

Phase 5, Littlehampton

Noise Assessment

784-B028030



April 2021

Prepared on Behalf of Persimmon Homes



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1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report presents the findings of a road traffic noise assessment in support of a planning application for a proposed residential development at Phase 5, Littlehampton. This assessment considers the effects of road traffic noise upon proposed receptors directly adjacent to the proposed link road through the site in relation to both internal and external noise levels.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the effects of noise. The noise levels across the site have been predicted at proposed receptors using CADNA noise modelling software, which incorporates ISO 9613 and CRTN methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and a set of location plans, noise contour plots relevant to the assessment are presented throughout the document.

1.2 LEGISLATIVE CONTEXT

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in NPPF, published on 19th February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

“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*

A further 2 short statements are presented at paragraph 180, which state:

“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*

- 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.*"

Furthermore, paragraphs 182 and 183 state:

"182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to *'identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.'*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, 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.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The NPPF, NPSE and NPPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents, Section 2.0 presents the noise level criteria used as a basis of this assessment.

The NPPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

1.3 ACOUSTIC CONSULTANTS' QUALIFICATIONS, PROFESSIONAL MEMBERSHIPS

The lead acoustic consultant for this assessment is Emma Aspinall; the report has been verified by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

Table 1.2 Acoustic Consultants' Qualifications & Experience

Name	Education	Institute of Acoustics Post Graduate Diploma in Acoustic and Noise Control (Pass Date)	Experience In Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Emma Aspinall	MGeol (2017)	Dec (2020)	Jul (2017)	Jan (2021)	-
Graham Davis	BA (2008)	Nov (2013)	Sep (2011)	Jan (2014)	-
Nigel Mann	BSc (1997) Msc (1999)	Nov (2001)	Nov (1998)	Nov (2001)	Jul (2005)

2.0 ASSESSMENT CRITERIA

2.1 NOISE ASSESSMENT CRITERIA

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from the following standards and design guidance:

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

World Health Organisation (1999): *Guidelines on Community Noise*

Table 2.1 Noise Level Criteria and Actions

Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Noise levels below: Bedrooms – 30 dB $L_{Aeq,8hours}$ Living Rooms – 35 dB $L_{Aeq,16hours}$ External Amenity Space – 50 dB $L_{Aeq,16hours}$	No Action Required Within BS8233 Criteria
Lowest Observed Adverse Effect Level	Noise levels exceed: Bedrooms – 30 dB $L_{Aeq,8hours}$ Living Rooms – 35 dB $L_{Aeq,16hours}$ External Amenity Space – 50 dB $L_{Aeq,16hours}$	Mitigate to achieve: <i>Bedrooms – 30 dB $L_{Aeq,8hours}$</i> <i>Living Rooms – 35 dB $L_{Aeq,16hours}$</i> <i>External Amenity Space – 50 dB $L_{Aeq,16hours}$</i>
Significant Observed Adverse Effect	Noise levels exceed: Bedrooms – 35 dB $L_{Aeq,8hours}$ Living Rooms – 40 dB $L_{Aeq,16hours}$ External Amenity Space – 55 dB $L_{Aeq,16hours}$	Mitigate to achieve: <i>Bedrooms – 30 dB $L_{Aeq,8hours}$</i> <i>Living Rooms – 35 dB $L_{Aeq,16hours}$</i> <i>External Amenity Space – 55 dB $L_{Aeq,16hours}$</i>
Unacceptable Observed Adverse Effect	Noise levels with mitigation exceed: Bedrooms – 35 dB $L_{Aeq,8hours}$ Living Rooms – 40 dB $L_{Aeq,16hours}$ External Amenity Space – 60 dB $L_{Aeq,16hours}$	Prevent

3.0 ASSESSMENT METHODOLOGY

3.1 NOISE MODELLING METHODOLOGY

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically.

The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Building heights – around site	Tetra Tech Observations	8 m height for two storey residential properties, and 4 m for Bungalows. 3m per storey for multi-storey developments.
Barrier heights	Tetra Tech Observations	All existing barriers at 1.8 m with the exception of hedges and trees which are considered to offer no noise protection. Balcony screens at 1.3m high and garden fences at 1.8m high.
Receptor positions	Tetra Tech	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties. 1.5 m height for model grid and monitoring locations for validation.
Plans	Persimmon	Drawing Title: Site Layout – Information Parcels D1 & E1 Drawing No.: 546_PL_100a Dated: Jan 2021

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst-case.

