Environmental Code of Practice

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Pages: 1 / 50

1 Introduction

1.1 General

This Environmental Code of Practice (ECoP) has been developed to ensure that projects by any company of the HB Reavis Group or affiliated with it (further just HBR) are delivered to the highest environmental standards. The Construction Manager and all trade contractors are required to comply with the requirements of this document during the construction of the projects and related off site activities.

The term “construction” in this Code includes all site preparation, material delivery, excavated material disposal, waste removal and all related engineering and construction activities as defined in the planning applications.

The ECoP sets out a series of objectives and measures to be applied throughout the construction activity, to maintain satisfactory levels of environmental protection and limit disturbance from construction activities as far as reasonably practicable. It will include such measures that were assumed to be in place for the purposes of preparing the Environmental Impact Assessment (EIA) submitted with the original planning applications.

The term “project” means such projects forming part of the Delivery Programme.

1.2 Site

“As built” details and Health and Safety Plans have been produced to indicate the existing conditions that prevail. The Employer will provide all information to contractors who should become fully aware of the information.

1.3 Construction Supervision

The responsibility for managing construction will be the contractor’s.

The Contractor’s team will be required to appoint a suitably qualified Environmental Manager (EM) who will be responsible for monitoring and auditing compliance of the projects with all environmental commitments set out in this ECoP and elsewhere in other relevant environmental legislation.

1.4 The Contractor

The provisions of this ECoP will be incorporated into the contracts for the construction of all works defined in the planning applications and building permits. All such works within each project will be required to comply fully with the terms of the ECoP.

The Construction Manager will assume the role of Principal Contractor[1] and will be required to ensure that all reasonably practicable means are adopted to fulfil the requirements of this ECoP by both themselves and the Trade Contractors. The CM will hold regular meetings with the Project Manager and the relevant Authority Environmental team to discuss construction activities and compliance with this ECoP.

[1] The Principal Contractor is the main contractor for a package of work and management of all aspects of the construction phase works and is also a designation associated with the duty holder of that name under the Construction (Design and Management) Regulations 2015.

1.5 Structure of the ECoP

The Environmental Code of Practice will consist of this document and a number of Topical Environmental Plans (Section 2.2). Together these documents will set out the general objectives and measures for construction activities across the Project.

The content of this part of the ECoP is set out below:

- Section 2: Sustainability Targets
- Section 3: General principles
- Section 4: General site operations: working hours, layout and site appearance
- Section 5: Public access and transport management
- Section 6: Noise and vibration
- Section 7: Air quality
- Section 8: Contaminated land
- Section 9: Materials management and recycling
- Section 10: Protection of surface and groundwater resources
- Section 11: Ecology
- Section 12: Archaeology and heritage
- Section 13: Pollution incident control
- Section 14: Prohibited and referable materials.

1.6 Enforcement

This ECoP will be enforceable through the planning consents for construction as it will form part of the EIA mitigation measures. The Contractor Office (PMO) will develop an assurance system against which the contractor will be audited for compliance with the ECoP. The PMO and contractors will all have roles in ensuring compliance.

Each Contractor's Construction Manager will ensure that the work is planned and managed so that it is undertaken in a manner consistent with environmental requirements of this ECoP. Each Contractor's Construction Manager will require his EM to undertake a programme of monitoring and auditing to confirm compliance.

The provisions of this ECoP will be incorporated into all construction contracts. The contractor will be required to comply with the terms of the ECoP. The PMP will take appropriate action as required to ensure compliance with the contract.

2 Sustainability Targets

Key Performance Indicators have been set for the construction delivery of THE PROJECT. All contractors will be required to meet the sustainability KPIs. Performance monitoring against the construction stage sustainability KPIs will be via the Client's online reporting tool (information to be sent by the email)

KPIs are as follows:

Indicator	**Target**
Waste	5 Tonnes of construction waste / 100 m^2 GIA
	75% of non-hazardous construction waste diverted from landfill
	Zero enforcement notices or prosecutions from waste regulators
Energy	40 MWh energy consumption / €1M
	10T CO_2 eq / €1M
Water	6m^3 water / €1M
Materials	90% of non-timber materials sourced from suppliers holding ISO 14001
	100% of timber to be FSC or PEFC Certified
	50% of materials suppliers by value to have completed SEDEX self-assessment questionnaires
	20% of materials (by value) with recycled content (pre/post consumer)
Procurement	40% of suppliers from within 200 km of site (by value)
	40% of labour to be from within 100 km of site (by value)
	1 apprentice or trainee place per €5M package value
Environmental Practices	Compliance with all measures on BREEAM Checklist
	Full compliance with the STOFF Construction Code of Practice
	Construction Environmental Management Plan in place and reviewed
	Environmental permits in place and complied with
BREEAM	Anticipated final construction BREEAM score and rating
	% of construction stage credits secured (by points)

Each Trade Contractor will be required to provide monthly data supporting the above targets.

3 General principles

3.1 Environmental Management System

An Environmental Management System (EMS) for the works to monitor compliance with the procedures, standards and other measures required to provide satisfactory levels of environmental protection is proposed.

Environmental Management Plans will form part of the EMS. The EMS will, inter alia, provide for the preparation and implementation of a programme of environmental monitoring. Monitoring protocols, which set out the purposes and minimum requirements of the monitoring, will be included within the relevant Environmental Management Plans. Enforcement protocols will also be included.

As part of the Delivery Programme, each contractor will develop a Programme Environmental Management Plan that includes a suite of Topical Environmental Management Plans. The Programme Environmental Management Plan sets out the environmental requirements.

3.2 Topical Environmental Management Plans (TEMPs)

A number of environmental plans and strategies for construction management relevant to construction arrangements across THE PROJECT will be prepared and implemented by the each appointed package contractor. These will cover construction transport management, waste management, energy management, water management, ecology and pollution incident control.

A Construction Transport Management Plan (CTMP) (see Section 5.3) will be prepared by the Logistics Contractor with input from each package contractor and will be implemented in conjunction with the CM. The plan will outline proposed transport control measures and routes that will be used during the construction, in accordance with specified traffic management principles. The plan will be consistent with the objectives of the Transport Assessment and will be approved by the Construction Manager and Local Authority.

The CTMP will outline proposed measures for:

- Managing vehicle volumes and control measures;
- Vehicle means and routes, including holding areas;
- Promoting vehicle and driver safety and vulnerable road users;
- Highway works and consents on the external road network;
- Management of the internal road network within the site;
- Travel to work during the transformation phase.

Construction Waste Management Plan (see Section 9.3) will be prepared by the Contractor for the contract works and implemented in conjunction with the CM. The plan will manage construction waste across THE PROJECT in accordance with a waste hierarchy to minimise, reuse and recycle waste materials.

A Water Management Plan (see Section 10.2) will be prepared by the Contractor for the contract works and implemented in conjunction with the CM. The plan will include the site wide approach to surface water and foul water drainage, and water supply during construction. The plan will be consistent with the Environmental Impact Assessment, Flood Risk Assessment and all relevant permits.

An Ecology Management Plan (see Section 11.4) will be prepared by the Contractor for the contract works and implemented in conjunction with the CM. The plan will include measures to protect newly created and existing habitat, adjoining areas of nature conservation interest. The plan will be consistent with the Environmental Impact Assessment and associated documents and project construction permits.

A Pollution Incident Control Plan (see Section 13.3) will be prepared by the Contractor for the contract works and implemented to include measures to be adopted in the event of a pollution incident including a release of hazardous material or fire.

3.3 Project Environmental Management Plans

A Project Environmental Management Plan (EMP) will be prepared for each major scope of work or project. Project EMPs will identify the major construction activities and the environmental issues and impacts of those construction activities. Project EMPs will also identify the mitigation measure/best practice for each environmental impact. This is to include any mitigation required as a condition of the EIA. The project EMP will set out how the contractor intends to manage construction and will set out specific control measures necessary to deliver the requirements of this ECoP and any other mitigation measures that have been committed to by the Employer that relate specifically to the construction phase of the project. The Environmental Manager will submit the project EMPs to the PMO. All EMPs developed shall be in compliance with the following HBR Policies and Procedures:

- HBR Corporate Policy Commitment to Environment and Society (CPC4-Environment)
- HBR Corporate Policy CP4-001 Protecting the Environment
- HBR Operational Policies
  - Operational Policy OP4-001 Waste Minimisation and Resource Efficiency
  - Operational Policy OP4-002 Energy Efficiency
  - Operational Policy OP4-003 Environmental Management Systems and Compliance
  - Operational Policy OP4-004 Environmental Due Diligence for Business Transactions
- HBR Environmental Management System and Procedures
  - EP01 Completion of Environmental Aspects Review
  - EP02 Assessing the environmental Impacts of projects and changes
  - EP03 Environmental Objectives and Targets and Environmental Management Programmes
  - EP04 Environmental Communications
  - EP06 Environmental Management Review
  - EP07 Environmental Emergency Preparedness and Response
  - EP08 Fluid Material Control
  - EP09 Waste Compliance Audits
  - EP10 Environmental Operational Control
  - EP11 Environmental Auditing
- HBR Environmental Compliance Assurance Process

Subject to the EMP being acceptable, the CM shall issue formal authority to commence the planned work.

The project EMP will include a site layout and summary of construction activities, along with a supporting statement as to how principles to minimise environmental impact have been incorporated in the construction arrangements. Details will include, but not be limited to proposals for boundary treatment, screening, the location of storage sites, lighting, and air quality management.

The contractor will develop an EMP, requiring approval by the CM. For each activity of work, EMPs shall identify specific construction work process/aspects, the environmental impact of each process/aspect, the mitigation measure/best practice and the relevant procedure or method of work to be followed.

3.4 Consultation on Environmental Management Plans

Once the Environmental Management Plans (TEMPs and project EMPs) have been prepared, plans will be sent out to statutory bodies and the local authorities for consultation. Unless otherwise agreed with the PMO and CM, plans must be submitted prior to the commencement of construction works. The observations of statutory bodies and local authorities will be taken into account in amending the plans as far as reasonably practicable. The CM will then publish the final version of each plan and provide a copy to statutory bodies and the local authorities if necessary. In accordance with relevant planning conditions attached to planning permissions for the project, the Construction Traffic Management Plan, Construction Waste Management Plan, Water Management Plan, and Ecology Management Plan will be subject to the approval of the Local Authority. The measures and standards identified in the plans will then be implemented by the contractors.

It is envisaged that some or all of the Environmental Management Plans (either in part or whole) may need to be updated from time to time. The process adopted for the updating of the plans will be the same as that for the production of the plans described above. The updating process will ensure that an equivalent or no worse environmental standard is achieved to that set out in the published version of each plan.

