

A57 Link Roads

TR010034

9.78 Noise and Vibration Management Plan

Rule 8(1)(k)
Planning Act 2008
Infrastructure Planning (Examination Procedure) Rules 2010

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Infrastructure Planning

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The Infrastructure Planning (Examination Procedure) Rules 2010

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Abbreviations

Term	Definition
BPM	Best Practicable Means
BS	British Standard
CoPA	Control of Pollution Act
DCO	Development Consent Order
dDCO	Draft Development Consent Order
DMRB	Design Manual for Roads and Bridges
ES	Environmental Statement
EMP	Environmental Management Plan
NVMP	Noise and Vibration Management Plan
REAC	Register of Environmental Actions and Commitments

1. Introduction

1.1. Objective

- 1.1.1. This Outline Noise and Vibration Management plan (NVMP) sets out a framework to be used by the appointed Principal Contractor when preparing the detailed NVMP for the A57 Link Roads Scheme prior to the commencement of works. It is based on the commitments set out in the ES for the Scheme, and specifically those detailed within the Environmental Management Plan (EMP) (First iteration) (REP6-007) and Register of Environmental Actions and Commitments (REAC) (REP6-008), which details the requirement for a NVMP to be developed.
- 1.1.2. The Scheme is a Nationally Significant Infrastructure Project (NSIP) and this Outline NVMP has been developed in support of National Highways' application for a Development Consent Order (DCO) to authorise construction, operation and maintenance of the Scheme. An Environmental Impact Assessment (EIA) has been carried out for the Scheme and is reported in the Environmental Statement (ES). The ES and other DCO documents prepared to support the application are available through the Planning Inspectorate project document library: [TR010034-000603-A57 Link Road Examination Library Published.pdf \(planninginspectorate.gov.uk\)](https://planninginspectorate.gov.uk/TR010034-000603-A57%20Link%20Road%20Examination%20Library%20Published.pdf).
- 1.1.3. In order to minimise the potential for noise and vibration nuisance, this Outline NVMP details the measures that the appointed Principal Contractor will be required to adopt to control and limit those emissions at residential properties and other sensitive receptors in the vicinity of the Scheme. This Outline NVMP applies to all construction activities occurring on the Scheme.
- 1.1.4. This Outline NVMP will be updated by the appointed Principal Contractor into a detailed NVMP prior to commencement of works in accordance with Requirement 4 in Schedule 2 of the draft Development Consent Order (dDCO) (REP1-041). The detailed NVMP will be one of a number of management plans that will be annexed to the EMP (Second iteration) under Requirement 4.

2. Noise and vibration

2.1. Introduction

- 2.1.1. This section will be updated by the appointed Principal Contractor for the purposes of the final version. It will set out the purpose of the final NVMP and set out the processes that will be adopted to minimise nuisance through the management, control and reporting of construction noise and vibration in accordance with relevant legislation, regulations and contractual requirements.
- 2.1.2. This Outline NMVP plan identifies the key items which will be included in the final NMVP as follows:
- Roles and responsibilities at project and site-specific levels
 - The approach to construction noise and vibration management
 - Section 61 Control of Pollution Act (CoPA) 1974 consent process
 - Noise and vibration control measures
 - Noise and vibration monitoring
 - Communication and complaints arrangements
 - Reporting requirements.
 - The criterion for noise insulation and rehousing

2.2. Relevant legislation

[The appointed Principal Contractor will need to update this section prior to construction and provide an overview of the key legislation that the Scheme has to comply with.]

Control of Pollution Act 1974

- 2.2.1. The CoPA 1974 gives local authorities powers for controlling noise and vibration from construction sites and other similar works. These powers may be exercised either prior to, or during the works.
- 2.2.2. Best Practicable Means (BPM) will be applied during construction works to reduce noise and vibration impacts as far as is reasonably practicable.

Best practicable means

- 2.2.3. The BPM for noise control will be applied during construction works to minimise noise (including vibration) at neighbouring residential properties and other sensitive receptors arising from construction activities.
- 2.2.4. BPM are defined in section 72 of CoPA and section 79 of the Environmental Protection Act 1990.

