MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13 Series, Noise and Vibration
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M
Date: November 2019

NetworkRail | West of England Local Enterprise Partnership | West of England Combined Authority | HM Government | Bath & North East Somerset Council | Bristol City Council | North Somerset Council | South Gloucestershire Council | travelwest

Notice

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SECTION 1

Introduction to Noise

1.1 Human perception

1.1.1 Noise is commonly defined as unwanted sound and is therefore to some extent subjective.

1.1.2 The human perception of noise is influenced by physical, physiological and psychological factors. Physical factors include the sound pressure level at the position of the listener, physiological factors include the acuity of hearing, and psychological factors include acclimatisation to steady noise and the activity that an individual is undertaking while the noise is present.

1.1.3 Sound consists of vibrations transmitted to the ear as rapid variations in air pressure which can be measured accurately. The more rapid the variations in air pressure the higher the frequency of the sound. Frequency is defined as the number of pressure fluctuations per second and is expressed in Hertz (Hz).

1.1.4 The ear can detect both loudness and frequency of sound. However, the sensitivity of the human ear varies with frequency, and therefore noise is commonly measured using the A-weighted filter network which mimics the frequency response characteristics of the human ear. The 'A' notation is used to indicate when noise levels have been filtered using the A-weighting network.

1.1.5 Noise levels range from the threshold of hearing at 0 dB(A) to levels of over 130 dB(A) at which point the noise becomes painful. Noise levels over 80 dB(A) are considered potentially damaging to hearing. Table 1.1 presents guide to the A-weighted sound pressure levels in common areas and activities.

Table 1.1: Common noise levels[1]

Situation / noise source	Sound Pressure Level, dB(A)	Average subjective description
30 m from a military jet aircraft take off	140	Painful, Intolerable
Pop concert	105	
Night club	100	
Pop concert at mixer desk	98	
Passing heavy good vehicle at 7m	90	Very noisy
Ringing alarm clock at 1m	80	
Domestic vacuum clearer at 3m	70	Noisy
Business office	60	
Normal conversation at 1m	55	

Table 1.1: Common noise levels[1]

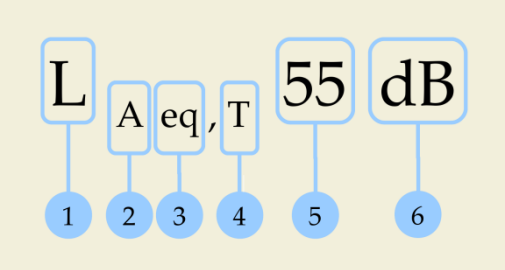
Situation / noise source	Sound Pressure Level, dB(A)	Average subjective description
The reading room of the British Museum	35	
Bedroom in a quiet area with the windows shut	30	Very quiet
Remote country location without any identifiable sound	20	
Theoretical threshold of hearing	0	Uncanny silence

[1] Taken from Table 1.1 of Horizontal Guidance for Noise Part 2 – Noise Assessment and Control (Environment Agency, 2004).

1.2 Acoustic descriptors

1.2.1 Outdoor noise levels fluctuate rapidly over time, and therefore to describe the acoustic environment it is necessary to collect statistical data on the distribution of noise levels during the period of interest.

1.2.2 The nomenclature used to represent acoustic quantities can appear complicated, however once understood it becomes a logical and efficient way of qualifying noise levels. As an example, the level recommended by BS 8233:2014 for noise levels in gardens is $L_{Aeq,T}$ 55dB:



1.2.3 The above descriptor is comprised as follows:

- The first grouping ('L') indicates that the quantity is a *sound pressure level*. Other common quantities are *sound intensity level* (L_I) and *sound power level* (L_W).
- The second grouping ('A') denotes that the sound pressure level is evaluated using the A-weighted filter network.
- The third grouping of characters identify the statistical index. In this example, the letters indicate that the quantity is in terms of the ***eq****uivalent continuous noise level* (eq), which has some similarities with the concept of an average noise level. Numerical values are also shown, and these indicate the level exceeded for *n* per cent of the measurement (e.g. a value of $L_{A90,T}$ 45 dB indicates that the A-weighted sound pressure level exceeds 45 dB for 90% of the period analysed).
- The quantity ('T') shown after the statistical descriptor is the duration over which the quantity is evaluated. This is typically represented in minutes or hours, e.g. 15min, 16h.

- The fifth term of the statistical descriptor identifies its numeric value. This value is usually given as a whole number or to one decimal place.
- The sixth and final group of characters indicate that the units of the sound pressure level are decibels.

1.2.4 A variety of statistical indices are used to quantify noise in different situations. The most common are described below.

1.3 Road traffic noise

1.3.1 The index adopted by the UK Government to quantify road traffic noise is the $L_{A10,18h,}$ which is the arithmetic mean of the noise levels exceeded for 10% of the time in each of the 18 one-hour periods between 6am and midnight. The $L_{A10,18h}$ index has been shown to have the best relationship with annoyance caused by road traffic noise, which has a strong low frequency content and is often steadier over the course of a day than other sources of environmental noise.

1.4 Rail noise

1.4.1 The index used to characterise rail noise is $L_{Aeq,18h}$. This level can be calculated by considering the number, type, speed of trains over a given time period.

1.5 Ambient noise level

1.5.1 General environmental noise from commercial, industrial or unidentified sources is often expressed in terms of the equivalent continuous sound pressure level over the time period of interest ($L_{Aeq,T}$). This is the notional continuous constant noise that contains the same sound energy over the period of interest as the actual fluctuating noise. This is not an 'average' sound level over a period, but the concept has some similarities and provides a single figure quantity that can be used to compare noise levels which fluctuate with time.

1.6 Background noise level

1.6.1 The $L_{A90,T}$ index identifies the noise level exceeded for 90% of the period of interest, and provides a good indication of the background noise level that remains in a location in the absence of any easily identifiable sources.

1.7 Maximum sound level

1.7.1 The maximum sound level (L_{Amax}) is the highest time-weighted sound level measured during a period. The time constant of the measure may either be **F**ast (125 ms), **S**low (1 s) or **I**mpulsive (35 ms), and it is usual to identify the time constant in the notation – e.g. L_{AFmax} indicates that the maximum sound level was measured with the fast time-weighting. The longer the time constant over which the measurement is integrated, the greater the smoothing effect of the time-weighting, which gives a lower numeric value of the measurement. If it is not clear which time weighting has been used for a measurement, then it is generally assumed to be the fast time weighting as this is most common.

1.8 Vibration

1.8.1 Groundborne vibration is typically measured in terms of velocity (millimeters per second) or acceleration (metres per second). Where sources of vibration are impulsive / intermittent it is the peak velocity or acceleration which is measured (and this will be the maximum value recorded during a specific event). Peak Partial Velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. It should be noted that the PPV refers to the movement within the ground of molecular particles and not surface movement.

1.9 Glossary of acoustic terminology

A-Weighting

1.9.1 This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

dB

1.9.2 Abbreviation of decibel.

dB(A)

1.9.3 Abbreviation of A-weighted decibel.

Decibel

1.9.4 The scale on which sound pressure level is expressed. In air it is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2x10^{-5}$Pa).

Equivalent Continuous Sound Pressure Level (L_{eq})

1.9.5 The Equivalent Continuous Sound Pressure Level is the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

Façade and free-field levels

1.9.6 Due to the effects of reflection, sound pressure levels measured close to large vertical reflecting surfaces such as building façades are higher than those that are measured away from reflective surfaces. Sound pressure levels measured 1m from a large solid, reflecting surface are termed 'façade' levels, while those measured at least 3m away from any reflective surfaces (apart from the ground) are termed 'free-field'. Façade levels are typically 2.5 dB higher than free-field levels and therefore it is important to know the conditions under which a noise measurement or prediction has been undertaken.

L_{10} or L_{A10}

1.9.7 Acoustic nomenclature indicating that the value is exceeded for 10% of the period of interest. This index, evaluated over the period 06:00 to 24:00, is commonly used to describe road traffic noise.

L_{90} or L_{A90}

1.9.8 Acoustic nomenclature indicating that the value is exceeded for 90% of the period of interest. This index is taken to be a good indicator of the background noise level remaining at a location in the absence of any easily identifiable sources.

L_{eq} or L_{Aeq}

1.9.9 Acoustic nomenclature indicating that a value is expressed in terms of the Equivalent Continuous Sound Pressure Level.

Peak Particle Velocity (PPV)

1.9.10 PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal. It is specified in millimetres per second (mms). It should be noted that the PPV refers to the movement within the ground of molecular particles and not surface movement.

Sound Exposure Level (SEL)

1.9.11 SEL is the logarithmic measure of the A-weighted Sound Pressure Level squared and integrated over a stated period of time or event, relative to a reference sound pressure value. The SEL value contains the same amount of acoustic energy over a normalised one second period as the actual noise event under consideration.

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SECTION 2

Approach to significance

2.1 Introduction

2.1.1 The Noise Policy Statement for England ("NPSE"), Department for Environment Food and Rural Affairs 2010c[1]), Planning Policy Guidance – Noise ("PPG-Noise"), Department for Communities and Local Government, 2014, and the Environmental Impact Assessment Regulations ("EIA Regulations") have been considered when identifying potential significant effects of noise and vibration from the construction and operation phase of the scheme.

2.1.2 This appendix first describes the relationship between value of resource and magnitude of impact in order to arrive at a level of significance. These are used to determine the significance of project environmental impacts. The appendix then describes the approach to assigning values to the effect level in relation to Government policy.

2.2 Value of environmental receptors

2.2.1 No formal guidance is available on the value of noise sensitive resources. The Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment (IEMA, 2014) includes as noise sensitive receptors dwellings, schools, hospitals and commercial premises. However, it should be noted that the degree of sensitivity may not be the same for all of them. For instance, since residential premises are intended to be used as permanent living and resting places, their value is considered to be 'High'.

2.2.2 Non-residential premises, such as schools, hospital, offices and commercial buildings, are not places of permanent residence. Given that their degree of noise sensitivity may vary depending on the use of the receptor, this (i.e. being a place of permanent residence) has not been considered when classifying the magnitude of the noise impact during the construction and operation phase. Table 2.1 provides the outline in determining the value of a receptor for noise, and is applicable to the value when assessing both construction and operation. This is followed in most cases, but any deviation for special cases are noted in the assessment.

2.2.3 A receptor may be placed into a different category for vibration. For example, a workshop using precision equipment may not necessarily be sensitive to noise, but it could be to vibration.

[1] The references are provided at the end of Chapter 13.

Table 2.1: Value of environmental receptors

Value (sensitivity)	Receptor type
Very High	Internationally designated areas such as World Heritage Sites, Special cases for noise or vibration sensitivity
High	Residential[1], Schools, Hospitals, National designated areas
Medium	Places of worship, Community facilities
Low (or lower)	Commercial buildings (e.g. offices), Sports facilities
Negligible	Farmland, Industrial premises

[1] The dwellings within an 'Important Area' defined by the 2014 Noise Action Plan for Roads (Department for Environment Food and Rural Affairs, 2010a) published under The Environmental Noise Regulations would be included in this category. The difference between them and residential areas not defined as an Important Area is covered by the approach adopted for treating an effect level.

2.3 Magnitude of impact

2.3.1 The magnitude of impact levels used in this project is defined in Table 2.2. The noise bands used for the impact (i.e. change in noise) have been taken from the noise chapter of the Design Manual for Roads and Bridges ("DMRB") – HD213/11 Revision 1 Noise and Vibration (Highways Agency and Welsh Office, 2011). These are applicable to both increases and decreases in noise, and applicable to both construction and operation. HD213/11 provides a scale for both short term and long term changes in noise and these are shown in Table 2.2.

Table 2.2: Magnitude of Impact – change in noise, dB

Magnitude of change	Short term	Long term
No change	0	0
Negligible	0.1 – 0.9	0.1 – 2.9
Minor	1.0 – 2.9	3.0 – 4.9
Moderate	3.0 – 4.9	5.0 – 9.9
Major	5.0 +	10.0 +

Source: DMRB, Volume 11, HD213/11

2.3.2 Table 2.2 is only applicable to changes in noise as possible impacts from vibration relate only to absolute levels and not change. These are described later in this appendix.

2.4 Significance of effect

2.4.1 The significance of effect for operational noise is determined from the combination of the value of the resource and the magnitude of impact as shown in Table 2.3. This table deviates from the example provided in the ES Table 5.3 of Chapter 5. For a receptor of 'high' value and a 'minor' change in noise, Table 5.3 suggested an effect of Moderate was used. If this was used for the noise impact assessment then significant effects would have been

identified for minor changes in noise and would have resulted in an unrealistic high level of mitigation being proposed. The approach presented in Table 2.3 is consistent with that used for the M4 Junctions 3 to 12 Smart Motorway scheme (Highways England, 2015).

Table 2.3: Significance of effect for noise

Magnitude of Change	**Value / Sensitivity of Receptor**				
	Very High	High	Medium	Low	Negligible
Major	Very Large	Large	Large	Moderate	Slight
Moderate	Large	Moderate	Moderate	Slight	Neutral
Minor	Moderate	Slight	Slight	Neutral	Neutral
Negligible	Slight	Slight	Neutral	Neutral	Neutral
No Change	Neutral	Neutral	Neutral	Neutral	Neutral

2.4.2 A significant effect, under the meaning of the EIA Regulations, is taken to mean an adverse or beneficial effect of moderate, large, or very large significance of effect.

2.4.3 For construction noise, where the predicted construction noise exceeds the relevant effect level, this is an indication of a potential significant effect. However, to determine whether there is a significant effect, other factors are taken into consideration. This is mainly the duration of the activity and time for which the receptor will be exposed.

2.5 Effect levels

2.5.1 As required by the NPSE and PPG-Noise, noise thresholds for the onset of adverse effects have been defined in terms of the overall levels of exposure. These effect levels and the change in noise levels predicted to occur with the scheme implemented have been considered when classifying the magnitude of the impact.

2.5.2 The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’, using the following concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and

- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.
- Unacceptable Adverse Effect Level (UAEL) – the level at which significant adverse effects on health and quality of life are to be prevented.

2.5.3 The last of these, UAEL, was added within Planning Practice Guidance – Noise (Department for Communities and Local Government, 2014). The NOEL has not been used for this assessment as it is considered that the effect would be similar to that of the LOAEL for this scheme.

2.5.4 The NPSE (para 2.22) 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. The levels are likely to be different for different noise sources, for different receptors and at different times of the day".

2.6 Construction noise effect levels – residential receptors

2.6.1 Noise impact thresholds for construction activities at residential premises have been classified in terms of Government policy based on the ABC Method set out in BS 5228-1:2009 + A1:2014 (British Standards Institution, 2014a). This defines thresholds at buildings based on the existing noise level and are presented in Table 2.4. In relation to construction noise, day is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00. The level provided for the day time is for the entire period, whereas that for evening and night is applicable to any single hour within the respective period.

Table 2.4: Construction noise effect levels for residential receptors

Construction noise effect level	Threshold value, 1m in front of the relevant façade
Lowest Observed Adverse Effect Level (LOAEL) – Category A in BS5228-1	Day 65 dB $L_{Aeq,daytime}$ Evening 55 dB $L_{Aeq,1h}$ Night 45 dB$L_{Aeq,1h}$
Significant Observed Adverse Effect Level (SOAEL) – Category C in BS5228-1	Day 75 dB $L_{Aeq,daytime}$ Evening 65 dB $L_{Aeq,1h}$ Night 55 dB$L_{Aeq,1h}$
Unacceptable Adverse Effect Level (UAEL)	Day 85 dB $L_{Aeq,daytime}$ Evening 75 dB $L_{Aeq,1h}$ Night 65 dB$L_{Aeq,1h}$

2.6.2 The LOAEL has been set in line with Category A from BS 5228-1:2009 + A1:2014 (British Standards Institution, 2014a).

2.6.3 For the day time, recent large infrastructure projects (e.g. HS1, Thames Tideway and the A14 Cambridge to Huntington Improvement Scheme) have set the SOAEL at 75 dB L_{Aeq}. This is the Category C level given in BS 5228-1:2009 + A1:2014 (British Standards Institution, 2014a). This level was given as a level that noise should not exceed outside the nearest window of an occupied room (Advisory Leaflet 72 – Noise Control on Building Sites, Department of the Environment 1976).

2.6.4 For the evening, the SOAEL is set 10 dB lower than the day-time SOAEL, consistent with the ABC criteria in BS 5228-1:2009 + A1:2014 (British Standards Institution, 2014a) and the accepted criteria from the Advisory Leaflet 72 - Noise Control on Building Sites (Department of the Environment, 1976). A noise level above the SOAEL would be considered as potentially significant in relation to the EIA Regulations.

2.6.5 For night-time, the Night Noise Guidelines for Europe published by the World Health Organisation (WHO, World Health Organisation, 2009) introduced an interim target of 55 dB $L_{Aeq,8hr}$ measured outdoors. Exceeding this noise threshold for one month or longer has been adopted as the SOAEL for night-time construction noise. The Night Noise Guidelines for Europe (World Health Organisation, 2009) are based on evidence gathered for long term exposure to primarily road and aircraft noise. There is no evidence of short-term construction noise leading to significant health effects. The WHO's interim target of 55 dB L_{Aeq} is therefore applied to construction on a precautionary basis.

2.6.6 The UAEL has been set in line with the criteria within BS 5228-1:2009 + A1:2014 (British Standards Institution, 2014a) to determine the eligibility for noise insulation. Listed within the standard are criteria to determine eligibility for noise insulation. These are that the works must be for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months. Planning Practice Guidance – Noise (Department for Communities and Local Government, 2014) states that exposure above the UAEL should be prevented, and re-housing if exposure is above these durations would be a means to prevent exposure to such a noise level.

2.7 Construction and operational vibration effect levels – all receptors

2.7.1 The potential impacts from vibration are based upon absolute levels and not a change in level. These are broken down into those relating to building damage and annoyance to occupants. Since levels of magnitude between these are large, these are treated separately for this assessment.

2.8 Buildings

2.8.1 BS 7385-2:1993 'Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration' (British Standards Institution, 1993) provides guidance on vibration levels likely to result in cosmetic damage, and is referenced in BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b). Guide values for transient vibration, above which cosmetic damage could occur, are given in Table 2.5.

Table 2.5: Transient vibration guide values for cosmetic damage

Type of building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50 mms^{-1} at 4Hz and above	
Unreinforced or light framed structures Residential or light commercial buildings	15 mms^{-1} at 4Hz increasing to 20 mms^{-1} at 15Hz	20 mms^{-1} at 15Hz increasing to 50 mms^{-1} at 40Hz and above

NOTE 1: Values referred to are at the base of the building.

NOTE 2: For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

2.8.2 BS 7385-2 (British Standards Institution, 1993) indicates that for continuous vibration the threshold is around half of a transient value. The level for cosmetic damage, which would be considered as a minor impact, has therefore been set to 7.5 mm/s, which is half of the lower of the values from Table 2.5 for residential or light commercial buildings. In addition, the standard states that minor damage occurs at a vibration level twice that of cosmetic damage and major damage occurs at a vibration level twice that of minor damage. This has been used to set the levels of magnitude for moderate and major impacts.

2.8.3 BS 7385-2 (British Standards Institution, 1993) also states that that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity, which can be halved for a conservative level for continuous vibration. Although now superseded, BS 5228-4:1992 (British Standards Institution, 1992) suggested a threshold for cosmetic damage at peak particle velocities of 10 mm/s for intermittent vibration and 5 mm/s for continuous vibrations. This lower level has been used to assign the level for no change. The thresholds within BS 5228-4:1992 (British Standards Institution, 1992) have not been updated within the more recent version but it assumed that they are still valid.

2.8.4 Table 2.6 presents the magnitude of impact for building damage from vibration. These are based on a building that is structurally sound. If a building is structurally unsound then these values may be reduced. It should be noted that BS 7385-2 (British Standards Institution, 1993) states (para 7.5.2) "*A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive*". As the receptor is a building and not a human receptor, no values for the effect level can be assigned.

Table 2.6: Magnitude of impact for potential vibration damage to buildings

Magnitude of Impact	Damage risk	PPV mm/s[1]
Major	Major	30
Moderate	Minor	15
Minor	Cosmetic	7.5
Negligible	Negligible	5
No change	None	< 5

[1] Peak Particle Velocity ("PPV") is defined as the maximum instantaneous positive or negative peak of the vibration signal. It is specified in millimetres per second (mm/s). It is important to note that the PPV refers to the movement within the ground of molecular particles and not surface movement.

2.9 People

2.9.1 The effect of building vibration on people inside buildings is often assessed using the Vibration Dose Value ("VDV") index, as described in BS 6472-1:2008 (British Standards Institution, 2008). However, a simpler approach is often initially to establish if there is potential for perceptible effects, and this is possible with the PPV index. This approach is described by BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b), which states in para B.2 "*BS 6472, as stated, provides guidance on human response to vibration in buildings. Whilst the assessment of the response to vibration in BS 6472 is based on the VDV and weighted acceleration, for construction it is considered more appropriate to provide guidance in terms of the PPV, since this parameter is likely to be more routinely measured based upon the more usual concern over potential building damage. Furthermore, since many of the empirical vibration predictors yield a result in terms of PPV, it is necessary to understand what the consequences might be of any predicted levels in terms of human perception and disturbance.*"

2.9.2 Further, BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b) states (para B.2) that "Human beings are known to be very sensitive to vibration, the threshold of perception being typically in the PPV range of 0.14 mm/s to 0.3 mm/s. Vibrations above these values can disturb, startle, cause annoyance or interfere with work activities. At higher levels they can be described as unpleasant or even painful. In residential accommodation, vibrations can promote anxiety lest some structural mishap might occur". Based on this, the LOAEL has been set at 0.3 mm/s and the SOAEL at 1.0 mm/s. A table of guidance levels is provided in BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b) and is shown in Table 2.7, together with the assigned effect levels.

Table 2.7: Magnitude of impact for vibration annoyance

Vibration level, PPV mm/s	Effect	Magnitude of impact	Effect level
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	Major	UAEL
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.	Moderate	SOAEL
0.3	Vibration might be just perceptible in residential environments.	Minor	LOAEL
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Negligible	
<0.14	Vibration not perceptible.	No change	NOEL

2.9.3 If the predicted levels for a single event for construction are above the SOAEL then mitigation measures and the duration of the construction activity will be considered first to determine if further investigation is required using the VDV index. For operation, if any single events are predicted above the SOAEL then a further assessment will be undertaken using the VDV index.

2.10 Operation noise effect levels – residential receptors

2.10.1 The effect levels assigned for operation noise are shown in Table 2.8, with an explanation of how they have been derived provided after the table.

Table 2.8: Operation noise effect levels for residential receptors

Effect level	Period	Noise level[1]
UAEL	Day	74 dB $L_{Aeq,16h}$
	Night	-
SOAEL	Day	66 dB $L_{Aeq,16h}$
	Night	55 dB $L_{Aeq,8h}$
LOAEL	Day	50 dB $L_{Aeq,16h}$
	Night	40 dB $L_{Aeq,8h}$

[1] All levels are free-field. A free-field level is one that does not contain the contribution from reflections from nearby buildings.

2.10.2 For the day-time the UAEL has been set with reference to Planning Policy Guidance - Noise (Department for Communities and Local Government, 2014), where it identifies that this level should be prevented. In the first round Noise Action Plan Major Railways (Department for Environment Food and Rural Affairs, 2010b) certain areas were defined the status of First Priority Locations, and these are where the noise levels are at least 73 dB $L_{Aeq,18h}$. The Rail Action Plan states (para 5.07) "*It is envisaged that in general the relevant rail authorities will investigate as a priority the Important Areas that contain First Priority Locations*". The level of 73 dB $L_{Aeq,18h}$ is equivalent to a level of 74 dB $L_{Aeq,16h}$ (conversion from Planning Policy Guidance Note 24: Planning and Noise (Department of Environment, 1994).

2.10.3 The UAEL at night has not been assigned as there is insufficient guidance available in order to define a level. This is acknowledged in the first round Noise Action Plan Major Railways (Department for Environment Food and Rural Affairs, 2010b), where it states in para 5.08 "*The $L_{Aeq,18h}$ indicator describes only the noise that occurs between the hours of 0600 and 2400 and doesn't cover the night period. Even so, the identification of Important Areas has been based solely on the $L_{Aeq,18h}$ value. This reflects the fact that for the first round of mapping the L_{night} values had to be based on a range of assumptions that, while perfectly adequate for strategic noise mapping, do not provide a robust basis for developing detailed actions. Furthermore, implementing many of the potential actions available to manage noise issues and effects would not only address the noise as measured by the $L_{Aeq,18h}$ indicator but also the noise that occurs at night*".

2.10.4 For daytime, the SOAEL is in relation to the daytime trigger level of 68 dB $L_{Aeq,18h}$ for Noise Insulation as defined in The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996. The 16h level of 66 dB is derived by first correcting to a free-field level from a façade level (-2.5 dB as defined by the Calculation of Railway Noise, Department of Transport 1995) and then adding 1 dB for and 18h to 16h conversion (Planning Policy Guidance Note 24: Planning and Noise, Department of Environment (1994). This derived level of 66.5 dB is then rounded down to 66 dB. Linking the SOAEL with the trigger level for noise insulation is consistent with a consequence of the SOAEL as stated in Planning Practice Guidance – Noise (Department for Communities and Local Government, 2014), where people start "*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*".

2.10.5 For night-time, the SOAEL is set at 55 dB $L_{Aeq,8h}$. This aligns with the interim night-time outdoor target level provided in the WHO Night Noise Guidelines for Europe (World Health Organisation, 2009). This is also consistent with a consequence of the SOAEL as stated in Planning Practice Guidance – Noise (Department for Communities and Local Government, 2014) of "*Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep*".

2.10.6 The LOAEL is set at 50 dB $L_{Aeq,16h}$ and is based on the information provided in the Guidelines for Community Noise ("GCN") (World Health Organisation, 1999). In that document it states that 50 to 55 dB L_{Aeq} represent "*day-time levels below which the majority of the adult population will be protected from becoming moderately or seriously annoyed*". The level of 50 dB $L_{Aeq,16h}$ for moderately annoyed has therefore been chosen.

2.10.7 For night-time the LOAEL is set at 40 dB $L_{Aeq,8h}$ which is explicitly defined as the LOAEL in the WHO Night Noise Guidelines for Europe ("NNG") (World Health Organisation, 2009).

2.10.8 Since the publication of the Preliminary Environmental Information Report for the Metrowest Phase 1 Scheme, the World Health Organisation has published the Environmental Noise Guidelines for the European Region ("ENG") (World Health Organisation, 2018). Although the 2018 ENG supersede the CNG and NNG, it is recommended that all CNG and NNG guidelines not covered by the ENG should remain valid.

2.10.9 These guideline levels presented in the ENG have been reviewed for use within the MetroWest Phase 1 Scheme noise criteria for significance of impact and have not been adopted for two reasons. First, the guideline levels within the ENG are yet to be adopted within UK policy and there are already existing threshold noise levels that are considered to be more appropriate for this Scheme. Secondly, the guideline noise levels presented within the ENG are in the L_{den} noise index, which is a weighted 24-hour noise level. The main guidance document used for this assessment is the Calculation of Railway Noise (Department of Transport, 1995), which used the L_{Aeq} noise index and not L_{den}. There are no adopted conversions between the two difference noise indices and so adopting the guidance values from the ENG would conflict with following the approved guidance.

2.10.10 The guideline levels presented above have been reviewed in the development of the scheme specific noise criteria for significance of impact. The levels themselves have not been adopted as threshold values, as there are UK Policy based threshold noise levels that are considered to be more appropriate.

2.10.11 The effect levels presented in Table 13.2.8 do not provide an exact level for a certain situation and may not be applicable to all locations as the onset of annoyance will vary across the scheme and with the noise sources. The NPSE purposely does not assign values to the effect levels because they need to be considered on a project by project basis taking into account local factors. While the effect levels presented in Table 2.8 do follow those derived for recent major infrastructure projects they are considered to be a starting point rather than a definitive set of values.

2.10.12 A report published in 2014 by defra (Department for Environment Food and Rural Affairs (2014b)) has suggested a range of possible values that could be used as effect levels for rail projects. These are shown in Table 2.9.

Table 2.9: Operation noise effect levels for rail from defra research report

Effect level	Period	Noise level (range)
SOAEL	Day	72 dB $L_{Aeq,16h}$ (70 to 74)
	Night	59 dB $L_{Aeq,8h}$
LOAEL	Day	63 dB $L_{Aeq,16h}$ (61 to 66)
	Night	45 dB $L_{Aeq,8h}$

2.10.13 Although these values have not be used for this project, it should be noted that the suggested levels, even at the lower end of the range, are above those presented in Table 2.8. This could indicate that using the levels in Table 2.8 is a conservative approach.

2.11 Operational noise – maximum levels

2.11.1 While the assessment of noise impacts using the 16-hour daily level follows guidance and is aligned to policy documents, it does not take into account the maximum noise level that would occur with each individual passing passenger train. To take this into consideration, noise measurements have been undertaken of a Class 166 DMU to determine the maximum noise level of a pass-by. This data is presented in Table 3.5 of Appendix 13.3.

2.11.2 Along with no formal method to assess maximum noise level, there is also little guidance with which to compare a maximum level. Within the Good practice guide on noise exposure and potential health effects (European Environment Agency, 2010), Table 2.1 shows that the L_{Amax} indicator can be used as an indicator to measure stress, which can be used as measure of effects of noise on health and wellbeing. However, there is no suggested noise level as a threshold within that document. Guidance exists for workplace noise but this is not considered relevant for gardens or inside dwellings. In the Environmental Statement for Crossrail, a maximum level of 85 dB L_{Amax} is presented (Table 5.8 within RPS, 2005) as a level where if occurring at night there could be a significant impact. If maximum level at night is considered to have more impact that a one during day of similar magnitude, applying the 85 dB L_{Amax} level to the daytime would be considered as a conservative approach. This maximum noise level is therefore used in this assessment to determine the likely significance of impact from an individual train passage.

2.12 Mitigation approach

2.12.1 Table 2.10 presents the approach to mitigation for residential receptors at each effect level for policy and environmental impacts. As with the effect levels presented in Table 2.8, the suggested levels on when to mitigate presented in Table 2.10 are not definitive values and the decision to mitigate or not should not be based solely on a change in noise level.

Table 2.10: Approach to mitigation for operational noise – residential receptors

Government policy mitigation approach	Environmental assessment mitigation approach
Prevent	N/A – level would be prevented from occurring
Unacceptable Adverse Effect Level (UAEL) Day – 74 dB $L_{Aeq,16h}$	
Avoid - Reduce noise level through scheme design	Mitigate any increase in noise from the scheme that is above 1 dB[1].
Significant Observed Adverse Effect Level (SOAEL) 66 dB $L_{Aeq,16h}$ and 55 dB $L_{Aeq,8h}$	

Table 2.10: Approach to mitigation for operational noise – residential receptors

Government policy mitigation approach	Environmental assessment mitigation approach
No specific action unless environmentally significant	Mitigate where increases are environmentally significant in the short term (i.e. > 3 dB(A))
Lower Observed Adverse Effect Level (LOAEL) 50 dB $L_{Aeq,16h}$ and 40 dB $L_{Aeq,8h}$	
No specific action unless environmentally significant	Mitigate where increases are environmentally significant in the long term (i.e. > 5 dB(A))

[1] To reflect the adverse health effects of being above the SOAEL, a smaller increase in noise is considered sufficient to determine the need for mitigation to be considered. This is reflected in PPG-Noise as "*In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur*".

2.13 Construction and operational noise effect levels and mitigation approach – non-residential receptors

2.13.1 The use of effect levels for non-residential receptors is not considered possible since there is very little research to arrive at the levels. Instead, a single criteria has been used in order to determine the need for mitigation. This is presented in Table 2.11.