3.2 MODEL INPUT DATA

3.2.1 Traffic Noise Data

For the purposes of the assessment, road traffic flows have been based upon traffic data for the proposed link road through the site from outline planning application reference LU/47/11, provided by Mayer Brown, and detailed in Table 3.2 below.

Table 3.2 Traffic Data

Road	18hr AAWT	Speed (mph)
Development Link Road East	7882	20

A correction has been made to convert the predicted 18 hour L_{A10} traffic noise levels to 16 hour daytime L_{Aeq} (07:00-23:00) and 8hr night-time L_{Aeq} (23:00-07:00) noise levels using the following formula, as provided within PPG 24:

- Daytime L_{Aeq}

$$L_{Aeq}(16\text{hour}) = L_{A10}(18\text{hour}) - 2\text{dB}$$

- Night-time L_{Aeq}

$$L_{Aeq}(8\text{hour}) = 0.90L_{A10}(18\text{hour}) - 3.77\text{dB}$$

3.3 SENSITIVE RECEPTORS

Existing noise levels have been assessed at a selection of worst-case properties, directly adjacent to the link road through the site. Additionally, proposed balcony spaces within apartment blocks and proposed garden spaces adjacent to the link road have also been assessed. The details are presented in Table 3.3-3.5. The locations of the proposed receptors are shown on Figure 3.2 below with external balcony and garden areas shown on Figure 3.3-3.4.

Table 3.3 Proposed Sensitive Receptors

Ref.	Description	Approximate Distance to Road (m)
R01	West of Site – South Façade	8.0
R02	West of Site – North Façade	8.0
R03	West of Site – North Façade	7.5
R04	Centre of Site – South Façade	7.5
R05	Centre of Site – East Façade	9.5
R06	Centre of Site – South Façade	6.5
R07	East of Site – South Façade	6.5
R08	East of Site – North Façade	7.0
R09	East of Site – Southeast Façade	42.5
R10	East of Site – Northeast Façade	37.0
R11	South of Site – Southeast Façade	7.5
R12	South of Site – Southeast Façade	7.0
R13	South of Site – Southeast Façade	13.5
R14	South of Site – Southwest Façade	17.5

