday 31/03/2021. Data from the Department for Transport (DfT) government statistics table on transport use during the COVID-19 pandemic for the period of interest is reproduced below. Taking the average 81% value for the 'All motor vehicles' category on the dates of the survey, it is considered appropriate to apply a +0.9dB correction to measured road traffic  $L_{Aeq}$  sound levels and statistical  $L_n$  values.

**Table 1: DfT transport use statistics around the time of site surveys**

**Department for Transport statistics**  
<https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic>

**Use of transport modes: Great Britain, since 1 March 2020<sup>a</sup>**  
 Figures are percentages of an equivalent day or week.

Date <sup>1</sup> (weekends and bank holidays in grey)	Percentage								
	Cars <sup>2</sup>	Light Commercial Vehicles <sup>2</sup>	Heavy Goods Vehicles <sup>2</sup>	All motor vehicles <sup>2</sup>	National Rail <sup>3,4</sup>	Transport for London Tube <sup>5</sup>	Transport for London Bus <sup>5,7</sup>	Bus (excl. London) <sup>6,8,9</sup>	Cycling <sup>10,11</sup>
26/03/2021	75%	92%	105%	80%	r25%	23%	48%	43%	62%
27/03/2021	73%	92%	113%	77%	r25%	22%	43%	35%	169%
28/03/2021	65%	82%	110%	69%	r25%	20%	40%	33%	95%
29/03/2021	78%	99%	108%	84%	r23%	26%	50%	42%	100%
30/03/2021	81%	99%	108%	87%	p23% <sup>4</sup>	28%	53%	45%	121%
31/03/2021	81%	99%	110%	86%	p23% <sup>4</sup>	27%	50%	42%	129%
01/04/2021	84%	100%	106%	88%	p26% <sup>4</sup>	26%	54%	43%	104%

- 2.9 The joint ANC/IOA guidance refers to online resources for strategic noise mapping covering the major sources of transportation noise within large urban agglomerations and along road and rail corridors between them, designed to provide a global view of noise exposure in line with the reporting requirements of the Environmental Noise Directive. Extrium's online England Noise and Air Quality Viewer provides annual average noise levels for both the 16-hour day period between 0700-2300 hours, and the 8-hour night period between 2300-0700 hours for areas near main road and rail networks. However, this site is beyond the catchment area of these maps.

### **3.0 NEW NOISE SOURCES**

- 3.1 The new development is residential in nature and therefore will introduce no significant long-term noise sources. There may be potential for noise generation from new M&E equipment, such as ventilation systems, but typical domestic systems for the type of development proposed here do not generate significant external noise. This can usually be adequately addressed at the detailed design stage, or by an appropriately worded planning Condition if needed.
- 3.2 There will potentially be noise produced at times during the construction of the development. However, this will be restricted to daytime hours only, and can be controlled by an appropriately worded planning Condition if needed.

## 4.0 NOISE SURVEY

- 4.1 Noise monitoring was undertaken by Blue Tree Acoustics in order to determine the existing environmental noise climate at the site.
- 4.2 Unattended external noise measurements at façade locations were logged between Friday 26/03/2021 and Wednesday 31/03/2021. The measurements were taken at 1<sup>st</sup> floor façade locations, as indicated in Figure 1.
- 4.3 The instruments used during the surveys were 2no Rion NL-52 Type 1/Class 1 integrating sound level meters. Each meter was within a valid period of laboratory calibration. Calibration checks were carried out both before and after the measurements, with no variance observed. A proprietary environmental windshield was fitted to each microphone. The measurements were made with each microphone mounted on a tripod and positioned out of a 1<sup>st</sup> floor window. Measurement locations were in ‘facade’ conditions, i.e. 1m from the wall of the building.
- 4.4 Weather conditions throughout the survey periods were generally dry and calm. Some periods of excessive wind speed are noted, and data from these periods has been excluded. Archival data from a local weather station is presented in Appendix 3.
- 4.5 The dominant noise source at the development site was found to be local road traffic from Sheffield Road. Occasional commercial noise is present in the data measured at the rear of the building, primarily from plant items.
- 4.6 The measurement results are detailed in Appendix 2 and are summarised in the tables below. These show the daytime and nighttime external noise levels recorded at the measurement locations, with the +0.9dB correction described above applied to  $L_{Aeq}$  and statistical  $L_n$  values.

**Table 2: Free-field external noise levels at Location 1**

Time period	dB $L_{Aeq,15min}$	dB $L_{Amax,15min}$	dB $L_{A10,15min}$	dB $L_{A90,15min}$
Day (0700-2300 hours)	40 - 79 (Average = 64)	50 - 107	42 - 74	32 - 55
Night (2300-0700 hours)	32 - 70 (Average = 58)	34 - 94	32 - 74	31 - 51

**Table 3: Free-field external noise levels at Location 2**

<b>Time period</b>	<b>dB L<sub>Aeq,15min</sub></b>	<b>dB L<sub>Amax,15min</sub></b>	<b>dB L<sub>A10,15min</sub></b>	<b>dB L<sub>A90,15min</sub></b>
Day (0700-2300 hours)	38 - 69 (Average = 55)	53 - 99	39 - 73	33 - 58
Night (2300-0700 hours)	34 - 58 (Average = 48)	41 - 86	34 - 60	31 - 52

4.7 As can be seen from the tables above, noise levels are greatest at Location 1, which is most exposed to road traffic noise.

## 5.0 NOISE ASSESSMENT

5.1 First published in March 2012, and most recently updated in June 2019, the National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. Reference to noise is made at Paragraph 170 of NPPF Section 15 'Conserving and enhancing the natural environment', stating that:

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

*[...]*

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

5.2 Noise is also referenced within the Ground conditions and pollution subsection within Section 15 of the NPPF at Paragraph 180, which states:

*"180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*(a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life <sup>60</sup>,*

*(b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

<sup>60</sup> See Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs, 2010).

5.3 Department for Environment, Food and Rural Affairs, Noise Policy Statement for England (NPSE), 2010 states:

#### **Noise Policy Vision**

**Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.**

#### **Noise Policy Aims**

**Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:**

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

#### **Guiding principles of sustainable development**

**Ensuring a Strong Healthy and Just Society** – Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

**Using Sound Science Responsibly** – Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

**Living Within Environmental Limits** – Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

**Achieving a Sustainable Economy** – Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

**Promoting Good Governance** – Actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy and diversity.

Source: Securing the future – delivering UK sustainable development strategy, HM Government, March 2005.

#### 5.4 The Noise Policy Statement for England Explanatory note states that:

*Noise is an inevitable consequence of a mature and vibrant society. For some the noise of city life provides a desirable sense of excitement and exhilaration, but for others noise is an unwanted intrusion that adversely impacts on their quality of life, affecting their health and well being.*

*The management of noise has developed over many years as the types and character of noise sources have altered and as people's attitude to noise has changed. The Noise Abatement Act came into law in 1960 and the Report from the Committee on the Problem of Noise was published in 1963 (the Wilson report). Since then, examples of noise management can be found in many areas including reducing noise at source; the use of the land use and transport planning systems, compensation measures, the statutory nuisance and licensing regimes and other related legislation.*

*Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receivers and to 'minimise' noise. Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as reasonably practical. This concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of 'best practicable means' in summary statutory nuisance proceedings.*

*By describing clear policy vision and aims the NPSE provides the necessary clarity and direction to enable decisions to be made regarding what is an acceptable noise burden to place on society.*

*The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise). For the purposes of the NPSE, "noise" includes:*

- *"environmental noise" which includes noise from transportation sources;*
- *"neighbour noise" which includes noise from inside and outside people's homes;*  
*and*
- *"neighbourhood noise" which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.*

*The application of the NPSE should mean that noise is properly taken into account at the appropriate time. In the past, the opportunity for the cost effective management of noise has often been missed because the noise implications of a particular policy, development or other activity have not been considered at an early enough stage.*

*In addition, the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications.*

*In the longer term, the Government hopes that existing policies could be reviewed (on a prioritised basis), and revised if necessary, so that the policies and any noise management measures being adopted accord with the vision, aims and principles of the NPSE.*

*Noise management is a complex issue and at times requires complex solutions. Unlike air quality, there are currently no European or national noise limits which have to be met, although there can be specific local limits for specific developments. Furthermore, sound only becomes noise (often defined as 'unwanted sound') when it exists in the wrong place or at the wrong time such that it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance. Unlike many other pollutants, noise pollution depends not just on the physical aspects of the sound itself, but also the human reaction to it. Consequently, the NPSE provides a clear description of desired outcome from the noise management of a particular situation.*

*The guiding principles of Government policy on sustainable development should be used to assist in its implementation. The development of further principles specifically to underpin implementation of noise management policy will be kept under review as experience is gained from the application of the NPSE.*

*There are several key phrases within the NPSE vision and these are discussed below.*

### **Health and quality of life**

*The World Health Organisation defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, and recognises the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being.*

*It can be argued that quality of life contributes to our standard of health. However, in the NPSE it has been decided to make a distinction between 'quality of life' which is a subjective measure that refers to people's emotional, social and physical well being and 'health' which refers to physical and mental well being.*