2.3. Management of site activities

Main roles and responsibilities

- 2.3.1. In relation to the control and management of noise and vibration, the appointed Principal Contractor shall establish the main roles and responsibilities of site personnel to ensure the proposed control measures are being implemented during the construction activities. These will be set out in Section 2 of the EMP (Second iteration) and within the detailed NVMP.

Section 61 compliance

- 2.3.2. The appointed Principal Contractor will be responsible for developing a monitoring programme to ensure compliance with any Section 61 consents. Specific actions required to ensure compliance will be included within the detailed REAC at the Detailed Design stage.

Working hours

Normal working hours (NWHs)

- 2.3.3. Normal Working Hours will be defined as per Action reference GEM1.4 in Table 2-1 of the REAC (REP6-008). All works will be undertaken during NWH only, unless otherwise consented.

Start-up and close down periods

- 2.3.4. To maximise productivity within the NWH hours; a period of up to one hour before core working hours is allowed for the start-up of activities as per Action reference GEM1.4 in Table 2-1 of the REAC (REP6-008).

Additional working hours

- 2.3.5. Any additional working hours or out of hours working, will be identified within the Section 61 CoPA application which will require approval from the relevant local authority as per Action reference NV1.31.4 in Table 2-1 of the REAC (REP6-008).

Consultation

- 2.3.6. Consultation will be carried out with the environmental health departments of the local authorities regarding the management of noise and vibration during construction of the Scheme.
- 2.3.7. The implementation of a Community Engagement Plan will ensure that local residents and other affected parties are kept informed of the progress of the works, including when and where the noisiest activities would be taking place and how long they are expected to last. Communication mechanisms include newsletters, newspaper and radio announcements, and communications from the appointed Principal Contractor.

2.4. Noise and vibration control

Noise control strategy

2.4.1. The general principles of noise management, considered as BPM, are given below:

2.4.2. Control at source:

- Equipment – newest, well maintained equipment with lower noise emissions
- Equipment – controlling plant and machinery noise e.g. by retrofitting controls
- Equipment - indirect methods of controlling noise e.g. acoustic screens
- Equipment - indirect methods of controlling noise e.g. using alternative construction methodologies; selection of quieter tools/machines; application of quieter processes.

2.4.3. Control across site by:

- Administrative and legislative control
- Control of working hours
- Control of delivery areas and times
- Careful choice of compound location
- Physically screening site
- Control of noise via contract specification of limits
- Noise monitoring to check compliance with noise level limits, cessation of works until alternative method is found
- Use of vehicles, plant and equipment that generate lower levels of noise or vibration should be selected over alternatives that produce higher levels of noise or vibration as far as reasonably practicable
- Many of the activities which generate noise can be mitigated to some degree by careful operation of machinery, use of tools and the management of personal behaviours. This may best be addressed by toolbox talks and site inductions.

2.4.4. Mitigation will be considered in the following order:

- BPM as identified above
- Specific noise and vibration control measures as identified below
- Where, despite the implementation of these measures, there are residents who would still be affected (e.g. shift workers, elderly, sick or disabled residents, etc.), the possibility of an offer of temporary relocation may be considered, if appropriate. These residents would be identified prior to works taking place. The recommendations of BS 5228: 2009+A1:2014 'Code of practice for Noise and Vibration Control on Construction and Open Sites', will be implemented, together with the specific requirements of this management plan.

