HS2 Phase One: London - West Midlands

Draft Code of Construction Practice

A draft report to HS2 Ltd by Arup/~~URS~~AECOM

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Requirement		
Employer's Review	~~Darren White/Peter Miller~~	
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1 Introduction

1.1 Background

1.1.1 This document is the draft Code of Construction Practice (CoCP) for the Phase One London - West Midlands route of the proposed High Speed 2 (HS2) railway (hereafter referred to as the Proposed Scheme). HS2 is being delivered by High Speed Two Limited (HS2 Ltd), which is the company set up by the Government to develop proposals for a new high speed railway line between London and the West Midlands and to consider the case for new high speed rail services linking London, northern England and Scotland. Powers to construct and operate the Proposed Scheme will be sought by means of a hybrid Bill to be submitted to Parliament. Responsibilities for construction will be discharged by the nominated undertaker appointed to implement the powers of the hybrid Bill. The nominated undertaker is the body appointed by the Secretary of State (SoS) responsible for delivering the Proposed Scheme.

1.1.2 The CoCP contains control measures and the standards to be implemented throughout Phase One of the HS2 project. At a local level, site specific control measures will be included within Local Environmental Management Plans (LEMPs) to be developed following consultation with the relevant stakeholders.

1.1.3 As the HS2 project (as defined in 1.1.1) extends across 28 local authorities (LAs), the CoCP will provide a consistent approach to the management of construction activities across ~~LA~~local authority boundaries, and with a wide range of key stakeholders.

1.1.4 The CoCP will evolve and is subject to refinement, amendment and expansion as necessary as the project design, assessment and Parliamentary processes develop. Engagement with stakeholders especially through the planning forums, the national environment forum and the community forums will inform its future development. This draft CoCP should not be taken to represent the views of the SoS for Transport until such time as it has been finalised prior to Royal Assent to the hybrid Bill.

1.2 Structure of this document

1.2.1 This document comprises following sections:

- Purpose of the CoCP (Section 2) - which includes reference to measures and standards to protect communities and the environment during construction works;
- Policy and environmental management principles (Section 3) – which form the basis of environmental management systems (EMSs) to be implemented during construction;
- Implementation (Section 4) – the mechanisms by which general environmental commitments and specific requirements in local community areas are passed from the nominated undertaker to their construction contractors; and
- General requirements by environmental topic (Section 5 to 16) – which set out the measures that will be implemented to limit disturbance from

construction activities as far as reasonably practicable in relation to the following topics which respond directly to the HS2 Environmental Statement (ES):

- General requirements related to community relations, hours of work, pollution incident control and security etc.;
- Agriculture, forestry and soils;
- Air quality;
- Cultural heritage;
- Ecology;
- Ground settlement;
- Land quality;
- Landscape and visual;
- Noise and vibration;
- ~~Traffic and transport;~~
- Traffic and transport; and
- Water resources and flood risk.

2 Purpose of the Code of Construction Practice

2.1.1 This draft CoCP sets out a series of proposed measures and standards of work, which shall be applied by the nominated undertaker and its contractors throughout the construction period to:

- provide effective planning, management and control during construction to control potential impacts upon people, businesses and the natural and historic environment; and
- provide the mechanisms to engage with the local community and their representatives throughout the construction period.

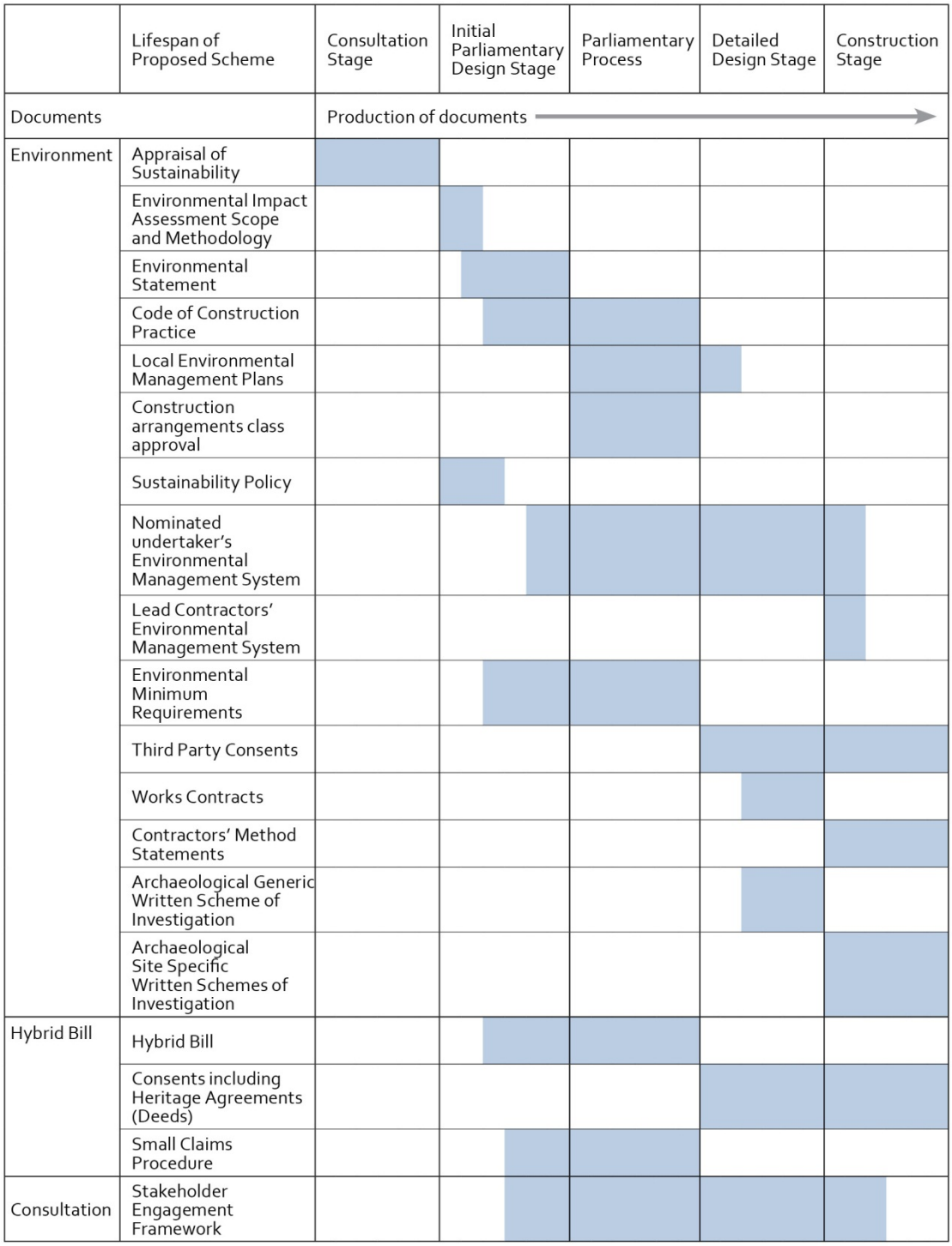
2.1.2 Measures will be applied to the construction to enable it to be undertaken economically and meet the requirements of the hybrid Bill and its associated commitments.

2.1.3 The nominated undertaker and its contractors will comply as a minimum with applicable environmental legislation at the time of construction together with any additional environmental controls imposed by the hybrid Bill. For this reason the applicable statutory requirements are not repeated within this CoCP. Further guidance on specific areas, such as soil handling and dust management, will be considered from industry best practice guidance documents as set out in each discipline section of this CoCP. The references to guidance documents within this document are not intended to be exhaustive.

2.1.4 This draft CoCP has been produced in conjunction with the ES documentation with the aim of ensuring that likely significant construction effects that are reported in the ES will either be avoided or mitigated. Site specific controls, which will be included within the LEMPs, will be developed during the Parliamentary process and detailed design stage.

2.1.5 The draft CoCP is one of a suite of documents to be submitted to Parliament with the hybrid Bill. ~~See Figure 1~~See Figure 1 for a diagrammatic representation showing its relationship to other project documentation.

Figure 1: Diagram showing the CoCP within the context of other documentation for the Proposed Scheme



	Lifespan of Proposed Scheme	Consultation Stage	Initial Parliamentary Design Stage	Parliamentary Process	Detailed Design Stage	Construction Stage
Documents		Production of documents →				
Environment	Appraisal of Sustainability					
	Environmental Impact Assessment Scope and Methodology					
	Environmental Statement					
	Code of Construction Practice					
	Local Environmental Management Plans					
	Construction arrangements class approval					
	Sustainability Policy					
	Nominated undertaker's Environmental Management System					
	Lead Contractors' Environmental Management System					
	Environmental Minimum Requirements					
	Site Specific Management Plans					
	Third Party Consents					
	Works Contracts					
	Contractors' Method Statements					
	Archaeological Generic Written Scheme of Investigation					
	Archaeological Site Specific Written Schemes of Investigation					
Hybrid Bill	Hybrid Bill					
	Consents including Heritage Agreements (Deeds)					
	Small Claims Procedure					
Consultation	Community Engagement Framework					

Note: This figure is provided for illustrative purposes only and the list of documents is not exhaustive. Document titles and timescales for their production may change.

3 Policy and environmental management principles

3.1 HS2 sustainability policy

3.1.1 HS2 Ltd has developed and is implementing a sustainability policy, which is included in Annex 2. The policy sets out both the corporate approach to be adopted by the nominated undertaker to incorporating environmental and sustainability aspects and the high level principles which will define how these matters will be addressed on the Proposed Scheme. All contractors will be required to comply with the requirements of the sustainability policy.

3.2 Environmental Minimum Requirements

3.2.1 The draft CoCP will be annexed to the ES submitted to Parliament as part of the hybrid Bill process. The CoCP will form a component of the HS2 Environmental Minimum Requirements (EMRs). The EMRs will set out the high level environmental and sustainability commitments that the Government will enter into through the hybrid Bill process. The EMRs will consist of a suite of framework documents which will (i) define the mechanisms by which the nominated undertaker will engage with communities and other key stakeholders and (ii) implement environmental and sustainability management measures designed to protect communities and the environment during detailed design development and construction.

3.2.2 The nominated undertaker, taking forwards the detailed design and implementation of the scheme after the hybrid Bill has been enacted, will be required by the SoS for Transport to comply with the EMRs.

3.2.3 The EMRs are likely to be formed of:

- a CoCP;
- a ~~[~~planning and~~]~~ heritage memorandum, to identify the responsibilities in relation to certain planning matters and site specific details where particular heritage features may be affected by the Proposed Scheme, to be agreed with local planning authorities (LPAs) and ~~English~~ Heritage ~~(EH~~England (HE);
- an environmental memorandum identifying the management approach to and controls on environmental aspects of the Proposed Scheme, to be agreed with stakeholders such as Environment Agency (EA), Natural England (NE);
- policies setting out the approach on particular aspects of the Proposed Scheme, e.g. land acquisition and disposal, noise mitigation, property hardship scheme prevention of and repairs relating to damage from settlement; and
- undertakings and assurances given to petitioners and to Parliament during the passage of the hybrid Bill.

3.3 Statutory Requirements

3.3.1 The hybrid Bill will require the nominated undertaker to seek certain additional approvals from statutory bodies and undertakers e.g. the EA and Highway Authorities.

3.3.2 The hybrid Bill will also require approvals of construction arrangements as conditions of the deemed planning permission conferred by the hybrid Bill. In respect of the following matters class approvals may be given by the SoS following consultation with the LPAs. The matters for class approval will be as follows:

- handling of reusable spoil and topsoil;
- storage sites for construction material, spoil or topsoil;
- works screening;
- artificial lighting;
- dust suppression; and
- road mud prevention measures.

3.3.3 In the absence of class approvals, these matters must obtain approval from the relevant LPA. In respect of the following matters approvals can only be obtained from the LPA:

- construction compounds; and
- routes for construction traffic.

3.3.4 Where not inconsistent with the hybrid Bill powers and not specifically disapplied, relevant existing statutory controls will continue to apply to the nominated undertaker and its contractors e.g. relating to the environmental permitting regime for discharges into watercourses.

3.4 Environmental management system

The nominated undertaker's Environmental Management System

3.4.1 As part of the sustainability policy, the nominated undertaker will develop an EMS in accordance with *BS EN ISO 14001*. The EMS provides the process by which environmental management both within its organisation and in relation to its operations is undertaken to ensure the relevant findings of the ES are addressed through the construction phase. The EMS will set out:

- the procedures to be implemented to plan and monitor compliance with environmental legislation~~;~~ and other relevant requirements;
- the key environmental aspects of the work and how they will be managed;
- staff competence and awareness requirements and how these are achieved and maintained;
- record keeping arrangements;

- the procedures to be implemented to monitor compliance with the environmental provisions in the hybrid Bill; and
- monitoring compliance and the effectiveness of the measures included within this CoCP.

Lead contractors' Environmental Management System

3.4.2 The nominated undertaker will require each of its lead contractors to have an EMS certified to *BS EN ISO14001*. Their EMS will include roles and responsibilities, together with appropriate control measures and monitoring systems to be employed during planning and constructing the works for all relevant topic areas. Where the lead contractor is a joint venture, the EMS will be certified to cover the activities of the joint venture.

3.4.3 As part of their EMS, lead contractors will be required to plan their works in advance to ensure that, in so far as is reasonably practicable, measures to reduce environmental effects are integrated into the construction methods and that commitments from the ES and hybrid Bill are complied with. The works will also be subject to approval processes set out in this CoCP by the nominated undertaker (e.g. suitability of construction phase plans) and by any statutory consents required.

3.4.4 The lead contractors' EMS will cover the activities of all their contractors. The lead contractors will also be required to coordinate with other contractors and relevant parties that may affect their works. This will be documented in their EMS, as appropriate.

3.4.5 The lead contractors' EMS will include procedures to monitor and report on compliance with the project's environmental requirements, as set out in Section 4.3.1 of this CoCP, together with provisions for any corrective actions required.

3.4.6 The detailed provisions of the lead contractors' EMS will be subject to review and acceptance as being suitable by the nominated undertaker.

4 Implementation

4.1 Enforcement

4.1.1 The CoCP will be implemented during the planning and undertaking of construction works. The provisions of the CoCP will be imposed by the nominated undertaker on the lead contractors by means of the works contracts. The contracts will incorporate both:

- general requirements; and
- site specific requirements, including the requirements of the LEMPs.

4.1.2 The lead contractors and their contractors will be required to comply with the terms of the CoCP by the nominated undertaker and appropriate action will be taken by the nominated undertaker as required to ensure compliance.

4.1.3 The ~~general~~ requirements ~~are listed in the following sections~~ of the CoCP ~~and~~ will be applicable to the whole of the Proposed Scheme. They will apply to each construction contract let by the nominated undertaker. The ~~general~~ requirements will be supplemented by LEMPs for each relevant local authority area (i.e. district council, London borough or other unitary authority). Further details on the LEMPs are given in Section 4.2.

4.1.4 The nominated undertaker will develop an EMS, which will set out the arrangements and responsibilities for auditing and assuring compliance with the environmental mitigation set out in this CoCP. The nominated undertaker will also be required by the EMRs to comply with the CoCP.

4.2 Local Environmental Management Plans

4.2.1 The LEMPs will include a number of specific measures by topic as relevant to each relevant local authority area, as set out in Section 6 onwards of this CoCP. The LEMPs will build on the general environmental requirements given below and will set out how the project will adapt and deliver the required environmental and community protection measures within each relevant local authority area.

4.2.2 The nominated undertaker and/or its contractors will engage with the local communities, ~~LAs~~local authorities and other stakeholders in order to develop the LEMPs.

4.2.3 A template for the LEMPs is included in Annex 3 of this CoCP.

4.3 Site management

Site Management Plans

4.3.1 The HS2 Environmental Memorandum (LWM-HS2-EV-REP-000-000033) identifies key worksites along the Phase One of HS2 route that are environmentally sensitive in terms of nature conservation, terrestrial and aquatic ecology water resources, geomorphology, recreation and amenity, landscape, public open space and agriculture land. The criteria for inclusion are 'worksites where a key significant

impact (that has been agreed with the National Environment Forum members) is generated in any of the environmental topics as mentioned above.

4.3.2 The nominated undertaker will prepare site-specific management plans for these identified environmental sensitive worksites, focusing on mitigation, compensation and monitoring requirements, with opportunities for enhancement in relation to the identified environmental topics as outlined within the Environmental Memorandum.

Monitoring

~~4.3.1~~4.3.3 The lead contractors will undertake the necessary monitoring as outlined for each environmental topic (see Sections 6 to 16) to comply with the requirements of this CoCP, the relevant LEMP, any additional consent requirements and their EMS. Monitoring will include:

- monitoring the effectiveness of mitigation measures;
- monitoring the impact of construction works; and
- taking other actions as may be necessary to enable compliance.

~~4.3.2~~4.3.4 Monitoring, together with provisions for any corrective action required, will be implemented under the lead contractors' EMS.

Training and competence

~~4.3.3~~4.3.5 The nominated undertaker will require all contractors to employ an appropriately qualified and suitably experienced workforce, where appropriate, this will include holding a registration with relevant recognised competence schemes.

~~4.3.4~~4.3.6 The nominated undertaker and its contractors will be responsible for identifying the training needs of their personnel to enable appropriate training to be provided and suitably qualified and experienced professionals will be engaged for this purpose. The training will include site briefings and toolbox talks to equip relevant staff with the necessary level of knowledge on health, safety, community relations and environmental topics, and an ability to follow environmental control measures and to advise employees of changing circumstances as work progresses.

Considerate constructors

~~4.3.5~~4.3.7 All lead contractors will be required to sign up and adhere to the Considerate Constructors Scheme (see the Glossary in Annex 1 for more information).

4.4 Contractors' method statements

4.4.1 The nominated undertaker's contractors will set out the procedures to be followed for construction operations in method statements which will address health, safety, site security and the environmental issues associated with construction operations. The operations requiring a method statement will be identified using a risk based approach. As a minimum, method statements will be prepared for site preparation, construction activities and reinstatement of land and/or infrastructure following completion of the main construction works.

4.4.2 Method statements will define any specific environmental control measures, including environmental and cultural heritage protection works, to be implemented to meet the requirements of this CoCP and the LEMPs, and will consider the measures required to reduce cumulative effects of concurrent construction activities.