*It is recognised that noise exposure can cause annoyance and sleep disturbance both of which impact on quality of life. It is also agreed by many experts that annoyance and sleep disturbance can give rise to adverse health effects. The distinction that has been made between 'quality of life' effects and 'health' effects recognises that there is emerging evidence that long term exposure to some types of transport noise can additionally cause an increased risk of direct health effects. The Government intends to keep research on the health effects of long term exposure to noise under review in accordance with the principles of the NPSE.*

### **Promote good health and good quality of life**

*This statement expresses the long term desired policy outcome, but in the use of 'promote' and 'good' recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.*

### **Effective management of noise**

*This concept confirms that the policy applies to all types of 'noise' (environmental, neighbour and neighbourhood) and that the solution could be more than simply minimising the noise.*

### **Within the context of Government policy on sustainable development**

*Sustainable development is a core principle underpinning all government policy. For the UK Government the goal of sustainable development is being pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment and a just society that promotes social inclusion, sustainable communities and personal wellbeing. The goal is pursued in ways that protect and enhance the physical and natural environment, and that use resources and energy as efficiently as possible.*

*There is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focussing solely on the noise impact without taking into account other related factors.*

*There are several key phrases within the NPSE aims and these are discussed below.*

#### **“Significant adverse” and “adverse”**

*There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:*

#### **NOEL . No Observed Effect Level**

*This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*

#### **LOAEL . Lowest Observed Adverse Effect Level**

*This is the level above which adverse effects on health and quality of life can be detected.*

*Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*

#### **SOAEL . Significant Observed Adverse Effect Level**

*This is the level above which significant adverse effects on health and quality of life occur.*

*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.*

### **The first aim of the Noise Policy Statement for England**

*Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

*The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.*

### **The second aim of the Noise Policy Statement for England**

*Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

*The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.*

### **The third aim of the Noise Policy Statement for England**

*Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

*This aim seeks, where possible, positively to improve health and quality of life through the proactive management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.*

- 5.5 Unfortunately, the above guidance gives no objective, tangible standards or criteria that enable planning decisions to be made. In the absence of such guidance, quantification of noise impact in terms of guidance such as BS8233, which present noise limits and criteria based on World Health Organisation recommendations, can be considered as appropriately assessing the potential noise impact with regard to toxicology concepts and hence in line with the principles of the NPPF and NPSE. Therefore, if a site meets the recommendations of BS8233 and any associated Local Authority noise requirements, it can be considered as being below the level where there is no detectable adverse effect on health and quality of life due to noise, and this meets the NOEL (No Observed Effect Level) set out in the NPSE.

- 5.6 Appropriate acoustic guidance for dwellings is given in *British Standard 8233: 2014, 'Guidance on sound insulation and noise reduction for buildings'* (BS8233:2014), which provides information on the design of internal acoustics in buildings. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.
- 5.7 BS8233:2014 guidance regarding indoor ambient noise criteria for residential accommodation is presented below.

**Table 4: BS8233:2014 Guidance criteria for indoor ambient noise levels**

Activity	Location	0700-2300 hours	2300-0700 hours
Resting	Living rooms	35dB L <sub>Aeq</sub> (16hour)	-
Dining	Dining room/area	40dB L <sub>Aeq</sub> (16hour)	-
Sleeping (daytime resting)	Bedroom	35dB L <sub>Aeq</sub> (16hour)	30dB L <sub>Aeq</sub> (8hour)

- 5.8 BS8233:2014 does not stipulate any criteria for maximum noise levels within rooms in terms of dB L<sub>Amax</sub>, but does state 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<sub>Amax,F</sub>, depending on the character and number of events per night. Sporadic noise events could require separate values.”*
- 5.9 BS8233:2014 states, *“If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.”*
- 5.10 With regard to ventilation, BS8233:2014 states, *“The Building Regulations’ supporting documents on ventilation [i.e. Building Regulations Approved Document F in England] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant’s choice.”*
- 5.11 It is noted that BS8233:2014 also states that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.

- 5.12 The levels shown in the table above are based on the existing guidelines issued by the WHO, and presume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern (for example, on a road serving a port with high levels of traffic at certain times of the night), an appropriate alternative period (e.g. 1 hour) may be used, but the level should be selected to ensure consistency with the levels recommended in the table. These levels are based on annual average data, and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.
- 5.13 In addition, the BS8233:2014 guidance relating to gardens makes reference to external noise levels in gardens and balconies, etc., as follows:

*“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$ , with an upper guideline value of 55 dB  $L_{Aeq,T}$  which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*

*Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB  $L_{Aeq,T}$  or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”*

- 5.14 The following general noise mitigation advice is based on achieving the BS8233:2014 indoor noise level criteria defined above to ensure a suitable level of protection for the future occupants

of the development. Noise ingress calculations have been carried out in accordance with BS8233:2014. In order to provide additional protection in relation to the commercial noise, the recommended noise mitigation is additionally designed to reduce commercial  $L_{eq}$  sound levels to be no more than NR25 within habitable rooms.

## 6.0 NOISE MITIGATION MEASURES

- 6.1 The following noise mitigation measures are recommended in order to meet the criteria set out above.
- 6.2 There are a variety of proportionate and reasonable techniques that could be introduced to mitigate the effects of noise, such as:
- a) **Engineering:** reduction of noise at source (e.g. use of quiet machinery and working methods), containment of generated noise, and protection of noise-sensitive buildings (e.g. by sound insulation and/or screening them by purpose-built barriers);
  - b) **Layout:** adequate distance between source and noise-sensitive building; screening by natural barriers, other buildings or non-critical rooms in a building;
  - c) **Administrative:** limiting operating time of source, restricting activities onsite, specifying an acceptable noise limit.
- 6.3 Daytime sound levels at Location 1 were 64dB  $L_{Aeq}$ , which exceeds the BS8233:2014 recommended upper limit of 55dB  $L_{Aeq}$ . The space is already a garden for a dwelling, and it is considered that there is no change of use and no requirement to comply with the BS8233 criteria. It would nonetheless be desirable to reduce noise levels; provision of a 1.8m high acoustic fence around the garden would reduce noise levels in the garden by a significant margin, and we anticipate that the 55dB  $L_{Aeq}$  criterion would normally be met.

### Dwelling protection

- 6.4 External walls should be repaired where necessary, but generally they look to be in good condition.
- 6.5 A traditional pitched tile/slate roof construction should provide suitable sound insulation. Ceilings in bedrooms immediately below the roofspace should comprise solid gypsum-based board (total minimum mass per unit area 10kg/m<sup>2</sup>), overlaid with mineral wool insulation of minimum 200mm thickness.
- 6.6 Our calculations indicate that an enhanced acoustic specification for glazing and ventilation will be required in order that BS8233:2014 internal noise levels can be met. However, it is clear that the BS8233:2014 criteria can be met, and that the site is suitable for residential development.
- 6.7 Suitable glazing acoustic performance specifications are given in the following table, based on acoustic data used in the BS8233 noise ingress calculations.

**Table 5: Glazing minimum octave band sound reduction**

Room type	Octave band minimum sound reduction indices (dB)					
	125	250	500	1k	2k	4k
<u>Living rooms:</u> 4mm glass / minimum 12mm airgap / 4mm glass (nominal $R_w$ 31dB)	18	20	25	35	38	35
<u>Bedrooms:</u> 10mm glass / minimum 12mm airgap / 6.4mm acoustic laminated glass (nominal $R_w$ 39dB)	27	29	36	41	42	52

- 6.8 Systems with thicker glass and/or greater cavity depth will provide greater sound insulation, and therefore should also be suitable.
- 6.9 For all windows, the required acoustic performance should be attained by the glazing system as a whole, including opening lights, seals, and frames. To achieve the required sound insulation, it is anticipated that this will require solid or insulated frames rather than hollow section.
- 6.10 Enhanced acoustic performance to ventilators is required in order to meet the BS8233:2014 internal noise criteria in bedrooms and living rooms. Calculations indicate that a minimum ventilator sound insulation performance of 55dB  $D_{n,e,w}$  is suitable for front-facing bedrooms (i.e. overlooking Sheffield Road), and 42dB  $D_{n,e,w}$  is suitable for all other rooms. Ventilators capable these performances (or greater) are available from various manufacturers, such as Greenwood, Titon, Simons, Ryttons, Passivent, etc.
- 6.11 Glazing and ventilators to non-habitable rooms or spaces do not require special acoustic measures, and these spaces may have standard trickle ventilation. (For the purposes of noise assessment, separate kitchens, bathrooms, WCs, etc., are considered as non-habitable spaces.)
- 6.12 All specifications given above are outline recommendations based on the information currently available for the proposed development, and should be verified during the detailed building design. Equivalent acoustic performance may be achieved by an alternative design or other materials and products. Acoustic performance data for all proposed systems should be submitted to a competent acoustic consultant for checking in order to ensure adequate acoustic performance will be achieved.

