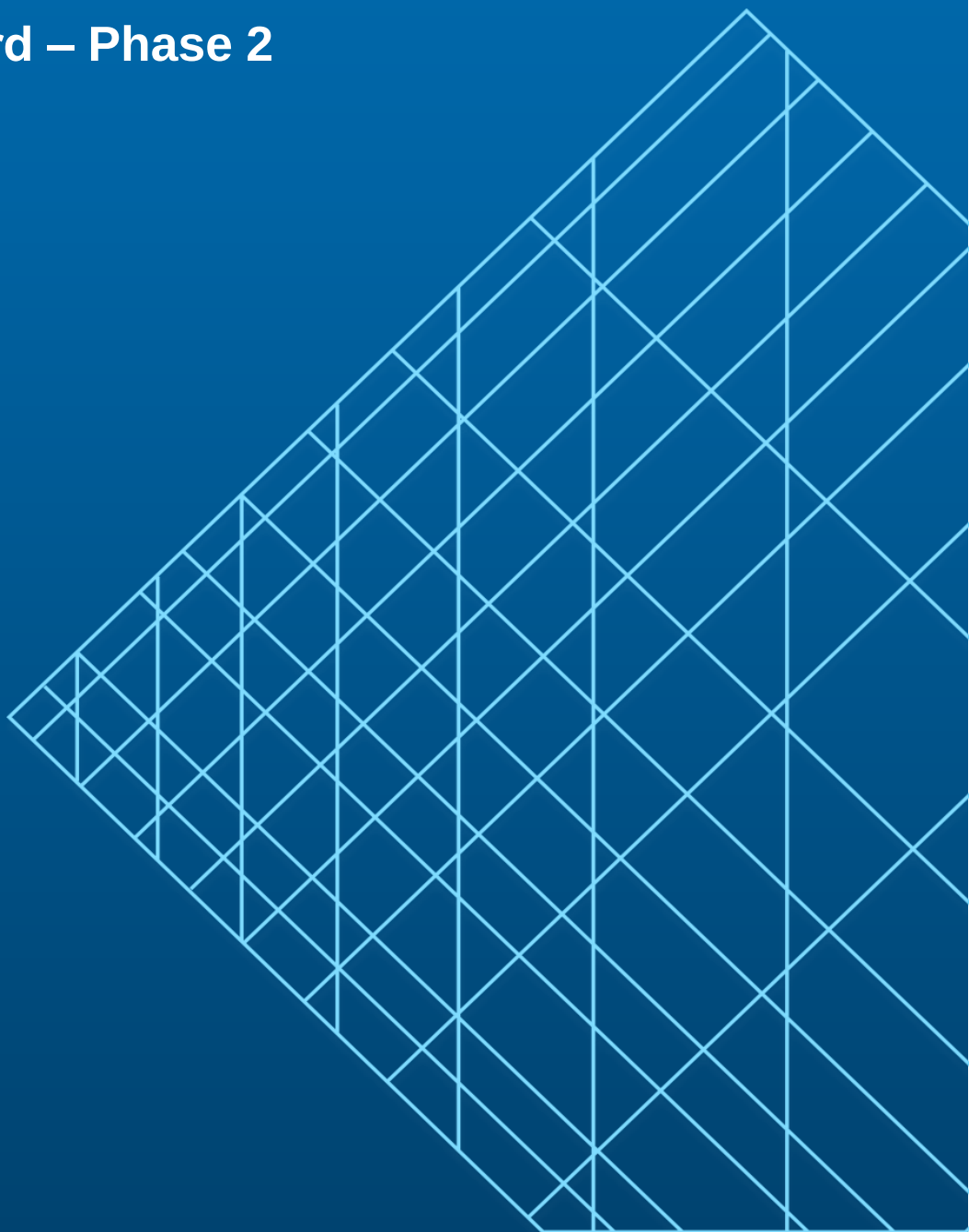
Hunter ACOUSTICS

Independent Acoustic Consultancy Practice

Environmental Noise Assessment

Galliford's Yard – Phase 2
Newport

6435/ENS1



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Environmental Noise Assessment

Project:	**Galliford's Yard – Phase 2**
Site Address:	Coverack Road Newport NP19 0DR
HA Reference:	6435/ENS1
Date:	19/03/2024
Client:	Newport City Homes c/o Asbri Planning Ltd
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- CTRL and click on the table of contents or references to tables/figures/sections to navigate.
- Press CTRL and Home key to return to the top of the document.
- Press Alt-left arrow to return to your previous location.

TABLE OF CONTENTS

1. INTRODUCTION

We understand a residential apartment block consisting of 40no apartments over 5no storeys is proposed at Galliford's Yard – Phase 2, Coverack Road, Newport, NP19 0DR.

This report has therefore been commissioned to assess existing ambient and background noise levels impinging on the site from local sources.

Survey results have been used for comparison with typical Local Authority Planning conditions and current planning guidance.

2. CRITERIA

2.1 Planning Policy Wales

The Welsh Government's Planning Policy Wales (Edition 12) dated February 2024, states the following;

"6.7.20 Where sensitive developments need to be located close to existing transportation infrastructure for sustainable movement and access they should be designed, as far as practicable, to limit harmful substances and noise levels within and around those developments both now and in the future. This may include employing the principles of good acoustic design and the inclusion of active travel or travel management measures as part of development proposals. Such development, however, should preferably be located away from existing sources of significant noise, which may include aircraft noise or roads, particularly new roads or those with programmed route improvements."

The document states *"For more information on the principles of good acoustic design, readers are referred to Professional Planning Guidance (ProPG) Supplementary Document 2, produced by the Association of Noise Consultants, the Institute of Acoustics and the Chartered Institute of Environmental Health (http://www.association-of-noise-consultants.co.uk/propg/). ProPG has been written principally to assist with the planning process in England, but the design principles put forward in Supplementary Document 2 may also be adopted in Wales.*

2.2 ProPG Supplementary Document 2

Professional Practice Guidance on Planning & Noise, New Residential Development 'Supplementary Document 2 – Good Acoustic Design' produced by the ANC, IOA and CIEH discusses the general principles of Good Acoustic Design, including the following hierarchy of noise management measures in descending order of preference;

i) Maximising the spatial separation of noise source(s) and receptor(s).
ii) Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.
iii) Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.
iv) Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.
v) Using the layout of the scheme to reduce noise propagation across the site.
vi) Using the orientation of the buildings to reduce the noise exposure of noise-sensitive rooms.
vii) Using the building envelope to mitigate noise to acceptable levels.

"It should be remembered that good acoustic design is a process that begins as soon as land is under consideration for development. The timeline for good acoustic design stretches from the conceptual design stage, through quality control during construction, and beyond to post construction performance testing.

Both internal and external spaces should be considered in the acoustic design process. Care should be taken to ensure that acoustic mitigation measures do not result in an otherwise unsatisfactory development. Good acoustic design must be regarded as an integrated part of the overall design process".

2.3 Technical Advice Note (Wales) 11

Noise bands defining categories A-D of TAN 11 are set in terms of $L_{Aeq,16hr}$ daytime and $L_{Aeq,8hr}$ night time levels for road traffic noise and mixed sources, free field 1.2-1.5m above ground level as follows;

Table 2.1 – TAN11 Noise Exposure Categories

Recommended noise exposure categories for new dwellings near existing noise sources (ref Table 2 of TAN 11 (Wales) October 1997)					
Noise Source	**Time**	**Noise Exposure Categories**			
		A	**B**	**C**	**D**
Road Traffic	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66
Rail Traffic	07:00-23:00	<55	55-66	66-74	>74
	23:00-07:00	<45	45-59	59-66	>66
Air Traffic	07:00-23:00	<57	57-66	66-72	>72
	23:00-07:00	<48	48-57	57-66	>66
Mixed Sources(4)	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66

Note: In addition, sites where individual noise events regularly exceed 82dB(A) L_{max}(slow), several times in any night time hour should be treated as being in NEC C, unless the L_{eq}(8 hour) already puts the site in NEC D.

(4) Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.

2.4 British Standard 8233:2014

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' includes internal noise criteria of habitable rooms in residential dwellings, as shown below;

Table 2.2 – BS 8233:2014 Internal Ambient Noise Criteria for Habitable Rooms

Location	Desired		Reasonable *	
	07:00 to 23:00	23:00 to 07:00	07:00 to 23:00	23:00 to 07:00
Living room	35 dB $L_{Aeq,16hr}$	-	40 dB $L_{Aeq,16hr}$	-
Dining room/area	40 dB $L_{Aeq,16hr}$	-	45 dB $L_{Aeq,16hr}$	-
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$	40 dB $L_{Aeq,16hr}$	35 dB $L_{Aeq,8hr}$

* *NOTE 7 states "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.*

In addition BS 8233:2014 states: *"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. Sporadic noise events could require separate values."*

Reference is therefore made to World Health Organisation (WHO) 'Guidelines for Community Noise, 1999' which states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)".*

Section 7.7.3.2 of BS 8233:2014 entitled 'Design criteria for external noise' states;

"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 recognised 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 to 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."

The above criteria in BS 8233:2014 apply for sources without specific character, previously termed "anonymous noise". BS 8233:2014 7.7.1 advises:

"NOTE: 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."

2.5 Building Regulations Part O 2022 Edition - For use in Wales

Requirement O1 of Part O in Wales applies when a new residential building is erected and states,

"(1) Reasonable provision must be made to –

a) limit unwanted solar gains in summer;
b) provide an adequate means to remove heat from the indoor environment.

(2) In meeting the obligations in sub-paragraph(1) –

a) ***account must be taken of the safety of any occupant, and their reasonable enjoyment of the building; and***
b) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.

Under the heading *"Intention"*, it states that requirement O1(2)(a) is met if the building's overheating mitigation strategy takes account of all the following:

a. Noise at night
b. Pollution
c. Security
d. Protection from falling
e. Protection from entrapment

Noise at night is covered in paragraphs 2.2 to 2.4 as follows:

"2.2 High levels of external noise could limit the use of cross-ventilation to mitigate the risk of summer overheating. External noise is a material consideration considered when applying for Planning permission and mitigating measures may be required in the design in order to obtain Planning permission and controlled through a condition imposed on the consent. In exceptional cases, this could include non-openable windows. More commonly, windows will be openable in order to enable natural ventilation to occur at less sensitive times of day, when there is lower noise, when people are not present in the room, or when they are present but not engaged in noise-sensitive activities. But those windows may need to be kept closed at times to maintain acceptable indoor

acoustic conditions, for example when people are using the rooms for sleep or office work. A noise issue may be identified at the Planning stage but rely on occupants to close windows at noise-sensitive times rather than prevent them from ever opening them, and in those cases overheating strategies should assume windows will be closed during noise-sensitive periods even if they are not fixed closed.

2.3 When the removing excess heat as part of the overheating strategy, noise levels in bedrooms should be kept to a minimum during the sleeping hours of 23:00 – 07:00. Building control bodies may accept as evidence that this requirement is satisfied:

a. documentation to demonstrate that the local planning authority did not consider external noise to be an issue at the site at the planning stage or;

b. if the local planning authority did consider external noise to be an issue that should be controlled through a condition at planning stage, then documentation to demonstrate that the proposals for heat removal (during the sleeping hours of 23.00 – 07.00) are accommodated within or do not conflict with documentation provided to the local planning authority to satisfy any related planning permission condition(s). (For example any expectation that windows on one or more façade, or in certain rooms, will need to be kept closed during noise-sensitive periods.)

2.4 Where active measures (e.g. mechanical system) are used for removing excess heat within the overheating strategy, the noise generated by these measures, particularly within bedrooms and living rooms should be considered. Noise generated by ventilation/cooling systems (which may travel through ducts) and noise from the fan unit may disturb the occupants of the building and so discourage their use. Therefore, the designer should consider minimising noise by careful design and the specification of quieter products. Further guidance on mechanical ventilation systems can be found in Approved Document F.

There are no further criteria or guidance on internal noise levels within Building Regulations Part O in Wales and therefore guidance is sought from the Acoustics, Ventilation and Overheating Residential Design Guide (AVO Guide): 2020 prepared by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA).

2.6 AVO Guide: 2020

The Acoustics, Ventilation and Overheating – Residential Design Guide (AVO Guide) 2020 aims to assist designers to adopt an integrated approach to the acoustic design of residential dwellings within the context of ventilation and thermal comfort requirements.