4.4.3 The lead contractors' approach to method statements will be reviewed and accepted by the nominated undertaker. An assurance programme will be established by the nominated undertaker and its contractors to ensure compliance with these planned arrangements.

4.5 Supervision

4.5.1 Sufficient suitably qualified and experienced personnel will be appointed by the lead contractors to supervise the main construction works. This will include professionally qualified environmental management staff, with relevant experience in the environmental disciplines included within the ES and this CoCP. They will be present on site during the main construction works to advise the nominated undertaker and the contract management team, and supervise and report on the implementation of appropriate environmental mitigation measures and safeguards.

Contact person

4.5.2 At each construction site, a contact person will be identified, who will be the single point of contact for the regulatory authorities. The nominated undertaker will provide the regulatory authorities with relevant contact details prior to the commencement of construction.

5 General requirements

5.1 Community relations

5.1.1 The nominated undertaker and its contractors will produce and implement a ~~stakeholder~~community engagement framework and provide appropriately experienced community relations personnel to implement the framework, to provide appropriate information and to be the first point of contact to resolve community issues. The nominated undertaker will take reasonable steps to engage with the community, particularly focussing on those who may be affected by construction impacts including local residents, businesses, land owners and community resources, and the specific needs of protected groups (as defined in the Equalities Act 2010).

5.1.2 Regular meetings will be held at Community Forum locations between the lead contractor, the nominated undertaker, local authority and representatives of the local community or other stakeholders to discuss construction issues and the forthcoming programme of works. Experienced support for local businesses, land owners, voluntary and community organisations that may be affected by the works will be provided by the nominated undertaker.

5.1.3 The nominated undertaker and its contractors will consider local employment, apprenticeships and educational initiatives when recruiting staff.

Advance notice of works

5.1.4 The nominated undertaker and its contractors will ensure that local residents, occupiers, businesses, local authorities and parish councils affected by the proposed construction works, as outlined in the ES, will be informed in advance of works taking place by methods identified in the framework. The notifications will detail the estimated duration of the works, the working hours and the nature of the works. In the case of works required in response to an emergency, the local authority, parish council, local residents, businesses and community resources will be advised as soon as reasonably practicable. All notifications will include the community helpline number.

5.1.5 Information on the works will also be available on the HS2 website and at appropriate locations along the route, which will be identified in the LEMPs.

Community helpline

5.1.6 The nominated undertaker and its contractors will maintain a construction operations website (which includes an email function or the latest communication technique) and telephone helpline staffed 24 hours a day, 7 days a week, to handle enquiries from the general public and local businesses regarding construction activities. It will also act as a first point of contact for information in the case of any emergency or an incident. The helpline will be widely promoted and displayed on site signboards and hoardings. It will also be possible to contact the HS2 helpline service via the HS2 website email function. Information for the public will also be provided using other methods such as social media, email alerts, local radio and newspapers as appropriate. The service will also be available in different languages, on a case by case basis as agreed by the nominated undertaker.

5.1.7 A process for handling complaints will be established whereby all calls will be logged together with responses. Statistical information on enquiries, complaints and actions to resolve these will be sent to relevant local authorities on a regular basis (mechanism and period to be confirmed).

5.1.8 An independent Complaints Commissioner will be appointed by the SoS for Transport to provide an independent arbitration service for the complaints process detailed above.

Community emergency plan

5.1.9 A comprehensive community emergency plan will be put in place, where relevant, for each section of the work. This will ensure that in the case of a major emergency, when working in partnership with the relevant emergency service, the community can be kept fully informed and that adequate arrangements are in place for the evacuation of an affected area if necessary.

Small claims procedure

5.1.10 Following Royal Assent of the hybrid Bill the nominated undertaker will establish a small claims procedure, modelled on those operated for the construction of the Channel Tunnel, the Channel Tunnel Rail Link (CTRL) and Crossrail, to provide a positive and clear mechanism for minor construction related residential, business or agricultural claims up to a value to be determined at the time. See *HS2 Information Paper C10: Small Claims Scheme.*

5.1.11 The scheme is an informal approach to handling small claims that is designed to give a prompt response at minimum cost and inconvenience to claimants. It is a voluntary arrangement that does not affect statutory rights of redress.

Claims

5.1.12 The scheme would cater for claims related to damage to property and effects arising from the construction of the Proposed Scheme, but not for personal injury.

5.1.13 The scheme would deal with claims up to a value to be determined at the time of the start of construction. It is expected that this value would be up to £7,500 and periodically be subject to review.

5.1.14 The scheme would not apply to local authorities, Government departments or agencies.

Operation

5.1.15 The nominated undertaker would be required to appoint an administrator to deal with small claims (known as the Small Claims Administrator).

5.1.16 If a member of the public considers that he or she has a claim for physical damage arising from construction related activity, the claimant must first address the claim to the person identified as the point of contact by the nominated undertaker.

5.1.17 The point of contact would be responsible for receiving any complaint. If immediate action cannot be taken to resolve or settle the small claim, it would be passed to the Small Claims Administrator for resolution and settlement.

5.1.18 The Small Claims Administrator would be responsible for investigating the claim, setting up a meeting with the claimant to discuss the claim, deciding whether the claim is warranted, assessing the damage and arranging payment to the claimant.

5.1.19 If a claimant considers that the award of the Small Claims Administrator is inadequate then he would be able to write to the Complaints Commissioner requesting resolution and settlement.

5.1.20 It would be possible for claims to be referred to the Small Claims Administrator by the Complaints Commissioner.

Remedies and monitoring

5.1.21 The Complaints Commissioner would determine requests for arbitration under the scheme. The operation of the scheme would be monitored by the HS2 Ltd Complaints Commissioner who would report performance to the nominated undertaker annually and at other times as he/she considers necessary.

5.2 Working hours

Consents

5.2.1 The nominated undertaker's contractors will seek to obtain consents from the relevant local authority under Section 61 of the Control of Pollution Act 1974 for the proposed construction works, excluding non-intrusive surveys (see Section 13). Applications will include details on proposed working hours.

Core working hours

5.2.2 Core working hours will be from 08:00 to 18:00 on weekdays (excluding bank holidays) and from 08:00 to 13:00 on Saturdays. The nominated undertaker will require that its contractors adhere to these core working hours for each site as far as is reasonably practicable or unless otherwise permitted under Section 61 of the Control of Pollution Act 1974.

5.2.3 Guidance on the site specific variations to core hours and/or additional hours likely to be required will be included within the LEMP following consultation with the relevant local authority.

5.2.4 Except in the case of an emergency, any work required to be undertaken outside of core hours (not including repairs or maintenance) will be agreed with the local authority prior to undertaking the works under Section 61 of the Control of Pollution Act 1974 within the framework set out by the LEMP and this CoCP.

Start up and close down periods

5.2.5 To maximise productivity within the core hours, the nominated undertaker's contractors will require a period of up to one hour before and up to one hour after normal working hours for start-up and close down of activities. This will include but not be limited to deliveries, movement to place of work, unloading, maintenance and general preparation works. This will not include operation of plant or machinery likely to cause a disturbance to local residents or businesses. These periods will not be considered an extension of core working hours.

Additional working hours

5.2.6 Tunnelling[1] and directly associated activities (such as removal of excavated material, supply of materials and maintenance of tunnelling equipment) will be carried out on a 24 hour day, 7 day week basis. Where reasonably practicable, material will be stockpiled within the site boundary for removal during normal working hours.

5.2.7 Work within existing stations, track laying activities and work requiring possession of major transport infrastructure may be undertaken during night time, Saturday afternoon, Sunday and/or bank holiday working for reasons of safety or operational necessity and will often involve consecutive nights work over weekend possessions, and may on occasion involve longer durations. Activities outside core working hours that could give rise to disturbance will be kept to a reasonably practicable minimum.

5.2.8 Certain operations such as earthworks are season and weather dependent. In these instances the nominated undertaker's contractors will seek to extend the core working hours and/or days for such operations to take advantage of daylight hours, with the consent of the relevant local authority.

5.2.9 Certain other specific construction activities will require extended working hours for reasons of engineering practicability. These activities include, but are not limited to, major concrete pours and piling/diaphragm wall works. Surveys, e.g. for wildlife or engineering purposes, may also need to be carried out outside of core working hours.

5.2.10 Repairs or maintenance of construction equipment that is required to be carried out outside of core working hours will normally be carried out on Saturday afternoons or Sundays between 09:00 and 17:00.

5.2.11 In the case of work required in response to an emergency or which if not completed would be unsafe or harmful to the works, staff, public or local environment, the relevant local authority will be informed as soon as reasonably practicable of the reasons for, and likely duration of, the works. This information will also be made available to the HS2 helpline. Examples of the type of work envisaged includes: where pouring concrete takes longer than planned due to equipment failure or where unexpectedly poor ground conditions, encountered whilst excavating, require immediate stabilisation.

Abnormal deliveries

5.2.12 Abnormal loads or those that require a police escort may be delivered outside core working hours subject to the requirements and approval of the relevant authorities.

5.3 Construction site layout and good housekeeping

5.3.1 To reduce the likelihood of either an environmental incident or nuisance occurring the following measures will be used, where relevant:

- treatment of perimeters, cleanliness on site, provision of staff facilities, waste management;

[1] This does not refer to cut and cover tunnels.

- effective preventative pest and vermin control and prompt treatment of any pest and vermin infestation, including arrangements for disposing of food waste or other attractive material. If infestation occurs the contractor will take action to eliminate the infestation and prevent further occurrence;
- prohibition of open fires, and a requirement to take measures to minimise likelihood of fires;
- removal or stopping and sealing of drains and sewers taken out of use;
- no discharge of site runoff to ditches, watercourses, drains, sewers or soakaways without agreement of the appropriate authority;
- maintenance of wheel washing facilities or other containment measures;
- location of storage, machinery, equipment and temporary buildings to minimise environmental effects and where practicable, outside flood risk areas;
- the use of less intrusive noise alarms that meet the particular safety requirements of the site, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- controls on lighting/illumination to minimise visual intrusion or any adverse effect on sensitive ecology;
- the location of site accommodation to avoid overlooking residential property;
- management of staff congregating outside of site prior to commencing or leaving work;
- security measures, including close circuit television (CCTV). The location and direction of view of security cameras or blocking software to prevent intrusion to residential properties will be considered;
- avoidance of use of loudspeaker or loudhailer devices;
- containing and limiting visual intrusion of construction sites, as far as reasonably practicable;
- provision of maps showing sensitive areas and buffer zones where no pollutants are to be stored or used;
- where reasonably practicable, maintenance of public rights of way (PRoW) (including diversions) for pedestrians, cyclists and equestrians affected by the Proposed Scheme, including reasonable adjustments to maintain or achieve inclusive access;
- adequate welfare facilities for staff;
- smoking areas at site offices/compounds or work sites equipped with

containers for smoking wastes - these would not be located at the boundary of working areas or adjacent to neighbouring land; and

- the implementation of a Construction Workers Travel Plan to encourage use of public transport by project staff and control off-site parking.

5.4 Site lighting

5.4.1 Site lighting and signage will be provided to enable the safety and security of the construction sites. It will be at the minimum luminosity necessary and use low energy consumption fittings. Where appropriate, lighting to site boundaries will be provided and illumination will be sufficient to provide a safe route for the passing public. In particular, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas. Where appropriate, lighting will be activated by motion sensors to prevent unnecessary usage. It will comply with the *Institution of Lighting Engineers' guidance notes for the reduction of light pollution* and the provisions of *BS 5489, Code of Practice for the Design of Road Lighting,* where applicable.

5.4.2 Lighting will also be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings, ecological receptors, structures used by protected species and other land uses to prevent unnecessary disturbance, interference with local residents, railway operations, passing motorists, or the navigation lights for air or water traffic. This provision will apply particularly to sites where night working will be required. In addition, at construction sites where potentially significant impacts are identified, the lead contractor will develop and implement lighting controls as part of their EMS.

5.5 Worksite security

5.5.1 Construction worksites will be under the control of a lead contractor, which has a statutory duty to prevent unauthorised access to the site. Lead contractors will carry out site specific assessments of the security and trespass risk at each site and implement appropriate control measures.

5.5.2 The following measures may be used by the contractors to prevent unauthorised access to the site:

- use of high perimeter fencing or hoarding but only where necessary for site security and public safety, and placed so that PRoW are maintained, or appropriately diverted;
- site lighting at site perimeters;
- adequate security guards and patrols;
- CCTV and infrared surveillance and alarm systems where required;
- communications initiatives for local schools to warn of dangers, and involving schools in response to incidents involving their pupils;
- consultation with neighbours on site security matters;

- consultation with local crime prevention officers on security proposals for each site with regular liaison to review security effectiveness and response to incidents; and
- immobilisation of plant out of hours, removing or securing hazardous materials from site, securing fuel storage containers and preventing unauthorised use of scaffolding to gain access to restricted areas and neighbouring properties.

5.6 Hoardings, fencing and screening

5.6.1 The following measures will be applied, as appropriate:

- maintenance of adequate fencing and hoardings to an acceptable condition to prevent unwanted access to the construction site, to provide noise attenuation, screening, and site security where required. This will include the need to provide viewing points at relevant locations, if appropriate;
- use of different types of fencing, including hoardings used for noise control;
- painting the side of hoardings facing away from the site, and to keep them free of graffiti or posters;
- providing site information boards with out of hours contact details, 24 hour telephone number (for comments/complaints), community information and information on the works programme, at key locations;
- displaying notices on site boundaries to warn of hazards on site such as deep excavations, construction access, etc.;
- providing signage to indicate re-routed pedestrian/cycle paths;
- providing information on routes to alternative community facilities;
- displaying notices confirming that businesses whose access or view may be affected by construction works, remain open with directions for how to access them;
- maintenance of protective fencing ~~(Heras or equivalent)~~ and/or specialist fencing (e.g. reptile fencing) to protect environmentally sensitive features during construction; and
- retaining existing walls, fences, hedges and earth banks for the purpose of screening as far as reasonably practicable.

5.6.2 Design of hoardings around construction activities shall ensure fitness for purpose and include consideration of the character of the surrounding landscape (e.g. use of open mesh fencing where possible and appropriate in rural areas, solid hoarding in urban areas, use of artwork where appropriate, or use of vegetation on hoardings). Fencing and hoarding shall be kept well maintained throughout construction.

5.6.3 Where hoarding is required, it will be 2.4m in height and will be raised to 3.6m and possibly altered in form to enhance acoustic performance for specific locations. Further details will be included within the relevant LEMPs.

5.6.4 Temporary fences may be used in certain areas, such as for short-term occupation of sites or at more remote locations.

5.6.5 Clear sight lines will be maintained around hoardings and fencing with no hidden corners in order to avoid, where reasonably practicable, opportunities for anti-social behaviour and crime and to ensure safety of vehicles. Footways of adequate width to facilitate pedestrian flows will be provided with signs provided to facilitate safe access around the site boundary. Adequate lighting will be installed near hoardings. Businesses located close to hoardings will be consulted on their design, materials and construction to reduce impacts on access to and visibility of their premises.

5.6.6 Hoarding and fencing in areas at risk of flooding will be permeable to floodwater, unless otherwise agreed with the EA, to ensure that the fluvial floodplain and areas liable to other sources of flooding, continues to function effectively for storage and conveyance of floodwater.

5.6.7 Fencing and hoarding will, as far as is reasonably practicable, be located such that it does not damage sensitive habitats, trees or hedgerows.

5.7 Unexploded ordnance

5.7.1 As with any major infrastructure project, the nominated undertaker's contractors will carry out risk assessments for the possibility of unexploded ordnance being found within construction areas. An emergency response procedure will be prepared and implemented by the contractors to respond to the discovery of unexploded ordnance. This will include notifications to the relevant local authorities and emergency services.

5.8 Electromagnetic interference

5.8.1 The nominated undertaker and its contractors will consider the impacts of electromagnetic interference on wireless telecommunication systems during the design and construction of the Proposed Scheme, which will include site specific impacts from the demolition of buildings and the installation of tower cranes, and where appropriate will employ best practice technology to ensure that levels of radio frequency interference (RFI) associated with the Proposed Scheme are low and at acceptable levels.

5.9 Temporary living accommodation

5.9.1 The provision of on-site workers' temporary living accommodation will be considered and approved in advance by the local authority and will be located and managed in accordance with arrangements set out in that approval. Standards of temporary living accommodation will be approved by the relevant local authority, be subject to the same environmental control measures as are set out in this CoCP for other construction works and be positioned with consideration to known flood risk areas e.g. surface water.

5.10 Occupational healthcare

5.10.1 The nominated undertaker will ensure there is provision for either access to on-site or near site occupational healthcare in relevant locations, which may include occupational health nurses and doctors. This service will include campaigns such as promotion of healthy living and wellbeing.

5.11 Clearance and re-instatement of sites on completion

5.11.1 On completion of construction works, plant, materials, equipment, temporary buildings and vehicles not required during subsequent activities will be removed from the site. All reinstatement will be completed in accordance with the requirements of the hybrid Bill.

5.12 Pollution incident control and emergency preparedness

Pollution prevention measures

5.12.1 The nominated undertaker's lead contractors will develop and implement appropriate measures to control the risk of pollution due to construction works, materials and extreme weather events. This will include a pollution incident control plan, as part of the contractors' EMS, which recognises the risk of pollution from construction activities and presents pro-active management practices to ensure that any pollution incident that may occur, such as a diesel spillage, is minimised, controlled, reported to relevant parties and remediated. The plan will define the criteria for implementing the relevant measures.

5.12.2 The following measures will be adopted by the lead contractors to manage the risk of pollution incidents:

- statement of appropriate information to be provided in the event of any incident such as a spillage or release of a potentially hazardous material;
- notification of appropriate emergency services, authorities and personnel on the construction site;
- notification of relevant statutory bodies, environmental regulatory bodies, local authorities and local water and sewer providers of pollution incidents, where required;
- provision of maps showing the locations, together with address and contact details, of local emergency services facilities such as police stations, fire authorities, medical facilities and other relevant authorities;
- ensure that site drainage plans and flood risk management plans are available on site and are kept up-to-date;
- ensure that pollution shut off valves are used in compounds with formal drainage;
- ensure staff competence and awareness in implementing plans and using pollution response kit;

- provision of contact details for the relevant authorities, such as the EA, and the persons responsible on the construction site and within the contractors' organisation for pollution incident response; and
- provision of contacts with a competent spill response company which can be contacted at short notice for an immediate response (where appropriate).