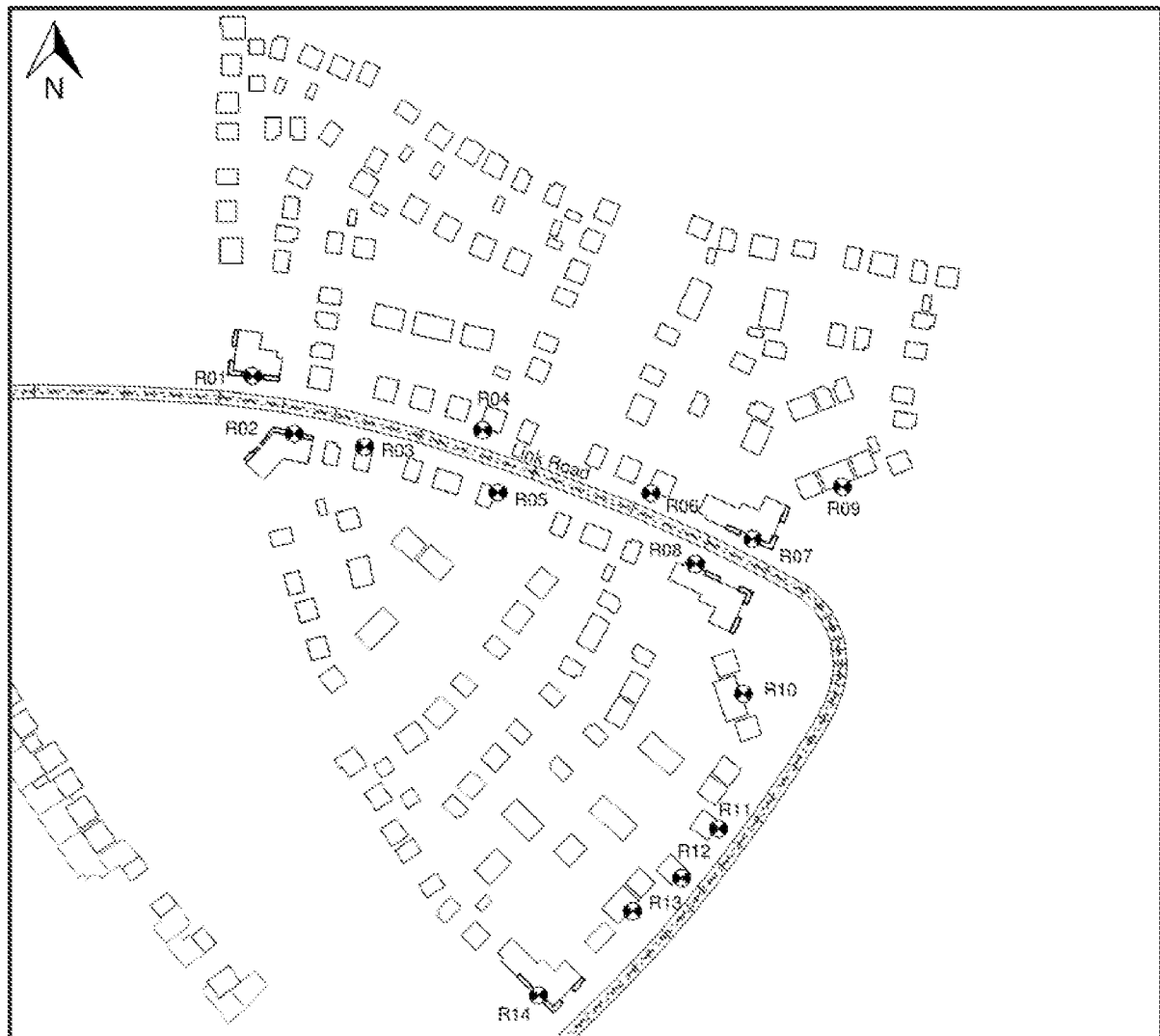
Table 3.4 Proposed Balcony Receptors

Ref.	Description	Approximate Distance to Road (m)
G01	Western Apartment Block – South Façade	8.0
G02	Western Apartment Block – South Façade	8.0
G03	Western Apartment Block – West Façade	20.0
G04	Western Apartment Block – Northwest Façade	20.0
G05	Western Apartment Block – North Façade	8.0
G06	Western Apartment Block – North Façade	8.0
G07	Eastern Apartment Block – South Façade	6.5
G08	Eastern Apartment Block – South Façade	7.0
G09	Eastern Apartment Block – East Façade	20.0
G10	Eastern Apartment Block – North Façade	9.0