2.13.2 In addition, for schools, the Acoustics of Schools: A design guide (Institute of Acoustics and the Association of Noise Consultants, 2015) states (section 2.2) *"Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$".*

Table 2.11: Approach to mitigation for non-residential receptors

Building type	Impact criteria[1]	
	Day	Night (where applicable)
Place of worship	50 dB[2] L_{Aeq} and a change of ≥ 3 dB	
Schools, colleges, hospitals, and libraries	50 dB[3] L_{Aeq} and a change of ≥ 3 dB	45 dB[4] L_{Aeq} and a change of ≥ 3 dB
Offices	55 dB[2] L_{Aeq} and a change of ≥ 3 dB	
Shops	70 dB[2] L_{Aeq} and a change of ≥ 3 dB	

[1] These reflect external levels based on guidance levels for internal area. The difference between internal and external has been assumed to be 15 dB that is attenuation provided by a partially open window, BS 8233:1999 (British Standards Institution, 1999).

[2] BS 8233:2014 (British Standards Institution, 2014c).

[3] Acoustics of Schools: A design guide (Institute of Acoustics and the Association of Noise Consultants, 2015).

[4] Guidelines for Community Noise (World Health Organisation, 1999).

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.3 Assumptions and Noise Model / Input Data
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 3

Assumptions and noise model / assessment input data

3.1.1 This Appendix presents the assumptions made during the assessment of noise and vibration impacts. It also contains the background data to support the input data for the various noise sources used during the assessment.

3.1.2 Table 3.1 lists the assumptions that have been made in order to complete the assessment of operational noise and vibration for the Portishead Branch Line DCO Scheme from Portishead station to Ashton Junction.

Table 3.1: Operational assumptions – DCO Scheme

Topic / Area	Assumption
Train types	All trains will be Class 166 DMUs (three carriage). In the future (15 years after opening) it has been assumed that these will be five carriage and the type will remain as Class 166. The noise level associated with these trains when moving is taken from the values provided within the Calculation of Railway Noise (Department of Transport, 1995).
Track type	Continuous Welded Rail (CWR) is assumed for the track, with ballast correction applied (as defined in the Calculation of Railway Noise (CRN), Department of Transport, 1995).
Operating times and number of trains	20 passenger trains in each direction per day (Mon-Sat), with 10 passenger trains in each direction on Sundays. This is assumed the same for the future year. The number of freight trains using the line varies. No assumptions have been made with regard the number of freight trains as these are accounted for within the baseline measurements.
Turnaround / dwell times	Three minutes at Portishead. 30 seconds at Pill. These times are based on best estimates.
Stationary noise sources	The stationary noise from Class 165 and 166 Diesel Multiple Units (DMU) has been measured at Oxford sidings (see Table 3.2). For the opening year three point sources are assumed (i.e. one for each unit). The input levels have been adjusted to account for the time that the DMUs are stationary at each station. For the future year scenario there is assumed to be five point sources. The units will remain on when stationary at Portishead and Pill.

Table 3.1: Operational assumptions – DCO Scheme

Topic / Area	Assumption
Line speed / train speed	The CRN requires the speed of each train to be entered and from this the noise level is calculated. For locations where there are accelerating and/or decelerating trains, the advice in CRN is to take an average of the speeds over the line length (CRN, Para 14.3). In order to keep the line lengths within the noise model to a manageable number, a minimum length of 200 m has been taken.
Rail and brake squeal and points / crossings.	No assessment has been made of rail squeal caused by a train negotiating a curve. The presence of rail squeal is a result of a combination of track design and train operating speed. If rail squeal occurs it would be because of the radius of curvature and wheelbase of the bogies running over the line. The only radius on the new section of line that could cause squeal is that leaving Pill and heading towards Portishead. It is assumed that this will be new track and designed to reduce likelihood of rail squeal and the likelihood of rail squeal in this location is low. If rail squeal is identified on opening and requires treatment then this will be a maintenance issue normally treated with flange lubricators. The occurrence of squeal from braking to a standstill is unlikely where the train is braking from a relatively low speed due to less heat build-up in the braking system. Furthermore, the potential for brake squeal is reduced further by the braking system fitted to the Class 166 units to be used; this is disc rather than tread braking and is inherently quieter in operation and leads to lower rolling noise levels from the train. Therefore, no assessment of the potential noise from brake squeal has been undertaken as it is assumed this would be minimal, subject to standard railway vehicle maintenance procedures. The increase in noise from a train passing over a switch or points is taken into consideration within CRN by the addition of +2.5 dB to the rolling noise component of the calculations (CRN, Table 1).
Duration of station Public Address announcements (Portishead and Pill)	Assumed four announcements per train, each lasting 35 seconds. These would be three train specific and one security / safety related. The noise levels have been taken from measurements undertaken at Bristol Parkway (see Table 3.3).

Table 3.1: Operational assumptions – DCO Scheme

Topic / Area	Assumption
Unmanned Non Motorised User crossing at Barons Close	The existing unmanned Non Motorised User crossing at Barons Close will be closed before the scheme opens or as part of the scheme. Therefore, the routine sounding of train horns while on approach to this crossing will not continue. For the avoidance of doubt this does not refer to the vehicle crossing point at Ashton Vale Road in Ashton Gate.
Maintenance	Given the higher specification of the DCO Scheme, the maintenance regime would be different to that at present for the part of the line that is currently open (i.e. that from Pill to Ashton Junction). As with the existing situation, the highest noise level from routine maintenance activities is likely to be from maintenance tamping of the line to retain line the appropriate alignment for the line speed. Other routine maintenance activities would be low noise activities, apart from where drain clearing is required. The regular track inspections are likely to be undertaken by line walking or on a road rail buggy. Where major maintenance is required this would involve more equipment and would require possessions. This maintenance would mainly involve ballast cleaning, tamping and lining, which have the potential to generate high levels of noise due to the equipment used as all have the potential to generate high noise levels.

Table 3.2: Stationary noise measurements of 165 and 166 DMUs. Oxford sidings. 02/09/2015.

Time of measurement	Duration of measurement, seconds	Distance to DMU[1], m	Measured L_{Aeq}, dB	Corrected level to L_w, dB
11:16	130	11	73.8	102.6
11:19	72	11	73.0	101.8
11:21	310	11.3	72.5	101.6
11:33	73	11.3	72.2	101.3
11:43	153	11	73.9	102.7
11:47	150	7.3	76.6	101.9
11:49	50	6.8	76.8	101.4
13:23	40	10.9	73.8	102.6

Table 3.2: Stationary noise measurements of 165 and 166 DMUs. Oxford sidings. 02/09/2015.

Time of measurement	Duration of measurement, seconds	Distance to DMU[1], m	Measured L_{Aeq}, dB	Corrected level to L_w, dB
13:26	60	11.8	76.5	105.9
13:29	120	9.8	76.0	103.8
Average				102.8

[1] The measurements were taken level with the engine of an individual DMU. The engine of the adjacent unit was at least three times further away, and the noise contribution would be at least 10 dB lower than that of closest unit. The contribution from a source that is 10 dB below the dominant source is considered negligible in acoustic terms. The level measured is therefore considered to be that from a single unit and not from a number of units. Subsequently there is no distinction necessary between the stationary noise measurements taken of an individual unit from a Class 165 or 166.

Table 3.3: Noise measurements of the Public Announcement Voice Alarm system (PAVA) at Bristol Parkway Station[1] on 19/06/2014

Duration of announcement	Measured L_{Aeq} dB
34 seconds	68.4
25 seconds	68.5
51 seconds	69.1
29 seconds	69.6
41 seconds	68.7
39 seconds	68.5
21 seconds	68.8
Average	68.8
Corrected L_{Aeq} to Sound Power Level (L_w)	83.9

[1] These measurements were undertaken by CH2M in order to assess the impact from station upgrades required for the Intercity Express Programme (IEP). This was a separate project to MetroWest Phase 1 but the measurements are considered as valid data for the assessment of noise from a PAVA system at the proposed Portishead and Pill stations. The measurements were taken with the microphone directly in front of the speaker at a distance of 2.25m.

Table 3.4: Measurements of car park noise at the CH2M Swindon office (undertaken on 30/10/2014)

Event	Duration of measurement	Distance to vehicle when stationary, m	L_{Aeq} of arriving vehicle[1]	L_{Aeq} of departing vehicle[2]
Arriving	47 seconds	10	51.0	
Departing	34 seconds	10		54.2
Arriving	41 seconds	10	53.0	
Departing	27 seconds	10		52.7
		Average	52.1	53.5

[1] This event involved a vehicle pulling alongside a parking space, reversing into the space, the engine being switched off, and then the driver and front passenger doors opening and closing.

[2] This event involved the driver and front passenger doors being opened and then closed, followed by the engine of the vehicle being started and then the vehicle pulling away.

3.1.3 Table 3.5 provides the results from measured data that have been used for the assessment of maximum noise level impacts. For these measurements the distance from the microphone to the closest railhead was 10 m, and the ground where the measurement was taken was about 1.5 m above the railhead. An approximate speed of the trains was calculated by timing the pass-by and relating this to the length of the train. This was estimated at 40 mph for all train passages.

Table 3.5: Noise measurements of Class 166 DMU on the Severn Beach line at Portway, Bristol. 17/01/2018.

Time of pass-by	Direction[1]	L_{Amax} (dB)
10:33	NB	76.2
10:40	SB	77.9
11:03	NB	77.0
11:16	SB	78.8
11:39	NB	79.0
12:06	SB	80.7
12:26	NB	77.7
12:35	SB	78.1
12:59	NB	72.6
13:16	SB	81.1

[1] SB (South Bound) was from Severn Beach towards Bristol. The line is single track at this location so the SB and NB (North Bound) trains were using the same track and therefore the same distance from the microphone.

3.1.4 From the ten measurements, the highest measured level of 81.1 dB(A) at 10 m from the railway line would be around 80 dB(A) at 15 m. This maximum noise level would reduce with distance from the railway line to approximately 77 dB(A) at 30 m, 74 dB(A) at 60 m, and 71 dB(A) at 120 m.

3.1.5 An examination of the time history of the train passages (not shown in this appendix) shows that the maximum noise level is relatively stable for five seconds.

3.1.6 The noise levels presented in Table 3.5 are a worst case situation because the trains at Portishead are likely to be travelling slower and would be further away (e.g. closer to 20 m).

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.4 Time Period Conversions
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 4

Conversions from model output time periods to periods required for assessment

4.1.1 The noise indices and time periods within the prediction methodologies of the Calculation of Road Traffic Noise (CRTN, Department of Transport Welsh Office, 1988) and the Calculation of Railway Noise (CRN, Department of Transport, 1995) are shown in Table 4.1. The table also shows the time periods and noise indices to which the significance criteria adopted within this assessment are aligned.

Table 4.1: Noise indices and time periods

		Daytime		Night time	
		Index	**Time period**	**Index**	**Time period**
Prediction methodology	Road, CRTN	L_{A10}	18-hour (06:00 to 24:00)	L_{A10}	6-hour (00:00 to 06:00)
	Rail, CRN	L_{Aeq}	18-hour (06:00 to 24:00)	L_{Aeq}	6-hour (00:00 to 06:00)
Assessment / Significance	Combined noise level	L_{Aeq}	16-hour (07:00 to 23:00)	L_{Aeq}	8-hour (23:00 to 07:00)

4.1.2 Table 4.2 shows the conversions that are required in order to align the prediction methodologies with the assessment and significance criteria.

Table 4.2: Conversions required from noise model predicted data to assessment criteria

		Conversion required	**Conversion (source of conversion)**
Day time	Road	$L_{A10,18h}$ to $L_{Aeq,16h}$	$L_{Aeq,16h} = L_{A10,18h} - 2$ (PPG24[1], BS 8233[2])
	Rail	$L_{Aeq,18h}$ to $L_{Aeq,16h}$	$L_{Aeq,16h} = L_{Aeq,18h} + 1$ (PPG24[1])
Night time	Road	$L_{A10,6h}$ to $L_{Aeq,6h}$	$L_{Aeq,6h} = L_{A10,6h} + X$ (No conversion readily available. X is derived from the baseline measured data in order to use the relationship between time periods in the local area. See Table 4.3.)
	Rail	$L_{Aeq,6h}$ to $L_{Aeq,8h}$	$L_{Aeq,8h} = L_{Aeq,6h} + X$ (No conversion readily available. X is derived from the baseline measured data in order to use the relationship between time periods in the local area. See Table 4.3.)

Table 4.2: Conversions required from noise model predicted data to assessment criteria

	Conversion required	Conversion (source of conversion)

[1] Planning Policy Guidance: Planning and Noise (PPG24) (Department of the Environment, 1994).

[2] Guidance on sound insulation and noise reduction for buildings. BS 8233:2014 (British Standards Institution, 2014c).

4.1.3 As stated in Table 4.2 there is no readily available source for the required night time conversions. The approach adopted to derive these was to use the actual differences from the data collected during the baseline surveys. This has the advantage of being recent and representative of local conditions. These are divided into general areas of the route and are shown in Table 4.3.

Table 4.3: Conversions calculated from survey data

Baseline survey location[1]	$L_{Aeq,6h}$	$L_{Aeq,8h}$	$L_{A10,6h}$	$L_{Aeq,8h} - L_{Aeq,6h}$	$L_{A10,6h} - L_{Aeq,6h}$
Pill					
LT1	47.6	48.3	48.9	0.7	1.3
LT17	42	43.2	42	1.2	0
LT18	46.9	48.1	47.5	1.2	0.6
LT19	47	48	48.5	1	1.5
LT20	46.3	47.4	46.6	1.1	0.3
LT21[2]	48.2	48.8	44.8	0.6	-3.4
LT22[2]	42.8	44.6	40.2	1.8	-2.6
Average				**1.0**	**0.7**
Sheepway					
LT2	45.6	48.1	46.5	2.5	0.9
LT3	48.3	49.6	49.9	1.3	1.6
LT4	44.8	45.4	45.1	0.6	0.3
LT5	48.0	49.4	49.2	1.4	1.2
LT13	50.3	51.8	51.6	1.5	1.3
Average				**1.5**	**1.1**
Portishead					
LT6	40.1	41.2	40.8	1.1	0.7
LT7	46.0	48.2	47.8	2.2	1.8
LT8	37.5	38.2	38.2	0.7	0.7
LT12	42.6	43.7	43.4	1.1	0.8

Table 4.3: Conversions calculated from survey data

Baseline survey location[1]	$L_{Aeq,6h}$	$L_{Aeq,8h}$	$L_{A10,6h}$	$L_{Aeq,8h} - L_{Aeq,6h}$	$L_{A10,6h} - L_{Aeq,6h}$
LT15	41.8	43.3	42.5	1.5	0.7
Average				**1.3**	**0.9**
Ashton Gate					
LT9	43.3	44.6	44.2	1.3	0.9
LT10	42.9	44.5	44.0	1.6	1.1
LT11[3]	40.3	41.3	41.6	1.0	1.3
Average				**1.3**	**1.1**
Parson Street					
LT14	41.3	43.2	41.3	1.9	0
LT16[4]	53.4	53.8	51.5	0.4	-1.9
Average				**1.9**	**0**

[1] From the full survey results presented in Appendix 13.5.

[2] As is reported in Appendix 13.5, during the morning periods of 05:00 to 07:00 the measured noise levels contained a high contribution from bird song. This would have a high influence on the L_{Aeq} but not necessarily on the L_{A10}, and it is considered these would produce unreliable comparison between the two indices. The measured levels in this period has been included for completeness in the survey results but these have not been used to determine the noise index conversions.

[3] On one day the L_{Aeq} in the periods from 23:00 to 24:00 and 00:00 to 01:00 were dominated by a passing freight train. This location was close (approximately 15 meters) to the rail and so a single event while the background is low will have a dominating effect for the L_{Aeq} index, even if the passage of the freight train is for a short time period. In order to use data from this location for the determining of differences in noise indices, the freight train pass-by has been excluded from the data presented above. There is no reason to exclude the noise from the passage of the freight trains from the baseline data and so the data presented above will differ from that in Appendix 13.5 for LT11.

[4] As is reported in Appendix 13.5, during the survey at this location the wind speed was above that considered suitable for reliable and repeatable noise measurements. The measured levels have been included for completeness but have not been used to determine the noise index conversions.

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

6.25, Environmental Statement, Volume 4, Appendix 13.5 Noise Survey Results
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

SHORT TERM MEASUREMENT LOCATIONS:

Noise Measurement Record

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST1 - Tansy Lane - Portishead			By	SR
GPS Coordinates	N: 51.482823 W: -2.7544302				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST1	Day	01/04/2014	14:03:58	15-minute	49.3	63.8	45.5	51.2
		01/04/2014	19:09:14	15-minute	53	67.9	45.2	56.8
		03/04/2014	07:39:12	15-minute	53.9	64.7	46.7	57.8
	Night	01/04/2014	23:51:48	5-minute	42.5	51.6	40.7	43.6

Comments

This position is considered to be acoustically representative of the ambient noise levels at the existing residential premises on both sides of the Scheme, together with the north boundary of the Scheme, where Trinity School is located at 25m from the proposed track.

Day-time and night-time noise levels were recorded at this location.

The sound level meter was located south of the proposed track, between the residential houses on Tansy Lane and Galingale Way.

The dominant noise source at this location was children playing at the school, birds singing constantly, and also road traffic noise from A369 Wyndham Way.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST2 - Tydeman Road - Portishead			By	SR
GPS Coordinates	N: 51.482225 W: -2.7517855				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST2	Day	01/04/2014	14:41:13	15-minute	48.7	63.8	45.5	51.2
		01/04/2014	16:43:15	15-minute	49.7	67.9	45.2	56.8
		03/04/2014	07:12:34	15-minute	53.2	64.7	46.7	57.8
	Night	01/04/2014	23:39:41	5-minute	46.1	54.5	43.7	48

Comments

This position is considered to be acoustically representative of the ambient noise levels at the existing residential premises on the south boundary of the proposed track.

Day-time and night-time noise levels were recorded at this location.

The sound level meter was located between Tydeman Road and The Pippins.

The dominant noise sources at this location were road traffic noise from the M5 and also noise from birds singing constantly. There was also occasional noise from aircraft.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST3 - South west corner of Portbury Wharf Nature Reserve - Sheepway			By	SR
GPS Coordinates	N: 51.480979 W: -2.7439052				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST3	Day	01/04/2014	15:58:35	15-minute	47.7	57.5	45	49.6
		01/04/2014	18:19:26	15-minute	50	61.7	47.4	51.9
		03/04/2014	08:10:24	15-minute	52.7	62.1	49.3	55
	Night	01/04/2014	23:26:21	5-minute	45.3	57.8	41.9	47.3

Comments

This position is considered to be acoustically representative of the ambient noise level along the line to the east of Portbury towards the M5.

Day-time and night-time noise levels were recorded at this location.

The sound level meter was located north of the proposed track, at the Portbury Wharf Natural Reserve, just off Sheepway.

The dominant noise sources at this location was road traffic from the M5 and the A369. Noise from birds singing and aircraft also contributed to the noise climate.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST4 - Monmouth Road - Pill			By	SR
GPS Coordinates	N: 51.482118 W: -2.6881662				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST4	Day	01/04/2014	14:37:03	15-minute	52.5	80.8	45.4	53.9
		01/04/2014	17:50:39	15-minute	52.8	66.1	45.8	56.4
		03/04/2014	06:13:15	15-minute	52.9	63.4	49.1	55.2
	Night	01/04/2014	23:55:05	5-minute	40.9	45.9	39	42.5

Comments

This position is considered to be acoustically representative of the ambient noise levels at the existing residential premises on both sides of the Scheme.
in Pill. It is also representative of the location of the proposed Pill railway station located on Monmouth Road.
Day-time and night-time noise levels were recorded at this location.
The sound level meter was located on Monmouth Road, which forms the east boundary of the new station location.
The dominant noise sources at this location were road traffic noise from the M5 and birds singing constantly. There was also occasional noise from aircraft.
During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST5 - Watchhouse Hill - Pill			By	SR
GPS Coordinates	N: 51.478964 W: -2.6827884				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST5	Day	01/04/2014	17:11:53	15-minute	48.3	61.6	44	50.8
		01/04/2014	17:27:22*	15-minute	48.8	61.4	44.5	51.6
		01/04/2014	17:27:22**	15-minute	53.2	70.3	44.6	55.2
		03/04/2014	06:37:26	15-minute	54.6	62.1	51.5	56.9
	Night	01/04/2014	00:03:44***	5-minute	41.7	49	39.1	43.5

*Measurement period with the contribution from a passing freight train removed.

**Measurement period * with the inclusion of the contribution from the passing freight train.

***While this time period was just outside of the operational time period for the trains, the noise climate was considered to be consistent with that immediately before 00:00

Comments

This position is considered to be acoustically representative of the ambient noise levels at the residential premises located along Ham Green in Pill.
Day-time and night-time noise levels were recorded at this location.

The sound level meter was located in Watchhouse Hill at a location representative of dwellings in the area.
The dominant noise sources were road traffic noise from Ham Green and birds singing constantly. There was also occasional noise from aircraft.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

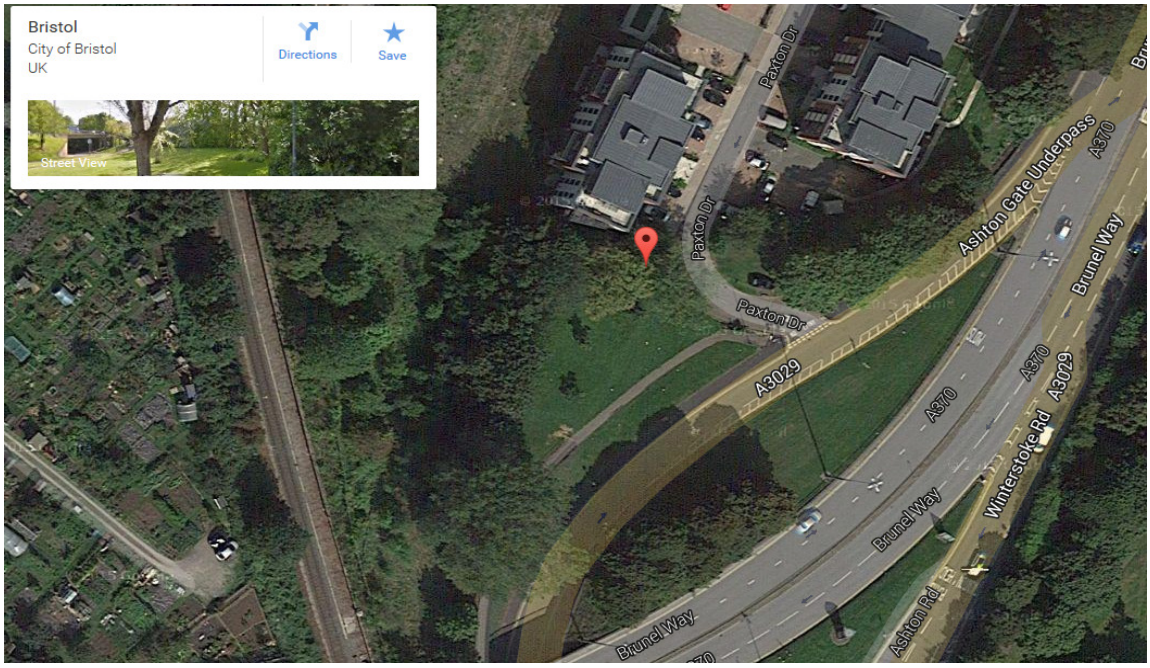
ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Jul-13/Apr-14/Jan-16
Measurement Location	ST6 - Paxton Drive (Meridian building) - Ashton Gate			By	SR
GPS Coordinates	N: 51.442038 W: -2.6248848				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	03/02/201
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure



Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST6	Day	05/07/2013	15:09:00*	3-hour	54	72.7	50.3	55.7
	Night	03/04/2014	06:14:40	15-minute	62.1	77.5	57.6	54.6
		20/01/2015	06:00:02	30-minute	63	74.1	58.1	65.5

*This measurement was undertaken during a project for Bristol City Council in 2013. The survey position was further to the north within one of the communal outdoor areas of the development.

Comments

Day-time noise levels were recorded at this location.

The sound level meter was located at the Meridian Building (the new housing development off Paxton Drive) in Ashton Gate.

The dominant noise source at this location was road traffic road from A370 and A3029. Noise from birds singing also contributed to the noise climate, especially during the April 2014 survey.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

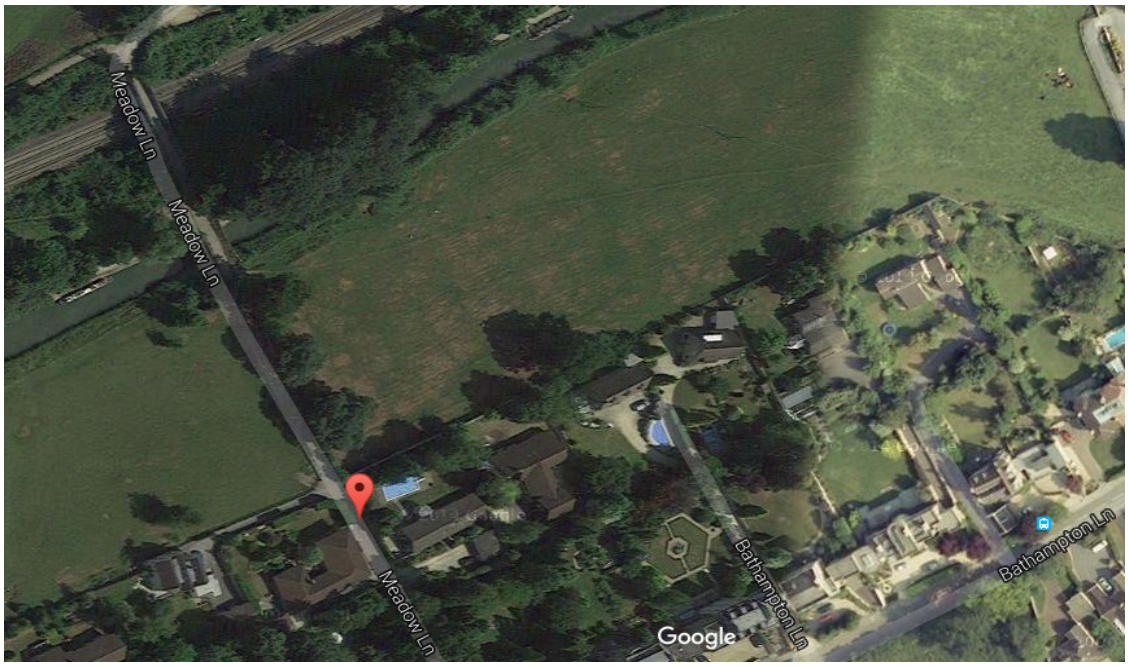
ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST7 - Meadow Lane - Bathampton			By	SR
GPS Coordinates	N: 51.393599 W: -2.3321271				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure



Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST7	Day	04/04/2014	11:57:02	15-minute	52.6	68.8	49.2	54.5
		04/04/2014	12:55:45	15-minute	54.1	65.1	50.5	56.5
		04/04/2014	14:23:04	15-minute	55	72.9	50.8	57.2

Comments

This position is considered to be acoustically representative of the existing ambient noise levels at the residential premises to the south of the Bathampton Spur.

Day-time noise levels were recorded at this location.

The sound level meter was located in Meadow Lane. The dominant noise sources at this location were road traffic noise from the A4 and also the A36, together with train noise.

Passing trains were observed between every 5 and 10 minutes. Noise from birds singing constantly and aircraft also contributed to the noise climate.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Apr-14
Measurement Location	ST8 - Grosvenor Bridge Road - Bathampton			By	SR
GPS Coordinates	N: 51.393857 W: -2.3426950				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST8	Day	04/04/2014	12:27:06	15-minute	52.9	69.6	42.1	56.6
		04/04/2014	13:23:13	15-minute	49.5	66.9	41.8	51
		04/04/2014	13:51:04	15-minute	48.8	66	41.3	51

Comments

This position is considered to be acoustically representative of the existing ambient noise levels at the residential premises the north of the Bathampton Spur.

Day-time noise levels were recorded at this location.

The sound level meter was located in the southern boundary of Grosvenor.

The dominant noise source at this location was train noise, with trains passing every 5 and 10 minutes. Noise from birds singing constantly and aircraft also contributed to the noise climate.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	May-15
Measurement Location	ST9 - Cotswold Road North - Bedminster			By	SR
GPS Coordinates	N: 51.43878 W: -2.59614				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST9	Day	22/05/2015	12:41:55	1-hour	52.5	73.1	45.6	52.6

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was people walking in the park, birds singing constantly, and also noise from the railway.
During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

Project	MetroWest Phase 1			Date	May-15
Measurement Location	ST10 - Napier Road - Avonmouth			By	SR
GPS Coordinates	N: 51.49891 W: -2.69771				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST10	Day	22/05/2015	10:04:46	1-hour	56.3	82.7	46.2	59

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was road traffic noise from the Avonmouth Road, birds singing constantly, and also noise from the railway.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	ST11 - Bunting Lane - Portbury Wharf Nature Reserve			By	SR
GPS Coordinates	N: 51.48853 W: -2.74249				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	50441914	Cal. Date	16-Oct-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST11	Day	21/09/2015	15:06:23	30-minute	45.2	66	41	46.3
		29/09/2015	10:00:42	17-minute	47.2	74.9	35.8	46.6
		29/09/2015	12:15:17	16-minute	46.7	65.6	37	49.6

Comments

Day-time noise levels were recorded at this location.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	ST12 - Wharf Lane - Portbury Wharf Nature Reserve			By	SR
GPS Coordinates	N: 51.48369 W: -2.74075				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST12	Day	21/09/2015	16:27:19	20-minute	47.3	61.2	45.7	48.4
		25/09/2015	11:01:19	18-minute	50.1	73.1	39.6	50.2
		25/09/2015	13:23:27	17-minute	52.4	76.1	41.3	47.1

Comments

Day-time noise levels were recorded at this location.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	ST13 - Near sea wall - Portbury Wharf Nature Reserve			By	SR
GPS Coordinates	N: 51.49141 W: -2.7436				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	50441914	Cal. Date	16-Oct-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST13	Day	21/09/2015	15:04:11	30-minute	44.9	69.4	39.2	47.1
		25/09/2015	10:25:37	17-minute	48.9	78.5	32.6	49.1
		25/09/2015	12:36:02	15-minute	45.5	73.3	32.3	42.7

Comments

Day-time noise levels were recorded at this location.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	ST14 - Avon George SAC			By	SR
GPS Coordinates	N: 51.45701 W: -2.63165				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	50441914	Cal. Date	19-Oct-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST14	Day	20/10/2015	14:43:39	28-minute	58.7	67.8	56.5	60.1

Comments

Day-time noise levels were recorded at this location.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	ST15 - Albert Road - Severn Beach			By	RS
GPS Coordinates	N: 51.55802 W: -2.6639163				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST15	Day	19/10/2015	11:36:26	24-minute	48.9	59.1	47	50

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was noise from the railway and road traffic noise.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	ST16 - Riverside Park - Severn Beach			By	SR
GPS Coordinates	N: 51.557356 W: -2.6653594				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST16	Day	19/10/2015	11:41:51	17-minute	53	73	46.4	49.9

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was noise from the railway and road traffic noise.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	ST17 - Chapel Pill Lane 1 - Ham Green			By	SR
GPS Coordinates	N: 51.47670 W: -2.67282				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST17	Day	20/10/2015	13:50:14	17-minute	39.5	59.9	36.1	40.4

Comments

Day-time noise levels were recorded at this location.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-16
Measurement Location	ST18 - Chapel Pill Lane 2 - Ham Green			By	SR
GPS Coordinates	N: 51.47914 W:-2.67165				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	20-Jan-2016
Microphone	MCE212	Serial No.	91247	Cal. Date	20-Jan-2016
Preamplifier	PRE21S	Serial No.	11790	Cal. Date	20-Jan-2016
Field Calibrator	01dB-Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST18	Day	29/09/2016	11:07:22	16-minute	46.2	64.9	43.2	47.7
		29/09/2016	12:15:46	15-minute	45.4	59.9	42.3	46.8
		29/09/2016	14:11:11	17-minute	47.5	61.7	43.9	49.7

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was birds singing constantly and noise from leaves in the trees.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-16
Measurement Location	ST19 - Chapel Pill Lane 3 - Ham Green			By	SR
GPS Coordinates	N: 51.47986 W:-2.66987				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	19-Jan-2015
Field Calibrator	01dB-Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST19	Day	29/09/2016	11:11:11	15-minute	47.8	56	45.8	49.3
		29/09/2016	12:19:00	14-minute	48	62.5	45.6	49.3
		29/09/2016	14:14:26	15-minute	49.3	69.2	46.1	50.7

Comments

Day-time noise levels were recorded at this location.