The following internal ambient noise levels are quoted for guidance in AVOG.

Figure 2.1 - Guidance for level 2 assessment of noise from transport noise sources relating to overheating condition

Internal ambient noise level [Note 2]			Examples of Outcomes [Note 5]	
$L_{Aeq,T}$ [Note 3] during 07:00 – 23:00 [Note 6]	$L_{Aeq,8h}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00 [Note 4]		
> 50 dB	> 42 dB	Normally exceeds 65 dB $L_{AF,max}$	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time	Avoiding certain activities during periods of intrusion. Having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.
			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time. [Note 8]
≤ 35 dB	≤ 30 dB	Do not normally exceed $L_{AF,max}$ 45 dB more than 10 times a night	Noise can be heard, but does not cause any change in behaviour	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response[Note 9]. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.

2.7 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound", provides current guidance for the assessment of industrial noise affecting residential receivers.

This standard describes a rating method comparing L_{Aeq} noise levels from the industrial source with pre-existing background L_{A90} levels at the residential receiver. It advises at a difference (industrial noise - background) of:

- +10dB or higher, likely to be an indication of a significant adverse impact, depending on the context.

- A difference of + 5dB, likely to be an indication of an adverse impact, depending on the context.

- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

A sliding scale of penalties can be applied to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency.

Tonality – A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

Impulsivity – A penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB where it is highly perceptible.

Other sound characteristics – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied

Intermittency – If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

BS 4142:2014 states under section 11;

"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."

3. ENVIRONMENTAL NOISE SURVEY

3.1 Procedures

3.1.1 Continuous Monitoring

Continuous noise monitoring was carried out from 1200hrs on Tuesday, 05 March 2024 to 1030hrs on Thursday, 07 March 2024 at position A.

Data including L_{Amax}, L_{Aeq} and background L_{A90} was logged at 1 minute intervals over the monitoring period, along with continuous audio and 100ms data to allow source identification and further detailed analysis of results if required.

Figure 3.1 – Site Plan Showing Monitoring Locations

Site plan in Figure 3.1 above shows the development site and continuous monitoring positions used, namely:

Table 3.1 – Continuous Monitoring Location Details

Position	Description
A	Located on the south-eastern corner of the roof of the Bankside House with line of sight to George Street Bridge, approximately 18.5m above local ground height

3.1.2 Sample Measurements

Additional sample measurements were taken on Thursday, 07 March 2024 in parallel with the continuous monitor. Parameters recorded include L_{max} and L_{eq} levels including 1/3 octave band spectra.

Site plan in Figure 3.1 shows the sample measurement positions used, namely:

Table 3.2 – Sample Measurement Location Details

Position	Description
1	Located 5m within the site from the security fence (approximately 8m from the bridge)
2	Located 2m in from the security fence (approximately 37m from the bridge)

Note: All microphone positions approximately 1.5m & 4m above local ground level.

3.2 Meteorological Conditions

Approximate weather conditions are shown in time history graphs in Figure B.1, Figure B.2 & Figure B.3 of Appendix B.

To summarise, the weather conditions during the monitoring period were generally dry with an occasional breeze. A period of rain occurred on the 06 March 2024 between 1514hrs – 1605hrs.

3.3 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 3.3 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	15 August 2023	UK-23-094
	Preamplifier	MA220	5435	15 August 2023	UK-23-094
	Microphone Capsule	MC230	8547	15 August 2023	UK-23-094
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-14577-E0	23 June 2022	UK - 22 -051
	Preamplifier	MA220	7485	23 June 2022	UK - 22 -051
	Microphone Capsule	MC230	A15594	23 June 2022	UK - 22 -051
Larson Davis	Calibrator (94.00dB / 114.03dB @ 1kHz)	CAL200	19047	15 August 2023	45153-19047-CAL200

Measurement systems were calibrated before and after the surveys and no variation occurred.

Note: Copies of traceable calibration certificates for all equipment are available upon request.

3.4 Results

3.4.1 Continuous Monitoring

Time history graph in Figure B.4 of Appendix B show L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels measured at position A.

The following $L_{Aeq,16hr}$ daytime (0700-2300hrs) and $L_{Aeq,8hr}$ night-time (2300-0700hrs) noise levels were measured:

Table 3.4 – Summary of Daytime $L_{Aeq,16hr}$ and Night-time $L_{Aeq,8hr}$ Results

Period	Date	Position A
Daytime $L_{Aeq,11hr}$ (dB)	05/03/2024	65.0
Night-time $L_{Aeq,8hr}$ (dB)	05-06/03/2024	58.9
Daytime $L_{Aeq,16hr}$ (dB)	06/03/2024	64.6
Night-time $L_{Aeq,8hr}$ (dB)	06-07/03/2024	58.3
Daytime $L_{Aeq,3.5hr}$ (dB)	07/03/2024	65.8

There were no $L_{Amax,F}$ events over 82dB measured during the night-time period (2300-0700hrs). The 10th highest $L_{Amax,F}$ event was measured at 75dB on both nights.

Daytime period is therefore assessed as critical (>5dB difference between daytime and night-time).

L_{eq} and $L_{max,F}$ spectra measured at position A are included in Figure B.5 in Appendix B.

3.4.2 Sample Measurements

Results of sample measurements taken at Positions 1 and 2 are shown in Table 3.5 below;

Table 3.5 – Sample Measurement Results

Position	Height Above Local Ground (m)	Duration (mm:ss)	L_{Aeq} (dB)
1	1.5	09:51	51.8
1	4	09:35	53.1
2	1.5	10:00	51.8
2	4	09:57	53.4

4. NOISE MAP MODELLING

Three-dimensional noise map modelling has been undertaken using environmental noise mapping software package, which in turn uses calculation methods of Calculation of Road Traffic Noise (CRTN), Calculation of Rail Noise (CRN), British Standard 5228-1:2009 and ISO 9613.

Models have been set up to predict daytime and/or night-time noise levels across the site from surrounding sources based on measured noise levels discussed in section 3.4 of this report.

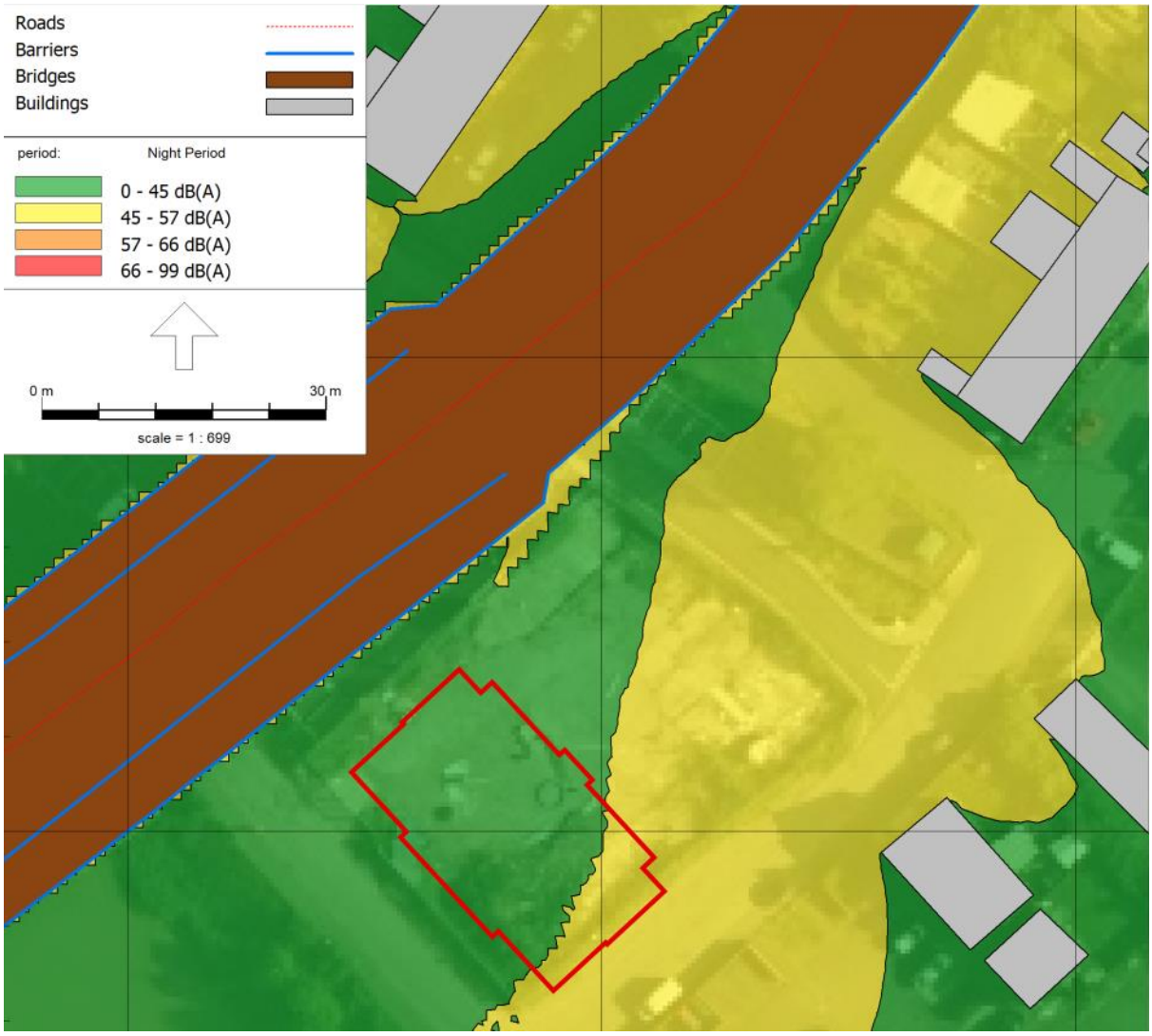
The model takes into account distance and screening losses from existing and new structures, allowing garden noise levels to be assessed, as well as predicting noise levels at proposed residential facades.

4.1 Undeveloped Site

The noise map models in Figure 4.1 & Figure 4.2 below shows predicted road traffic noise levels during the critical daytime period (0700-2300hrs) & night-time period (2300–0700hrs) at 1.5m above local ground level across the undeveloped site.

Figure 4.1 - Daytime Model (Undeveloped Site) $L_{Aeq,16hr}$ Contours at 1.5m Height

Figure 4.2 – Night-time Model (Undeveloped Site) $L_{Aeq,8hr}$ Contours at 1.5m Height



The majority of the site is indicated to fall under NEC A of TAN11 at 1.5m above local ground height during the critical daytime period.

During the night-time period, the majority of the site falls under NEC A of TAN11 with the southern section of the site falling under NEC B of TAN11 at 1.5m above local ground height.

4.2 Developed Site

The proposed housing layout plan referenced in Appendix D has been used for the developed model.

Noise map models at all floor levels during the daytime and night-time period are located in figures under Appendix C.

5. EXTERNAL BUILDING FABRIC ASSESSMENT

Based on survey results and noise map models, we have carried out an external building fabric assessment with the aim of controlling noise intrusion to habitable rooms to meet 35dB $L_{Aeq,16hr}$ daytime and 30dB $L_{Aeq,8hr}$ night-time, in line with the desirable internal ambient noise values quoted in BS 8233:2014 (see section 2.4 of this report) under whole dwelling ventilation conditions..

The assessment also aims to control noise intrusion from regular events to <45dB $L_{Amax,F}$ in bedrooms during the night.

Critical façades are shown on site plan in Figure 5.1 below, marked up with **MAGENTA** lines.

Figure 5.1 – Façades Requiring Additional Sound Insulation Measures

Note: Habitable rooms include bedrooms, lounges, dining rooms and kitchen/diners but not kitchens or bathrooms.

All habitable rooms (at 3rd & 4th floor levels) on façades highlighted above require up-rated acoustic glazing, walls, roof and ventilation as specified below.

Standard thermal double glazing and trickle ventilation should be sufficient on remaining façades (not highlighted).

The analysis is based on the noise spectra quoted in Figure B.5.

5.1 External Walls

The following typical external wall construction has been used in our analysis:

- Rainscreen cladding/brick slips or render system on external frame system with mineral wool insulation and 2no 12.5mm plasterboard inner leaf.