3.5 Other environmental controls

In addition to the ECoP, TEMPs and project EMPs contractors will be required to comply with specific legislative requirements, and other standards and management practices including the Employer Design and Construction Health, Safety and Environmental Standards. There are many codes, standards, Laws and subsidiary legislation as well as statutory guidance, which cover environmental and related matters. The Construction Manager shall ensure he is aware of all regulatory requirements and these are communicated to the Trade Contractors. The key environmental regulatory provisions are referred to where applicable in this ECoP. Appropriate recognition will be given to changes over time to these requirements and/or new or alternative environmental control provisions.

Contractors will also be required to demonstrate compliance with sustainability objectives, as set out in the Employer's Sustainability Strategy and Sustainability Best Practice Guide. Contractors will be required to report progress against agreed sustainability indicators. This process will be supported by the use of BREEAM to encourage attainment of environmental excellence in projects.

3.6 Local community liaison

A Community Forum is being established and managed by HBR Management that manage interactions with local stakeholders, including HBR, each occupier of the THE PROJECT, local businesses and representatives of the town. The Contractor and Trade Contractors shall liaise with the Community Forum to provide information updates to local stakeholders and interested parties.

The Community Forum will also be the point of contact for complaints regarding construction of THE PROJECT. The Construction Manager and Trade Contractors shall act immediately on any complaints received, and shall provide feedback to the Community Forum on how the complaint has been resolved to allow the Community Forum to respond the affected party.

The Construction Manager is to write to neighbours affected by their works at the close of the contract to thank them for their patience during the duration of the contract and provide a feedback form to inform management practices for future works at the site.

3.7 Considerate Constructors Scheme

In addition to the arrangements under this ECoP the contractors will be required to work in accordance with the principals of the EU Considerate Constructors Scheme, which is a voluntary code of practice that seeks to:

- minimise any disturbance or negative impact (in terms of noise, dirt and inconvenience) sometimes caused by construction sites to the immediate neighbourhood;
- eradicate offensive behaviour and language from construction sites; and
- recognise and reward the constructor's commitment to raise standards of site management, safety and environmental awareness beyond statutory duties.

Contractors are required to adhere to the Scheme's Code of Considerate Practice, and demonstrate compliance using BREEAM International Checklist and associated supporting evidence. Contractors are not required to register with the Considerate Constructors Scheme or have their works audited by the CCS.

3.8 Environmental Information

All Contractors are required to record and report the following information on a monthly basis to the contractor:

- Fuel usage (litres) for all fuels consumed by mobile plant and generators;
- Electricity consumption from sub-metered supplies to their work area, including temporary accommodation;
- Water consumption from sub-metered water supplies to their work area, including temporary accommodation;
- Quantities of materials delivered to site within the period, including details of environmental accreditations for each product or material;
- Quantities of timber delivered to site, with all timber deliveries to be accompanied by compliant Chain of Custody documentation;
- Waste transfer notes for all waste removal from the contract area and total tonnage of waste removed;
- Recycling / diversion from landfill performance for the waste facility receiving waste;
- Records of travel distance to site for the Contractor's labour force;
- Records of distance from site of suppliers supplying the Contractor in the period;
- Employee numbers on site, including the number of apprentices and/or trainees on site within the reporting period.

Environmental information is to be provided via the project's online environmental reporting tool.

4 General site operations: Working hours, layout and site appearance

4.1 Objective

The works will be carried out in such a way as to limit, as far as reasonably practicable, the adverse environmental impact of the construction activities.

4.2 Working Hours

The site working hours will be Monday to Friday 08.00-18.00 and Saturday 08.00-13.00. In order to maximise the use of these hours, half an hour start-up and close-down periods will be permitted from 07:30-08:00 and 18:00-18:30. The activities that will take place in these start-up and close-down periods will not include any noisy activities, but will typically include:

- movement of plant to the worksite;
- unloading; and
- maintenance of plant and equipment.

In accordance with Environmental Impact Assessment construction activities that elevate noise levels, measured as LAeq (1hr) by more than 1dB above the ambient level at the façade of any noise sensitive premises, may only take place outside the normal hours of work, where these construction activities have been approved in writing by the Local Authority.

All of the arrangements set out below may be varied by agreement with the relevant local authority. The right to appeal against a withholding of consent or against conditions subject to which it is given is retained, and references to agreement are to be so construed.

The works that may be undertaken outside of the “core hours” will include the following:

- A period for repair and maintenance will be required on Saturday between 13:00-18.00.
- Public Holidays will have the same working hours as Saturdays.
- Operations such as earthworks are seasonal and weather-dependent, and as is customary in the construction industry the working day and or days may be extended to take advantage of extended daylight hours during the period April-October.
- For certain types of activities evening, night time, additional weekend Sunday and Public Holiday working may be required. Examples include work that entails the possession of a railway or road (and may be timed to avoid periods of heavy traffic flows), works for reasons of public safety, site logistics operations or work within buildings.
- Timings for road and rail deliveries will be agreed through the approval of the Construction Traffic Management Plan (section 5.3).
- Timing of external highway works will be agreed with the relevant regulators and authorities.
- Some activities by their nature may need to be completed for reasons of engineering practicality and/or public safety and so will need to be extended beyond the normal working day. Examples of this could include:
  - temporary highway/traffic management works;
  - demolitions;
  - formwork - erection and removal;
  - concrete pours;

- earthwork movements;
- completion of crane lifting operations;
- heavy/large components of the project structure

Where works, which have been granted consent by the relevant regulator, have to be rescheduled for reasons not envisaged at the time of the submission and are expected to extend beyond the agreed or normal working hours or to exceed the agreed limits, an application will be made at least 14 days in advance of the start of those works for a dispensation from the agreed consent. The dispensation will be sought by means of an application for a variation to the agreed consent, setting out the revised construction programme or method and the relevant noise calculations.

Where the rescheduling relates to work of a more urgent or critical nature (such as a key activity likely to delay other key activities) application will be made to the relevant local authority Environmental Officer where practicable seven days, but at least two working days, ahead of the start of those works for a variation to the agreed consent.

Where such working outside normal hours has been discussed and accepted, occupiers of nearby residential or other sensitive property who are likely to be affected will be informed as soon as reasonably practicable about this, and about, the likely duration of works.

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

4.3 Construction site layout and housekeeping

In planning the construction site layout the contractor will ensure that a “good housekeeping” policy is applied at all times, and as far as reasonably practicable; that amongst other things:

- existing hedges, tree screens and the topography will be utilised to screen construction sites; temporary earth mounding or other temporary screening will also be included, where appropriate, within the confines of land take for construction sites;
- perimeter fencing / hoardings will be regularly inspected repaired and repainted as necessary, other hoardings will be regularly inspected and repaired;
- all working areas will be kept in clean and tidy condition;
- wheel washing facilities will be brushed or sprayed clean frequently;
- adequate toilet facilities will be provided for all site staff;
- rubbish will be removed at frequent intervals and the site kept clean and tidy;
- food waste will be removed frequently;
- any waste susceptible to spreading by wind or liable to spreading by wind or liable to cause litter will be stored in enclosed containers;
- open fires will be prohibited at all times;
- all necessary measures will be taken to minimise the risk of fire and the contractor will comply with requirements of the local fire authority;
- storage sites, fixed plant and machinery, equipment and temporary buildings will be located to limit adverse environmental effects;
- all external lighting and illumination, associated with the construction process, will be in accordance with the guidance issued by the I CIE (International Commission on Illumination) Report: “Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations”;

- to ensure that construction lighting does not affect the amenity of residents or create a nuisance, external lighting will be designed and positioned to:
  - provide the minimum light levels necessary for safe working;
  - avoid disturbance to adjoining residents and occupiers;
  - avoid creating dazzle or distraction for drivers using adjacent highways or the railway;
  - seek to minimise light spillage or pollution; and
  - ensure that excess light does not fall on sensitive ecological habitats

Energy efficient options for site facilities will seek to be incorporated wherever possible; these may include energy efficient light bulbs and automatic controls, which will supplement good housekeeping such as switching off equipment when not in use;

- adequate security will be exercised by the Contractor to protect the public and prevent unauthorised entry to or exit from the site. Site gates will be closed and locked when there is no site activity and site security measures will be implemented;
- any security cameras will be located and directed so that they do not intrude into occupied residential property; and
- radios (other than two way radios used for the purposes of communication related to the works) and other forms of equipment with loud speakers will not be used on the site.

Provision of alternative sources of energy should be considered for the temporary accommodation, such as PV panels to accommodation roofs or temporary wind turbines. The visual intrusion of construction sites on nearby residents and users of local facilities and amenities will be contained and limited, as far as reasonably practicable.

The Contractor will ensure that all working areas are sufficiently and adequately fenced off from members of the public and to prevent animals from straying on to the working area. The standard of enclosure and screening at a particular site will be selected in order to maintain effective site security and achieve appropriate noise attenuation and visual effect.

Permanent fencing will be installed around the perimeter of the site as part of the early enabling package. Temporary fencing will be installed where works do not permit installation of the permanent fence. Suitable access points will be installed, with permanent security provided via the Logistics Contractor.

Temporary hoardings will be selected to suit the location but may be:

- a 2.4m minimum height, plywood faced, timber framed boundary hoarding, of a surface density of not less than 7 kg/m² or other hoarding providing equivalent security and noise attenuation, in the vicinity of noise sensitive neighbours; or
- based on other designs, where a particular appearance or acoustic rating is considered to be required and is agreed with the relevant local authority.

Hoardings that create poorly lit pedestrian routes will have bulkhead lights fitted and these will be used in hours of darkness.

The contractor will ensure that where hoardings are provided, they are painted on the side facing away from the site and include identification of the project and contact information. All hoardings, screening and other forms of enclosure will be maintained in reasonable condition and monitored for fly posting and graffiti.

The contractor is expressly prohibited from displaying or allowing the display of any advertisement, notice, etc. including illicit bill or fly posting on the hoardings. The contractor will ensure that all graffiti, fly posting or defacement to the hoardings is removed and made good or obscured within 48 hours of discovery.

An information board will be provided at each work site. It will detail information on the site programme and estimated duration of the works, together with the web address and a 24 hour telephone number for use by members of the public who wish to lodge complaints or comments.

Where temporary or permanent possession of a site is taken and an enclosure has been removed an enclosure will be erected on the new temporary or permanent boundary to maintain the security of the property.

CCTV will be installed as part of the site security package. Adjacent pedestrian routes will be monitored.

The contractor will regularly inspect all working areas (at least fortnightly) and will provide a report to the Project Manager on compliance with this Section 4.3 of the ECoP. A nominated representative of the Project Manager may carry out inspections of the site at any time without prior notice of time and place of the inspections. Access to all areas of the works will be given to visiting inspectors and the contractor will give inspectors all reasonable assistance during their site inspection.

All fencing and hoarding will be removed as soon as reasonably practicable after completion of works.

4.4 Other arrangements

The following preventative pest control measures will be adopted:

- prompt treatment of any pest infestation and arrangements for effective preventative pest control; and
- appropriate storage and regular collection of putrescible waste (See also section 8, Waste Management).