The dominant noise source at this location was birds singing constantly, noise from leaves in the trees and road traffic noise from the M5.

During the surveys the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-16
Measurement Location	ST20 - 5, Monmouth Road - Pill			By	SR
GPS Coordinates	N: 51.48160 W:-2.68709				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11159	Cal. Date	20&21-Oct-2014
Microphone	01 dB MCE 212	Serial No.	153676	Cal. Date	20&21-Oct-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16796	Cal. Date	20&21-Oct-2014
Field Calibrator	01dB-Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Position	Period	Date	Start time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
ST20	Day	29/09/2016	12:00:00	1-hour	56.9	73.6	54.7	58
		29/09/2016	13:00:00	1-hour	57.3	85.1	54.9	58.2
		29/09/2016	14:00:00	50-minute	56.8	70.3	54.8	58.1

Comments

Day-time noise levels were recorded at this location.

The sound level meter was located in the front garden of the number 5 Monmouth Road.

During the surveys the weather conditions were suitable for enviromental noise measurements.

LONG TERM MEASUREMENT LOCATIONS:

Noise Measurement Record

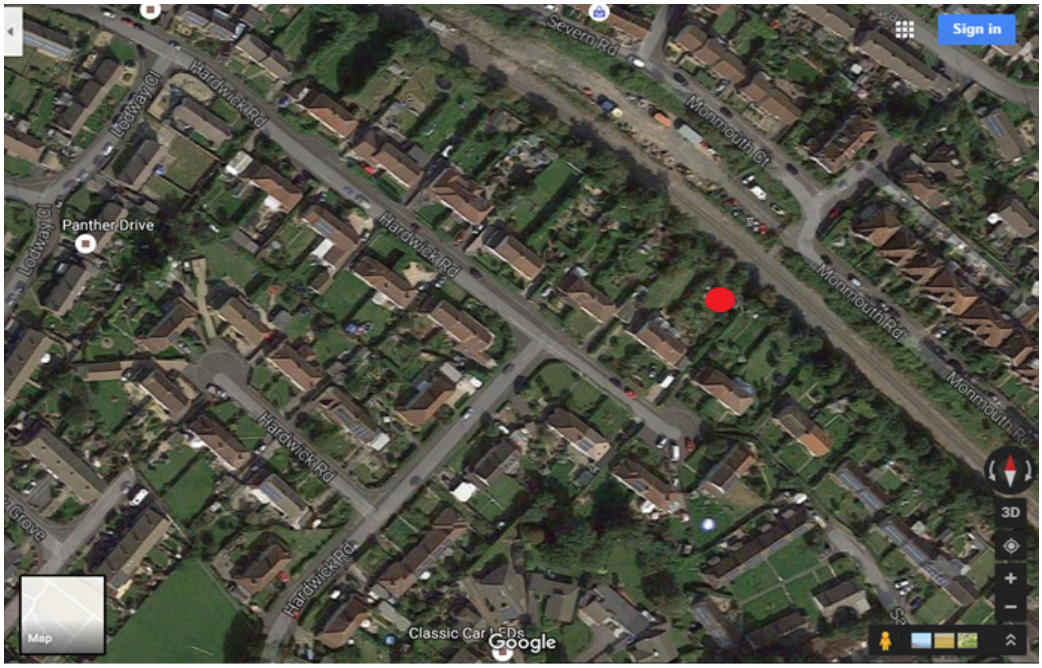
ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Dec-14
Measurement Location	LT1 - 38 Hardwick Road BS20 0DB - Pill			By	SR
GPS Coordinates	N: 51.481781 W: -2.688665				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	7-Jan-2014
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure



Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	50.9	85.8	46.5	50.6
Night time 6hour	47.6	74.1	43.1	48.9

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	51.0	85.8	46.7	50.7
Night time 8hour	48.3	74.1	43.7	49.2

Comments

The sound level meter was located at 30 meters from the existing rail line.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-14
Measurement Location	LT1 - 38 Hardwick Road BS20 0DB - Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	15/12/2014 12:00
End	19/12/2014 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
15/12/2014 12:00	45.8	63.7	42.7	47.5
15/12/2014 13:00	46.5	67.6	42.7	47.3
15/12/2014 14:00	46.6	62.8	43.1	47
15/12/2014 15:00	50.5	74.7	44	47.8
15/12/2014 16:00	48.3	66.7	45.4	48.7
15/12/2014 17:00	47.8	78	45.6	48.7
15/12/2014 18:00	49	65.3	47.2	49.9
15/12/2014 19:00	50.7	64.6	48.4	51.8
15/12/2014 20:00	49	64.2	45.7	50.4
15/12/2014 21:00	47.1	58.6	44	49.9
15/12/2014 22:00	50.2	69.3	45.8	50.9
15/12/2014 23:00	47.2	54.7	44.5	49.1
16/12/2014 00:00	46.3	61	42.9	47.8
16/12/2014 01:00	42.1	50.8	39.7	43.9
16/12/2014 02:00	49.4	71.6	42.6	47.8
16/12/2014 03:00	44.3	52.3	40.6	46.3
16/12/2014 04:00	48.9	58.2	45.1	51.4
16/12/2014 05:00	50.4	58.5	46.5	52.7
16/12/2014 06:00	53.3	60.2	49.9	56.1
16/12/2014 07:00	55.6	61.6	52.6	57.2
16/12/2014 08:00	53.9	64.6	51.9	55.4
16/12/2014 09:00	51.8	67.8	49	53.5
16/12/2014 10:00	57.8	85.8	49.4	53.6
16/12/2014 11:00	51.2	67.2	48.3	52.3
16/12/2014 12:00	50.5	68.2	47.3	50.9
16/12/2014 13:00	52.6	78.6	47.4	50.8
16/12/2014 14:00	49.6	69.9	46.8	51
16/12/2014 15:00	46.1	61.8	42.2	48.2
16/12/2014 16:00	47.4	71.7	41.9	46.5
16/12/2014 17:00	46.9	67.4	41.7	47.1
16/12/2014 18:00	45.3	64.5	41.8	46.4
16/12/2014 19:00	44.7	63.3	42.5	45.3
16/12/2014 20:00	47.7	73.6	41	44.7
16/12/2014 21:00	42.9	63.5	39.6	43.5
16/12/2014 22:00	45.6	65.3	39.6	45.8
16/12/2014 23:00	42.9	59.8	39.3	44.3
17/12/2014 00:00	45.9	64.1	40.8	48.9
17/12/2014 01:00	48	66.5	43.4	50.3
17/12/2014 02:00	49.3	71	42.6	49.3
17/12/2014 03:00	46.5	58.3	43.7	48.3
17/12/2014 04:00	45.6	57.7	42.7	47.4
17/12/2014 05:00	46.1	59.6	44.1	47.4
17/12/2014 06:00	48.6	56.2	46.5	50
17/12/2014 07:00	51	71.7	49	52.2
17/12/2014 08:00	52.5	75.2	50.6	53.2
17/12/2014 09:00	51.4	62.4	49.7	52.6
17/12/2014 10:00	51.8	67.9	49.1	52.7
17/12/2014 11:00	50	64.9	48.4	51.1
17/12/2014 12:00	54.6	80.3	47.4	50.8
17/12/2014 13:00	50.3	68	47.1	50.7
17/12/2014 14:00	50.2	67.6	47.3	50.4
17/12/2014 15:00	49.5	58.9	48	50.5
17/12/2014 16:00	49.5	63.9	47.6	50.5
17/12/2014 17:00	48.1	60.9	46.8	49.1

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-14
Measurement Location	LT1 - 38 Hardwick Road BS20 0DB - Pill	By	SR

17/12/2014 18:00	50	65.6	47.4	50.7
17/12/2014 19:00	49.6	65.7	47.4	50.8
17/12/2014 20:00	49.1	69.4	45.2	49.1
17/12/2014 21:00	46.5	59.3	44.4	47.7
17/12/2014 22:00	49.7	71.8	44.2	50
17/12/2014 23:00	44.9	57.3	42.4	46.4
18/12/2014 00:00	46	60.6	41.9	47.8
18/12/2014 01:00	47.6	69.4	41.4	48.3
18/12/2014 02:00	46.2	60.1	42.4	48.5
18/12/2014 03:00	46.5	59.6	43.2	48.6
18/12/2014 04:00	46.4	56.2	43.4	48.2
18/12/2014 05:00	49.7	74.1	46.4	51.7
18/12/2014 06:00	51.4	63.6	48.4	53.4
18/12/2014 07:00	52	64.2	49.9	53.4
18/12/2014 08:00	52.6	72.8	50.3	54.1
18/12/2014 09:00	52.5	67	49.8	54.4
18/12/2014 10:00	52	71.2	48.6	53.3
18/12/2014 11:00	50	64.2	48	51.1
18/12/2014 12:00	51.8	64.9	48.7	54
18/12/2014 13:00	54.2	77.8	49.2	54.1
18/12/2014 14:00	50.8	64.2	48.4	52.4
18/12/2014 15:00	51.5	64.5	49	53.2
18/12/2014 16:00	52.6	78.3	49.6	54.2
18/12/2014 17:00	52.8	64.9	49.2	55.3
18/12/2014 18:00	50.9	65.9	48	52.9
18/12/2014 19:00	50.3	64.7	47.1	52.2
18/12/2014 20:00	48.1	63.6	43.8	49.7
18/12/2014 21:00	45	63.2	42.5	46.3
18/12/2014 22:00	46.1	66.1	41.1	45.2
18/12/2014 23:00	43.6	58.5	40.8	45.2
19/12/2014 00:00	45.5	66.9	41	47.7
19/12/2014 01:00	48	63.9	43.2	50.3
19/12/2014 02:00	48.5	66.9	42.9	50.7
19/12/2014 03:00	47.4	60.5	43.1	49.8
19/12/2014 04:00	45.6	55.2	42.2	47.7
19/12/2014 05:00	51.1	60.6	47.7	53.2
19/12/2014 06:00	54	60.6	51.5	55.9
19/12/2014 07:00	54.8	66.8	52.8	56.1
19/12/2014 08:00	54	66.1	51.7	55.2
19/12/2014 09:00	52.2	74	50.1	53.2

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Aug-15
Measurement Location	LT2 - Shipway Gate Farm - Sheepway			By	SR
GPS Coordinates	N: 51.48087 W: -2.74099				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels (dB)

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	52.7	77.6	47.6	52.7
Night time 6hour	45.6	77.9	40.1	46.5

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	52.8	77.6	47.7	52.8
Night time 8hour	48.1	77.9	41.6	47.8

Comments

The dominant noise source at this location was road traffic noise from the M5. Other sources included birdsong and noise from a local road network.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Aug-15
Measurement Location	LT2 - Shipway Gate Farm - Sheepway	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	17/08/2015 11:00
End	21/08/2015 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
17/08/2015 11:00	48	72.5	37.4	50.6
17/08/2015 12:00	44.6	69.7	36.1	47.1
17/08/2015 13:00	45.5	64.8	36.6	48.2
17/08/2015 14:00	45.4	75.1	34.4	46.7
17/08/2015 15:00	44.1	63.2	34.1	47
17/08/2015 16:00	42.5	61.2	34.4	45.7
17/08/2015 17:00	46	66.8	35.6	49
17/08/2015 18:00	44.5	68.7	35.3	47.9
17/08/2015 19:00	41.3	61.7	33.2	44.7
17/08/2015 20:00	42.6	66.2	33	44.6
17/08/2015 21:00	46.8	76	42.3	48.3
17/08/2015 22:00	43.6	58.3	39.2	45.9
17/08/2015 23:00	43.6	52.8	39.7	45.9
18/08/2015 00:00	41.9	53.1	37.7	44.1
18/08/2015 01:00	41.8	51.8	37.7	44
18/08/2015 02:00	41.8	54.1	36.3	44.5
18/08/2015 03:00	40.7	52.7	36.9	43.1
18/08/2015 04:00	41.7	50.7	39	43.6
18/08/2015 05:00	47.5	77.9	40.7	48.5
18/08/2015 06:00	51.2	66.7	46.8	53
18/08/2015 07:00	54.2	67.9	51.5	55.8
18/08/2015 08:00	52	65.6	49.2	53.6
18/08/2015 09:00	49.7	69.1	45.7	51.4
18/08/2015 10:00	46.5	62.5	41.8	48.3
18/08/2015 11:00	48.4	68.7	43.1	49.7
18/08/2015 12:00	48.5	64.2	46.1	50.1
18/08/2015 13:00	49.9	63.8	47.7	51.3
18/08/2015 14:00	50.9	60.4	48.2	52.8
18/08/2015 15:00	53	77.6	49.9	54.5
18/08/2015 16:00	51.8	70.9	49.5	53.4
18/08/2015 17:00	52	68.9	49	53.7
18/08/2015 18:00	50.9	63.8	47.9	53
18/08/2015 19:00	49.6	64.2	47.2	51
18/08/2015 20:00	48.8	65.9	46.5	49.9
18/08/2015 21:00	47.6	69.8	44.6	49
18/08/2015 22:00	45.8	56.6	42.3	47.7
18/08/2015 23:00	43.9	58.2	39.8	46
19/08/2015 00:00	41.5	56.7	36.6	43.8
19/08/2015 01:00	40.4	56.5	35.4	42.7
19/08/2015 02:00	40.4	57.6	35.7	42.5
19/08/2015 03:00	44	55.8	39.4	46.4
19/08/2015 04:00	45.7	57.3	41.4	48.1
19/08/2015 05:00	50.7	76.3	46.4	52.6
19/08/2015 06:00	54.9	66.7	51.8	57
19/08/2015 07:00	56.2	66.8	54	57.6
19/08/2015 08:00	55.1	68.7	53.3	56.1
19/08/2015 09:00	53.5	62.8	52.1	54.5
19/08/2015 10:00	55.5	67.8	52.7	57.4
19/08/2015 11:00	56.4	65.6	53.3	58.5
19/08/2015 12:00	55.4	66.2	52.6	57.1
19/08/2015 13:00	54.4	60.4	52.8	55.6
19/08/2015 14:00	55.3	66.3	53.9	56.3
19/08/2015 15:00	56.4	68.2	55	57.3
19/08/2015 16:00	57	77.6	55.4	57.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Aug-15
Measurement Location	LT2 - Shipway Gate Farm - Sheepway	By	SR

19/08/2015 17:00	56.8	64.4	55.6	57.6
19/08/2015 18:00	56.2	68.6	54.6	57.2
19/08/2015 19:00	54.8	66.5	53	56
19/08/2015 20:00	53.2	67.3	51.1	54.4
19/08/2015 21:00	51.5	56.6	49.8	52.7
19/08/2015 22:00	50.4	58.1	47.8	52.1
19/08/2015 23:00	47.6	58.8	43.1	49.8
20/08/2015 00:00	44.2	59	38.9	46.6
20/08/2015 01:00	41.7	51.3	37.2	44.2
20/08/2015 02:00	42.8	54.7	37.5	45.6
20/08/2015 03:00	42.6	52.6	38.4	45
20/08/2015 04:00	44.9	53.3	41.2	47.1
20/08/2015 05:00	50.3	76.3	44.3	51.8
20/08/2015 06:00	55.3	69.2	51.3	57.1
20/08/2015 07:00	56.4	77.3	54.6	57.3
20/08/2015 08:00	55.1	65.7	52.8	56.6
20/08/2015 09:00	52.9	65.8	51.2	54.1
20/08/2015 10:00	53.6	65.6	51.3	54.9
20/08/2015 11:00	53.8	67.5	51.2	55
20/08/2015 12:00	53.7	65.9	51.7	54.9
20/08/2015 13:00	53.2	72.3	50.9	54
20/08/2015 14:00	52.4	66.9	49.8	53.8
20/08/2015 15:00	52.5	64.3	50.4	53.5
20/08/2015 16:00	53.4	66	51.5	54.5
20/08/2015 17:00	53.2	65.3	51.4	54.5
20/08/2015 18:00	54.3	76.6	52.1	55.3
20/08/2015 19:00	53.9	64.1	52.2	55.1
20/08/2015 20:00	53	65.3	51	54.2
20/08/2015 21:00	51.6	64	49.6	52.9
20/08/2015 22:00	50.7	64.9	48.5	52
20/08/2015 23:00	48.6	56.5	45.8	50.3
21/08/2015 00:00	47.2	59.1	43.9	49.3
21/08/2015 01:00	47.6	57.7	43.7	50
21/08/2015 02:00	44.9	55.1	41.8	46.9
21/08/2015 03:00	44.9	54.5	42.1	46.9
21/08/2015 04:00	46.3	54.4	43.5	48
21/08/2015 05:00	49.5	64.3	45.6	51.2
21/08/2015 06:00	53.6	72.9	50.6	54.6
21/08/2015 07:00	55.1	66.9	53.2	56.4
21/08/2015 08:00	55	62.2	53.4	56.1
21/08/2015 09:00	53.9	65	52.1	55.1

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	LT3 - The New House, Sheepway Lane - Sheepway			By	SR
GPS Coordinates	N: 51.481538 W: -2.7301455				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	52.9	78.3	48.1	52.8
Night time 6hour	48.3	66.6	43.8	49.9

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	53.0	78.3	48.2	52.8
Night time 8hour	49.6	73.0	44.8	50.7

Comments

The sound level meter was located in the front garden.

Some periods were contaminated by the barking of dogs. These periods have been removed from the analysis as they are only representative of the local environment and not the general area.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT3 - The New House, Sheepway Lane - Sheepway	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	21/09/2015 18:00
End	25/09/2015 13:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
21/09/2015 18:00	55.5	78.3	52.6	57.5
21/09/2015 19:00	54.4	70.8	51	54.4
21/09/2015 20:00	52.2	66.3	50	53.6
21/09/2015 21:00	51.4	59.1	49.2	52.9
21/09/2015 22:00	53.3	59.8	50.8	55
21/09/2015 23:00	52.3	63.5	48.7	54.3
22/09/2015 00:00	50	58.8	46.7	51.9
22/09/2015 01:00	50.3	60.6	46.6	52.9
22/09/2015 02:00	53.2	62.8	48.2	55.6
22/09/2015 03:00	48.8	60.2	43.8	51.4
22/09/2015 04:00	47.7	57	44	50
22/09/2015 05:00	50	58.6	47	51.9
22/09/2015 06:00	52.2	71	48.9	53
22/09/2015 07:00	52.1	69.8	47.5	52.3
22/09/2015 08:00	51	67	46	52.3
22/09/2015 09:00	50.5	69.4	44.3	52
22/09/2015 10:00	45.4	60.6	41.2	47.2
22/09/2015 11:00	45.3	69.3	41.5	46.5
22/09/2015 12:00	43.3	54.9	40	45.1
22/09/2015 13:00	43	64.1	38.7	44.9
22/09/2015 14:00	44.9	65.7	39.4	45.1
22/09/2015 15:00	45.1	59.7	39.8	47.2
22/09/2015 16:00	45	60.1	42.7	46.5
22/09/2015 17:00	43.8	62.7	40	45.5
22/09/2015 18:00	44.8	65.9	41.8	46.7
22/09/2015 19:00	46.7	72.7	40.3	45.3
22/09/2015 20:00	41.4	56.8	38.2	43.3
22/09/2015 21:00	45.9	57	39.4	49
22/09/2015 22:00	49.7	58.2	46.7	51.5
22/09/2015 23:00	47.2	62.1	42.5	49.5
23/09/2015 00:00	44.8	66.6	40.2	46.9
23/09/2015 01:00	45.5	56.3	40.2	48.2
23/09/2015 02:00	45.6	56.8	41	48.1
23/09/2015 03:00	45.6	56.1	41.2	48.3
23/09/2015 04:00	48.1	58.5	44.1	50.4
23/09/2015 05:00	49.8	56.7	47.2	51.4
23/09/2015 06:00	53.9	69.3	49.9	55.7
23/09/2015 07:00	57.4	70.1	55.5	58.4
23/09/2015 08:00	55.9	71	52.2	57.5
23/09/2015 09:00	54.8	71.4	50.7	56.1
23/09/2015 10:00	54.1	69.2	51.4	55.2
23/09/2015 11:00	54.5	68	52.4	55.4
23/09/2015 12:00	54.5	71.1	53	55.5
23/09/2015 13:00	54.3	62.1	52.5	55.6
23/09/2015 14:00	53.9	66.7	52.2	55.1
23/09/2015 15:00	53.5	65.4	51.8	54.6
23/09/2015 16:00	54	59.7	52.6	55.1
23/09/2015 17:00	55.5	64.5	54	56.6
23/09/2015 18:00	55.4	65.8	53.3	56.8
23/09/2015 19:00	55.4	73.7	53.4	56.5
23/09/2015 20:00	53.8	60.2	52	55.1
23/09/2015 21:00	53.4	69.7	51.5	54.7
23/09/2015 22:00	53	62.6	50.8	54.6
23/09/2015 23:00	51.2	60.6	48.5	53

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT3 - The New House, Sheepway Lane - Sheepway	By	SR

24/09/2015 00:00	49.1	61.1	45.9	51
24/09/2015 01:00	48.8	57.7	45.6	50.9
24/09/2015 02:00	48.5	57.5	45.1	50.5
24/09/2015 03:00	45.9	54.8	42.8	47.9
24/09/2015 04:00	48.4	55.9	44.9	50.5
24/09/2015 05:00	50	56.9	47.7	51.6
24/09/2015 06:00	53	69.4	49.5	54.8
24/09/2015 07:00	55.9	75.4	53.9	56.8
24/09/2015 08:00	55.7	71.5	52.2	56.9
24/09/2015 09:00	54	75	49.6	54.6
24/09/2015 10:00	53	69.9	50.6	54.3
24/09/2015 11:00	55	76.5	51.6	56.5
24/09/2015 12:00	55	59.4	53.4	56.2
24/09/2015 13:00	54.3	65.4	51.6	55.9
24/09/2015 14:00	54.1	67.4	52.4	55.2
24/09/2015 15:00	55.4	67.3	52.7	57.4
24/09/2015 16:00	58	67.4	54.9	60.7
24/09/2015 17:00	56	73.1	54.3	57
24/09/2015 18:00	54.9	67.9	53.3	56
24/09/2015 19:00	53.9	74.9	51.1	55.2
24/09/2015 20:00	50.9	58.8	47.2	52.7
24/09/2015 21:00	51	58.6	48.7	52.5
24/09/2015 22:00	48.2	55.4	45.7	49.8
24/09/2015 23:00	47.1	55.9	43.6	49.1
25/09/2015 00:00	46.9	59.8	41.8	49.4
25/09/2015 01:00	45.9	56.4	41	48.5
25/09/2015 02:00	45	58.8	40.7	47.4
25/09/2015 03:00	43.4	51.1	39.5	45.8
25/09/2015 04:00	44.9	53.6	41.5	47
25/09/2015 05:00	48.9	55	45.6	50.9
25/09/2015 06:00	53.9	73	49.7	55
25/09/2015 07:00	53.2	70.8	50.3	54.3
25/09/2015 08:00	52.4	70.8	45.8	53.9
25/09/2015 09:00	48.7	69.5	43	49.3
25/09/2015 10:00	48.8	70.6	41.2	48.8
25/09/2015 11:00	47.2	68.4	43.2	47.8
25/09/2015 12:00	45.1	66.1	40.2	46.4
25/09/2015 13:00	48.8	71.6	43	50.2

Noise Measurement Record

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travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	LT4 - Springfield Cottage Wharf Lane -Sheepway			By	SR
GPS Coordinates	N: 51.484251 W: -2.7382216				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	48.8	84.7	44.3	48.9
Night time 6hour	44.8	73.3	39.4	45.1

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	49.0	83.2	44.5	49.0
Night time 8hour	45.4	84.7	40.1	45.7

Comments

The dominant noise source at this location was intermittent road traffic noise from the local road and birdsong.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT4 - Springfield Cottage Wharf Lane -Sheepway	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	21/09/2015 17:00
End	25/09/2015 12:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
21/09/2015 17:00	51.7	77.6	47.9	50.8
21/09/2015 18:00	49	60.8	47.2	50.2
21/09/2015 19:00	48.4	78	45.8	48.6
21/09/2015 20:00	47.5	65.3	45.2	48.3
21/09/2015 21:00	47.1	57.2	45	48.5
21/09/2015 22:00	48.5	54.5	46.2	50
21/09/2015 23:00	47.7	64.1	44.7	49.4
22/09/2015 00:00	46.3	55.4	43.3	48.1
22/09/2015 01:00	47.5	60.2	42.7	51.1
22/09/2015 02:00	52.2	62.3	45	55.5
22/09/2015 03:00	47.3	55.3	42.3	50
22/09/2015 04:00	42.7	53.5	39.3	45.2
22/09/2015 05:00	44.6	57.2	41.2	46.7
22/09/2015 06:00	46.3	62	43.6	47.9
22/09/2015 07:00	44.9	58.1	42.9	46.3
22/09/2015 08:00	46	68	42.7	47.4
22/09/2015 09:00	45.6	70.8	41.1	46.4
22/09/2015 10:00	46.4	73.7	39.5	46.6
22/09/2015 11:00	49.2	74	39.7	49
22/09/2015 12:00	45.1	73.6	39.9	45.4
22/09/2015 13:00	43.2	62.5	37.9	44.6
22/09/2015 14:00	47.3	70.9	38.4	48.3
22/09/2015 15:00	45.7	62.1	38.1	48.5
22/09/2015 16:00	44.7	63.6	40.4	46
22/09/2015 17:00	46.2	71.5	38.6	45.2
22/09/2015 18:00	44.7	70.8	39.1	44.8
22/09/2015 19:00	45.4	77.9	37.3	42.6
22/09/2015 20:00	38.6	53.9	35.4	39.7
22/09/2015 21:00	42.4	73.5	35.4	42.4
22/09/2015 22:00	43.7	60.1	40.8	45.4
22/09/2015 23:00	43.3	65	35.7	42.9
23/09/2015 00:00	38.1	46.7	35.2	40
23/09/2015 01:00	39	49.3	35.3	41.3
23/09/2015 02:00	39.3	46.9	36.1	41.4
23/09/2015 03:00	39.2	49	36.3	41.1
23/09/2015 04:00	41.6	52.1	37.7	43.9
23/09/2015 05:00	42.4	50.1	40.1	43.8
23/09/2015 06:00	47	67.4	41.5	48.9
23/09/2015 07:00	52.4	62.2	50.4	53.5
23/09/2015 08:00	53.1	71.5	48.4	54.8
23/09/2015 09:00	50.7	70.2	46.4	51.8
23/09/2015 10:00	51.3	66.8	49.2	52.2
23/09/2015 11:00	50.3	64	48.3	51.4
23/09/2015 12:00	50	61.2	48.2	51.3
23/09/2015 13:00	50.4	66.6	48.1	51.7
23/09/2015 14:00	49.5	62.3	47.3	50.7
23/09/2015 15:00	50.1	66.5	47.4	50.8
23/09/2015 16:00	49.7	65.3	47.9	50.7
23/09/2015 17:00	51.3	62.8	49.7	52.1
23/09/2015 18:00	51.5	65	49.3	52.9
23/09/2015 19:00	51.4	59.7	49.4	52.6
23/09/2015 20:00	49.6	59.3	47.9	50.7
23/09/2015 21:00	49.3	61.4	47.8	50.4
23/09/2015 22:00	48.9	55.6	46.8	50.3

Noise Measurement Record

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travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT4 - Springfield Cottage Wharf Lane -Sheepway	By	SR

23/09/2015 23:00	46.9	57.4	44.5	48.4
24/09/2015 00:00	45.3	58.4	42.7	47
24/09/2015 01:00	45.3	55.2	42.7	47
24/09/2015 02:00	44.8	51.5	41.9	46.6
24/09/2015 03:00	42	54.3	39.4	43.6
24/09/2015 04:00	43.4	50.2	40.4	45.2
24/09/2015 05:00	44.9	53.6	42.6	46.5
24/09/2015 06:00	48.3	64.5	44.2	50.8
24/09/2015 07:00	50.9	62.8	49.2	52
24/09/2015 08:00	50.5	65.8	48.2	51.6
24/09/2015 09:00	48.9	65.8	46	50
24/09/2015 10:00	49.4	73.1	46.8	50.3
24/09/2015 11:00	50.4	63	47.7	52
24/09/2015 12:00	50.8	64.1	49	51.9
24/09/2015 13:00	50.1	63.9	47.1	51.6
24/09/2015 14:00	50.7	69.8	48	52.2
24/09/2015 15:00	50.6	71.1	47.7	51.4
24/09/2015 16:00	51.8	73.5	49.2	52.8
24/09/2015 17:00	52	71.9	49.8	52.3
24/09/2015 18:00	51	74.1	48.5	51.2
24/09/2015 19:00	50.6	81.9	46.1	50.5
24/09/2015 20:00	47.1	60.5	43.6	48.7
24/09/2015 21:00	47	75.7	44.3	48.4
24/09/2015 22:00	44.6	71.8	40.8	44.8
24/09/2015 23:00	48	84.7	40.5	45.6
25/09/2015 00:00	48.7	73.3	40	46.9
25/09/2015 01:00	43.3	50.4	39.3	45.6
25/09/2015 02:00	40.9	55.7	36.2	43.3
25/09/2015 03:00	36.5	51.1	33.4	38.6
25/09/2015 04:00	37.9	46.5	34.9	40.1
25/09/2015 05:00	41.8	52.3	38.7	43.7
25/09/2015 06:00	45.8	60.2	42.7	47.2
25/09/2015 07:00	45.8	62.3	42.4	47.1
25/09/2015 08:00	46.5	61.4	41.9	49
25/09/2015 09:00	48.9	83.2	40.6	46.8
25/09/2015 10:00	42.9	71	38.7	43.7
25/09/2015 11:00	44.3	67.1	40.6	45.4
25/09/2015 12:00	42.9	56.1	39.5	44.7

Noise Measurement Record

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travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	LT5 - The Bungalow BS20 7TE - Sheepway			By	SR
GPS Coordinates	N: 51.48127 W: -2.73414				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	52.9	78.8	50.4	53.7
Night time 6hour	48.0	63.9	45.4	49.2

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	53.0	74.5	50.6	53.8
Night time 8hour	49.4	78.8	46.2	50.0

Comments

The dominant noise source at this location was distant road traffic noise from the M5. Other sources included birdsong