- 6.13 It should be acknowledged that careful design and close attention to detail, along with high standards of site supervision and workmanship, are essential in achieving the required acoustic performance, particularly in relation to controlling flanking sound transmission paths, airgaps, and use of suitable materials. Therefore, effective work management plans will be needed to ensure all contractors and tradesmen are aware of the acoustic performance requirements and details to ensure works are implemented to the necessary standard.

## 7.0 SUMMARY AND CONCLUSIONS

- 7.1 A noise assessment has been carried out on behalf of Erodatools Ltd for a proposed residential development at 224 Sheffield Road, Penistone.
- 7.2 The assessment has been undertaken to address the invalidity statement issued by Barnsley MBC for application ref. 2021/0014/INVALID.
- 7.3 A noise survey has been undertaken at the development site over representative daytime and nighttime periods. This has included appropriate corrections to allow for potentially reduced road traffic during COVID-19 partial lockdown.
- 7.4 Road traffic was found to be the dominant noise source at the site during daytime and nighttime. Some noise from the commercial activity to the rear of the site is noted.
- 7.5 Noise control measures, including enhanced acoustic specification of ventilation and glazing, have been recommended in order to meet appropriate noise level criteria defined for the proposed development, in line with BS8233:2014.
- 7.6 The site is therefore considered suitable for residential development in planning and noise terms, as acceptable acoustic conditions in accordance with BS8233:2014 can be achieved by the design and implementation of suitable noise mitigation measures in the construction of the proposed development.

## 8.0 DISCLAIMER

- 8.1 This document is limited to addressing the specific acoustic issues contained herein, and its content is based on drawings and information provided to date by our Client/their Design Team.
- 8.2 All findings, comments, recommendations, etc., in this document are for acoustic purposes only; any and all other considerations and requirements, e.g. structural, airflow, thermal, fire safety, CDM compliance, determination of whether materials are dangerous, hazardous, deleterious, etc. (non-exhaustively), are the responsibility of other such suitably qualified specialists to check and advise on.
- 8.3 BTA's work may occasionally involve provision of acoustic performance advice and acoustic design recommendations that others may choose to regard as a "specification" under CDM 2015 (and thus others may occasionally choose to regard BTA to be a "Designer" under CDM 2015). Notwithstanding this, it is always the responsibility of others (Principal Designer) to approve/incorporate into their final design – or not – their final specification selections; although these may be based on BTA's acoustic performance advice, as BTA neither has control over how or whether BTA's acoustic advice is incorporated into the final design by others, nor any power to enforce that any such final specification selections made by others based on BTA's advice are appropriate in any regard beyond their acoustic performance qualities, it also remains the responsibility of others under CDM 2015 to ensure that any ancillary (non-acoustic) considerations in the course of selection, installation, maintenance, etc. of final specifications are advised upon by such relevantly qualified specialists (non-acoustic, and therefore non-BTA), and that any safety precautions identified in the course of their consideration by others are taken by others (the Principal Designer, Designers, Contractors, Client, etc.).
- 8.4 Products and materials that perform well acoustically tend to be heavier than standard products. Use of these products and materials may increase the weight of the element, and the CDM Principal Designer, Client, etc. must take care to ensure that this risk is mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe lifting and installation techniques, maintenance, etc. are used to reduce any remaining risk. Wherever BTA advises that works such as acoustic barriers are desirable to attenuate noise, care must be taken by the CDM Principal Designer, Client, etc. to ensure that the risks associated with constructing and maintaining bunds, walls, fences, etc. are mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe construction and installation techniques, maintenance, etc. are used to reduce any remaining risk.

- 8.5 This document has been prepared for the sole use, benefit, and information of our direct Client for the purposes agreed at the time of their formal instruction. The liability of BTA in respect of the information contained herein will not extend to any third party.

**FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATIONS**

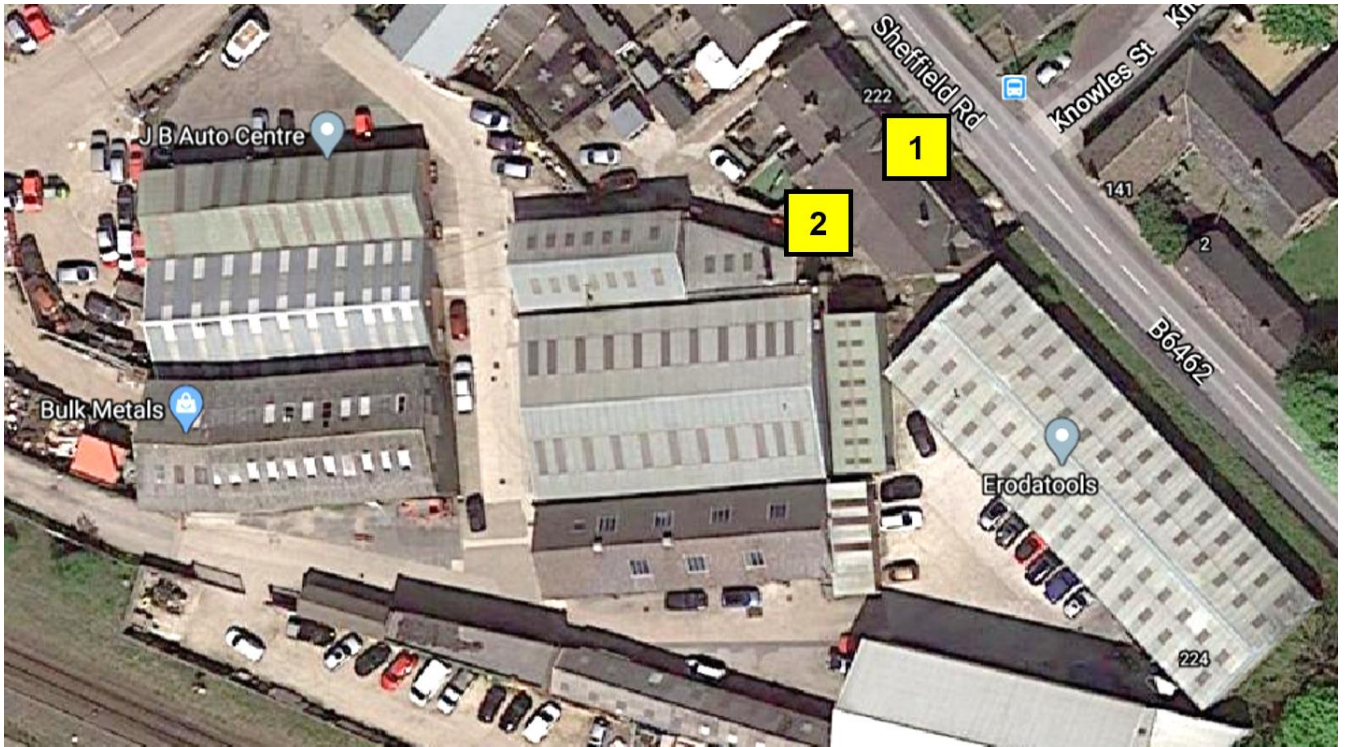
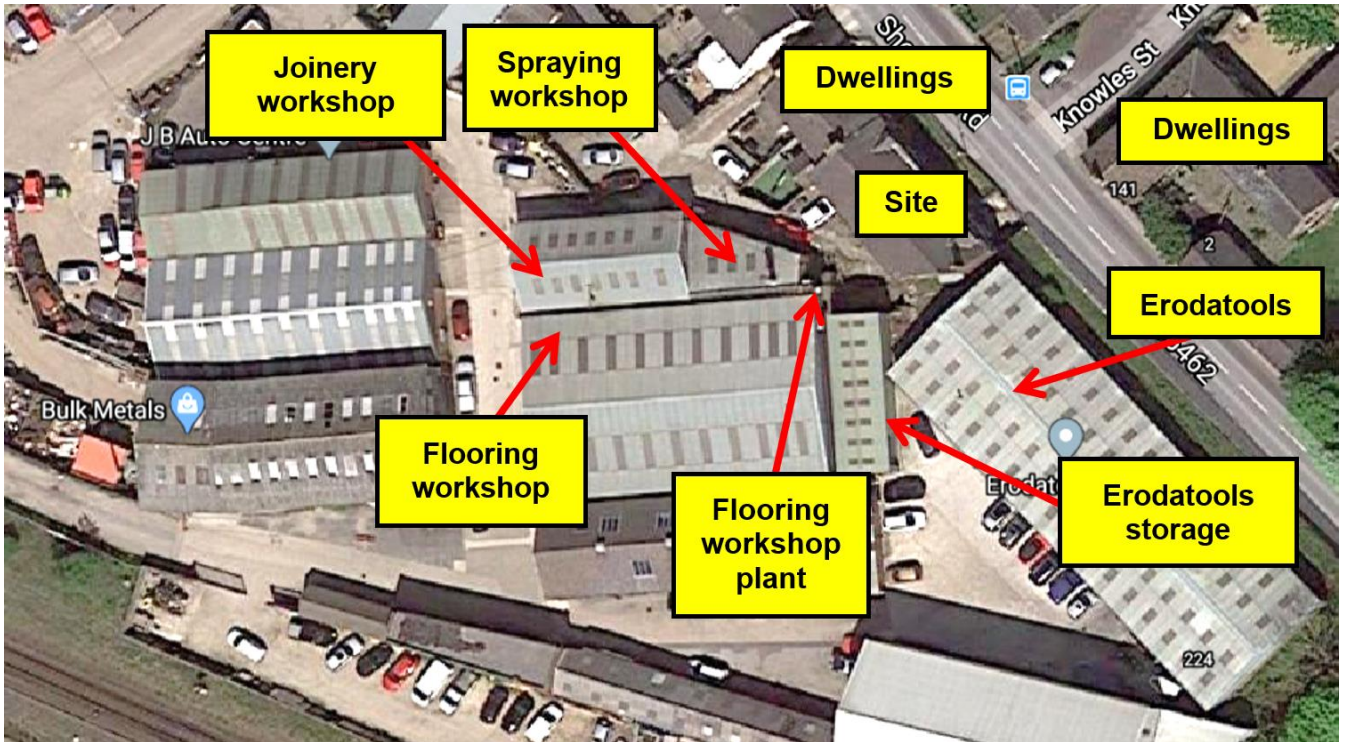