5.12.3 In the preparation of local pollution incident response measures, the nominated undertaker's contractors will consult with relevant organisations, including, but not limited to, statutory bodies and other relevant parties, such as the Health and Safety Executive (HSE) (Construction), the Fire Authority, the Ambulance Service, the EA, NE, utilities companies and the respective ~~LAs~~local authorities (emergency planning and pollution control functions). Reference should also be made to the EA *Pollution Prevention Guidelines 21 (Incident Response Planning)*.

Monitoring

5.12.4 The nominated undertaker will require that its contractors have in place effective arrangements to investigate and provide reports on any potential or actual significant pollution incidents, including, as appropriate:

- a description of the pollution incident, including its location (and Ordnance Survey (OS) grid reference), the type and quantity of contaminant and the likely receptor(s);
- contributory causes;
- adverse effects;
- measures implemented to mitigate adverse effects; and
- any recommendations to reduce the risk of similar incidents occurring.

Emergency preparedness

5.12.5 The nominated undertaker will ensure that emergency procedures for each work site are developed. The procedures will be standardised as far as practicable across the various work sites and will be appropriate to the anticipated hazards and the specific layout. The emergency procedures will be produced in consultation with the emergency services and for works on the existing railway network will be produced in accordance with established industry procedures. Further guidance is contained within *Guidance on Development of a Site Clearance Capability in England and Wales*, published by ODPM in October 2005 and *BS6164 Code of practice for health and safety in tunnelling in the construction industry.*

5.12.6 The emergency procedure will contain emergency phone numbers and the method of notifying statutory authorities. Contact numbers for the key staff of the nominated undertaker will also be included.

Emergency Access

5.12.7 The nominated undertaker will ensure that the requirements of the relevant fire authority will be followed for the provision of site access points. The accesses may vary over time and will also be suitable for ambulances.

5.13 Fire prevention and control

5.13.1 All construction sites and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires.

5.14 Extreme weather events

5.14.1 The nominated undertaker's contractors will pay due consideration to the impacts of extreme weather events and related conditions during construction. The contractors will use a short to medium range weather forecasting service from the Met Office or other approved meteorological data and weather forecast provider to inform short to medium term programme management, environmental control and impact mitigation measures. The contractors will register with the EA's Floodline Warnings Direct service in areas of flood risk.

5.14.2 The lead contractor will ensure appropriate measures within this CoCP are implemented and, as appropriate, additional measures to ensure the resilience of the proposed mitigation of impacts during extreme weather events.

5.14.3 The lead contractors' EMS should consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements. As appropriate, method statements should also consider extreme weather events where risks have been identified.

5.15 Carbon management plans

5.15.1 The nominated undertaker will require its lead contractors to produce carbon management plans. These will contain measures in accordance with the HS2 Carbon Minimisation Policy including:

- Proposed measures to reduce significant sources of construction energy use and carbon emissions;
- The approach to procuring energy from renewable and/or low emission sources;
- The approach to energy and CO_2 monitoring and reporting from relevant site activities; and
- Consideration of the procurement, maintenance and use of energy and carbon efficient construction plant.

~~5.15~~5.16 Interface management between adjacent construction areas

~~5.15.1~~5.16.1 The nominated undertaker will oversee the interface between the lead contractors and will require its contractors put in place measures to manage the environmental aspects of interfaces between adjacent construction areas, including the boundaries between areas under the control of different contractors or where reasonably practicable other third party contractors.

6 Agriculture, forestry and soils

6.1 Agriculture, forestry and soils management – general provisions

6.1.1 Controls will be implemented to mitigate potential avoidable impacts on soils, farms, and farm-based businesses, including maintaining access and for this purpose the nominated undertaker will:

- identify the farms and types of farms adjacent to the construction site;
- identify watercourses and, where known, field drainage layouts and outfalls into watercourses or ditches, fixed irrigation pipes and sources of irrigation water and fixed water supplies for livestock;
- maintain details of the owners, occupiers and agents for land adjacent to the construction site; and
- maintain details of the husbandry associated with the areas of land adjacent to the construction site.

6.1.2 The controls will include the following, as appropriate:

- protecting agricultural land adjacent to the construction site, including provision and maintenance of appropriate stock-proof fencing and avoidance of traffic over the land leading to soil compaction;
- reinstating any agricultural land which is used temporarily during construction, where this is the agreed end use;
- details of farm accesses which may be affected by construction, including the manner in which farm access will be maintained and avoidance of traffic over land which is used temporarily during construction; and
- providing a method statement for stripping, handling, storage and replacement of agricultural, forestry and woodland soils to reduce risks associated with soil degradation on areas of land to be returned to agriculture, forestry and woodland following construction. This will include any remediation measures necessary following completion of works as part of a five year aftercare regime.

6.1.3 The nominated undertaker will ensure liaison is maintained with affected landowners, occupiers and agents, as appropriate.

6.1.4 The nominated undertaker will require its contractors to:

- advise landowners, occupiers and agents, as appropriate, regarding the intended commencement of construction works in areas of the site adjacent to agricultural and forestry holdings, and when any agricultural and forestry land used temporarily, is intended to be returned to agricultural and forestry use;
- advise landowners, occupiers and agents, as appropriate, regarding the

provision of accommodation works;

- to advise the programme of works and access routes to be used; and
- take precautions in developing the construction programme to reduce disturbance.

6.2 Measures to reduce potential impacts on agricultural, forestry and soil resources

6.2.1 Appropriate measures will be implemented, in accordance with the *Code of practice for the sustainable use of soils on construction sites* (Defra 2009), in relation to undertaking works on or adjacent to agricultural and forestry land.

6.2.2 Prior to works commencing, surveys will be undertaken to record agricultural and forestry soils disturbed for the Proposed Scheme. ~~These surveys will include as appropriate:~~These surveys will collect data that will inform agricultural restoration, landscape design and ecological mitigation measures, as well as feed into a Soil Resources Plan. Soil surveys will be carried out on land within the Consolidated Construction Boundary, including from existing agricultural land, woodland, ancient woodland, and public and private open spaces, where access to such land becomes available. The soil information will be used to calculate the volumes of available soil resources and inform soil handling that may be necessary for the reinstatement of land and preparation of habitats.

6.2.3 The soil surveys will provide the necessary information to delineate, quantify (in cubic metres) and characterise the topsoils and subsoils (upper and lower, if both are present within a soil profile) available within the construction site prior to these materials being stripped. The surveys will provide sufficient detail to assess the suitability of the different soil materials for agricultural and other land uses, and to recommend appropriate methods for handling and storing soils in order to protect their natural functions during the construction period. This information will also determine the soil storage areas required.

6.2.4 Agricultural restoration will rely principally on identifying and recording the physical characteristics of the soil profile; landscape planting and habitat creation will also be informed by the chemical and organic matter characteristics of the soil horizons to be recorded.

6.2.5 These soil surveys will include as appropriate:

- relevant local topographic features (local relief, slope, aspect, micro-relief), land use and groundcover;
- depth of the topsoil ~~and~~, upper subsoil (~~depth, texture and structure);~~where present) and lower subsoil horizons;
- soil textures;
- soil structures;

- soil colours;
- stone content;
- signs of impeded drainage and presence of slowly permeable layers;
- presence of calcium carbonate; and
- sampling for laboratory analysis of pH, major nutrients (extractable Phosphorus, Potassium and Magnesium) and organic matter content.

6.2.6 Other features that will be recorded include:

- drainage, irrigation and water supplies;
- roads, accesses and paths;
- hedgerows, ditches, field boundaries and irrigation ponds; and
- ~~forestry~~forest land, including individual trees and ~~small~~ancient and other woodlands.

~~6.2.3~~6.2.7 Where land used temporarily for construction is to be reinstated to agricultural and forestry use, reinstatement works will be implemented in accordance with the contract specification and Defra guidance where appropriate. Such reinstatement will be carried out under appropriately qualified supervision.

~~6.2.4~~6.2.8 Reasonable precautions will be taken in relation to the handling and storage of agricultural and forestry soils, including the following, as appropriate:

- the separate handling and storage of different soils, particularly topsoils and subsoils and those recovered from ancient woodlands;
- handling soils that are in a suitably dry condition and not during wet weather to avoid long-term damage to soil structure from compaction;
- seed or seal medium or long-term excavated material and soil stockpiles;
- the prevention of soil contamination with chemicals or other materials; and
- the control of weeds on soil stores either through treatment or removal.

~~6.2.5~~6.2.9 The requirements stated in Section 6, 7 and 15 of this CoCP relating to the handling and storage of material, and Section 16 of this CoCP in relation to control of run-off, in so far as they are applicable to protecting soils, will be met. Additionally, the requirements stated in ~~of~~ this CoCP in relation to control of dust, in so far as they are applicable to the protection of agricultural crops (including grass), will also be met.

~~6.2.6~~6.2.10 Reasonable precautions will be taken during the design and construction of the Proposed Scheme to identify, protect and maintain existing land drainage, irrigation and livestock water supply systems.

~~6.2.7~~6.2.11 The requirements of Section 9 of this CoCP in relation to measures to prevent the spread of invasive and non-native species will be met. Measures to prevent the spread of weeds generally from the construction site to adjacent land will also be implemented.

~~6.2.8~~6.2.12 The nominated undertaker will require its contractors to comply with the relevant guidance issued by Defra regarding the prevention, as far as reasonably practicable, of the spread of soil-borne, ~~crop~~plant and animal diseases. Appropriate measures, such as those described in Section 16 of this CoCP, will be implemented to control run-off to reduce any risks associated with disease transmission.

~~6.2.9~~6.2.13 Wherever reasonably practicable, the nominated undertaker will endeavour to identify recorded locations of carcass burial sites within the construction site and to mitigate risks associated with the existence of any unrecorded sites. This will include the obtaining locations of recorded burial sites from Animal Health and Veterinary Laboratories Agency and the establishment of a protocol for procedures in the event that an unexpected/unrecorded burial site is discovered.

6.3 Monitoring

6.3.1 Appropriately qualified environmental management staff, whose responsibility will include the monitoring of topsoil and subsoil stripping, handling, storage and replacement, as appropriate, will be appointed to facilitate compliance with this section of the CoCP in relation to soils.

7 Air quality

7.1 Air quality management – general provisions

7.1.1 The nominated undertaker will require its contractors to manage dust, air pollution, odour and exhaust emission during the construction works in accordance with Best Practicable Means (BPM). This will include the following as appropriate:

- reference to the general site management and good housekeeping procedures (relevant to limiting dust and air pollution);
- controls and measures to control or mitigate the effect of potential nuisance caused by the construction works, as determined by an up-to-date and site-specific assessment of the risks;
- dust and air pollution monitoring measures to be employed during construction of the project; ~~and~~
- measures relevant to control risks associated with asbestos dust; and
- reference to current publications on 'best practice' which include:

- Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance: Institute of Air Quality Management (IAQM), January 2014.
- Air Quality Monitoring in the Vicinity of Demolition and Construction Sites: IAQM November 2012.
- The Control of Dust and Emissions during Demolition and Construction: GLA Supplementary Planning Guidance Document, July 2014.

7.2 Measures to reduce potential impacts on air quality

Site management

7.2.1 The site layout will be planned to locate machinery and dust-causing activities away from sensitive receptors, where reasonably practicable. Appropriate methods, such as the erection of hoardings or other barriers along the site boundary, will be used, where appropriate, to mitigate the spread of dust to any sensitive buildings or other environmental receptors.

Construction plant, vehicles and equipment

7.2.2 Measures will be implemented to limit emissions from construction plant and vehicles, which will include the following, as appropriate:

- operation of construction plant in accordance with the manufacturer's written recommendations;
- vehicles and plant will be switched off and secured when not in use;
- construction vehicles to conform to the current EU emissions standards and where reasonably practicable their emissions should meet up-coming

standards prior to the legal requirement date for the new standard;

- vehicle and construction plant exhausts to be directed away from the ground and be positioned at a height to facilitate appropriate dispersal of exhaust emissions;
- the enclosure, shielding or provision of filters on plant likely to generate excessive quantities of dust beyond the site boundaries;
- devices such as dust extractors, filters and collectors on drilling rigs and silos will be used;
- movement of construction traffic around the site will be kept to the minimum reasonable for the effective and efficient operation of the site and construction of the project;
- use of tower cranes to reduce vehicle movements;
- construction plant will be located away from site boundaries which are close to sensitive receptors where reasonable and practicable;
- site access points will be designed to minimise queuing traffic adjacent to access points;
- the use of diesel or petrol powered generators will be reduced by using mains electricity or battery powered equipment where reasonably practicable;
- non-road mobile machinery will use ultra-low sulphur diesel, where reasonably practicable;
- cutting and grinding operations will be conducted using equipment and techniques which reduce emissions and incorporate appropriate dust suppression measures;
- damping down of dust generating equipment and vehicles within the site and the provision of dust suppression in all areas of the site that are likely to generate dust;
- measures to keep roads and accesses clean; and
- vehicle, plant and equipment maintenance records will be kept on site and reviewed regularly.

7.2.3 In order to mitigate impacts on Local Air Quality, in areas where there is action in place to meet EU limit values through the introduction of Low Emission Zones (such as the London Low Emission Zone), HS2 Ltd will require Heavy Duty Vehicles (with a weight greater than 3.5 tonnes) entering these designated Zones during construction, for the purposes of transporting excavated material, to be powered by EURO VI (or lower emission) engines. See also *HS2 Information Paper E13: Management of Traffic During Construction*.

Transportation, storage and handling of materials

~~7.2.3~~7.2.4 Dust and air quality management measures will be implemented to limit pollution arising from the transportation and storage of materials, including the following, as appropriate:

- covering materials, deliveries or loads entering and leaving the construction site for the purposes of preventing materials and dust spillage. This will apply to the transport of materials by road, rail or waterway;
- vehicles transporting materials within or outside the construction site will not be overloaded;
- stockpiles and mounds will be kept away from sensitive receptors (including natural and historic features), watercourses and surface drains where reasonably practicable and sited to take into account the predominant wind direction relative to sensitive receptors;
- stockpiles and mounds will be maintained to avoid material slippage;
- materials stockpiles likely to generate dust will be enclosed or securely sheeted, kept watered or stabilised as appropriate;
- fine dry material will be stored inside buildings or enclosures with measures in place to ensure no escape of material and of overfilling during delivery;
- mixing of large quantities of concrete or bentonite slurries will be undertaken in enclosed or shielded areas;
- the number of handling operations for materials will be kept to the minimum reasonably practicable;
- materials handling areas will be maintained to constrain dust emissions through the use of measures such as watering facilities to reduce or prevent escape of dust from the site boundaries; and
- mixing of grout or cement-based materials will be undertaken using appropriate techniques/mitigation suitable for the prevention of dust emissions.

Haul routes

~~7.2.4~~7.2.5 Haul routes will be provided through the works for use by construction vehicles to access the works. The construction and maintenance of haul routes, will include the following measures, as appropriate:

- the surfacing and maintenance of haul routes to control dust emissions as far as reasonably practicable, taking into account the contractors intended level of traffic movements;
- inspection of haul routes regularly and their prompt repair if required;

- reuse of haul route surfacing materials where the locations of haul routes change during the course of construction;
- provision of areas of hard-standing at site access and egress points to be used by any waiting vehicles;
- methods to clean and suppress dust on haul routes (including watering) and in designated vehicle waiting areas. The frequency of cleaning will be suitable for the purposes of suppressing dust emissions from the site boundaries; and
- enforcement of speed limits on haul roads for safety reasons and for the purposes of suppressing dust emissions.

Demolition activities

~~7.2.5~~7.2.6 Dust pollution from demolition activities will be limited through the use of the following measures, as appropriate:

- stripping of insides of buildings before demolition;
- blasting works will be kept to the minimum reasonably practicable in the context of the design and programme requirements of the project;
- buildings or structures to be demolished will be sprayed with water or screened as necessary, prior to and during demolition;
- rubble chutes will be shielded or enclosed or use water to suppress dust emissions from such equipment;
- skips covered and secured;
- burning of any material will not be permitted on site;
- avoidance of the prolonged storage of waste materials on site and compliance with this CoCP in respect to storage; and
- removal of waste from the site will comply with the requirements of this CoCP relating to the transportation of materials.

Excavations and earthworks activities

~~7.2.6~~7.2.7 Dust pollution from excavations and earthworks activities will be limited through the use of the following measures, as appropriate:

- topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with run-off or dust generation;
- drop heights from excavators to vehicles involved in the transport of excavated material will be kept to the reasonably practicable minimum;
- materials will be compacted after deposition, with the exception of topsoil and subsoil on land to be restored for agriculture, forestry, landscaping and wildlife habitats; and

- soil spreading, seeding, planting or sealing of completed earthworks will be undertaken as soon as reasonably practicable following completion of the earthworks.

Grouting activities

~~7.2.7~~7.2.8 Dust pollution associated with grouting activities will be limited through the use of the following measures, as appropriate:

- dust extractors, filters and collectors on silos for example; and
- the mixing of grout or cement based materials will be undertaken using a process suitable for the prevention, as far as reasonably practicable, of dust emissions.

Conveying, processing, crushing, cutting and grinding activities

~~7.2.8~~7.2.9 Dust pollution associated with processing and crushing rock, for use as aggregate or other materials within the works, and for conveying material, processing, crushing, cutting and grinding and liming will be limited through the use of the following measures, as appropriate:

- drop heights from conveyors, excavators, and crushing plant to stockpiles will be kept to the minimum reasonably practicable;
- the enclosure of conveyer transfer points, and damping of conveyor loads;
- enclosed conveyers where crossing roads, other public areas and property not owned by the nominated undertaker;
- suitable temporary enclosures for cutting and grinding activities; and
- the application of water sprays to damp down in dry weather.

7.3 Monitoring

7.3.1 The nominated undertaker will require its contractors to implement inspection and monitoring procedures to assess the effectiveness of measures to prevent dust and air pollutant emissions. Relevant local authorities will be consulted regarding the monitoring procedures to be implemented which will include the following measures, as appropriate:

- site inspections covering the establishment of operation of the construction site;
- inspection procedures for areas adjacent to the construction site to visually assess any dust and air pollution which may be generated;
- reference to inspection and maintenance schedules for construction vehicles, plant and machinery; and
- inspection procedures relating to the level of traffic movements, use and condition of haul routes.

