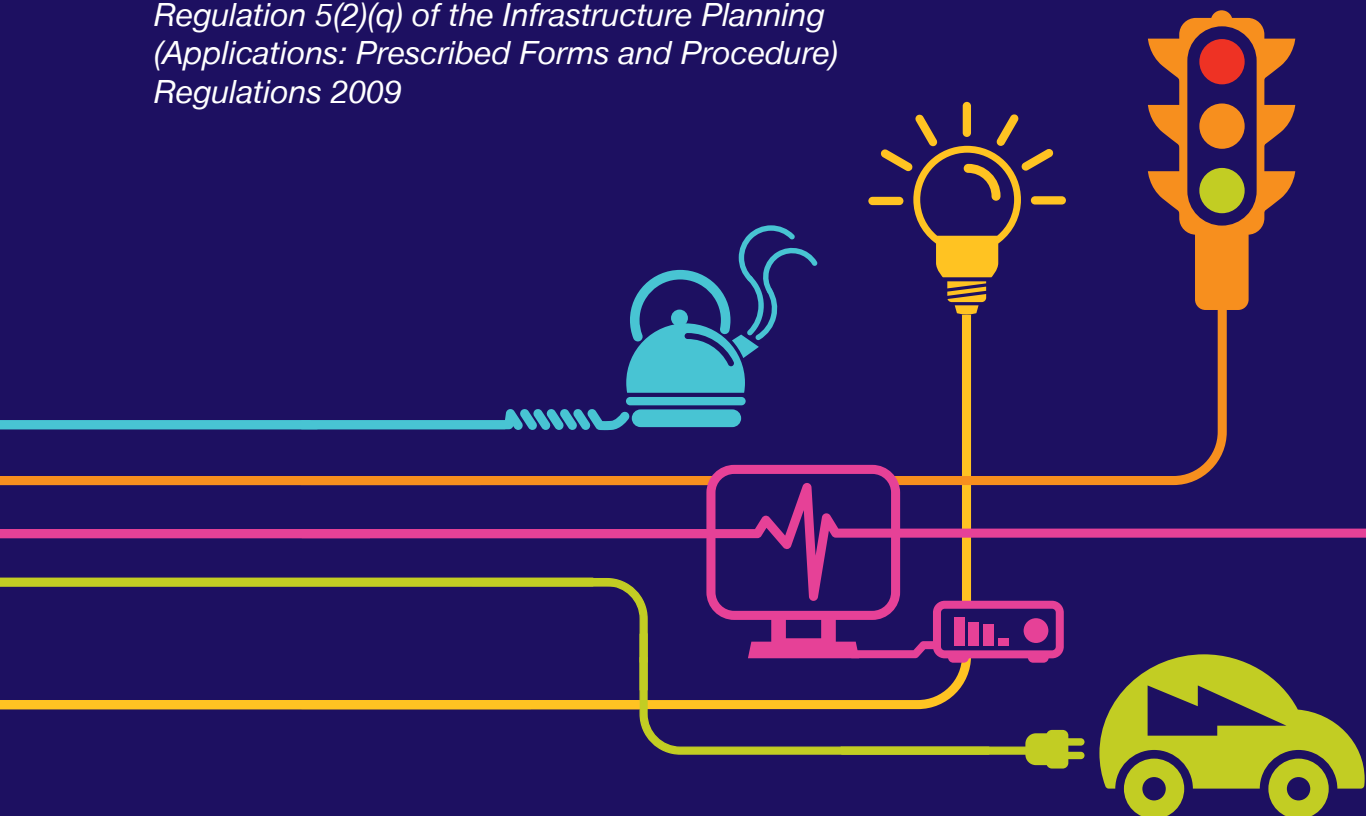


Environmental Statement
Construction Environmental
Management Plan
Appendix 6
Noise and Vibration Management Plan

Hinkley Point C Connection Project

*Regulation 5(2)(q) of the Infrastructure Planning
(Applications: Prescribed Forms and Procedure)
Regulations 2009*





Hinkley Point C Connection Project

JULY 2015

**VOLUME 5.26.7B, CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
APPENDIX 6 – NOISE AND VIBRATION MANAGEMENT PLAN**

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Author	Ric Cope, Bureau Veritas		
Approved By	Sue Fitton, National Grid		
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EX EXECUTIVE SUMMARY**EX1.1 Noise and Vibration Management Plan**

EX1.1.1 This Noise and Vibration Management Plan (NVMP) forms an appendix (**Volume 5.26.7B**) to the Construction Environmental Management Plan (CEMP) and as such forms part of the delivery of National Grid's commitment to best practice.