G11	Eastern Apartment Block – North Façade	8.5
G12	Eastern Apartment Block – East Façade	23.0
G13	Southern Apartment Block – Southeast Façade	9.5
G14	Southern Apartment Block – Southwest Façade	9.5
G15	Southern Apartment Block – Southwest Façade	26.5

Table 3.5 Proposed Garden Receptors

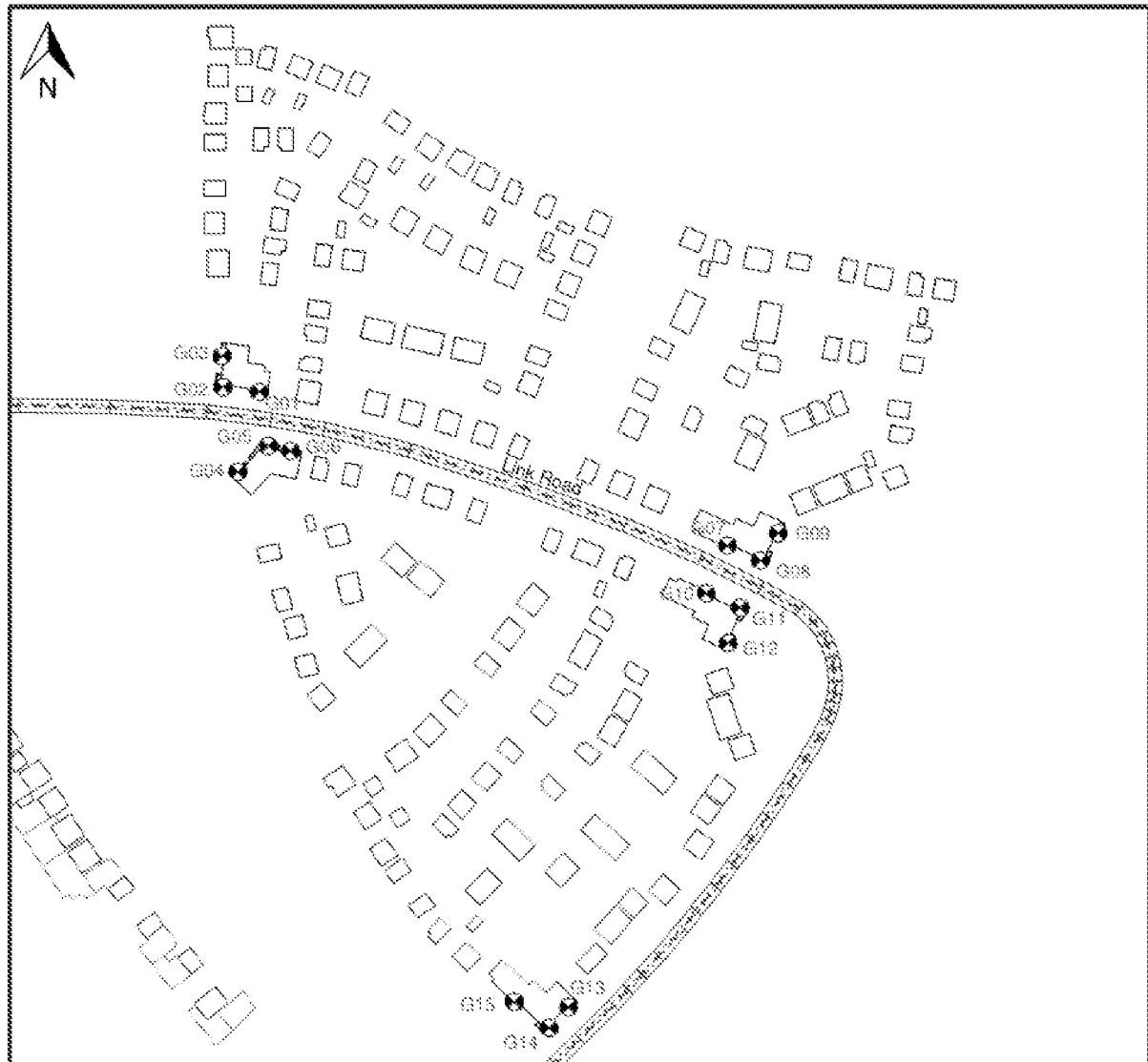
Ref.	Description	Approximate Distance to Road (m)
A01	West of Site	10.0
A02	West of Site	21.0
A03	West of Site	22.0
A04	West of Site	22.0
A05	Centre of Site	22.0
A06	Centre of Site	22.0
A07	Centre of Site	22.5
A08	East of Site	20.0
A09	East of Site	23.0
A10	South of Site	30.0
A11	South of Site	52.5