2.5. Specific noise and vibration control measures

- 2.5.1. To mitigate and understand the noise and vibration impact of the proposed works and to effectively implement controls, a noise and vibration specialist with relevant competences and resources, will be appointed. The noise and vibration specialist will be required to undertake or coordinate the preparation of noise and vibration risk assessments for all works that require a prior consent under Section 61 of CoPA.
- 2.5.2. Regular site inspections are to be undertaken to ensure that suitable and appropriate mitigation measures are being implemented to reduce noise and vibration emissions
- 2.5.3. The appointed Principal Contractor will consult with the Environmental Health Departments at the relevant Local Planning Authorities prior to the commencement of construction works. From this, guidance will be obtained on their requirements for managing and controlling noise and vibration from construction works, including communication preferences for updates during the construction phase.
- 2.5.4. The appointed Principal Contractor is a member of the Considerate Constructors Scheme that is recognised by industry and the Government for encouraging firms to be sensitive to the environment.
- 2.5.5. Piling methods will be selected to carefully minimise noise and vibration impacts at receptors. Although the Applicant's preference is to use a rotary bored method at all piling locations, which results in low levels of vibration, it may not be possible due to the ground type or other engineering constraints. The piling methods that will be used for the Scheme will be confirmed during the detailed design stage.
- 2.5.6. Alternative piling methods such as vibratory piling or the Giken method will be considered at locations where methods producing the lowest levels of vibration are not feasible at certain locations. Methods that generate high levels of vibration such as percussive piling shall be avoided as far as practicable.
- 2.5.7. In proximity to the proposed Mottram Underpass, the use of percussive piling should be avoided unless geologically essential. If the use of percussive piling cannot be avoided, the following measures should be considered to lessen the impact of noise:
 - Pre-boring to reduce the duration of impulsive sounds and vibration
 - Enclosing the pile driving system in an acoustic shroud,
 - Preventing metal-to-metal contact during hammer strikes by introducing a non-metal dolly between the hammer and the driving helmet
 - Appropriate measures to minimise disturbance from 'other' sources of piling noise, such as the screeching of pulleys or guides, clanking of locking kelly bars and ringing of piles
 - Consideration of working hours required for piling and the acceptability of these to local residents

- Reducing the energy input per hammer strike, which would decrease vibration but increase the duration of the piling
- Setting noise and vibration control targets, accompanied by monitoring for compliance

2.5.8. In addition to specific requirements of the relevant local authority, the following more specific control measures will be adopted:

- The equipment and construction plant will comply with relevant EC Directives and corresponding UK legislation on noise emissions.
- Plant certified to meet the current EU legislation and should not be louder than the noise levels provided in Annex C and D of BS 5228-1
- The methodology / technique for noisy operations will be carefully considered to ensure that noise is kept to a practicable minimum. This includes the reduction of the level of the working platform used in the construction of the Mottram Moor Link Road so that the cutting slopes provide additional screening of noise
- Undertaking only one noise-generating operation in sensitive areas at one time.
- Without prejudice to the other requirements of this section, the aAppointed Principal Contractor shall comply with the recommendations set out in BS 5228:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites, Part 1: Noise.
- Vehicles and mechanical plant, and their exhausts, will be fitted with effective exhaust silencers and maintained in a good and effective working order and operated in a manner to minimise noise emissions.
- All ancillary pneumatic percussive tools should be fitted with mufflers or suppressors as recommended by the manufacturers which should be kept in a good state of repair
- Machines in intermittent use will be shut down or throttled down to a minimum during periods between working.
- The site compound and static machines be sited as far as is practicable from noise sensitive buildings
- Consideration will be given to the 'off network' haulage routes that fall within the footprint of the Scheme, with specific reference made to the predicted number of vehicle movements to and from temporary welfare and storage sites, and location of the off network routes.
- Where demolition and other breaking out activities are necessary, percussive or impact breaking equipment / methods will only be used where other less noisy techniques are not reasonably practicable.
- Care would be taken when loading and unloading vehicles to avoid unnecessary noise.
- The speed of vehicle movements will be required to be reduced.
- Ensure that operations are designed to be undertaken with any directional noise emissions pointing away from noise-sensitive receptors.
- All generators and compressors will be "sound reduced" models fitted with acoustic linings / sealed acoustic covers where appropriate.
- Drop heights will be minimised when loading vehicles with rubble.