8 Cultural heritage

8.1 Cultural heritage management – general provisions

8.1.1 The nominated undertaker and its lead contractors will manage the impact of construction works on cultural heritage assets, including:

- designated assets: scheduled monuments; listed buildings, registered parks and gardens; conservation areas and registered historic battlefields; and
- non-designated assets: archaeological and palaeo-environmental remains including geological deposits that may contain evidence of the human past, historic landscapes and historic buildings and the built environment and locally designated assets.

8.1.2 ~~All works will be managed in accordance with accepted industry~~All works will be managed in accordance the Heritage Memorandum which presents the commitments of the Secretary of State to the historic environment and heritage assets and addresses the elements of the works authorised by the Bill that have a direct impact on it. This commitment made by the Secretary of State to the historic environment is made binding on the nominated undertaker. Work will follow accepted archaeological and built heritage practice and guidance, taking account of the relevant sections of the National Planning Policy Framework (NPPF) (2012). Additional information regarding the approach to archaeological works is set out in the *HS2 Information Paper E8: Archaeology*.

Written scheme of investigation

8.1.3 Two project-wide generic written schemes of investigation (GWSI) will be prepared by the Nominated Undertaker in advance of site preparation and construction, in consultation with Historic England (HE) and the LAs. One GWSI will address archaeology and one will address built heritage. These documents will outline the project mechanisms for archaeology and built heritage design, evaluation, investigation, analysis, dissemination and archive deposition that will be adopted for the design and construction of Phase One of HS2. They present a statement of objectives, standards and procedures for the planning and implementation of archaeological and heritage works.

8.1.4 Before enabling works and construction works begin a series of location specific investigation and recording works will be developed and set out in a series of location specific Written Scheme of Investigation (WSI)). These documents will be developed in consultation with HE and the relevant local authority and will follow the principles set out in the GWSI.

Heritage agreements

8.1.5 The hybrid Bill will disapply the various legislative provisions for designated heritage assets (listed buildings (Schedule 17) and scheduled monuments (Schedule 18) that will be affected by construction of the railway and associated works. For specified works, which will be set out in the schedules to the hybrid Bill, the usual need for

consents will be removed and a project specific regime put in place to implement the terms of the hybrid Bill. The nominated undertaker will enter into an agreement with the relevant local authorities, HE and any other relevant party. Under each Heritage Agreement, a method statement will need to be submitted for specified works for approval to the LPAs for listed buildings, and HE for scheduled monuments.

8.1.6 The lead contractor will adhere to the terms of the Heritage Agreement.

~~8.1.3~~8.1.7 General cultural heritage management measures will include:

- provision to ~~relevant~~its contractors of locations and descriptions of all known cultural heritage assets within and adjacent to, construction works, including restrictions to construction methods to protect cultural heritage assets, where these have been identified in the ES, Additional Provisions, undertakings and assurances, subsequent consultation and through the development of the detailed design;
- a programme detailing the implementation of ~~cultural~~ archaeological and heritage investigation and recording works prior to and during construction;
- the nominated undertaker will ensure that the ~~cultural~~archaeological and heritage works are properly programmed by its lead contractor;
- the nominated undertaker will require its lead contractors to monitor compliance against the programme of ~~cultural~~archaeological and heritage investigation and recording works using appropriately qualified environmental management staff;
- during all stages, the nominated undertaker will require its lead contractors to facilitate archaeological and built heritage specialists undertaking the works as specified as an appropriate mitigation measure (including purposive investigation);
- all archaeological, built heritage and historic landscape intervention, recording, analysis, dissemination and archiving will be undertaken by a suitably qualified and demonstrably experienced organisation; and
- ~~EH~~HE and the local authority (and National Trust ~~(NT) or,~~ Canal and River Trust (CRT) or Commonwealth War Graves Commission as appropriate) will be consulted as appropriate through all stages of the implementation of the programme of cultural heritage works.

~~**Heritage assets**~~

~~8.1.4 Suitable route-wide measures and procedures, to be developed in consultation with EH and the local authorities, will include the following, as appropriate:~~

8.1.8 The lead contractor will carry out works in such a way as to ensure that disturbance to all heritage assets is managed in accordance with accepted industry practice and,

where disturbance cannot reasonably be avoided, is controlled and limited as far as reasonably practicable.

8.1.9 The lead contractors will develop a plan for the management of the archaeological and heritage works during construction. In addition to demonstrating adherence to, in particular the Heritage Memorandum and Project Specification Requirements, the plan shall include the following:

- the lead contractor will carry out works in such a way as to ensure that disturbance to all heritage assets is managed in accordance with accepted industry practice and, where disturbance cannot reasonably be avoided, is controlled and limited as far as reasonably practicable.
- implementation of controls ~~at each site~~ to avoid damage by settlement where reasonably practicable (and to record effects should these occur) to ~~structures of historic importance or interest and the movement of construction vehicles and machinery as they relate to areas of heritage interest that may comprise standing archaeological remains and historic buildings;~~heritage assets (historic buildings and structures). *HS2 Information Paper C3 Ground Settlement* provides guidance.
- Implementation of controls on the ~~nominated undertaker will require the lead contractors to develop procedures~~movement of construction vehicles and machinery in areas of heritage interest, for ~~topsoil~~example archaeological remains and historic buildings;
- the development and implementation of a procedure for soil stripping and excavation before commencement of such works ~~and~~. This procedure will identify the interface of those works with areas of identified archaeological investigations~~, including procedures to be adopted in~~. The procedure will reference the ~~event of a potentially nationally significant unanticipated discovery or disturbance of significant archaeological remains~~ HS2 Unexpected Discoveries of National Importance procedure (refer also to Section ~~8.2);~~ 8.2);
- procedures adopted to preserve archaeological remains in situ beneath earthworks;
- procedures for the recording, dismantling and re-erection of buildings of heritage significance; and
- management of protective measures that will be implemented for heritage assets that are to be retained within the land required for construction~~; and~~.

~~• should during the course of construction artefacts of archaeological interest or expected interest be located these will immediately be reported to the lead contractor's project manager (see Section 8.1.3 and 8.2.1).~~

Metal detectors

~~8.1.5~~8.1.10 During site preparation and construction the use of metal detectors will be prohibited within areas of identified/defined archaeological interest unless deployed by archaeological specialists or other appointed persons in the execution of their activities.

Human remains

8.1.11 The nominated undertaker will develop a 'Burial Grounds, Human Remains and Monuments Procedure' to implement the legal requirements of the Bill. The lead contractor will comply with this procedure.

~~8.1.6~~8.1.12 Should human remains be located during construction either during archaeological works or as part of construction activity the nominated undertaker and its lead contractors will comply with all relevant legislative and project specific requirements.

Treasure Act

~~8.1.7~~8.1.13 Should during the course of construction artefacts be located that are deemed by their material content or context to be treasure, as defined by the Treasure Act 1996, then all necessary measures to comply with the requirements of the Act and any project specific requirements will be implemented.

~~Written scheme of investigation~~

~~8.1.8 A project-wide generic written scheme of investigation (WSI) will be prepared in advance of site preparation and construction, in consultation with EH and the LAs. This document will detail the generic principles, standards, methods and techniques to be employed on the project for cultural heritage works.~~

~~8.1.9 A site specific WSI will be developed for each area or site specific cultural heritage works. These documents will be developed in consultation with EH and the LAs.~~

~~8.1.10 All cultural heritage works will be undertaken in accordance with the generic and site specific WSIs.~~

~~Heritage agreements~~

~~8.1.11 The hybrid Bill will seek to disapply the various legislative provisions for designated heritage assets (scheduled monuments, listed buildings and buildings in conservation areas) that will be affected by construction of the railway and associated works. For specified works, which will be set out in the schedules to the hybrid Bill, the usual need for consents will be removed and a project specific regime put in place to implement the terms of the hybrid Bill. The nominated undertaker will enter into an agreement (known as Heritage Deeds) with the relevant LAs, EH and any other relevant party. Under each Heritage Agreement, a method statement will need to be submitted for specified works for approval to the LPAs for listed buildings, and EH for scheduled monuments.~~

8.2 Measures in the event of unexpected discoveries of national ~~significance~~importance

8.2.1 Should cultural heritage assets of potential national ~~significance~~importance be unexpectedly revealed during construction the procedure, as previously agreed with ~~EH~~HE and the local authorities, will be implemented in the event of any such discoveries being made. Mitigation and / or investigation and recording may include the following, as appropriate:

- investigation and assessment of discoveries to determine their significance if this cannot be determined from the asset as found;
- assessment of potential project impacts to inform design of appropriate mitigation and / or investigation and recording measures;
- preparation of a written scheme of investigation for any stage of archaeological work required;
- excavation, recording and reporting on any discoveries; and
- recording and implementing measures to preserve any discoveries in situ, if required or if appropriate.

~~8.3~~1.1 Measures in relation to unexpected discoveries of other~~Monitoring~~

~~8.3.1 Risk assessments, appropriate structural or condition surveys and vibration monitoring will be undertaken at sites of archaeological or built heritage interest adjacent to the construction site prior to, during and following construction works. The risk assessments will include, but not be limited to, specific buildings identified in the ES.~~

8.3 heritage assets

Should, during the course of construction works, artefacts and / or remains of archaeological interest or expected interest be located unexpectedly, these will immediately be reported to the lead contractor's project manager. The project manager will obtain specialist archaeological advice to undertake and prepare an appropriate response.

8.4 Monitoring

8.4.1 The nominated undertaker will require its lead contractors to implement appropriate monitoring of the consequences of construction work on all cultural heritage assets (designated and non-designated) to ensure the effectiveness of management measures and compliance with agreed approaches to construction activities and cultural heritage assets.

8.4.2 Risk assessments, appropriate structural and / or condition surveys and vibration monitoring will be undertaken at locations of archaeological or built heritage interest adjacent to the construction site prior to, during and following construction works.

The risk assessments will include, but not be limited to, specific buildings identified in the hybrid Bill and the ES.

9 Ecology

9.1 Ecological management – general provisions

9.1.1 Appropriate measures will be adopted to protect the ecology of the area through which the Proposed Scheme is constructed, with special attention to specified areas of ecological value, as identified within the ES.

9.1.2 The nominated undertaker will require its contractors to manage impacts from construction on ecological resources, including the following:

- designated sites including Sites of Special Scientific Interest (SSSIs), nature reserves and local wildlife sites (i.e. non-statutory sites designated for nature conservation);
- protected and notable species; and
- other habitats and features of ecological importance (including ancient woodlands, linear/ecological corridors and surface and groundwater bodies).

1.1.1 Where reasonably practicable, environmental mitigation will be provided via the design and implemented by the contractors within the works. An Ecological Review Group will be established to provide independent advice on the monitoring of created habitats. This may require preparatory work to be undertaken ahead of the start of construction to permit timely progress of the programme.

9.1.3 Ecological management measures will include the following, as appropriate:

- summary of features of interest for all known areas of nature conservation interest (as identified within the ES) which may be affected due to construction;
- plans showing the locations of all known areas of nature conservation interest that may be affected due to construction including access routes;
- provision of guidance on ecological best practice methods to be followed in order to mitigate potential ecological effects during construction;
- plans showing the location for all fences/barriers to be erected for the purpose of controlling animal movements during and post construction, e.g. deer, badger and amphibian fencing;
- plans showing the location of any ecological features which are to be created/installed prior to construction (e.g. bat roosting features/boxes, otter holts);
- procedures to be adopted in the event of unanticipated discovery or disturbance of protected species or important habitats;
- reference to the relevant procedures, including any special measures, to be implemented in the event of a pollution incident, where this occurs on or adjacent to a designated nature conservation site or where protected

and/or notable species are known to be present or other habitats and features of ecological importance; and

- individual habitat or species management plans to include the information above (where appropriate) for:

- terrestrial habitats;
- wetland habitats;
- European Protected Species (e.g. great crested newt, dormouse, otter, and bats); and
- other protected and/or notable species as appropriate (e.g. badgers, breeding birds, freshwater fish - including migratory species and their migration patterns, water vole, white clawed crayfish, common reptiles, invertebrates, and Schedule 9 invasive species such as Japanese knotweed).

9.1.4 The contractors will, where it is reasonably practicable reduce any habitat loss within the land required for the Proposed Scheme by keeping the working area to the minimum required for construction of the Proposed Scheme.

9.2 Measures to reduce potential impacts on ecological resources

9.2.1 Management measures for potential ecological impacts are addressed in other sections of this document and are not repeated here. These include measures relating to:

- protection of retained habitat, including trees (see Section 12);
- control of dust (see Section 7);
- control of water quality and flow (see Section 16);
- control of noise and vibration (see Section 13); and
- lighting (see Section 5.4).

9.2.2 The programming of construction works will take cognisance of the requirements set out in the ES, other relevant project documents, and ecological best practice guidance. In particular, the timing of construction works will be undertaken with due regard to the following:

- site clearance works – to mitigate potential impacts on protected and/or notable species; and
- works within watercourses – to mitigate potential impacts on plants, migratory fish, mammals, birds, amphibians and invertebrates.

9.2.3 In addition to the measures described in other sections, management of construction activities to minimise ecological effects will include where relevant:

- provision of appropriate watching briefs to be implemented during construction works;

- relocation or translocation of species, soils and plant material;
- reinstatement of any areas of temporary habitat loss and any arrangements necessary for displaced species to maintain long-term conservation status of those species concerned;
- restoration and replacement planting (e.g. trees, hedgerows, scrub, grassland etc.) to reinstate any retained habitats adversely effected during construction; and
- use of by-products of construction to enhance mitigation provision (e.g. use of felled timber to provide dead wood habitat).

9.2.4 Prior to and during construction, there will be consultation with NE, the EA, local wildlife trusts, and LPAs as appropriate.

Statutory designated sites, non-statutory sites, protected habitats and species

9.2.5 The nominated undertaker will require its contractors to manage impacts upon all statutory designated sites of ecological interest (including SSSIs), non-statutory sites of ecological interest, and other areas of notable habitat.

9.2.6 The nominated undertaker will require its contractors to obtain and comply with the requirements of any wildlife licences, including all protected species licences necessary for construction of the Proposed Scheme.

Control of invasive and non-native species

9.2.7 Appropriate measures for the treatment/control of invasive, non-native species (both plants and animals) and injurious weeds will be implemented.

9.2.8 Appropriate construction, handling, treatment and disposal procedures will be implemented in relation to these and any other species listed in Schedule 9, Part I or Part II of Section 62 the Wildlife and Countryside Act 1981, as amended, or the Weeds Act 1959 to prevent the spread of such species. Advice in the EA's publication: *Managing invasive non-native plants, April 2010*, will also be referenced in determining the strategy.

9.2.9 Route-wide measures will be implemented to promote bio-security and minimise the risk that invasive non-native species and diseases are spread as a consequence of the project.

9.2.10 A programme of works will be implemented which will reflect the fact that it can take a number of years to eradicate invasive species such as Japanese knotweed.

9.2.11 Removal of invasive species will take account of ecological best practice guidance and appropriate measures will be taken to identify and protect other features of environmental importance (e.g. heritage assets).

9.3 Monitoring

9.3.1 The nominated undertaker will define a programme for undertaking ecological surveys prior to and during construction. The surveys will be used to verify the

baseline ecological conditions described in the ES, to refine the mitigation and control measures required during construction as appropriate, and to provide appropriate monitoring during construction.

9.3.2 The nominated undertaker will require its contractors to undertake appropriate monitoring of the consequences of construction works on ecological resources and of the effectiveness of the management measures designed to control ecological effects, associated with works that may affect protected or notable species, statutory designated or non-statutory sites of ecological interest.

10 Ground settlement

10.1 Ground settlement – general provisions

Techniques to control and limit settlement

10.1.1 Excavation for the Proposed Scheme tunnels, shafts cross passages, station boxes and other below ground structures will potentially lead to small ground movements at the surface and below ground. The amount of ground movement will depend on a number of factors including depth and volume of works below ground, soil and groundwater conditions and the presence and nature of building foundations/third party assets. In most cases this will have no visible impact on property/third party assets. Very rarely these ground movements may affect properties/third party assets. Techniques for controlling settlement of buildings and protecting buildings from irreparable damage are well developed, based on other tunnelling projects within London such as the Jubilee line extension, CTRL and Crossrail. Appropriate techniques will be implemented in order to control and limit, as far as reasonably practicable, the effects of settlement.

10.2 Measures to reduce settlement

10.2.1 Measures to reduce settlement and requirements with regard to surveys and monitoring are contained in the Settlement Policy as set out in *HS2 Information Paper C3: Ground Settlement* and will be enforceable as part of the EMRs.

11 Land quality

11.1 Land quality management – general provisions

11.1.1 Land quality encompasses the issues of land contamination, designated geological resources and designated mineral and mining resources. The nominated undertaker will require that its contractors will adopt appropriate measures to protect geological resources, to mitigate the sterilisation or severance of mineral areas and to assess potentially contaminated land, and where necessary undertake remediation.

11.1.2 Any site assessment and remediation works required will be based upon the *Model Procedures for the Management of Land Contamination* (CLR11).

11.1.3 Existing land contamination and construction activities, which alter or create new pathways could affect the quality of aquifers in the vicinity of the Proposed Scheme and impact the wider environment, including end-users of the scheme. Provisions to mitigate this risk are contained here. Wider issues of groundwater quality are dealt with in Section 16 of this CoCP.

11.2 Measures to reduce potential impacts on geology and soils

Geological and mineral resources

11.2.1 The ES identifies any SSSI of geological interest, or other geological resources, for example local geological sites (LGS) that may be impacted by the Proposed Scheme, and the extent of the anticipated impacts. Procedures will be agreed in consultation with stakeholders for any works which may affect geological SSSIs, LGS or other geological resources, including for example, inspections, the appropriate recording of geological information, and mapping of soil and rock exposures.

11.2.2 The ES identifies where land required for construction crosses designated mineral resources, and as such, may have a negative impact (either by isolation or sterilisation) on the future working of such resources. The nominated undertaker and its contractors will be required to consult with the Mineral Planning Authority and other relevant stakeholders with regard to mitigating the loss of mineral resources by appropriate prior extraction of them for use within construction.