EX1.1.2 This NVMP has been prepared by National Grid and Western Power Distribution (WPD) and was certified by the Secretary of State in accordance with Article 45 (Certification of plans etc.) of the Development Consent Order (DCO). The NVMP will be implemented by National Grid, Western Power Distribution (WPD) and their appointed contractors in accordance with **Schedule 3, Requirement 5** of the DCO.

EX1.2 Purpose and Content of the NVMP

EX1.2.1 The purpose of this NVMP is to set out the principles and procedures for the management of noise and vibration during the construction of the Proposed Development. This includes:

- working hours, and the procedures for applying for out of hours working under a CoPA Section 61 application;
- procedures for gaining a Section 61 consent;
- general noise and vibration control measures in accordance with Best Practicable Means (BPM);
- definition and triggers for noise insulation and temporary re-housing; and
- site/activity specific mitigation measures.

EX1.3 General Measures

EX1.3.1 General noise and vibration control measures are listed, with reference to British Standard (BS) 5228 'Code of practice for noise and vibration control on construction and open sites', Part 1: Noise (+A1:2014), and Part 2: Vibration (+A1:2014).

1 INTRODUCTION

1.1 General Introduction

- 1.1.1 This Noise and Vibration Management Plan (NVMP) forms an appendix (**Volume 5.26.7B**) to the Construction Environmental Management Plan (CEMP) and describes the mitigation measures for all work activities associated with the construction of the proposed 400,000 volt (400kV) connection between Bridgwater, Somerset and Seabank Substation, north of Avonmouth, together with various associated development and other works ("the Proposed Development").
- 1.1.2 This NVMP has been prepared by National Grid and Western Power Distribution (WPD) and was certified by the Secretary of State in accordance with Article 45 (Certification of plans etc.) of the Development Consent Order (DCO). The NVMP will be implemented in accordance with **Schedule 3, Requirement 5** of the DCO.

2 WORKING HOURS

- 2.1.1 The control of working hours is a fundamental means of controlling noise and vibration.
- 2.1.2 Works will be undertaken in accordance with **Schedule 3, Requirement 7** of the DCO. The contractor will carry out the works in such a way as to limit the adverse noise and vibration impact of the construction activities.

3 NOISE CONTROL MEASURES

3.1 Mitigation Measures

3.1.1 All construction contractors will be required to follow standard good construction practice as outlined in BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014. This will include the following measures:

- a) Construction work will be undertaken in accordance with **Schedule 3, Requirement 7** of the DCO (construction hours).
- b) Electrical items of plant will be used instead of diesel plant where possible particularly in sensitive locations.
- c) Plant will be started up sequentially rather than all together.
- d) Internal haul roads will be well maintained and avoid steep gradients where possible.
- e) Loading/unloading activities will be located away from residential properties and shielded from those properties where practicable.
- f) Drop heights of materials will be minimised.
- g) The bunding (soil stockpiles) and fencing proposed at the construction compounds will be maintained to help to attenuate noise.
- h) Continuous noisy plant will be housed in acoustic enclosures, where practicable.
- i) Exhaust silencing and plant muffling equipment will be fitted and maintained in good working order.
- j) Static plant known to generate significant levels of vibration will be fitted with vibration dampening features.
- k) Each item of plant used will be selected so as to comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 (Ref. 4).
- l) Consideration will be given to the recommendations set out in Annex B of Part 1 of BS 5228 noise sources, remedies and their effectiveness.
- m) Equipment will be well-maintained and where possible will be used in the mode of operation that minimises noise.
- n) Plant and equipment will be shut down when not in use.
- o) Semi-static equipment will be sited and orientated as far as is reasonably practicable away from occupied buildings and, where feasible, will be fitted with suitable enclosures.
- p) Mobile construction plant will be located, as far as is reasonably practicable, away from adjacent occupied buildings or as close as possible to noise barriers or site hoardings to provide additional screening from sensitive noise receptors.
- q) Materials will be handled in a manner that minimises noise.
- r) Vehicles will not wait or queue on the public highway with engines idling; construction traffic movements will be undertaken in accordance with the Construction Traffic Management Plan (CTMP) (**Volume 5.26.5C**).
- s) All appropriate National Grid/WPD staff and their contractor's personnel will be instructed on BPM measures to reduce noise and vibration as part of their induction training, and followed up by 'tool box' talks.
- t) Noisy activities will be staggered in time and space where feasible.
- u) Only designated haul routes (on site) will be used.