FIGURE 2 – SURROUNDING USES



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## APPENDIX 1 – TECHNICAL UNITS AND INDICES

### a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0dB (threshold of hearing) to 120dB (threshold of pain).

### b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighting applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

### c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

**L<sub>Aeq</sub>** This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L<sub>Aeq</sub> is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

**L<sub>Amax</sub>** This is the maximum A-weighted sound level that was recorded during the monitoring period.

**L<sub>A90</sub>** This is the A-weighted sound level exceeded for 90% of the time period. L<sub>A90</sub> is used as a measure of background noise.

**L<sub>A10</sub>** This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

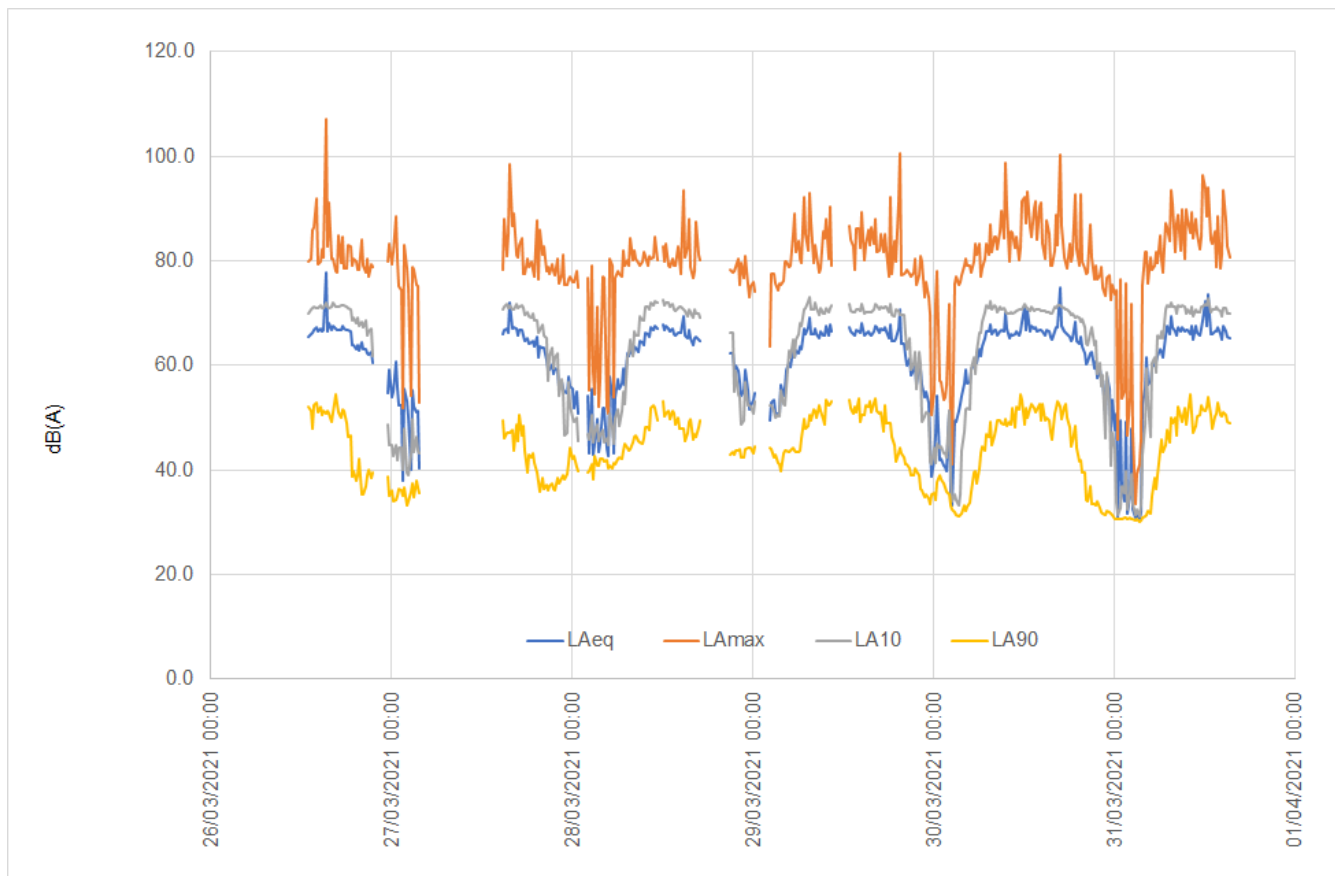
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- NR Measured noise levels in each octave band are compared to the NR curve reference values. The overall NR value is the lowest NR curve that has not been exceeded.
- $D_{nT,w}$  Weighted standardised level difference, a single figure generated by comparing the  $D_{nT}$  with a reference curve. The reference curve is shifted in 1dB steps until the sum of adverse deviation of the test curve, compared to the reference curve, is as large as possible, but no more than 32.0dB. The value of the shifted reference curve at 500Hz is taken as the  $D_{nT,w}$ . N.B. As  $D_{nT,w}$  for airborne transmission represents a level difference, an improvement generates a larger figure – used in airborne tests.
- $R_w$  Similar to the  $D_{nT,w}$  term, but a measure of the airborne sound insulation performance of a separating element, when tested in laboratory conditions. As such the build is essentially perfect, and has no flanking noise routes.  $D_{nT,w}$  values measured onsite will always be of a significantly lower value than the  $R_w$  value for a structure.

### APPENDIX 2 – NOISE SURVEY DATA

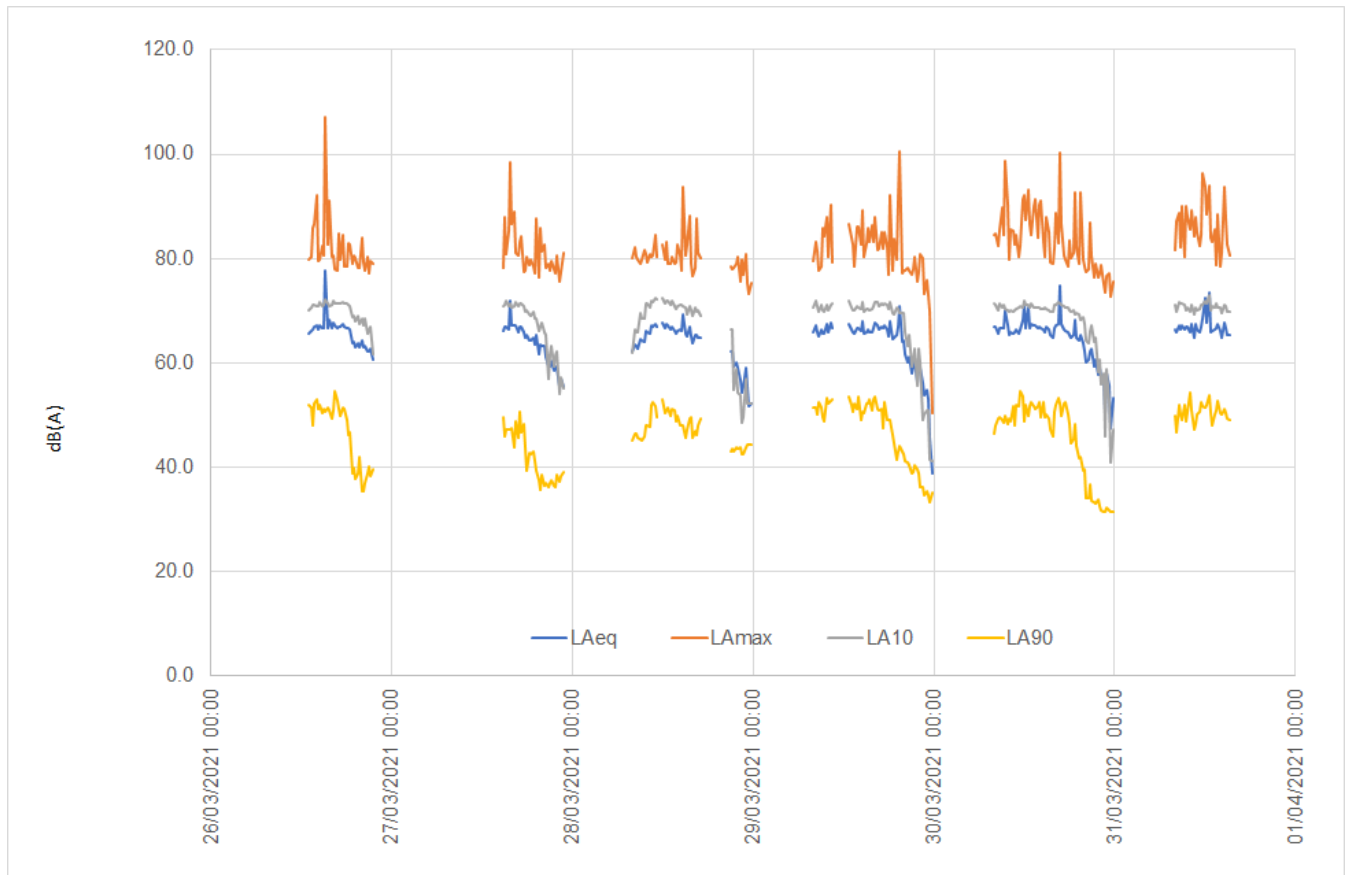
#### Location 1 – Front elevation, Sheffield Road 1<sup>st</sup> floor window