The proposed constructions should be capable of achieving these figures as a minimum;

Table 5.1 – External Wall Sound Reduction Index Figures

Element	Description	Sound Reduction Index dB *R* (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
External Wall	Rainscreen cladding/brick slips or render system on external frame system with insulation and plasterboard inner leaf.	29	42	49	54	53

5.2 Roof

The following roof constructions have been used in our analysis;

• Flat, timber-joist roof, asphalt on boarding, 12mm plasterboard ceiling, thermal insulation

The following minimum SRI performance figures are taken from Building Regulations Part E:

Table 5.2 – Roof Sound Reduction Index Figures

Element	Description	Sound Reduction Index dB R (BS EN ISO 10140-2:2010) at Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
Roof	Flat, timber-joist roof, asphalt on boarding, 12mm plasterboard ceiling, thermal insulation	22	37	43	49	57

This is indicated sufficient for unmarked façades and those highlighted **MAGENTA.**

5.3 Glazing

The housing layout plan in Figure 5.1 shows façades where windows require up-rating. The following sound reduction index figures shall be met for glazing on these critical façades:

Table 5.3 - Glazing Sound Reduction Index Figures

Element	Description	Sound Reduction Index dB *R* (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
MAGENTA	For budgetary guidance: based on Pilkington 6mm / 6 – 16mm / 4mm	21	20	25	38	37

A typical glazing system that should be capable of achieving the quoted SRI figures (based on Pilkington test data) is included in the table for initial budgetary guidance, however;

The successful glazing suppliers shall provide independent laboratory test data to BS EN ISO 10140-5 – 2010, confirming their proposed systems (including frames/seals) meet the quoted octave band sound reduction performance figures above.

For all other façades standard thermal double-glazing is indicated to be sufficient.

5.4 Ventilation

A natural ventilation strategy utilising background ventilators and intermittent extract fans is indicated to be feasible on all plots, as specified in Building Regulations Part F, Regulation F1(1) 2010 *2022 Edition.*

> ***Natural Ventilation with background ventilators and intermittent extract fans (guidance suitable only for less airtight dwellings*).*** *Guidance on minimum provisions for intermittent extract and background ventilators is set out in Para 1.47 & 1.59 of Building Regulations Part F.*

The final proposed ventilation strategy should be confirmed acceptable with planners/ EHO and Building Control.

5.4.1 Natural Ventilation

This strategy relies on windows being closed; however, occupiers may still open windows for purge ventilation, or under normal ventilation conditions if they so choose.

The following minimum ventilator ($D_{n,e}$) performance has been used in our assessment on critical facades;

Table 5.4 – Acoustic Background Ventilator Specifications

Element	Description	Dn,e at Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
Magenta	For budgetary guidance: based on Greenwood 2500EA + 1 acoustic set	41	39	36	42	44

The calculation has allowed for a maximum of 2no acoustic background ventilators per room, required to meeting the minimum 8000mm^2 equivalent area requirement of Part F.

The successful trickle ventilator suppliers shall provide independent laboratory test data to BS EN ISO 10140-5 – 2010, confirming their proposed ventilator meet the quoted octave band performance figures above.

For all other façades standard trickle ventilation is indicated to be sufficient (min. $D_{n,e,w}+C_{tr}$ 30dB in open position).

5.4.2 Continuous Mechanical Extract Ventilation

Alternatively continuous mechanical ventilation may be provided where dwellings are not less airtight. "Less airtight" dwellings are defined in Part F as:

a. A design air permeability higher than 5m^3/(h·m^2) at 50Pa.
b. An as-built air permeability higher than 3m^3/(h·m^2) at 50Pa.

Continuous mechanical extract. *Guidance on minimum provisions for extract and whole building ventilation is set out in Para 1.61 & 1.62 of Building Regulations Part F.*

5.4.3 Mechanical Ventilation with Heat Recovery

Alternatively, a Mechanical Ventilation with Heat Recovery (MVHR) strategy could be utilised which does not require any background ventilators in the external façade.

5.4.4 Mechanical Ventilation System Noise

All mechanical ventilation systems should be designed to meet the noise criteria set out in Building Regulations Approved Document Part F, 2022 Edition – For use in Wales which states the following:

"Although there is no requirement to undertake noise testing, achieving the levels in the following guidance should ensure good acoustic conditions. The average A-weighted

sound pressure level for a ventilator operating under normal conditions and not at boost rates should not exceed both of the following.

a) 30dB LAeq,T for noise-sensitive rooms (e.g. bedrooms and living rooms) when a continuous mechanical ventilation system is running on its minimum low rate.

b) 45dB LAeq,T in less noise-sensitive rooms (e.g. kitchens and bathrooms) when a continuous operation system is running at the minimum high rate or an intermittent operation system is running."

5.4.5 General

Do not include standard background (trickle) ventilators within window frames on critical facades.

Final proposals should be confirmed with Building Control and Environmental Health prior to orders being placed.

6. OVERHEATING

Our assessment indicates that a natural ventilation strategy is indicated feasible with acoustic trickle vents to bedroom on critical facades. This is based on windows normally being closed (excluding purge ventilation).

Approved Document O (Wales) advises:

When the removing excess heat as part of the overheating strategy, noise levels in bedrooms should be kept to a minimum during the sleeping hours of 23:00 – 07:00.

There are no further criteria or guidance on internal noise levels within Building Regulations Part O in Wales and therefore guidance is sought from the Acoustics, Ventilation and Overheating Residential Design Guide (AVO Guide): 2020 prepared by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA).

It is therefore proposed to refer to the upper 42dB $L_{Aeq,8hr}$ and 65dB $L_{Amax,F}$ quoted in AVO Guide (Figure 2.1) as initial internal ambient noise criteria during overheating conditions.

The following table summarises permissible open areas for bedrooms of each plot.

Note: It is assumed that plot numbers run consecutively up the building, like for like in terms of layout at this stage.

Table 6.1 – Permissible Open Area for Bedroom Windows

Floor Level	Plot No.	Predicted $L_{Aeq,8hr}$ (dB)	Predicted $L_{Amax,F}$ (dB)	Permissable Window Open Area (m^2)
Ground	1	41	58	No restrictions
	2	41	58	No restrictions
	3	48	65	1.00
	4	48	65	1.00
	5	40	57	No restrictions
	5 (Bed 2)	42	58	No restrictions
	6	42	59	No restrictions
	7	42	58	No restrictions
	8	41	58	No restrictions
	8 (Bed 2)	41	58	No restrictions
First	9	46	62	1.58
	10	45	61	2.00
	11	45	62	2.00
	12	45	61	2.00
	13	43	60	3.16
	13 (Bed 2)	44	60	2.51
	14	45	62	2.00
	15	46	62	1.58
	16	45	62	2.00
	16 (Bed 2)	45	62	2.00
Second	17	51	67	0.50
	18	50	66	0.63
	19	47	64	1.26
	20	47	64	1.26
	21	46	62	1.58
	21 (Bed 2)	47	63	1.26
	22	48	65	1.00
	23	50	66	0.63
	24	50	67	0.63
	24 (Bed 2)	50	67	0.63
Third	25	54	70	0.25
	26	52	69	0.40
	27	49	66	0.79
	28	49	65	0.79
	29	48	64	1.00
	29 (Bed 2)	48	64	1.00
	30	50	67	0.63
	31	52	68	0.40
	32	52	69	0.40
	32 (Bed 2)	53	69	0.32
Fourth	33	54	71	0.25
	34	53	70	0.32
	35	50	67	0.63
	36	50	66	0.63
	37	49	66	0.79
	37 (Bed 2)	50	66	0.63
	38	51	67	0.50
	39	53	69	0.32
	40	53	70	0.32
	40 (Bed 2)	54	70	0.25

This should be confirmed acceptable with a suitably qualified thermal modelling engineer, however some of these external noise levels may mean that openable windows are not feasible as part of the overheating mitigation strategy to all plots.

If this is not sufficient, an alternative means of controlling overheating may be required, such as local mechanical extraction ("ventilative cooling") to affected bedrooms.

7. CONCLUSION

An environmental noise assessment has been carried out for the proposed residential development at Galliford's Yard – Phase 2, Coverack Road, Newport, NP19 0DR.

Road traffic is indicated to control the ambient noise climate day and night.

Noise surveys have been carried out across the site. Additional sample measurements were undertaken to aid calibration of a noise map model.

The noise survey indicates that daytime is the critical period (day/night difference > 5dB).

Noise map models have been generated to show noise propagation across both the undeveloped and developed sites.

An external building fabric assessment has been carried out. Critical facades requiring additional sound insulation measures have been highlighted and specifications for external wall, roof, ventilation and glazing are included.

An assessment of permissible open window areas for potential overheating control has also been included. This should be confirmed acceptable with a suitably qualified thermal modelling engineer. If this is not sufficient, an alternative means of controlling overheating may be required, such as local mechanical extraction ("ventilative cooling") to affected bedrooms.

APPENDIX A - ACOUSTIC TERMINOLOGY

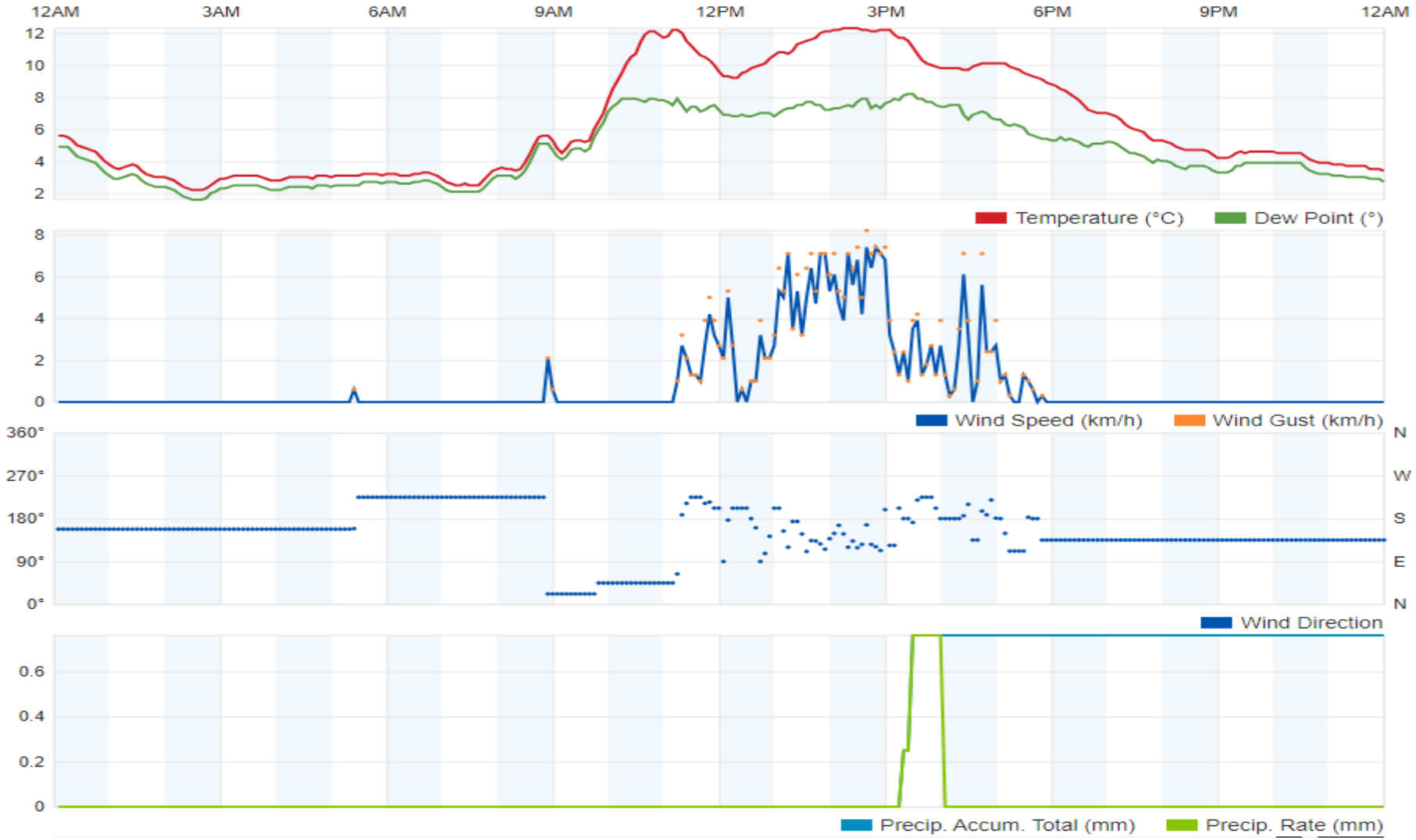
Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

dB(A)	The sound pressure level A-weighted to correspond with the frequency response of the human ear and therefore a persons' subjective response to frequency content.
L_{eq}	The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
L_{max}	The highest instantaneous sound level recorded during the measurement period.
L_{10}	The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1 hour measurement - used as a measure of background noise.
L_{90}	The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement - used as a measure of background noise.
SSR	Sound sensitive receiver