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT5 - The Bungalow BS20 7TE - Sheepway	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	29/09/2015 11:00
End	01/10/2015 12:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
29/09/2015 11:00	52.9	64.9	50.6	54.3
29/09/2015 12:00	53.4	66.5	51.4	54.5
29/09/2015 13:00	52.7	64.3	50.6	54.1
29/09/2015 14:00	51.5	64.4	49.6	52.8
29/09/2015 15:00	51.8	61.3	49.7	53.2
29/09/2015 16:00	52.9	68.8	51	54
29/09/2015 17:00	52.8	65.3	51	53.9
29/09/2015 18:00	52.1	66.6	50.2	53.1
29/09/2015 19:00	51.3	63.2	49.7	52.5
29/09/2015 20:00	51.3	64.2	49.7	52.5
29/09/2015 21:00	50.8	62	49.1	52
29/09/2015 22:00	50.1	57.9	47.8	51.6
29/09/2015 23:00	48.1	58.1	45.6	49.7
30/09/2015 00:00	45.6	53.5	43.4	47.1
30/09/2015 01:00	45.4	53.5	43.1	47
30/09/2015 02:00	45.4	54.8	43.4	46.8
30/09/2015 03:00	46.8	63.9	44.5	47.9
30/09/2015 04:00	48.1	57.8	46	49.7
30/09/2015 05:00	50.5	58	48.3	52.1
30/09/2015 06:00	54	74.7	51.9	55.2
30/09/2015 07:00	56.1	66.4	54.6	56.9
30/09/2015 08:00	55	69.7	53.6	56
30/09/2015 09:00	52.9	64.3	50.9	54.2
30/09/2015 10:00	50.9	61.6	49.2	52.1
30/09/2015 11:00	54.4	69.7	49	54.2
30/09/2015 12:00	53.4	65.5	51.7	54.5
30/09/2015 13:00	53.4	63.7	51.8	54.6
30/09/2015 14:00	54	68.5	52.1	55.1
30/09/2015 15:00	54.4	66.9	52.6	55.6
30/09/2015 16:00	55.2	63	53.5	56.3
30/09/2015 17:00	55.3	63.9	53.6	56.4
30/09/2015 18:00	54.7	62.8	53.2	55.7
30/09/2015 19:00	54	65.3	52.5	55
30/09/2015 20:00	52.6	61.2	51	53.8
30/09/2015 21:00	52.4	65.1	50.3	53.7
30/09/2015 22:00	49.6	57.3	47.1	51.6
30/09/2015 23:00	47.6	55.3	45.6	49.1
01/10/2015 00:00	47.4	56.1	45.2	48.9
01/10/2015 01:00	47.7	57.3	45.2	49.4
01/10/2015 02:00	48	56.5	45.4	49.6
01/10/2015 03:00	47.7	56	45.2	49.3
01/10/2015 04:00	48.7	55.5	46.2	50.3
01/10/2015 05:00	50.5	55.9	48.3	51.8
01/10/2015 06:00	54.4	78.8	51.8	55.5
01/10/2015 07:00	55.2	74.5	52.1	56.5
01/10/2015 08:00	52.1	70.6	50.2	53.2
01/10/2015 09:00	51.3	67.9	49.5	52.5
01/10/2015 10:00	50.4	64.2	48.2	51.4
01/10/2015 11:00	50.1	71.8	46.8	51.6
01/10/2015 12:00	48.8	65.1	46.5	49.9

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Sep-15
Measurement Location	LT6 - 28 Conference Avenue - Portishead			By	SR
GPS Coordinates	N: 51.480148 W: -2.7552671				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	45.8	79.3	41.4	47.0
Night time 6hour	40.1	66.8	37.3	40.8

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	46.0	79.3	41.5	47.4
Night time 8hour	41.2	67.9	38.0	41.5

Comments

The dominant noise source at this location was from traffic on the local road network. Other sources included noise from the school in Portisahead.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Sep-15
Measurement Location	LT6 - 28 Conference Avenue - Portishead	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	29/09/2015 11:00
End	01/10/2015 12:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
29/09/2015 11:00	45.6	66.7	40.6	45.5
29/09/2015 12:00	46.8	60.2	41.2	49.5
29/09/2015 13:00	45.6	67.9	38.9	48.2
29/09/2015 14:00	44.4	71.3	39.5	45.6
29/09/2015 15:00	45.4	63.8	41.5	47.2
29/09/2015 16:00	45.6	67.6	41.1	46.7
29/09/2015 17:00	45.1	65.1	41.1	47.5
29/09/2015 18:00	45.1	67.4	41.1	47
29/09/2015 19:00	45.8	79.3	41.7	46.1
29/09/2015 20:00	43.5	57.7	41.3	45
29/09/2015 21:00	43.1	60.8	40.5	43.7
29/09/2015 22:00	42	60.7	39.4	43
29/09/2015 23:00	40.6	61.7	37.1	41.5
30/09/2015 00:00	38.2	50.4	36.2	39.4
30/09/2015 01:00	37.5	47.2	35.7	38.8
30/09/2015 02:00	40.1	64.5	36	39.4
30/09/2015 03:00	40.9	62.3	37.3	41.1
30/09/2015 04:00	40.3	49.6	38.1	41.7
30/09/2015 05:00	42.7	53.1	40.5	44
30/09/2015 06:00	45.6	67.9	43.2	46.8
30/09/2015 07:00	49.9	65.9	47	51.9
30/09/2015 08:00	49.4	66.2	46.4	51.3
30/09/2015 09:00	46.6	61.8	44.5	48
30/09/2015 10:00	46	64.9	42.5	47.9
30/09/2015 11:00	46.7	71.5	41.5	47.3
30/09/2015 12:00	48	70.5	42.2	49.8
30/09/2015 13:00	46.9	66.6	42.7	49.5
30/09/2015 14:00	47.4	63.7	43.2	49.6
30/09/2015 15:00	47.5	62.5	43.2	49.6
30/09/2015 16:00	48	63.8	44.2	50.2
30/09/2015 17:00	46.7	63.3	43.7	48.5
30/09/2015 18:00	46.2	64.2	42.9	47.9
30/09/2015 19:00	45.8	64.8	43.4	47
30/09/2015 20:00	43.8	72.5	41.3	44.7
30/09/2015 21:00	42.7	53.7	40.4	44.2
30/09/2015 22:00	41	54.3	37.9	42.7
30/09/2015 23:00	39.1	50.9	37.2	40.4
01/10/2015 00:00	38.9	49.2	37	40
01/10/2015 01:00	38	44.6	36.1	39.4
01/10/2015 02:00	41.2	66.8	37.8	41
01/10/2015 03:00	39.8	60.4	37.5	40.8
01/10/2015 04:00	38.7	50.3	37.1	39.7
01/10/2015 05:00	41.8	60.8	38.6	43.8
01/10/2015 06:00	45	53.7	43.2	46.2
01/10/2015 07:00	46.6	56.8	42.8	49.3
01/10/2015 08:00	45.5	65.2	38.9	48.3
01/10/2015 09:00	43.8	66.2	39.2	46.2
01/10/2015 10:00	45	63.1	38.2	48.9
01/10/2015 11:00	43.6	68.9	37.2	46.2
01/10/2015 12:00	45.9	65.5	40.5	48

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT7 - 15 Peartree Field - Portishead			By	SR
GPS Coordinates	N: 51.483295 W: -2.7567369				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	53.9	94.0	45.1	55.7
Night time 6hour	46.0	68.8	36.2	47.8

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	54.2	94.0	46.0	56.1
Night time 8hour	48.2	78.3	37.1	49.4

Comments

The dominant noise source at this location was road traffic noise from Quay Avenue.

Some data has beeen removed from the analysis due to contamination from a local source assumed to be an extractor fan.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT7 - 15 Peartree Field - Portishead	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	06/10/2015 12:00
End	09/10/2015 10:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
06/10/2015 12:00	52.5	65.9	43.9	55.6
06/10/2015 13:00	53	65.7	44.9	55.9
06/10/2015 14:00	52.6	67.7	44.2	55.5
06/10/2015 15:00	52.7	66.8	45.7	55.3
06/10/2015 16:00	54.6	77.4	48	56.6
06/10/2015 17:00	54.8	72.2	49.9	56.6
06/10/2015 18:00	54.3	64.6	49.6	56.5
06/10/2015 19:00	52.3	62.3	44.5	55.3
06/10/2015 20:00	51.1	66.1	43.1	54.4
06/10/2015 21:00	49.1	64.9	38.9	53.2
06/10/2015 22:00	49.8	83.2	35.9	52.3
06/10/2015 23:00	49	78.7	36.1	51.7
07/10/2015 00:00	44	61.1	31.7	46.5
07/10/2015 01:00	41.9	63.3	31.9	43.6
07/10/2015 02:00	44.4	58.6	38.3	47.3
07/10/2015 03:00	45.1	61.8	39.5	47.3
07/10/2015 04:00	45	62.4	36.5	47.6
07/10/2015 05:00	50.3	69.1	38.4	54.5
07/10/2015 06:00	53.2	67.3	43.6	57
07/10/2015 07:00	55.5	63.7	50.2	58
07/10/2015 08:00	57.4	69.9	52.3	59.3
07/10/2015 09:00	56.4	90.2	49.5	58.2
07/10/2015 10:00	57.4	83.6	49.5	57.9
07/10/2015 11:00	55.1	66.9	49.8	57.6
07/10/2015 12:00	56.1	90.8	48.4	57.1
07/10/2015 13:00	55	77.8	48.8	57
07/10/2015 14:00	54.5	69.1	48.8	57
07/10/2015 15:00	54.6	71.2	49.2	56.8
07/10/2015 16:00	54.8	69	49.6	57
07/10/2015 17:00	55.6	68.1	51.4	57.7
07/10/2015 18:00	55.7	64.7	51.9	57.7
07/10/2015 19:00	53.6	65.4	46.5	56.4
07/10/2015 20:00	51.3	62.3	42.4	54.7
07/10/2015 21:00	50.7	62.9	40.8	54.3
07/10/2015 22:00	49.8	65.6	38.3	53.5
07/10/2015 23:00	45.2	62	31.2	49.6
08/10/2015 00:00	39.8	58.1	28.6	40.5
08/10/2015 01:00	39.3	64.5	28.2	38.4
08/10/2015 02:00	37.9	57	28.5	37.8
08/10/2015 03:00	39.8	64.6	29	34.7
08/10/2015 04:00	42.6	63.5	30.2	43.1
08/10/2015 05:00	48.8	63.9	34.4	52.4
08/10/2015 06:00	53.3	65.9	47.1	56.5
08/10/2015 07:00	54.5	66.6	48.8	57.1
08/10/2015 08:00	54.8	67.7	49.1	57.2
08/10/2015 09:00	54.9	83	45.3	57
08/10/2015 10:00	52.7	82.5	42.3	55.3
08/10/2015 11:00	56.3	96.2	44.4	56
08/10/2015 12:00	53	81.8	44.4	55.5
08/10/2015 13:00	53.2	74.1	44.8	55.7
08/10/2015 14:00	53.3	67.2	46.5	55.9
08/10/2015 15:00	53.2	71.1	46.8	55.8
08/10/2015 16:00	53.8	72.9	48.1	56.2
08/10/2015 17:00	56.9	89.7	50.2	57.2

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT7 - 15 Peartree Field - Portishead	By	SR

08/10/2015 18:00	54.9	82	49.6	56.6
08/10/2015 19:00	53.3	80	44.9	55.8
08/10/2015 20:00	51.1	70.4	41.4	54.7
08/10/2015 21:00	50.1	66.2	40.7	53.8
08/10/2015 22:00	48.5	60.8	36.9	53
08/10/2015 23:00	44.6	63.3	31.8	49
09/10/2015 00:00	42.5	62.2	28.6	44.2
09/10/2015 01:00	40.2	61.9	27.5	38.4
09/10/2015 02:00	35.2	63.4	28	34.1
09/10/2015 03:00	47.8	62.7	32.3	49.7
09/10/2015 04:00	46.6	62.3	44.1	47.1
09/10/2015 05:00	48.8	62.3	44.1	51.8
09/10/2015 06:00	51.1	62	42.2	55.3
09/10/2015 07:00	54.7	66.6	47.3	57.2
09/10/2015 08:00	56.6	89.6	49.2	57.6
09/10/2015 09:00	54.2	67.7	46.8	57

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT8 - 10 Tydeman Road BS20 7LS - Portishead			By	SR
GPS Coordinates	N: 51.48234 W: -2.7524936				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	44.5	82.6	35.6	44.7
Night time 6hour	37.5	64.2	31.8	38.2

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	44.8	82.6	35.8	45.3
Night time 8hour	38.2	66.5	32.2	38.7

Comments

The dominant noise source at this location was local road traffic noise. Other sources included birdsong and the nearby school.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT8 - 10 Tydeman Road BS20 7LS - Portishead	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	06/10/2015 11:00
End	09/10/2015 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
06/10/2015 11:00	45.7	70.7	39.7	45.4
06/10/2015 12:00	47.2	70.4	39.6	49.9
06/10/2015 13:00	51.4	76.9	39.2	48.5
06/10/2015 14:00	44.7	78.7	37.4	46.2
06/10/2015 15:00	46.3	68	36.2	48.8
06/10/2015 16:00	48.8	74.6	34.2	50.8
06/10/2015 17:00	47.8	69.4	33	49.8
06/10/2015 18:00	45.3	71.1	33.1	47.6
06/10/2015 19:00	40.3	74.6	33.9	39.5
06/10/2015 20:00	37.7	60	33.8	38.6
06/10/2015 21:00	34.9	53	31.9	36.6
06/10/2015 22:00	34.7	66.8	30.4	36.1
06/10/2015 23:00	38.7	55.4	31.6	41.5
07/10/2015 00:00	35.1	55.2	27.6	39.3
07/10/2015 01:00	34.1	53.8	28.8	36.7
07/10/2015 02:00	40.6	64.2	35.3	42.5
07/10/2015 03:00	40.8	62.4	35.6	43.1
07/10/2015 04:00	39.4	60.1	33.7	41.8
07/10/2015 05:00	42.5	60.4	34.1	46.5
07/10/2015 06:00	41.1	60.7	36.4	42.9
07/10/2015 07:00	45.7	66.1	40.2	47.4
07/10/2015 08:00	45.7	67.9	41.2	47.8
07/10/2015 09:00	46.8	77.1	39.7	47.9
07/10/2015 10:00	47.4	70.5	39.5	51.4
07/10/2015 11:00	44.9	73	40.3	46.6
07/10/2015 12:00	48.9	66	40.7	52.3
07/10/2015 13:00	43.6	73.8	37.6	44.1
07/10/2015 14:00	45.4	64.3	39.5	47.7
07/10/2015 15:00	45.3	73.3	37.7	45.8
07/10/2015 16:00	43.7	63.2	37.7	46.3
07/10/2015 17:00	42.7	62	38.6	44.8
07/10/2015 18:00	43.8	61.3	38.1	46
07/10/2015 19:00	40.9	66.1	35.3	44.3
07/10/2015 20:00	37	56.7	32.6	39
07/10/2015 21:00	36.6	60.8	29.3	43
07/10/2015 22:00	32.7	50.4	29	34.7
07/10/2015 23:00	31.6	46.3	27.1	33.3
08/10/2015 00:00	29.1	52.8	24.9	30.9
08/10/2015 01:00	33.2	62.8	26.6	35
08/10/2015 02:00	32.7	44.4	29.6	34.9
08/10/2015 03:00	33.9	44	31.3	35.6
08/10/2015 04:00	35.2	46.7	32.8	36.5
08/10/2015 05:00	38.4	51.7	35.3	40
08/10/2015 06:00	41.9	63.3	36.9	42.4
08/10/2015 07:00	45.8	65.7	38.9	47.5
08/10/2015 08:00	45.6	68.1	39.4	47
08/10/2015 09:00	44.2	66.3	33.9	46.2
08/10/2015 10:00	45.2	65.9	32.5	49.3
08/10/2015 11:00	40.8	63.4	31.4	42.5
08/10/2015 12:00	46.9	72.9	33.8	49.9
08/10/2015 13:00	42.7	69.3	32.9	43.8
08/10/2015 14:00	44.1	66.2	36.1	47.1
08/10/2015 15:00	42.4	65.1	31.8	44.7
08/10/2015 16:00	43.2	64.3	31.8	47.1

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT8 - 10 Tydeman Road BS20 7LS - Portishead	By	SR

08/10/2015 17:00	44.4	82.6	32.8	44.6
08/10/2015 18:00	41.5	71.3	34.1	42.1
08/10/2015 19:00	42	63.8	36.4	44.9
08/10/2015 20:00	40.4	61.6	34.3	40.1
08/10/2015 21:00	41.1	69.2	36.4	44.3
08/10/2015 22:00	37.7	61.7	35.3	38.8
08/10/2015 23:00	36	44.4	32.2	37.9
09/10/2015 00:00	32.5	51.2	29	34.6
09/10/2015 01:00	35.7	55.5	30.7	35.6
09/10/2015 02:00	35.3	51.5	32	37.2
09/10/2015 03:00	37.8	45.8	36.2	38.9
09/10/2015 04:00	37.2	50.7	32.6	38.9
09/10/2015 05:00	38.3	49.6	36	40.1
09/10/2015 06:00	42.7	66.5	37.4	43.2
09/10/2015 07:00	46.2	73.6	40.2	47.4
09/10/2015 08:00	46.1	72	38.4	47.6
09/10/2015 09:00	43.7	65.9	34.1	46.2

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT9 - 61 Swiss Drive BS3 2RN - Ashton Gate			By	SR
GPS Coordinates	N: 51.432649 W: -2.6206671				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	50.4	86.8	45.3	49.7
Night time 6hour	43.3	73.2	40.2	44.2

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	50.7	86.8	45.5	49.9
Night time 8hour	44.6	73.2	41.0	45.1

Comments

The dominant source at this location was distant road traffic noise. When present the noise from freight trains dominated the noise climate.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT9 - 61 Swiss Drive BS3 2RN - Ashton Gate	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	12/10/2015 11:00
End	14/10/2015 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
12/10/2015 11:00	47.4	64.7	44.9	48.8
12/10/2015 12:00	48.5	69.7	44.2	50.5
12/10/2015 13:00	48.3	71.5	43.5	49.6
12/10/2015 14:00	46.4	63.6	43.3	47.9
12/10/2015 15:00	49	73.3	45.6	49.5
12/10/2015 16:00	47.5	73.8	45	48.6
12/10/2015 17:00	50.7	80.1	45.1	49.6
12/10/2015 18:00	48.8	64.5	45.3	50.8
12/10/2015 19:00	49.8	65.3	47.5	51.1
12/10/2015 20:00	54	81.9	46.2	49.3
12/10/2015 21:00	46.7	58.2	43.6	48.5
12/10/2015 22:00	44.7	61.6	42.4	46.1
12/10/2015 23:00	44.2	63.9	40.3	45.8
13/10/2015 00:00	42.7	61	40	44.3
13/10/2015 01:00	40.3	61.8	36.7	42.2
13/10/2015 02:00	42.4	55.4	39.6	44.1
13/10/2015 03:00	41.5	53.1	39.8	42.7
13/10/2015 04:00	44.7	62.8	41.7	46.5
13/10/2015 05:00	46.8	73.2	43.6	47.6
13/10/2015 06:00	47.3	61	44.2	49.3
13/10/2015 07:00	47.7	62.4	45.5	49
13/10/2015 08:00	47.8	63.8	44.5	49.4
13/10/2015 09:00	57.7	86.8	46.1	52.2
13/10/2015 10:00	50.1	72.4	47.9	51.6
13/10/2015 11:00	52.7	82.6	47.2	54
13/10/2015 12:00	51	74	46.4	51.3
13/10/2015 13:00	50.2	70.2	47	51.8
13/10/2015 14:00	50.3	68.8	45.7	52.3
13/10/2015 15:00	49	66.6	45.8	50.8
13/10/2015 16:00	52.8	78.6	45.8	50.5
13/10/2015 17:00	47.9	63.4	45.9	49.2
13/10/2015 18:00	53.8	77.7	46.4	50.3
13/10/2015 19:00	48.3	66.9	46.4	49.5
13/10/2015 20:00	55.2	83	44.9	48.1
13/10/2015 21:00	46.4	63.4	44	47.3
13/10/2015 22:00	45.2	56	43.3	46.4
13/10/2015 23:00	43.6	63.1	41.2	44.7
14/10/2015 00:00	43.6	64	41.4	44.4
14/10/2015 01:00	42.3	63.8	39.3	43.6
14/10/2015 02:00	40.3	54.1	38.6	41.4
14/10/2015 03:00	40.1	53.2	38.3	41.3
14/10/2015 04:00	42.7	63.3	40.4	44.1
14/10/2015 05:00	46.1	61.1	42.9	47.8
14/10/2015 06:00	50.1	60.7	47.7	51.6
14/10/2015 07:00	50	65.4	48.1	51.3
14/10/2015 08:00	50.9	79.7	48.3	51.7
14/10/2015 09:00	49.9	72.5	45.4	51.6
14/10/2015 10:00	48	71.3	45.2	48.7
14/10/2015 11:00	49	67.9	45.7	50.1

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT10 - 56 Ashton Drive BS3 2PP - Ashton Gate			By	SR
GPS Coordinates	N: 51.433952 W: -2.6218164				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	49.6	87.2	44.4	49.1
Night time 6hour	42.9	62.6	38.7	44.0

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	49.8	87.2	44.7	49.3
Night time 8hour	44.5	69.0	39.7	45.0

Comments

The dominant noise source at this location was distant road traffic nosie. When present the noise from freight trains dominated the noise climate.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT10 - 56 Ashton Drive BS3 2PP - Ashton Gate	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	12/10/2015 12:00
End	14/10/2015 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
12/10/2015 12:00	46.8	75.6	43.3	47.9
12/10/2015 13:00	46.6	65.8	43.3	48.3
12/10/2015 14:00	46.5	63.8	43.2	48
12/10/2015 15:00	51.6	87.2	45.5	49.9
12/10/2015 16:00	48	68.1	45.3	49.2
12/10/2015 17:00	50.9	85.6	45.5	50.5
12/10/2015 18:00	48.6	71.8	45.2	50.1
12/10/2015 19:00	49	69.4	46.5	50.3
12/10/2015 20:00	53	80.4	45	49.1
12/10/2015 21:00	46.3	56.7	43.4	48.2
12/10/2015 22:00	45	68.5	42.3	46.1
12/10/2015 23:00	43.5	54.8	39.5	45.8
13/10/2015 00:00	42.3	59.5	38.8	44.3
13/10/2015 01:00	40.4	52.5	36.6	42.6
13/10/2015 02:00	42.1	62.5	38.7	44.4
13/10/2015 03:00	40.3	50.3	37.3	42.2
13/10/2015 04:00	43	54.8	39.5	45.1
13/10/2015 05:00	45.2	55.3	42.6	46.8
13/10/2015 06:00	46.9	61.3	44.4	48.2
13/10/2015 07:00	48.4	72.1	45.4	49.6
13/10/2015 08:00	47.2	64.6	42.5	48.3
13/10/2015 09:00	52.3	77.9	45.3	51.2
13/10/2015 10:00	51.5	78.4	46.7	51.2
13/10/2015 11:00	48.6	68	45.8	49.9
13/10/2015 12:00	48.9	69.5	44.7	49.9
13/10/2015 13:00	48.3	69.6	44.8	49.6
13/10/2015 14:00	48.1	72.7	44.8	49.4
13/10/2015 15:00	46.8	62.4	44.3	48.3
13/10/2015 16:00	51.8	77.4	44.5	49.6
13/10/2015 17:00	47.7	62.1	45.2	49.2
13/10/2015 18:00	52.2	75.3	45.4	50.1
13/10/2015 19:00	49.1	79.1	44.6	49
13/10/2015 20:00	52.9	84.4	43.7	47.7
13/10/2015 21:00	46	65.8	42.4	47.2
13/10/2015 22:00	43.7	54.3	41.3	45.4
13/10/2015 23:00	42.3	69	38.5	43.8
14/10/2015 00:00	40.6	54.6	37.9	42.3
14/10/2015 01:00	39.2	46.5	36.7	41.1
14/10/2015 02:00	38.5	58.8	35.8	40.2
14/10/2015 03:00	40.4	51.8	36.2	43.2
14/10/2015 04:00	43.6	55.6	39.7	46
14/10/2015 05:00	48	62.6	44.2	50.1
14/10/2015 06:00	51.3	64.5	48.2	53.1
14/10/2015 07:00	52.1	78.5	47.7	53.4
14/10/2015 08:00	52.1	74.4	47.8	52.2
14/10/2015 09:00	50.3	74.9	44.2	50.1
14/10/2015 10:00	49.5	81.5	44.4	48.6
14/10/2015 11:00	52.2	83.3	45.1	49.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT11 - 55 Ashton Drive BS3 2PN - Ashton Gate			By	SR
GPS Coordinates	N: 51.433709 W: -2.620883				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	49.3	86.9	42.4	46.6
Night time 6hour	41.7	67.8	37.1	41.9

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	48.9	85.9	42.7	46.9
Night time 8hour	46.4	86.9	37.9	42.5

Comments

The dominant noise source at this location was distant road traffic noise. When present the passing of freight trains dominated the noise climate.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT11 - 55 Ashton Drive BS3 2PN - Ashton Gate	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	14/10/2015 13:00
End	16/10/2015 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
14/10/2015 13:00	46	65.2	43.4	47.1
14/10/2015 14:00	46.3	66.9	43.4	47.2
14/10/2015 15:00	46	64	43.9	47.1
14/10/2015 16:00	52	81.5	43.8	47.6
14/10/2015 17:00	46.7	71.4	43.2	47.3
14/10/2015 18:00	45	60.6	42.8	46
14/10/2015 19:00	44.9	60.6	42.6	46
14/10/2015 20:00	44.3	61.2	42.2	45.3
14/10/2015 21:00	43.5	61.2	40.2	44.9
14/10/2015 22:00	47.1	71.6	39.8	43.9
14/10/2015 23:00	56.5	86.9	39.1	42.7
15/10/2015 00:00	47.7	67.7	36.9	45.7
15/10/2015 01:00	38.7	65.4	35.3	40
15/10/2015 02:00	38.3	47.7	35.9	40.1
15/10/2015 03:00	37.9	48.7	36.3	39.2
15/10/2015 04:00	39.8	53.9	37.2	41.9
15/10/2015 05:00	42.5	53.5	39.3	44.1
15/10/2015 06:00	44.9	61.1	41.8	46.3
15/10/2015 07:00	49.9	80.5	43.4	48.9
15/10/2015 08:00	52.6	76.3	43.3	51.7
15/10/2015 09:00	48.6	72.8	42.9	48.6
15/10/2015 10:00	46.5	71.1	42.9	47.1
15/10/2015 11:00	46.3	71.7	41.9	46.1
15/10/2015 12:00	46.9	67.7	42.7	47.6
15/10/2015 13:00	46.6	67.5	42.6	46.8
15/10/2015 14:00	45.2	68.5	42.5	46.5
15/10/2015 15:00	44.8	63.3	42.8	45.9
15/10/2015 16:00	46	66.3	42.8	46.4
15/10/2015 17:00	56.3	77.5	42.9	47.2
15/10/2015 18:00	45.2	61.7	42.6	46
15/10/2015 19:00	45.4	61.1	43.4	46.4
15/10/2015 20:00	44.1	61.2	42.2	45.3
15/10/2015 21:00	56.4	85.9	41.1	45.3
15/10/2015 22:00	42.4	55	39.8	43.6
15/10/2015 23:00	40.5	50.5	38.1	42.2
16/10/2015 00:00	40.7	49.7	38	42.1
16/10/2015 01:00	40	55.6	36.7	41.5
16/10/2015 02:00	40.9	67.8	36.8	41.5
16/10/2015 03:00	38.4	53.1	35.9	40.5
16/10/2015 04:00	40.5	49.9	37.6	42.2
16/10/2015 05:00	42.6	50.6	39.6	44.2
16/10/2015 06:00	45.1	64.2	41.9	45.9
16/10/2015 07:00	47.6	71.7	43	47.3
16/10/2015 08:00	48.5	76.1	43.4	48.5
16/10/2015 09:00	48.9	70.6	43.4	50.2
16/10/2015 10:00	48.5	76.8	43.8	48.3
16/10/2015 11:00	47.2	68.2	44.6	48.5

Noise Measurement Record

ch2m

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Dec-15
Measurement Location	LT12 - 14 Peartree Field BS20 7LE - Portishead			By	SR
GPS Coordinates	N: 51.483027 W: -2.7553797				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Weekend

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)	Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	49.3	72.7	45.3	49.5	Day time 16hour	43.7	64.8	38.7	44.1
Night time 6hour	39.3	59.7	36.0	40.6	Night time 8hour	40.3	68.0	36.8	41.1

Weekday

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)	Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	48.6	76.5	44.8	48.9	Day time 16hour	48.9	76.5	45.3	49.3
Night time 6hour	42.6	62.3	37.7	43.4	Night time 8hour	43.7	64.8	38.7	44.1

Comments

The dominant noise source at this location was road traffic from local road network and the M5 was also audible. Other sources included the nearby school.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT12 - 14 Peartree Field BS20 7LE - Portishead	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	08/12/2015 11:00
End	14/12/2015 10:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
08/12/2015 11:00	49.7	66.5	46.1	51.1
08/12/2015 12:00	49.9	65.8	46.9	50.9
08/12/2015 13:00	48.6	61.1	46.1	50.5
08/12/2015 14:00	50.5	63.3	47.6	52.5
08/12/2015 15:00	51.3	67.7	48.2	53.4
08/12/2015 16:00	50.1	64.9	47.1	51.4
08/12/2015 17:00	50.5	71.1	47.4	51.1
08/12/2015 18:00	48.4	62	45.9	50.1
08/12/2015 19:00	46.3	67.7	42.2	46.7
08/12/2015 20:00	48.4	63	39.7	53.4
08/12/2015 21:00	43.6	67.4	39	43
08/12/2015 22:00	42.2	55	39.6	44.1
08/12/2015 23:00	39.1	64.8	35.7	40.7
09/12/2015 00:00	37.3	45.7	34.8	38.9
09/12/2015 01:00	39.7	59.1	35	39.9
09/12/2015 02:00	43.3	59.6	36.6	43.4
09/12/2015 03:00	39.8	53.5	37.8	41.2
09/12/2015 04:00	42	46.7	39.9	43.3
09/12/2015 05:00	45.6	52.5	43.4	47.2
09/12/2015 06:00	49.2	57.6	47.2	50.3
09/12/2015 07:00	50.4	66.5	49.3	51.1
09/12/2015 08:00	52	74.7	48.4	51.2
09/12/2015 09:00	50.6	66.8	48.1	50.8
09/12/2015 10:00	49.8	64.7	48.4	50.7
09/12/2015 11:00	48.5	59.7	46.9	49.5
09/12/2015 12:00	48.7	68.6	46.6	49.8
09/12/2015 13:00	48.3	66.9	46.3	49.7
09/12/2015 14:00	49.3	64.5	47.2	50.5
09/12/2015 15:00	50.7	71.4	48.5	50.8
09/12/2015 16:00	50	59.7	48.8	50.8
09/12/2015 17:00	49.4	60.6	47.9	50.4
09/12/2015 18:00	49.1	59.1	47.6	50.1
09/12/2015 19:00	48.4	62.2	46.9	49.4
09/12/2015 20:00	49.7	75.6	45.6	49.8
09/12/2015 21:00	46.9	59.3	44.3	48.7
09/12/2015 22:00	47.3	71.9	42.7	48.1
09/12/2015 23:00	44.1	54.7	40.4	46.5
10/12/2015 00:00	41.8	55.1	37.3	44.5
10/12/2015 01:00	42.4	56.3	37.2	45.2
10/12/2015 02:00	41.4	55.4	36.9	44.3
10/12/2015 03:00	44.2	58.4	37.9	47.5
10/12/2015 04:00	47.3	61	41.2	50.2
10/12/2015 05:00	47.8	62.3	42.5	50.8
10/12/2015 06:00	49.1	62.2	46.1	51.1
10/12/2015 07:00	50.3	63.2	47.9	51.9
10/12/2015 08:00	51.4	74	49.1	52.7
10/12/2015 09:00	50.5	61.1	48.2	52.1
10/12/2015 10:00	50.5	64.1	48	51.9
10/12/2015 11:00	50.1	64.4	47.9	51.7
10/12/2015 12:00	50.1	62	48.4	51.2
10/12/2015 13:00	49.3	71.6	46.1	50.6
10/12/2015 14:00	46.9	62.8	44.1	48.2
10/12/2015 15:00	44.7	62.7	41.3	46.9
10/12/2015 16:00	46.4	67.2	41.6	46.8

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT12 - 14 Peartree Field BS20 7LE - Portishead	By	SR