Rion NL-52 sound level meter. All values dB(A), 15-minute duration, façade.

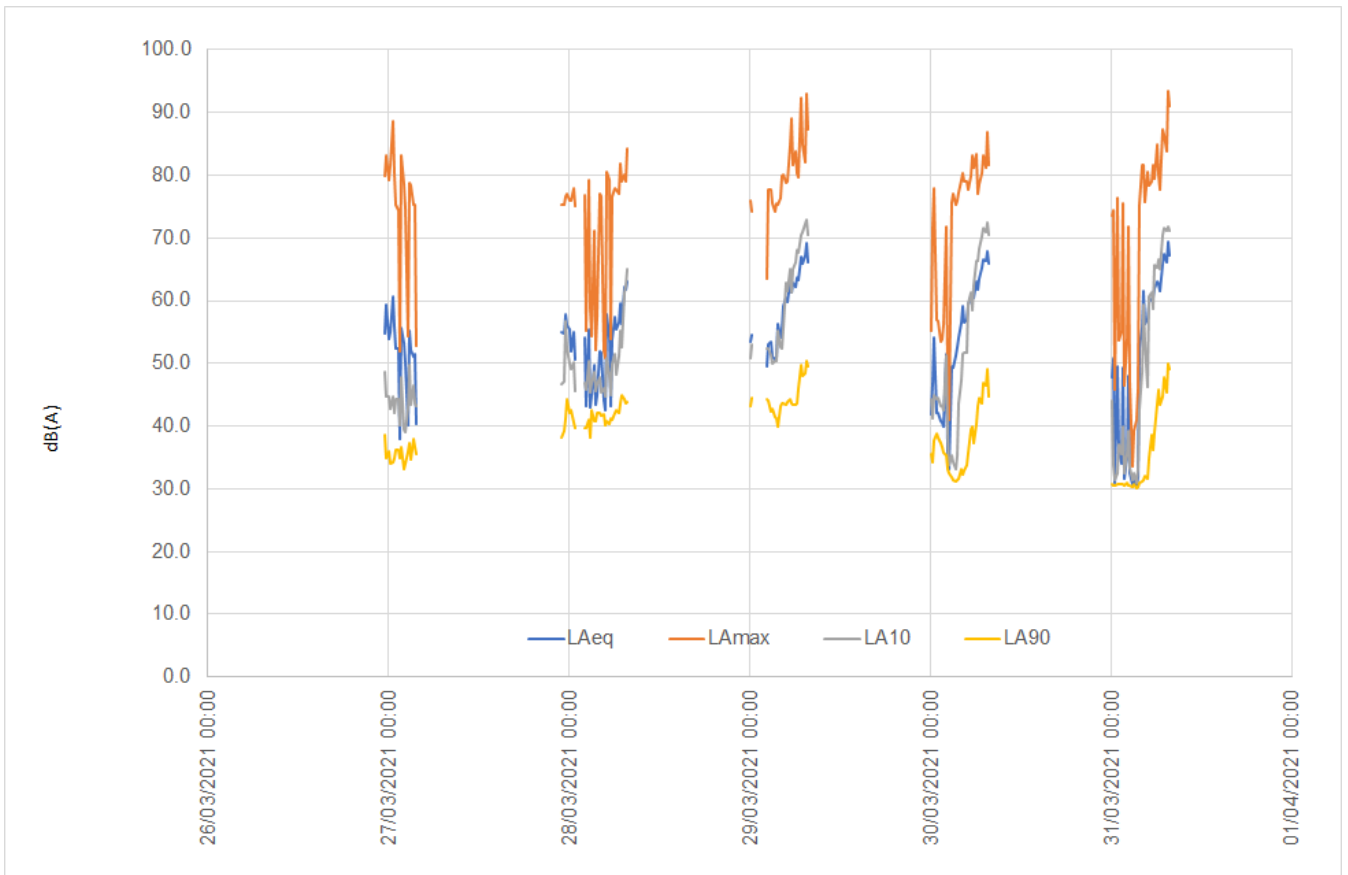
#### All values



Daytime



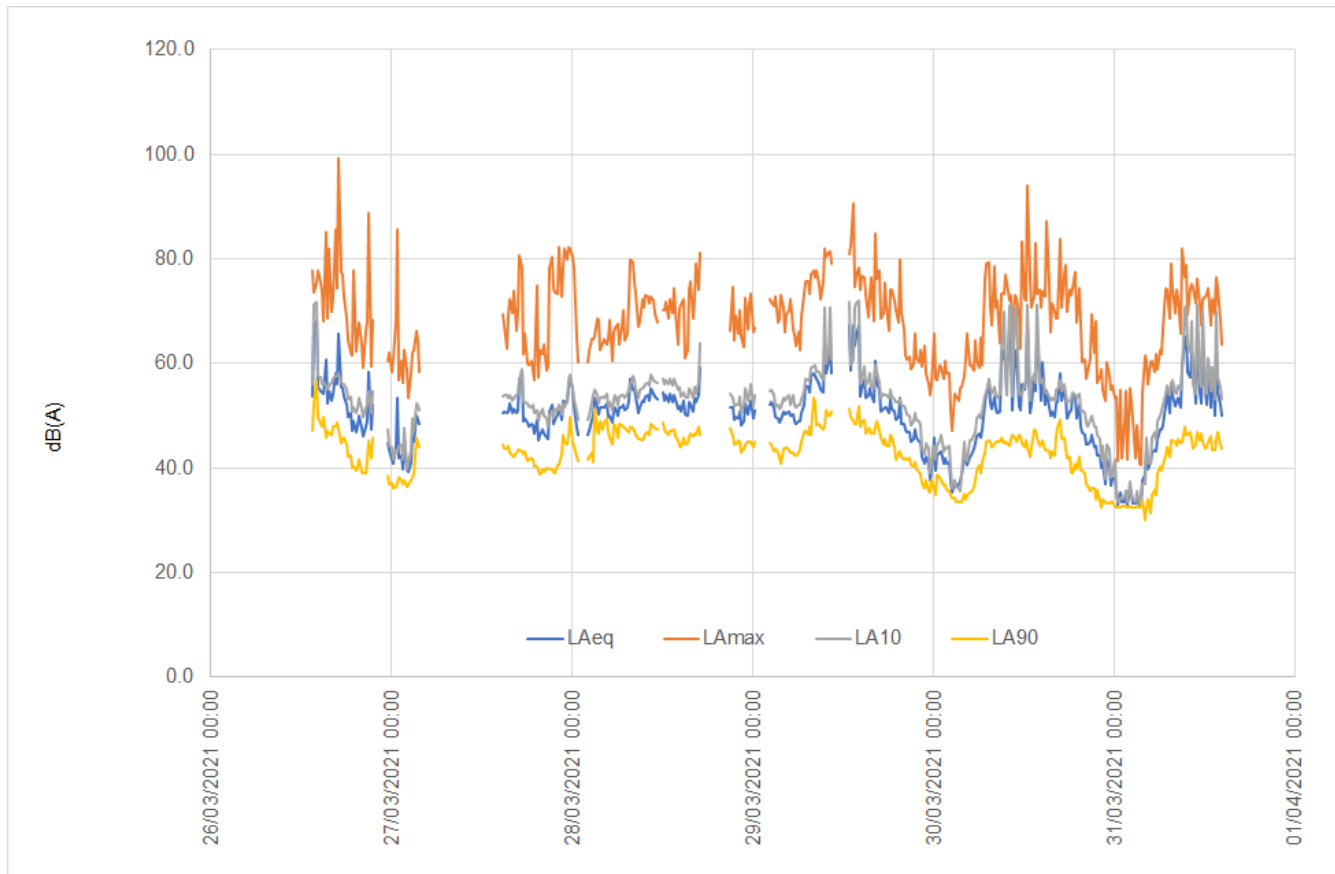
### Nighttime



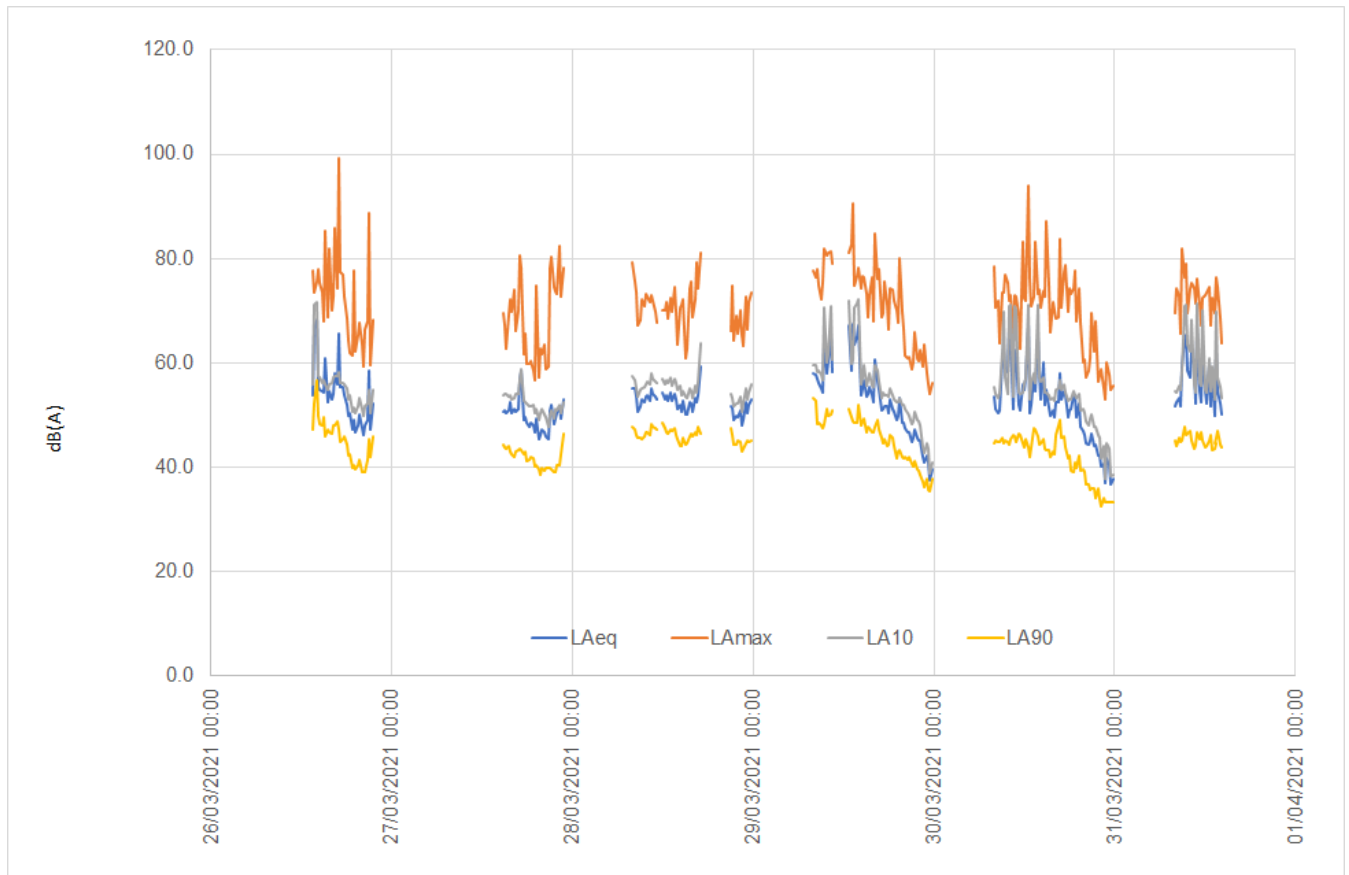
**Location 2 – Rear elevation, facing commercial units**

Rion NL-52 sound level meter. All values dB(A), 15-minute duration, façade.

