

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

Noise Addendum Appendices A, B and C

AFPF Regulation Rule 8(1)(c)

Planning Act 2008

Infrastructure Planning (Prescribed Forms and Procedure)

Regulations 2009

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to
Ellingham**

Development Consent Order 20[xx]

Noise Addendum Appendices A, B and C

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APPENDIX A: LEGISLATION POLICY AND GUIDANCE

INTERNATIONAL LEGISLATION

DIRECTIVE 2014/52/EU OF THE EUROPEAN PARLIAMENT, 2014

This Directive published on 16 April 2014 amends Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

It was considered necessary to amend the 2011 Directive to strengthen the quality of the environmental impact assessment procedure, align that procedure with current best practice and other relevant legislation and policies developed by the European Union and Member States.

An Environmental Impact Assessment report prepared under this legislation should include, inter alia, a description of the likely significant effects of the project and the measures envisaged to avoid, reduce or, if possible, offset any identified significant adverse effects on the environment.

DIRECTIVE 2002/49/EC OF THE EUROPEAN PARLIAMENT, 2002

This Directive relates to the assessment and management of environmental noise, and it is commonly referred to as the Environmental Noise Directive (END). It promotes the implementation of a three-step process:

- Undertake strategic noise mapping to determine exposure to environmental noise
- Ensure information on environmental noise is made available to the public
- Establish Action Plans based on the strategic noise mapping results, to reduce environmental noise where necessary, and to preserve environmental noise quality where it is good

NATIONAL LEGISLATION

THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

EU Directive 2014/52/EU has been transposed into UK law through the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

ENVIRONMENTAL NOISE (ENGLAND) REGULATIONS 2006

EU Directive 2002/49/EC has been transposed into UK law as the Environmental Noise (England) Regulations 2006 (as amended). As part of this process, noise mapping has been undertaken and Noise Important Areas (NIAs) have been identified at locations where the 1 % of the population that are affected by the highest noise levels are located, in order to identify the areas which, require potential action.

THE NOISE INSULATION REGULATIONS 1975 (AS AMENDED 1988) (NIR)

The NIR were made under powers inferred by Section 20 of Part II of the Land Compensation Act. Regulation 3 imposes a duty on authorities to undertake or make a grant

in respect of the cost of undertaking noise insulation work in or to eligible buildings, subject to meeting certain criteria given in the Regulation, for new roads or carriageways.

Regulation 4 provides authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings for an altered road. Regulation 5 provides authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings during construction works for a substantial period of time, but in respect of which building no duty under Regulation 3 or power under Regulation 4 has arisen.

With respect to residential properties affected by noise from new or altered highways, to qualify for such an offer, four criteria must all be fulfilled at 1m in front of the most exposed door or window of an eligible room in the façade of a property:

Level - The highest total traffic noise level expected within the first fifteen years use of the road (the 'Relevant Noise Level') must be not less than the Specified Level of 68 dB $L_{A10,18h}$. Predicted noise levels of 67.5 dB $L_{A10,18h}$ and above are rounded up to 68 dB $L_{A10,18h}$.

Increase - The Relevant Noise Level in the design year, or within any other year between the year before the highway construction works commenced and the design year, must be at least 1 dB(A) greater than that immediately before construction commenced (the 'Prevailing Noise Level').

Contribution - Noise from traffic on the road for which the Regulations apply must contribute at least 1.0 dB $L_{A10,18h}$ to the Relevant Noise Level.

Locality - The property under consideration must be within 300 m of the Scheme.

The Regulations apply only to qualifying eligible rooms, which include living rooms and bedrooms affected by road traffic noise.

The NIR requires application of the road traffic noise level calculation method detailed within the Calculation of road traffic noise memorandum 1988 (CRTN).

NATIONAL POLICY AND GUIDANCE

NATIONAL POLICY STATEMENT FOR NATIONAL NETWORKS (NPS NN), 2015

The Department for Transport published the NPS NN in December 2015. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks.

Paragraph 5.189 of the NPS NN states where a development is subject to EIA and significant noise impacts are likely to arise from the Scheme, the applicant should include a noise assessment which details the noise and vibration baseline, sensitive receptors, predictions of changes in baseline with the Scheme and mitigation measures.

It goes on to state in paragraph 5.193 that developments must be undertaken in accordance with the statutory requirements for noise and that due regard must be given to the relevant

sections of the National Policy Statement for England, National Planning Policy Framework and the Government's associated planning guidance on noise.

The NPS NN also confirms that for most national network projects, the relevant Noise Insulation Regulations will apply.