10/12/2015 17:00	46.9	61	43.9	48.4	
10/12/2015 18:00	48.1	60.6	46.1	48.9	
10/12/2015 19:00	47.5	63	46	48.1	
10/12/2015 20:00	45.2	60.1	44	46.1	
10/12/2015 21:00	44.9	63.2	43.2	45.7	
10/12/2015 22:00	43.3	51.4	40.4	44.8	
10/12/2015 23:00	41.3	63.4	39.2	42.6	
11/12/2015 00:00	40.1	51.9	36.5	42.4	
11/12/2015 01:00	37.4	48	34.6	39.3	
11/12/2015 02:00	36.9	56	33.4	38.5	
11/12/2015 03:00	37.9	58.5	33.4	40.2	
11/12/2015 04:00	41.9	61.7	34.7	44.7	
11/12/2015 05:00	39.4	54.2	35.9	41.7	
11/12/2015 06:00	42.8	58.9	38.7	44.5	
11/12/2015 07:00	47.5	68.7	43.8	49.1	
11/12/2015 08:00	47.5	64.9	45.1	48.2	
11/12/2015 09:00	47.4	67	45.5	48.2	
11/12/2015 10:00	49.4	67.6	45.6	51.5	
11/12/2015 11:00	54	73.2	46.7	58.6	
11/12/2015 12:00	48.4	70.3	44.5	51.4	
11/12/2015 13:00	47	65.5	43.5	48.9	
11/12/2015 14:00	50.1	75.8	44	47.6	
11/12/2015 15:00	47.8	69.5	44.5	47.8	
11/12/2015 16:00	47.4	70.8	44.5	47.6	
11/12/2015 17:00	45.4	54.7	43.8	46.7	
11/12/2015 18:00	45.1	56.8	43.1	46.4	
11/12/2015 19:00	43.2	51.4	41.1	44.6	
11/12/2015 20:00	41.6	59.4	38.8	43.3	
11/12/2015 21:00	40.7	53.1	37.5	42.6	
11/12/2015 22:00	41.9	68.3	37.5	42.9	
11/12/2015 23:00	39.8	51.3	37.4	41.4	
12/12/2015 00:00	39.5	59.7	37.7	40.7	
12/12/2015 01:00	38.5	45.2	36.6	40	
12/12/2015 02:00	40.1	46.3	38.2	41.5	
12/12/2015 03:00	40	46.9	37.3	41.9	
12/12/2015 04:00	39.8	46.8	37.2	41.6	
12/12/2015 05:00	43	50.2	40.3	44.9	
12/12/2015 06:00	45.4	56	44.1	46.4	
12/12/2015 07:00	49.7	67.3	45.5	50.7	
12/12/2015 08:00	49.7	66	47.6	50.7	
12/12/2015 09:00	49.6	61.1	48.1	50.6	
12/12/2015 10:00	51	65.6	48.6	52.4	
12/12/2015 11:00	50.5	60.6	49.1	51.6	
12/12/2015 12:00	51.9	68.4	49.5	53.4	
12/12/2015 13:00	53.2	69.9	49.8	55.2	
12/12/2015 14:00	53	65.6	49.5	55.5	
12/12/2015 15:00	51.8	70	48.9	53.6	
12/12/2015 16:00	53.1	66.6	49.4	55.2	
12/12/2015 17:00	51	72.7	47.9	52.5	
12/12/2015 18:00	50.4	64.8	47.1	52.5	
12/12/2015 19:00	48.9	66	45.5	50.9	
12/12/2015 20:00	49.3	70.7	43.6	52.6	
12/12/2015 21:00	44.9	59.9	42	46.7	
12/12/2015 22:00	45.2	61.5	41.1	47.6	
12/12/2015 23:00	41.9	60.8	39.6	43.4	
13/12/2015 00:00	41.3	55.1	38.1	43.3	
13/12/2015 01:00	36.3	52.4	31.7	38.8	
13/12/2015 02:00	36.6	53.3	32.6	38.7	
13/12/2015 03:00	36.7	44.7	33.3	39	
13/12/2015 04:00	36.4	46.2	34.2	37.9	
13/12/2015 05:00	37.6	56.8	34.6	39.1	

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT12 - 14 Peartree Field BS20 7LE - Portishead	By	SR

13/12/2015 06:00	39.1	68	36	39.6
13/12/2015 07:00	42.2	68.9	38	43.2
13/12/2015 08:00	42.7	65.5	38.9	42.9
13/12/2015 09:00	46.3	68	41.8	46.4
13/12/2015 10:00	48.4	65.1	44.2	50
13/12/2015 11:00	48	63.2	45.7	49.3
13/12/2015 12:00	50.3	67	46	52.4
13/12/2015 13:00	49	65	46.6	50.1
13/12/2015 14:00	49.9	68.5	46.5	52
13/12/2015 15:00	52.4	65.6	50.8	53.2
13/12/2015 16:00	51	71.2	48.9	51.4
13/12/2015 17:00	50.2	64.6	48.7	51.1
13/12/2015 18:00	48.6	68.9	46.7	49.5
13/12/2015 19:00	47.2	57.3	45.8	48.1
13/12/2015 20:00	46.5	55.7	45.1	47.4
13/12/2015 21:00	45.2	52.9	43.7	46.3
13/12/2015 22:00	43.9	57.4	41.5	45.1
13/12/2015 23:00	42.1	57.5	40.3	43.1
14/12/2015 00:00	41.1	55.5	39.4	42.2
14/12/2015 01:00	41.1	48.6	39.3	42.3
14/12/2015 02:00	40.3	46.3	38	41.8
14/12/2015 03:00	40.2	45.8	37.6	41.9
14/12/2015 04:00	42	50.6	39.6	43.6
14/12/2015 05:00	45.3	50	42.7	46.7
14/12/2015 06:00	48.1	57.5	46.6	49.1
14/12/2015 07:00	50.8	69.3	48.4	50.9
14/12/2015 08:00	51.1	65.4	49.1	51.8
14/12/2015 09:00	50.6	76.5	47.9	50.9
14/12/2015 10:00	50.9	73.4	46.7	52.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT13 - Old Station House, Station Road - Sheepway			By	SR
GPS Coordinates	N: 51.477798 W: -2.7268839				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	55.1	82.2	52.4	55.3
Night time 6hour	50.3	61.3	46.4	51.6

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	55.2	82.2	52.6	55.3
Night time 8hour	51.8	64.6	47.5	52.5

Comments

The dominant noise source at this location was road traffic noise from the M5. Other sources included birdsong and noise from local road network.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT13 - Old Station House, Station Road - Sheepway	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	19/10/2015 11:00
End	23/10/2015 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
19/10/2015 11:00	56.8	66.9	54.7	58.1
19/10/2015 12:00	57.5	73.3	56	58.6
19/10/2015 13:00	56.3	66.7	54.4	57.4
19/10/2015 14:00	54.2	67.6	52.7	55.2
19/10/2015 15:00	53.7	69.5	52	54.8
19/10/2015 16:00	55	67.3	53.5	56.2
19/10/2015 17:00	55.1	69.7	52.9	56.5
19/10/2015 18:00	55.6	74.1	52.7	55.1
19/10/2015 19:00	52.8	61.2	51.1	53.9
19/10/2015 20:00	52.2	59.5	49	54
19/10/2015 21:00	50.4	62.2	48.7	51.4
19/10/2015 22:00	49.9	59.8	47.7	51.3
19/10/2015 23:00	49.6	57.8	47.6	50.9
20/10/2015 00:00	48.1	55.9	44.8	50
20/10/2015 01:00	47.2	55.5	44.8	48.7
20/10/2015 02:00	47.1	56.6	44.8	48.6
20/10/2015 03:00	47	53.2	44.6	48.5
20/10/2015 04:00	51.1	59.2	48.6	52.8
20/10/2015 05:00	53.5	59.6	51.8	54.6
20/10/2015 06:00	56.7	62.3	54.3	58.2
20/10/2015 07:00	57.9	71.7	55.9	59.1
20/10/2015 08:00	57.6	68.4	55.9	59.1
20/10/2015 09:00	54.6	66.9	51.1	56.8
20/10/2015 10:00	50.6	64.6	48.8	51.4
20/10/2015 11:00	50.7	66.5	48.8	51.2
20/10/2015 12:00	52.3	71.8	49.2	52.6
20/10/2015 13:00	50.8	68.3	49.2	51.7
20/10/2015 14:00	51.9	68.2	49.6	52.7
20/10/2015 15:00	53.3	72.5	52	54.1
20/10/2015 16:00	56.6	79.5	53.3	55.4
20/10/2015 17:00	56.3	71.7	54.9	56.9
20/10/2015 18:00	54.7	65.5	52.4	56.3
20/10/2015 19:00	51.9	60.1	50.5	52.9
20/10/2015 20:00	50.7	61.3	48.7	51.9
20/10/2015 21:00	49.6	61.4	47.7	50.9
20/10/2015 22:00	49.4	56.4	47.2	50.8
20/10/2015 23:00	47.2	58.2	43.5	49.4
21/10/2015 00:00	45.5	52.2	41.7	47.8
21/10/2015 01:00	46	53	42.3	48.3
21/10/2015 02:00	50.7	56.2	48.2	52.4
21/10/2015 03:00	50.1	57.9	46.7	51.9
21/10/2015 04:00	51.5	58.2	49	53.2
21/10/2015 05:00	54.4	58.5	51	56.2
21/10/2015 06:00	57.6	60.6	55.4	59
21/10/2015 07:00	59.6	64.4	58.4	60.4
21/10/2015 08:00	59.4	65.6	58.2	60.1
21/10/2015 09:00	59.2	67.8	57.6	60.2
21/10/2015 10:00	57.9	62.2	56.5	59
21/10/2015 11:00	56.7	69.1	55.4	57.5
21/10/2015 12:00	57	69.6	55.6	57.9
21/10/2015 13:00	56.6	68.3	55.2	57.7
21/10/2015 14:00	56.5	72	55.2	57.4
21/10/2015 15:00	56.8	66.6	55.5	57.7
21/10/2015 16:00	56.6	63.4	55.4	57.4

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT13 - Old Station House, Station Road - Sheepway	By	SR

21/10/2015 17:00	57.2	67.6	56	58.1
21/10/2015 18:00	56.5	66.3	55	57.6
21/10/2015 19:00	54.6	59.5	52.9	55.9
21/10/2015 20:00	53.3	58.7	51.3	54.6
21/10/2015 21:00	53.4	64.3	50.5	55
21/10/2015 22:00	53	59.1	50.4	54.7
21/10/2015 23:00	54.8	63.5	50.1	57.5
22/10/2015 00:00	51.7	60.6	46.3	54.7
22/10/2015 01:00	50.9	59.4	45.5	53.9
22/10/2015 02:00	48.9	59	44.4	51.2
22/10/2015 03:00	46.9	57.1	43.5	49
22/10/2015 04:00	48.8	54.5	45.4	50.7
22/10/2015 05:00	51.7	59.4	48.7	53.5
22/10/2015 06:00	55.4	59.8	52.9	56.7
22/10/2015 07:00	56.6	82.2	54.7	57.2
22/10/2015 08:00	55.4	78.2	54	56.3
22/10/2015 09:00	54.6	71.7	53.2	55.5
22/10/2015 10:00	54.2	68.1	52.7	55.1
22/10/2015 11:00	53.5	73	51.6	53.9
22/10/2015 12:00	52.2	73.7	50.7	53.1
22/10/2015 13:00	52.7	81.3	51.2	53.2
22/10/2015 14:00	54.3	77.6	50.6	53.2
22/10/2015 15:00	52.2	66.1	50.8	53
22/10/2015 16:00	52.4	60.7	51.2	53.2
22/10/2015 17:00	52.6	68.7	51.4	53.3
22/10/2015 18:00	52	66.8	50.2	52.9
22/10/2015 19:00	51	57	49.6	51.9
22/10/2015 20:00	50.9	57.3	49.5	51.9
22/10/2015 21:00	52.1	56.2	50.6	53.1
22/10/2015 22:00	53.3	59	51.2	54.6
22/10/2015 23:00	52.5	59.2	50.3	53.9
23/10/2015 00:00	51.7	61.1	49.2	53.6
23/10/2015 01:00	50.6	61.3	46.1	53
23/10/2015 02:00	47.5	55.1	44.5	49.4
23/10/2015 03:00	48	54.3	45.2	50.1
23/10/2015 04:00	50.8	59.3	47.6	52.9
23/10/2015 05:00	51.7	57.3	50	53
23/10/2015 06:00	54.7	64.6	52	56.3
23/10/2015 07:00	58.4	72	56.7	59.4
23/10/2015 08:00	58	68.7	56.6	58.9
23/10/2015 09:00	56.5	66.7	54.9	57.5
23/10/2015 10:00	55.6	66.3	54.3	56.6
23/10/2015 11:00	54.7	70.4	53.1	55.5

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Oct-15
Measurement Location	LT14 - 29 Nelson Street BS3 2SP - Ashton Gate			By	SR
GPS Coordinates	N: 51.431893 W: -2.6132548				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	3-Feb-2014
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	3-Feb-2014
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	3-Feb-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Weekend

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	48.1	73.4	41.4	47.5
Night time 6hour	41.3	67.8	33.8	41.3

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	48.3	73.4	41.7	47.5
Night time 8hour	43.2	69.8	35.1	42.7

Weekday

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	50.3	88.0	43.5	49.9
Night time 6hour	43.2	69.5	32.8	41.8

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	50.5	88.0	43.8	50.1
Night time 8hour	45.1	70.3	34.6	43.1

Comments

The dominant noise source at this location was rail traffic noise from the nearby railway line.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT14 - 29 Nelson Street BS3 2SP - Ashton Gate	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	24/10/2015 13:00
End	31/10/2015 07:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
24/10/2015 13:00	49.3	66.3	43.8	51.2
24/10/2015 14:00	47	65.8	42.7	47.1
24/10/2015 15:00	47.1	65.2	42.4	47.4
24/10/2015 16:00	48.1	66.5	42.7	49.1
24/10/2015 17:00	48.5	66.7	43.8	49
24/10/2015 18:00	49.2	66.8	45.1	48.5
24/10/2015 19:00	49.3	68.1	43.3	47.5
24/10/2015 20:00	49.5	69.9	43.2	47.7
24/10/2015 21:00	47.4	67.7	42.8	47.8
24/10/2015 22:00	48.5	68.2	42.1	46.6
24/10/2015 23:00	44.8	59.6	42.5	46.2
25/10/2015 00:00	44	52.4	39.4	46.2
25/10/2015 01:00	42.5	51.5	38.2	44.8
25/10/2015 02:00	40.1	49.5	35.8	42.6
25/10/2015 03:00	38.6	48	34.7	40.9
25/10/2015 04:00	41.9	54.7	35.7	44.9
25/10/2015 05:00	43.6	53.2	39.7	46
25/10/2015 06:00	46.3	61.3	40.4	49.1
25/10/2015 07:00	46.4	64.2	41.8	48.1
25/10/2015 08:00	47.1	69.7	42.6	47.4
25/10/2015 09:00	47.6	67.4	42	47.5
25/10/2015 10:00	46.8	67.4	40.8	46.1
25/10/2015 11:00	48.8	67.5	43.5	49.3
25/10/2015 12:00	51.1	69.2	43.9	51.5
25/10/2015 13:00	48.3	68.2	42.7	49
25/10/2015 14:00	47.6	65.4	42.7	48.4
25/10/2015 15:00	49.3	68.7	42.5	48.6
25/10/2015 16:00	47.9	66.7	42.2	47.6
25/10/2015 17:00	50.1	70.5	42.1	47.1
25/10/2015 18:00	47.8	69.1	40.7	47
25/10/2015 19:00	48.2	69	38.2	46
25/10/2015 20:00	48.1	70.1	37.3	44.5
25/10/2015 21:00	47.8	70.2	36.8	43.7
25/10/2015 22:00	44.4	67.6	34.7	40.2
25/10/2015 23:00	40.9	62.5	33.9	41.8
26/10/2015 00:00	35.6	56.9	29.6	36
26/10/2015 01:00	43.1	67.7	28.5	35.4
26/10/2015 02:00	36.4	56.5	27.5	37.7
26/10/2015 03:00	35.9	47	31.2	38.1
26/10/2015 04:00	38.4	49.3	33.8	40.8
26/10/2015 05:00	45	69.5	39.1	43.9
26/10/2015 06:00	48.3	65.5	41.4	48.9
26/10/2015 07:00	49.5	66.8	44.4	51
26/10/2015 08:00	52.3	76.8	43.4	56.9
26/10/2015 09:00	49.1	68.5	43.7	49.1
26/10/2015 10:00	51.5	70.1	46.9	51.7
26/10/2015 11:00	52.6	67.6	47.6	54.3
26/10/2015 12:00	50.2	67.5	46	51.1
26/10/2015 13:00	50.2	67.8	45.4	50.5
26/10/2015 14:00	49.8	67.7	45.2	50.4
26/10/2015 15:00	47.3	66.3	42.8	47.6
26/10/2015 16:00	47.2	65.5	42.3	47.9
26/10/2015 17:00	47.7	68	41	46.8
26/10/2015 18:00	48.1	64.9	39.5	48.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT14 - 29 Nelson Street BS3 2SP - Ashton Gate	By	SR

26/10/2015 19:00	45	65.3	38.5	44.2	
26/10/2015 20:00	44.9	66.1	37.3	42.6	
26/10/2015 21:00	46.3	68	38	44.3	
26/10/2015 22:00	45.7	68.5	38.6	44	
26/10/2015 23:00	43.2	66.9	31.8	41.2	
27/10/2015 00:00	33	48.3	26.4	35.6	
27/10/2015 01:00	33.1	58.1	25.4	34.8	
27/10/2015 02:00	32.6	53.7	25	34.9	
27/10/2015 03:00	33.3	45.8	27.9	35.9	
27/10/2015 04:00	41.6	64.5	31.7	39.2	
27/10/2015 05:00	46.1	66.4	36.5	45	
27/10/2015 06:00	46.7	64.2	40.9	47.2	
27/10/2015 07:00	49.4	72	41.2	52.1	
27/10/2015 08:00	49.7	68	40.9	52.7	
27/10/2015 09:00	48.5	66.7	42.6	48.4	
27/10/2015 10:00	48.5	66.6	45.3	49.5	
27/10/2015 11:00	51.4	77.7	42.7	49.4	
27/10/2015 12:00	49.2	68.4	43.1	49.5	
27/10/2015 13:00	47.4	66	43.4	48.6	
27/10/2015 14:00	48.8	69.6	44.9	49.1	
27/10/2015 15:00	48.3	66.5	44.5	48.8	
27/10/2015 16:00	49.9	65.8	46.3	51.3	
27/10/2015 17:00	51.8	67	45.6	53.5	
27/10/2015 18:00	49.1	67.4	44.3	49.6	
27/10/2015 19:00	49.1	68.6	41.9	49.1	
27/10/2015 20:00	48.1	65.6	43	48.9	
27/10/2015 21:00	48.7	67.2	42.4	49.1	
27/10/2015 22:00	50.4	70.8	38.4	47	
27/10/2015 23:00	43.9	65.8	33.5	42.8	
28/10/2015 00:00	38.6	51.9	32	41.5	
28/10/2015 01:00	38.1	56	27.4	41.2	
28/10/2015 02:00	35	55.9	28.1	37.5	
28/10/2015 03:00	34.2	51.9	26	36.9	
28/10/2015 04:00	44.6	68	32.3	40.8	
28/10/2015 05:00	45.7	63.2	38.4	48.7	
28/10/2015 06:00	48.1	68.7	42.5	48.2	
28/10/2015 07:00	50.4	73.1	42.9	53	
28/10/2015 08:00	51.3	72	43.1	54.4	
28/10/2015 09:00	49.1	66.5	41.7	50.1	
28/10/2015 10:00	46.8	64.6	41.1	48.1	
28/10/2015 11:00	53.2	86	43.3	49.6	
28/10/2015 12:00	51.5	83.4	42.5	48.9	
28/10/2015 13:00	53.4	84.9	44.8	51.7	
28/10/2015 14:00	52	72.2	45.8	52.7	
28/10/2015 15:00	50.1	66.1	46.8	51	
28/10/2015 16:00	50.1	66.3	46.6	50.9	
28/10/2015 17:00	51.2	67.8	45.7	51	
28/10/2015 18:00	49.5	66.7	45.4	49.8	
28/10/2015 19:00	49.1	71.6	43.3	49.2	
28/10/2015 20:00	51.3	79.8	43.6	50.1	
28/10/2015 21:00	49.1	67.3	44	49.8	
28/10/2015 22:00	47.7	69	41.5	48.2	
28/10/2015 23:00	47.5	68.4	41.3	48.2	
29/10/2015 00:00	42	52.3	34.8	45	
29/10/2015 01:00	40.4	52.7	32.4	43.7	
29/10/2015 02:00	40.2	56.8	31.4	43.6	
29/10/2015 03:00	40.8	53.2	32.8	44	
29/10/2015 04:00	46.6	66.8	37.9	47.1	
29/10/2015 05:00	49.9	69.1	43.9	50.7	
29/10/2015 06:00	51.6	69.8	47.6	52.5	
29/10/2015 07:00	53.1	72.2	49.6	54.9	

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Oct-15
Measurement Location	LT14 - 29 Nelson Street BS3 2SP - Ashton Gate	By	SR

29/10/2015 08:00	54.4	69.8	50.2	56.8
29/10/2015 09:00	55.7	88	49.3	54.2
29/10/2015 10:00	53.5	73.5	48	54.8
29/10/2015 11:00	52.6	72.5	47.6	53.6
29/10/2015 12:00	50.7	68.2	44.6	50.9
29/10/2015 13:00	49	67.7	43.4	50.8
29/10/2015 14:00	49.2	68.3	44	50.3
29/10/2015 15:00	49.8	67	45	51.2
29/10/2015 16:00	51	67.3	45.9	52.1
29/10/2015 17:00	50.9	69.1	44	51.4
29/10/2015 18:00	50.1	69	44.8	50.9
29/10/2015 19:00	49.6	80.5	43.8	49
29/10/2015 20:00	48.5	71.1	40.8	47.3
29/10/2015 21:00	48	66	41.7	49.1
29/10/2015 22:00	49.1	67.5	42.6	50.1
29/10/2015 23:00	47.4	70.3	37.6	46
30/10/2015 00:00	36	58.9	29.8	38.1
30/10/2015 01:00	42.6	60	34.7	46.3
30/10/2015 02:00	40.8	59.7	36.1	43.3
30/10/2015 03:00	43	50.2	37.7	46.3
30/10/2015 04:00	47.5	65.1	41	48.8
30/10/2015 05:00	50.3	67.5	45.4	52
30/10/2015 06:00	52.4	68.5	48	53.5
30/10/2015 07:00	53.8	66.2	50.1	56.1
30/10/2015 08:00	54.7	68.6	49.9	57.4
30/10/2015 09:00	54	78.5	49.5	55.4
30/10/2015 10:00	51.5	68	47.9	52.7
30/10/2015 11:00	52.4	67.2	48.6	53.5
30/10/2015 12:00	53.3	69.7	49.5	53.8
30/10/2015 13:00	51.6	70.4	47.2	52.1
30/10/2015 14:00	50.5	70	46	51.5
30/10/2015 15:00	51.2	68.5	46.5	52.2
30/10/2015 16:00	49.3	69.1	44.9	50
30/10/2015 17:00	48.5	69.6	40.2	46.6
30/10/2015 18:00	46.6	66.9	40.9	46
30/10/2015 19:00	46.3	65.9	40.4	45.7
30/10/2015 20:00	46.1	66.2	40.5	45.9
30/10/2015 21:00	46.6	68	37.8	43.7
30/10/2015 22:00	45.3	67.8	37.2	42.2
30/10/2015 23:00	45.8	69.8	35	42
31/10/2015 00:00	39.3	62.3	32.7	39.4
31/10/2015 01:00	34.4	53.4	28.6	36.3
31/10/2015 02:00	38.4	64.4	26.6	35.9
31/10/2015 03:00	33.9	47	28.3	36.5
31/10/2015 04:00	41.5	64.9	31.7	38.1
31/10/2015 05:00	44.5	67.8	34.6	43.5
31/10/2015 06:00	48	66.7	38.3	51.4
31/10/2015 07:00	48.6	73.4	40.5	49.4

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Dec-15
Measurement Location	LT15 - 16 Tydeman Road, Portishead			By	SR
GPS Coordinates	N: 51.482372 W: -2.7526035				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	24-Jan-2014
Microphone	MCE 212	Serial No.	142693	Cal. Date	24-Jan-2014
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	24-Jan-2014
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2015
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Weekend

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	49.0	74.0	45.4	49.1
Night time 6hour	39.4	54.3	35.8	40.6

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	49.4	74.0	46.0	49.8
Night time 8hour	40.5	54.3	36.8	41.2

Weekday

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	48.9	76.4	44.7	48.8
Night time 6hour	41.8	64.2	38.2	42.5

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	49.1	76.4	45.1	49.2
Night time 8hour	43.3	73.0	39.2	43.3

Comments

The dominant noise source at this location was distant road traffic noise from the M5 and a local road network and nearby school during breaks.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT15 - 16 Tydeman Road, Portishead	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	08/12/2015 11:00
End	14/12/2015 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
08/12/2015 11:00	49.3	70	46.1	50.7
08/12/2015 12:00	52.1	72.6	47.9	54.5
08/12/2015 13:00	49.1	63.6	46.3	51.1
08/12/2015 14:00	51.3	65.2	48.2	53.2
08/12/2015 15:00	50.9	68.6	48.2	52.4
08/12/2015 16:00	49.3	64.7	47.3	50.3
08/12/2015 17:00	50	73.3	46.4	50.1
08/12/2015 18:00	46.7	61.2	44.1	48.3
08/12/2015 19:00	44.9	67.4	40.8	44.8
08/12/2015 20:00	44.1	59.3	38.2	48.1
08/12/2015 21:00	44.2	71.3	38.7	43.5
08/12/2015 22:00	42.6	57.9	39.9	44.5
08/12/2015 23:00	39.3	63.3	36	41
09/12/2015 00:00	38.2	54.3	35.8	39.7
09/12/2015 01:00	40.7	64.2	35.9	40.6
09/12/2015 02:00	40.3	52.6	37	41.6
09/12/2015 03:00	40.5	49.5	38.5	41.8
09/12/2015 04:00	42.9	51.1	40.9	44.2
09/12/2015 05:00	46.7	56.7	44.4	48.4
09/12/2015 06:00	50.2	58	48.3	51.2
09/12/2015 07:00	50.8	70.6	49.8	51.2
09/12/2015 08:00	52.4	74.9	49	51.8
09/12/2015 09:00	50.9	72.2	49.1	51.6
09/12/2015 10:00	51	69.1	49.1	52.5
09/12/2015 11:00	49	69.7	47.4	49.9
09/12/2015 12:00	52	73.9	47.1	54.7
09/12/2015 13:00	49.6	71.9	46.9	50.9
09/12/2015 14:00	51.2	73.6	48	52.5
09/12/2015 15:00	51.4	74.4	49.1	51.7
09/12/2015 16:00	50.6	61.8	49.1	51.5
09/12/2015 17:00	49.3	59.4	48	50
09/12/2015 18:00	49.1	59.7	47.7	49.9
09/12/2015 19:00	48.3	58.7	46.9	49.2
09/12/2015 20:00	49.1	69.9	45.5	48.8
09/12/2015 21:00	46.7	58.7	44.6	48.2
09/12/2015 22:00	46.8	71.9	42.7	47
09/12/2015 23:00	42.6	57.2	39.9	44.2
10/12/2015 00:00	39.8	52.2	37.2	41.4
10/12/2015 01:00	40.5	55.1	37.2	42.3
10/12/2015 02:00	39.9	50	37.3	41.5
10/12/2015 03:00	41.9	58.3	38.3	43.9
10/12/2015 04:00	43.8	62	40.4	45.1
10/12/2015 05:00	46.2	61.7	42.7	47.8
10/12/2015 06:00	47.9	65.1	46	49.1
10/12/2015 07:00	49.9	66.3	48.3	50.8
10/12/2015 08:00	51	73.3	49.1	51.7
10/12/2015 09:00	50.6	74.4	48.4	51.1
10/12/2015 10:00	50.1	66.5	48.2	51.2
10/12/2015 11:00	49.4	65.5	48.1	50
10/12/2015 12:00	51.7	65.7	48.6	53.8
10/12/2015 13:00	48.9	63	45.5	50.2
10/12/2015 14:00	49	76.1	41.6	46.4
10/12/2015 15:00	44.1	69.2	39.6	45.1
10/12/2015 16:00	43.3	64.4	40.6	44.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT15 - 16 Tydeman Road, Portishead	By	SR

10/12/2015 17:00	46.9	58.5	43.4	48.5	
10/12/2015 18:00	48.6	60.5	46.5	49.5	
10/12/2015 19:00	47.8	60	46.4	48.6	
10/12/2015 20:00	45.8	54.1	44.6	46.6	
10/12/2015 21:00	46.8	74.5	44	46.4	
10/12/2015 22:00	43.8	55.2	40.9	45.5	
10/12/2015 23:00	42.2	73	39.8	43.1	
11/12/2015 00:00	39.9	55.4	36.7	41.7	
11/12/2015 01:00	37.5	54.1	35.2	39	
11/12/2015 02:00	36.9	50.1	33.9	38.6	
11/12/2015 03:00	37.2	51	34.3	38.9	
11/12/2015 04:00	40.5	62.2	36	42.7	
11/12/2015 05:00	39.2	55.1	36.9	40.5	
11/12/2015 06:00	42.8	60.6	39.3	44.2	
11/12/2015 07:00	46.7	73.5	42.6	47.7	
11/12/2015 08:00	47.4	65.5	45.5	48.4	
11/12/2015 09:00	48.2	68.9	45.6	48.7	
11/12/2015 10:00	50.3	72.1	45.8	51.7	
11/12/2015 11:00	54	76.4	47.8	58.9	
11/12/2015 12:00	47.7	65	43.7	49.5	
11/12/2015 13:00	51.1	67.9	42.6	55.4	
11/12/2015 14:00	49.6	74.9	43	47.1	
11/12/2015 15:00	46.5	67.9	43.1	46.8	
11/12/2015 16:00	45	64.3	43.1	45.9	
11/12/2015 17:00	43.7	54.3	41.9	45	
11/12/2015 18:00	43.8	55.6	41.8	45.3	
11/12/2015 19:00	42	55.3	39.9	43.2	
11/12/2015 20:00	39.4	57.2	36.9	40.9	
11/12/2015 21:00	38.5	47.5	35.9	40.3	
11/12/2015 22:00	41.8	70.7	37.2	42.8	
11/12/2015 23:00	40.3	51.4	38.1	41.9	
12/12/2015 00:00	40.6	47.9	38.4	42.1	
12/12/2015 01:00	38.8	45.5	36.8	40.1	
12/12/2015 02:00	40.7	50.9	38.4	42.4	
12/12/2015 03:00	40	48.7	37.3	41.9	
12/12/2015 04:00	39.9	50.4	37.2	41.7	
12/12/2015 05:00	43.4	51.5	40.4	45.3	
12/12/2015 06:00	46.3	53.9	45	47.1	
12/12/2015 07:00	48.7	64	46.2	49.5	
12/12/2015 08:00	49.5	63.7	47.7	50.4	
12/12/2015 09:00	49.6	65.4	48.2	50.4	
12/12/2015 10:00	50.8	68.4	48.6	52	
12/12/2015 11:00	50.4	65.6	49.1	51.3	
12/12/2015 12:00	51.3	73.6	49.3	52.3	
12/12/2015 13:00	51.5	67.6	49.2	52.8	
12/12/2015 14:00	51.8	67.1	49	53.5	
12/12/2015 15:00	51.2	72.4	48.4	52.7	
12/12/2015 16:00	51	67.6	48.6	52.6	
12/12/2015 17:00	50.5	67.7	47.9	52.1	
12/12/2015 18:00	49.5	70.2	46.8	51	
12/12/2015 19:00	48.1	70.8	45.1	49.4	
12/12/2015 20:00	46.9	65.9	43.1	48.8	
12/12/2015 21:00	43.9	58.9	41.8	45.2	
12/12/2015 22:00	43.6	56.2	41	45.5	
12/12/2015 23:00	41.7	53.2	39.8	43.1	
13/12/2015 00:00	40.8	53	38.2	42.3	
13/12/2015 01:00	36.1	47.1	30	38.4	
13/12/2015 02:00	35.5	50.6	32.2	37.5	
13/12/2015 03:00	35.9	54.3	32.3	38.1	
13/12/2015 04:00	36	46.2	33.6	37.7	
13/12/2015 05:00	37.4	51.7	34.3	39.3	

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Dec-15
Measurement Location	LT15 - 16 Tydeman Road, Portishead	By	SR

13/12/2015 06:00	38.8	53.4	36.1	40.2
13/12/2015 07:00	41.7	68.6	37.6	43
13/12/2015 08:00	43	67.9	39.9	44.1
13/12/2015 09:00	44.9	61.8	42.1	46.3
13/12/2015 10:00	47.6	68.2	44	49.2
13/12/2015 11:00	48.7	74	45.2	49.8
13/12/2015 12:00	48.4	66.4	45.7	50.4
13/12/2015 13:00	48.9	69.7	45.9	50.1
13/12/2015 14:00	50.6	69.3	46.2	52.2
13/12/2015 15:00	53	70.9	51.4	54
13/12/2015 16:00	52.4	59.2	50.5	53.6
13/12/2015 17:00	51.6	62.5	49.9	52.8
13/12/2015 18:00	49.1	61.4	47.5	50.1
13/12/2015 19:00	48	57.9	46.6	48.9
13/12/2015 20:00	47.1	54.9	45.6	48.1
13/12/2015 21:00	45.6	53.2	43.9	46.9
13/12/2015 22:00	44.1	49.2	41.4	45.5
13/12/2015 23:00	42.2	47.3	40.6	43.4
14/12/2015 00:00	41.6	53.6	39.6	43
14/12/2015 01:00	41.1	48.6	39.3	42.3
14/12/2015 02:00	40.2	47.6	38.1	41.7
14/12/2015 03:00	40.4	45.8	37.7	42.1
14/12/2015 04:00	42.3	50.4	39.7	43.9
14/12/2015 05:00	45.7	50.6	43.3	47.1
14/12/2015 06:00	48.7	55	47.1	49.8
14/12/2015 07:00	50.2	60.8	49	51
14/12/2015 08:00	51.3	68.5	49.7	52.3
14/12/2015 09:00	50.4	68.7	48.6	51.6
14/12/2015 10:00	51.8	72	47.5	54.2

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	Feb-16
Measurement Location	LT16 - 6 Willada Close, Parson Street			By	SR
GPS Coordinates	N: 51.432594 W: -2.6086575				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61083	Cal. Date	20-Jan-2016
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	20-Jan-2016
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	20-Jan-2016
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	56.4	90.5	50.1	55.7
Night time 6hour	53.4	88.1	43.6	51.5

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	56.6	90.5	50.8	56.1
Night time 8hour	53.8	88.1	43.6	51.6

Comments

The dominant noise source at this location was road traffic noise from Ashton Drive and freight trains passing thought the nearby railway line.