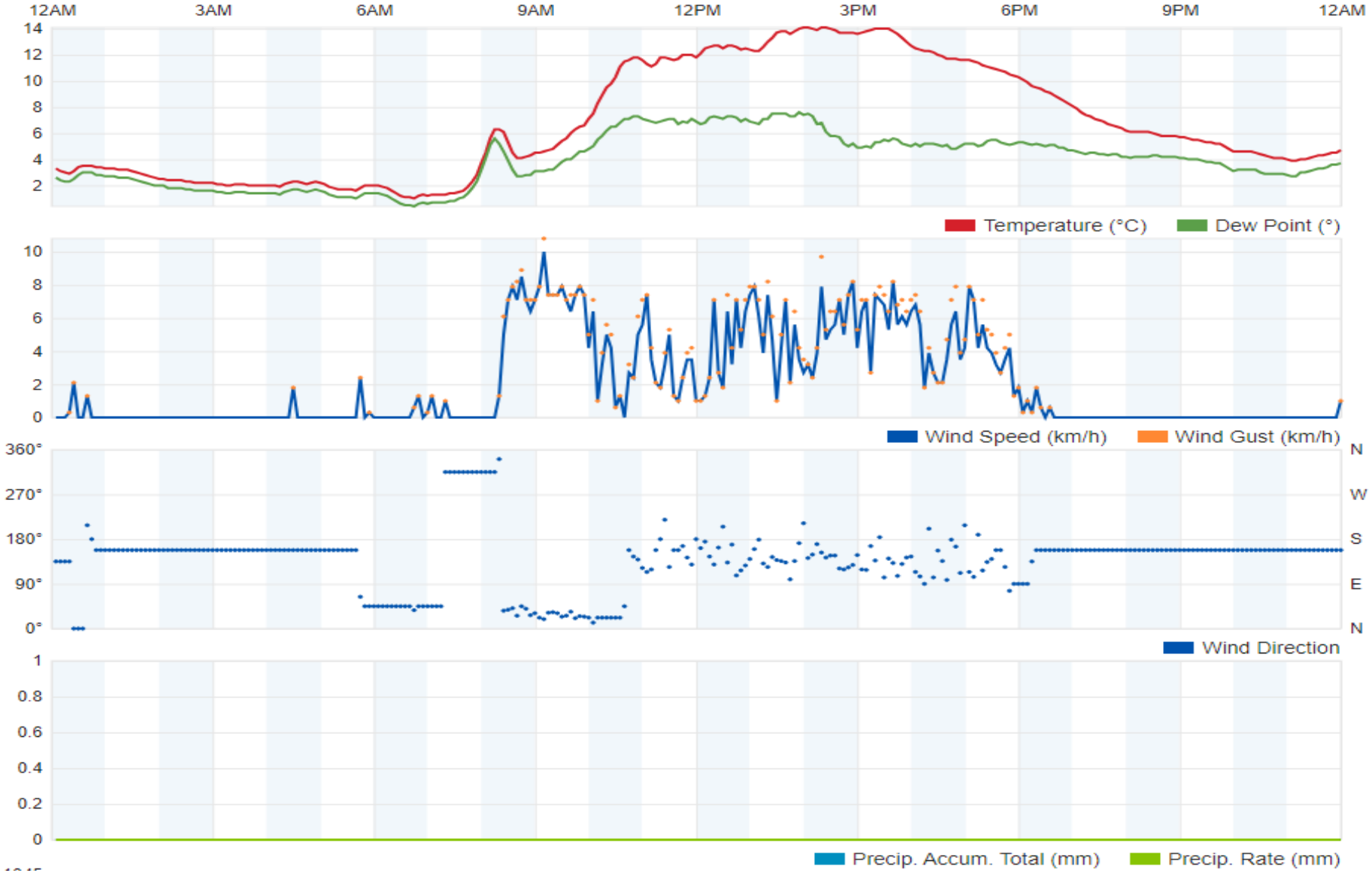
APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Tuesday, 05 March 2024



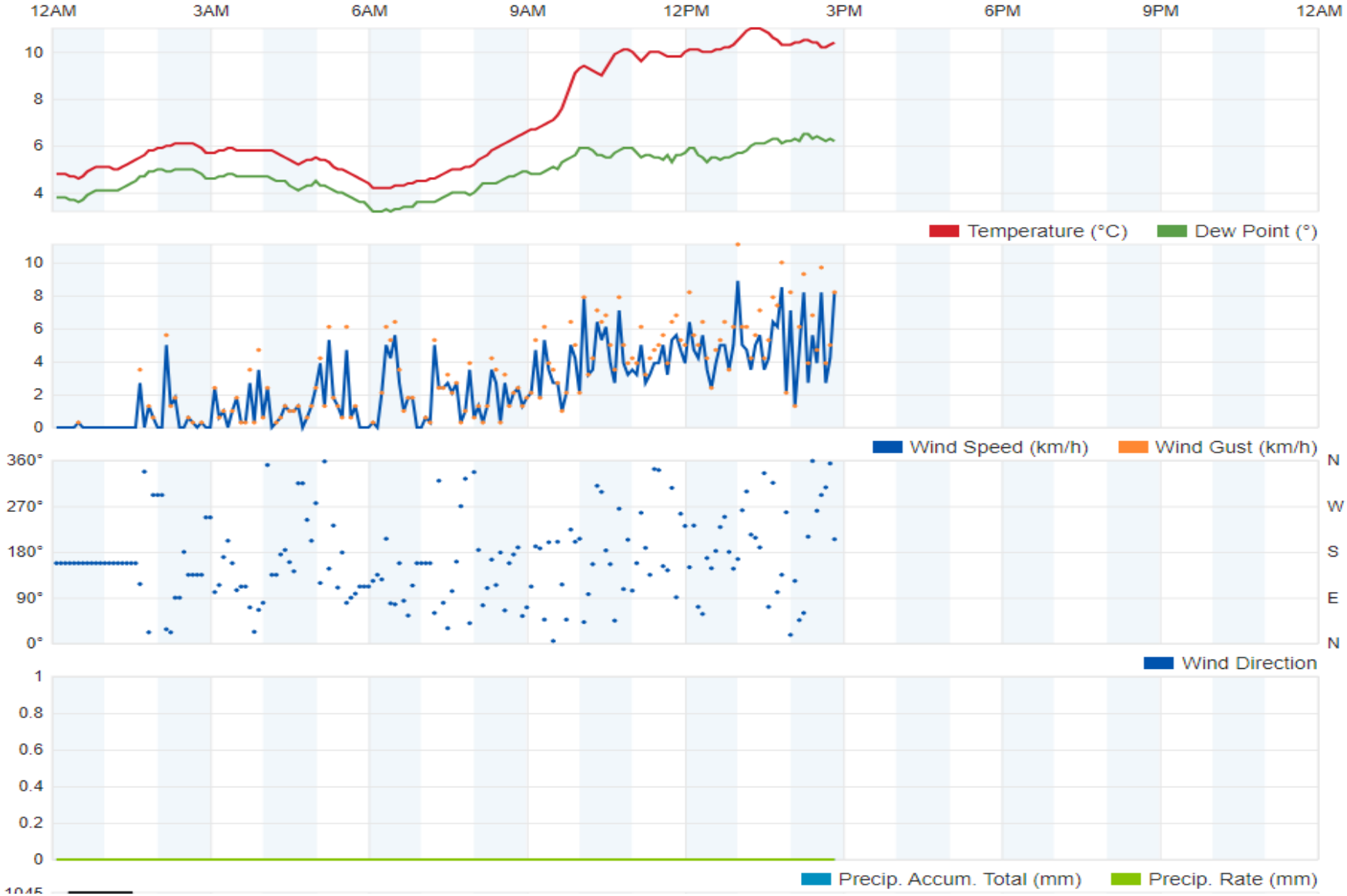
Note: Taken from www.wunderground.com - weather station INEWPO60 located in Newport [Elev 9 m, 51.59 °N, 2.97 °W]

Figure B.2 – Approximate Weather History for Wednesday, 06 March 2024



Note: Taken from www.wunderground.com - weather station INEWPO60 located in Newport [Elev 9 m, 51.59 °N, 2.97 °W]

Figure B.3 – Approximate Weather History for Thursday, 07 March 2024



Note: Taken from www.wunderground.com - weather station INEWPO60 located in Newport [Elev 9 m, 51.59 °N, 2.97 °W]

Figure B.4 – Time History at Position A (Tuesday, 05 March 2024 to Thursday, 07 March 2024)