NOISE POLICY STATEMENT FOR ENGLAND (NPSE), 2010

The NPSE seeks to ensure that noise issues are considered at the right time during the development of policy and decision making, and not in isolation. It highlights the underlying principles on noise management already found in existing legislation and guidance.

The NPSE sets out the long-term vision of Government noise policy as follows:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development” (Paragraph 1.6, page 3).

This long-term vision is supported by the following aims:

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

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life” (Paragraph 1.7, page 4)

To assist in the understanding of the terms ‘significant adverse’ and ‘adverse’, the NPSE acknowledges that there are concepts that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

NOEL - No Observed Effect Level - This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL - Lowest Observable Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected (Paragraph 2.20, page 8).

SOAEL - Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur (Paragraph 2.21, page 9).

However, the NPSE goes on to state that:

“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available” (Paragraph 2.22, page 9).

NATIONAL PLANNING POLICY FRAMEWORK (NPPF), 2019

First published in 2012 and most recently updated in February 2019, the NPPF sets out the Government's planning policies for England and how these are expected to be applied. The NPPF superseded Planning Policy Guidance Note (PPG) 24: Planning and noise amongst other PPG's and Planning Policy Statements (PPS's). In contrast to PPG 24, reference to noise is scant within the NPPF. Noise is referenced within the document as follows:

"170. Planning policies and decisions should contribute to and enhance the natural and local environments by:...[a number of points including]...

- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans" (Page 49);

and

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

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁰; and
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason...." (Page 52).

Reference number 60 of the above quotation points to the Explanatory Note to the Noise Policy Statement for England (NPSE).

PLANNING PRACTICE GUIDANCE NOISE, 2014 (UPDATED JULY 2019)

This web-based resource was issued for use by the Department for Communities and Local Government (DCLG). The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies

The section on noise was published in 2014 and last updated in July 2019. It includes a table that summarises "the noise exposure hierarchy based on the likely average response of those affected" and offers "examples of outcomes" relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE. The term Unacceptable Adverse Effect (UAE) level is introduced which equates to noise perceived as "present and very disruptive". It is stated that UAEs should be prevented.

These outcomes are in descriptive form and there is no numerical definition of the NOEL, LOAEL and SOAEL (or UAE), or detailed advice regarding methodologies for their

determination. There is also no reference to the further research that is identified as necessary in the NPSE. The noise exposure hierarchy table is duplicated in **Table A-1** below.

Table A-1- Noise Exposure Hierarchy Based on the Likely Average Responses

Perception	Examples of outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in	Significant Observed Adverse Effect	Avoid

Perception	Examples of outcomes	Increasing Effect Level	Action
	getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

ROAD INVESTMENT STRATEGY: FOR THE 2015/16 – 2109/20 ROAD PERIOD, 2015

The Department for Transport document, Road Investment Strategy: for the 2015/16 - 2019/20 Road Period (RIS), was published in March 2015 and sets out policies relating to the strategic planning and funding of the road network.

The document outlines (in Section 6) an aspiration for a 90 % reduction in the number of people impacted by noise from the Strategic Road Network (SRN) by 2040.

The RIS identifies a capacity to improve noise levels through the management and redevelopment of Highways England assets, via low noise road surfacing, noise barriers etc. It is expected that Highways England will deliver mitigation measures to at least 1,150 NIAs, helping to improve the quality of life of around 250,000 people by the end of the first road period.

All new and improved road schemes will, therefore, be expected to utilise low noise road surfaces as a default and investigate noise attenuating barriers and other potential mitigation options, where practicable.

HIGHWAYS ENGLAND: LICENCE, 2015

The Department for Transport document titled Highways England: Licence (Secretary of State for Transport statutory directions and guidance to the strategic highways company) was published in April 2015.

In complying with paragraph 4.2(g) (page 8) and paragraph 5.26 (page 15) respectively, and its general duty under section 5(2) of the Infrastructure Act 2015, Highways England should:

"Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment [and ensure this is considered at all levels of operation]"

"In exercising its functions, the licence holder must have due regard to relevant principles and guidance on good design, to ensure that the development of the network takes account of geographical, environmental and socio-economic context."

LOCAL POLICY AND GUIDANCE

EMERGING NORTHUMBERLAND LOCAL PLAN

The Emerging Northumberland Local Plan – Publication Draft Plan (Regulation 19) Consultation (January 2019) is intended to replace all current District and County Council Local Plans and Core Strategy documents into a single document. Neighbourhood Plans will not be replaced and will remain of relevance when determining planning applications.

The document has a number of policies which seek to alleviate the potential for adverse noise or vibration effects.