Pest infestation of construction sites will be notified to the relevant local authority as soon as is practicable.

Steps will be taken, as far as reasonably practicable, to see that the behaviour of personnel on site does not cause offence to the public.

Site personal shall not be permitted to use local facilities in their site clothing. All PPE shall be left at site when making use of local amenities. On-site welfare and catering facilities will be provided for construction works via the Logistics Contractor and Construction Manager. This will include shower and locker facilities.

4.5 Clearance of site on completion

The contractor will clear and clean all working areas and accesses as work proceeds and when no longer required for the works.

At the completion of the development all plant, temporary buildings or vehicles not required during subsequent construction works shall be removed from the site. All land, including highways, footpaths, loading facilities or other land occupied temporarily shall be made good to the satisfaction of the local planning authority.

5 Public access and transport management

5.1 Objective

The works will be managed so that traffic impacts are minimised as far as reasonably practicable. This will include a delivery booking system and clearly signposted routes to the construction site from the local road network, in addition to the optimising the use of sustainable transportation, in particular the rail head for the delivery of construction materials to the project, so far as is reasonably practicable.

5.2 General provisions

Approvals from the relevant highways authorities will be obtained in respect of the means and routes by which anything required for construction is to be transported by large goods vehicles on a highway to a construction or storage site, or to a waste disposal site.

Approval will be obtained from the relevant highways authorities to the formation, layout or alteration of any permanent or temporary means of access to a highway to be used by vehicular traffic.

Options for reducing the quantities of construction materials and waste requiring transfer by public roads will be considered so far as reasonably practicable.

Site access points for construction traffic construction personnel and emergency access will be identified and signed for both vehicular traffic and pedestrian/cycle access.

Protocols will be discussed with the relevant authorities for maintaining utilities in the highway. The condition of relevant highways in the vicinity of points of access will be recorded and monitored.

Ground movement and settlement on the railway lines will be monitored and procedures will be agreed with the relevant authorities for working adjacent to live railway lines.

5.3 Construction Transport Management Plan

A Construction Transport Management Plan (CTMP) will be produced and implemented. The plan will include the requirements for the management of construction traffic and of construction workforce. This will be develop from that outlined in the EIA2.

It is intended that the plan will be updated in accordance with the development of the construction strategy and re-issued as appropriate. The CTMP will be consulted on with the local highway authorities and the emergency services. In accordance with relevant planning conditions attached to planning permissions and construction permits for site construction works the CTMP will be subject to the approval of the District Office. All proposals for off-site transport management will be required to conform to the CTMP.

The objectives of the CTMP are:

- to minimise the level of road based construction traffic through the promotion of rail based transport options;
- to minimise the impact of road based construction traffic by identifying clear controls on routes for large goods vehicles, vehicle types, vehicle quality and hours of site operation;
- to identify highway works required to provide the permanent highway connections to the project site;

- to minimise the number of private car trips to and from the site (both workforce and visitors) by encouraging alternative modes of transport and identifying control mechanisms for car use and parking; and
- the arrangements for liaison with the relevant highway authorities and emergency services;

The plan, as a minimum, will include but not be limited to details of:

- the method for applying for approvals for off-site highway works;
- road closures implementation and management, including management of “stub ends”;
- provision of rail facilities for movement of construction materials;
- direction signing to worksites;
- emergency access protocols and internal road naming conventions;
- workforce distribution, mode share and assignment, to include proposals for transport provision for movement of construction workforce;
- designated routes for large goods vehicles and dealing with abnormal loads;
- construction traffic access arrangements and phasing to and from the construction sites;
- off-site parking issues and on-site parking provision and control;
- provision for walking and cycling;
- lorry holding areas;
- driver standards and enforcement within the construction sites and on the highway;
- monitoring;
- dealing with complaints and community liaison; and
- Construction Transport Management Plan (CTMP) review.

The CTMP will provide the framework for the preparation of a site wide travel plan, to be produced in conjunction with the CEMP.

Access arrangements to adjacent areas of development and utilities within the THE PROJECT, in particular the supplier park, may also be identified within the Construction Transport Management Plan.

5.4 Temporary or permanent closure and diversion

The Employer will ensure that public notices are issued in advance informing local residents and, businesses of dates and durations of road and rights of way that may temporarily close. The contractor will ensure provision and maintenance of suitable and sufficient signs and barriers indicating temporary closures to public accesses and rights of way.

5.5 Road cleanliness

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 the use of the site and will include:

- hardstanding at the access and egress points which will be cleaned at appropriate intervals;
- vehicle clean down points to clean vehicle wheels at each exit point on to the highway;

- the correct loading of vehicles and sheeting of loads where necessary to avoid spillage during their journeys;
- the use of mechanical road sweepers combined with water sprays for the suppression of dust to clean site hard standings, roads and footpaths in the vicinity of the site; and
- the flushing of gullies in the vicinity of the site.

5.6 Highway reinstatement

Where temporary alterations to the highway are required, the highway will be restored to the reasonable requirements of the local highway authority.

The condition of relevant parts of the highway will be recorded prior to commencement and after completion in consultation with the highway authorities. The highway authorities will be notified of surveys and may send a representative if they wish. Any remedial works required as a result of the works will be undertaken to the reasonable satisfaction of the relevant highway authority.

After completion of any works affecting a highway, 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.

5.7 Large vehicle controls

As part of the Construction Transport Management Plan, routes for large goods vehicles into and out of the site will be identified. The routes identified will primarily be major roads (motorways and A roads), except for immediate access points into the Park. Approval of local routes to be used by large construction vehicles will be sought from the relevant authorities.

Deliveries to the site or removal of materials from the site shall take place during the hours and in the manner specified in the CTMP. Deliveries to site will be managed and controlled through a delivery booking system with marshalling points to hold delivery vehicles until required on site.

There will be no parking of large goods vehicles on the highway in the vicinity of any worksite. The location of any lorry holding area will be approved through the Construction Transport Management Group. Delivery vehicles will be required to turn their engines off when waiting within or near the site.

An appropriate control system will be implemented for the dispatch of all vehicles containing excavated material, demolition materials or other waste material.

Vehicle identification signs will be displayed in a prominent position on large goods vehicles using public roads.

5.8 Management of large goods vehicle movement

Large goods vehicles which are either, reported for utilising routes which are not approved (unless for reasons of local access or which are directed by a Police Officer or Traffic Warden in uniform) or which are observed by accredited representatives of the Employer to travel on inappropriate routes, or in an inappropriate manner, shall be reported to the principal contractor and Construction Manager for investigation. The principal contractor shall carry out all possible enquiries to identify the relevant company and driver. Members of the public or council officers will be able to report vehicles identified on unauthorised routes or at unauthorised times, by calling the Employer helpline.

Drivers of any vehicle operated on-site shall obey any traffic sign, road marking or traffic signals, or the direction of any traffic marshal appointed by the principal contractor or any accredited representative of the Employer.

5.9 Car Parking

A parking area is to be established. The parking area is to:

- Suitably surfaced to prevent damage to vehicles or result in transfer of mud to surrounding roads
- Be suitably segregated to ensure the safety of workers returning to their vehicles, and to be separate from all construction activities;
- Sufficiently well-lit to enable workers to reach their vehicles safely.

6 Noise and vibration

6.1 Objective

The contractor will have a general duty to use “best practicable means” (BPM) to minimise nuisance from noise and vibration. BPM is defined by:

- “practicable” means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;
- the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;
- the test is to apply only so far as compatible with any duty imposed by law;
- the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances.”

The noise and vibration limits specified in this ECoP, or which may be agreed with the local authorities, will not be regarded as a licence to make noise or vibration up to the allowable limit. However, works carried out during the “core hours” described in section 3.2, will be permissible within the terms of this ECoP up to the limits described in section 6.5: noise limits.

The contractor will accord with any relevant conditions relating to noise mitigation and monitoring, such as those specified in any planning or EIA permissions.

6.2 Neighbour notification

Occupiers of nearby properties shall be informed in advance of the works taking place where relevant, including the duration and likely noise and vibration impacts. In the case of work required in response to an emergency, the local authority and local occupiers shall be advised as soon as reasonably practicable that emergency work is taking place. Potentially affected occupiers will also be notified of the helpline number.

Where, in exceptional circumstances essential work causing noise above the limits set out in table 1 may be required, as part of the section 61 consent application process outlined above, the contractor will notify the occupants of noise sensitive properties at least two weeks prior to the commencement of the consultation with the relevant local authority. Proposals to cause noise above the limits set out above must be fully justified and kept to an absolute minimum.

The contractor will take into account consultation responses received from the neighbours and will have regard to any reasonable requests by the relevant local authority.

6.3 Noise control measures

Best practicable means will be employed to keep the level of noise and vibration generated on site as low as reasonably practicable (ALARP). Measures to be considered in implementing best practicable means will be consistent with the recommendations of BS5228:2009 or equivalent local standard if available and include one or more of the following as appropriate:

- Careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives and recommendations on noise and vibration emissions will be used.
- Design and use of site enclosures, housing and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity. Where practicable, doors and gates shall not be located opposite occupied noise-sensitive

buildings. The mechanisms and procedures for opening doors/gates will minimise noise, as far as reasonably practicable (see also section 3, general site operations).

- Choice of routes and programming for the transport of construction materials, spoil and personnel, (see also section 4, public access and transport management).
- Careful programming so that activities which may generate significant noise are planned with regard to local occupants and sensitive receptors.

Each item of plant used on the project will comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC. A register of plant and equipment and statutory certification will be completed for each construction zone.

The recommendations set out in Annex B of Part 1 of BS5228 and Sections 7.3 and 9.2 of Part 4 of BS5228 and or equivalent local standard will be adopted with regard to noise and vibration mitigation options. Where alternative authoritative guidance and procedures are thought to be more appropriate and have been agreed in advance with the relevant local authority, these may be adopted in place of the aforementioned.

Without prejudice to the other mitigation requirements in this section of the ECoP, the Contractor will comply with the following mitigation measures:

- All vehicles and mechanical plant used for the purpose of the work shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order and operated to minimise noise emissions.
- All compressors and generators shall be “sound reduced” models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.
- All machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum. Lorry engines will be switched off when vehicles are stationary.
- Noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure (see BS5228 Part 1:2009, Figures B.1, B.2 and B.3) or local equivalent standard.
- As far as practicable, demolition shall be carried out using equipment that breaks concrete in bending in preference to percussive methods.
- All pile driving shall be carried out by plant equipped with a noise reducing system or by silent driving systems. Percussive piling shall only be used where no other suitable system is available.
- Temporary noise barriers will be used to reduce noise levels where appropriate and practicable.
- Such measures can be particularly appropriate for stationary or near-stationary plant such as pneumatic breakers, piling rigs and compressors. Barriers should be located as close to the plant as possible and, in order to provide adequate attenuation, should have a mass per unit area of at least 7 kg/m^2. The screens may include soil mounds, site offices, site huts, acoustic sheds or partitions.
- Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors.
- Materials for night-time working shall be delivered during normal hours of working and be placed as close as possible to the work area for which they are required.
- Where reasonably practicable, fixed items of construction plant should be electrically powered in preference to diesel or petrol driven.