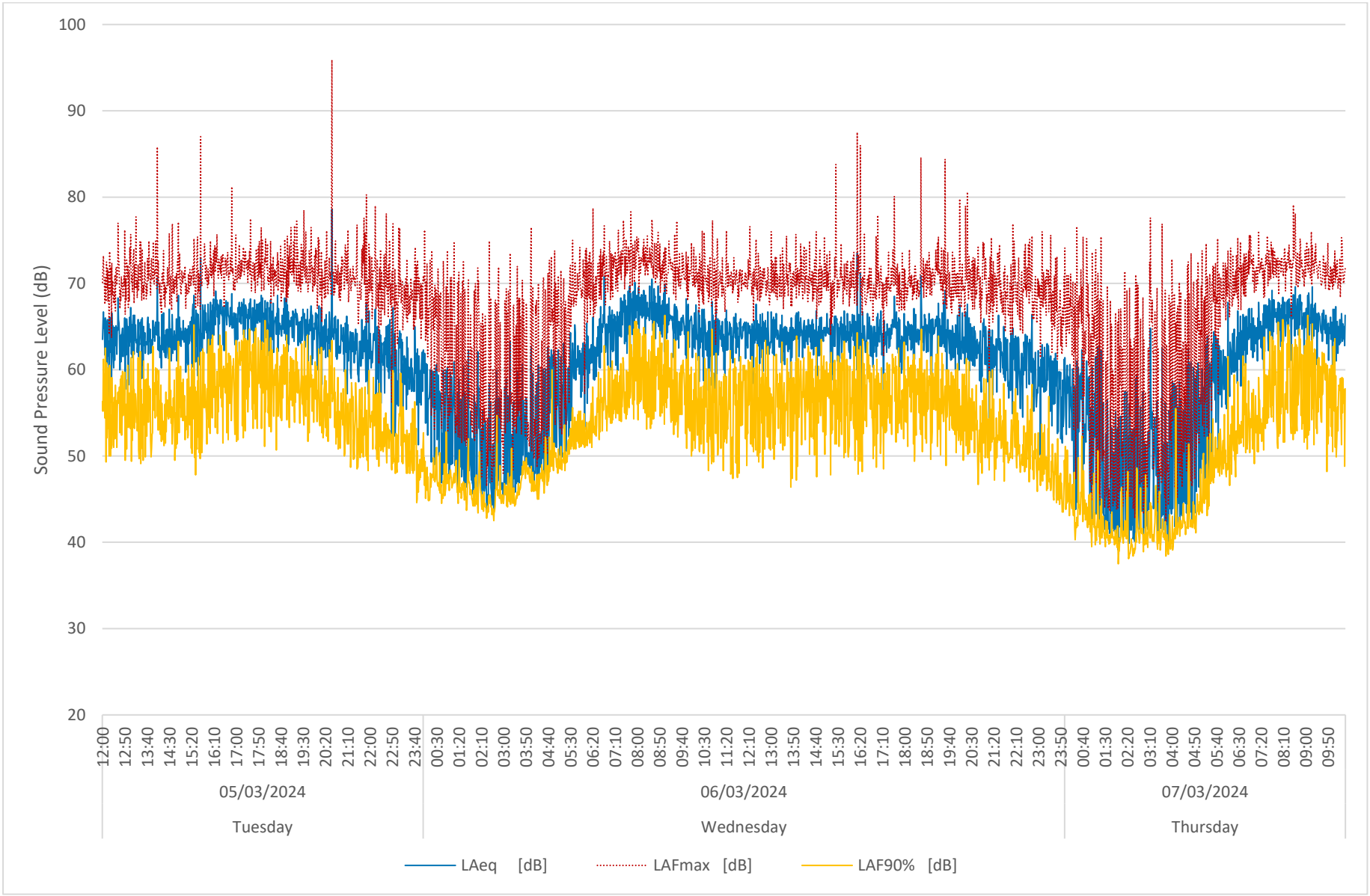
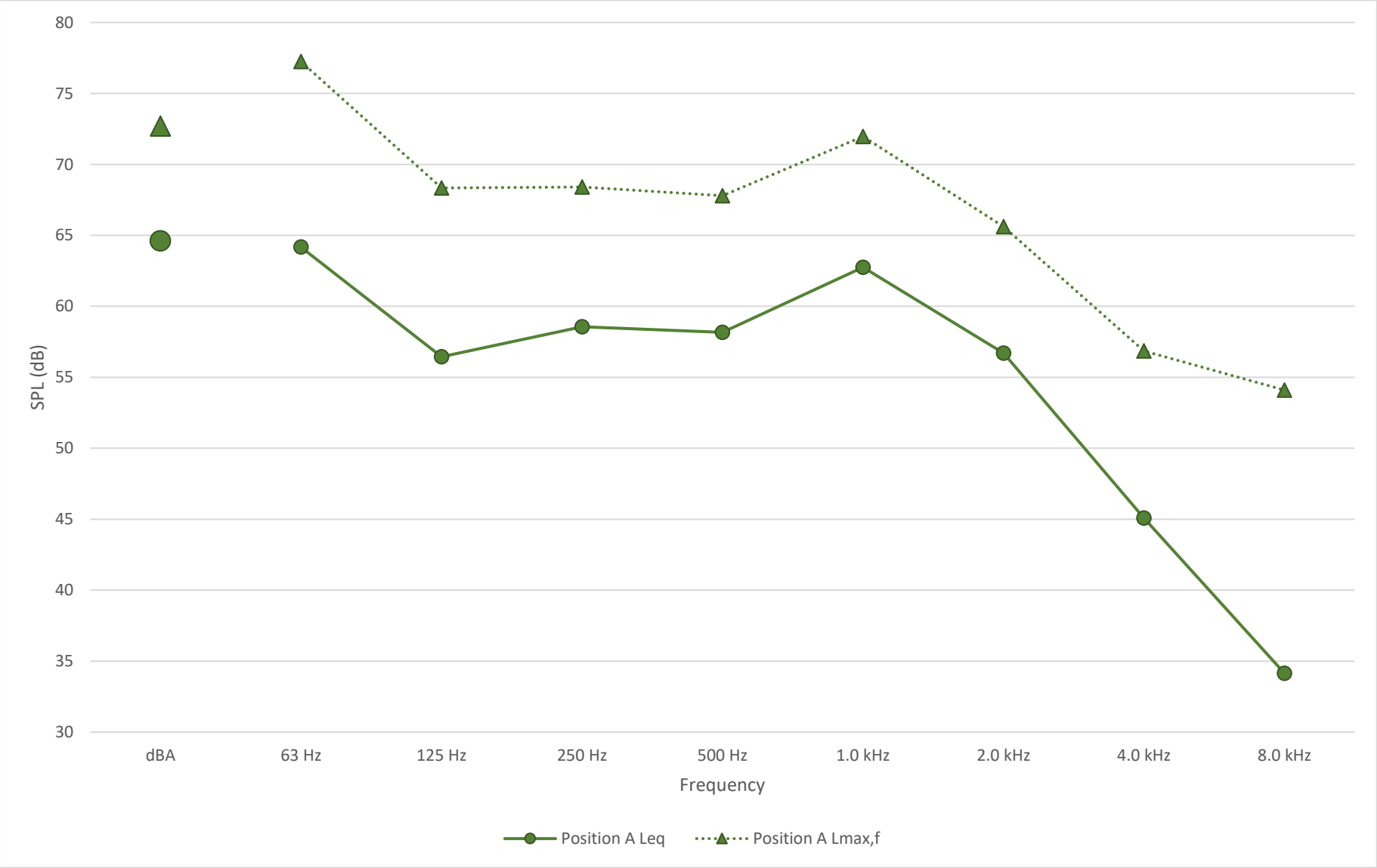


Figure B.5 – L_{eq} and $L_{max,F}$ Octave Band Spectra Measured at Position A (Wednesday, 06 March 2024)



APPENDIX C - NOISE MAP MODELS

Figure C.1 – Daytime Noise Map (Undeveloped Site) $L_{Aeq,16hr}$ Contours at 1.5m Height

Figure C.2 – Night-time Noise Map (Undeveloped Site) $L_{Aeq,8hr}$ Contours at 1.5m Height

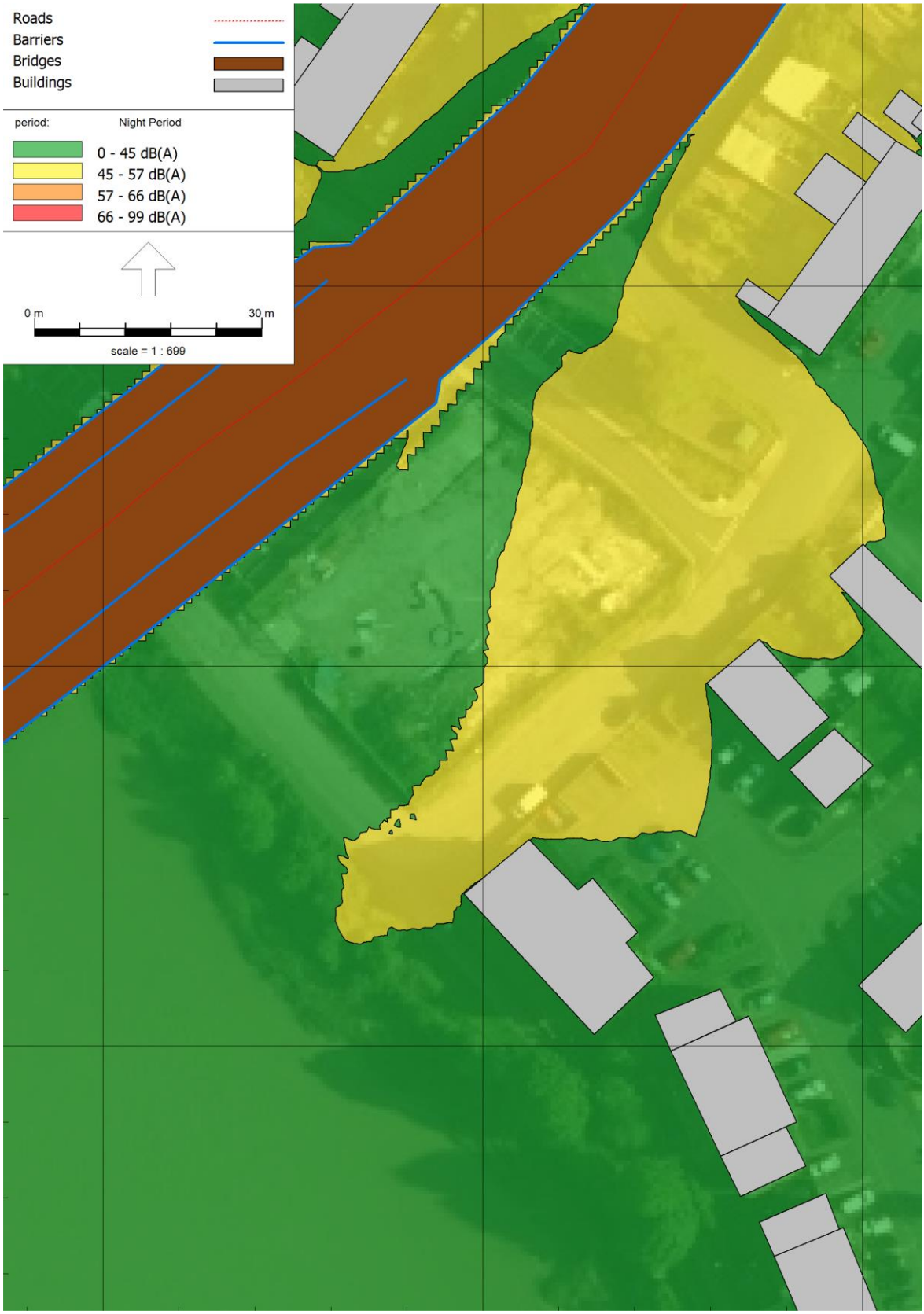


Figure C.3 – Daytime Noise Map (Developed Site) $L_{Aeq,16hr}$ Contours at 1.5m Height

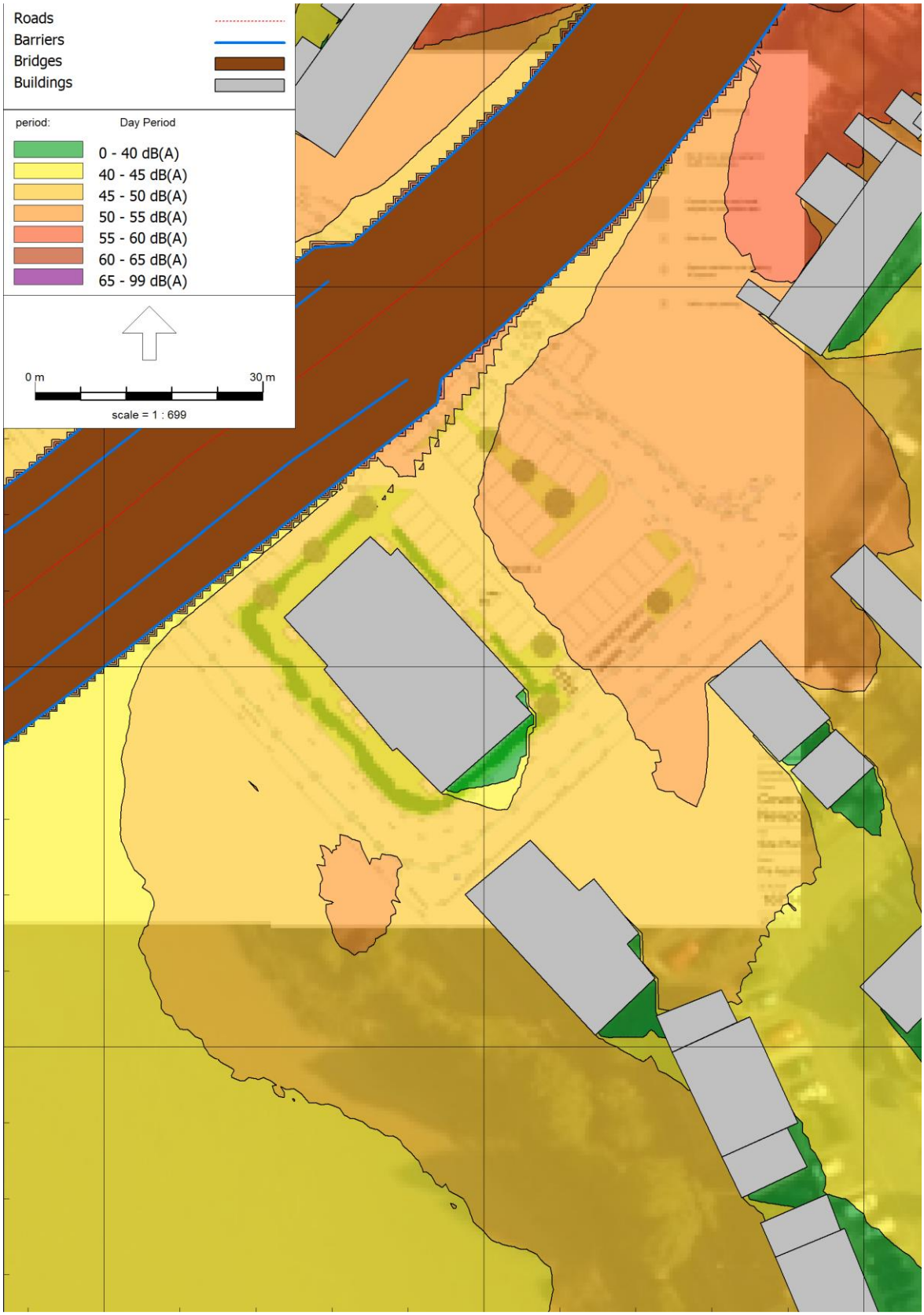


Figure C.4 – Night-time Noise Map (Developed Site) $L_{Aeq,8hr}$ Contours at 1.5m Height