Figure 3.2 Proposed Sensitive Receptor Locations



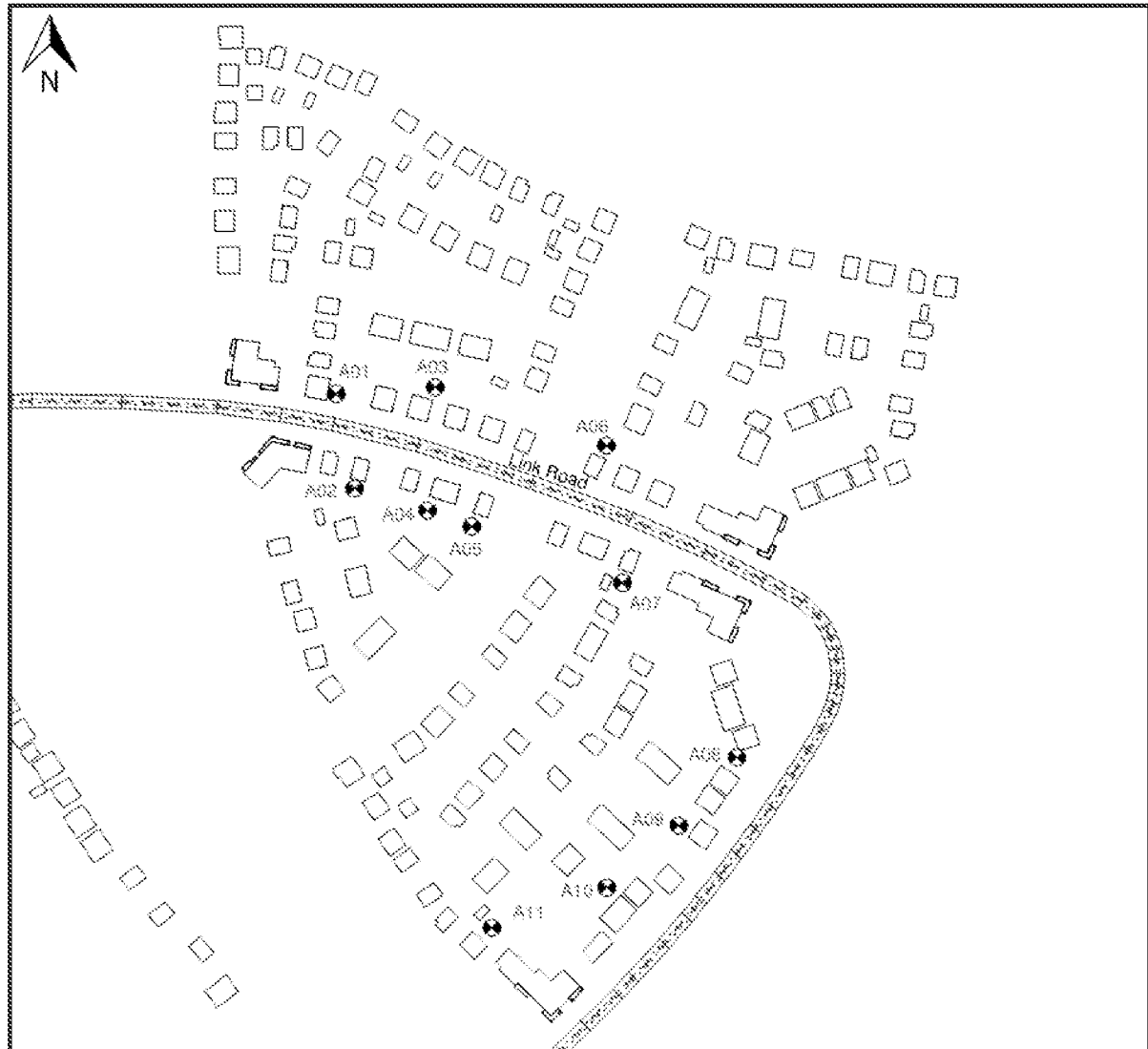
Not to scale
OS Licence No. AL553611

Figure 3.3 Proposed Balcony Receptor Locations – Apartment Blocks



Not to scale
OS Licence No. AL553611

Figure 3.4 Proposed Garden Receptor Locations



Not to scale
OS Licence No. AL553611

4.0 ASSESSMENT OF KEY EFFECTS

4.1 NOISE INTRUSION ASSESSMENT

Noise from the existing ambient noise climate have been assessed with respect to the proposed residential dwellings. Internal noise levels within the proposed dwellings have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of glazing with specification $R_w + C_{tr}$ 30 dB (e.g 6/12/6mm double glazing or equivalent) has been used.