- Machines in intermittent use should be shut down or throttled down to a minimum during periods between works. Static noise emitting equipment operating continuously will be housed within suitable acoustic enclosure, where appropriate. Doors on plant and equipment will be kept closed.
- All generators and compressors will be „sound reduced" models fitted with acoustic lining/sealed acoustic covers where appropriate. All ancillary pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the manufacturer.

6.4 Reversing alarms

As far as reasonably practicable, noise from reversing alarms will be controlled and limited. This will be managed through the following hierarchy of techniques:

- The site layout will be designed to limit and where reasonably practicable, avoid the need for the reversing of vehicles. Measures will be undertaken to ensure that drivers are familiar with the worksite layout.
- Banksmen will be utilised to avoid the use of reversing alarms.
- Reversing alarms incorporating one of more of the features listed below or any other comparable system will be used where reasonably practicable:
  - highly directional sounders;
  - use of broad band signals;
  - self-adjusting output sounders; and
  - flashing warning lights.
- Reversing alarms will be set to the minimum output noise level required for health and safety compliance.

6.5 Noise Limits

The Contractor and Trade Contractors shall ensure that the above techniques are applied. The following noise limits, measured 1.5m above ground 1 m from the nearest noise sensitive receptors shall be met:

Table 6.1. Noise limits to be achieved

Building type	**Daytime $L_{Aeq,p}$**	**Night-time $L_{Aeq,p}$**
Buildings requiring special protection, as defined by Regulation of the Ministry of Health of the Slovak Republic No. 549/2007 Coll.	46	40
Habitable rooms in residential properties, schools, hospitals and recreation zones as defined by Regulation of the Ministry of Health of the Slovak Republic No. 549/2007 Coll.	50	46
Industrial sites and other low sensitivity receptors, as defined by Regulation of the Ministry of Health of the Slovak Republic No. 549/2007 Coll.	70	70

The contractor shall ensure all methods of working and noise mitigation techniques achieve the above criteria.

6.6 Vibration

Criteria and 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, for which Vibration Dose Values are assessed (VDVs are defined in BS 6841 (or local equivalent) and their application to occupants of buildings is discussed in BS 6472 (or local equivalent); to protect buildings and other structures from risk of physical damage, for which peak component particle velocities (PPVs) are assessed in accordance with BS 7385, or local equivalent; 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.

It is recognised that in some buildings, two or three of the above sets of criteria may apply, and in those cases the criteria shall be evaluated separately. In establishing criteria, controls and working methods, guidance in BS 6472, BS 5228 and BS 7385 (or local equivalents) will be taken into account.

6.7 Vibration disturbance criteria

Subject to the specific requirements of the local authorities, the following minimum requirements, as specified in BS 6472:2008 (or local equivalent), and set out in table 6.2 below, will be met as far as practicable, to protect residents and users of buildings from nuisance and harm:

Table 6.2: vibration dose values

Building type	**Period**	**VDV (ms-1.75)**
Eligible dwellings [1]	08:00 to 23:00	0.40
	23:00 to 08:00	0.20
Residential, any period of intermittent vibration	-	PPV <0.28 (mm/s)
Educational establishments, offices and similar [2]	Over normal daily period of use	0.40
Commercial [3]	Over normal daily period of use	0.80

[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.

The VDVs set out in table 6.2 are those specified in BS 6472:2008 (or local equivalent) below which there is a “low probability of adverse comment”.

Best practicable means will be used to control vibration levels so that the PPV measured at the base of any building in accordance with BS 7385 (or local equivalent) does not routinely exceed a level of 5mm/s except for particularly sensitive buildings (see below) where the level should not exceed 3 mm/s.

Where the level of 5mm/s is predicted to be exceeded, an appropriate defects survey will be carried out. In addition an assessment of the vulnerability of that building will be carried out by an engineer or consultant experienced in the assessment of vibration damage to buildings in accordance with the

relevant standards and the results recorded in Part B. Works expected to generate peak component particle velocities above 5 mm/s will be notified to the relevant local authority in the Method Statement and the measured vibration levels will not exceed the relevant thresholds given in both table 1 and figure 1 of BS 7385; part 2: 1993.

Best practicable means will be used to control the potential impact of soil relaxation on surrounding properties.

Some medical, scientific and commercial procedures are especially sensitive to vibration and may be adversely affected at magnitudes of vibration independent of disturbance criteria. All reasonable endeavours will be used to identify any premises where such activities are taking place. Those buildings which are to be considered as sensitive will be agreed with the relevant local authority. As such a dispensation may be applied for at an appropriate time for the works in consultation with the relevant authority where the vibration levels during construction are predicted to exceed 1.0mm/s PPV and 3.0mm/s PPV in residential and commercial respectively.

If vibration levels are predicted to exceed the criteria specified then vibration monitoring will be undertaken by a suitably qualified practitioner during the activity and the contractor will adopt alternative methods of working to reduce vibration levels as necessary. The monitoring programme will be agreed between the Contractor, the owner, and the relevant local authority. This programme will include the location and frequency of readings and will identify to whom the results should be made available.

In the event of a complaint the contractor will investigate the cause and apply mitigation measures as necessary.

6.8 Noise and vibration monitoring

Prior to the start of construction works in any particular delivery zone, a scheme for noise and vibration monitoring, assessment and mitigation for all construction plant and processes within that delivery zone shall be submitted to the local planning authority for approval. Such a scheme should include the following:

- the identification of noise sensitive premises to be used as the location for noise monitoring, including any arrangements proposed for amending the selected locations if new noise sensitive premises are introduced during the construction period;
- the noise parameters to be measured and the circumstances when continuous monitoring will be undertaken;
- the arrangements for reporting the results of noise monitoring to the local planning authority; and
- the arrangement for implementing mitigation measures during construction for sensitive premises.

A schedule of premises containing people or equipment potentially sensitive to disturbance from vibration or any building potentially at risk of damage from vibration shall be submitted to the local planning authority for approval prior to the start of construction works in any particular delivery zone where appropriate. The schedule shall include proposals for monitoring vibration levels, where necessary, ensuring that where practicable, vibration levels do not exceed those specified above in section 5.7: vibration disturbance criteria, and details of mitigation or other remedial measures to be applied.

The results of any noise and vibration monitoring will be made available, as required, to relevant local authorities. Regular liaison with the relevant authorities will be established to review noise monitoring procedures. Access to monitoring sites within the site boundary will be facilitated at all reasonable times for inspection and/or noise measurements by the local authority environmental health personnel, following appropriate site specific induction and/or health and safety training.

7 Air quality

7.1 Objective

Emissions to the atmosphere in terms of gaseous and particulate pollutants from vehicles and plant used on the site and dust from construction activities will be controlled and limited, as far as reasonably practicable. Potential sources, and sensitive receptors will be identified and appropriate control techniques will be applied.

All provisions of Act of the NC of the SR No. 137/2010 Coll. on Air, as subsequently amended, Act of the NC of the SR No. 401/1998 Coll. on Charges for Air Pollution, as subsequently amended, Act of the NC of the SR No. 124/2006 Coll. on Safety and Health at Work and Regulation No. 396/2006 Coll. on Minimum Safety and Health Requirements for Construction Sites will be complied with.

7.2 Vehicle and plant emissions

The adverse impacts of vehicle and plant emissions will be controlled. Measures to be considered for limiting emissions and avoiding nuisance will include measures such as:

- ensuring that the engines of all vehicles and plant on site are not left running unnecessarily;
- using low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices;
- using ultra low sulphur fuels in plant and vehicles which meet the EN 590 specification;
- ensuring that plant is well maintained, with routine servicing of plant and vehicles to be completed
- in accordance with the manufacturers' recommendations and records maintained for the work undertaken;
- ensuring that all project vehicles, including off-road vehicles, hold current MOT certificates, where required due to the age of the vehicle, (or to be tested to an equivalent standard) and that they comply with exhaust emission regulations for their class;
- locating haul routes and operating plant away from potential receptors such as houses, schools and hospitals;
- maximising energy efficiency (this may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing), use of biofuels and electric vehicles; all commercial road vehicles and construction plant, including stationary plant used in construction must comply with any legislative requirements, including the European Emission Standards pursuant to the EC Directive 98/69/EC and 715/2007/EC (commonly known as Euro standards) during any works. In the event of a change to these standards, all such vehicles will meet any new standard within one year of its introduction.

7.3 Dust control

The contractor will take all necessary measures to avoid creating a dust nuisance during both construction and demolition works. Best practicable means will be used to minimise dust. Contractors will be required to follow Best Practice Guidance.

Dust control measures for large sites of strategic importance should include:

Site planning:

- erect solid barriers to site boundary in dust sensitive locations;

- no bonfires;
- plan site layout – work compounds will be laid out so that accesses and loading areas and machinery and dust causing activities are located as far away from sensitive receptors as practicable so that where practicable temporary structures screen these activities;
- all site personnel to be fully trained;
- trained and responsible manager on site during working times to undertake observations of dust and weather conditions, maintain a
- site logbook and carry out site inspections;
- hard surface site haul routes;
- put in place dust monitors at the perimeter of the site; and
- obtain all consents required including any abstraction licence from relevant local regulators for the use of water as a dust suppressant.

Construction traffic:

- effective vehicle cleaning and specific fixed wheel washing on leaving site and damping down of haul routes;
- all loads entering and leaving site to be covered;
- no site runoff of water or mud;
- provision of easily cleaned hard surfacing for vehicles and the effective cleaning of haul routes; and
- appropriate speed limit around site, including limiting vehicle speeds on unpaved surfaces to 20 kph.

Site activities:

- minimise dust generating activities;
- use water as dust suppressant where applicable;
- cover, seed or fence stockpiles to prevent wind whipping;
- drilling and excavation surfaces to be wetted where appropriate;
- debris piles to be kept watered or sheeted as necessary;
- the enclosure of material stockpiles at all times and damping down of dusty materials using water sprays during dry weather;
- re-vegetate earthworks and exposed areas; and
- if applicable, ensure concrete crusher or concrete batcher has a permit to operate.

The EMP will include an inventory and timetable of dust-generating activities, identify appropriate control measures, and arrangements for dust monitoring with particular regard to the location of sensitive receptors, including monitoring equipment to be used.

7.4 Dust monitoring

The monitoring and control measures detailed in the Best Practice Guidance will be adopted, in so far as is reasonably practicable.

A scheme for dust monitoring, assessment and mitigation for all construction activities will be submitted to the local planning authority for approval. The scheme will include:

- the identification of dust sensitive premises to be used as the location for dust monitoring, including any arrangements proposed for amending the selected locations if new dust sensitive premises are introduced;
- the frequency and other arrangements for dust monitoring; and
- the arrangements for reporting the results of dust monitoring to the local planning authority.