11.2.3 There is potential for construction works to be undertaken over or close to abandoned mine workings. Measures will be implemented, including consultation with the Coal Authority, EA and HSE as appropriate, in relation to undertaking such works. Where necessary, a ground investigation and detailed risk assessment will be undertaken of the potential impact of drilling and grouting to consolidate abandoned mine workings, on groundwater, ground gas migration and ground movements in order to identify appropriate measures required to mitigate potential environmental impacts and health and safety risks.

11.2.4 Measures to be implemented will include, as appropriate, undertaking ground investigation work, risk assessments, monitoring of ground movement, groundwater and ground gas, and undertaking structural or condition survey of buildings or structures adjacent to the works where there may be potential risks of ground movements which may damage structures (as set out in Section 10 of this CoCP).

Detailed ground investigation to assess land contamination

11.2.5 The nominated undertaker will require its contractors to undertake detailed ground investigation work, where necessary, to assess land contamination and this will be based upon the following known details, as appropriate:

- historical and current land uses;
- historical and current activities, processes and waste products;
- geological and hydrogeological setting;
- existing results of soils, gas, surface water and groundwater monitoring/sampling/testing; and
- appropriate risk assessments.

11.2.6 Ground investigations and risk assessments will be undertaken in accordance with the following, as appropriate:

- the requirements of the NPPF;
- *BS 10175:2011 Investigation of potentially contaminated sites. Code of practice;*
- *BS 5930:1999 + A2: 2010 Code of practice for site investigations;*
- the Site Investigation Steering Group publication, *Guidelines for the safe investigation by drilling of landfills and contaminated land (1993);*
- relevant EA and Defra guidance (including *Assessing risks posed by hazardous ground gases to buildings CIRIA 665 for ground gases*); and
- relevant new/replacement guidance or legislation published prior to construction.

11.2.7 Where significant contamination is encountered, a remedial options appraisal will be undertaken to define the most appropriate remediation techniques. This appraisal will be undertaken based on multi-criteria attribute analysis that considers environmental, resource, social and economic factors in line with *Sustainable Remediation Forum UK A Framework for Assessing the Sustainability of Soil and Groundwater Remediation (2010).* The preferred option will then be developed into a remediation strategy, which will be consulted on with regulatory authorities prior to implementation.

11.2.8 Where appropriate, the risk to ground and surface water resources, processes and abstractions will be assessed. In addition to the excavation and treatment of contaminated soils, it may also be necessary to install gas and leachate control systems within affected sites, on a temporary or permanent basis, in order to ensure that gas and leachate migration pathways are controlled and do not adversely affect the Proposed Scheme or the wider environment as a consequence of the Proposed Scheme.

11.2.9 Sites where remediation is minimal or not required may include sites that are not found to contain significant contamination, sites that are both contiguous with and

beyond the Proposed Scheme or temporary sites where no significant earthworks are proposed.

Construction on or adjacent to land affected by contamination

11.2.10 Where land affected by contamination is identified, the nominated undertaker will require its contractors to comply with relevant legislation. Any remediation plan will comply with HS2 Ltd's sustainability policy. This may include considering the relative benefits of removal of contamination to enable re-use of the land for agriculture, ecological or amenity enhancements. Alternatively material could be treated and retained for re-use where needed within environmental mitigation earthworks.

11.2.11 Management measures for potential land contamination impacts are addressed in other sections of this document and are not repeated here. These include measures relating to:

- construction site layout (see Section 5);
- pollution incident control (see Section 5);
- control of dust (see Section 7); and
- control of water quality (see Section 16).

11.2.12 Other control measures will also be implemented which will include the following, as appropriate:

- consultation with the relevant local authorities and EA regarding control or protection measures to be implemented to deal with identified risks, including appropriate techniques for excavating/handling contaminated material and the control of contaminants and discharges in their in situ or mobilised form, for solids, liquids, gas and leachate;
- the on site remediation of soils or groundwater, in accordance with the agreed strategy;
- procedures including watching briefs, to identify all areas within the Proposed Scheme where land contamination is unexpectedly encountered;
- sealing of existing pathways through services/service trenches (e.g. land drains) affected during construction;
- lining of drainage trenches to inhibit the mobilisation of contaminated groundwater or lateral migration through granular backfill;
- monitoring of groundwater/ground gases prior to, during and post construction;
- validation testing of remediated ground and/or groundwater and preparation of validation reports; and
- post remediation permit to work system to protect remediated areas.

11.2.13 Any specific remedial treatment undertaken in relation to land affected by contamination will be carried out under the appropriate remediation permitting system where these apply.

11.2.14 An assessment of soils to be reused will be undertaken in order to identify potential risks posed to the water environment, human health and the wider environment (including crops/livestock) at the location of re-use in accordance with the *CL:AIRE: Development Industry Code of Practice* or similar.

11.2.15 Where piling or similar penetrative works are undertaken in areas of land affected by contamination, appropriate guidance will be adhered to including the *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention, National Groundwater and Contaminated Land Centre Report NC/99/73 (2001).*

11.2.16 The measures will apply equally to land used for the construction and land used temporarily, for example for site offices and works compounds. However, for temporary works land, normally risk assessment and remediation will only be designed for the temporary use, rather than any long term post-construction use.

11.3 Monitoring

11.3.1 The nominated undertaker will require a gas monitoring procedure to be implemented as appropriate due to the presence of areas of landfill, made ground, industry sites, quarries and naturally occurring gassing strata.

11.3.2 Groundwater and surface water monitoring plans will be prepared, as appropriate, by the lead contractors as part of their EMS, in the vicinity of contamination remedial works, or where piling may affect below ground contamination.

11.3.3 Monitoring of any works that will impact geological or geomorphological resources will be carried out in accordance with any agreed procedures outlined in Section 11.2.

11.3.4 Appropriate health, safety and environmental monitoring will be set out to support adherence to the procedures relating to working on or adjacent to land affected by contamination.

11.4 Interface between adjacent construction areas

11.4.1 Details regarding the management of remedial actions undertaken or planned to be undertaken on adjacent construction zones will include, but will not be limited to:

- ensuring that remediation actions are compatible between zones;
- allowing the 'chasing out' of contamination to an extent agreed by the nominated undertaker, which may be, for example, either present in old pipe runs, or that which may extend outside the boundary of the works and will need to be fully removed or stopped-off to prevent the site being affected again in the future, and vice versa;
- additional supplementary site investigation or protection, if significant cross boundary migration is envisaged;

- installation of additional monitoring wells; and
- provision of clear reference data.

12 Landscape and visual

12.1 Landscape management – general provisions

12.1.1 Appropriate controls will be put in place to protect the landscape and visual ~~amenity~~receptors in rural and urban areas from construction activities including designated landscape areas, heritage assets, parks ~~and~~, open spaces and smaller green spaces in urban areas. Controls will include, as appropriate:

~~• the sustainable management of landscape issues;~~

- a plan showing areas of existing trees and vegetation within the construction site to be retained (and protected), and those to be removed;
- the involvement of an ecological specialist as required, in relation to vegetation clearance, tree works and the creation of new wildlife habitats;
- provision of appropriate protective fencing to reduce the risks associated with vehicles trafficking over root systems or beneath tree canopies;
- a schedule of plant species and planting mixes to be used and provision of sufficient stock of specified species and provenance that typify the local area, including details of plant suppliers to be used;
- a programme for undertaking planting works;
- protection of existing and new areas of planting;
- inspection, maintenance and management of existing and new planting;
- prevention of damage to the landscape and landscape features adjacent to the construction site by movement of construction vehicles and machinery;
- removal, handling, storage and transplanting of any vegetation which is to be reused, relocated or transplanted;
- adoption of other procedures set out in this CoCP so far as they are relevant for the protection of the landscape;
- provision of suitable specialist landscape management staff with specific responsibility for monitoring and supervising the landscape works, i.e. works in relation to the clearance of vegetation, topsoil and subsoil stripping, handling, storage and replacement, works to trees, grass seeding, protective fencing, the planting of trees and shrubs and the creation of new wildlife habitats;
- use of appropriate lighting; and
- use of appropriate well maintained hoardings or fencing, as described in Section 5.

12.2 Protection of trees

12.2.1 The nominated undertaker will require its contractors to employ an arboricultural consultant to oversee works relating to the protection of trees.

12.2.2 Retained trees will be protected in line with the recommendations in *BS 5837: Trees in relation to design, demolition and construction.*

12.2.3 The following measures will be implemented, as appropriate:

- provision of appropriate protective fencing to reduce the risks associated with vehicles trafficking over root systems or beneath canopies;
- measures to prevent compaction of soils;
- maintenance of vegetation buffer strips, where reasonably practicable;
- selective removal of lower branches to reduce the risk of damage by construction plant and vehicles;
- standard guidance for working within root protection zones (RPZs) including procedures to follow in the event that significant roots are uncovered during work;
- provision of contractor guidance for working in close proximity to retained aged and veteran trees and areas of retained ancient woodland, and watching briefs as appropriate;
- maintenance of trees on highways which are temporarily stopped as a result of the Proposed Scheme works prior to re-opening (e.g. selective branch removal) following consultation and agreement with relevant local authority; and
- monitoring of the effectiveness of the tree protection measures throughout the construction period by an appropriately qualified arboricultural consultant.

12.2.4 Any tree surgery and felling operations will comply with the recommendations in *BS 3998: Tree work. Recommendations*, as appropriate.

12.2.5 Where individual stands of trees require felling and the requirement for felling was not identified with the ES, the nominated undertaker's contractor will undertake an arboricultural assessment by appropriately qualified specialists and where necessary, appropriate mitigation shall be employed.

Tree planting and replacement

12.2.6 Trees intended to be retained which may be accidentally felled or die as a consequence of construction works will be replaced. Where reasonably practicable, the size and species of replacement trees will be selected to achieve a close resemblance ~~of~~to the original trees ~~most effectively using locally occurring native species of local provenance~~in line with the HS2 Landscape Common Design Approach document and taking cognisance of any management plans for immediately adjacent areas of woodland.

12.2.7 The supply, storage, handling, planting and maintenance of new planting will be undertaken in accordance with appropriate British Standards, including *BS 8545: 2014 - Trees: from nursery to independence in the landscape – Recommendations; BS 5837 Trees in relation to design, demolition and construction; BS 3998 Tree Work - Recommendations* and *BS 4428 Code of practice for general landscape operations (excluding hard surfaces)* and other appropriate guidance including the *UK Forestry Standard* and the *UK Woodland Assurance Standard*.

12.3 Measures to reduce potential impacts on landscape and visual features

12.3.1 Planting and other landscape measures will be implemented as early as is reasonably practicable where there is no conflict with construction activities or other requirements of the Proposed Scheme. The nominated undertaker will require its contractors to consider where measures can be implemented early and programme the landscape works accordingly. Locations for landscape measures will relate to the findings of the ES, and will be aimed at the protection and mitigation of adverse effects on sensitive and valued landscape features and characteristics.

12.3.2 A record of how the implementation of the works meets control measures, relevant to protection of the landscape and key landscape features, will be maintained and regularly reviewed.

12.3.3 Relevant local authorities, NE, ~~EH~~HE, NT and other bodies (where they have an interest) and adjacent landowners will be consulted, as appropriate, regarding the landscape and planting proposals.

12.3.4 Access to the construction site will be controlled in accordance with the requirements of Section 14 of this CoCP. Potential impacts on trees or other mature vegetation will be considered, seeking to avoid unnecessary impact, when positioning site access and egress points.

12.3.5 Reusable excavated material will be handled in an appropriate manner to ensure it is of sufficient quality to be used for either structural embankments, environmental mitigation earthworks or agreed third party use. Appropriate construction good practice in handling all material re-use will be followed, and controls set out in Sections 7.2 and 9 of the CoCP will apply.

12.3.6 The procedures set out in Section 6 of this CoCP relating to the handling of agricultural soils will be applied equally in relation to soils used in areas to be seeded or planted. The sourcing, testing, stripping, handling, storage and spreading of site-won and imported topsoil will comply with *BS 6031: Code of practice for earthworks*. Imported topsoil will comply with the *BS 3882: Specification for topsoil and requirements for use.*

12.3.7 The following measures will be implemented:

- compliance with the requirements of Section 9 of this CoCP in relation to preventing the spread of invasive and non-native species;
- avoidance of unnecessary tree and vegetation removal and protection of

existing trees in accordance with *BS 5837: Trees in relation to design, demolition and construction;*

- protection of habitat areas and ecological features;
- procurement, movement, handling, storage, planting and maintenance of plant material in accordance with *BS 3936-1: Nursery stock specification for trees and shrubs*; and
- maximising use and recycling of plant material salvaged during enabling works (see also 9.2.5), and of plant material propagated from flora on the site prior to commencement of the works.

12.3.8 Planting, seeding, wildflower seeding and other landscape works will consider the recommendations of the latest version of the following standards. Alternatively, where a British Standard does not exist, works will follow industry best practice and agreement will be sought from the local authority:

- *BS 3936-1: Nursery stock. Specification for trees and shrubs, British Standards Institution;*
- *BS 3936-4: Nursery stock. Specification for forest trees, poplars and willows, British Standards Institution;*
- *BS 3882: Specification for topsoil and requirements for use, British Standards Institution;*
- *BS 3998: Tree Work. Recommendations, British Standards Institution;*
- *BS 5837: Trees in relation to design, demolition and construction, British Standards Institution;*
- *BS 6031: Code of practice for earthworks, British Standards Institution; and*
- *CAP772: Bird Strike Risk Management for Aerodromes, Civil Aviation Authority.*

12.3.9 The protection of habitats and ecological features will be integrated with the landscape works and will follow appropriate British Standards and agreement will be sought from the local authority. Reference should be made to Section 9 of this CoCP.

12.4 Monitoring

12.4.1 The nominated undertaker will require its contractors to implement appropriate inspection, monitoring and maintenance of landscaping and planting and seeding works throughout the construction period. Further detail is described in the *HS2 Information Paper E16: Maintenance of landscaped areas* and *Information Paper E26: Indicative periods for the management and monitoring of habitats created for HS2 Phase One.*

12.4.2 The nominated undertaker will supply its contractors with information prior to construction to verify the landscape planting and seeding design and arboricultural

requirements as set out in the ES, on drawings and in the specification. This will allow the contractor(s) to fully understand the required mitigation measures.

12.4.3 The nominated undertaker will require its contractors to undertake appropriate maintenance of planting and seeding works and implementation of management measures, through the construction period as landscape works are completed. The contractor will monitor the progress of new landscape works through the construction period. Any failures of landscape planting and seeding will be managed via the specification and works requirements. This will ensure annual replanting and reseeding works are undertaken (as required) to achieve successful establishment of the landscape mitigation proposals at completion of the construction works.

13 Noise and vibration

13.1 Noise and vibration management - general provision

13.1.1 BPM will be applied during construction works to minimise noise (including vibration) at neighbouring residential properties and other sensitive receptors (including local businesses and quiet areas[2] designated by the local authority) arising from construction activities.

13.2 Measures to reduce potential noise and vibration impacts

Best Practicable Means

13.2.1 BPM are defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990 as those measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.

13.2.2 The nominated undertaker will require its contractors to consider mitigation in the following order:

- BPM, including:

- noise and vibration control at source - for example the selection of quiet and low vibration equipment, review of construction programme and methodology to consider quieter methods, location of equipment on site, control of working hours (see Section 5.2), the provision of acoustic enclosures and the use of less intrusive alarms, such as broadband vehicle reversing warnings;

- screening - for example local screening of equipment, perimeter hoarding or the use of temporary stockpiles;

- then, where despite the implementation of BPM the noise exposure exceeds the criteria defined in this CoCP, the contractors may offer:

- noise insulation; or ultimately

- temporary re-housing.

13.2.3 The recommendations of *BS 5228 Code of practice for noise and vibration control on construction and open sites parts 1 and 2*, will be implemented, together with the specific requirements of this CoCP.

Noise and vibration management

13.2.4 The effects of noise and vibration from construction sites will be controlled by introducing management and monitoring processes to ensure that BPM are planned and employed to minimise noise and vibration during construction. As part of the lead contractors' EMS, a noise and vibration management plan will be prepared and will set

[2] As defined under the Environmental Noise Regulations (England) 2006.

out these processes. The plan will include management and monitoring processes to ensure as a minimum:

- integration of noise control into the preparation of method statements;
- ensuring proactive links between noise management activities and community relations activities (see Section 5);
- preparing details of site hoardings, screens or bunds that will be put in place to provide acoustic screening during construction, together with an inspection and maintenance schedule for such features;
- developing procedures for the installation of noise insulation or provision of temporary re-housing and to ensure such measures are, where required, in place as early as reasonably practicable;
- preparing risk assessments to inform structural surveys of buildings and structures which may be affected by vibration from construction;
- developing a noise and vibration monitoring protocol including a schedule of noise and vibration monitoring locations and stages during construction of the Proposed Scheme when monitoring will be undertaken;
- preparing and submitting Section 61 consent applications (see Section 13.2.5);
- undertaking and publishing all monitoring required to ensure compliance with all acoustic commitments and consents; and
- implementing management processes to ensure ongoing compliance, improvement and rapid corrective actions to avoid any potential non compliance.

Section 61 consents

13.2.5 The nominated undertaker's contractors will seek to obtain consents from the relevant local authority under Section 61 of the Control of Pollution Act 1974 for the proposed construction works, excluding non-intrusive surveys. Applications will normally be made to the relevant local authority for a Section 61 consent at least 28 days before the relevant work is due to start.

13.2.6 Details of construction activities, prediction methods, location of sensitive receivers and noise and vibration levels will be discussed with the relevant local authority, or authorities, both prior to construction work and throughout the construction period. Prediction, evaluation and assessment of noise and vibration as well as discussion between the nominated undertaker and its contractors and the relevant local authority will, by necessity, continue throughout the construction period.

13.2.7 Annex 1 of *BS 5228 Code of practice for noise and vibration control on construction and open sites parts 1 and 2* provides a flow diagram demonstrating the process of a Section 61 application. The nominated undertaker will seek to agree with local authorities a common format and model consent conditions for Section 61

applications or any dispensations and variations to an existing consent. An example application form is included in Annex 4.

13.2.8 The application for a Section 61 consent will require noise assessments to be undertaken and BPM measures set out to minimise noise associated with construction of the Proposed Scheme. The nominated undertaker's lead contractors will submit the assessment initially to the nominated undertaker for review, prior to submission to the relevant local authority (refer to Section 13.2.5).