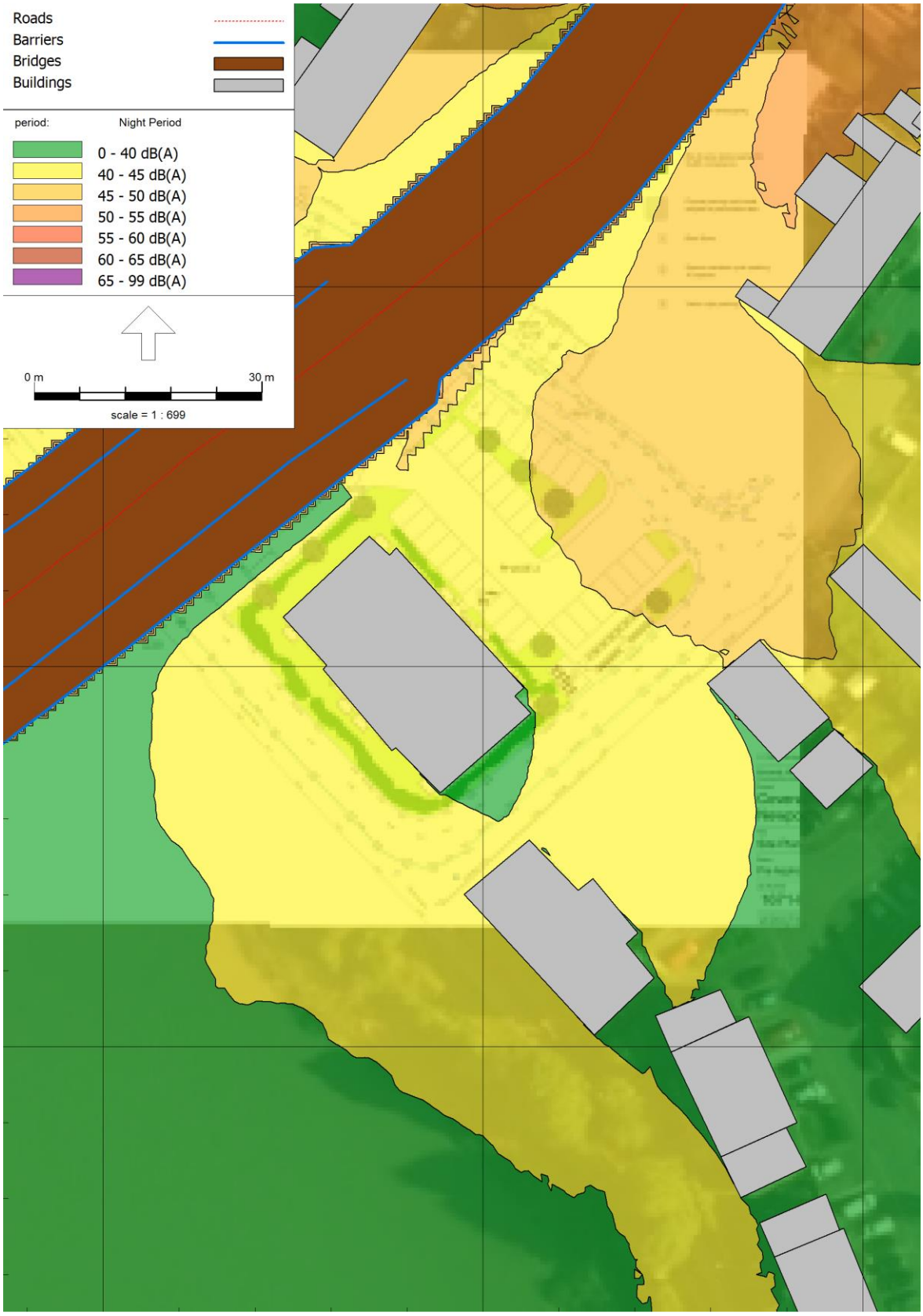


Figure C.5 – Daytime Noise Map (Developed Site) $L_{Aeq,16hr}$ Contours at 4.5m Height

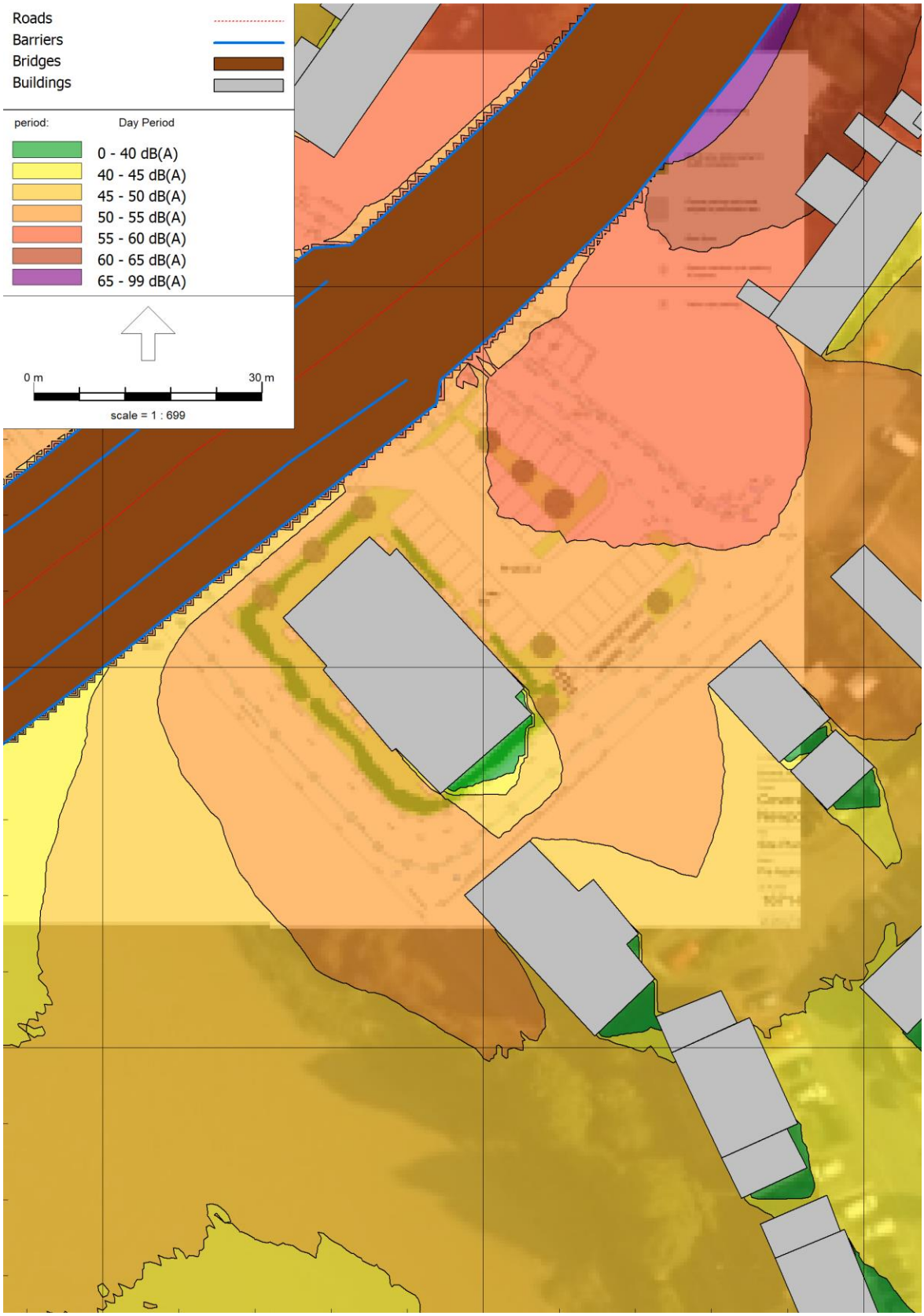


Figure C.6 – Night-time Noise Map (Developed Site) $L_{Aeq,8hr}$ Contours at 4.5m Height

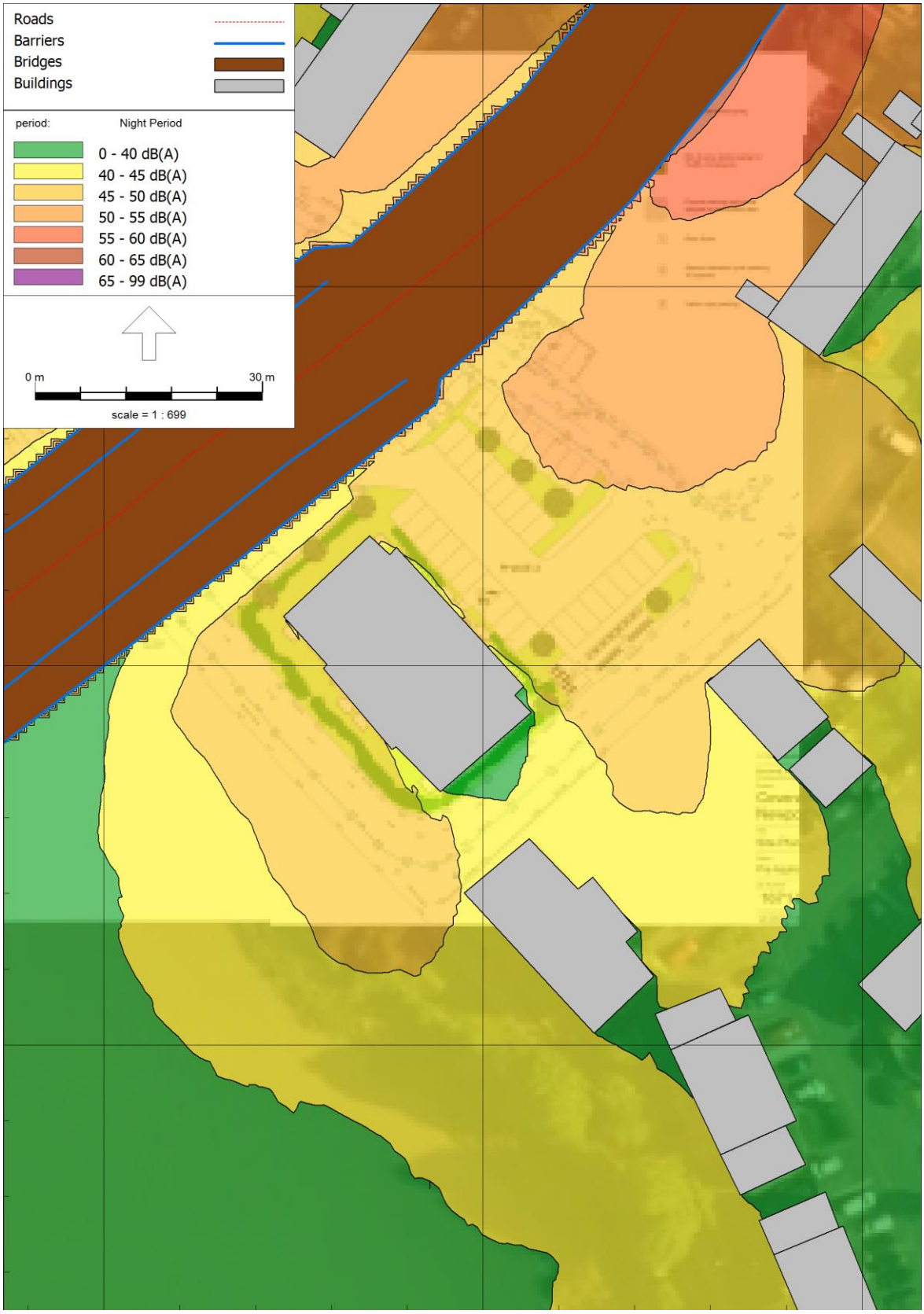


Figure C.7 – Daytime Noise Map (Developed Site) $L_{Aeq,16hr}$ Contours at 7.5m Height