- Vehicles will be prohibited from waiting within the site with their engines running or alternatively, located in waiting areas away from sensitive receptors.
- Vehicles will not be permitted to wait or queue on the public highway with engines running
- Local hoarding, screens or barriers will be erected to shield particularly noisy activities. The relevant locations include the boundary of the construction compound and work sites close to sensitive receptors. The appointed Principal Contractor has indicated the planned use of a 3 m bund along the perimeter of the compound.
- Piling will be carried out with the method that minimises both noise and the transmission of vibration to sensitive receptors.
- Hours of operation will be strictly enforced, and will be in line with the Section 61 application agreed with the local authority and enforceable under this agreement.
- Wherever practicable, fabrication will be undertaken off site.
- As far as reasonably practicable noise from reversing alarms will be controlled and limited. Broadband reversing alarms will be used where possible.
- Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors.
- Where practicable, plant and materials will arrive on site during normal working hours.
- Where practicable plant will be left in position at the end of the day, thus minimising vehicle trips and minimising the required 'start up' and 'close down' durations.
- Cleaning of concrete mixers to not be undertaken by hammering the drums.

2.6. Noise monitoring

- 2.6.1. Noise monitoring will take the form of either unattended long-term noise monitoring, or short-term attended noise monitoring. The decision to use either type of monitoring will be based on the nature and location of the works being undertaken, and subject to discussion and agreement with the Local Planning Authority.

Unattended continuous noise monitoring

- 2.6.2. Noise monitors utilised will be Class 1 IEC 61672-1:2013 compliant. All monitoring equipment will be calibrated in accordance with either the relevant standards or the manufacturer / supplier recommendations as appropriate, but it is anticipated that this will be at least annually.
- 2.6.3. Unattended monitoring is considered to be required only when a risk of SOAEL exceedances is present at a given location. A maximum of 5 unattended noise monitors are envisaged at any one time during the construction programme. The following locations have been identified as potential sites for noise monitoring as works progress and the potential of disturbance arises:

- Four Lanes
- Old Hall Lane / Old Road
- Tollemache Close
- Meadowcroft / Littlefields
- Carrhouse Lane
- Woolley Bridge

2.6.4. Noise monitors may be set up at other locations in consultation with the relevant local authority.

Attended noise monitoring

2.6.5. To supplement the agreed unattended noise monitoring, attended noise measurements will be carried out on a risk-based approach. A programme of attended noise monitoring would be developed by the appointed Principal Contractor in consultation with the relevant local authority, for example at the commencement of a new significant activity. Any of the locations identified above (paragraph 2.6.3) may be subject to attended noise monitoring. However, attended monitoring is likely to focus on other areas with potential for adverse effects, such as A57 Hyde Road, Lodge Court, and Edge Lane.

2.7. Noise Insulation and Temporary Re-housing

2.7.1. Noise Insulation or temporary re-housing, or the reasonable costs thereof, will be offered to residential receptors which meet the following criteria:

2.7.2. Noise Insulation or temporary re-housing will be offered where construction noise levels exceed trigger level criteria for a time period exceeding either;

- 10 days in any consecutive 15 day period, or
- any 40 days in any consecutive 6 month period.

2.7.3. Noise insulation would be triggered by the higher of;

- a noise level 5 dB above the pre-construction ambient noise levels, or
- the noise insulation trigger levels presented in Table 2-1

2.7.4. Temporary re-housing would be triggered by the higher of;

- a noise level 10 dB above the pre-construction ambient noise levels, or
- the temporary rehousing trigger levels presented in Table 2-1.

Table 2-1 – BS 5228 Noise insulation and temporary re-housing noise thresholds

Day	Time period	Averaging time, T	Noise insulation trigger level (L _{Aeq,T} dB)	Temporary rehousing trigger level (L _{Aeq,T} dB)
Monday to Friday	07:00 – 08:00	1 hour	70	80
	08:00 – 18:00	10 hours	75	85
	18:00 – 19:00	1 hour	70	80
	19:00 – 22:00	3 hours	65	75

Day	Time period	Averaging time, T	Noise insulation trigger level (L _{Aeq,T} dB)	Temporary rehousing trigger level (L _{Aeq,T} dB)
	22:00 – 07:00	1 hour	55	65
Saturday	07:00 – 08:00	1 hour	70	80
	08:00 – 13:00	5 hours	75	85
	13:00 – 14:00	1 hour	70	80
	14:00 – 22:00	3 hours	65	75
	22:00 – 07:00	1 hour	55	65
Sunday and Public Holidays	07.00 – 21.00	1 hour	65	75
	21.00 – 07.00	1 hour	55	65

All noise levels are predicted at 1m in front of the most exposed of any windows and doors in any façade of any eligible dwelling

Table Source: British Standards Institution (2014). BS 5228 Part 1, Table E2.