7.5 Other measures

The contractor will ensure that bitumen is not overheated, pots and tanks containing bitumen will be covered, spillages will be minimised and where possible, bitumen will not be heated with open flame burners.

The contractor will take precautions to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oils. Plant will be well maintained and measures will be taken to ensure that it is not left running for long periods when not in use.

8 Contaminated land

8.1 Current site condition

Construction works will be carried out in such a way as to prevent, contain or limit, as far as reasonably practicable, any adverse impacts arising from the presence of contaminated land or material.

8.2 Site assessment and remediation work

Should contamination be detected in either soils or groundwater, the contractor shall develop a remediation strategy for approval by the client. Following implementation of the remediation works appropriate validation will be undertaken and a Remediation Validation Report will be prepared for individual sites. The Remediation Validation Report will be submitted to the District Office following the completion of the remediation works confirming that the remediation strategy has been implemented in full.

8.3 Control of Earthworks

A certification scheme shall be operated for the control of any treated or acceptable excavated materials. Where excavated materials cannot be taken to the place of deposition immediately materials shall be stored in intermediate stockpiles prior to placement at the treatment site. Each stockpile will be clearly demarcated, and will be protected so that the materials cannot become re-contaminated i.e. they will be placed on hard standing and covered. Stockpiles will also be constructed in such a way as to prevent the possibility of the materials contaminating the surrounding area.

Potential pollution concerns through increased infiltration within open excavation areas will be assessed, and given due regard. Particular care will be undertaken when areas of soluble contaminants have been identified and these areas will be addressed to ensure that contaminants are not mobilised and impact receptors.

Any groundwater control measures that are required will also take note of the contaminated nature of the site. Contaminated groundwater will only be allowed to re-enter the site when the appropriate consent is held, otherwise dirty waters will be treated as a waste and processed through the local temporary waste treatment processes.

Free product whenever encountered will be collected and removed from the site.

8.4 Soil movements, Waste management licensing/exemptions

Soil movements will not be allowed between different construction sites without a materials requirement note and certification of conformance being exchanged between the sites or soil handling area and the receiving site. Written permission is required from the National authority prior to moving any soil. With reference to:

- controls that will be in place to ensure that the fill is appropriate and will comply with site specific remediation targets;
- appropriate management of stockpiles of pre-treated materials to reduce the risks associated with the potential mobilisation of contamination, via leaching of contaminants

within the stockpile as a result of infiltration, migration of contaminants within the surface water on site and subsequent vertical and lateral migration; and

- the materials management system proposed to control the various earthworks operations to be undertaken.

This system will be open to inspection by the Local Authority EHO and/or the Environment Agency.

8.5 Soil treatment

Any soil treatment processes will be operated in accordance with their licence requirements. All emissions will be managed so not to impact upon site neighbours and the local environment, and specific measures shall be incorporated to reduce risks associated with potential airborne emissions and discharges of water effluent resulting from the temporary treatment works. All emissions/discharges will be subject to licence conditions and authorisations in conjunction with the relevant regulatory authorities.

8.6 Validation

Validation testing shall encompass the final surface and materials deposited at depth.

The frequency of testing will be sufficient to provide confidence to regulators, future land owners and the regulatory authorities.

Certification of materials moved from one site to another will be included with the validation report.

The validation report will contain a clear and unambiguous statement relating to the on-going need for further remediation in the event of any change of use and / or legacy use of the site.

If remediation of groundwater is undertaken then the validation process will be agreed before remediation commences, but will follow established practice, with interim monitoring reports being provided at an agreed frequency.

On-going Issues

The Health and Safety file, prepared under the CDM regulations 2015, will be passed on to developers and contractors by Employer, this will include details on the procedures of any excavations and particular buried hazards i.e. areas of the site containing levels of contaminants.

Monitoring – and subsequent closure of monitoring wells

Monitoring of surface water and groundwater will be undertaken at agreed locations and an agreed frequency as detailed in the site monitoring plan.

Wells for monitoring the groundwater are to be maintained in line with the monitoring plan. The abandonment programme will be agreed with the District of The city. This will be done to ensure that monitoring wells do not provide a future preferential pathway for contaminants.

8.7 Control

A ‘Permit to Proceed Protocol’ system will be operated to control excavation works. In particular the Permit to Proceed Protocol will provide a system for the protection of the integrity of the remediation works already undertaken pre development and also ensure that excavation arising are handled, stored and managed in an appropriate manner and in accordance with the relevant waste management requirements (see also Chapter 8).

The ‘Permit to Proceed Protocol’ system will require as a minimum to be managed by an appropriately ‘Qualified Person’ (QP) and the details outlined below:

- detail the work to be undertaken;
- detail the precautions to be taken;
- state that all foreseeable hazards have been noted; and state the control measures to be implemented.

8.8 Specific provisions for pollution prevention and control

Appropriate controls should be implemented during earthworks and construction activities to provide adequate pollution prevention. Contractors will be required to identify appropriate control procedures and measures within the delivery zone EMPs. These should include but not be limited to the issues outlined below and should be implemented in accordance with current legislation and approved codes of practice.

- Procedures to reduce risks associated with the presence of plant on site to reduce risks of spillages/leakages - managed through implementation of appropriate controls and authorizations to ensure the appropriate storage, handling and transportation of potentially contaminating materials, outline of controls to be put into place.
- Measures to reduce risks associated with the increase in infiltration of any surface water from the site which may result in an increase in leaching within the upper zones of the underlying strata and related mobilisation of any entrained contamination via vertical and/or lateral migration.
- Procedures for the removal of any deep piling/sheet piled walls (which may create a preferential pathway for any contamination within the upper strata to the underlying minor and major aquifers).
- Measures to limit the risks associated with any dewatering undertaken.
- Measures to reduce risks to the human health of site workers, site visitors and adjacent land users due to disturbance of the current land cover and subsequent groundworks, will include the following:
  - preparation of health and safety assessments for the tasks undertaken which will identify appropriate working methods, permits to work procedures to reduce the potential risks to site workers and site visitors (for example, the placement of a surface tracking layer), dust monitoring and suppression and personal protective equipment (PPE) where necessary;
  - details of contaminants identified will be provided in the health and safety file for the site to inform site workers and visitors during induction procedures;
  - appropriate working methods to reduce risks from wind blow including damping down the works and dust control techniques as outlined in the specification for demolition works; and
  - adoption of the safe working practices as set out in the HSE documents.
- Measures to reduce risks associated with potential airborne emissions and discharges of water effluent resulting from the temporary treatment works. All emissions/discharges will be subject to licence conditions and authorisations in conjunction with the relevant regulatory authorities.
- Appropriate pollution control measures will be introduced to monitor and manage the potential environmental effects of both the enabling works as a whole and the site remediation works components. These control measures will themselves be monitored throughout the works to ensure that the controls are effective with corrective actions and improvements put into place when relevant.
- Measures to reduce risks associated with potential for cross boundary migration of contamination from adjacent sites into delivery zones or vice versa depending on the

respective environmental characteristics. Circumstances may also apply with adjacent delivery zones where phasing of works may render a remediated zone exposed to conditions from a neighbouring site that is yet to be commenced.

- Measures to reduce risks associated with surface watercourses throughout the application site in particular due to mobilisation of any contamination.
- Measures to reduce risks with regards to accumulation of vapours and gases which may give rise to effects on health and safety and the built environment during construction works.
- Monitoring of effects that the work is having on the surrounding environment. Reference should be made to the groundwater quality monitoring strategy, surface water monitoring strategy, etc.
- Reference to controls that will be in place to ensure that the imported fill is appropriate and will comply with site specific remediation targets.
- Reference to appropriate management of stockpiles of pre-treated materials to reduce the risks associated with the potential mobilisation of contamination, via leaching of contaminants within the stockpile as a result of infiltration, migration of contaminants within the surface water on site and subsequent vertical and lateral migration.
- Reference to the materials management system proposed to control the various earthworks operations to be undertaken.
- Reference to the piling works in accordance with good practice etc.
- Measures to reduce the risks associated with the installation of groundwater monitoring wells.
- Procedures for dealing with any radioactive waste on a precautionary basis (in accordance with the Environmental Assessment).
- Measures to communicate the constraints on further construction following completion of the remediation works.

In carrying out work on any contaminated site all relevant statutory provisions, including the appropriate authorities' requirements, will be complied with and CIRIA and other local guidance.

9 Materials management and recycling

9.1 Objective

Excavated materials and construction wastes generated at worksites will be managed, so far as reasonably practicable, in accordance with all applicable waste management legislation and in accordance with the following waste hierarchy:

- minimise the generation of waste;
- excavated material and waste will be re-used in environmentally beneficial uses within the site;
- excavated material and waste will be re-used in environmentally beneficial uses at sites outside of the site;
- excavated material and waste will be recycled in environmentally beneficial uses within the site;
- excavated material and waste will be recycled in environmentally beneficial uses at sites outside of the site.

9.2 General provisions

The Contractor will ensure that adequate, appropriate storage areas are provided to minimise the risk of accidental or weather damage to materials to reduce wastage. Materials are to be stored in an organised and tidy fashion to facilitate ease of use and efficient operation of lay-down areas. Just in time deliveries are to be used as far as practicable to reduce the risk of accidental damage.

The Contractor prepares a detailed 'Recycle and Re-use Schedule' to account for all of the materials arising from the construction works showing the proposed method of recycling and re-use for each material stream. The Contractor updates and submits the Recycle and Re-use Schedule on a monthly basis for the Project Manager's acceptance.

A Construction Waste Management Plan (CWMP) will be produced and implemented to manage waste generated during construction works.

The statutory requirements of Act No. 223/2001 Coll. and all other local and national legal requirements will be complied. Any necessary exemptions from waste management licensing in respect of the movement and storage of waste materials will be obtained. The THE PROJECT site is to be considered as one site for the purposes of waste management licensing and regulatory controls.

Where unsuitable material and other wastes have to be transported off site, the contractor will use registered waste carriers and appropriately licensed sites.

9.3 Construction Waste Management Plan

A Construction Waste Management Plan (CWMP) will be produced to manage construction waste during construction The plan will ensure all waste arising from the construction works are managed in a sustainable manner, maximising the opportunities to reduce, reuse and recycle waste materials. The CWMP will also detail the compliance and assurance requirements to be maintained on site during all phases of construction. The CWMP will contain:

- classification of all waste including hazardous waste according to current legislative provisions(see also section 7, contaminated land)
- performance measurement and target setting against estimated waste forecasts;
- reporting of project performance on quantities and options utilised;
- measures to minimise waste generation;

- opportunities for re-use or recycling;
- provision for the segregation of waste streams on site that are clearly labelled;
- recording of proposed carriers and the terms of their respective licences;
- licensing requirements for disposal sites;
- an appropriate audit trail encompassing waste disposal activities and waste consignment notes;
- measures to avoid fly tipping by others on lands being used for construction. Returns policies for unwanted materials; and
- measures to provide adequate training and awareness through toolbox talks.