3.2 Site Area

3.2.1 All construction work activities will be undertaken within the designated operational site boundaries; including areas designed to accommodate stockpiles and haul routes.

3.3 Reversing

3.3.1 The contractor will manage the noise from reversing alarms by means of the following:

- a) The site layout will be designed to limit and where reasonably practicable, avoid the need for the reversing of vehicles.
- b) A banksman will be utilised to avoid the use of reversing alarms.
- c) Reversing alarms incorporating one or more of the features listed below or any other comparable system will be used: highly directional sounders, broad band signals, self-adjusting output sounders, flashing warning lights.

3.3.2 Reversing alarms will be set to the minimum output noise level required for health and safety compliance.

3.4 Erection of Physical Barriers

3.4.1 Where deemed appropriate (through risk assessment), physical barriers will be erected around activities that are expected to generate particularly high noise levels to provide screening attenuation.

3.5 Training

3.5.1 All site personnel will receive training appropriate to the nature of their roles and responsibility; the training will include specific information in relation to noise and vibration management. If their work activities are assessed as being particularly noise/vibration emission prone all staff will receive induction training that will incorporate environmental awareness training, plus specific training in relation to noise and vibration. On site Tool-Box training will enable site workers to understand how their actions will interact with the environment and potentially impact upon sensitive receptors close to their work areas.

3.6 Cable Transition Jointing

3.6.1 Cable transition jointing operations may be required to continue through the night (due to overruns). However, this would mainly comprise low noise generating activities, such as resin pouring involving the use of a generator for operation of lighting and a dehumidifier. To minimise potential noise impacts, National Grid will set an obligation on the appointed contractor to complete the cable cutting process within core daytime working hours.

4 SECTION 61 CONSENT APPLICATIONS

Introduction

- 4.1.1 Contractors will be required to submit applications for Section 61 consents, variations and dispensations under the Control of Pollution Act 1974 (CoPA) for all construction activities that may generate a significant noise and/or vibration effect, including piling and activities to be undertaken outside of core working hours, unless otherwise agreed with the relevant planning authority. Activities that typically do not require a Section 61 consent include those which do not have significant noise and vibration impact, and would occur during core working hours, such as construction of temporary haul roads and scaffolding works.
- 4.1.2 The potential for a significant noise and/or effect, and therefore the trigger for the need to submit a Section 61 application to the relevant local authority, is defined against the following criteria:
- driven (sheet or column) piling operations within 50m of a private residential property;
 - vibratory compaction of haul road/bellmouth within 20m of a private residential property;
 - transition jointing operations outside of core working hours within 275m of a private residential property;
 - cable trench within 15m of a private residential property;
 - horizontal directional drilling (HDD) pit within 25m of a private residential property; and
 - breaking out of 132kV pylon foundations within 35m of a private residential property.
- 4.1.3 The contractor will be required to demonstrate that Best Practicable Means (BPM), as defined under Section 72 of the CoPA, are employed at all times for all activities, to minimise noise and vibration effects.
- 4.1.4 Where a Section 61 consent is to be sought, before starting any construction activities which may cause significant noise and/or vibration, the contractor will, or as agreed with the local authority, prepare and submit to the relevant local authority information which will include:
- a) an outline of the proposed construction method, type and number of plant to be used;
 - b) definition of the working hours required and, where these differ from the core working hours detailed in **Schedule 3, Requirement 7** of the DCO, a justification for the working hours sought;
 - c) a work programme which identifies the location and duration of each significant noise-generating activity;
 - d) the sound power levels, or sound pressure level at 10m, for each item of plant for each relevant activity;
 - e) appropriate (in terms of noise/vibration level, duration and working hours) justification that the method and plant proposed demonstrates that BPM has been employed to control noise and vibration impacts;

- f) predicted noise and vibration levels at specified locations supported by calculations as per the methodology in BS 5228 Part 1 (Ref. 2) and Part 2 (Ref. 3); and
- g) all steps to be employed to minimise noise and vibration during the works.