The highest wind speed was 31phm during the 1st of February 2016 and 22mph during 2nd of February 2016.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	Feb-16
Measurement Location	LT16 - 6 Willada Close, Parson Street	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	01/02/2016 13:00
End	03/02/2016 03:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
01/02/2016 13:00	57.3	75.4	53.5	58
01/02/2016 14:00	58.9	82.3	53.9	59.1
01/02/2016 15:00	57.4	77.1	53.5	58.1
01/02/2016 16:00	56.6	74.8	52.9	57.8
01/02/2016 17:00	55.4	77.9	51.7	56.4
01/02/2016 18:00	57.1	75.6	52.4	57.1
01/02/2016 19:00	56.2	72.5	52.8	57.5
01/02/2016 20:00	56	74.7	51.4	57.2
01/02/2016 21:00	56	81.1	50	57.3
01/02/2016 22:00	54.4	74.7	48.3	54.4
01/02/2016 23:00	53.9	75.9	46.9	54
02/02/2016 00:00	48.6	69.1	42.9	51.4
02/02/2016 01:00	47.3	68.6	39.6	49.6
02/02/2016 02:00	49.9	76.5	38.7	47.7
02/02/2016 03:00	44.9	58.2	39.5	47.7
02/02/2016 04:00	46.6	63.6	39.5	49.6
02/02/2016 05:00	52.9	73.2	48.1	53.8
02/02/2016 06:00	55.4	73.3	51.3	56.2
02/02/2016 07:00	59.3	88.1	53.2	57.8
02/02/2016 08:00	59.2	80.5	52.6	59.9
02/02/2016 09:00	57	82.7	52.7	57.2
02/02/2016 10:00	57.8	77.7	53.3	58
02/02/2016 11:00	59.3	80	54.9	59.7
02/02/2016 12:00	58	78.9	53.5	58.4
02/02/2016 13:00	59.1	90.5	52.5	57
02/02/2016 14:00	59.1	85.8	53.6	58.7
02/02/2016 15:00	57.5	80.5	53.4	57.8
02/02/2016 16:00	55.4	74.4	51.3	55.6
02/02/2016 17:00	58.6	80.8	51.2	58
02/02/2016 18:00	56.6	74.2	52.7	56.7
02/02/2016 19:00	55	74.6	50.8	56
02/02/2016 20:00	53.6	72.4	49.7	53.7
02/02/2016 21:00	54.3	79.5	49.1	54
02/02/2016 22:00	55.4	77.8	47.3	52.9
02/02/2016 23:00	53	86.8	44.4	51.3
03/02/2016 00:00	45.9	68.2	41	48.4
03/02/2016 01:00	44	55.9	38.9	46.4
03/02/2016 02:00	50.1	78.8	38	47.7
03/02/2016 03:00	49.4	76.8	40.1	51.2

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	14-Mar-2016
Measurement Location	LT17 - 1 Sunnyside BS20 0AN, Pill			By	SR
GPS Coordinates	N: 51.480733 W: -2.6858608				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	21-Jan-2016
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	21-Jan-2016
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	21-Jan-2016
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	50.1	85.5	42.2	49.2
Night time 6hour	42.0	75.9	36.8	42.0

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	50.4	85.5	42.4	49.6
Night time 8hour	43.2	75.9	37.8	43.1

Comments

The dominant noise source at this location was rail noise when present the passing of freight trains.

The vibration logger was setup just outside the back door.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	14-Mar-2016
Measurement Location	LT17 - 1 Sunnyside BS20 0AN, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	14/03/2016 12:00
End	16/03/2016 10:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
14/03/2016 12:00	48.8	70.4	43.2	51.4
14/03/2016 13:00	52.3	79.6	42.9	51.8
14/03/2016 14:00	48.2	71.5	42.9	50.2
14/03/2016 15:00	49	70.9	43.3	52.1
14/03/2016 16:00	48.4	69.3	43.9	50.6
14/03/2016 17:00	47.8	74.5	43.4	49.5
14/03/2016 18:00	49.1	72.2	43.6	51.8
14/03/2016 19:00	46.1	76.5	42.5	46.9
14/03/2016 20:00	45.3	66.4	40.9	47.6
14/03/2016 21:00	43	59	39.6	44.9
14/03/2016 22:00	41.6	56.8	38.8	43
14/03/2016 23:00	39.7	61.2	36.9	41
15/03/2016 00:00	38	55.4	35.8	39.4
15/03/2016 01:00	36.3	48.4	34.4	37.6
15/03/2016 02:00	36.6	56.1	34.6	37.7
15/03/2016 03:00	38	45.9	36.2	39.3
15/03/2016 04:00	39.9	53.4	37.8	41.3
15/03/2016 05:00	45.6	62.3	41.7	48.1
15/03/2016 06:00	48.7	61.1	45.4	50.5
15/03/2016 07:00	50.2	64.8	47.9	51.5
15/03/2016 08:00	48.5	64.6	44.7	50
15/03/2016 09:00	50.2	71.1	41.1	51
15/03/2016 10:00	51.6	79.7	40	46.6
15/03/2016 11:00	51.2	76.5	39.3	45
15/03/2016 12:00	49.9	66.7	41.3	51.8
15/03/2016 13:00	53.9	78.7	41.4	55.2
15/03/2016 14:00	58.5	85.5	42.9	62
15/03/2016 15:00	47.4	71.8	43.2	49.3
15/03/2016 16:00	53.9	84.8	42.9	48.1
15/03/2016 17:00	55.4	83.9	43.2	50.9
15/03/2016 18:00	48.8	63.8	42.8	52.2
15/03/2016 19:00	47.8	77.5	41.3	49
15/03/2016 20:00	41.7	54	39.7	43.1
15/03/2016 21:00	43.1	59	39.7	44.9
15/03/2016 22:00	46	62.7	40	48.9
15/03/2016 23:00	43.6	59.8	37.6	46.4
16/03/2016 00:00	43	75.9	36.5	44.5
16/03/2016 01:00	42.1	59.4	36.4	44.9
16/03/2016 02:00	43.9	71.4	34.2	40.1
16/03/2016 03:00	39.3	54.5	35.1	41.6
16/03/2016 04:00	41.2	57.3	38	42.9
16/03/2016 05:00	45.9	62.5	41	47
16/03/2016 06:00	45.5	65.4	43.1	46.7
16/03/2016 07:00	48.2	63.2	46.2	49.3
16/03/2016 08:00	48.3	62.5	45.7	49.7
16/03/2016 09:00	47.4	66.9	43.5	48.6
16/03/2016 10:00	48.1	70.9	43.3	49.3

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	14-Mar-2016
Measurement Location	LT18 - 25 Avon Road, Pill			By	SR
GPS Coordinates	N: 51.483443 W: -2.6914673				
Equipment					
Sound Level Meter	01 dB BlueGrey Solo	Serial No.	61083	Cal. Date	20-Jan-2016
Microphone	01 dB MCE 212	Serial No.	91247	Cal. Date	20-Jan-2016
Preamplifier	01 dB Pre 21 S	Serial No.	11790	Cal. Date	20-Jan-2016
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	50.7	89.3	45.8	50.2
Night time 6hour	46.9	72.3	41.6	47.5

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	50.8	89.3	45.9	50.3
Night time 8hour	48.1	81.6	42.5	48.0

Comments

Vegetation clearance on the freight line was taking place at certain periods during the survey. Times when there was clear and sustained noise from vegetation clearance activities have been removed for the analysis.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	14-Mar-2016
Measurement Location	LT18 - 25 Avon Road, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	14/03/2016 12:00
End	16/03/2016 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
16/03/2016 11:00	48.7	65.6	45.6	50.2
16/03/2016 12:00	58.7	89.3	45.9	51.8
14/03/2016 14:00	48.3	65.4	45.4	50
14/03/2016 15:00	49.3	77.8	45.8	50.2
14/03/2016 16:00	48.5	70	45	50.4
14/03/2016 17:00	48.5	70.7	44.5	50.2
14/03/2016 18:00	47.6	59.8	45.5	48.8
14/03/2016 19:00	46.6	58.5	44.4	48.2
14/03/2016 20:00	45.5	65	43.1	46.6
14/03/2016 21:00	47	73.9	42.2	47
14/03/2016 22:00	43.3	68.9	39.7	44.3
14/03/2016 23:00	42.1	52.8	38.7	44.1
15/03/2016 00:00	41.5	62.4	38.1	43.6
15/03/2016 01:00	41.6	51.4	38	43.8
15/03/2016 02:00	43.2	51.3	40.3	45.1
15/03/2016 03:00	45.7	52.1	42.4	47.7
15/03/2016 04:00	48.5	65.7	44.8	49.6
15/03/2016 05:00	51.7	66.7	48.4	53.4
15/03/2016 06:00	53.3	81.6	51.3	54.1
15/03/2016 07:00	50.8	65.8	48.2	52.6
15/03/2016 08:00	51.3	70.5	46.5	50.6
15/03/2016 09:00	49.6	76	45.9	51.2
15/03/2016 10:00	48.5	61.1	46	49.9
15/03/2016 11:00	51.8	74.5	46.7	52.5
15/03/2016 12:00	49	64.8	45.8	50
15/03/2016 13:00	51.3	72.6	47.8	52.1
15/03/2016 14:00	52.3	78.3	48.7	52.5
15/03/2016 15:00	51.3	73.1	49	52.5
15/03/2016 16:00	53.9	75.5	46.9	51.4
15/03/2016 17:00	50.6	73.2	47.4	51.8
15/03/2016 18:00	50.1	73.8	47.2	50.8
15/03/2016 19:00	47.6	54.6	45	49.2
15/03/2016 20:00	47.6	64.2	44.8	49.1
15/03/2016 21:00	47.8	72.4	44.1	48.7
15/03/2016 22:00	46.9	68.9	43.1	48.7
15/03/2016 23:00	44.3	62.4	40.3	46.5
16/03/2016 00:00	43.8	59.4	39.5	46.3
16/03/2016 01:00	46.9	72.3	38.2	46.2
16/03/2016 02:00	42.9	54.6	38	45.7
16/03/2016 03:00	45.1	58.5	40.8	47.6
16/03/2016 04:00	47.2	64	43.9	49
16/03/2016 05:00	50.4	69.3	47.2	52.1
16/03/2016 06:00	52.4	71.6	50.2	53.3
16/03/2016 07:00	52.1	65.8	50.1	53.2
16/03/2016 08:00	50.8	64.3	48.9	52.1
16/03/2016 09:00	53.6	77.9	48.8	53.7

Noise Measurement Record

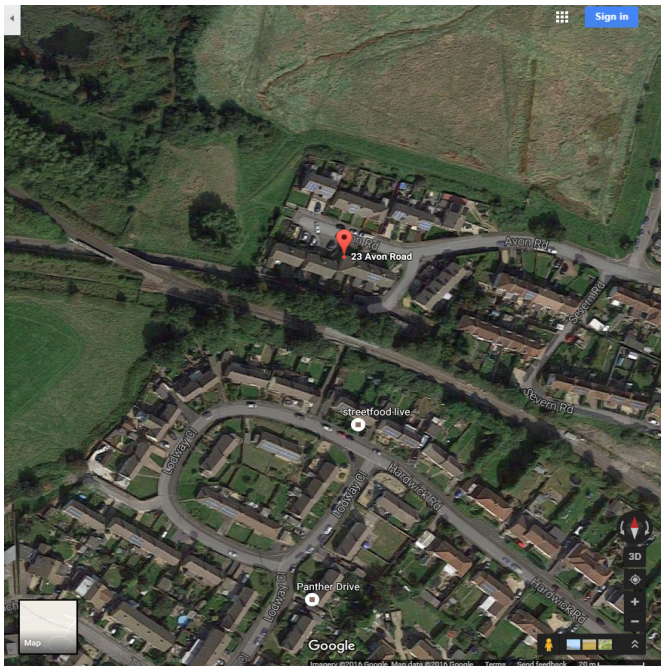
ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	16-Mar-2016
Measurement Location	LT19 - 23 Avon Road, Pill			By	SR
GPS Coordinates	N: 51.483416 W: -2.6912165				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	16796	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	153676	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure



Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	53.4	95.4	46.5	51.4
Night time 6hour	47.0	67.2	41.5	48.5

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	53.7	95.4	46.7	51.5
Night time 8hour	48.0	67.2	42.4	48.9

Comments

Vegetation clearance on the freight line was taking place at certain periods during the survey. Times when there was clear and sustained noise from vegetation clearance activities have been removed for the analysis.

During Thursday 17 March 2016 the owner was having the windows of the house replaced. Periods of obvious contamination have been removed from the data for the analysis.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	16-Mar-2016
Measurement Location	LT19 - 23 Avon Road, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	16/03/2016 11:00
End	18/03/2016 13:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
16/03/2016 11:00	50.9	71.8	47.8	52.4
16/03/2016 12:00	55.8	85.8	46.4	51.6
16/03/2016 13:00	60.7	95.4	45.9	51.6
16/03/2016 14:00	49	67.5	46.5	50.5
16/03/2016 15:00	53.3	76.5	48.3	52.6
16/03/2016 16:00	50.6	76.6	46	52.5
16/03/2016 17:00	51.7	72	46	50.9
16/03/2016 18:00	50.2	66.7	46.4	51.6
16/03/2016 19:00	51.7	66.2	48.7	52.5
16/03/2016 20:00	49.8	63.9	47.1	51.3
16/03/2016 21:00	46.8	64.5	42.4	49
16/03/2016 22:00	44.9	68	40.3	45.7
16/03/2016 23:00	43.3	59.7	39.3	45.6
17/03/2016 00:00	44.2	56.1	39.3	46.8
17/03/2016 01:00	42.4	51.1	38.1	45.1
17/03/2016 02:00	43.5	57.1	38.5	45.9
17/03/2016 03:00	44.1	52.4	39.9	46.4
17/03/2016 04:00	44.7	58.1	40.8	47.1
17/03/2016 05:00	48.6	66.7	44.2	50.2
17/03/2016 06:00	50.8	64.3	47.2	52.6
17/03/2016 07:00	51.3	65.7	49.6	52.5
17/03/2016 08:00	51.8	73.6	48.5	53.3
17/03/2016 09:00	53.8	75.7	48	53.4
17/03/2016 10:00	60.3	89.2	46.8	51.9
17/03/2016 11:00	59.2	91.2	44.5	50.3
17/03/2016 12:00	51.9	77.3	43.9	50.2
17/03/2016 13:00	57.7	86.3	43.8	52.5
17/03/2016 14:00	54.5	82	44.4	50.6
17/03/2016 15:00	50.9	67.5	48.2	52.2
17/03/2016 16:00	54.5	82.5	47.5	53
17/03/2016 17:00	53.9	82.2	46.8	50.7
17/03/2016 18:00	52.6	72.8	48.7	53.5
17/03/2016 19:00	51.2	68.8	47.9	52.3
17/03/2016 20:00	48.4	71.3	45.6	48.9
17/03/2016 21:00	48.4	68.5	45.7	49.2
17/03/2016 22:00	47.6	59.7	45.1	49.1
17/03/2016 23:00	46.5	65.8	42.7	48.4
18/03/2016 00:00	45.1	53.6	40.7	48
18/03/2016 01:00	45.3	53.9	40.8	47.9
18/03/2016 02:00	47.7	58	41.7	50.8
18/03/2016 03:00	46.4	56.1	42	48.9
18/03/2016 04:00	47.5	57	44.3	49.7
18/03/2016 05:00	52.6	67.2	48	54.7
18/03/2016 06:00	53.6	61.9	51.6	54.9
18/03/2016 07:00	52.5	62	50.2	54.3
18/03/2016 08:00	51.3	62.2	49.2	52.6
18/03/2016 09:00	49.4	67.1	46.4	50.8
18/03/2016 10:00	49.1	63.7	46.7	50.4
18/03/2016 11:00	50.6	59.4	47.6	52.5
18/03/2016 12:00	51.9	70.4	48.5	52.8
18/03/2016 13:00	51.3	68.4	49.1	52.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	16-Mar-2016
Measurement Location	LT20 - 3 Star Lane, Pill			By	SR
GPS Coordinates	N: 51.480203 W: -2.6854780				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	21-Jan-2016
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	21-Jan-2016
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	21-Jan-2016
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	54.2	88.8	46.0	51.0
Night time 6hour	46.3	68.9	41.2	46.6

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	53.9	88.8	45.9	50.8
Night time 8hour	47.4	81.2	42.0	47.2

Comments

During the passing of freights train, this was the dominant noise source. Other noise sources included road traffic and birdsong.

Daytime periods contaiminated from dog barking in a nearby house. These periods were frequent throughout the day.

The vibration logger was setup just outside the back door, close to the side of the house.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	16-Mar-2016
Measurement Location	LT20 - 3 Star Lane, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	16/03/2016 12:00
End	18/03/2016 11:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
16/03/2016 12:00	60.3	85	46.1	59.9
16/03/2016 13:00	53.2	82.3	45.2	50
16/03/2016 14:00	51	76.5	45.8	49.4
16/03/2016 15:00	53.5	79.9	46.7	50.7
16/03/2016 16:00	51.6	75.5	47.5	51.4
16/03/2016 17:00	55.6	80	47.4	51.4
16/03/2016 18:00	51.5	69.1	48.6	53
16/03/2016 19:00	54.9	78.6	50.8	53.8
16/03/2016 20:00	51.3	81.5	47.1	52
16/03/2016 21:00	45.7	63.8	41.5	47.8
16/03/2016 22:00	43.6	64.2	39.8	45.7
16/03/2016 23:00	41.3	56.2	38.7	42.9
17/03/2016 00:00	41.7	55.6	38.4	43.7
17/03/2016 01:00	40.8	50.8	37.6	42.8
17/03/2016 02:00	45.1	65.8	38.7	45.5
17/03/2016 03:00	43.2	62.1	40	45
17/03/2016 04:00	43	65.7	39.8	44.7
17/03/2016 05:00	49.9	68.9	45	50.3
17/03/2016 06:00	51.1	58.2	48	53.2
17/03/2016 07:00	52.6	67.5	50.5	54.2
17/03/2016 08:00	59	86.3	47.3	52
17/03/2016 09:00	54.9	88.8	46.9	50.5
17/03/2016 10:00	57	79	44.7	50.5
17/03/2016 11:00	54.1	81.2	43.6	49.5
17/03/2016 12:00	55.8	83.3	42.8	48.4
17/03/2016 13:00	53	80.1	42	47.6
17/03/2016 14:00	54.6	80.1	43.1	50.4
17/03/2016 15:00	49	74.6	44.7	49.2
17/03/2016 16:00	54	78.7	46.7	50.7
17/03/2016 17:00	52.2	77.5	47.6	51.3
17/03/2016 18:00	53.8	75.1	50.5	55.3
17/03/2016 19:00	52.5	66.4	50.3	53.6
17/03/2016 20:00	47.7	54.7	45.5	49.2
17/03/2016 21:00	47.6	57.4	45.9	48.9
17/03/2016 22:00	46.9	58.5	44.4	48.5
17/03/2016 23:00	43.5	52	41.1	45.1
18/03/2016 00:00	43.1	52.3	40.2	45.1
18/03/2016 01:00	41.1	52.5	37.4	43.1
18/03/2016 02:00	44.2	54.9	38.9	46.8
18/03/2016 03:00	46.5	63.8	43	48.6
18/03/2016 04:00	49.4	56.2	46.7	51.3
18/03/2016 05:00	51	60.7	48.3	52.7
18/03/2016 06:00	53.2	81.2	50.7	54
18/03/2016 07:00	58.2	82.5	51	54.7
18/03/2016 08:00	54.9	77.5	47.5	54.2
18/03/2016 09:00	48.9	76.8	42.8	48.2
18/03/2016 10:00	55.1	79	43.2	49.4
18/03/2016 11:00	55.2	78.9	45.7	50.6

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	21-Mar-2016
Measurement Location	LT21 - 16 New Road, Pill			By	SR
GPS Coordinates	N: 51.480348 W: -2.6856174				
Equipment					
Sound Level Meter	01 dB Grey Solo	Serial No.	11144	Cal. Date	19-Jan-2015
Microphone	01 dB MCE 212	Serial No.	16796	Cal. Date	19-Jan-2015
Preamplifier	01 dB Pre 21 S	Serial No.	153676	Cal. Date	19-Jan-2015
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	51.0	84.5	41.6	51.0
Night time 6hour	48.2	73.2	37.8	44.8

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	51.1	84.5	41.8	51.3
Night time 8hour	48.8	73.2	38.4	45.7

Comments

During the passing of freights train, this was the dominant noise source. Other noise sources included road traffic and birdsong.

The morning periods between 05:00 and 07:00 contain a high contribution from bird song.

The vibration logger was located in the garage on the side of the house closest to the railway line.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	21-Mar-2016
Measurement Location	LT21 - 16 New Road, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	21/03/2016 12:00
End	24/03/2016 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
21/03/2016 12:00	50.3	70.8	44.8	51.7
21/03/2016 13:00	55.3	71.7	43.2	58
21/03/2016 14:00	52.3	71.8	42.3	55.3
21/03/2016 15:00	53.9	74.3	43.7	57.1
21/03/2016 16:00	52.9	70.9	41.3	57.1
21/03/2016 17:00	51.8	71.7	40.6	54.9
21/03/2016 18:00	45.6	65.3	39.6	47.2
21/03/2016 19:00	45	67.5	39.7	46.5
21/03/2016 20:00	44.2	67.1	41.2	45.2
21/03/2016 21:00	42.2	64.4	38.5	43.5
21/03/2016 22:00	39.1	48.8	36.8	40.8
21/03/2016 23:00	37.6	58.7	29.5	40.1
22/03/2016 00:00	32.3	47	28.5	34.5
22/03/2016 01:00	33.6	48.3	27.8	36.5
22/03/2016 02:00	39	50.7	32.8	42.2
22/03/2016 03:00	43.9	53.6	40.4	46
22/03/2016 04:00	44.5	55.6	41.3	46.2
22/03/2016 05:00	56.7	73.2	42.8	59.2
22/03/2016 06:00	50.4	69.3	42.8	52.5
22/03/2016 07:00	49.3	66.6	43.3	51.5
22/03/2016 08:00	50.3	69.7	43.1	52.7
22/03/2016 09:00	56.3	84.5	42.6	54.3
22/03/2016 10:00	52.6	73.2	43.3	55.4
22/03/2016 11:00	53	76.3	43.3	53.6
22/03/2016 12:00	45.2	68.4	40.7	46.5
22/03/2016 13:00	53.6	70	42.1	57.8
22/03/2016 14:00	49.8	69.1	41.2	52
22/03/2016 15:00	49.2	72.2	43.2	50.9
22/03/2016 16:00	54.3	74.3	42.9	57.9
22/03/2016 17:00	55.1	77.9	42.3	55.5
22/03/2016 18:00	47.8	74.7	43.9	48.9
22/03/2016 19:00	44.6	64.8	41.8	46.5
22/03/2016 20:00	45.4	61.9	41.6	47.2
22/03/2016 21:00	44.4	53.2	41.8	46.3
22/03/2016 22:00	44.6	62.9	41.5	46.5
22/03/2016 23:00	43.8	57	40.2	46.1
23/03/2016 00:00	43.9	59	40.2	46.2
23/03/2016 01:00	44.4	54.7	41.1	46.7
23/03/2016 02:00	45.2	53.4	41.8	47.7
23/03/2016 03:00	46.6	54	43.8	48.5
23/03/2016 04:00	47.1	60.8	44.8	48.5
23/03/2016 05:00	52.7	69.5	46.6	54.6
23/03/2016 06:00	53.7	67	48.7	56.3
23/03/2016 07:00	50.5	70.1	45.7	52.4
23/03/2016 08:00	48.3	70.8	40.7	50.6
23/03/2016 09:00	49.2	76.6	38.8	49.4
23/03/2016 10:00	52.4	74.7	38.8	53.5
23/03/2016 11:00	50.7	73.8	39.4	53.6
23/03/2016 12:00	51	70	39.7	53.8
23/03/2016 13:00	53	69.7	39.9	56.6
23/03/2016 14:00	52.4	74.6	41	54.1
23/03/2016 15:00	51.8	73	42.2	54.2
23/03/2016 16:00	52.6	71.5	44.2	54
23/03/2016 17:00	47.8	66.8	43	50.4

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	21-Mar-2016
Measurement Location	LT21 - 16 New Road, Pill	By	SR

23/03/2016 18:00	54	74.2	43.2	52.4
23/03/2016 19:00	45.6	57.5	43.6	46.8
23/03/2016 20:00	45.7	64.5	43.6	46.8
23/03/2016 21:00	44.5	54.7	40.9	46.3
23/03/2016 22:00	39.3	62.7	36.1	40.3
23/03/2016 23:00	38.3	48.8	35.9	39.9
24/03/2016 00:00	36	51.1	32.9	37.7
24/03/2016 01:00	42.3	67.2	32.8	37.8
24/03/2016 02:00	35.3	50.2	32.8	37
24/03/2016 03:00	37.1	61.7	33.4	38.8
24/03/2016 04:00	38.3	54	36	39.6
24/03/2016 05:00	54.1	70.7	40	57.8
24/03/2016 06:00	53.6	69.8	43.5	57.2
24/03/2016 07:00	52	68.9	44.7	55.1
24/03/2016 08:00	50.7	67	44.6	53.5
24/03/2016 09:00	54.6	75.5	42.9	56.4

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1			Date	21-Mar-2016
Measurement Location	LT22 - 11 Mount Pleasant, Pill			By	SR
GPS Coordinates	N: 51.479201 W: -2.6838445				
Equipment					
Sound Level Meter	01 dB Blue Solo	Serial No.	61046	Cal. Date	21-Jan-2016
Microphone	01 dB MCE 212	Serial No.	142693	Cal. Date	21-Jan-2016
Preamplifier	01 dB Pre 21 S	Serial No.	16016	Cal. Date	21-Jan-2016
Field Calibrator	01 dB Stell Cal 21	Serial No.	51031300	Cal. Date	13-Jan-2016
Initial Calibration Level	94dB	Final Calibration Level	94dB		

Measurement Figure

Measured Noise Levels

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 18hour	47.1	82.8	37.3	46.9
Night time 6hour	42.8	66.7	32.3	40.2

Period	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
Day time 16hour	47.0	82.8	37.6	47.3
Night time 8hour	44.6	75.3	33.0	41.1

Comments

During the passing of freights train, this was the dominant noise source. Other noise sources included road traffic and birdsong.

The morning periods between 05:00 and 07:00 contain a high contribution from bird song.

During the survey the weather conditions were suitable for enviromental noise measurements.

Noise Measurement Record

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travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	21-Mar-2016
Measurement Location	LT22 - 11 Mount Pleasant, Pill	By	SR

Hourly Measured Noise Levels

Periods	1h
Start	21/03/2016 12:00
End	24/03/2016 09:00

Period Start	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)	L_{A10} (dB)
21/03/2016 12:00	49.5	80.3	41	49.5
21/03/2016 13:00	48	64.6	40.2	50.6
21/03/2016 14:00	47.3	75.3	40.3	47.9
21/03/2016 15:00	47	65.5	42	48.6
21/03/2016 16:00	46.1	64	40.4	48.6
21/03/2016 17:00	45.8	66.5	38.3	48.5
21/03/2016 18:00	45	64.3	35.8	47.2
21/03/2016 19:00	39.5	59.5	32.5	39.3
21/03/2016 20:00	37.7	55.3	30.9	42.1
21/03/2016 21:00	37.7	56.7	28.8	40.6
21/03/2016 22:00	34.9	51.2	26.6	38.9
21/03/2016 23:00	30.8	50.5	23.2	32.7
22/03/2016 00:00	27.8	49.1	22.3	30
22/03/2016 01:00	27.9	53.4	21.9	30.1
22/03/2016 02:00	32.7	52.1	24.7	36.1
22/03/2016 03:00	33.5	51.8	30.1	35.9
22/03/2016 04:00	38.1	64.6	30.6	38.7
22/03/2016 05:00	48.5	66.7	34.4	52.4
22/03/2016 06:00	49.6	75.3	35.9	51.3
22/03/2016 07:00	46.3	70.3	36.5	48.4
22/03/2016 08:00	47.2	66.9	36.6	49.9
22/03/2016 09:00	49.1	71.6	35.2	50.1
22/03/2016 10:00	46.4	65.1	36.1	49.2
22/03/2016 11:00	50.4	82.8	37.9	50
22/03/2016 12:00	46.4	72.7	36.1	47.4
22/03/2016 13:00	45.1	65.3	37.1	46.5
22/03/2016 14:00	45.6	62.8	36.7	48.9
22/03/2016 15:00	50.8	71.5	38.2	52.1
22/03/2016 16:00	50.5	75.6	39.3	52.5
22/03/2016 17:00	46.7	74	37.5	49.4
22/03/2016 18:00	48.3	72.2	37.7	49.5
22/03/2016 19:00	39.9	60.1	35	43.1
22/03/2016 20:00	38.4	57	33.6	41.1
22/03/2016 21:00	38	60.4	31.4	38.6
22/03/2016 22:00	38.4	60.8	32.1	38.5
22/03/2016 23:00	35.7	53.5	31.9	37.8
23/03/2016 00:00	36.6	49.7	32.9	39.3
23/03/2016 01:00	36.7	52.1	32.1	39.1
23/03/2016 02:00	39.2	51	34.3	42.3
23/03/2016 03:00	41.3	53.6	36.8	43.8
23/03/2016 04:00	42.9	60.9	38.2	44.4
23/03/2016 05:00	50.1	62.9	42.7	53.6
23/03/2016 06:00	52.8	73.2	44.4	54.8
23/03/2016 07:00	51.4	72.2	39.7	54
23/03/2016 08:00	45.7	67	35.6	47.9
23/03/2016 09:00	49.8	73.3	36.5	49.5
23/03/2016 10:00	48.8	73.9	35.5	50.1
23/03/2016 11:00	44.9	69.6	35	46.9
23/03/2016 12:00	47.4	72.4	37.8	47.1
23/03/2016 13:00	44.1	70.5	37.3	44.7
23/03/2016 14:00	48	68.7	39.5	49.4
23/03/2016 15:00	47.4	70.5	41.3	50.1
23/03/2016 16:00	48.6	68.5	43.1	50.2
23/03/2016 17:00	46.4	70.4	42.1	47.7

Noise Measurement Record

ch2m

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Project	MetroWest Phase 1	Date	21-Mar-2016
Measurement Location	LT22 - 11 Mount Pleasant, Pill	By	SR

23/03/2016 18:00	48.2	68.7	42.1	50.1
23/03/2016 19:00	45.6	66.9	43	46.4
23/03/2016 20:00	45.3	58.7	43.1	47
23/03/2016 21:00	45.7	62.3	42.3	46.9
23/03/2016 22:00	38.8	58	35.8	40.8
23/03/2016 23:00	37.3	48.8	34.8	38.7
24/03/2016 00:00	35.1	55.7	32.4	36.7
24/03/2016 01:00	40.4	64.2	31.1	36.6
24/03/2016 02:00	34.6	48.3	31.5	36.3
24/03/2016 03:00	34.9	47	32	36.9
24/03/2016 04:00	37.6	59.7	35	38.6
24/03/2016 05:00	49.1	64.3	38.2	53.3
24/03/2016 06:00	47.5	72	41.1	47.7
24/03/2016 07:00	49.6	66.7	42.8	51.1
24/03/2016 08:00	48.1	65	43.1	50
24/03/2016 09:00	48.8	72.7	41.4	49.1

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.6 Vibration Survey Results
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 6

Vibration survey results

6.1 Oxford Station

6.1.1 Tables 6.1 to 6.3 in this appendix present the results from vibration measurements undertaken at Oxford station on 24th September 2015. The distances quoted in the tables are from the vibration sensor to the closest rail. All measurements are the over the period of the train passing, and are in Peak Particle Velocity (PPV) mm/s. PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal. It is specified in millimetres per second (mm/s). It is important to note that the PPV refers to the movement within the ground of molecular particles and not surface movement.