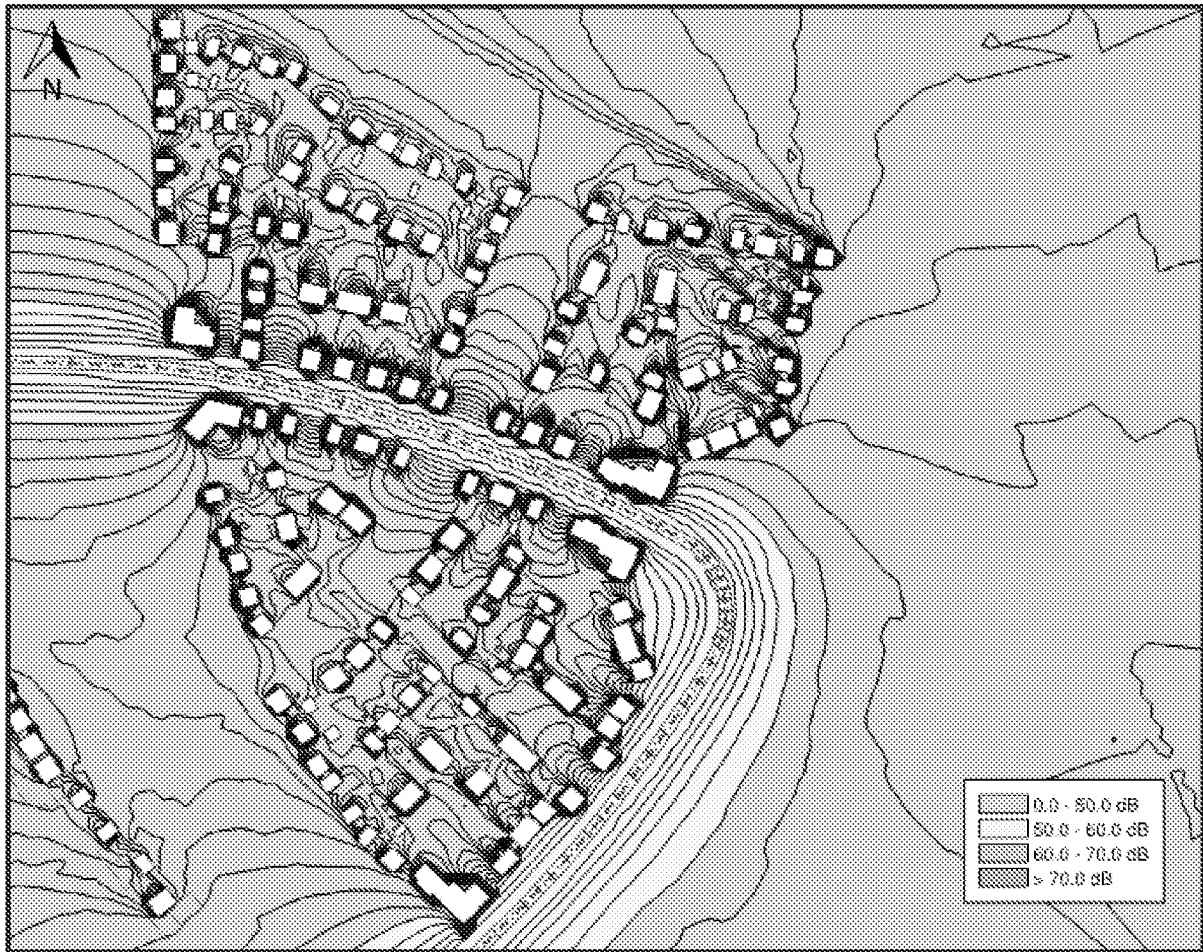
The results presented in Table B1-B2 within Appendix B show the predicted noise intrusion levels at properties adjacent to the link road. The recommended WHO/BS 8233 internal noise levels are generally met across the site during the daytime and night-time, assuming a windows-closed scenario however certain façades are predicted to exceed the relevant criteria with windows open. Figure 4.1 and 4.2 illustratively show the daytime and night-time L_{Aeq} noise levels across the development site.