- 4.1.5 The number, extent (geographically and in terms of construction activities) and duration of Section 61 approvals will be the subject of timely consultation between the contractor and each relevant planning authority.
- 4.1.6 Where works are near local authority boundaries, the Section 61 submission will be made to the planning authority within which the construction activities are located, with a noise assessment made at locations representative of all neighbouring noise-sensitive receptors.
- 4.1.7 Neighbouring local authorities will be consulted in advance of the works to determine the need for any additional measures.
- 4.1.8 Where the works are to be undertaken on the boundary within two local authorities, an application will be made to each authority. The authorities are requested, through discussion, to agree a common set of consent conditions to be issued from each local authority.
- 4.1.9 Typical generic noise and vibration suppression measures to be employed are included in section 3 of this report and will be adopted on all sites where applicable. Agreement of proposed measures will be sought from the relevant planning authority through Section 61 consent, dispensation or variation (see section 2.3 below) applications.
- 4.1.10 Notification of the start of works and the provision of advanced information to local stakeholders is a key part of mitigating the effect of noise and vibration.
- 4.1.11 The CoPA appeals process (Ref. 1) (Sections 60(7) and 61(7)) has been changed by the DCO. The contractor will be responsible for any appeals under the DCO in relation to Sections 60 and 61 of the CoPA.

Implementation

- 4.1.12 Before any works are undertaken which may generate significant noise and/or vibration effects, including any works outside of core working hours, the contractor will submit an application to the relevant planning authority for prior consent under Section 61 of the CoPA.
- 4.1.13 The Section 61 application will set out the specific method of working, the actual working hours required, and the specific standards and measures that will be used at identified locations to minimise noise and vibration.
- 4.1.14 The contractor will engage in early discussions with the relevant planning authorities with respect to the information to be provided prior to submitting any Section 61 applications. This will include a list of the activities/stages for which separate Section 61 applications will be required. This is to enable all parties to focus on and agree those activities that could give rise to noise complaint and the most efficient approach to the Section 61 consent, dispensation or variation.

4.1.15 As required by the CoPA, BPM will be employed and demonstrated through programme, method and noise predictions in the Section 61 consent application(s) to the relevant planning authority.

4.1.16 Justification, detailed description and assessment will be provided for activities outside core working hours.

4.2 Dispensation/Variation

4.2.1 In the event that works (for which a Section 61 consent has been applied) have to be rescheduled or modified (e.g. method or working hours) for reasons not envisaged at the time of the Section 61 consent submission, the contractor will apply for a dispensation or variation from the relevant planning authority in advance of the start of those works and at the time specified within the CoPA. The dispensation will be sought by means of an application for a variation to the agreed matters, setting out the revised construction programme or method and the relevant noise calculations.

4.2.2 Where the rescheduling relates to work of a more urgent or critical nature (such as a key activity likely to delay other key activities), the contractor will apply to the relevant planning authority using the Section 61 process, where practicable. This change application will be issued seven days (but at least two working days) before the start of those works.

4.2.3 Where working outside of core hours has been accepted in a Section 61 consent (including dispensation or a variation), occupiers of nearby residential or other sensitive properties who are likely to be affected will be informed, as soon as reasonably practicable, by the contractor and the likely duration of planned works (in accordance with section 4.4 below).

4.2.4 The contractor will be required to maintain an up to date log of all relevant agreed hours and controls on working. This will incorporate any changes to working hours or practices set out in the NVMP which have been agreed through the Section 61 process.

4.3 Unscheduled Overruns

4.3.1 In the event that planned works not covered by a consent (either full Section 61 application or dispensation/variation) extend beyond the approved working hours and continue due to unforeseen circumstances that would affect safety or engineering practicability, the relevant planning authority will be kept informed of the nature, time, location and reasons for the overrun as soon as possible, and records kept by the site management.