9.4 Handling and disposal of waste

In addition to the relevant statutory provisions, the approved guidance and procedures in the identification, handling, transport, storage, recovery and disposal of waste will be complied with.

In the case of odour, suitable containment will be used so as to avoid the perception of odour at the site boundary. In the case of particulates dust control measures will be adopted as set out in section 7, air quality.

10 Protection of surface and groundwater resources

10.1 Objective

Works will be carried out and working methods implemented to protect surface and groundwater from pollution and other adverse impacts including change to flow volume, water levels and quality. This will be completed in accordance with relevant legislative requirements and appropriate industry guidance.

10.2 Water Management Plan

A Water Management Plan will be produced by the Contractor in consultation with the District of The city and other statutory bodies. The plan will outline procedures to prevent or limit adverse impact on the environment or protected rights for water resources and to ensure that the effects of the construction are balanced against other requirements. The Water Management Plan will take in to account information included within the Environment Impact Assessment.

The Water Management Plan will take account of the guidance contained within the relevant Pollution Prevention Guides issued by the UK Environment Agency and CIRIA documents. Local and national legal requirements are to be complied with in full.

The Water Management Plan will include the following:

- A description and definition (including schedules and maps) of surface watercourses and underground strata likely to be affected by the construction, either directly or indirectly.
- Maps showing all licensed abstractions of surface and groundwater within 2km of the site works
- The measures to protect against pollution of ground and surface water, which will include the following as appropriate:
  - drainage/treatment of contaminated effluent/potentially contaminated water;
  - discharge to public sewer;
  - discharge via settlement tanks or ponds;
  - installation of balancing ponds;
  - installation of interceptors;
  - control of potentially polluting substances to prevent accidental contamination of land or water bodies;
  - control of excavated material and other materials to prevent spillage, particularly during periods of higher flood risk (September to March), through appropriate handling and selection of materials storage locations;
  - monitoring and maintenance of drainage systems, collection ditches, lagoons and interceptors. The types of precautions when constructing diverted or new watercourses, culverts or bridges across watercourses to control and limit particularly during the higher flood risk period (September to March) any adverse impact on watercourses, flows, erosion, sedimentation or conservation interest;
  - a summary groundwater protection matrix, indicating protection measures likely to be required for various construction activities in designated groundwater protection zones for abstraction boreholes;
  - maps of all groundwater protection zones defined by the Ministry of the Environment, for all sources whose catchment zone is impacted by works;

- issues relating to contaminated land affected by the construction, together with proposals for protection of surface and groundwater (see also section 8);
- reference to procedures to be adopted in the event of unanticipated disturbance of groundwater levels affecting abstractions, watercourses or springs;
- arrangements for the supply of water to be used during construction, including avoiding unnecessary use of potable water; and
- water quality monitoring requirements.

10.3 General provisions

Site drainage, including surface runoff and dewatering effluents, will be discharged to sewers where possible and relevant permissions will be obtained from the sewerage or statutory undertaker. Discharge to watercourses will only be permitted where discharge consent or other relevant approval has been obtained.

Site drainage will meet the effluent standards required by the sewerage provider or environmental regulator as appropriate. Holding or settling tanks, separators and other measures as may be required, will be provided and maintained. Access will be provided to the sewerage system provider so that samples of discharge can be obtained and analysed and the flows verified as required.

The relevant sections of BS 6031: Code of Practice for Earthworks for the general control of site drainage will be followed.

The approval of the District of The city will be sought for plans of work likely to affect any surface or groundwater resource.

In so far as is reasonably practicable, the good working practices detailed in the English Environment Agency's Pollution Prevention Guidelines will be adopted. These guidelines include:

PPG 01: general guide to the prevention of water pollution;

PPG 05: Works and maintenance in or near water;

PPG 06: working at construction and demolition sites;

PPG 22: dealing with spillages on highways; and

Storage, handling, use, and disposal of any potentially hazardous materials shall be in accordance with the relevant statutory provisions.

Suitable spill response procedures will be produced by each Principal Contractor for the works being undertaken, with spill kits provided and positioned in vulnerable areas. Briefings and toolbox talks on the procedures will be given to site personnel to raise awareness.

Any environmental incidents will be reported even if they do not result in environmental damage. This will enable learnings and proactive preventative measures to be implemented.

Any necessary permits for holding substances in accordance with local legislation will be highlighted and obtained in a timely manner.

10.4 Protection of watercourses

Approval and all relevant consents will be obtained in advance for all crossings of, diversions to, and work within statutory buffer zones for watercourses from the District Office of The city and other appropriate bodies.

Protection measures for works in or adjacent to watercourses will be provided in accordance with appropriate requirements.

Watercourses, including land and/or road drainage, within the construction sites will be maintained to provide effective working conditions at all times.

All reasonably practicable measures will be taken to prevent the deposition of silt or other material in, and the pollution by sediment of, any existing watercourse, canal, lake, reservoir, borehole, aquifer or catchment area, arising from work operations. The measures will accord with the principles set out in industry guidelines including as the EA's note "PPG05: Works and maintenance in or near water:" and CIRIA's report "C532: Control of water pollution from construction sites". Measures may include use and maintenance of temporary lagoons, tanks, bunds and silt fences or silt screens as well as consideration of the type of plant used and the time of the year for working in watercourses.

10.5 Control of pollution of surface water

Protection measures to control the risk of pollution to surface water will be adopted and will include, where reasonably practicable:

- Any containers of contaminating substances on site will be leak proof and kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism. The containers will be protected by temporary impermeable bunds with a capacity of 110 per cent of the maximum stored volume. Areas for transfer of contaminating substances will be similarly protected.
- All refuelling, oiling and greasing will take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses and away from drains as far as reasonably practicable. Vehicles will not be left unattended during refuelling.
- Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on site. Drip trays will be placed below static mechanical plant.
- Any maintenance to vehicles will routinely be done off site but could be on site if undertaken over an impervious base.
- All wash down of vehicles and equipment will take place in designated areas and washwater will be prevented from passing untreated into watercourses.
- As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses.
- Appropriate measures to be taken to protect erodible earthwork surfaces.

10.6 Control of pollution of groundwater

The relevant sections of BS 6031: Code of Practice for Earthworks concerning the general control of site drainage (including, for example, all washings, dewatering, abstractions and surface water runoff) will be complied with.

Protection measures to control the risk of pollution to groundwater will be included within the overall strategy; these will in particular be consistent with the Environmental Permitting Regulations 2010 and the Groundwater Directives.

Where reasonably practicable, used materials in the permanent or temporary works that could pollute groundwater will be avoided.

Soak away and drainage arrangements will be determined in consultation with the District of The city and/or other appropriate regulatory bodies. Discharge consents will be obtained where required.

The Contractor and Trade Contractors shall employ techniques to prevent the movement of groundwater between shallow and deep groundwater horizons, which are separated by a clay layer. The deeper groundwater is subject to artesian pressure.

10.7 Dewatering

The foregoing provisions will also apply to dewatering, in addition to the following:

- Records of water pumped will be kept at all major dewatering sites where wells are constructed in the aquifer or shallow groundwater or where required under the terms of discharge consent;
- water quality at all major dewatering sites will be monitored weekly for the first four weeks of pumping and monthly thereafter. Monitoring will comprise a laboratory test of major ions and a field test of temperature and electrical conductivity as well as other parameters required under the conditions of an abstraction or discharge licence consent or permit;
- Pumps used for dewatering will stand in drip trays to prevent any fuel or oil spills contaminating the ground or the water.
- monitoring arrangements for dewatering will be developed in liaison with the Environmental District Office, local regulator or any extant permit conditions (such as those in the EIA1); and
- any site specific monitoring arrangements outside of limits will be dealt with by consent.

10.8 Water Efficiency

Measures shall be put in place to ensure water is used efficiently on site. Site welfare will use low flow fittings for WCs, urinals and taps. Wheel wash facilities will be recirculating to minimise water consumption. Settlement tanks will be provided for de-watering operations, and settled water used for local dust suppression and wheel wash top-up. The use of rainwater harvesting within the temporary accommodation will be investigated. All water supplies are to be metered, with monthly water consumption monitored and reported.

10.9 Flood risk compliance

The site is protected by existing flood defences. Works are being undertaken by the National authorities to upgrade the defences up stream, and all drainage connections for surface water discharge from the site to the River Of the city are being made by HBR Management. The Contractor and Trade Contractors shall not undertake any works that jeopardise the integrity of the flood defences, and are not permitted to do any works that penetrate the flood defences or within its vicinity without written consent of the Employer and all relevant national authorities. The Contractor should make themselves aware of any planning or regulatory constraints relating to works close to the flood defences.

11 Ecology

11.1 Objective

The requirements of the Act of the National Council of the SR No. 543/2002 Coll. on Nature and Landscape Protection, as subsequently amended and Decree of the MoE of the SR No. 24/2003 Coll. implementing the Act No. 543/2002 Coll. on Nature and Landscape Protection, as subsequently amended and other relevant local legislation and policy guidance in respect of areas of nature conservation interest and protected species will be complied with.

11.2 General provisions

The contractor will be required to:

- take all reasonably practical measures to minimise harm and disturbance to wildlife or their habitats caused by any work, light, noise, dust and vibration and other air pollution;
- take reasonably practical measures to minimise harm and disturbance to the aquatic environment and its biota caused by construction practices;
- fence off areas of adjacent habitat to prevent incursion into or damage (See section 11.5). Ensure that all site personnel are aware of the need to avoid damage;
- comply with the guidelines set out in British Standard (BS 6031 Code of Practice for Earthworks on soil stripping, storage and placing);

11.3 Protected species

Ecological surveys were undertaken as part of the site selection and original Environmental Impact Assessment for the site planning application. Detailed protected species surveys were not undertaken. Areas of potential use by protected species were removed during the enabling works contract under consent from the Office for Nature Conservation. Breeding birds have the potential to make use of the site throughout the construction period.

THE PROJECT will be an active construction site, therefore it is paramount that all on-site ecology is protected with appropriate management and mitigation to be identified and implemented.

Any required protected species licences will be obtained. These licences must be in place before works which are the subject of these licences start on site. The conditions of any licence will be adhered to. Where a species is protected by specific legislation, the approved guidance will be adopted in complying with the legislative requirements for that species.