Figure 4.1 Proposed Daytime $L_{Aeq,16hr}$ Noise Contour Plot (Grid Height: 1.5m)



Not to scale
OS Licence No. AL553611

Figure 4.2 Proposed Night-time $L_{Aeq,8hr}$ Noise Contour Plot (Grid Height: 4.0m)



Not to scale
OS Licence No. AL553611

In order to achieve the recommended internal noise criteria, a range of mitigation measures are outlined in Section 5.1 of this report.

4.2 EXTERNAL AMENITY SPACE ASSESSMENT

Daytime noise levels within balcony spaces of adjacent apartment blocks and garden spaces have been assessed in Table B3-B4 of Appendix B. The balcony spaces include the presence of a 1.3m high solid screening whilst garden spaces include the beneficial effects of 1.8m high garden fences.

The results presented in Table B3 show that daytime L_{Aeq} noise levels within private balcony spaces are not predicted to exceed the upper BS 8233 guideline value (55dB). The results in Table B4 show that daytime L_{Aeq} noise levels within garden spaces are not predicted to exceed the lower BS 8233 guideline value (50dB) at the receptors across the development site.

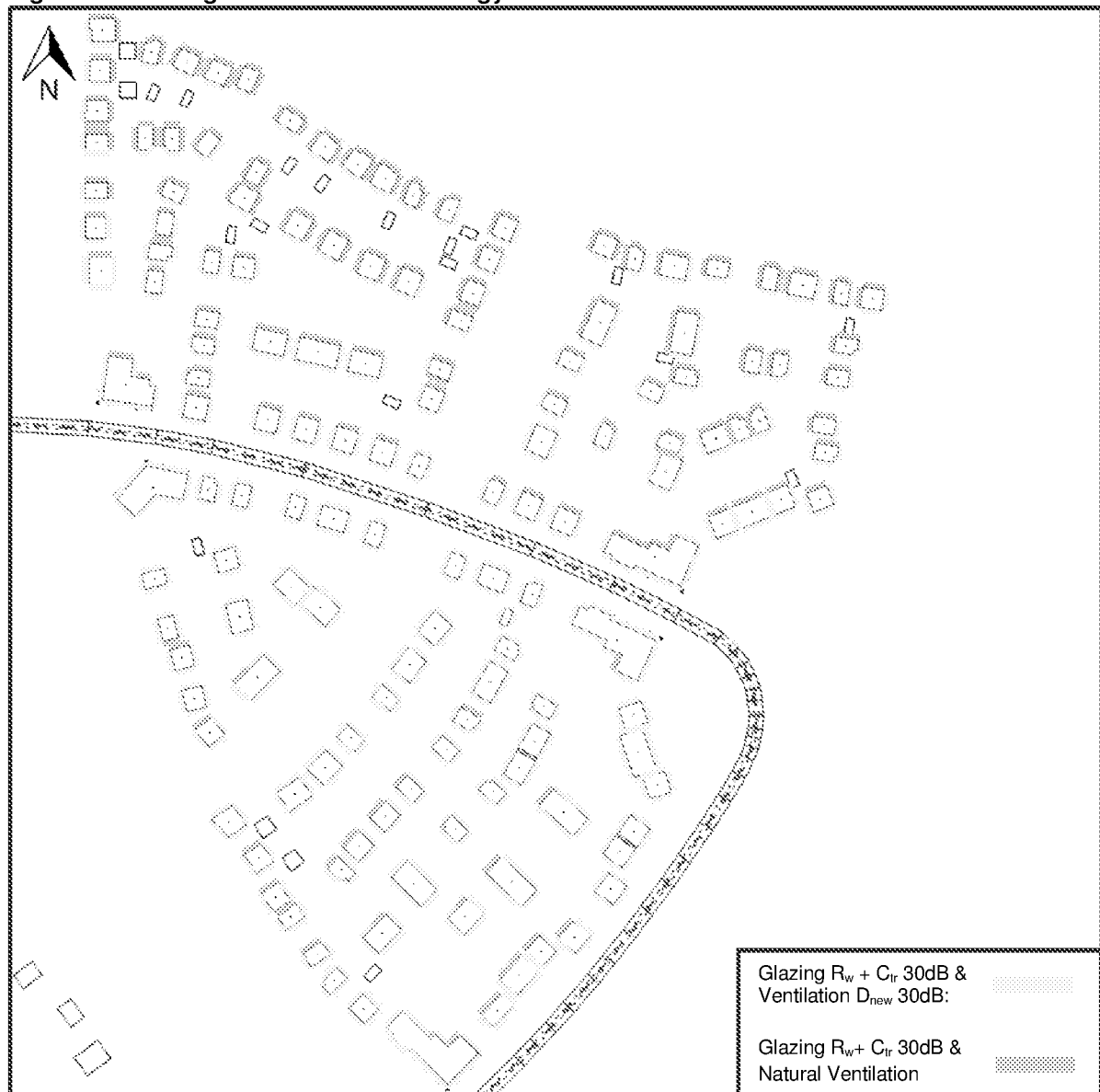
5.0 MITIGATION

5.1 GLAZING AND VENTILATION STRATEGY

The glazing and ventilation strategy has been designed to achieve internal daytime L_{Aeq} of 35 dB and an internal night-time L_{Aeq} of 30 dB in habitable rooms of the proposed development.

In order to meet the internal target noise levels and protect the amenity of future occupants against road traffic noise from the surrounding road network, all facades will feature double glazing of $R_w + C_{tr}$ 30 dB. A number of facades will also feature an alternative means of ventilation which matches or exceeds the glazing specification. Alternative ventilation can be provided in several ways from acoustic trickle vents (which need to have a minimum sound reduction equal to or greater than the glazing), to other passive ventilation systems or mechanical ventilation systems. Figure 5.1 illustratively shows the proposed glazing and ventilation strategy.

Figure 5.1 Glazing and Ventilation Strategy



5.2 PROPOSED AMENITY SPACES

Noise levels within balcony spaces fall below the BS 8233 upper guideline value of 55dB with the inclusion of 1.3m high solid screening, whilst noise levels within garden spaces fall below the BS 8233 lower guideline value of 50dB with the inclusion of 1.8m high fences around proposed garden spaces.

Furthermore, it should be noted that ProPG: Planning and Noise identifies that consideration should also be given to the presence of “[publicly] accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)” when considering the effects of noise levels in amenity spaces. The proposed development is located adjacent to the proposed central wetland area to the west; therefore, residents will also benefit from access to this local green space.

Therefore, the provision of solid screening to the balcony areas and garden fences around garden areas would represent measures to mitigate and reduce traffic noise levels to a minimum and considering the additional local access to green spaces and areas of relative tranquillity, there are not expected to be any significant adverse impacts relating to road traffic noise within amenity spaces.

6.0 CONCLUSIONS

This report presents the findings of a noise assessment in support of a planning application for a proposed residential development at Phase 5, Littlehampton. The NPPF gives test points relating to noise; considering these the following conclusions can be drawn:

- *NPPF Paragraphs 170 (e) and 180 (a)*

The proposed development is not expected to have an 'adverse impact' on health or quality of life. The recommended WHO/BS 8233 internal noise levels are generally met across the site during the daytime and night-time, assuming a windows-closed scenario. It is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by a suitable glazing and ventilation strategy which achieves both ventilation and internal ambient noise level requirements of L_{Aeq} daytime 35dB and L_{Aeq} night-time of 30dB in all sensitive spaces of the proposed development. The suggested glazing specifications are understood to be achievable.