4.3.2 The relevant planning authority will be requested to provide a telephone number and nominate an officer to receive such notifications. Overruns and the reasons for these will be reviewed by the National Grid/WPD, its contractors and the relevant planning authority, with the aim of reducing the potential for further unplanned overruns.

4.3.3 In the case of work required in response to an emergency (or which, if not completed, would be damaging or unsafe), the relevant planning authority will be advised as soon as is reasonably practicable of the reasons for, and likely duration of, such works.

4.4 Public Notification

4.4.1 **Schedule 3, Requirement 31** sets out a need for a written scheme for the provision of information to local residents and occupiers about the works and for the handling of complaints to be submitted to and approved by the relevant planning authority prior to the commencement of works. As described in **Volume 5.26.1C, section 1.10** (the CEMP), a community relations agency will be appointed to provide dedicated community relations and external communication support.

4.4.2 Amongst other duties, the community relations team will be responsible for managing the interface between the project and the communities in which the works are being undertaken. In respect of the NVMP the following procedures will be implemented:

- Local residents will be informed of the commencement and likely duration of the construction work activities through a letter drop. The letter will include a contact telephone number which will be manned at all times that construction activities are being undertaken on site.
- If construction activities are likely to generate noise levels in excess of the construction noise trigger levels (refer to **Table 5.1**), written agreement will be obtained from the relevant planning authority and local residents informed of the works at least 48 hours prior to works commencing.
- Where a person from a community local to the works makes a complaint with respect to construction noise and/or vibration, it will be passed initially to the community relations team. The community relations team will liaise with the other members of the project team to investigate the complaint. Appropriate action will be taken by the project construction team.

5 NOISE INSULATION AND TEMPORARY RE-HOUSING

- 5.1.1 Annex E of BS5228-1+A1 (Ref. 2) provides criteria for the assessment of significance of construction noise. Exceedances of threshold levels trigger a responsibility on the developer to provide noise insulation or a scheme to facilitate temporary rehousing. This represents additional protection for a residential property in the event that it is not practical to mitigate construction noise on site, or reduce its exposure durations to tolerable levels.
- 5.1.2 The standard suggests that noise insulation should be provided if the trigger levels shown in **Table 5.1** are predicted to be exceeded for a period of ten or more days of working in any 15 consecutive days, or for a total number of days exceeding 40 in any six month period.
- 5.1.3 This process will be undertaken as part of the Section 61 consent process.
- 5.1.4 Where noise levels at affected residential properties are expected to exceed the trigger levels for the periods defined below (**Table 5.1**) and where the temporal criteria is met, approved noise insulation, (or reimbursement of the reasonable costs thereof), or temporary re-housing of occupants as appropriate, will be offered. Affected parties will be notified in advance of the commencement of works which may cause the relevant trigger levels to be exceeded.
- 5.1.5 Noise insulation or temporary re-housing will be offered to qualifying parties when noise levels are predicted, or measured, to exceed:
- a) the relevant trigger levels as detailed in **Table 5.1**; or,
 - b) where the current ambient noise level is greater than the noise insulation trigger level:
 - i. the ambient noise level shall be used as the noise insulation trigger level.
 - ii. the ambient noise level +10dB shall be used as the temporary re-housing trigger level.
- 5.1.6 Acceptance of the offer of noise insulation or temporary rehousing would be voluntary.

Table 5.1 Noise Trigger Levels

Day	Relevant Time Period	Averaging Time, T	Noise Insulation Trigger Level, dB $L_{Aeq, T}^1$	Temporary Re-housing Trigger Level, dB $L_{Aeq, T}^1$
Monday to Friday	07:00 – 08:00	1h	70	80
	08:00 – 18:00	10h	75	85
	18:00 – 19:00	1h	70	80
	19:00 – 22:00	3h	65	75
	22:00 – 07:00	1h	55	65
Saturday	07:00 – 08:00	1h	70	80

Day	Relevant Time Period	Averaging Time, T	Noise Insulation Trigger Level, dB $L_{Aeq, T}^1$	Temporary Re-housing Trigger Level, dB $L_{Aeq, T}^1$
	08:00 – 13:00	5h	75	85
	13:00 – 14:00	1h	70	80
	14:00 – 22:00	3h	65	75
	22:00 – 07:00	1h	55	65
Sunday & Public Holidays	07:00 – 21:00	1h	65	75
	21:00 – 07:00	1h	55	65

Note 1) Equivalent continuous A-weighted noise level predicted or measured at a point 1m in front of the most exposed windows or doors leading directly to a habitable room (living room or bedroom) in an eligible dwelling, due to construction noise only.