11.4 Ecology Management Plan

An Ecology Management Plan will be prepared and implemented to include:

- the identification of all known areas and features of nature conservation interest potentially affected, in particular, those areas to be retained (including those listed in 10.3 above), including a site plan at an appropriate scale indicating protection zones, work area and access routes etc.;
- protection measures to prevent incursion into or damage of retained habitat areas, and steps to ensure that all site personnel are aware of the need to avoid damage
- protection measures, both temporary and permanent, to prevent disturbance or encroachment into adjoining areas of nature conservation interest whether by air, land or water;
- procedures for the establishment, maintenance and auditing of ecological records;

- procedures for the safeguarding and, where agreed, relocation of protected and notable species identified in the ES and set out above, under formal licences where necessary, including details of the receptor sites and monitoring of relocations;
- procedures to be adopted in the event of unanticipated discovery or disturbance of protected species or important habitats of high ecological value;
- procedures to be adopted in addition to those general controls identified in section 13, Pollution Incident Control in the event of a pollution control emergency on or near a designated nature conservation site;
- procedures for the control of invasive species listed in Decree No. 24/2003 Coll. or other relevant statutory provisions, to the satisfaction of the Ministry of Environment and relevant local authorities; and
- methods for watching briefs.

11.5 Protection of trees

Prior to development of the site by HBR , HBR have undertaken surveys of the trees and shrubs on site and removed those of low value.

Two trees are to be retained at the southern side of the site. Trees are to be protected in accordance with BS 5837: 2012 - "Guide for trees in relation to construction" or equivalent local standard. All tree surgery will Comply with BS 3998 “Recommendations for Tree Works” or equivalent local standard insofar as these are reasonably practicable.

The elements of this approach are as follows:

- selective removal of lower branches in an approved manner, to reduce mechanical damage by construction plant;
- retained trees will be protected with tree protective fencing to BS 5837: 2005 - "Guide for trees in relation to construction" or equivalent local standard;
- the tree protective fencing will be placed on a line formed by the retained tree canopies, or at a greater distance from the tree canopy if working conditions allow;
- the tree protection is to be installed before any materials or machinery are brought onto the site and before any stockpiling commences. Special attention should be paid to ensuring that barriers remain rigid and complete.
- matting is to be installed around the root zone to minimise soil compaction;
- notwithstanding the above, construction activities will be controlled to minimise compaction of the ground beneath the entire tree canopy. No heavy plant or materials or plant will be stored and construction movements will be controlled by fencing or other means so as to minimise vehicle movement within the canopy;
- the existing ground levels will not be altered beneath the extent of the tree canopy, unless agreed by an arboriculturalist in relation to tree pruning requirements;
- no ploughing, ripping, storage materials or soil tipping, etc. will take place in the protected areas beneath the tree canopy;
- all works to ground within the protected area will be undertaken by hand unless agreed otherwise with the arboriculturalist. In particular, any works to eradicate invasive plants (e.g. Japanese Knotweed) will need to use the “cut and inject” method or contact surface application of herbicide; and
- any works to tree canopies will be undertaken by a qualified tree surgeon.

Whilst trees of significant ecological value have been retained, there is a requirement of the local legislation to plant a tree for every 4 car parking spaces on the site. The trees will be placed in

suitable locations as part of the landscaping design. Any tree that dies as a consequence of the construction must be replaced by a suitably sized transplant determined by the Employer in an agreed location. There may be cases where more than one new tree will be required to adequately compensate for the loss of amenity. Any site for new planting must be thoroughly prepared prior to planting. Aftercare including irrigation must be implemented to all set horticultural and arboricultural standards for suitable periods. Any tree which dies within five years must be replaced with suitable new trees.

12 Archaeology and heritage

Intrusive archaeological investigations are ongoing. Until investigations are completed a fully Archaeological Method Statement for works cannot be prepared. However, it has been confirmed that there are no archaeological features within the footprints of any of the buildings, and therefore mitigation plans are not required for works within these areas of the site.

13 Pollution incident control

13.1 Objective

Works will be carried out in such a way as to avoid pollution incidents; however should any occur procedures and measures will be implemented to contain and limit the effects as far as reasonably practicable.

Such procedures and measures will cover atmospheric, aquatic or land pollution and procedures in the event of fire.

13.2 General provisions

The correct storage, handling, use, and disposal of any potentially hazardous materials will be used in accordance with the relevant statutory provisions, the requirements of this document and Environment Agency and Health and Safety Executive (HSE) Codes of Practice and Guidance notes.

Suitable spill kits will be provided and positioned in vulnerable areas. Briefings and toolbox talks will be given to site personnel to raise awareness.

13.3 Pollution Incident Control Plan

The relevant statutory bodies including the National Environment Agency, Ministry of Labour (Construction), Fire Authority, and the Local Authority (Emergency Planning) will be consulted in preparing a Pollution Incident Control Plan. This plan will cover the procedures to be followed to limit the spread of pollution in the event of an incident. Contractors will be required to implement the provisions contained in the Pollution Incident Control Plan.

The Pollution Incident Control Plan will complement and be consistent with the relevant Emergency Preparedness Plans, as required by health and safety legislation, other environmental management and health and safety procedures.

The Pollution Incident Control Plan will contain, but not necessarily be restricted to:

- guidance on the storage and use of hazardous materials with the aim of preventing and containing spills and releases;
- guidelines on the degrees of containment which take account of the nature of the materials and the sensitivity of the environment;
- procedures to be adopted in the event of a pollution incident, to contain and limit any adverse effects;
- procedures and appropriate information required in the event of any incident such as a spillage or release of a potentially hazardous material;
- systems for notifying appropriate emergency services, authorities, the Employer and Contractor's personnel;
- arrangements for notifying appropriate statutory bodies and local authorities of pollution incidents where required to by legislation; and
- relevant procedures and contacts for each work site for forwarding to the emergency services, and appropriate authorities.

14 Prohibited and referable materials

14.1 HBR Restricted Substance Management Standard

HBR requires all suppliers to it to ensure that the materials supplied comply with their Supplier Environmental and Social Requirements (June 2015). The following black, grey and green lists are to be adhered to by all suppliers and manufacturers supplying products to THE PROJECT

14.2 Black List Materials

Conflict Minerals
HBR supports the goals and objectives of the Dodd-Frank Conflict Minerals Act, which aims to prevent the use of conflict minerals that directly or indirectly finance or benefit armed groups in The Democratic Republic of the Congo (DRC) or an adjoining country as defined in the Act. Conflict minerals include: columbite-tantalite (coltan) (i.e. tantalum), cassiterite (i.e. tin), gold, wolframite (i.e. tungsten) or their derivatives and could expand to include any other mineral or their derivative determined by the U.S. Secretary of State to be financing the DRC conflict. The Act requires due diligence with respect to the sourcing of conflict minerals.

Aggregates not in compliance with BS EN 206-1: 2000 and BS 8500: 2002
Aggregates not complying with these standards such as sea dredged aggregates may contain sulphates, chlorides, organic materials which are incompatible with cement and can cause Alkali-Silica Reaction. Cracking caused can make concretes more susceptible to frost attack leading to corrosion of the reinforcement. The presence of chlorides also impairs sulphate resistance.

Asbestos or asbestos containing products
These include white asbestos (chrysotile), brown asbestos (amosite) and blue asbestos (crocidolite). Asbestos is a proven carcinogen and there is no known cure for asbestos related diseases.

Azodoic Dyes (Azo Dyes)
Used in the production of textiles, plastics, leather, and some paints. A small number of these dyes have been found to break down under certain conditions to produce carcinogenic *aromatic amines.* Some, in their normal state have also been identified as causing allergic reactions when in contact with the skin. Studies have shown that these dyes accumulate in the environment, and the release of their degradation products (aromatic amines) is facilitated under conditions where oxygen is not present (e.g., in landfill sites). Azo dyes which break down to form any of the aromatic amines listed under the *Controls on Certain Azo Dyes and "Blue Colourant" Regulations 2003* are not permitted for use.

Calcium Chloride admixtures in reinforced concrete
The protective oxide film that forms over steel in concrete is not stable in concretes containing calcium chloride, and therefore the potential for corrosion exists. Appropriate limits for chloride ion sources are detailed in BS5328 and BS8110. Only admixtures with sufficiently low chloride content to meet these overall limits should be used in mixes in contact with steel or corrodible metal. This includes mortar in contact with metal wall ties.

CFCs, HCFCs, Halons etc
Any product, which consists of, or contains or uses in its manufacture (eg extruded polystyrene using CFCs as a blowing agent) substances currently prohibited by the Montreal Protocol on substances that deplete the ozone layer. This does not preclude the use of substances to be phased out.

High Alumina Cement (HAC) in structural elements
The chemical resistance of HAC is reduced following conversion (crystallographic alteration), that occurs naturally with age or accelerated by increased temperature. Conversion products are also more susceptible to chemical attack.

Lead used in circumstances where prohibited by UK or Local Legislation
Lead is toxic and human ingestion can result in anaemia, digestive disorders and damage to the central nervous system. It is also a cumulative poison and prolonged low level exposure can result in low IQ behavioural disorders, hyperactivity in children and cardiovascular disease in soft water areas. Particularly important in children where retarded development may arise. The use of lead is therefore prohibited by legislation in specific circumstances such as for water pipes, lead lined tanks, lead based solders and paints.

Lindane (gamma-HCH)
Lindane is used as a wood treatment and as an insecticidal spray and is considered to be carcinogenic, cause damage to the nervous system and hormone disruption. It use is already banned in Sweden, Denmark, France and the Netherlands.

Mundic Blocks and Mundic Concrete
Mundic blocks and concrete are formed from contaminated aggregates from mining wastes. The structural strength is reduced to a friable and weak condition subject to certain ambient conditions.

Polychlorinated Biphenyls (PCBs), Polychlorinated Terphenyls (PCTs)
PCBs and PCTs are a family of organochlorine chemicals used extensively as insulators in electrical equipment. They are considered to be carcinogenic. Their use and manufacture is now prohibited in the UK.

Pentachlorophenol or timber treated with Pentachlorophenol
Pentachlorophenol is a manufactured chemical used as a biocide and wood preservative. Short term exposure to high concentrations or long term exposure to low concentrations can cause harm to the liver, kidneys, blood, gastrointestines, immune and nervous systems.

Tributyltin (TBT)
TBT is a family of chemicals including TBT oxide, TBT sulphide, TBT adiapate TBT methylacrylate, TBT fluoride and TBT acetate. TBT is used as a fungicide and bactericide in underwater and anti- fouling paints, as a water-repellent coating, antioxidant, preservative for wood, textiles leather and glass, as a curing agent and a corrosion inhibitor. It is a potent central

nervous system toxin and skin irritant, causing pruritis, or itching and exposure can cause nausea, cramps and vomiting.

Urea Formaldehyde Foam or other materials that may release formaldehyde at concentrations above limits set by HSE.
Urea Formaldehyde Foam is a cellular product, which has poor strength properties but good thermal properties. It is used in wall cavities to improve thermal insulation. Building materials made with formaldehyde resins can emit formaldehyde gas (colourless and strong smelling), that may pose a hazard to human health. Formaldehyde is considered to be carcinogenic.