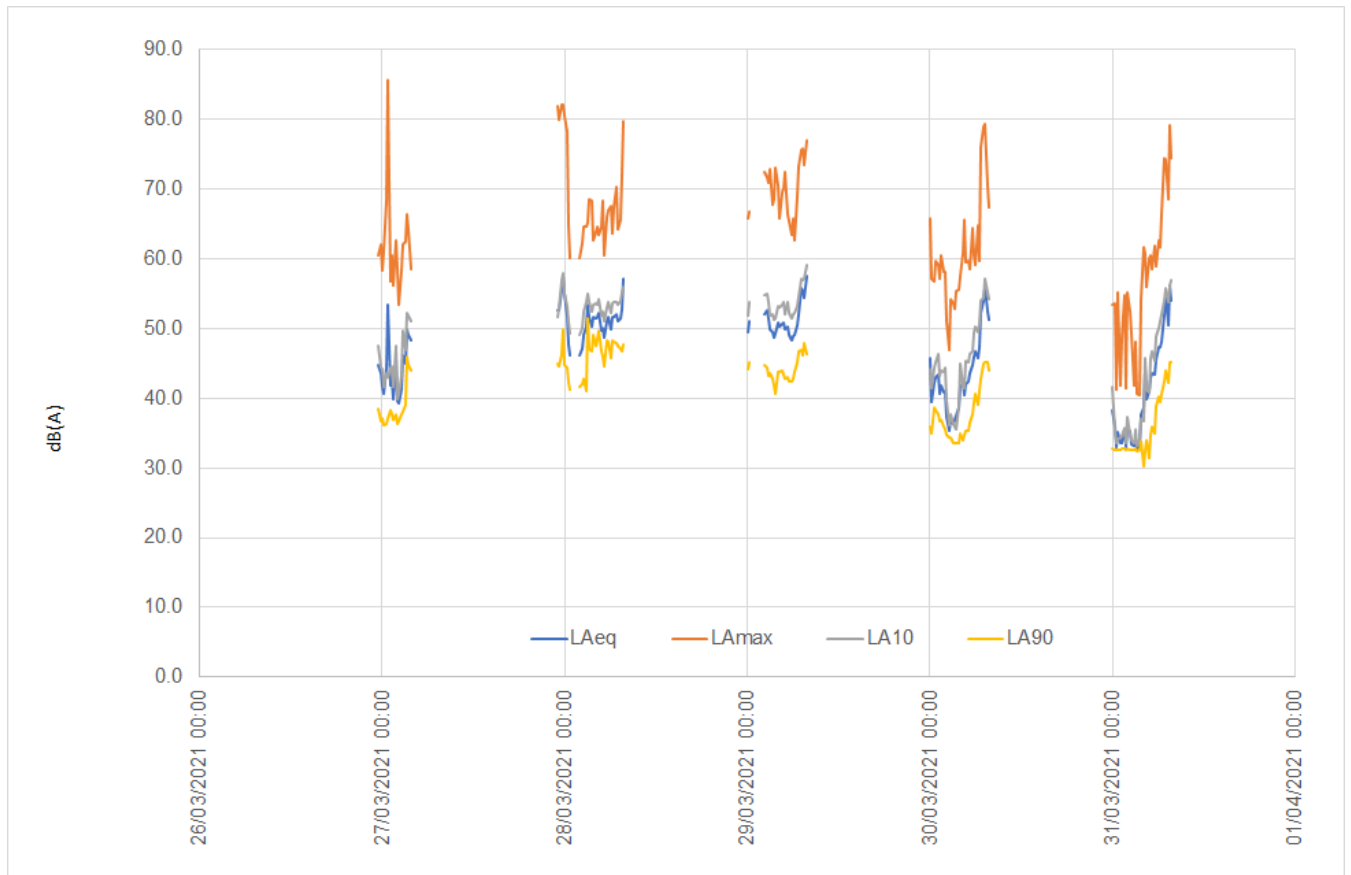
**All values**



### Daytime

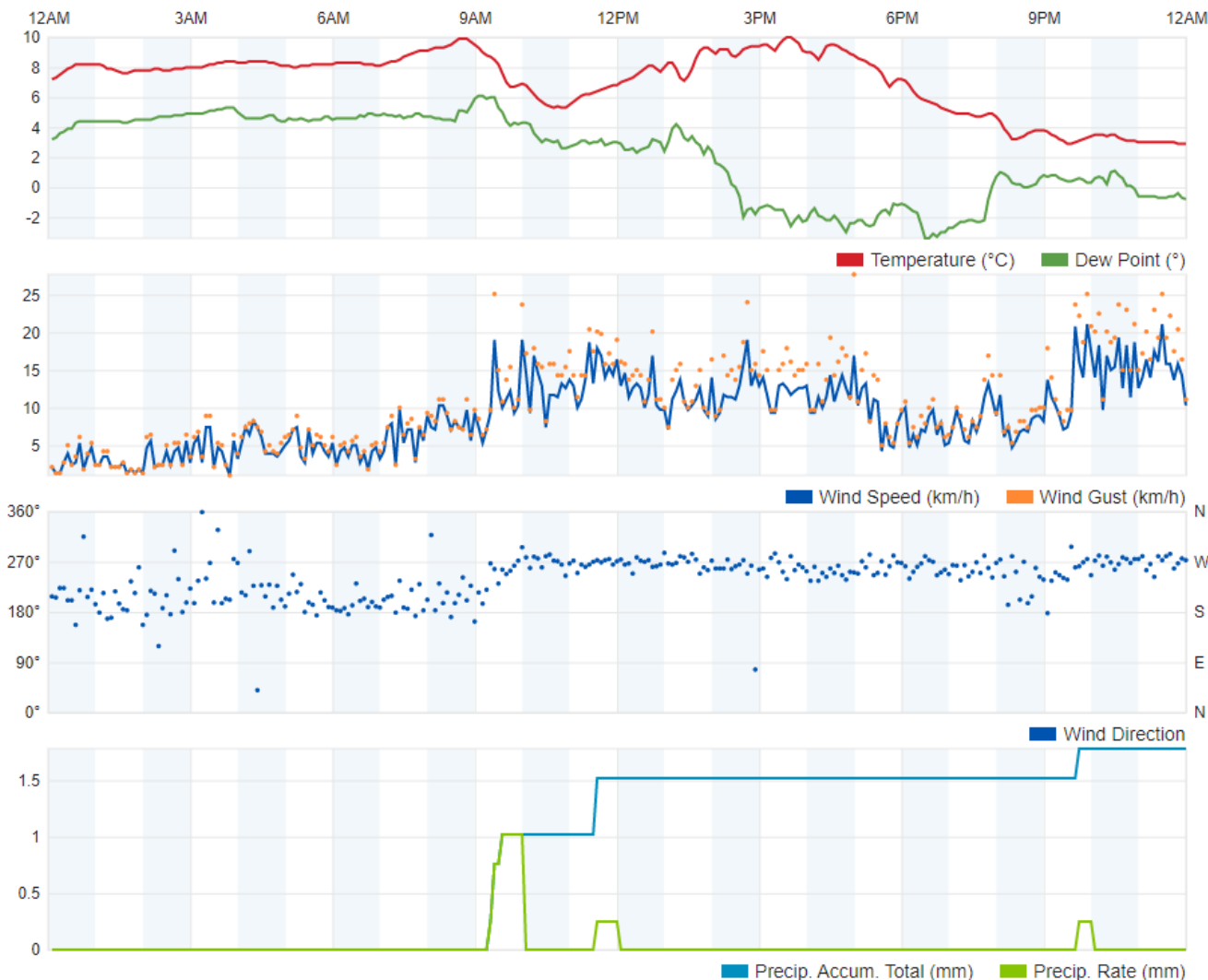


### Nighttime

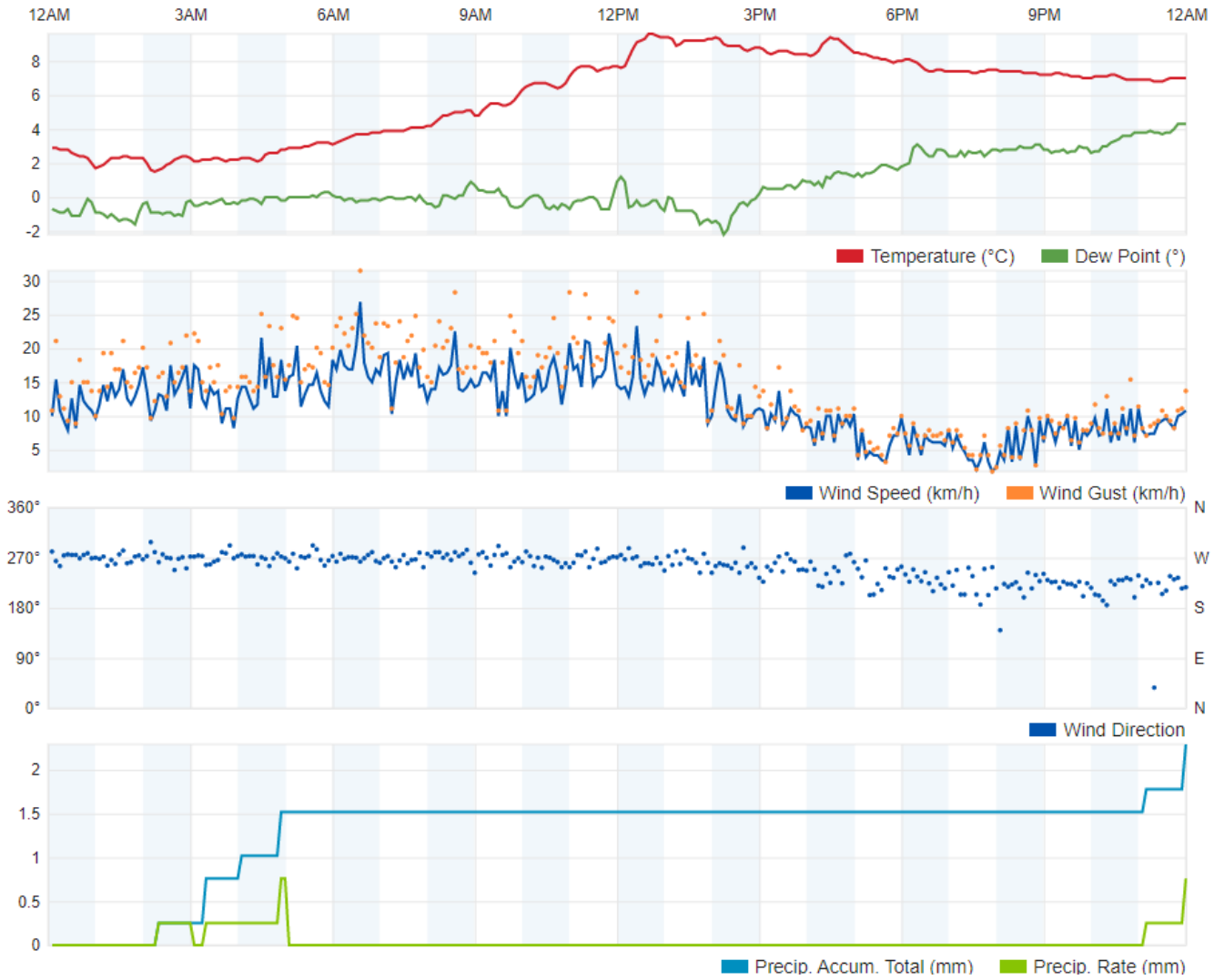