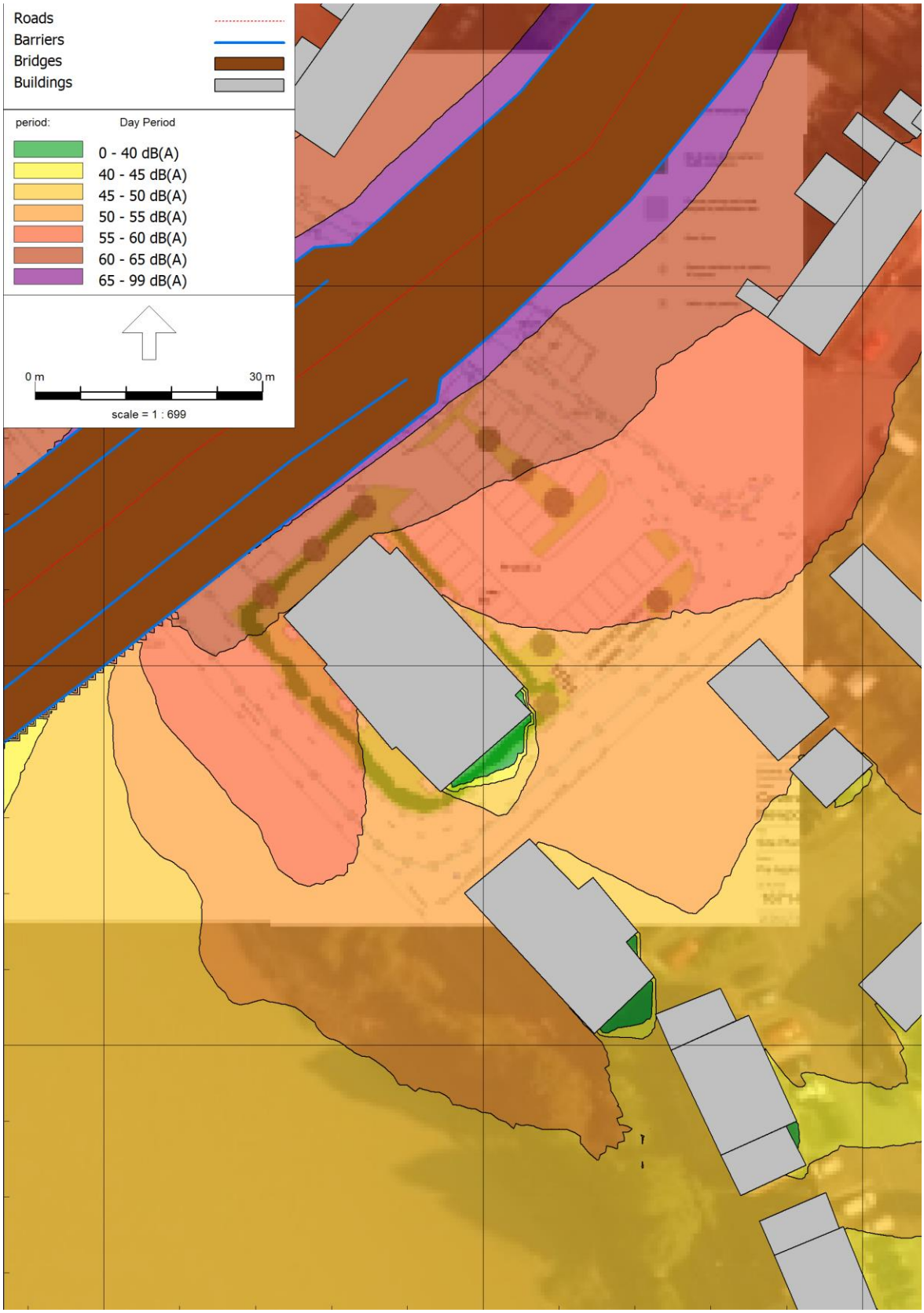


Figure C.8 – Night-time Noise Map (Developed Site) $L_{Aeq,8hr}$ Contours at 7.5m Height

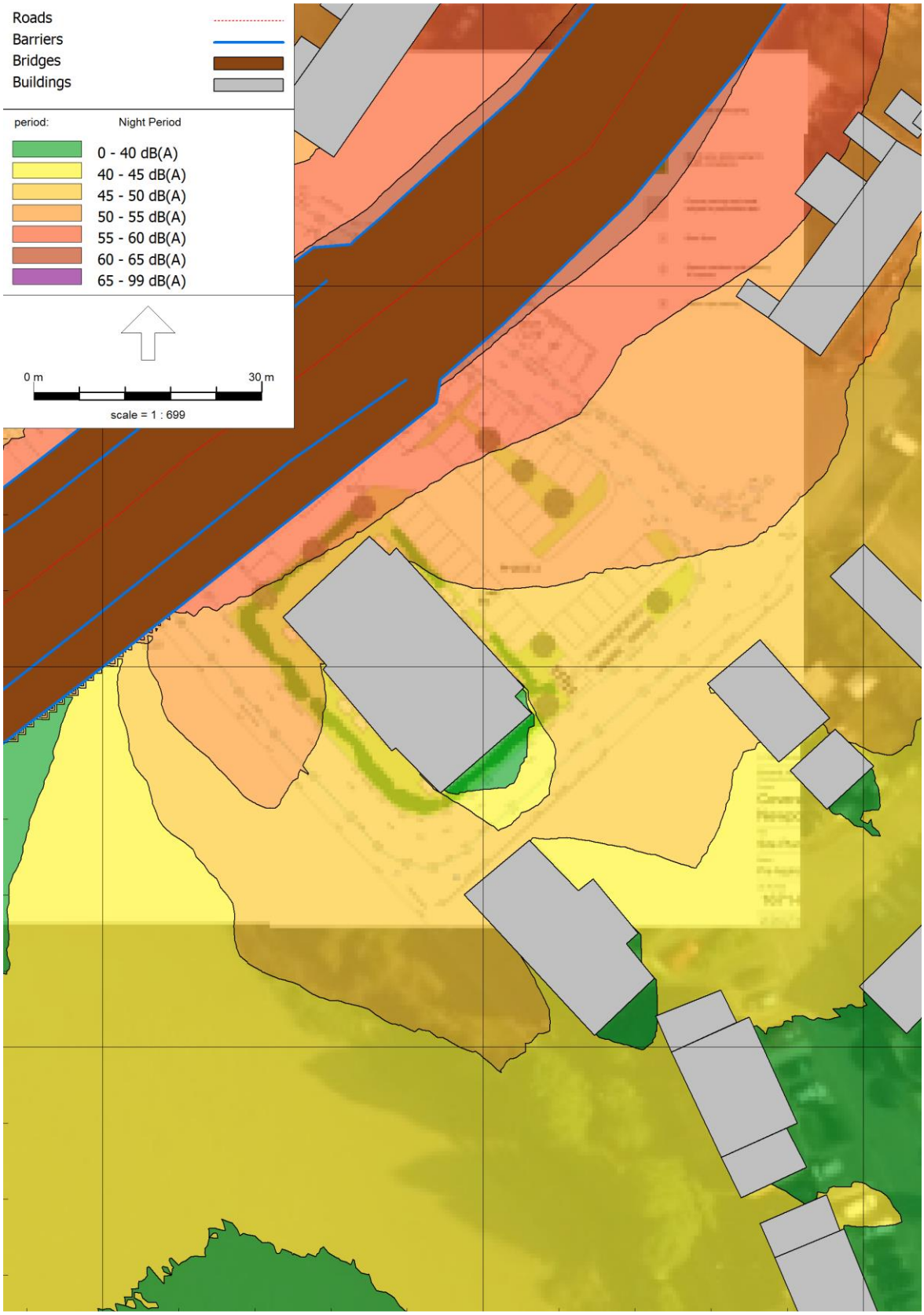


Figure C.9 – Daytime Noise Map (Developed Site) $L_{Aeq,16hr}$ Contours at 10.5m Height

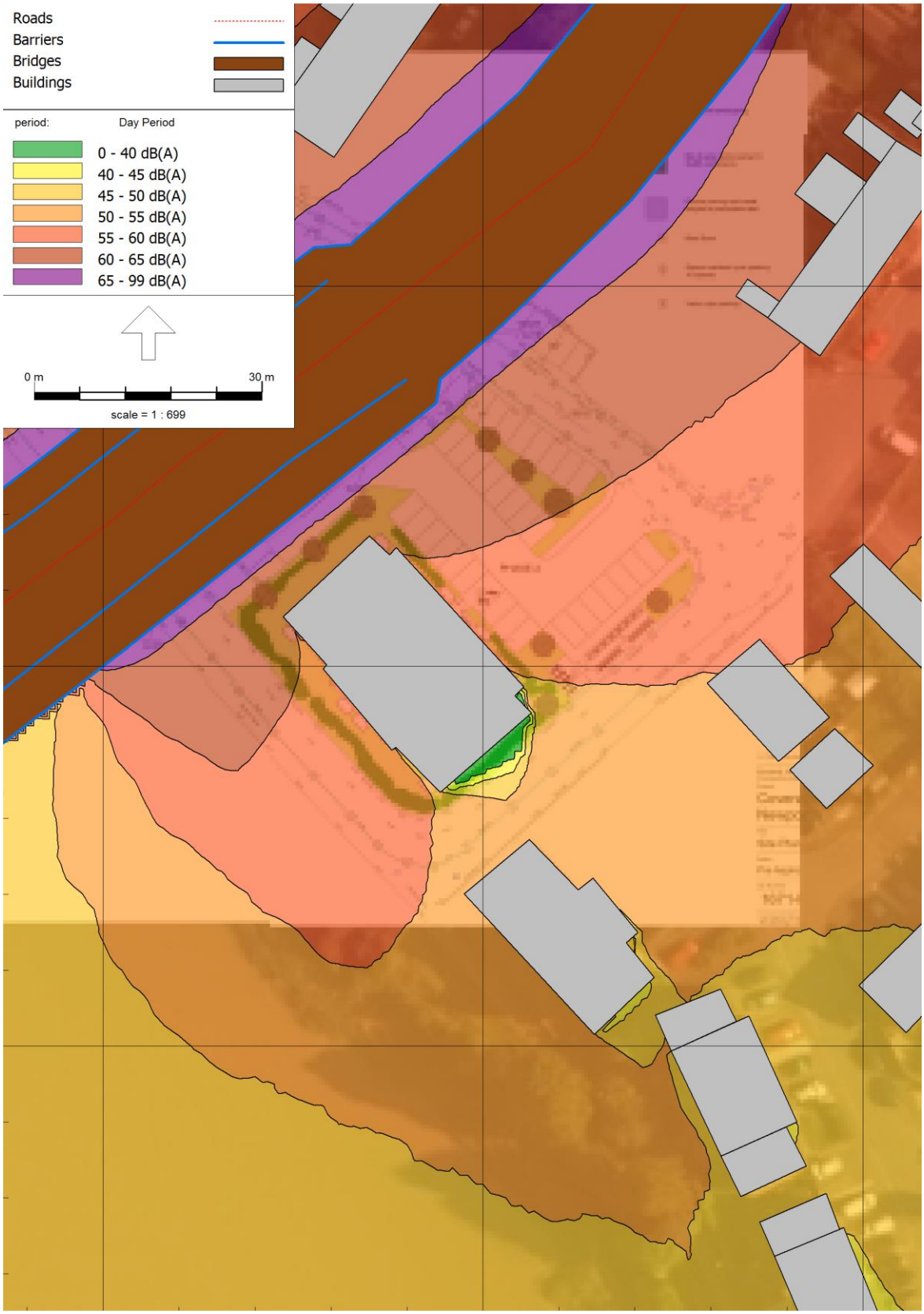


Figure C.10 – Night-time Noise Map (Developed Site) $L_{Aeq,8hr}$ Contours at 10.5m Height