13.2.9 The nominated undertaker's contractors will carry out noise (and vibration where appropriate) predictions for Section 61 applications. An assessment of the predicted levels will be carried out with reference to the EMRs (refer to Section 3.2).

Noise insulation and temporary re-housing policy

13.2.10 The nominated undertaker will implement a noise insulation and temporary re-housing policy. The policy is intended to provide additional protection to residents in the event that it is not practicable to mitigate airborne noise, or reduce its exposure, to levels that are tolerable during certain intensive construction phases. The nominated undertaker's contractors will submit a noise insulation/temporary re-housing appraisal at least six[3] months prior to starting that phase of work on site or such time appropriate to the scale and nature of the works. It is essential that the assessment is carried out early enough so that noise insulation can be installed before the start of the works predicted to exceed noise insulation or temporary re-housing criteria.

13.2.11 The contractors will use BPM to minimise the extent to which noise insulation work or temporary re-housing of occupiers of dwellings adjacent to the works needs to be considered.

13.2.12 Notwithstanding the measures set out in this CoCP and any Section 61 consents, noise insulation or temporary re-housing will be offered to qualifying parties when:

- noise levels are predicted or measured by the contractors to exceed the relevant trigger level defined in Table 1 at that property for at least ten days out of any period of fifteen 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 Systems) Regulations 1996;
- the property should be lawfully occupied as a permanent dwelling; and
- in respect of insulation, 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 Systems) Regulations 1996.

13.2.13 The relevant trigger levels are shown in Table 1.

[3] Where noise insulation is potentially required at listed building the appraisal shall be submitted at least nine months prior to starting of the phase of work on site.

Table 1 Noise thresholds for noise insulation/temporary re-housing.

Day	Time (hrs)	Averaging period T	Noise insulation trigger level $L_{Aeq,T}$ (dB) */**	Temporary re-housing trigger level $L_{Aeq,T}$ (dB) */**
Monday to Friday	07:00 – 08:00	1 hr	70	80
	08:00 – 18:00	10 hrs	75	85
	18:00 – 19:00	1 hr	70	80
	19:00 – 22:00	1 hr	65	75
Saturday	07:00 – 08:00	1 hr	70	80
	08:00 – 13:00	5 hrs	75	85
	13:00 – 14:00	1 hr	70	80
	14:00 – 22:00	1 hr	65	75
Sunday and public holidays	07:00 – 22:00	1 hr	65	75
Any day	22:00 – 07:00	1 hr	55	65

*Proposed Scheme construction sound only. Trigger levels are defined as 1m in front of the closest facade of a habitable room.

** Where the current ambient noise level is greater than the noise insulation trigger level:

a) the ambient noise level shall be used as the noise insulation trigger level, and

b) the ambient noise level +10dB shall be used as the temporary rehousing trigger level.

13.2.14 The nominated undertaker will develop and seek to agree with local authorities a noise insulation and temporary re-housing policy that will set out all roles, responsibilities and actions required in respect of these measures.

13.2.15 The nominated undertaker will consider at its discretion applications supported by evidence for noise insulation or temporary rehousing from occupiers who may have special circumstances, such as night workers, those working in home occupations , local businesses or buildings that provide community facilities requiring a particularly quiet environment and those with a medical condition which will be seriously aggravated by construction noise, and provide noise insulation or temporary housing where it is demonstrated that this is necessary.

Vibration thresholds and actions

13.2.16 Criteria and/or procedures for vibration control are specified for three purposes and assessed using three different sets of parameters:

- to protect the occupants and users of buildings from ~~disturbance~~vibration, for which vibration dose values are assessed (vibration dose values (VDVs) are defined and their application to occupants of buildings is discussed in *BS 6472- 1 Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting, 2008);*

- to protect buildings from risk of physical damage, for which peak component particle velocities are assessed in accordance with *BS 7385-2 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration, 1993;* and
- to protect particularly vibration-sensitive equipment and processes from damage or disruption, for which peak component acceleration, velocity or displacement are assessed as appropriate to each process or item of equipment.

13.2.17 In some buildings, two or three of the above parameters may apply, and in those cases the nominated undertaker will require its contractors to evaluate the criteria separately. In establishing criteria, controls and working methods, the contractors will take account of guidance in *BS 6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting 2008, BS 5228 Code of practice for noise and vibration control on construction and open sites parts 1 and 2:, ISO 4866: Mechanical vibration and shock, vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures* and *BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993.*

13.2.18 In the following sections vibration thresholds are set out. The thresholds are trigger levels at which a set of actions will be carried out by the nominated undertaker's contractors. Except where stated otherwise, they are not designed to be maximum permitted levels.

Protection of building occupants ~~from disturbance~~and users

13.2.19 To protect the occupants and users of buildings from ~~disturbance~~vibration, BPM will be used to control vibration levels so that the vibration dose values in Table 2, as measured in accordance with *BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1:* Vibration sources other than blasting 2008 are not routinely exceeded (considered to be ten days in any 15 consecutive days) as a result of the works:

Table 2 Vibration trigger levels for protection of occupants of buildings from disturbance.

Building type	Period	VDV ($ms^{-1.75}$)
Eligible dwellings[1]	07:00 to 23:00	0.4
	23:00 to 07:00	0.2
Education buildings, offices and similar[2]	Over normal period of use (daytime)	0.8
Commercial[3]	Over normal period of use (daytime)	1.6

[1] Measured on a normally-loaded floor of any bedroom or living room. For this purpose, eligible dwellings include dwelling houses, residential institutions, hotels, and residential hostels.

[2] Measured on a normally-loaded floor of areas where people normally work. This category of receiver will include all areas where clerical work, meetings and consultations are regularly carried out (e.g. Doctors' surgeries, day-care centres but not shop floors of industrial premises).

[3] Measured on a normally-loaded floor of areas where people normally work. Commercial premises include retail and wholesale shops.

13.2.20 The vibration thresholds in Table 2 will be weighted in accordance with *BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting 2008.*

13.2.21 For application of threshold levels, it will be assumed that people are standing or sitting during daytime, and lying down during night-time hours as defined in the table. The orientation of the person is important as it determines the vibration weighting factor to be applied.

Protection of buildings from damage

13.2.22 To protect buildings from damage, the nominated undertaker will require its contractors to use BPM to control vibration levels so that the peak particle velocity (PPV) in Table 3, as measured in accordance with *BS6472-1 Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting 2008*, are not exceeded as a result of the works at the building foundation unless agreement is sought under clause 13.2.26:

Table 3 Vibration trigger levels for building damage.

Category of building	**Impact criteria: (PPV at building foundation)**	
	Transient vibration	Continuous vibration
Structurally sound buildings	≥12 mm/s	≥6 mm/s
Potentially vulnerable buildings[4]	≥6 mm/s	≥3 mm/s

13.2.23 To determine whether a detailed assessment needs to be undertaken to determine whether the levels in Table 3 are likely to be exceeded, or that there is a potential for building damage, the nominated undertaker's contractors will carry out a scoping vibration assessment. Activities requiring an assessment could include vibratory compaction, impact or vibratory piling and other driven processes.

13.2.24 If predicted vibration levels exceed 1mm/s component PPV at occupied residential buildings or 3mm/s PPV at occupied commercial buildings more detailed assessment should be carried out in accordance with *BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993.* If this identifies that people occupying buildings may experience levels in excess of the threshold values in Table 3 those potentially affected will be notified as soon as practicably possible in advance of the works. The notification will describe the nature and duration of the works and any associated proposals for vibration monitoring.

13.2.25 The nominated undertaker will require its contractors to be cognisant of the advice given in *BS ISO 4866 Mechanical vibration and shock, vibration of fixed structures.*

[4] BS7385 highlights that the criteria for aged buildings may need to be lower if the buildings are structurally unsound. The standard also notes that criteria should not be set lower simply because a building is important or historic (e.g. listed). Where information about these structures is not currently known, the more onerous criteria on this row of the table shall be adopted on a precautionary basis until condition surveys have been undertaken.

Guidelines for the measurement of vibrations and evaluation of their effects on structures and *BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration 1993.*

13.2.26 The nominated undertaker will require its contractors to notify and consult it and the relevant local authority regarding any works predicted to generate a PPV above 10mm/s. Where it is agreed that there is no reasonable or practicable means to reduce predicted or measured vibration then the contractors will:

- agree with the nominated undertaker and seek to agree with the local authority under the relevant Section 61 consent[5], monitoring for vibration and strain induced in the building during the works;
- seek to agree with occupiers of properties:

- the surveys to be carried out and any consequent actions;
- any additional reasonable and practicable mitigation to be provided for occupants;

- carry out a condition survey before and after the relevant works; and
- advise the local authority through the relevant Section 61 consent application.

13.2.27 In addition, any old buildings, or buildings that maybe unusually vulnerable to vibration, that are located within 50m of any activities that may give rise to significant vibration shall be identified.

13.2.28 Where the predicted vibration at the foundations of such buildings exceeds 5mm/s PPV then the nominated undertaker will require its contractors to undertake an initial structural survey of the building. Based on the survey, the level of vibration above which condition surveys and continuous vibration monitoring are required will be confirmed and agreed with the building owner. The local authority will be notified through the relevant Section 61 consent application.

13.2.29 Where the condition and vibration monitoring surveys demonstrate that vibration from the Proposed Scheme works has given rise to building damage then the nominated undertaker will require its contractors to make good that damage.

Protection of particularly vibration-sensitive equipment/processes

13.2.30 The nominated undertaker will endeavour to avoid any impact on sensitive equipment. Any actions to control or mitigate impacts will be agreed between its contractors and the operator of the equipment. The local authority will be notified through the relevant Section 61 consent application.

13.3 Monitoring

13.3.1 The nominated undertaker will require its contractors to undertake and report such monitoring, including real time noise and vibration monitoring, as is necessary to

[5] Also under the Party Wall Act as necessary.

ensure and demonstrate compliance with all noise and vibration commitments and the requirements of this CoCP.

13.3.2 The monitoring and compliance assurance process will be set out in each of the lead contractors' noise and vibration management plans.

13.3.3 Proposals for monitoring locations will be set out in each LEMP.

13.3.4 The Section 61 applications will include a detailed description of the monitoring and monitoring locations proposed for the particular works covered by the consent application.

13.3.5 Monitoring data will be provided regularly to and reviewed by the nominated undertaker and will be made available to the local authorities.

14 Traffic and transport

14.1 Traffic management – general provisions

14.1.1 During ~~its~~ construction works, the nominated undertaker will require that the impacts ~~on the local community~~ from construction traffic on the local community (including all local residents and businesses and their customers, visitors to the area, and users of the surrounding transport network) are minimised by its contractors ~~and~~where reasonably practicable.

~~14.1.1~~14.1.2 The nominated undertaker will require that public access is maintained ~~where reasonably practicable.~~ , where reasonably practicable, and appropriate measures will be implemented to ensure the local community, economy and transport networks can continue to operate effectively. Where this is not reasonably practicable, alternative measures shall be identified to maintain continual public access, especially for pedestrians and cyclists, to routes in the vicinity of the construction sites. The impact of road based construction traffic will be reduced by ~~identifying~~ implementing and monitoring clear controls on vehicle types, hours of site operation, parking and routes for large goods vehicles.

~~Construction workforce travel plans will be prepared by the lead contractors with the aim of encouraging the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses. The plans will include:~~

- ~~identification of a travel plan co-ordinator and a description of their responsibilities;~~
- ~~key issues to consider for each compound/construction site or group of sites;~~
- ~~site activities and surrounding transport network including relevant context plans;~~
- ~~anticipated workforce trip generation and how it may change during the construction process;~~
- ~~travel mitigation measures that will be introduced to reduce the impact of construction workforce on the transport network;~~
- ~~target to reduce individual car journeys by the for construction workforce;~~
- ~~methods for surveying workforce travel patterns;~~ ~~and~~
- ~~the process for monitoring and reviewing the construction workforce travel plan.~~

14.2 Measures to reduce potential transport impacts during construction

14.2.1 ~~Generic~~Route-wide, local area and site specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRoW affected by the proposed scheme as necessary.

Traffic and Transport management- ~~generic~~route-wide measures

14.2.2 Generic measures, which will apply route-wide, will be discussed in advance with the local highway authorities and any other appropriate authorities ~~and may~~. Prior to the commencement of the works, the nominated undertaker will ensure that a Route-wide Traffic Management Plan (RTMP) will be produced in consultation with the highway and traffic authorities and the emergency services and other relevant key stakeholders. The RTMP will include~~:~~, as appropriate.

- ~~measures to~~Measuresto ensure that the maintenance and condition of public roads, cycleways and PRoW do not deteriorate due to the construction traffic, including monitoring arrangements with local highway authorities;
- ~~measures~~measures which may include engagement with vulnerable road users (pedestrians, motorcyclists, cyclists, equestrians), to provide for road safety for all modes for the public and construction staff during traffic management works and temporary traffic control measures;
- ~~procedures~~contractor quality plans for management of construction vehicles through the supply chain;
- contractor implementation of driver training programmes relevant for their specific environment (e.g. to protect pedestrians and non-motorised traffic~~));~~;
- vehicle safety measures including signage, mirrors, prevention of under-running and ~~appropriate~~ use of technology to remove blind spots according to vehicle size;
- process of submission and, as necessary approval, of site specific traffic management measures;
- procedures to be followed for the temporary or permanent closure or diversion of roads, PRoW or accesses;

~~• installation of appropriate signage indicating all temporary and permanent diversions of PRoW;~~

- procedures to be followed to obtain consent to work on or over railways, highways and canals;

~~• measures to be implemented to reduce construction traffic impacts or impacts associated with parking on residential streets;~~

- measures for highway reinstatement;
- the arrangements for liaison with the relevant highway authorities and emergency services (including air ambulances) and protecting corridors for emergency vehicles;

~~• permitted access routes and accesses for construction traffic;~~

~~• retaining access for cyclists and pedestrians, where safe and appropriate;~~

- procedures to address any highway incidents or vehicle breakdowns relating to construction traffic, especially at peak times;
- emergency access protocols;
- monitoring requirements;
- lorry route signing strategy;
- means of monitoring lorry use and any routes prohibited from use;
- dealing with large goods vehicles and abnormal loads;
- clear identification for construction heavy goods vehicles under the lead contractors' control;
- ~~requirements relating to the movement of farm animals where farm accesses are affected.~~

~~14.2.3 Routes of construction traffic will be subject to approval of the relevant planning authority in accordance with the hybrid Bill.~~

- introduction of a GPS vehicle location and tracking system for tipper lorries within the lead contractors' control to be used for the movement of materials and waste in bulk and/or appropriate tracking solutions for the measurement of HS2 related traffic flows;
- monitoring for deviation from authorised routes; and
- controls on reversing alarms.

14.2.3 Other measures to manage construction traffic on a route-wide basis will include, as appropriate and where reasonably practicable the use of rail or water transport for movement of materials and waste in bulk.

Transport and traffic management - local area measures

14.2.4 Prior to the commencement of the works, the nominated undertaker will ~~ensure~~require that Local Traffic Management Plans (~~TMPs~~LTMPs) will be produced in consultation with the highway and traffic authorities ~~and~~, the emergency services~~.~~ and other relevant key stakeholders. The ~~TMP~~LTMP(s) will include, as appropriate:

- permitted access routes and accesses for construction traffic;
- site boundaries and the main access/egress points for worksites and compounds;
- temporary and permanent closures and diversions of highways and other PRoW; ~~and~~
- ~~the proposed traffic and construction vehicle management strategy.~~

~~Traffic management – site specific measures~~

~~14.2.5 Site specific traffic management measures will include the following, as appropriate:~~

- ~~phasing of works;~~

- ~~road traffic management layouts and signage;~~
- ~~timing of operations;~~
- ~~the arrangements for liaison with the relevant highway authorities and emergency services;~~
- a list of roads which may be used by construction traffic in the vicinity of the site including any restrictions to construction traffic on these routes, such as the avoidance of large goods vehicles operating adjacent to schools during drop off and pick-up periods and any commitments set out in the register of Undertakings and Assurances;
- phasing of works;
- the proposed traffic management strategy;
- other measures which will affect the highway, such as lorry holding areas;
- regular operation of traffic liaison groups with key stakeholders to ensure that programmes of HS2 works are shared and which will assist with the highways authorities to carry out their network management duties; and
- a register of applications for consents associated with temporary traffic management measures~~;~~.
- ~~emergency access protocols;~~

14.2.5 ~~proposals for transport of~~ In relation to lorry management, LTMPs will include details of the following, where appropriate;

- timing of site operations and timing of traffic movements;
- local routes to be used by lorries generated by construction ~~workforce~~activity;
- lorry holding areas;
- lorry holding areas on- or off-highway, how they will be laid out and operated; and
- weighbridge(s) at a suitable location(s) on site to monitor compliance with vehicle weight restrictions.

14.2.6 Lorry routes will be set out in the LTMPs and as set out in the Planning Memorandum, the nominated undertaker will have forward discussions, where reasonably practicable, on lorry route applications prior to submission.

Traffic and Transport management – site specific measures ~~to ensure safe~~

14.2.7 Site specific traffic management measures may include temporary interference to carriageways, footway, cycleways, verges, public paths and other public rights of way such as bridleways and their respective users. Site specific traffic management measures will include the following, as appropriate:

- details about specific traffic management, within site specific plans;

- road traffic management layouts and signage including works necessary for site access for construction traffic, which will be subject to consultation with the relevant highway authority;
- installation of appropriate signage indicating all temporary and permanent diversions of PRoW;
- measures to minimise impact on highway users;
- measures to be implemented to reduce construction traffic impacts, or impacts associated with parking on residential streets;
- retaining access for cyclists and pedestrians, where safe and appropriate;
- ~~to and from site~~requirements relating to the movement of farm animals where farm accesses are affected;
- timing of traffic management operations, if their scope can be undertaken during off-peak, night or weekend working;
- parking controls;
- use of internal haul routes for construction vehicles to minimise the need to use public roads;
- ~~dealing with large goods vehicles and abnormal loads;~~
- ~~controls on reversing alarms;~~
- measures to ensure that construction vehicles do not cause damage to ~~grass verges to roads;~~
- highways, and measures to ensure that any damage to grass verges is repaired and reinstated;
- ~~lorry holding areas;~~
- ~~clear identification for construction heavy goods vehicles under the lead contractors' control;~~
- ~~weighbridge(s) at a suitable location(s) on site to monitor compliance with vehicle weight restrictions;~~
- ~~monitoring for deviation from authorised routes;~~
- requirements relating to the movement of traffic from business and commercial operators of road vehicles, including goods vehicles;
- ~~measures for highway reinstatement;~~
- ~~introduction of a GPS vehicle location and tracking system for tipper lorries within the lead contractors' control to be used for the movement of materials and waste in bulk;~~
- on-site speed limits and controls~~; and~~ to reduce environmental impacts to nearby receptors and consideration of temporary reduced speed limits around worksites;

- co-ordination with utility companies and service diversions; and
- winter gritting plans, which will complement those of the relevant highway authority.