### APPENDIX 3 – WEATHER DATA

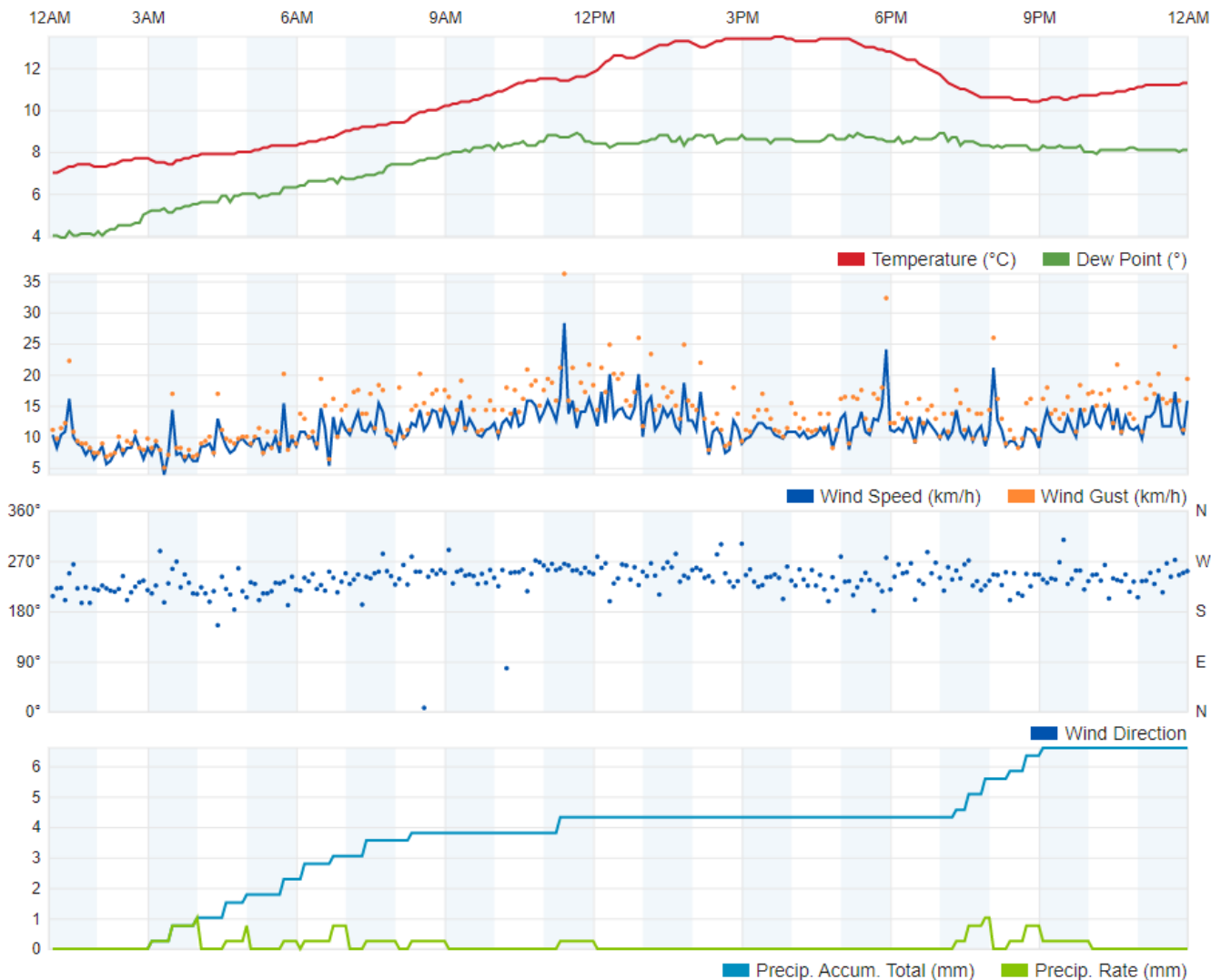
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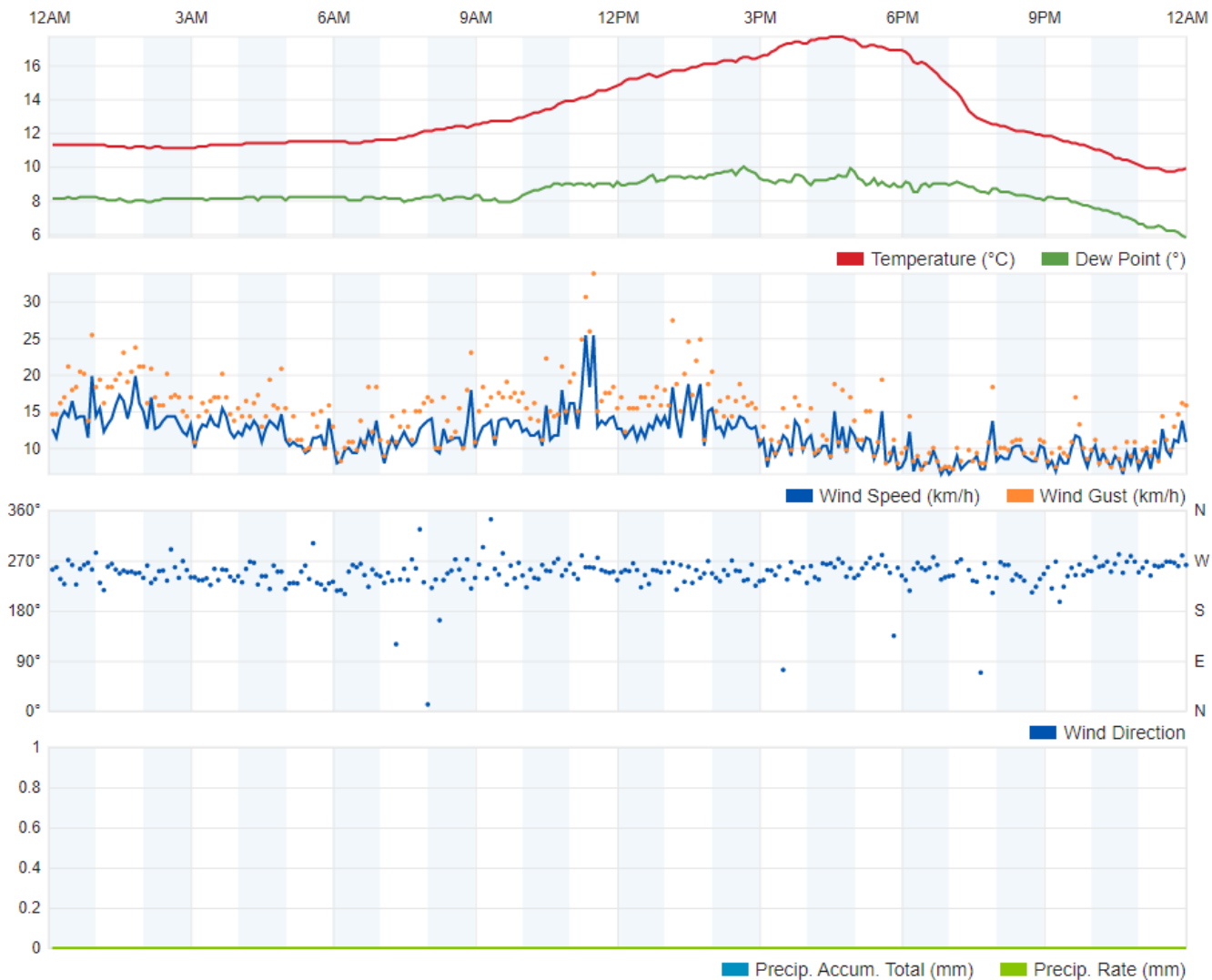