- 5.1.7 Noise insulation (or the reasonable costs thereof against agreed bills) will be offered to owners, where applied for by owners or legal occupiers, if all of the following apply to a property lawfully occupied as a permanent dwelling:
- The predicted noise level exceeds the noise trigger level for noise insulation at the property during at least ten days out of any period of fifteen consecutive days or alternatively during 40 days in any six month period.
 - Noise insulation does not already exist that is of an equivalent standard to that which would be allowed for under the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (Ref. 5).
 - The property complies with all other requirements of the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996.
- 5.1.8 Temporary re-housing (or the reasonable costs thereof) will be provided, where applied for by legal occupiers, if both of the following apply to a permanent dwelling:
- The predicted noise level exceeds the noise trigger level for temporary re-housing at that property for at least ten days out of any period of 15 consecutive days or alternatively 40 days in any six month period.
 - The property complies with all other requirements of the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996.
- 5.1.9 The noise insulation and temporary re-housing policy is primarily applicable to residential buildings; however non-residential buildings will be considered on a case by case basis where these are occupied by noise sensitive uses such as hospitals and educational establishments.

6 VIBRATION ACTION LEVELS

- 6.1.1 Whilst the levels are not expected to be significant, the construction activities with the greatest potential to result in perceived vibration effects at nearby residential properties will include piling works (pylon construction) and ground compaction (cabling). As stated above, nuisance impacts of piling will be limited by restricting working hours, and through public liaison and communications.
- 6.1.2 The construction vibration action level provided in **Table 6.1** below relates to typical site construction activities, and is based upon guidance provided in BS 5228-2:2009+A1:2014 (Ref. 3).

Table 6.1 Vibration Action Level

Construction Activity	Vibration Level (mm/s PPV)	Effect
All activities	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 is provided to residents.
	15	Onset of possible cosmetic damage to residential or light commercial buildings.

- 6.1.3 In the event that a complaint of excessive vibration levels is received, a vibration monitoring exercise will be undertaken at impacted sensitive receptors. If the levels of vibration recorded are determined to exceed those stated in the table above, National Grid, WPD or their contractors will investigate the cause and cease the responsible activity until appropriate mitigation measures have been applied to prevent further exceedances.

7 NOISE AND VIBRATION MONITORING

- 7.1.1 It is not currently proposed that routine long-term noise and vibration would be undertaken during the construction period. The need for such, and any potential monitoring locations, would be identified in any Section 61 applications, and will be the subject of discussion between the contractor, National Grid/WPD and the relevant planning authority prior to submission of any Section 61 application.
- 7.1.2 In the event that complaints regarding noise and/or vibration are received, measurements will be undertaken either at the complainant's property or at a suitable known reference distance from the works so that any additional attenuation factors can be determined in accordance with the procedures in BS 5228 Part1 and Part 2; measurements if required will also be undertaken in accordance with these and other appropriate standards.

8 SUITABLY QUALIFIED PERSONS

8.1.1 The person(s) responsible for the development of Section 61 applications and variations, and for the associated noise and vibration calculations and/or monitoring, will demonstrate:

- a) a summary of training and education relevant to the management of construction noise and vibration;
- b) experience of the Section 61 process and of monitoring noise and vibration (if required);
- c) confirmation that the individual is, at minimum, an Associate Member of the Institute of Acoustics; and
- d) a 'certificate of competence' from the Institute of Acoustics course, 'Environmental Noise Measurement'.

9 REFERENCES

1. Control of Pollution Act 1974, The Stationary Office.
2. British Standards Institution. BS5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Noise, London, 2014.
3. British Standards Institution. BS5228-2:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Vibration, London, 2014.
4. European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701
5. Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996, The Stationary Office.