~~14.2.6~~14.2.8 Where reasonably practicable and necessary, site specific measures will be discussed with highway authorities and the emergency services and via local meetings, prior to any formal submissions required by the HS2 Bill or non-disapplied highways legislation.

Road Cleanliness

~~14.2.7~~14.2.9 All reasonably practicable measures will be put in place to avoid/limit and mitigate the deposition of mud and other debris on the highway. These measures will have regard to the nature and use of the site(s) in question, and will include:

- hardstanding at the access and egress points will be cleaned at appropriate intervals;
- vehicle wash down points to clean vehicle wheels at each exit point onto the highway;
- the correct loading of vehicles and sheeting of loads where necessary to avoid spillage during their journeys;
- appropriate wheel cleaning measures will be employed to prevent the transfer and accumulation of mud and other granular deposits on the public highway;
- the use of mechanical road sweepers combined with water sprays for the suppression of dust to clean hardstandings, roads and footpaths in the vicinity of the site; ~~and~~
- measures to avoid water runoff onto the adjacent highway (footways or carriageways), including avoiding ponding adjacent to hoardings on the carriageway;
- ensure no material is deposited onto the public highway which will affect drainage interceptors, etc; and
- the flushing of gullies in the vicinity of the site.
- ~~the flushing of gullies in the vicinity of the site.~~

14.2.10 ~~After~~For works which are being undertaken on the highway which are not protected by secure temporary-type fencing or hoarding, then at the completion of ~~any~~each day's works ~~affecting~~, the site is to be left in a ~~highway,~~tidy condition. All surplus materials arising from the works will be cleared from the highway, leaving it in a clean and tidy condition in accordance with the reasonable requirements of the highway authority.

14.3 Workforce travel plans

14.3.1 Construction workforce travel plans will be prepared by the lead contractors, through engagement with the relevant highways authority, with the aim of encouraging the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses.

14.3.2 Objectives to support these aims will include:

- effective management of construction worker traffic to minimise damage to the environment, impact on the surrounding road network, danger to road users and disturbance to neighbouring properties; and
- the introduction of measures to reduce single occupancy car journeys by staff working on construction sites through the encouragement of car-sharing, use of available public transport, cycling and walking to work where reasonably practicable.

14.3.3 Construction workforce travel plans will be required to set out proposals for site access for construction workers, taking into account the availability of public transport routes and facilities for cycling and walking according to anticipated demands. Where appropriate, plans will include secure sheltered cycle parking and safe access to welfare facilities for workforce and visitors, including layouts for visitor and any worker parking.

These plans will include:

- identification of a travel plan co-ordinator and a description of their responsibilities;
- key issues to consider for each compound/construction site or group of sites;
- site activities and surrounding transport network including relevant context plans;
- anticipated workforce trip generation and how it may change during the construction process;
- travel mitigation measures that will be introduced to reduce the impact of the construction workforce on the transport network and services;
- measures to control on-site parking provision and promoting travel by public transport where available;
- target to reduce individual car journeys by the construction workforce;
- methods for surveying workforce travel patterns;
- the process for monitoring and reviewing the construction workforce travel plan; and
- proposals for transport of construction workforce and measures to ensure safe access to and from site.

14.3.4 Regular workforce travel surveys will be undertaken and the results shared with the relevant stakeholders.

~~14.3~~14.4 Monitoring

~~14.3.1~~14.4.1 The nominated undertaker will require its contractors to undertake such monitoring as is necessary to ensure compliance with the requirements of this CoCP, and this will include the maintenance of records of traffic management measures. The monitoring programme, the approach to regular consultation with highway authorities and emergency services and the control processes will be set out in the lead contractors' EMS.

15 Waste and materials

15.1 Waste management - general provisions

15.1.1 The principle objectives of sustainable resource and waste management are to use material resources more efficiently, reduce waste at source and reduce the quantity of waste that requires final disposal to landfill in accordance with the waste hierarchy. These are translated to the Proposed Scheme as: the application of designing-out waste principles to minimise construction waste; working towards a cut and fill balance in relation to excavation and tunnelling arisings; and the segregation of construction and demolition materials on-site, or through the use of a suitable waste contractor, to maximise diversion from landfill via re-use, recycling and recovery.

15.2 Measures to reduce potential impacts from waste

Minimisation of waste generation

15.2.1 The nominated undertaker will require that its contractors will act to minimise the waste generated from their construction activities where reasonably practicable. This will include measures such as 'just-in-time' deliveries, careful storage of materials on-site, minimisation of packaging and use of re-usable packaging etc.

Management of excavated materials and waste

15.2.2 All waste will be managed in accordance with the waste hierarchy (i.e. prevention, preparing for re-use, recycling, other recovery and disposal as set out in the Waste (England and Wales) Regulations 2011) and in such a way as to prevent harm to human health, amenity and the environment. Waste management measures will be prepared that facilitate the re-use and recovery of excavated material and diversion of waste from landfill in line with the waste hierarchy.

15.2.3 The nominated undertaker will require its contractors to maintain responsibility for the management of waste generated during the construction. The contractors' staff will be suitably trained to undertake these duties, which will include, but will not be limited to waste management handling, inspection and reporting.

15.2.4 Excavated material that is either uncontaminated or which can be remediated to a suitable standard and can be used for site engineering and restoration purposes will be managed in accordance with the controls specified by the *CL:AIRE Definition of Waste: Development Industry Code of Practice*[6] and/or in accordance with an appropriate environmental permit or exemption from permitting. Materials management plan(s) (MMP) will be developed describing the methods for reusing soils at specific sites, or cluster of sites. The movement and placement of materials will be as described in the MMP tracking system and recorded in a verification report for each sites or cluster of sites. This will help to maximise opportunities for re-use of excavated material and comply with the measures set out under CL:AIRE code of practice.

[6] Contaminated Land: Applications in Real Environments (2011) The Definition of Waste: Development Industry Code of Practice (Version 2, March 2011).

15.2.5 Suitable third party projects or other opportunities for reuse of excavated material may be identified as the detailed construction planning of the Proposed Scheme progresses.

15.2.6 In addition to excavated materials, construction, demolition and excavation waste (CDEW) will be generated by the construction works. This will include:

- site preparation and demolition works;
- excavation and earthworks (where the material is classified as waste and subject to waste management regulatory controls);
- construction and fit-out of above-ground structures, such as new and redeveloped stations, staff depots and rail maintenance facilities; and
- construction and installation of rail infrastructure components, including tunnelling sections and laying of new tracks.

15.2.7 The management of foul water and surface water, and minimising their impacts, are specified in Section 16 of the CoCP.

Identification and classification of waste

15.2.8 In line with ~~current statutory requirements~~good practice, a site waste management plan (SWMP) will be prepared and maintained by the nominated undertaker's lead contractors. This will be used to identify the specific types and quantities of waste likely to arise during the construction process. Where generated, waste will be classified in accordance with the statutory controls governing the management of inert, non-hazardous and hazardous wastes.

15.2.9 A pre-demolition asbestos survey will be undertaken on all buildings to be demolished or refurbished to identify the presence of any asbestos-containing materials (ACM) that may be present. Where identified, ACM will be removed by a suitability licensed asbestos removal contractor and managed in accordance with the relevant statutory controls governing its disposal.

Segregation and storage of waste

15.2.10 Skips and other storage receptacles used for the containment of CDEW will be colour-coded in line with the generic colour-coding scheme developed by the Institution of Civil Engineers. They will also have appropriate signage to facilitate separation of waste for re-use, recycling or disposal and the separation of inert, hazardous and non-hazardous wastes. Plastic sheeting will be used to prevent leaching from waste soils and aggregates where these are not contained within skips or other storage receptacles.

15.2.11 Skips and storage receptacles will be sheeted, or otherwise remain lidded or closed, during times when waste is not being deposited into them. They will also be covered to prevent the escape of waste whilst in transit and loaded for maximum payload efficiency.

15.2.12 Skips and storage receptacles shall be inspected on arrival to ensure they are fit for purpose. Skips and storage receptacles that are not fit for purpose will be taken out of

use immediately with appropriate signage used to signify that they should not be used.

15.2.13 Mixing of inert, hazardous and non-hazardous wastes, either whilst stored on-site or upon collection will not be permitted.

15.2.14 Liquid wastes will be stored on hard-surfaced areas with secondary containment systems to prevent spillages.

15.2.15 Waste will not be stored within 10m of any controlled watercourse, borehole, well, spring, surface water drainage system or foul water drainage system.

15.2.16 The storage and segregation of waste will comply with any air quality management measures outlined in Section 7 of the CoCP that are necessary to prevent harm to human health, amenity and the environment through nuisances such as dust, odour or pests.

15.2.17 Storage receptacles will be used for the collection and storage of waste within site operation facilities to facilitate the segregation of waste for re-use, recycling and recovering.

Duty of care requirements and authorisations

15.2.18 The nominated undertaker will require its contractors to maintain a duty of care at all times to ensure that waste generated during the construction period is handled in accordance with the relevant legislation governing its storage, transfer, treatment and disposal.

15.2.19 The nominated undertaker will require its contractors to put in place all relevant authorisations prior to the removal of any waste from site and maintain a register of this information. This will be in relation to the transfer of waste (waste carriers), any off-site waste management facilities (permitted or exempt sites) to which waste is taken to and any requirements for hazardous waste premises notification. The contractors will also ensure that an environmental permit or registered exemption is in place prior to any on-site transfer, treatment or disposal of waste being undertaken.

15.2.20 Any waste leaving the site will be accompanied by appropriate duty of care documentation in line with the relevant statutory requirements for waste transfer and hazardous wastes (as appropriate). Duty of care documentation will be retained by the contractors in line with statutory requirements.

15.2.21 The nominated undertaker will require its contractors to maintain a register of all waste loads leaving the site and/or a tracking system (defined in the MMP) for excavated material destined for reuse to provide a suitable audit trail and to facilitate monitoring and reporting of waste and material types, quantities and management methods.

15.3 Monitoring

15.3.1 The nominated undertaker will require its lead contractors to undertake regular audit and inspection of waste management activities to ensure compliance with the requirements of this CoCP, statutory controls and other nominated undertaker

policies and procedures relevant to the management of surplus excavated material and waste.

15.3.2 The types, quantities and fate of waste generated during the construction process shall be identified, measured and recorded by way of a SWMP. This information shall be reported on a periodic basis to facilitate monitoring of any key performance indicators and to measure progress against any waste management performance targets that may apply.

15.3.3 A register of all waste loads leaving the site will be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

16 Water resources and flood risk

16.1 Surface water and groundwater management – general provisions

16.1.1 The nominated undertaker will require its contractors to manage their site activities and working methods to protect the quality of surface water and groundwater resources from other adverse effects, including significant changes to the hydrological regime through controls to manage the rate and volume of runoff. Monitoring systems will be employed during the construction works and emergency procedures in the case of any pollution incidents. BPM will be used (e.g. through the use of silt traps and the re-use of water in wheel washers). Where required, the contractor, will include arrangements to obtain appropriate approval for works from the relevant regulatory body or statutory undertaker, which could affect any surface water or groundwater resource.

16.1.2 Surface water and groundwater control measures will include the following, as appropriate:

- identification of resources:

- a description of watercourses, surface water bodies, ground water bodies including ground water-dependent ecosystems, and ground and surface water which could be affected during construction (including maps and schedules);

- plans showing all watercourses, surface water bodies, ground water bodies (including source protection zones), licensed abstractions and unlicensed abstractions within 1km of the Proposed Scheme and at greater distance if necessary, where the route intersects source protection zones or lead aquifers and identify areas at risk of flooding;

- plans identifying sources of potential pollution; and

- plans showing drainage within the site;

- a description of the measures to be used to protect surface water and groundwater from pollution, including site good practice and the EA *Groundwater protection: Principles and practice* (GP3); and precautions to be taken to prevent damage to services and to avoid pollution during service diversions, excavation ground penetration and tunnelling.

16.2 Measures to reduce potential impacts to water resources

Waste water and groundwater

16.2.1 The nominated undertaker will require its contractors to consult with the relevant regulatory bodies where required, regarding the measures to be implemented to contain and manage surface water run-off from the construction site. In order to prevent deterioration of the water environment and other adverse impacts including changes to flow volume, water levels and water quality anywhere in the river

catchment or groundwater body. Measures to be implemented will include the following, as appropriate:

- procedures for monitoring groundwater levels and quality at abstraction boreholes and wells to enable adverse effects on quality or levels to be identified;
- a description of the response procedures to be implemented in the event of works affecting groundwater levels or quality with subsequent adverse effects on abstractions, watercourses, water bodies or springs;
- methods of dealing with works in areas of potentially contaminated land;
- a method for dealing with intercepted groundwater containing elevated concentrations of contaminants;
- provision of a suitable construction site drainage system including cut-off valves, ditches or drains and sustainable drainage systems, or equivalent, with suitably sized treatment facilities such as settlement or detention basins;
- use of oil interceptors, if required by the relevant regulatory body or where relevant the statutory undertaker, at site offices and works compounds;
- use of pollution shut-off valves in compounds with formal drainage;
- obtaining the necessary approval to enable discharge of dewatering, surface water run-off and waste water from the construction site to soakaway or filtration systems, watercourses, foul sewers or disposal off-site;
- appropriate measures such as use of bunds of non-erodible material or silt or sediment fences adjacent to watercourses;
- implementing a surface water or groundwater monitoring plan, particularly in relation to works which may affect aquifers;
- in so far as is reasonably practicable, the good working practices detailed in the EA's pollution prevention guidelines will be adopted;
- temporary construction methods from the following CIRIA publications (including *C532: Control of water pollution from construction sites, C648: Control of water pollution from linear construction projects: technical guidance* and *C649: Control of water pollution from linear construction projects: site guide*); and
- where required, approval of the relevant regulatory body will be sought for plans of work likely to affect any surface or groundwater resource.

16.2.2 The measures set out in Section 7 of this CoCP to limit adverse dust and air pollution effects associated with construction works will apply equally in relation to limiting the likelihood of polluted surface water run-off being generated.

16.2.3 The nominated undertaker will require its contractors to comply with *BS 6031 Code of practice for earthworks* regarding the general control of site drainage including, for example, all washings, dewatering, abstractions and surface water run-off, unless otherwise agreed by the nominated undertaker. Any monitoring stations or boreholes should be protected from physical damage. If boreholes are decommissioned the contractors will follow *Good practice for decommissioning redundant boreholes and wells* (EA January 2012 or subsequent guidance).

Protection of surface water bodies

16.2.4 Protection measures for works in or adjacent to surface water bodies will be provided in accordance with requirements set out by the relevant regulatory body. Watercourses and associated land drainage within or adjacent to construction sites will be protected to ensure appropriate working conditions at all times. Appropriate precautions will to be taken when working in the channels of or adjacent to watercourses, realigning watercourses, providing new culverts and or extending culverts, if required, to appropriately manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the EA's *General Guide to Prevention of Pollution* (PPG 1), *Works and maintenance in or near water* (PPG5) and *Maintenance of structures over water* (PPG23) and *Control of water pollution from construction sites CIRIA 532.*

16.2.5 Measures will also be implemented in relation to construction associated with outfalls, including the following, as appropriate:

- undertake construction of outfalls during periods of low flow to reduce the risk of scour and erosion;
- measures to be provided to prevent run-off and other pollutants being washed into watercourses; and
- restrictions or controls with regard to excavation within watercourses to limit effects on water flow, water quality, sedimentation, fisheries or river ecology.

Control of pollution, including storage and control of oils and chemicals

16.2.6 In relation to storage of any oil-based materials including petrol, diesel, waste and vegetable and plant oil, and above ground fuel and oil storage tanks, the nominated undertaker will require its contractors to comply with the Control of Pollution (Oil Storage) (England) Regulations 2001, as amended, and the EA *Pollution Prevention Guidelines 2: Above ground oil storage tanks* (PPG2). PPG2 sets out requirements including those relating to positioning, specification, capacity, secondary containment and ancillary equipment for storage tanks. Where below ground oil storage is proposed, this must comply with *Pollution Prevention Guidelines 27: Installation, decommissioning and removal of underground storage tanks.*

16.2.7 Stationary plant will be used with secondary containment measures such as plant nappies to retain any leakage of oil or fuel, which will be emptied at regular intervals to prevent overflow.

16.2.8 Spillage kits will be stored at key locations on site as set out in the pollution incident control plan (see Section 5.12) and in particular at refuelling areas. Spillage kits will also be kept with mobile bowsers. Staff will be trained in their use.

16.2.9 The contractors will comply with *Pollution Prevention Guidelines 26: Drums and intermediate bulk containers* in relation to chemical storage, handling and use.

16.2.10 The contractors will consult with the relevant regulatory bodies regarding specific requirements in relation to establishing and operating concrete batching plants on site. Wash water from any batching plants will not be discharged to the water environment without the approval of the relevant authority.

16.2.11 The contractors will keep a record of all spillage incidents and inform the nominated undertaker of any spills which cause land contamination or pollution off-site.

Control and management of foul drainage

16.2.12 The nominated undertaker will require its contractors to manage and dispose of foul water and sewage effluents from site facilities, complying with *Pollution Prevention Guideline 4: Treatment and disposal of sewage where no foul sewer is available*, the EA's guidance document *GP3 - Groundwater Protection Policy and Practice*, other relevant guidance and the following measures, as appropriate:

- containment by temporary foul drainage facilities and disposal off-site by a licensed contractors;
- by preference, connection to the local foul sewer system as agreed with the relevant authorities; or
- where a foul sewer is not present, appropriate treatment and discharge to a watercourse or soakaway with approval from the EA, where required.

Any foul drainage discharge to the public sewer will require approval from the statutory water undertaker. If not permitted, provisions need to be adopted to remove the liquid from site for disposal, such as via tanker.