2.8. Vibration control strategy

- 2.8.1. The appointed Principal Contractor will use BPM to control groundborne vibration and any consequent groundborne noise. The appointed Principal Contractor will undertake vibration risk assessments and identify where significant impact thresholds are expected to be exceeded. The relevant thresholds for determining significant impacts (for both building damage risk and human disturbance) will be sourced from relevant standards and guidance including BS 5228 Code of practice for noise and vibration control on construction and open sites. Part 2: 2009+A1:2014 Vibration, BS 7385 Parts 1 and 2, and BS 6472 Part 1, and the DMRB. Where relevant, other stakeholder imposed threshold values will also be complied with, particularly in the case of buried utilities infrastructure.
- 2.8.2. Peak Particle Velocity (PPV) magnitudes in excess of 1 mms⁻¹ external to a building will be used as an indicator of a potential significant impact on occupants of a residential building (although higher levels will be tolerated in certain circumstances).
- 2.8.3. The appointed Principal Contractor will use BPM to control vibration levels so that the PPV measured at the base of any building in accordance with BS 7385 does not routinely exceed a level of 5 mms⁻¹ (or 3mms⁻¹ for vulnerable buildings). Where these levels are predicted to be exceeded a more detailed assessment in accordance with the guidance provided in BS 7385 Parts 1 and 2 will be undertaken to further inform the level of risk of damage which may result in the commissioning of an appropriate defects survey.
- 2.8.4. Works expected to generate component PPVs above 1 mms⁻¹ within buildings will be notified to the relevant local authority in the relevant Section 61 application along with enhanced monitoring proposals.
- 2.8.5. In addition, The appointed Principal Contractor will apply any appropriate measures to protect medical, scientific and commercial premises, or properties that merit increased protection due to their structure or status that are especially sensitive to vibration.

- 2.8.6. Vibratory rolling will be minimised where practicable within 20m of sensitive receptors to avoid perceptible vibration.

2.9. Vibration monitoring

- 2.9.1. Vibration impacts generated by the works will be managed on a risk-based approach as outlined above. Vibration monitoring may be undertaken during significant vibration generating construction activity.
- 2.9.2. Vibration monitoring will take place in proximity to any impact piling activities that occur close to the proposed Mottram Underpass and where specified by the design. The following locations have been identified as potential sites for vibration monitoring as works progress and the potential of disturbance arises:
- Old Road
 - Tollemache Close
- 2.9.3. Additional vibration monitoring locations may be established at other locations in consultation with the relevant local authority.

2.10. Section 61 applications and compliance

Development of Section 61 consent applications

- 2.10.1. For noise and vibration, the appointed Principal Contractor will seek formal consent in accordance with Section 61 of the Control of Pollution Act 1974 to their proposed methods of work and to the steps proposed in order to minimise noise and vibration nuisance. Formal consent will be sought for any out of hours working and for any daytime works which have potential to generate significant effects.
- 2.10.2. The appointed Principal Contractor will consult on minimising nuisance through the proposed noise and vibration control measures with the relevant local authority through the development of the EMP (Second iteration).
- 2.10.3. Section 61 applications will contain the key construction working methods and the proposed mitigation measures, a plant list and information on the predicted noise and vibration levels generated by the works.

2.11. Communications

Stakeholder communication

- 2.11.1. The appointed Principal Contractor will maintain and develop a Community Engagement Plan in consultation with stakeholders.

Complaints

- 2.11.2. All complaints received will be recorded. All complaints will be investigated, and feedback will be given to the complainant. Where necessary, corrective actions will be implemented. The relevant local authority will be advised of any justified complaint, actions taken to investigate, and any actions found necessary to put

in place.

Records

- 2.11.3. Documentation and records will be produced, filed and maintained to record the activities and processes used to manage noise and vibration.

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