NORTHUMBERLAND CONSOLIDATED PLANNING POLICY FRAMEWORK

In July 2007 the Government announced that Northumberland would become a unitary council, replacing the previous two-tier system. The previous system comprised seven local planning authorities including Castle Morpeth and Alnwick, through which the Scheme passes¹.

In the past, each local planning authority produced its own set of planning documents to guide development in their area. As the seven local authorities become one, there was a need to collate relevant planning policy for the new council and to identify the geographical area to which these policies relate.

The Consolidated Planning Policy Framework for Northumberland (the latest version of which, 27, was published in May 2020) details the planning policy documents that are currently used to determine and guide planning applications in Northumberland. The framework comprises two sections. It is Section A, the schedule of documents that form the Statutory Development Plan, that is most relevant and in particular Part 1 of Section A which includes a schedule of adopted Statutory Development Plan Documents. Two of these documents are described briefly below.

CASTLE MORPETH DISTRICT LOCAL PLAN, 1991-2006

Policy RE10 relates to noise, but specifically noise sensitive development and aircraft noise and so this is not relevant to the Scheme.

¹ Most of the Part A: Morpeth to Felton (Part A) passes through the area comprising the former Castle Morpeth District Council. It is only the most northerly section of Part A that passes through the area comprising the former Alnwick District Council.
Part B passes through the area comprising the former Alnwick District Council.

There are a few other references to noise and vibration in this document, but these are also not relevant to the Scheme.

In Chapter 8 – Roads and Transportation – reference is made to the local plan adopting the five Local Transport Plan objectives, one of which is to “extend the highways network only where necessary to improve road safety, reduce unacceptable environmental impacts on communities or to enable new development” (Paragraph 8.13.1, page 129).

Reference is made in paragraph 8.14.2 (page 130) to the upgrading of the A1 “There is a strong case for pressing the Scottish Office and the Department for Transport to adopt a policy to improve the A1 to dual carriageway standard between Newcastle and Edinburgh and for implementation to take place within the foreseeable future. The Council fully supports this proposal and will, through the policies of the Local Plan, assist in the realisation of this objective”.

ALNWICK DISTRICT WIDE LOCAL PLAN, 1997

Although there are no guidelines or policies that directly refer to noise and vibration, there are some specific aims within the Traffic and Transport Chapter which would be applicable:

- Aim TT1: “improve the accessibility of the residents and businesses of the District to the national transportation systems” (Paragraph 5.2.1, page 52)
- Aim TT3: “ameliorate the impact of the motor vehicle on the rural and built environment” (Paragraph 5.2.1, page 52)

Aim TT6 describes the same objective mentioned in the Castle Morpeth Local Plan (refer to paragraph B4-7): “encourage the Highways Agency to upgrade the A1 Truck Road to dual carriageway standard through the District at the earliest opportunity” (Paragraph 5.2.1, page 53).

In the Community Development Chapter, Policy CD32 reinforces the requirement for development not to result in unacceptable environmental impacts or to cause harm to residential amenity: “planning permission will not be granted for development which would cause demonstrable harm to the amenity of residential areas or to the environment generally as a result of releases to water, land or air, or of noise, dust, vibration, light or heat” (Paragraph 8.12.1, page 92).

ALNWICK DISTRICT LOCAL DEVELOPMENT FRAMEWORK, CORE STRATEGY DEVELOPMENT PLAN DOCUMENT, 2007

Although there is no specific guidance or policy relating to noise and vibration, two strategic policies provide generic guidance which might be applied to the Scheme:

- Policy S3 sets out sustainability criteria which the council will need to be satisfied are met before granting planning permission for new development. The fifth criterion (out of six) states that “there would be no significant adverse effects on the natural resources, environment, biodiversity, cultural, historic and community assets of the district” (Paragraph 4.2.6, page 21).
- Policy S16 sets out the strategic principles of good design which should be applied to all developments “Proposals should take full account of the need to protect and enhance local

environment having regard to their layout, scale, appearance, access and landscaping...”
(Paragraph 9.3.4, page 46).

Paragraph 2.5.1, under the sub-heading Transport, notes that Alnwick is crossed by a number of strategic routes including the A1 and that some villages in the district, on or close to these routes suffer significantly from the effects of traffic flows and speeding traffic which has a detrimental impact on residential amenity and safety for residents. The core strategy goes on to identify key challenges, one of which is the “Need to reduce environmental impact or transport while meeting the needs of people and business for access” (Paragraph 2.5.4, page 9).

This theme is revisited later in Chapter 7 of the Core Strategy with Objective 6 which is to “assist in the delivery of a sustainable integrated transport system an enhance accessibility for all” (Paragraph 7.1.4, page 36).