Excavations and dewatering

16.2.13 The nominated undertaker will require its contractors to undertake risk assessments as appropriate associated with excavation work and dewatering impacts on surface water, groundwater and abstractions.

Private water supplies

16.2.14 A risk assessment will be undertaken for excavation work associated with impacts on aquifers and private water supplies.

16.2.15 Any water supply pipes damaged during construction will be repaired or replaced as quickly as reasonably practicable and normally within 24 hours. However, the repair of any such damage caused by utility companies working on behalf of the nominated undertaker will be the responsibility of that utility company. Until water supplies are reinstated and tested, drinking water will be provided by bottle and/or tanker as a temporary measure as appropriate to affected parties. Provision of an interim water supply will also apply where supplies to livestock are temporarily interrupted.

16.3 Measures to reduce potential flood risk impacts

16.3.1 Construction activities will be undertaken having regard to the requirements to avoid any significant increase of flood risk. Appropriate measures, such as keeping water courses clear of obstructions and debris to reduce blockage risk, will be implemented by the nominated undertaker's contractors to prevent, so far as is reasonably practicable, damage to equipment or the works during potential flooding events. Suitable access and safe refuges are to be identified for use in the event of a flood. Appropriate maintenance access will be made available to watercourses and associated flood risk structures, if required.

16.3.2 The contractors will consult with the relevant regulatory bodies and other relevant risk management authorities on areas at risk of flooding and make appropriate use of the EA's Floodline flood warning service for works within areas at risk of flooding.

16.3.3 The contractors will obtain copies of the relevant regulatory bodies' flood risk management plans, maps and strategies and prepare site specific flood risk management plans for those areas of the site at risk of flooding. These site specific flood risk management plans need to be compliant and produced in accordance with the appropriate Flood Risk Assessments. These plans would include all areas within Flood Zone 3, areas considered at more risk of flooding on the EA's surface water flood map and areas susceptible to groundwater flooding. Other flood risk sources, such as sewer flooding and areas at risk of reservoir flooding, will also be considered to ensure all sources of flooding are addressed appropriately.

16.3.4 The contractors will, as far as reasonably practicable, ensure that flood risk is managed safely throughout the construction and implementation period and consider flooding when planning sites and storing materials. A risk based precautionary approach using the source – pathway – receptor concept and will be applied to temporary and permanent works. Designers and contractors will be required to prepare construction and permanent works proposals that are safe and that flood risk (including that to third parties and the proposed works) is managed appropriately. Where necessary this will include the provision of evidence that appropriate flood warning and emergency management measures are established and detailed designs are supported by provision for long term management and maintenance. Where practicable, contractors should avoid locating temporary structures, such as accommodation and stockpiles, and the placing of construction equipment within Flood Zone 3 areas or areas at significant risk of flooding from other sources.

16.3.5 The contractors will submit, where appropriate, a report on flood risk to the nominated undertaker every three months. Where appropriate, these reports will summarise:

- any applications made for flood defence consent, where required, for temporary and permanent works and the status of the works;
- any specific requirements or conditions of the approval;
- any flood risk management or mitigation measures implemented in support of temporary and permanent works proposals; and

- a statement on the cumulative flood risk impact of temporary and permanent works with reference to the ES.

16.3.6 The level of detail submitted in the reports must be commensurate with the scale, nature and level of risk associated with the proposed development and the potential impact on third parties. The reports must refer to the compliance of the flood risk assessment.

16.4 Monitoring

16.4.1 The nominated undertaker will require surface water and groundwater monitoring plans to be implemented as part of the lead contractors' EMS.

16.4.2 The nominated undertaker will require its contractors to consult the EA regarding water quality, flow and level monitoring to be undertaken for watercourses and groundwater that will be affected by construction works or discharge of surface water run-off, which will include the following, as appropriate:

- pre-construction monitoring to establish baseline water quality conditions for watercourses and groundwater;
- monitoring during construction works to enable the effectiveness of mitigation measures to limit pollution risk to be monitored and any pollution incidents to be identified; and
- monitoring of watercourses or groundwater receiving surface water runoff during construction to enable the effectiveness of treatment and other sustainable drainage systems measures to be determined and to ensure that an unacceptable rise in groundwater levels does not occur.

16.4.3 The nominated undertaker will require its contractors to carry out appropriate monitoring to identify:

- pollution risks that are unacceptably high;
- spillages and leakages;
- non-compliance with the CoCP; and
- suspected pollution incidences.

16.4.4 Appropriate actions will be taken where pollution risks are unacceptably high, where there is noncompliance with the CoCP, where spillages and leakages are unacceptable or where there are any suspected pollution incidents.

16.4.5 Ground water monitoring will be undertaken at any ground water sensitive areas, as required, to inform the design of the Proposed Scheme and development of construction methods to mitigate potential impacts.

16.4.6 The nominated undertaker will require its lead contractors to implement appropriate inspection and monitoring procedures as part of their EMS. The contractors will also consult with the relevant regulatory body regarding the Pollution Incident Response Plan which will set out the measures to be implemented to address any adverse

findings from the monitoring procedures during and following completion of construction works.

Annex 1: Glossary of Terms

ACM	Asbestos containing material
BPM	Best Practicable Means - Defined in the Control of Pollution Act 1974 and Environmental Protection Act 1990 as measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.
BS	British Standard
CCTV	Closed circuit television
CDEW	Construction, demolition and excavation waste
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated land: applications in real environments – an organisation dedicated to raise awareness of practical sustainable remediation technologies
Considerate Constructors Scheme	A UK national scheme which promotes good practice on construction sites through its codes of considerate practice, which commit registered sites to be considerate and good neighbours, as well as being respectful, environmentally conscious, responsible and accountable. For more information see: www.ccscheme.org.uk
CoPA	Control of Pollution Act 1974
CRT	Canal and River Trust
CTRL	Channel Tunnel Rail Link
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
~~EH~~	~~English Heritage~~

EMRs	Environmental Minimum Requirements
EMS	Environmental management system
ES	Environmental Statement
HE	Heritage England
HS2 Ltd	High Speed Two Limited - is a company wholly owned by the Department for Transport, established in 2009 to develop plans for a new high speed network and present a proposed route connecting London - West Midlands.
HSE	Health and Safety Executive
ICE	Institution of Civil Engineers
~~LA~~	~~Local authority~~
Lead contractor	The lead contractor on a construction site responsible for planning, managing and co-ordinating themselves and/or the works and all other contractors working on their site, or any other contractor directly employed by the nominated undertaker to undertake key construction works on site.
LEMPs	Local Environmental Management Plans
LPA	Local planning authority
NE	Natural England - the Government's advisory body on the natural environment.
Nominated undertaker	The body or bodies appointed to implement the powers of the hybrid Bill to construct and maintain the railway.
NT	National Trust
NPPF	National planning policy framework
PPGs	Pollution prevention guidelines – EA guidance and advice on the law and good environmental practice

PPV	Peak particle velocity
Proposed Scheme	The Proposed Scheme to which this CoCP relates is the proposed high-speed railway between London - West Midlands. This is a high speed railway between London - West Midlands with a connection via the West Coast Main Line at conventional speeds to the North West and Scotland and to the Channel Tunnel via HS1. It includes four high speed rail stations at London Euston, Old Oak Common (West London), Birmingham Airport (Birmingham Interchange) and Birmingham (Curzon Street).
PRoW	Public rights of way
RFI	Radio frequency interference
RTMP	Route-wide Traffic Management Plan
Section 61	Section 61 of the Control of Pollution Act 1974 (which sets out procedures seeking and obtaining local authority consent to measures for the control of noise and vibration on construction sites).
SoS	Secretary of State
SSSI	Site of Special Scientific Interest
SWMP	Site waste management plan
VDVs	Vibration dose value – a measure of vibration used to assess human perception of vibration
WSI	Written scheme of investigation (a programme for archaeological investigation works)

Annex 2: HS2 Ltd sustainability policy

Sustainability policy

HS2's purpose is to create a world class high speed rail network to support sustainable growth in the UK. It is a major opportunity to provide greater choice in the way we travel to help deliver a sustainable transport system for the UK.

Our vision is of a high speed railway network which changes the mode of choice for inter-city journeys, reinvigorates the rail network, supports the economy, creates jobs, reduces carbon emissions and provides reliable travel in a changing climate throughout the 21st century and beyond.

This policy sets out HS2 Ltd's commitment to be an exemplar project. Building this network will inevitably cause some local effects on communities, the natural and the built environment. We will strive to limit the negative impacts through design, mitigation and by challenging industry standards and we will look for environmental enhancements and benefits.

Through this policy we aim to support the following Government goals:

- Create a step change improvement in transport links between regional centres and from them to London.
- Enable more equal distribution of opportunity, connect communities and encourage regeneration.
- Stimulate sustainable economic growth through increased capacity and shorter journey times between key cities.
- Support British engineering, create job opportunities and develop skills in the UK.
- Deliver lower carbon long distance travel.
- Maximise integration of HS2 with existing UK and international transport networks.
- Encourage wellbeing and protect the environment.

What we will do

We will promote high speed rail and balance community, environmental and economic issues. We have identified key themes as a focus for our work to:

Growth and regeneration • Support sustainable economic development and the localism agenda for regeneration.

Environmental change • Seek to avoid significant adverse effects on communities, business and the natural, historic and built environment. Minimise impacts where they occur and deliver enhancements as far as practicable to ensure there is no net loss to the natural environment.

Skills and employment • Improve skills, jobs, education and the economy through our investment along the length of the route. Act as a driver for improvements in the sustainability of the engineering and construction sector. Promote diversity, openness and fairness.

Climate change • Minimise the carbon footprint of HS2 as far as practicable and deliver low carbon long distance journeys that are supported by low carbon energy.

Resilience • Build a network which is resilient for the long term and seek to minimise the combined effect of the project and climate change on the environment.

Resources and waste • Source and make efficient use of sustainable materials, maximise the proportion of material diverted from landfill and reduce waste.

Integrated transport • Engage with stakeholders to create seamless transport links with other modes and ensure accessibility for all.

How we will deliver this

To deliver our vision we will embed sustainability in our business at each phase of the project through:

A clear plan • Setting goals relevant to the stage of the project from design, through development, construction, operation, maintenance and renewal which stimulate innovation and ensure enhancements are protected for the long term. Our plan and this policy will be reviewed biennially.

Robust processes • Ensuring sustainability is integrated into our culture, procedures and processes. This will include the development of Sustainable Design and Delivery Principles as part of a process to enable us to balance the sometimes competing elements of sustainability and to understand whole life cost.

Procurement • Ensuring sustainability is integral in our procurement processes and is applied to our entire supply chain.

Innovation • Promoting sustainable construction practices, continually focussing ideas and technologies for improving sustainability.

Engagement and reporting • Engaging in dialogue about the project and working with local communities, key stakeholders and our supply chain. Openly reporting our progress in delivering the commitments we make on sustainability regularly and sharing what we learn.

HS2 is determined to ensure sustainability is embedded in the DNA of this project and that it is integrated into all of our work.

Alison Munro, Chief Executive, HS2 Ltd
April 2013

HS2/HS2/SU/POL/000/000002

Sustainability Policy

HS2's purpose is to create world class high speed rail network to support sustainable growth in the UK. It is a major opportunity to provide greater choice in the way we travel to help deliver a sustainable transport system for the UK.

Our vision is of a high speed railway network which changes the mode of choice for inter-city journeys, reinvigorates the rail network, supports economy, creates jobs, reduces carbon emissions and provides reliable travel in a changing climate throughout the 21st century and beyond.

This policy sets out HS2 Ltd's commitment to be an exemplar project. Building this network will inevitably cause some local effects on communities, the natural and the built environment. We will strive to limit the negative impacts through design, mitigation and by challenging industry standards and we will look for environmental enhancements and benefits.
Through this policy we aim to support the following Government goals:

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- Enable more equal distribution of opportunity, connect communities and encourage regeneration.
- Stimulate sustainable economic growth through increased capacity and shorter journey times between key cities.
- Support British engineering, create job opportunities and develop skills in the UK.
- Deliver lower carbon long distance travel.
- Maximise integration of HS2 with existing UK and international transport networks.
- Encourage wellbeing and protect the environment.

What we will do

We will promote high speed rail and balance community, environmental and economy issues. We have identified key themes as a focus for our work to:

Growth and regeneration - Support sustainable economic development and the localism agenda for regeneration.

Environmental change – Commit to protection of the environment through seeking to avoid significant adverse effects on communities, businesses and the natural, historic and built environment, including the prevention of pollution. Minimise impacts where they occur and deliver enhancements as far as practicable to attain no net loss to the natural environment.

Skills and employment - Improve skills, jobs, education and the economy through our investment along the length of the route. Act as a driver for improvements in the sustainability of the engineering and construction sector by ensuring that the right workforce is available at the right time with the right skills and behaviours. Promote diversity, openness and fairness

Climate change - Minimise the carbon footprint of HS2 as far as practicable and deliver low carbon long distance journeys that are supported by low carbon energy.

Resilience - Build network which is resilient for the long term and seek to minimise the combined effect of the project and climate change on the environment.

Resources and waste - Source and make efficient use of sustainable materials, maximise the proportion of material delivered from landfill and reduce waste.

Integrated transport - Engage with stakeholders to create seamless transport links with other modes and allow accessibility for all.

Approved on: 23rd February 2015
Document No. HS2-HS2-SU-POL-000-000001 Revision P03

How we will deliver this

To deliver our vision we will embed sustainability in our business at each phase of the project through:

A clear plan - Setting goals relevant to the stage of the project for design, through development, construction, operation, maintenance and renewal which stimulate innovation and enable long term enhancements. Our plan and this policy will be reviewed biennially.

Robust processes - Ensuring sustainability is integrated into our culture, procedures and processes. This will be managed through the implementation and continual improvement of an Environmental Management System to enhance environmental and sustainability performance. This will include development of Sustainable Design and Delivery Principles as part of a process to enable us to balance the sometimes competing elements of sustainability and to understand whole life cost. We will comply with legal and other obligations.

Procurement - Ensuring sustainability is integral in our procurement processes and is applied to our entire supply chain.

Innovation - Promoting sustainable construction practices, continually focusing ideas and technologies for improving sustainability.

Engagement and reporting - Engaging in dialogue about the project and working with local communities, key stakeholders and our supply chain. Openly reporting our progress in delivering the commitments we make on sustainability regularly and sharing what we learn.

HS2 is determined to embed sustainability in the DNA of this project and integrate it into all of our work

Chief Executive Officer HS2

Annex 3: Local Environmental Management Plan Template

The LEMPs will set out any site specific local control measures and are expected to follow the layout and cover the broad issues as set out below.

Local authority: <Insert name>
Location / name of site(s): <Insert location of sites covered by the LEMP>
Anticipated worksite activities: <e.g. bored tunnels, surface railway, railway viaduct>

General requirements

Community relations – any specific local requirements for the advance notification of construction works.

Working hours – any local variations to core working hours to be agreed under third party consents (e.g. different working hours for works in the vicinity of the operational railway, where possessions may be needed, or where the works are in a commercial/business district).

Site lighting – identifying any sensitive receptors and local control measures.

Worksite security and hoardings – site specific measures relating to appearance and height of security fencing and hoardings.

Pollution incident control – any local requirements to be included in the contractors' pollution incident control plan.

Extreme weather events - Any receptors, and/or construction related operations and activities considered sensitive to the impacts of extreme weather events and related conditions to have additional contingency mitigation measures developed and implemented as necessary and appropriate to monitor and manage the effects of extreme weather events and related conditions during construction.

Agriculture, forestry and soils

Identifying sites of particular interest.

Air quality

Highlight any of the worksites that lie within or adjacent to any sensitive areas for air quality (e.g. air quality management areas) or other sensitive receptors.

Cultural heritage

Known or potential heritage assets (both designated and undesignated) will be identified, and any specific local control measures outlined. These measures will also subject to third party consents.

Ecology

Any local site-specific requirements and protection measures will be set out to avoid or limit the potential impact on ecological resources. Where known invasive, non-native species are known to be present, site specific control measures will be included.

Land quality

Site-specific local controls will be set out as required for any known sites of geological interest (both designated and undesignated), together with any abandoned mine workings and areas of known or potential land contamination.

Landscape and visual

Where landscapes, townscapes or views of particular sensitivity have been identified, local control measures e.g. screening and treatment of stockpiles to reduce the impact during construction will be set out.

Noise and vibration

Particularly sensitive receptors to construction noise or vibration will be identified, and any relevant site-specific controls proposed.

Traffic and transport

Local proposals for the management of construction traffic, including any required alterations to local roads, proposed access routes for site traffic, and for all heavy vehicle movements. These will also be subject to relevant third party consents and notifications.

Waste and materials

Any local site-specific requirements for the management of construction waste.

Water resources and flood risk

Measures to protect particularly sensitive water resources (watercourses, water bodies, groundwater and abstractions) will be identified. Any site-specific measures required to limit the risk of flooding will also be identified. These will also be subject to relevant third party consents and notifications.

Annex 4: Example application form for Section 61 Consent

CONTROL OF POLLUTION ACT 1974

EXAMPLE APPLICATION FORM FOR SECTION 61 CONSENT

To be developed further (with explanatory notes) in consultation with the relevant local authorities

Submission No:	
Local Authority Reference:	

To the[1]

I/WE HEREBY MAKE APPLICATION for prior consent in respect of works to be carried out on the [construction] site(s) specified below, under Section 61 of the Control of Pollution Act 1974.

Signed ✞..... Date.....

Name and address of applicant ✞

(in block letters please)

.....

Telephone No: .....

email: .....

[1] Insert name of Local Authority.

✞ Where application made by a Company the signature should be of a Director or the Company Secretary and the address should be the Company's registered office.

(Note: Supplementary sheets should be used for fuller descriptions and additional information as required)

1. Address or location of proposed works	
2. Name and address of main contractor Telephone No.	
3. Particulars of works to be carried out	

4. Methods to be used in each stage of development	
5. Hours of Work	
6. Number, type and make of plant and machinery (including heavy vehicles) stating Sound Power Levels	

7. Proposed steps to minimise noise and vibration	
8. Predicted Noise Levels	
9. Approximate duration of works	

10. Site Plan (Attached, yes/no)	
11. Other Information	
12. List of Plans and documents attached	