Vermiculite (unless established as asbestos free)
Vermiculite is the mineralogical name given to hydrated laminar magnesium-aluminium-iron silicates that resemble mica in appearance. It has been commonly used as an aggregate in lightweight concretes. Vermiculite is a dusty material and is associated with asbestos, which occurs as impurities in some vermiculite ore bodies. Use of vermiculite products is only permitted where it has been established that it is free from asbestos fibres.

Wood Wool Cement Slabs used as permanent formwork
Caution is needed when using slabs as permanent formwork in concrete construction because the absorbency of the material has a tendency to produce a loss of fine aggregate and grout from the concrete and may also cause inadequate compaction.

14.3 Advisory List of Referable Materials ("Grey" List)

The following materials and substances are not currently banned by legislation, **but in the specific circumstances described**, are considered to be potentially hazardous and/or environmentally deleterious or technically undesirable at one or more stages of their life cycle. This list includes certain materials and substances that should be avoided in undesirable circumstances but may be acceptable in other circumstances. These materials should not be used without guidance from the Construction Manager, Safety and/or Legal advisers. Use of these materials must be justified and approved by the Construction Manager.

Man Made Mineral Fibre (MMF) or naturally occurring fibre with a thickness of 3 microns or less and between 5 and 200 microns in length, unless appropriately sealed to prevent migration
Evidence is currently inconclusive as to whether these materials pose risks to human health. For the avoidance of doubt, this does not include Rockwool insulation products where used in uncut rigid slabs as supplied by the manufacturer. Any Alteration to the format of the slabs either by cutting, wiring, mitring or fixings will require to be suitably encased in paper to prevent migration of particles unless slabs are subsequently covered by other elements of the buildings fabric or finish.

PVC (Polyvinyl Chloride)
PVC has many applications in construction, but can be environmentally deleterious in manufacture, and is hazardous when burnt. PVC is not considered to be a sustainable material as it is derived from fossil fuels and where landfilled additives such as phthalates can leach out contaminating soil and groundwater. We will therefore seek to identify viable alternatives and encourage their use. When PVC is specified by clients, we will suggest such alternatives for consideration. When considering alternatives to PVC, we must consider the economic, environmental and social impacts across their whole life cycle, including fitness for purpose, exposure, workability, maintenance, dismantling, and ease of recycling. Where PVC is required for performance-based reasons, and this can be justified, we will take a number of mitigating measures to ensure that it is responsibly manufactured and the waste responsibly disposed of. We seek to work with suppliers who minimise impacts by having the following processes in place: • PVC manufacturers must have phased out, or be working towards and reporting on the phasing out of heavy metals such as lead, mercury or cadmium. • A recycled content of at least 30% (including post-consumer and post-industrial waste) unless this is specifically precluded by third-party performance requirements, such as BBA, BS:EN etc. • All chemicals used in the production of virgin PVC must be registered or preregistered for use under the regulations with the European Chemical Agency (REACH) otherwise they are banned from use • Manufacturers must either operate a take-back scheme that offers a closed loop recycling system or identify a mechanical recycling system for post-consumer waste and ensure that adequate controls are in place to prevent persistent organic compounds from being released into the environment.

Polyurethane or Polyisocyanate Foam
Rigid polyurethane and polyisocyanurate foams will, when ignited, burn rapidly and produce intense heat, dense smoke and gases which are irritating, flammable and/or toxic. As with other organic materials the most significant gas is usually carbon monoxide. Thermal decomposition products from polyurethane foam, consist mainly of carbon monoxide, benzene, toluene, oxides of nitrogen, hydrogen cyanide, acetaldehyde, acetone, propane, carbon dioxide, alkenes and water vapour.

Solvent Based Paints
Any paint (including oil based paints) with a high solvent content (VOCs) are potentially hazardous to health. The ability of organic chemicals to cause health effects varies greatly from those that are highly toxic, to those with no known health effect. As with other pollutants, the extent and nature of the health effect will depend on many factors including level of exposure and length of time exposed. Eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment are among the immediate symptoms that some people have experienced soon after exposure to some organics. Organic solvents such as benzene are known carcinogens.

Timber and products containing wood (unless FSC or PEFC certified with full chain of custody)
Refer to the HBR Sustainability Guide – Supplier Environmental and Social Requirements.

14.4 List of Preferred Materials (Green List)

The following list specifies materials and substances that are considered by EXERGY to be preferable due to their environmental desirability or reduced environmental impact. The inclusion of materials and substances on this list does not imply that they have zero environmental impact, but their use represents a tangible step towards the protection of environmental and/or human health.

FSC™ or PEFC™ Certified Timber
FSC (Forest Stewardship Council) and Programme for the Endorsement of Forest Certification (PEFC) are independent, international and credible labelling scheme on timber and timber products, accepted by a wide range of stakeholders as evidence of legal and sustainable sourcing. This provides the end user with a guarantee that the product has come from a forest which has been evaluated and certified as being managed according to agreed social, economic and environmental standards. The FSC and PEFC Trademarks are a label on timber and wood products which indicates that the wood comes from a well-managed forest. In order to carry the FSC or PEFC label, timber and wood products have to be marked and separated from uncertified timber during the processing stages. This is demonstrated by chain of custody certification, which are normally valid for 1-5 years. Chain of custody is proven by statements made on delivery notes, and verification of the certification via the FSC or PEFC websites. FSC and PEFC certification enables HBR to specify timber with the confidence that we are not contributing to the destruction of the world's forests. By ensuring that the timber comes from certified sources HBR helps to provide an incentive through market forces for good forestry practice.

Materials Certified to ISO 14001, BES6001 or SEDEX
HBR expects all major construction materials to be supplied by manufacturers or extractors holding ISO 14001 certification as a minimum for the production facility that supplies the site. Preference is given to those suppliers who hold ISO 14001 for the manufacturing facility and the raw materials supplying that facility. HBR requires that supplies provide copies of ISO 14001 certificates for materials procured. BES6001 is a certification scheme developed by BRE to demonstrate that construction materials are responsibly sourced. This is applicable to materials other than timber, and contributes towards the achievement of responsible sourcing credits in environmental assessments such as BREEAM. Whilst not widely adopted outside the UK, there are suppliers operating throughout Europe who have achieved BES 6001 accreditation. The Supplier Ethical Data Exchange (SEDEX) provides ethical procurement audits of suppliers and manufacturers to identify risks of poor practices. A SEDEX audit allows manufacturers to demonstrate they have good procedures in place for prevention of child slavery, offer fair pay and good working conditions amongst another indicators.

Reused and Recycled Materials
Provided that reused or recycled materials are of sufficient quality and of comparable cost they should be specified in preference for virgin materials. Reused materials are preferable to recycled materials, due to the reduced energy inputs required. A database of materials with a high recycled content can be found on Database on http://rcproducts.wrap.org.uk/index.cfm

Materials with Low Embodied Energy / Enhanced design life
Materials with low embodied energy (ie reduced energy inputs during raw materials extraction, manufacture, production) and that are sourced locally are preferable to materials requiring high levels of energy to manufacture and/or which must travel long distances. Durable, long lasting and reusable materials are preferable to single use disposable materials due to their reduced environmental impact.

Locally sourced materials
Locally sourced materials are preferred as this cuts down on pollution from transport, and also contributed to the local economy. Definitions of what constitutes local sourcing may vary, dependent on jurisdiction and materials type. This can be as little as 10km.

Pre-fabricated materials
Prefabricated materials constructed off-site are generally preferable to those constructed on site, since wastage can be more efficiently controlled and transport requirements are usually reduced.

Appendix A: Standards and Codes of Practice

British standards

BS 3998: Recommendations for tree works

BS 5228: Part 1&2: 2009 - Code of Practice for noise and vibration control on construction and open sites

BS 5228: Part 4: 1992 - Noise control on Construction and Open Sites: Code of Practice for noise and vibration control applicable to piling operations

BS 6472:1992 - Evaluation of human exposure of vibration in buildings

BS 7385:1990&1993 - Evaluation and measurement for vibration in buildings

BS 5489-1:2003 – Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas, Clause 12 Lighting of areas around aerodromes, railways, harbours, and navigable inland waterways

BS 5837:2005 - Trees in Relation to construction

BS 6031: 1981 - Code of Practice for Earthworks

BS 6164: 1990 - Code of practice for safety in tunnelling in the construction industry

BS 6472: 1992 - Guide to Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz) BS 7121 - Safe Use of Cranes

Industry codes of practice and guides

Fire prevention on construction sites

The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation.

Code of Practice, British Archaeologists and Developers Liaison Group 1986. English Heritage London Region - Guidance Papers

FCDA Fire Safety Guidance Note Number 29: Access for Fire Appliances

Institute of Field Archaeologists Code of Practice, 2008.

British Archaeologists & Developments Liaison Group Code of Practice 1991. CBI - Archaeological Investigations, ECoP for minerals operators 1991

DoE - Reports 1-5 produced by Contaminated Land Research (CLR), 1994/5

DoE: A Guide to Risk Assessment and Risk Management for Environmental Protection (1995) DoE: Waste Management Papers

DoE: Planning Policy Statement on Biodiversity and Geological Conservation: PPS 9 (1994)

DoE – Planning Policy Guidance on Planning and the Historic Environment. PPG 15. DoE: Planning Policy Guidance Note on Archaeology and Planning. PPG 16.

EA: Pollution Prevention Guidance Notes

EA: Piling into Contaminated Sites

DoE: Circular 11/94 Environmental Protection Act 1990

ICE: Site Investigation Steering Group: Site Investigation in Construction Sites, 1993, Vol 4 ”Guidelines on Safe Investigation by drilling of landfills and contaminated land”.

ICE: “Design Practice Guide on Contaminated Land” 1994

CIRIA: “Remedial treatment of contaminated land” Series: SP101 to SP111 (1995)

CIRIA: “Control of pollution from construction sites: Guidance for consultants and contractors” (C532).

CIRIA/EA: Concrete Bunds for Oil Storage Tanks

CIRIA/EA: Masonry Bunds for Oil Storage Tanks

BSI DD 175 - Code of Practice for the identification of potentially contaminated land and its investigation. PG3/1(95) - Process Guidance Note (as amended)

PPS 23 - Planning and Pollution Control (DoE 1994)

GLA and London Councils – Best Practice Guidance: "The Control of Dust and Emissions from Construction and Demolition", November 2006

Environment Agency Pollution Prevention Guidelines:

PPG 01: General guide to the prevention of water pollution. PPG 02: Above Ground Storage Tanks;

PPG 05: Works and maintenance in or near waterworks

PPG 06: Working at construction and demolition sites.

PPG 20: Dewatering underground ducts and chambers.

PPG 22: Dealing with spillages on highways.

PPG 27: Installation, decommissioning and removal of underground storage tanks; and

Guidance for the Regulation of Odour at Waste Management Facilities, July 2002, Version 3.0

Construction Health and Safety Manual section 20 Overhead and underground services (incorporating Dec 91, Dec 97, Dec 02, Jun 03, Jun 05 and Jun 07 amendments)