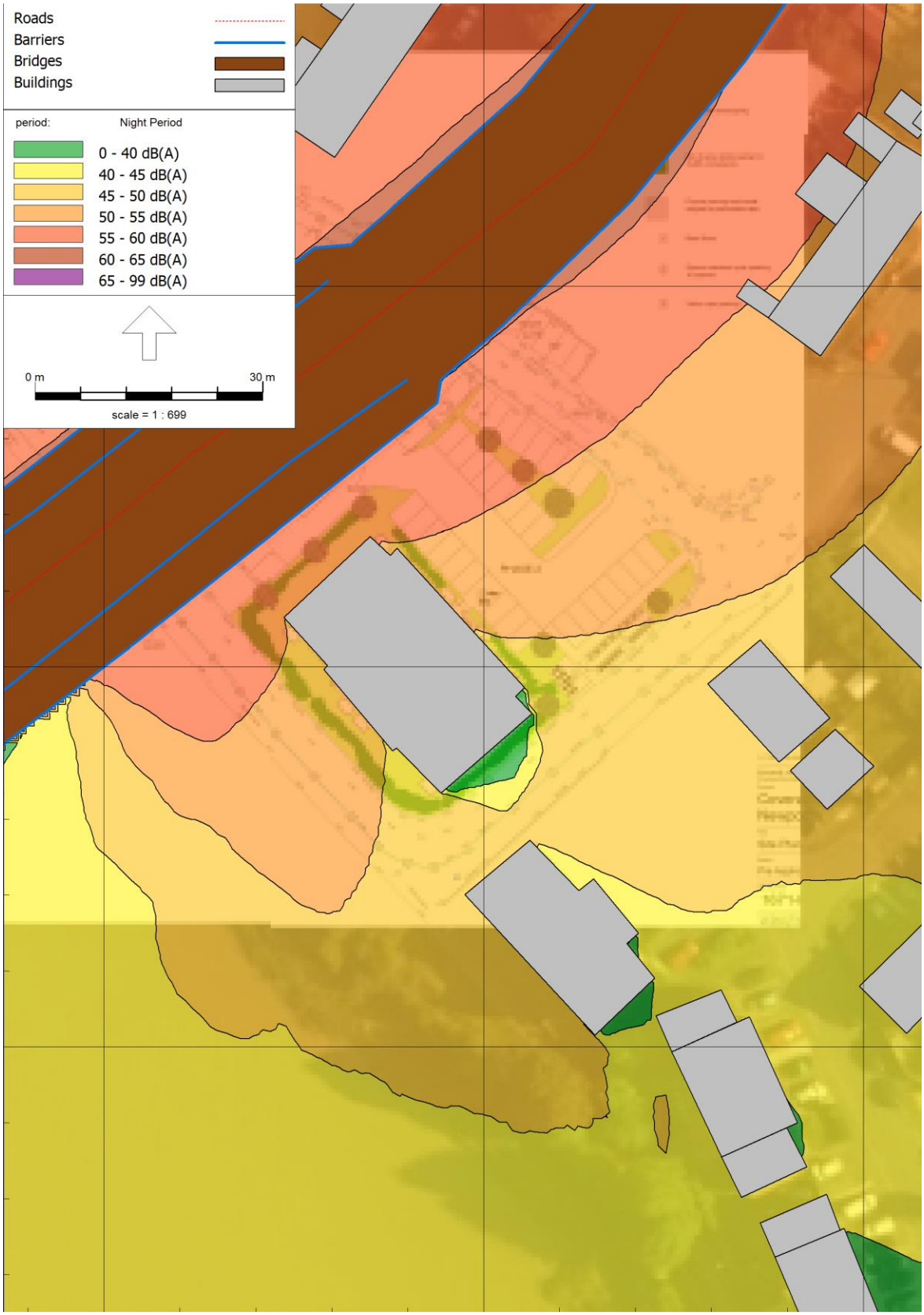


Figure C.11 – Daytime Noise Map (Developed Site) $L_{Aeq,16hr}$ Contours at 13.5m Height

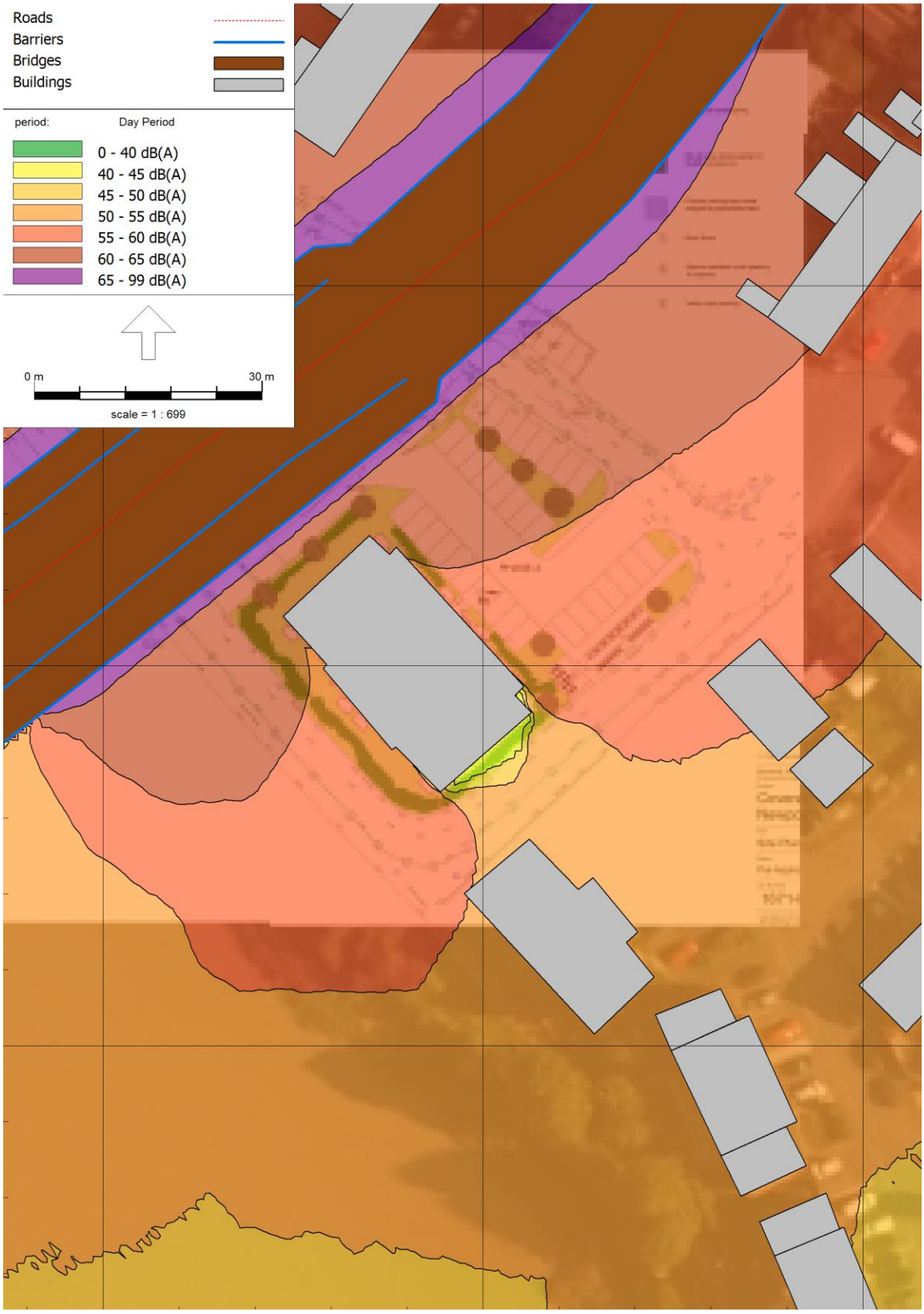
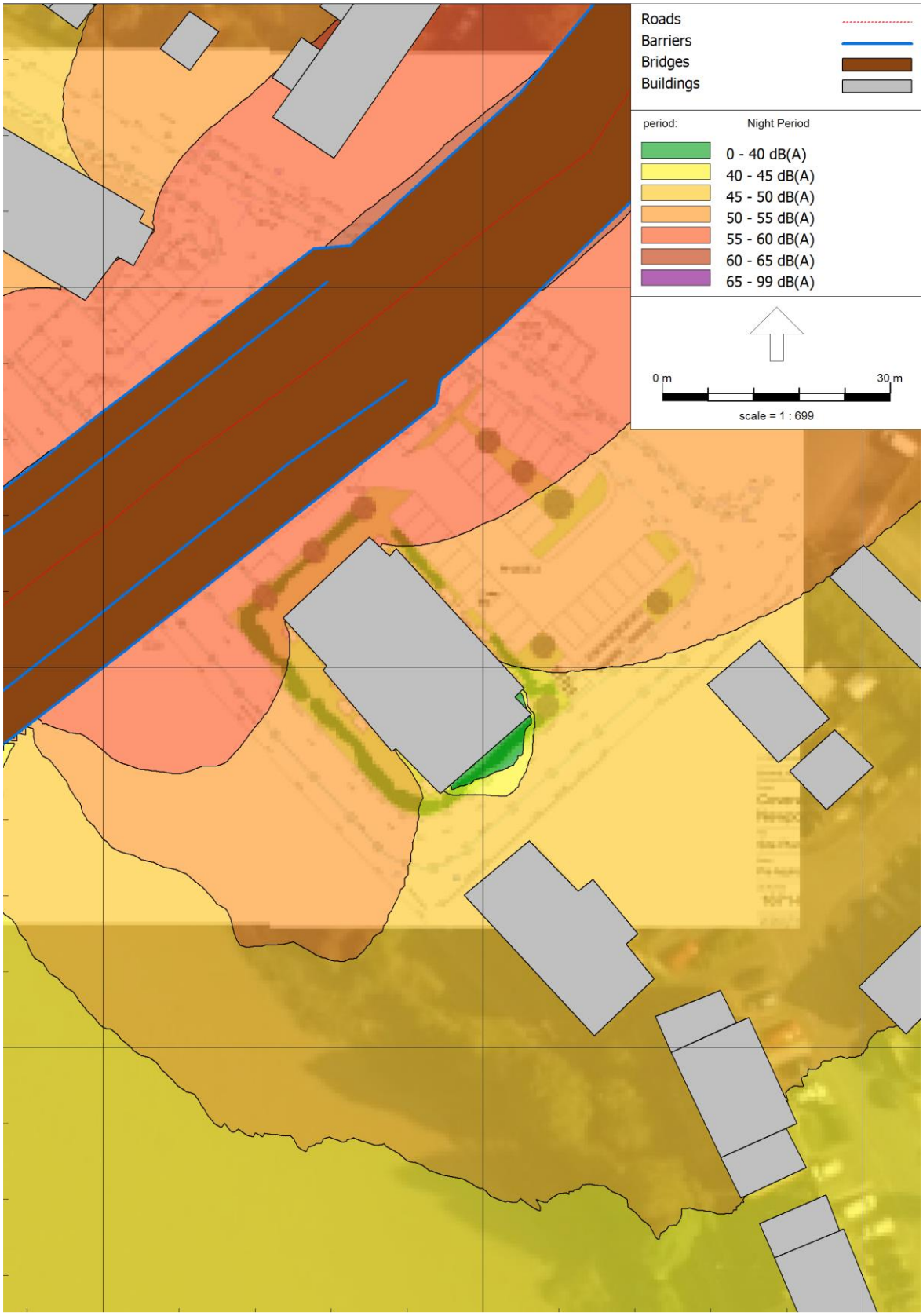


Figure C.12 – Night-time Noise Map (Developed Site) $L_{Aeq,8hr}$ Contours at 13.5m Height



APPENDIX D - DRAWING LISTS

The following Kennedy James Griffiths drawings and documents have been used in our assessment:

Table D.1 – Drawing List

Drawing Title	Drawing Number	Rev	Date
Site Plan : Option 1	1671-PA-1-02	A	14/12/2023
Ground Floor Plans	1671-PA-03	A	10/10/2023
Upper Floor Plans	1671-PA-04	A	10/10/2023
Elevations	1671-PA-05	-	04/01/2024
Context Elevation	1671-PA-06	-	09/01/2024