Double glazing with a sound reduction of $R_w + C_{tr}$ 30dB is sufficient across all facades, with alternative ventilation which matches or exceeds the performance of this glazing.

All balcony area spaces are predicted to be below the BS 8233 upper guideline value of 55dB $L_{Aeq,16hours}$ with the inclusion of 1.3m solid screening. All garden spaces are predicted to be below the BS 8233 lower guideline value of 50dB with the inclusion of 1.8m fences and it has been demonstrated that acceptable noise levels can be achieved within the context of the guidance provided within BS 8233.

- *NPPF Paragraphs 180 (b), 182 and 183*

No businesses are located nearby the site which would be adversely affected by the proposals. Therefore, it is considered that the noise mitigation options in Section 5.0 of this report are sufficient to demonstrate acceptable levels of noise in sensitive habitable spaces throughout the site.

APPENDICES

APPENDIX A – ACOUSTIC TERMINOLOGY AND ABBREVIATIONS

Acoustic Terminology

- dB** Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.
- dB(A)** Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.
- L_{Aeq}** Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The L_{Aeq, 07:00 – 23:00} for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the L_{Aeq, 07:00 – 23:00}.
- L_{Amin}** The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.
- L_{Amax}** The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.
- L_n** Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say, 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the L_{A10, 1 hr} = x dB.
- The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.
- R_w** The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

PPG – Planning Practice Guidance

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

APPENDIX B – NOISE INTRUSION ASSESSMENT TABLES

Table B1 Daytime Noise Intrusion Levels $L_{Aeq,16hr}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	61.9	51.9	31.9	35
R02	60.2	50.2	30.2	35
R03	62.2	52.2	32.2	35
R04	62.2	52.2	32.2	35
R05	59.7	49.7	29.7	35
R06	62.6	52.6	32.6	35
R07	62.4	52.4	32.4	35
R08	62.1	52.1	32.1	35
R09	54.7	44.7	24.7	35
R10	56.9	46.9	26.9	35
R11	62.4	52.4	32.4	35
R12	62.6	52.6	32.6	35
R13	60.3	50.3	30.3	35
R14	56.2	46.2	26.2	35

Table B2 Night-time Noise Intrusion Levels $L_{Aeq,8hr}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	53.6	43.6	23.6	30
R02	51.9	41.9	21.9	30
R03	53.8	43.8	23.8	30
R04	53.9	43.9	23.9	30
R05	51.6	41.6	21.6	30
R06	54.2	44.2	24.2	30
R07	54.0	44.0	24.0	30
R08	53.7	43.7	23.7	30
R09	47.7	37.7	17.7	30
R10	49.3	39.3	19.3	30
R11	54.1	44.1	24.1	30
R12	54.3	44.3	24.3	30
R13	52.3	42.3	22.3	30
R14	48.6	38.6	18.6	30

Table B3 Private Balcony Area Noise Levels $L_{Aeq,16hr}$ with 1.3m Screening

Ref	External $L_{Aeq,16hr}$ (dB) Daytime	BS 6233 Guideline Value Criteria L_{Aeq}
G01	53.5	50-55
G02	54.1	50-55
G03	48.9	50-55

Ref	External $L_{Aeq,16hr}$ (dB) Daytime	BS 8233 Guideline Value Criteria L_{Aeq}
G04	50.4	50-55
G05	54.3	50-55
G06	53.6	50-55
G07	54.9	50-55
G08	54.9	50-55
G09	51.4	50-55
G10	53.5	50-55
G11	55.0	50-55
G12	52.3	50-55
G13	54.7	50-55
G14	55.0	50-55
G15	50.0	50-55

All values are sound pressure levels in dB re: 2×10^{-5} Pa

Table B4 Private Garden Area Noise Levels $L_{Aeq,16hr}$ with 1.8m Garden Fences

Ref	External $L_{Aeq,16hr}$ (dB) Daytime	BS 8233 Guideline Value Criteria L_{Aeq}
A01	49.9	50-55
A02	44.3	50-55
A03	43.2	50-55
A04	44.9	50-55
A05	46.4	50-55
A06	44.2	50-55
A07	45.6	50-55
A08	50.8	50-55
A09	46.3	50-55
A10	40.5	50-55
A11	44.4	50-55

All values are sound pressure levels in dB re: 2×10^{-5} Pa

APPENDIX C – REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Persimmon Homes (“the Client”) for the proposed uses stated in the report by [Tetra Tech Limited] (“Tetra Tech”). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder’s permission.

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including; its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.