6.1.2 The Diesel Multiple Units (DMUs) on the down line were slowing to stop at the station, and those on the up line were accelerating from the station. Freight trains were passing through the station on the relief lines.

6.1.3 In each table the distance quoted is from the nearest rail head to the vibration monitor. Two vibration monitors were in use for the measurements and hence there are two measurements for most train passes. The instruments used for the survey continuously measure the maximum level of vibration over a 30-second period and the maximum of these during the train passage has been reported.

Table 6.1: Measurements of vibration from Class 165 DMUs at various distances, PPV

Time of pass-by	Down line		Down relief line		Up relief line		Up line	
	3m	4m	6.5m	7.5m	10m	11m	13.5m	14.5m
11:04	-	0.4	-	-	-	-	-	-
11:37	-	-	-	-	-	-	0.2	0.16
12:02	0.64	0.4	-	-	-	-	-	-
12:40	-	-	-	-	-	-	0.2	0.2
14:14	0.6	0.36	-	-	-	-	-	-

Table 6.2: Measurements of vibration from Class 166 DMUs at various distances, PPV

Time of pass-by	Down line		Down relief line		Up relief line		Up line	
	3m	4m	6.5m	7.5m	10m	11m	13.5m	14.5m
11:06	-	-	-	-	-	-	-	0.16
11:50	0.52	0.36	-	-	-	-	-	-
12:01	-	-	-	-	-	-	0.16	0.16

Table 6.2: Measurements of vibration from Class 166 DMUs at various distances, PPV

Time of pass-by	Down line		Down relief line		Up relief line		Up line	
	3m	4m	6.5m	7.5m	10m	11m	13.5m	14.5m
12:30	-	-	-	-	-	-	0.16	0.16
12:31	0.52	0.4	-	-	-	-	-	-
12:49	0.44	0.32	-	-	-	-	-	-
13:00	-	-	-	-	-	-	0.16	0.2
13:05	0.44	0.32	-	-	-	-	-	-
13:08	-	-	-	-	-	-	0.16	0.12
13:34	0.52	0.36	-	-	-	-	-	-
13:37	-	-	-	-	-	-	0.24	0.2
13:51	0.72	0.44	-	-	-	-	-	-
14:03	0.72	0.36	-	-	-	-	-	-
14:07	-	-	-	-	-	-	0.24	0.16

Table 6.3: Measurements of vibration from freight trains at various distances, PPV

Time of pass-by	Approximate speed	Down line		Down relief line		Up relief line		Up line	
		3m	4m	6.5m	7.5m	10m	11m	13.5m	14.5m
10:56	40 - 50 mph	-	-	-	1.21	-	-	-	-
11:55	40 - 50 mph	-	-	1.29	1.0	-	-	-	-
12:14	10 mph	-	-	0.48	0.4	-	-	-	-
12:27	10 mph	-	-	0.28	0.56	-	-	-	-
12:33	10 mph	-	-	-	-	0.32	0.32	-	-
13:24	10 mph	-	-	0.52	0.4	-	-	-	-
13:48	40 - 50 mph	-	-	-	-	0.8	0.6	-	-
13:56	40 - 50 mph	-	-	0.92	0.68	-	-	-	-
14:00	10 mph	-	-	-	-	0.24	0.28	-	-

6.2 Pill

6.2.1 Table 6.4 presents the results from vibration measurements undertaken at three residential locations near the operating freight line in Pill. Freight trains were passing along the existing line in two directions; arriving or leaving the Portbury Docks. The website www.realtimestrains.co.uk has been used to estimate the time that the train would have passed the survey location. In addition to this, reference has also been made to the noise survey results that were undertaken at the same time to assist with the identification of passing trains.

6.2.2 At these locations the vibration monitoring equipment was left unattended at locations close to the house in order to measure the levels at a location representative of the house. The equipment is very sensitive and can measure the vibration from movement close to the sensor or other events such as the closing of a nearby door. Due to this many events measured are contaminated due to the necessary use of the house by the residents and so when attempting to determine the level of vibration from a passing freight train the possible unavoidable contamination of the data had to be considered. Another difficulty in assigning a vibration level is determining the time of a freight train pass-by. Data obtained from the website www.realtimetrains.co.uk provides a time of a train at Parson Street and then at the Portbury Coal Terminal. The duration of this journey is approximately 30 minutes, yet for some events the time recorded was about an hour. This means that at some point(s) on the journey from Parson Street to the Portbury Coal Terminal the freight train would have stopped awaiting approval to proceed. These stopping points are unknown, and so an exact time that the freight train passed through Pill is also unknown without actual on site observations. It was therefore not possible to assign a level of vibration to every passing freight train. Those listed in Table 6.4 are where there was a high level of confidence that the measured vibration level could be attributed to the passing freight train.

Table 6.4: Measurements of vibration from freight trains

Date	Approximate time of pass-by	Approximate speed[1]	Direction in relation to the Portbury Docks	Survey location	PPV, mm/s
15/03/2016	16:56:00	10 mph	Leaving	LT17[2]	0.20
15/03/2016	17:23:30	10 mph	Leaving	LT17	0.32
16/03/2016	13:09:00	10 mph	Arriving	LT20	0.32
16/03/2016	17:55:30	10 mph	Leaving	LT20[3]	0.32
17/03/2016	09:58:00	10 mph	Arriving	LT20	0.32
17/03/2016	17:16:30	10 mph	Arriving	LT20	0.20
17/03/2016	17:31:30	10 mph	Leaving	LT20	0.22
22/03/2016	09:29:00	10 mph	Arriving	LT21[4]	0.34

[1] This is assumed at 10 mph due to the voluntary 10 mph speed limit through Pill.
[2] The vibration monitor was approximately 13m from the closest rail head.
[3] The vibration monitor was approximately 18m from the closest rail head.
[4] The vibration monitor was approximately 15m from the closest rail head.

6.3 Portway Park & Ride

6.3.1 Table 6.5 presents the results from vibration measurements undertaken at Portway Park & Ride on 17th January 2018. All measurements are the over the period of the train passing, and are in Peak Particle Velocity (PPV) mm/s.

6.3.2 These measurements of vibration were from trains using the Temple Meads to Avonmouth and Severn Beach line. The units using this line during the survey were all Class 166 and they were passing though the location at steady speed. In this location the railway track is continuous welded rail which is the same type of track to be used on the route between Pill and Portishead.

6.3.3 The vibration monitoring equipment was located at approximately 10 m from the nearest rail head and it was about 1.5 m higher than the rail head. An approximate speed of the trains was calculated by timing the pass-by and relating this to the length of the train. This was estimated at 40 mph for all train passages. The instrument used for the survey continuously measured the maximum level of vibration over 30-second periods, and the maximum of these levels during the train passage has been reported.

Table 6.5: Measurements of vibration from Class 166 DMUs using the Severn Beach line.

Time of pass-by	Direction[1]	Number of carriages	PPV, mm/s
11:03	NB	3	0.16
11:16	SB	3	0.16
11:39	NB	3	0.34
12:06	SB	3	0.16
12:26	NB	3	0.16
12:35	SB	3	0.16
12:59	NB	3	0.16
13:16	SB	3	0.16

[1] SB (South Bound) was from Severn Beach towards Bristol. The line is single track at this location so the SB and NB (North Bound) trains were using the same track.

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.7 Construction Plant List
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 7

Construction Plant List

7.1.1 Appendix 13.7 lists the equipment that has been assumed for each phase of construction. In the tables the ‘Plant Description’ are the descriptors given in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a). Where no reference is provided in the tables the information is from a source other than BS 5228 (e.g. manufacturers data, measured levels). It should be noted at this stage that the lists below do not form the full complement of plant and equipment for each phase of construction. The tables below contain those items of plant likely to be in close proximity to a receptor and can therefore be considered for the noise calculations to be a largely single homogenous source for the type of works described.

7.1.2 The percentage on-time for the activities within these calculations is defined as the period at which the equipment is operating within 3 dB of the maximum – in laymans terms this can be considered to the percentage of the time operating that the equipment is running and full power.

7.1.3 The calculations undertaken have used the ‘Sound Power’ method contained in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a), corrected for the likely hours of operation of the construction works. Each of the Table below report the assumed plant for this activity at the closest residential receptor, together with the calculated noise level at that point.

7.1.4 Tables 7.1 to 7.26 list the assumed equipment for construction activities in Portishead.

Table 7.1: Compound construction- Ground preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.4	Tracked excavator	80	2	25%	10	8
C.2.37	Roller	107	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						61.8

*Drive-by maximum sound pressure level.

Table 7.2: Compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.29	Tracked excavator	107	2	20%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
C.4.4	Dumper	104	2	20%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	10%	10	8
C.2.39	Vibratory roller	102	2	15%	10	8
C.2.8	Wheeled backhoe loader	96	2	10%	10	8
C.4.23	Small cement mixer	89	1	20%	10	8

Table 7.2: Compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Paslode Nail Gun	120	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						71.7

*Drive-by maximum sound pressure level.

Table 7.3: Compound construction- Drainage

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
C.2.29	Tracked excavator	107	2	15%	10	8
C.4.9	Dumper	105	2	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						70

*Drive-by maximum sound pressure level.

Table 7.4: Compound construction- Facilities

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.35	Telescopic handler	99	1	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						63.5

*Drive-by maximum sound pressure level.

Table 7.5: Compound operation including laydown area at Tansy Lane

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.13	Wheeled loader	99	2	20%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
C.4.79	Diesel generation	92	2	80%	10	8
C.4.89	Water tanker extracting water	107	1	10%	10	8
C.11.8	Lorry	116	2	5%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						62.1

Table 7.6: Utility diversions

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.70	Petrol hand held circular saw	119	1	10	10	8
C.2.19	Tracked excavator	105	1	20	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10	10	8
C.5.5	Compressor for breaker	93	1	25	10	8
C.1.6	Hand help pneumatic breaker	111	1	20	10	8
C.2.41	Vibratory plate	108	1	20	10	8
Predicted Noise Level from activity at the closest sensitive receptor (30m), $L_{Aeq,10h}$ dB						72.6

*Drive-by maximum sound pressure level.

Table 7.7: Road realignment- Subbase

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.30	Crawler mounted dozer	114	1	40%	10	8
C.5.21	Vibratory roller	108	1	25%	10	8
C.5.25	Vibratory roller	103	1	30%	10	8

Table 7.7: Road realignment- Subbase

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.38	Tractor	111	1	20%	10	8
C.6.16	Articulated dump truck	116	2	25%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						82.9

Table 7.8: Road realignment – Surfacing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.34	Lorry (4-axle wagon)*	108	2	20%	10	8
C.5.31	Asphalt paver (+ tipper lorry)	105	1	30%	10	8
C.5.21	Vibratory roller	108	2	30%	10	8
C.5.27	Vibratory roller	95	1	30%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						76.2

*Drive-by maximum sound pressure level.

Table 7.9: Road realignment - Lighting

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.21	Tracked excavator	99	1	30%	10	8
C.4.27	Concrete mixer truck	107	1	25%	10	8
C.4.34	Poker vibrator	97	1	15%	10	8
C.4.53	Lorry with lifting boom	105	1	40%	10	8
C.2.8	Wheeled backhoe loader	96	1	25%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.2

Table 7.10: Car park construction- Earthworks

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	2	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	20%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
C.2.39	Vibratory roller	102	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (30m), $L_{Aeq,10h}$ dB						67.7

*Drive-by maximum sound pressure level.

Table 7.11: Car park construction- Surfacing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.9	Dumper	105	2	15%	10	8
C.5.31	Asphalt paver (+tipper lorry)	105	1	30%	10	8
C.5.19	Road roller	108	1	25%	10	8
C.2.8	Wheeled backhoe loader	96	1	40%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (30m), $L_{Aeq,10h}$ dB						67.1

Table 7.12: Station construction- Vegetation removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Chain saw	114	2	10%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
	Brushcutter	110	2	10%	10	8
	Large wood chipper	120	1	25%	10	8
C.4.12	Wheeled excavator	87	1	30%	10	8
C.4.7	Dumper	106	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						78.2

Table 7.13: Station construction- Building

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck (discharging)	103	1	15%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	40%	10	8
C.4.33	Poker vibrator	106	2	30%	10	8
C.4.72	Hand-held circular saw	107	1	5%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						68.6

Table 7.14: Station construction- Platform and structure

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry (empty)	104	2	25%	10	8
C.4.41	Mobile telescopic crane	99	1	15%	10	8
C.2.35	Telescopic handler	99	1	20%	10	8
C.4.59	Diesel scissor lift	106	2	20%	10	8
C.4.7	Dumper	106	1	15%	10	8

Table 7.14: Station construction- Platform and structure

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.5.30	Asphalt paver (+tipper lorry)	103	1	30%	10	8
	Impact wrench	112	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						70.8

Table 7.15: Station construction- Piling

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry	104	1	10%	10	8
C.4.7	Dumper	106	1	10%	10	8
C.2.5	Tracked excavator	104	2	20%	10	8
C.3.1	Hydraulic hammer	117	1	10%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
C.4.52	Tracked mobile crane	103	1	20%	10	8
C.4.25	Concrete pump	110	1	25%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						72.9

Table 7.16: Railway line works- Old track removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.1.18	Gas cutter	107	1	10%	10	8
C.4.72	Vibratory roller	107	1	10%	10	8
C.4.12	Wheeled excavator	87	2	30%	10	8
C.4.39	Mobile telescopic crane	105	1	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.9

*Drive-by maximum sound pressure level.

Table 7.17: Railway line works- Trackbed preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	4	40%	10	8
C.4.4	Lorry (4-axle wagon)*	104	4	15%	10	8
C.2.12	Dozer	109	2	15%	10	8
C.4.7	Dumper	106	2	15%	10	8
	Triple wacker	107	2	25%	10	8

Table 7.17: Railway line works- Trackbed preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						78.5

*Drive-by maximum sound pressure level.

Table 7.18: Railway line works- Track drainage

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	1	40%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.4.7	Dumper	106	2	15%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.5

*Drive-by maximum sound pressure level.

Table 7.19: Railway line works- Track laying

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	28T Road-Rail Vehicle (RRV)	104	2	35%	10	8
	Fastclipper	95	1	30%	10	8
	McCulloch TRT	90	2	25%	10	8
	NTC Train	99	1	10%	10	8
	Class 66 Diesel Locomotive	100	1	10%	10	8
	Disc Cutter	107	2	15%	10	8
	Bance impact wrench	118	2	10%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						79.6

Table 7.20: Railway line works- Welding and stressing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Thermit welding	99	1	20%	10	8
	Rail profile grinder	106	1	15%	10	8
	Hydraulic Weld Trimmer	96	1	15%	10	8
	Disc Cutter	107	1	10%	10	8
C.4.86	Generator	93	1	15%	10	8
C.4.93	Angle grinders	108	2	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.7

Table 7.21: Railway line works- Ballasting, tamping and lining

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Bance impact wrench	118	2	10%	10	8
	Class 66 Diesel Locomotive	100	1	10%	10	8
	Autoballaster train	110	1	30%	10	8
	Network Rail tamper	111	1	30%	10	8
	Kango hammers	113	4	20%	10	8

Table 7.21: Railway line works- Ballasting, tamping and lining

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Gigarail	104	2	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						83.2

Table 7.22: Railway line works- Works to cattle creep

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	1	35%	10	8
C.4.4	Dumper	104	2	20%	10	8
C.2.34	Lorry (4-axle wagon) *	108	2	15%	10	8
C.5.27	Vibratory roller	95	1	20%	10	8
Predicted Noise Level from activity at sensitive receptor (15m), $L_{Aeq,10h}$ dB						73.6

*Drive-by maximum sound pressure level.

Table 7.23: Railway line works- Fencing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Post rammer	113	1	20%	10	8
C.4.74	Tractor (towing equipment)	108	1	20%	10	8
C.1.19	Lump Hammer	97	1	10%	10	8
Predicted Noise Level from activity at sensitive the closest receptor (15m), $L_{Aeq,10h}$ dB						74.8

Table 7.24: Trinity Primary School Bridge- Foundations

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck (discharging)	103	1	15%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	40%	10	8
C.4.33	Poker vibrator	106	2	30%	10	8
C.4.7	Dumper	106	2	20%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
C.2.41	Vibratory plate	108	2	20%	10	8
C.4.72	Hand-held circular saw	107	1	5%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						70.6

Table 7.25: Trinity Primary School Bridge- Piling

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry (empty)	104	2	10%	10	8
C.3.1	Hydraulic hammer rig	117	2	10%	10	8
C.4.52	Tracked mobile crane	103	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	40%	10	8
C.2.1	Wheeled backhoe loader	103	2	25%	10	8
C.2.38	Roller	101	2	20%	10	8
C.2.5	Tracked excavator	104	2	20%	10	8
C.4.7	Dumper	106	2	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						76.6

*Drive-by maximum sound pressure level.

Table 7.26: Trinity Primary School Bridge- Erection

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry (empty)	104	1	10%	10	8

Table 7.26: Trinity Primary School Bridge- Erection

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.38	Wheeled mobile telescopic crane	106	1	25%	10	8
	Impact wrench	112	2	10%	10	8
C.4.59	Diesel scissor lift	106	2	30%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (25m), $L_{Aeq,10h}$ dB						71.5

7.1.5 Tables 7.27 to 7.51 list the assumed equipment for construction activities between Portishead and Portbury Junction, Pill.

Table 7.27: Sheepway compound construction- Ground preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.4	Tracked excavator	80	2	40%	10	8
C.2.37	Roller	107	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						63

*Drive-by maximum sound pressure level.

Table 7.28: Sheepway compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.29	Tracked excavator	107	2	20%	10	8
C.4.4	Dumper	104	2	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	10%	10	8
C.2.39	Vibratory roller	102	1	20%	10	8
C.2.8	Wheeled backhoe loader	96	1	15%	10	8
C.4.23	Small cement mixer	89	1	20%	10	8
	Paslode Nail Gun	120	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						67.9

*Drive-by maximum sound pressure level.

Table 7.29: Sheepway compound construction- Drains

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.8	Wheeled backhoe loader	96	2	10%	10	8
C.4.9	Dumper	105	2	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	10%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						59.9

*Drive-by maximum sound pressure level.

Table 7.30: Sheepway compound construction- Site cabins

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.45	Mobile telescopic	110	1	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						58.4

*Drive-by maximum sound pressure level.

Table 7.31: Sheepway compound operation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.13	Wheeled loader	99	2	20%	10	8
C.4.79	Diesel generation	92	2	80%	10	8
C.4.89	Water tanker extracting water	107	1	10%	10	8
C.11.8	Lorry	116	2	5%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						63.3

Table 7.32: Lodway Farm compound construction- Ground preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.4	Tracked excavator	80	2	40%	10	8
C.2.37	Roller	107	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						71.7

*Drive-by maximum sound pressure level.

Table 7.33: Lodway Farm compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.29	Tracked excavator	107	2	20%	10	8
C.4.4	Dumper	104	3	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	10%	10	8
C.2.39	Vibratory roller	102	1	20%	10	8
C.2.8	Wheeled backhoe loader	96	1	15%	10	8
C.4.23	Small cement mixer	89	1	20%	10	8
	Paslode Nail Gun	120	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						71.7

*Drive-by maximum sound pressure level.

Table 7.34: Lodway Farm compound construction- Drains

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.8	Wheeled backhoe loader	96	2	10%	10	8
C.4.9	Dumper	105	2	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						67.2

*Drive-by maximum sound pressure level.

Table 7.35: Lodway Farm compound construction- Site cabins

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.45	Mobile telescopic	110	1	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						67.1

*Drive-by maximum sound pressure level.

Table 7.36: Lodway Farm compound operation- Import of materials from trackbed

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.4	Dumper	104	4	20%	10	8
C.2.29	Tracked excavator	107	3	20%	10	8
C.4.79	Diesel generator	92	2	80%	10	8
	General 4x4	108	2	20%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						63.9

Table 7.37: Lodway Farm compound operation- Treatment of trackbed waste

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.29	Tracked excavator	107	2	25%	10	8
C.10.15	Screen stockpiller	109	1	40%	10	8
C.4.79	Diesel generator	92	2	80%	10	8
C.4.89	Water tanker extracting water	107	1	20%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						63.4

Table 7.38: Lodway Farm compound operation- Removal of screen waste by road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.8	Wheeled backhoe loader	96	1	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	20%	10	8
C.4.89	Water tanker extracting water	107	1	20%	10	8
Predicted Noise Level from activity at sensitive receptor (20m), $L_{Aeq,10h}$ dB						69.2

*Drive-by maximum sound pressure level.

Table 7.39: Portbury Hundred compound construction- Ground preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.4	Tracked excavator	80	2	40%	10	8
C.2.37	Roller	107	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
Predicted Noise Level from activity at sensitive receptor (100m), $L_{Aeq,10h}$ dB						47.7

*Drive-by maximum sound pressure level.

Table 7.40: Portbury Hundred compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.29	Tracked excavator	107	2	20%	10	8

Table 7.40: Portbury Hundred compound construction- Haul road

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.4	Dumper	104	3	15%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
C.2.39	Vibratory roller	102	1	20%	10	8
C.2.8	Wheeled backhoe loader	96	1	15%	10	8
C.4.23	Small cement mixer	89	1	20%	10	8
	Paslode Nail Gun	120	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (100m), $L_{Aeq,10h}$ dB						57.5

*Drive-by maximum sound pressure level.

Table 7.41: Portbury Hundred compound construction- Drains

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.8	Wheeled backhoe loader	96	2	10%	10	8
C.4.9	Dumper	105	2	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (100m), $L_{Aeq,10h}$ dB						50.8

*Drive-by maximum sound pressure level.

Table 7.42: Portbury Hundred compound construction- Site cabins

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.45	Mobile telescopic	110	1	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10%	10	8
Predicted Noise Level from activity at sensitive receptor (100m), $L_{Aeq,10h}$ dB						51.7

*Drive-by maximum sound pressure level.

Table 7.43: Portbury Hundred compound operation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.13	Wheeled loader	99	2	20%	10	8
C.4.79	Diesel generation	92	2	80%	10	8
C.4.89	Water tanker extracting water	107	1	10%	10	8
C.11.8	Lorry	116	2	5%	10	8
Predicted Noise Level from activity at sensitive receptor (100m), $L_{Aeq,10h}$ dB						48.1

Table 7.44: Railway line works- Old track removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.1.18	Gas cutter	107	2	10%	10	8
C.4.72	Vibratory roller	107	1	10%	10	8
C.4.12	Wheeled excavator	87	2	30%	10	8
C.4.39	Mobile telescopic crane	105	1	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	15%	10	8
C.4.9	Dumper	105	2	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						74.4

*Drive-by maximum sound pressure level.

Table 7.45: Railway line works- Trackbed preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	3	20%	10	8
C.4.4	Lorry (4-axle wagon)*	104	2	15%	10	8
C.4.9	Dumper	105	2	30%	10	8
C.2.12	Dozer	109	2	30%	10	8

Table 7.45: Railway line works- Trackbed preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Triple wacker	107	1	40%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						78

*Drive-by maximum sound pressure level.

Table 7.46: Railway line works- Track drainage

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	2	20%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
C.4.9	Dumper	105	2	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.6

*Drive-by maximum sound pressure level.

Table 7.47: Railway line works- Track laying

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	28T Road-Rail Vehicle (RRV)	107	2	35%	10	8
	Fastclipper	95	1	30%	10	8
	McCulloch TRT	90	2	25%	10	8
	NTC Train	99	1	10%		
	Class 66 Diesel Locomotive	100	1	10%	10	8
	Disc Cutter	107	2	15%	10	8
	Bance impact wrench	118	2	10%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						79.6

Table 7.48: Railway line works- Welding and stressing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Thermit welding	99	1	20%	10	8
	Rail profile grinder	106	1	15%	10	8

Table 7.48: Railway line works- Welding and stressing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Hydraulic Weld Trimmer	96	1	15%	10	8
	Disc Cutter	107	1	10%	10	8
C.4.86	Generators	93	1	15%	10	8
C.4.93	Angle grinders	108	2	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.7

Table 7.49: Railway line works- Ballasting, tamping and lining

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Bance impact wrench	118	2	10%	10	8
	Class 66 Diesel Locomotive	100	1	10%	10	8
	Autoballaster train	110	1	30%	10	8
	Network Rail tamper	111	1	30%	10	8
	Kango hammers	113	4	20%	10	8
	Gigarail	104	2	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						83.2

Table 7.50: Railway line works- Works to cattle creep

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	1	35%	10	8
C.4.4	Dumper	104	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	25%	10	8
C.5.27	Vibratory roller	95	1	20%	10	8
Predicted Noise Level from activity at sensitive receptor (15m), $L_{Aeq,10h}$ dB						73

*Drive-by maximum sound pressure level.

Table 7.51: Railway line works- Fencing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Post rammer	113	1	20%	10	8
C.4.74	Tractor (towing equipment)	108	1	20%	10	8
C.1.19	Lump Hammer	97	1	10%	10	8
Predicted Noise Level from activity at sensitive the closest receptor (15m), $L_{Aeq,10h}$ dB						74.8

7.1.6 Tables 7.52 to 7.80 list the assumed equipment for construction activities in Pill.

Table 7.52: Avon Road bridge- Piling

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.3.16	Crane mounted auger	107	1	35%	10	8
C.3.8	Vibratory piling rig	116	1	30%	10	8
C.6.19	Road lorry	104	1	25%	10	8
C.2.35	Telescopic handler	99	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						79.1

Table 7.53: Avon Road bridge- Vegetation removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Chain saw	114	2	20%	10	8
	Brushcutter	110	2	20%	10	8
	Large wood chipper	120	1	25%	10	8
C.4.12	Wheeled excavator	87	1	30%	10	8
C.4.7	Dumper	106	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						83.5

Table 7.54: Avon Road bridge- Building demolition

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	1	40%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.2

*Drive-by maximum sound pressure level.

Table 7.55: Avon Road bridge- Removal of old track

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.72	Hand-held circular saw	107	2	10%	10	8
C.4.12	Wheeled excavator	87	2	30%	10	8
	Bance impact wrench	112	2	10%	10	8
	Kirow	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						73.8

Table 7.56: Avon Road bridge- Excavation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	2	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.1.9	Breaker mounted on excavator	118	1	10%	10	8
C.4.7	Dumper	106	2	25%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						78.1

*Drive-by maximum sound pressure level.

Table 7.57: Avon Road bridge- Installation of box culvert

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry (empty)	104	1	40%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.4.41	Mobile telescopic crane	99	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.3

*Drive-by maximum sound pressure level.

Table 7.58: Avon Road bridge- Footpath surfacing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.5.31	Asphalt paver (+tipper lorry)	105	1	30%	10	8
C.5.19	Road roller	108	1	25%	10	8
C.2.8	Wheeled backhoe loader	96	1	40%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.8

Table 7.59: Avon Road bridge- Track reinstatement

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	2	30%	10	8
	Bance impact wrench	112	2	10%	10	8
	Fastclipper	95	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						72.6

Table 7.60: Avon Road bridge- Tamping

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Bance impact wrench	112	2	10%	10	8
	Class 66 Diesel Locomotive	100	1	15%	10	8
	Autoballaster train	110	1	30%	10	8
	Network Rail tamper	111	1	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						77.6

Table 7.61: Avon Road embankment

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.3.4	Hydraulic hammer	105	1	20%	10	8
C.4.41	Mobile telescopic crane	99	1	30%	10	8
C.2.35	Telescopic handler	99	1	20%	10	8
C.2.5	Tracked excavator	104	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						68.6

Table 7.62: Utility diversions

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.70	Petrol hand held circular saw	119	1	10	10	8
C.2.19	Tracked excavator	105	1	20	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10	10	8
C.5.5	Compressor for breaker	93	1	25	10	8
C.1.6	Hand help pneumatic breaker	111	1	20	10	8
C.2.41	Vibratory plate	108	1	20	10	8
Predicted Noise Level from activity at the closest sensitive receptor (20m), $L_{Aeq,10h}$ dB						76.2

*Drive-by maximum sound pressure level.

Table 7.63: Car park construction- Earthworks

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	2	40%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8

Table 7.63: Car park construction- Earthworks

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.39	Vibratory roller	102	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						73.8

*Drive-by maximum sound pressure level.

Table 7.64: Car park construction- Surfacing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.5.31	Asphalt paver	105	1	30%	10	8
C.5.19	Road roller	108	1	25%	10	8
C.2.8	Wheeled backhoe loader	96	1	40%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.8

Table 7.65: Station construction- Property demolition

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	2	30%	10	8
C.2.8	Wheeled backhoe loader	96	1	15%	10	8

Table 7.65: Station construction- Property demolition

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.34	Lorry (4-axle wagon)*	108	2	20%	10	8
C.5.5	Compressor for hand-held pneumatic breaker	93	1	30%	10	8
C.1.6	Hand held pneumatic breaker	111	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (10m), $L_{Aeq,10h}$ dB						78.4

*Drive-by maximum sound pressure level.

Table 7.66: Station construction- Vegetation removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Chain saw	114	2	20%	10	8
	Brushcutter	110	2	20%	10	8
	Large wood chipper	120	1	25%	10	8
C.4.12	Wheeled excavator	87	1	30%	10	8
C.4.7	Dumper	106	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						83.5

Table 7.67: Station construction- Soil Nailing and Cutting Works

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck (discharging)	103	1	15%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	25%	10	8
C.3.19	Compressor for mini piling rig	103	1	35%	10	8
C.3.17	Mini piling rig	104	1	30%	10	8
C.2.4	Tracked excavator (idling)	80	1	20%	10	8
C.4.4	Dumper	104	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						74.2

Table 7.68: Station construction- Station foundations

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck (discharging)	103	1	15%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	40%	10	8
C.4.33	Poker vibrator	106	2	30%	10	8

Table 7.68: Station construction- Station foundations

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.72	Hand-held circular saw	107	1	5%	10	8
C.2.4	Tracked excavator (idling)	83	2	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						75.9

Table 7.69: Station construction- Platform and structure erection

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.6.19	Road lorry (empty)	104	1	40%	10	8
C.4.41	Mobile telescopic crane	99	1	15%	10	8
C.2.35	Telescopic handler	99	1	30%	10	8
C.4.59	Diesel scissor lift	106	1	40%	10	8
C.5.30	Asphalt paver	103	1	30%	10	8
	Impact wrench	112	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						74.6

Table 7.70: Hardwick Cutting embankment

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.3.1	Hydraulic hammer rig	117	1	10%	10	8
C.4.52	Tracked mobile crane	103	1	25%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	30%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (20m), $L_{Aeq,10h}$ dB						74.4

Table 7.71: Railway line works- Old track removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.1.18	Gas cutter	107	1	10%	10	8
C.4.72	Vibratory roller	107	1	10%	10	8
C.4.12	Wheeled excavator	87	2	30%	10	8
C.4.39	Mobile telescopic crane	105	1	25%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						71.9

*Drive-by maximum sound pressure level.