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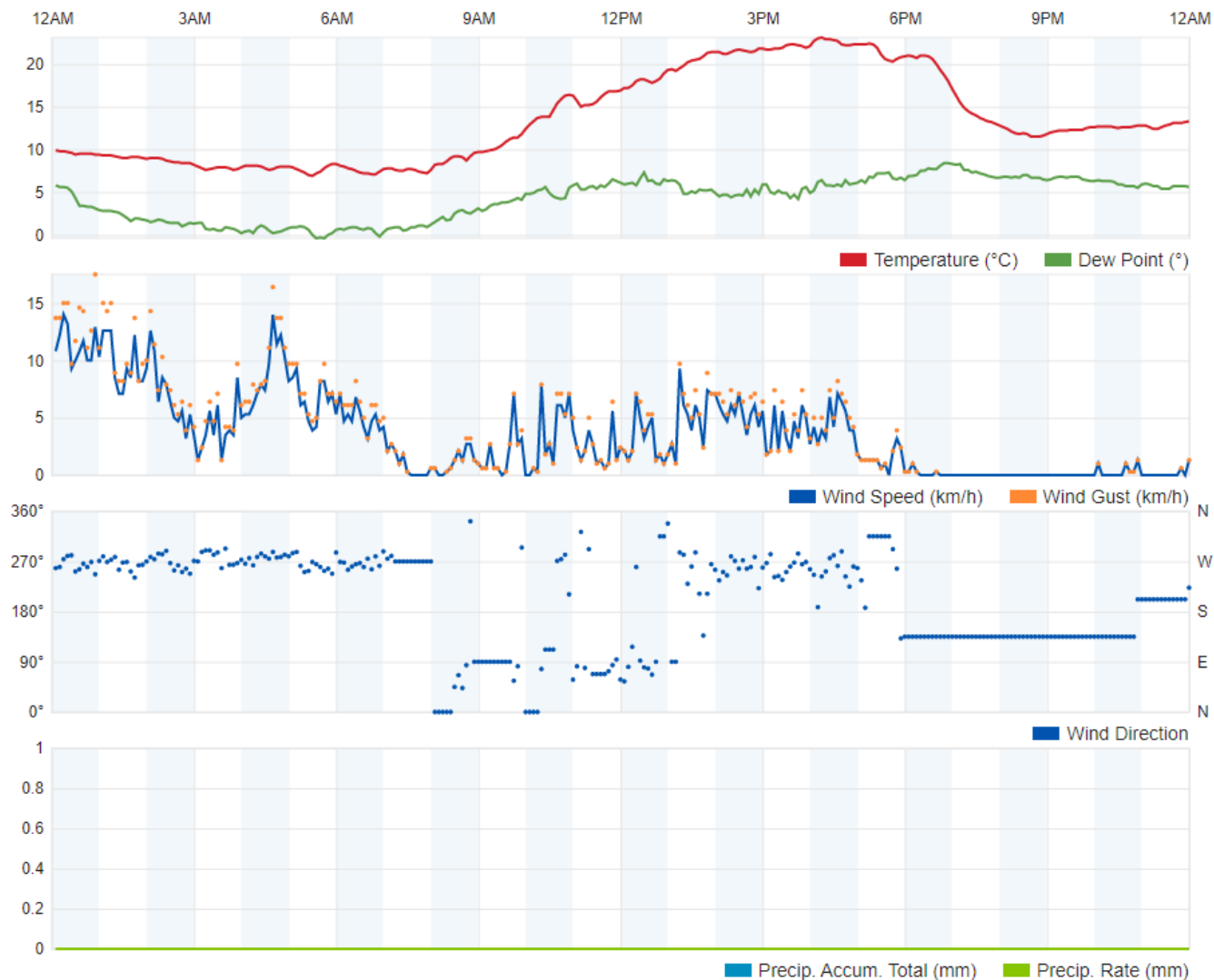
Sunday 28/03/2021



Monday 29/03/2021



Tuesday 30/03/2021



Wednesday 31/03/2021