TECHNICAL GUIDANCE

SUSTAINABILITY & ENVIRONMENT APPRAISAL: LA111: NOISE AND VIBRATION, REVISION 2

Sustainability & Environment Appraisal: LA111: Noise and vibration (LA111) is a guidance document published by Highways England which sets out the requirements for noise and vibration assessments from road projects, applying a proportionate and consistent approach using best practice and ensuring compliance with relevant legislation.

The document presents sections on defining the baseline scenario, assessment methodology for construction noise and vibration, including construction traffic and diversion routes, and assessment methodology for operational noise.

For each potential impact, guidance is provided on scoping, defining a study area, defining the baseline, determination of significance and design and mitigation. Guidance is also provided on the methodologies to be applied when calculating construction noise and vibration levels and operational road traffic noise.

In determining significance, guidance is provided on establishing appropriate lowest observable adverse effect levels (LOAEL) and significant observable adverse effect levels (SOAEL). Further guidance is then given on determining magnitude of impact and significance of effect.

CALCULATION OF ROAD TRAFFIC NOISE (CRTN), 1988

The former Department of Transport/Welsh Office technical memorandum Calculation of Road Traffic Noise (CRTN) methodologies have been adopted.

The factors which may influence road traffic noise levels at source can be divided into two groups:

- Road related factors - gradient and surface type
- Traffic related factors - flow, speed and the proportion of heavy-duty vehicles

The propagation of noise is also covered in CRTN and can influence the noise levels at receptor locations.

TRL PROJECT REPORT PR/SE/451/02, 2002

Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping

The Calculation of Road Traffic Noise prediction method produces noise levels in terms of L_{A10} , either over a 1-hour or an 18-hour period.

The European-wide noise mapping exercise required by EU Directive 2002/49/EC relating to the assessment and management of environmental noise (colloquially known as the Environmental Noise Directive or END), requires outputs in terms of L_{den} and L_{night} , both of which are based on the equivalent continuous noise level L_{den} .

TRL published a report in 2002, which provided a 'back-end' correction for converting the UK traffic noise index $L_{A10,18h}$ to the noise indices required for EU noise mapping.

The TRL report presented equations for three potential methods of conversion, depending on the quantity and quality of traffic data available.

- Method 1 is the most detailed and can be used when the assessor has available hourly traffic data. Equations are provided for motorway and non-motorway roads to convert $L_{A10,1h}$ to $L_{Aeq,1h}$, with the generated $L_{Aeq,1h}$ values subsequently being used to derive values of L_{den} and L_{night} as required by the END.
- Method 2 can be used where traffic data are known or can be estimated for the relevant time periods specified in the END (i.e. 12-hour day, 4-hour evening and 8-hour night) as well as the 18-hour period, with the generated L_{day} , $L_{evening}$ and L_{night} values subsequently being used to derive values of L_{den} as required by the END.
- Method 3 is the least detailed and can be used when only $L_{A10,18h}$ traffic data are available. Equations are provided for motorway and non-motorway roads to convert $L_{A10,18h}$ directly to the L_{den} and L_{night} values as required by the END.

For this assessment method 3 has been adopted and as none of the roads in the Study Area (including the Scheme) are motorways, all calculations to determine the L_{night} have utilised the non-motorway correction.

WORLD HEALTH ORGANISATION, GUIDELINES FOR COMMUNITY NOISE, 1999

The WHO guidelines consolidate scientific knowledge on the health effects of community noise and provide guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments. The main sources of community noise are identified as road, rail and air traffic, industries, construction and public work and neighbours.

A wide range of specific effects and environments re considered in the guidelines but a few that relate to this study are described below.

With regard to community noise, the guidelines state (in paragraph 4.2.7, page 60) that annoyance "varies with the type of activity producing the noise....During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately

annoyed with L_{Aeq} levels below 50 dB.” The time base for these values, which relate to the daytime period, is 16 hours.

With respect to cardiovascular effects, the guidelines state (in paragraph 4.2.4, page 59) that “epidemiological studies show that cardiovascular effects occur after long-term exposure to noise (aircraft and road traffic) with $L_{Aeq,24h}$ values of 65–70 dB.”

APPENDIX B: SOURCE INFORMATION AND ASSUMPTIONS FOR OPERATIONAL ROAD TRAFFIC NOISE ASSESSMENT

The Noise Modelling Assumptions and Settings are detailed in **Table B-1** below.