Table 7.72: Railway line works- Trackbed preparation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	2	25%	10	8
C.2.12	Dozer	109	2	30%	10	8
	Class 66 Diesel Locomotive	100	1	15%	10	8
	Triple wacker	107	1	40%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						76.8

Table 7.73: Railway line works- Track drainage

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	2	40%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.2.8	Wheeled backhoe loader	96	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						70.5

*Drive-by maximum sound pressure level.

Table 7.74: Railway line works- Track laying

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	28T Road-Rail Vehicle (RRV)	104	2	35%	10	8
	Fastclipper	95	1	30%	10	8
	McCulloch TRT	90	2	20%	10	8
	NTC Train	100	1	80%	10	8
	Class 66 Diesel Locomotive	100	1	15%	10	8
	Disc Cutter	107	2	10%	10	8
	Bance impact wrench	118	2	10%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
	Kirow	99	1	80%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						79.9

Table 7.75: Railway line works- Welding and stressing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Thermit welding	99	1	20%	10	8
	Rail profile grinder	106	1	25%	10	8
	Hydraulic Weld Trimmer	96	1	20%	10	8
	Disc Cutter	107	1	20%	10	8
C.4.86	Generators	93	1	10%	10	8
C.4.93	Angle grinders	108	2	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						73

Table 7.76: Railway line works- Ballasting, tamping and lining

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Bance impact wrench	118	2	10%	10	8
	Class 66 Diesel Locomotive	100	1	10%	10	8
	Autoballaster train	110	1	30%	10	8
	Network Rail tamper	111	1	35%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						80.5

Table 7.77: Railway line works- Works to cattle creep

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.19	Tracked excavator	105	1	35%	10	8
C.4.4	Dumper	104	1	30%	10	8
C.2.34	Lorry (4-axle wagon) *	108	1	25%	10	8
C.5.27	Vibratory roller	95	1	20%	10	8
Predicted Noise Level from activity at sensitive receptor (15m), $L_{Aeq,10h}$ dB						73

*Drive-by maximum sound pressure level.

Table 7.78: Railway line works- Fencing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Post rammer	113	1	20%	10	8
C.4.74	Tractor (towing equipment)	108	1	20%	10	8
C.1.19	Lump Hammer	97	1	10%	10	8
Predicted Noise Level from activity at sensitive the closest receptor (15m), $L_{Aeq,10h}$ dB						74.8

Table 7.79: Pill Viaduct works

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	1	25%	10	8
C.4.6	Dumper	107	1	25%	10	8
C.3.17	Mini piling rig	104	1	20%	10	8
C.3.25	Concrete pump	106	1	15%	10	8
C.4.22	Large concrete mixer	104	1	15%	10	8
Predicted Noise Level from activity at sensitive receptor (5m), $L_{Aeq,10h}$ dB						71.4

Table 7.80: Mount Pleasant embankment stabilisation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.3.1	Hydraulic hammer rig	117	1	10%	10	8
C.4.52	Tracked mobile crane	103	1	25%	10	8
C.4.25	Concrete pump + cement mixer truck	110	1	30%	10	8
C.2.35	Telescopic handler	99	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						76.8

7.1.7 Tables 7.81 to 7.100 list the assumed equipment for construction activities between Pill and Ashton Junction.

Table 7.81: Micro compound construction

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.4	Tracked excavator	80	2	40%	10	8
C.4.9	Dumper	105	1	30%	10	8
C.2.34	Lorry (4-axle wagon)*	108	2	25%	10	8
Predicted Noise Level from activity at sensitive receptor (300m), $L_{Aeq,10h}$ dB						42.2

*Drive-by maximum sound pressure level.

Table 7.82: Micro compound operation

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	4x4 vehicles	108	1	15	10	8
C.4.77	Generator	88	1	80	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	10	10	8
C.4.45	Mobile telescopic crane	110	1	10	10	8
Predicted Noise Level from activity at sensitive receptor (300m), $L_{Aeq,10h}$ dB						43

*Drive-by maximum sound pressure level.

Table 7.83: Rest of the line works- Vegetation removal

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Chain saw	114	2	20%	10	8
	Brushcutter	110	2	20%	10	8
	Large wood chipper	120	1	25%	10	8
C.4.12	Wheeled excavator	87	1	30%	10	8
C.4.7	Dumper	106	1	15%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						83.5

*Drive-by maximum sound pressure level.

Table 7.84: Rest of the line works- Fencing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.74	Tractor (towing equipment)	108	1	20%	10	8
	Post rammer	113	1	25%	10	8
C.1.19	Lump hammer	97	2	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						75.6

Table 7.85: Rest of the line works- Signal works

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage Acoustic On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	2	20%	10	8
C.3.16	Crane mounted auger	107	1	25%	10	8
C.4.23	Small cement mixer	89	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						68.6

Table 7.86: Rest of the line works- Track upgrading

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Class 66 Diesel Locomotive	100	1	40%	10	8
	Autoballaster train	110	1	15%	10	8
	Network Rail tamper	111	1	30%	10	8
C.4.12	Wheeled excavator	87	2	40%	10	8
	High Output Ballast Cleaner (HOBC)	115	1	25%	10	8
	Track renewal train	109	1	80%	10	8
	Kirow	99	1	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						80.6

Table 7.87: Rest of the line works- Culverting

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.72	Hand-held circular saw	107	1	10%	10	8
C.4.12	Wheeled excavator	87	2	30%	10	8
	Impact wrench	112	1	10%	10	8
C.2.34	Lorry (4-axle wagon)*	108	1	30%	10	8
C.1.9	Breaker mounted on excavator	118	1	10%	10	8
C.4.7	Dumper	106	2	20%	10	8
	28T Road-Rail Vehicle (RRV)	104	1	30%	10	8
C.4.23	Small cement mixer	89	1	10%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						78.5

*Drive-by maximum sound pressure level.

Table 7.88: Work at Liberty Lane Freightliner depot– Laydown area

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Class 66 Diesel Locomotive	100	1	10%	10	8
	28T Road-Rail Vehicle (RRV)	104	2	10%	10	8
	1200T crane	99	1	20%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (150m), $L_{Aeq,10h}$ dB						46.3

Table 7.89: Work at Liberty Lane Freightliner depot- Trackbed preparation and tamping

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Bance impact wrench	112	2	10%	1010	88
	28T Road-Rail Vehicle (RRV)	104	4	10%	10	8
	Autoballaster train	110	1	30%	10	8
	Network Rail tamper	111	1	30%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (100m), $L_{Aeq,10h}$ dB						61.4

Table 7.90: Rest of the line works- On network fencing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.12	Wheeled excavator	87	1	25%	10	8
C.4.67	Mini tracked excavator	102	1	30%	10	8
C.4.23	Small cement mixer	89	1	25%	10	8
	Impact wrench	112	1	5%	10	8
Predicted Noise Level from activity at the closest sensitive receptor (15m), $L_{Aeq,10h}$ dB						68.6

Table 7.91: Structure works

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.96	Directional drill (generator)	105	1	45%	10	8
C.4.69	Core drill (electric)	113	1	40%	10	8
Predicted Noise Level from activity at sensitive receptor (50m), $L_{Aeq,10h}$ dB						56.8

Table 7.92: Babcock ramp– Vegetation clearance

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
	Large wood chipper	120	1	25	10	8
	Chain saw	114	1	20	10	8
	Brushcutter	110	1	20	10	8
C.4.12	Wheeled excavator	87	1	15	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						61.5

Table 7.93: Babcock ramp– Moving watercourse

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.66	Wheeled backhoe loader	97	1	25	10	8
C.2.39	Vibratory roller	102	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						41

Table 7.94: Babcock ramp– Ground excavations

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	1	30	10	8
C.4.7	Dumper	106	1	15	10	8
C.2.39	Vibratory roller	102	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						48.3

Table 7.95: Babcock ramp– Piling

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck	103	1	15	10	8
C.4.25	Concrete pump	110	1	20	10	8
C.3.19	Compressor	103	1	30	10	8
C.3.17	Mini piling rig	104	1	25	10	8
C.4.4	Dumper	104	1	10	10	8
C.3.23	Tracked excavator	96	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						52.3

Table 7.96: Babcock ramp– Concreting

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.18	Cement mixer truck	103	1	15	10	8
C.4.25	Concrete pump	110	1	30	10	8
C.4.33	Poker vibrator	106	1	30	10	8
C.4.72	Hand held circular saw	107	1	5	10	8
C.4.4	Dumper	104	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						53.5

Table 7.97: Babcock ramp– Installation of suspended section

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.38	Wheeled mobile telescopic crane	106	1	30	10	8
	Impact wrench	110	1	15	10	8
C.4.59	Scissor lift	106	1	25	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						52.1

Table 7.98: Babcock ramp– Tie-in to bridge

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.69	Core drill	113	1	15	10	8
C.4.70	Hand held circular saw	119	1	5	10	8
C.4.87	Generator	93	1	30	10	8
C.4.25	Concrete pump	110	1	30	10	8
C.4.33	Poker vibrator	106	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						56.8

Table 7.99: Babcock ramp– Earthworks

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.2.5	Tracked excavator	104	1	20	10	8
C.4.4	Dumper	104	1	10	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						45.2

Table 7.100: Babcock ramp– Finishing

BS5228 Ref	Plant Description	Single Plant Lw dB	Quantity	Percentage On-Time	Shift Duration (hrs)	Duration of Activity (hrs)
C.4.87	Generator	93	1	30	10	8
C.4.69	Core drill	113	1	30	10	8
C.4.59	Scissor lift	106	1	25	10	8
	Impact wrench	110	1	15	10	8
Predicted Noise Level from activity at the closest sensitive receptor (95m), $L_{Aeq,10h}$ dB						55.8

7.1.8 Table 7.101 shows the input parameters used for the calculations of vibration levels during construction using percussive piling.

Table 7.101: Input parameters for construction vibration calculations using percussive piling

	Location				
Input parameters[1]	Portishead station	Trinity Primary School bridge	Avon Road embankment	Hardwick cutting	Mount Pleasant
Scaling factor (i.e. Probability of predicted value being exceeded)	33.3%	33.3%	33.3%	33.3%	33.3%
Distance to receptor (m)	25	25	20	20	15
Nominal hammer energy (joules)	85	85	45	85	85
Pile toe depth (m)	4	4	3	4	4

[1] The equations used are provided in Table E.1 of BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b).

7.1.9 Table 7.102 shows the input parameters used for the calculations of vibration levels during construction using vibratory compaction and vibratory piling.

Table 7.102: Input parameters for construction vibration calculations using vibratory compaction and vibratory piling

	Location	
Input parameters[1]	**Line works (Vibratory compaction)**	**Avon Road bridge (Vibratory piling)**
Scaling factor (i.e. Probability of predicted value being exceeded)	33.3%	33.3%
Number of vibrating drums	1	n/a
Maximum amplitude of drum vibration (mm)	1	n/a
Distance to receptor (m)	15	20
Width of vibrating roller drum (m)	1.8	n/a
Constant	n/a	1.3

[1] The equations used are provided in Table E.1 of BS 5228-2:2009 + A1:2014 (British Standards Institution, 2014b). Each type of activity has a different equation so different input parameters are used.

Ecology Receptors

7.1.10 Noise levels from the closest construction activities to ecology receptors have been predicted following the method contained in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a).

7.1.11 Table 7.103 presents the predicted noise levels calculated for each relevant construction activity to its closest sensitive receptor. Given the large distance between the construction activities and the receptors, some activities within these calculations have considered partial screening (a reduction of 5 dB(A)) due the presence of buildings. Also, a 50% soft ground (i.e. absorptive) attenuation has been applied.

7.1.12 The predicted construction noise levels have then been logarithmically added to the representative baseline noise levels at each location, also presented in Table 7.103 to obtain the combined noise level.

Table 7.103: Construction noise levels at ecology receptors

Area	Ecology Receptor	Construction Activity	Distance (m)	Representative Baseline Noise Level[1] ($L_{Aeq,16hr}$ dB)	Predicted Construction Noise Level ($L_{Aeq,12hr}$ dB)	Combined Noise Level[2] (dB)
Portishead	Portbury Wharf Nature Reserve	Ballasting / Tamping / Lining works	650	46	46	49
		Percussive (hammer) piling works at Trinity Primary School Bridge	500		46	49
Pill	Severn Estuary SPA	Vegetation removal	77	59	68	69
		Vibratory piling at Avon Road Bridge	77		60	63
		Excavation at the Avon Road Bridge	77		59	62
		Ballasting / Tamping / Lining of the line	77		62	64
		Percussive (hammer) piling at Hardwick Cutting	83		60	63
		Percussive (hammer) piling for Avon Road embankment works	67		53	60

[1] For Portbury Wharf Nature Reserve the most representative noise survey location was ST11 (see Appendix 13.5). Within the Severn Estuary SPA the noise level was predicted using the noise model since there is a dominant noise source from the M5 motorway.

[2] The combined noise level is the predicted noise from the construction activity added to the baseline noise level.

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.8 Noise Assessment Results
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 8

Noise assessment results

8.1.1 This Appendix presents the measured and predicted noise levels at the assessment locations. For the assessment, the opening year is 2021 and the future year is 2036.

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
A1	LT7	1	54.2	55.1	0.9	55.6	1.4
A2	LT7	1	54.2	54.4	0.2	54.9	0.7
A3	LT7	1	54.2	54.3	0.1	54.3	0.1
A4	LT7	1	54.2	54.2	0.0	54.2	0.0
B1	LT12	1	48.9	49.4	0.5	49.9	1.0
B2	LT12	1	48.9	49.1	0.2	49.4	0.5
C1	LT12	1	48.9	49.7	0.8	50.4	1.5
C2	LT12	1	48.9	49.4	0.5	49.9	1.0
C3	LT12	1	48.9	49.2	0.3	49.4	0.5
C4	LT12	1	48.9	49.0	0.1	49.2	0.3
D1	LT6	1	46.0	46.5	0.5	46.9	0.9
D2	LT6	1	46.0	46.1	0.1	46.3	0.3
D3	LT6	1	46.0	46.1	0.1	46.2	0.2
D4	LT6	1	46.0	46.2	0.2	46.3	0.3
D5	LT6	1	46.0	46.1	0.1	46.1	0.1
D6	LT6	1	46.0	46.0	0.0	46.1	0.1
D7	LT6	1	46.0	46.1	0.1	46.1	0.1
D8	LT6	1	46.0	46.0	0.0	46.1	0.1
E1	LT15	1	49.1	50.1	1.0	50.6	1.5
E2	LT15	1	49.1	49.7	0.6	50.1	1.0
E3	LT15	1	49.1	50.1	1.0	50.7	1.6

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
E4	LT15	1	49.1	49.4	0.3	49.6	0.5
E5	LT15	1	49.1	49.5	0.4	49.7	0.6
E6	LT15	1	49.1	49.2	0.1	49.2	0.1
E7	LT15	1	49.1	49.4	0.3	49.6	0.5
E8	LT15	1	49.1	49.1	0.0	49.2	0.1
F1	LT15	1	49.1	49.2	0.1	49.3	0.2
F2	LT15	1	49.1	49.3	0.2	49.4	0.3
F3	LT15	1	49.1	50.7	1.6	51.5	2.4
F4	LT15	1	49.1	51.0	1.9	51.9	2.8
F5	LT15	1	49.1	50.6	1.5	51.4	2.3
F6	LT15	1	49.1	49.1	0.0	49.2	0.1
F7	LT15	1	49.1	49.1	0.0	49.1	0.0
F8	LT15	1	49.1	49.1	0.0	49.1	0.0
F9	LT15	1	49.1	49.5	0.4	49.7	0.6
G1	LT8	1	44.8	46.8	2.0	47.8	3.0
G2	LT8	1	44.8	47.1	2.3	48.1	3.3
H1	LT15	1	49.1	51.9	2.8	53.1	4.0
H2	LT15	1	49.1	50.1	1.0	50.7	1.6
I1	LT2	1	52.8	53.1	0.3	53.4	0.6
I2	LT2	1	52.8	52.9	0.1	52.9	0.1
J1	LT4	1	49.0	49.1	0.1	49.1	0.1
J2	LT4	1	49.0	49.2	0.2	49.3	0.3
K1	LT5	1	53.0	53.1	0.1	53.2	0.2
K2	LT5	1	53.0	53.1	0.1	53.1	0.1
K3	LT5	1	53.0	53.1	0.1	53.1	0.1

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
L1	LT3	1	53.0	53.1	0.1	53.1	0.1
L2	LT3	1	53.0	53.2	0.2	53.4	0.4
L3	LT3	1	53.0	53.2	0.2	53.3	0.3
M1	LT13	1	55.2	43.2	0.3	45.4	0.5
M2	LT13	1	55.2	45.9	0.6	49.0	1.1
M3	LT13	1	55.2	56.7	1.5	57.5	2.3
M4	LT13	1	55.2	56.6	1.4	57.3	2.1
N1	LT1	1	51	51.2	0.2	51.4	0.4
N2	LT1	1	51	52.1	1.1	52.8	1.8
N3	LT1	1	51	52.8	1.8	53.6	2.6
N4	LT1	1	51	51.8	0.8	52.2	1.2
N5	LT1	1	51	51.5	0.5	51.8	0.8
N6	LT1	1	51	51.3	0.3	51.4	0.4
N7	LT1	1	51	51.6	0.6	51.8	0.8
N8	LT1	1	51	52.5	1.5	52.7	1.7
N9	LT1	1	51	52.8	1.8	52.9	1.9
N10	LT1	1	51	52.7	1.7	52.7	1.7
N11	LT17	1	50.4	51.0	0.6	51.5	1.1
N12	LT17	1	50.4	50.6	0.2	50.7	0.3
N13	LT17	1	50.4	50.6	0.2	50.8	0.4
N14	LT17	1	50.4	50.5	0.1	50.7	0.3
N15	LT17	1	50.4	50.5	0.1	50.5	0.1
N16	LT22	1	47	48.9	1.9	49.8	2.8
N17	LT22	1	47	47.7	0.7	48.0	1.0
N18	LT17	1	50.4	51.0	0.6	51.3	0.9

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
N19	LT17	1	50.4	51.3	0.9	51.8	1.4
N20	LT1	1	51	51.2	0.2	51.2	0.2
N21	LT1	1	51	51.0	0.0	51.1	0.1
N22	LT1	1	51	51.1	0.1	51.2	0.2
N23	LT1	1	51	51.2	0.2	51.3	0.3
N24	LT17	1	50.4	50.5	0.1	50.5	0.1
N25	LT17	1	50.4	50.5	0.1	50.6	0.2
N26	LT17	1	50.4	50.4	0.0	50.5	0.1
N27	LT17	1	50.4	50.5	0.1	50.5	0.1
N28	LT18	1	50.8	52.7	1.9	53.5	2.7
N29	LT18	1	50.8	51.7	0.9	52.2	1.4
N30	LT18	1	50.8	50.9	0.1	51.0	0.2
N31	LT18	1	50.8	51.5	0.7	51.9	1.1
N32	LT18	1	50.8	50.8	0.0	50.9	0.1
N33	ST20	1	57.0	58.2	1.2	58.5	1.5
N34	LT18	1	50.8	51.1	0.3	51.0	0.2
N35	LT17	1	50.4	50.8	0.4	51.1	0.7
N36	LT17	1	50.4	50.6	0.2	50.8	0.4
N37	LT17	1	50.4	50.5	0.1	50.6	0.2
N38	LT17	1	50.4	50.5	0.1	50.6	0.2
O1		2	75.9	75.9	0.0	76.3	0.4
O2		2	72.9	72.9	0.0	73.3	0.4
O3		2	73.6	73.6	0.0	73.9	0.4
O4		2	66.5	66.5	0.0	67.0	0.5
O5		2	71.4	71.4	0.0	71.8	0.4

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
O6		2	69.8	69.8	0.0	70.3	0.5
O7 Rear		2	59.7	59.7	0.0	51.0	1.2
O7 Front		2	72.6	72.6	0.0	73.6	1.1
O8		2	70.1	70.1	0.0	71.1	0.9
O9		2	63.8	63.8	0.0	63.8	0.0
O10		2	62.9	62.9	0.0	63.0	0.1
O11		2	64.4	64.3	0.0	64.5	0.1
O12		2	63.7	63.7	0.0	63.9	0.1
O13		2	60.0	60.0	0.0	60.2	0.1
O14		2	55.0	55.0	0.0	55.0	0.1
P1	LT10	1	49.8	50.8	1.0	51.3	1.5
P2	LT10	1	49.8	49.9	0.1	50.0	0.2
P3	LT10	1	49.8	51.1	1.3	51.7	1.9
P4	LT10	1	49.8	51.3	1.5	52.1	2.3
P5	LT10	1	49.8	51.4	1.6	52.3	2.5
P6	LT10	1	49.8	49.9	0.1	49.9	0.1
P7	LT10	1	49.8	49.8	0.0	49.8	0.0
P8	LT10	1	49.8	50.3	0.5	50.5	0.7
Q1	LT11	1	48.9	50.4	1.5	51.1	2.2
Q2	LT11	1	48.9	49.0	0.1	49.1	0.2
Q3	LT11	1	48.9	50.4	1.5	51.2	2.3
Q4	LT11	1	48.9	49.2	0.3	49.4	0.5
R1	LT9	1	50.7	51.1	0.4	51.3	0.6
R2	LT9	1	50.7	50.9	0.2	51.0	0.3

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
R3	LT9	1	50.7	50.8	0.1	50.9	0.2
R4	LT9	1	50.7	50.7	0.0	50.7	0.0
R5	LT9	1	50.7	50.7	0.0	50.7	0.0
S1	LT14	1	50.5	51.4	0.9	51.9	1.4
S2	LT14	1	50.5	50.7	0.2	50.8	0.3
S3	LT14	1	50.5	51.2	0.7	51.6	1.1
S4	LT14	1	50.5	51.1	0.6	51.4	0.9
S5	LT14	1	50.5	51.0	0.5	51.4	0.9
S6	LT14	1	50.5	50.8	0.3	51.0	0.5
S7	LT14	1	50.5	51.2	0.7	51.7	1.2
T1	ST18, ST19	1	47.6	47.7	0.1	47.7	0.1
T2	ST18, ST19	1	47.6	47.7	0.1	47.7	0.1
T3	ST18, ST19	1	47.6	47.7	0.1	47.8	0.2
T4	ST18, ST19	1	47.6	47.7	0.1	47.8	0.2
T5	ST18, ST19	1	47.6	47.7	0.1	47.8	0.2
T6	ST18, ST19	1	47.6	47.7	0.1	47.7	0.1
T7	ST18, ST19	1	47.6	47.8	0.2	47.8	0.2
U1	ST6	1	54.0	54.2	0.2	54.3	0.3
U2	ST6	1	54.0	54.1	0.1	54.2	0.2
U3	ST6	1	54.0	54.1	0.1	54.1	0.1
V1		2	58.6	58.6	0.0	59.2	0.6

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
V2		2	60.9	61.0	0.1	61.4	0.6
V3		2	62.6	62.6	0.0	63.1	0.5
V4		2	65.1	65.1	0.0	65.6	0.5
V5		2	66.2	66.2	0.0	66.7	0.5
V6		2	62.2	62.3	0.1	62.9	0.7
W1		2	70.3	70.3	0.0	71.1	0.8
W2		2	50.8	50.8	0.0	51.7	1.0
W3		2	52.3	52.3	0.0	51.4	-0.8
W4		2	47.7	47.7	0.0	46.8	-0.8
W5		2	38.4	38.7	0.3	39.2	0.5
W6		2	42.9	43.0	0.0	43.4	0.5
W7		2	42.5	42.7	0.2	42.6	0.1
W8		2	44.6	44.8	0.2	45.5	0.9
W9		2	69.2	69.2	0.0	70.0	0.8
W10		2	41.9	41.9	0.0	42.7	0.8
W11		2	50.3	50.6	0.3	51.5	1.1
W12		2	59.9	59.9	0.0	60.5	0.7
W13		2	56.9	57.0	0.1	57.5	0.6
W14		2	58.7	58.8	0.1	59.3	0.6
W15		2	57.4	57.4	0.0	57.9	0.5
W16		2	44.8	44.8	0.0	45.3	0.5
W17		2	51.9	52.0	0.1	52.5	0.6
W18		2	55.9	55.9	0.0	56.2	0.3
W19		2	54.4	54.5	0.1	54.9	0.5
W20		2	74.2	74.2	0.0	74.1	-0.1

Table 8.1: Daytime assessment levels

Location details			Do-Minimum opening year	Do-Something, opening year (short term)		Do-Something, future year (long term)	
ID[1]	Location of assumed background noise level[2]	Assessment Method used[3]	Noise level, $L_{Aeq,16h}$ A	Noise level, $L_{Aeq,16h}$ B	Change B - A	Noise level, $L_{Aeq,16h}$ C	Change C - A
W21		2	60.6	60.6	0.0	60.7	0.1
W22		2	63.1	63.1	0.0	63.7	0.6
W23		2	60.6	60.6	0.0	61.2	0.6
W24		2	59.6	59.7	0.1	60.0	0.4
W25		2	59.2	59.3	0.1	59.6	0.4
X1	LT15	1	49.1	49.9	0.8	50.5	1.4
X2	LT15	1	49.1	49.9	0.8	50.3	1.2
X3	LT15	1	49.1	49.4	0.3	49.6	0.5
X4	LT15	1	49.1	49.5	0.4	49.9	0.8

[1] As shown on Figure 13.1.

[2] As shown on Figure 13.1.

[3] As described in Chapter 13 – Noise and Vibration.

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 13.9 Rail Noise Management
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(a)
Planning Act 2008

Author: CH2M Date:
November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

SECTION 9

Rail noise management

9.1.1 When considering noise management, the principle of source – path – receiver is best applied (B J Smith, R J Peters, S Owen, 1996). This is a principle where noise control is first considered at source as this is more than often the most practical and cost effective solution, and it will also provide control to all the surrounding receptors. For a project under design this is certainly the case as it is more practical to build in noise control measures at design that it is to install it following opening. Planning controls to reduce noise are also best applied during the design stage.

9.1.2 The reduction of noise between the source and receiver is considered next as, after controlling noise at source, a reduction in the path will benefit the most number of receptors. A reduction in noise in the path is most likely to be achieved by placing a solid structure between the source and receiver, such as a purposely built noise barrier. However, the use of a solid barrier will only protect receptors within 200m of the barrier (Highways Agency and Welsh Office, 2011). It should be noted that the use of shrubs or trees as a noise barrier has been shown to be effective only if the foliage is at least 10m deep, dense and consistent for the full height of the vegetation (Highways Agency and Welsh Office, 2011).

9.1.3 The control of noise at the receiver in the form of the sound insulation of buildings is the last resort in terms of noise control. This is because it will only be of benefit to the individual receptor. In addition, providing insulation in terms of improved glazing will be ineffective if the windows of a property are open or if the individuals are outside.

9.1.4 Tables 9.1 to 9.3 list various noise control options that are considered relevant to the MetroWest Phase 1 Project. These are broken down into control at source (Table 9.1), path (Table 9.2), and then receiver (Table 9.3). The tables do not include some operational requirements of the route (e.g. train speed, train type, frequency of service) since these are determined by the operator of the route.

Table 9.1: Control of noise at source

Noise control area	Control option	Applicability to MetroWest / scope to be used for noise control
Technical Standards	The use of Technical Specifications for Interoperability (TSI) to control noise from new trains[1].	The trains to be used for MetroWest will have passed through what is effectively a type approval system to ensure that a new train meets determined levels of noise. **No scope for further noise control.**

Table 9.1: Control of noise at source

Noise control area	Control option	Applicability to MetroWest / scope to be used for noise control
Guidance / Policy	An assessment and decision making process is aligned with the National Planning Policy Framework (NPPF) which in turn is aligned to the Noise Policy Statement for England (NPSE)[1].	The assessment has followed the guidance within the NPPF. **The correct guidance has been followed for the assessment.**
Limit values	Noise limits can be used to restrict the noise produced activities.	*"There are no relevant formal noise limit values in force in England with regard to environmental noise levels from railway systems"* (Department for Environment Food and Rural Affairs, 2014b), para B13. **As there are no relevant limits available, none can be set for MetroWest.**
Brakes	Disc brakes or composite brake blocks which result in smoother wheels and hence lower rolling noise than that emitted from stock with cast-iron brake blocks, are installed on many passenger vehicles and freight vehicles[1].	The trains[2] to be used for MetroWest have disc brakes. **No scope for further noise control.**
Track type – maintenance	Routinely, railhead grinding occurs as part of the general maintenance of the track. Such grinding has been found to reduce the rolling noise emitted from the wheel and track and hence, has the benefit of providing environmental noise reduction[1].	The route will include all new track so maintenance is not relevant to noise control for design. **No scope to be used for noise control.**
Track type – new track	The use of Continuous Welded Rail (CWR) has been found to help reduce operational noise[1]. CWR provides the lowest correction in the Calculation of Railway Noise (Department of Transport, 1995).	CWR is proposed to be used on all new track[3]. **Best Available Techniques being used.**

Table 9.1: Control of noise at source

Noise control area	Control option	Applicability to MetroWest / scope to be used for noise control
Station public address system	Guidance on noise levels from public address systems is contained within internal Network Rail (NR) standards.	The station public address system will have to conform to NR standards. **Internal guidance being used.**

[1] Stated as a current approach to rail noise management in the Rail Noise Action Plan (Department for Environment Food and Rural Affairs, 2014b).

[2] Assumed to be Class 166 (see Appendix 13.3) which has disc brakes.

[3] MetroWest Phase 1 Grip 2 Feasibility Report, Network Rail, 2014. Available in Appendix A at http://travelwest.info/project/metrowest-phase-1-preliminary-business-case.

Table 9.2: Control of noise in the path

Noise control area	Control option	Applicability to MetroWest / scope to be used for noise control
Location of noise source to receiver	An increased distance between the source and receiver will reduce the noise at the receiver.	The route of the line is essentially fixed and it is impractical to move the receivers. **No scope to be used for noise control.**
Barriers / bunds	Adding a diffracting edge between the source and receiver will reduce the propagation of noise[1].	Used where necessary in accordance with the methodology described in Appendix 13.2.

[1] Stated as a current approach to rail noise management in the Rail Noise Action Plan (Department for Environment Food and Rural Affairs, 2014b).

Table 9.3: Control of noise at the receiver

Noise control area	Rail Noise Action Plan or other documents	Applicability to MetroWest / scope to be used for noise control
Eligibility under Part 2 of The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996.	If certain criteria are met, the promoter of the scheme must offer secondary glazing and alternative ventilation for habitable rooms of dwellings so affected[1].	Eligibility for noise insulation from the operational railway has been assessed and reported during the environmental assessment. No dwellings are eligible.
Eligibility under Part 1 of The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996.	Part 1 of the Land Compensation Act provides for monetary compensation to those home owners affected by the new or altered railway recognising any loss in value of the home that has occurred by the opening of the new or improved railway[1].	Although listed in the Rail Noise Action Plan (Department for Environment Food and Rural Affairs, 2014b) as railway noise management this is not considered here to be a technique available for noise control as the use is dependent upon a claim being made by home owners and is therefore outside of the control of the designer or train operator. This is acknowledged in the Rail Noise Action Plan 2014 where it states (para B10) *"This assessment is purely subjective, carried out by surveyors, and claims have to be made within a certain time period"*.

[1] Stated as a current approach to rail noise management in the Rail Noise Action Plan (Department for Environment Food and Rural Affairs, 2014b).