Table B-1 - Noise Modelling Assumptions and Settings

[1] Noise prediction methodology	<p>The Calculation of Road Traffic Noise (CRTN) memorandum (1988), published by the Department of Transport and Welsh Office.</p> <p>Additional advice detailed within Appendix A: Operational noise calculations of the DMRB LA 111.</p>
[2] Noise modelling software	Version 2019 MR 2 (64 bit) of the CadnaA, PC based, noise modelling suite.
[3] Base mapping	Ordnance Survey (OS) base mapping has been used in the creation of the noise models.
[4] Terrain data	<p>For the Scheme alignment, topographic data have been extracted from the 3D engineering drawings, as supplied by WSP.</p> <p>Immediately surrounding the Scheme and within the Order Limits, topographical survey data have been applied to generate associated ground contours.</p> <p>For the remainder of the Study Area, OS Terrain 5 data has been applied. This has been supplemented in some areas with Lidar data downloaded from the .GOV website and imported into CadnaA with 1m height contours subsequently generated by the noise modelling software.</p>
[5] Road traffic source	<p>All roads that are unaltered by the Scheme, have been spatially aligned using the OS base maps.</p> <p>All new, altered and relieved roads comprising Scheme improvements, have been spatially aligned using the engineering drawings provided by WSP.</p> <p>Road heights and gradients have been determined automatically from the terrain data as created (refer to [4] above).</p> <p>The traffic data (flow, speed and proportion of heavy vehicles) have been provided for all relevant scenarios:</p> <ul style="list-style-type: none"> Do-minimum, year of opening (2024) Do-something, design year (2039) Do-minimum, year of opening (2024) Do-something, design year (2039)

	<p>Roads with 18-hour flows of less than 1,000 in any scenario have been excluded. Where flows fall between 1,000 and 4,000 in the 18-hour period, a low-flow correction has been applied.</p> <p>Speed pivoting has been applied.</p> <p>Road surface corrections have been applied in accordance with DMRB LA 111 Appendix A.</p>
<p>[7] Buildings</p>	<p>Building outlines have been incorporated into the noise model based on the OS MasterMap Topography Layer. For sensitive receptor buildings, a height of 8 m has been assigned universally to all buildings except those which have been clearly identified through a review of street scene photography, to be 1-storey, for which a height of 5m has been applied. For non-receptor buildings, a height of between 3-8m has been assigned as appropriate.</p> <p>Where AddressBase receptor points were identified with no associated OS MasterMap building, these have been manually incorporated.</p> <p>All buildings have been set to be reflective (absorption coefficient of 0), which means that these buildings potentially might reflect noise if they lie close to, and on the opposite side of the highway (i.e. opposite reflections using CRTN terminology).</p>
<p>[8] Ground cover</p>	<p>A default ground absorption coefficient of 1 has been adopted (i.e. acoustically absorbent ground cover). However, roads and buildings have been set to be acoustically reflecting.</p>

APPENDIX C: WIDER NETWORK NOISE LEVEL CHANGES

It is appropriate to consider the noise level changes along the wider network roads outside of the Part A and Part B detailed calculation areas both for the short-term and the long-term.

SHORT-TERM

In the short-term, the majority of road links show either a negligible or minor increase or decrease in noise level. In terms of benefits of the Scheme, there are predicted to be four links which are subject to moderate beneficial impacts.

There are also expected to be two moderate adverse impacts as a result of the Scheme.

Table C-1 shows the road links expected to experience moderate adverse impacts, as well as the calculated Basic Noise Level (BNL).

Table C-1: Short-term Moderate Adverse Wider Network Noise Level Changes

Road Link	Road Name	DM2024 BNL, dB L _{A10, 18hr}	DS2024 BNL, dB L _{A10, 18hr}	Short-term change, dB
1497-1474	Unnamed Road at Broome Park Farm	58.3	61.4	3.2
1457-1395	Unnamed Road through Bolton, Alnwick	56.3	59.8	3.5

LONG-TERM

In the long-term, the majority of road links show either a negligible or minor increase or decrease in noise level. In terms of benefits of the Scheme, there is predicted to be three major beneficial impacts and one moderate beneficial impact.

There is also expected to be one moderate adverse impact as a result of the Scheme.

Table C-2 shows the road link which is expected to experience a moderate adverse impact, as well as the calculated BNL.

Table C-2: Long-term Moderate Adverse Wider Network Noise Level Changes

Road Link	Road Name	DM2024 BNL, dB L _{A10, 18hr}	DS2039 BNL, dB L _{A10, 18hr}	Long-term change, dB
1457-1395	Unnamed Road through Bolton, Alnwick	56.3	61.3	5.1

SUMMARY

Only two wider network road links are predicted to experience moderate adverse impacts. These links are considered not significant.

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