

# Northern Line Extension (NLE)

## Code of Construction Practice - Part A

November 2013

**DRAFT**

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#### REVISIONS SINCE APRIL 2013

Date	Paragraph	Revision
3 Aug.13	1.3.3	Refs to facilities for occupiers of lodge at Kennington Park and also the temporary shafts deleted.
3 Aug.13	3.3.4	New para 3.3.4 inserted, next two paragraphs renumbered
7 Aug. 13	12.1.2	Ref to Radcott St. temp shaft worksite deleted.
29.10.13	Section 13	Section updated to refer to LU Cat.1 standard S 1050
7.11.13	Abbreviations, 2.4.2, Section 12, 13	Changes following discussion with EH. EH added to abbreviations, Heritage Management Plan added 2.4.2, general revs to Sections 12 & 13
13.11.13	1.2.1, 3.2.8, 3.2.11, 5.1.2	Amended so as to not preclude the submission of S61 applications for some types of tunnelling operations
14.11.13	1.2.4	Amended to provide more clarity about Part B
14.11.13	12.3(m)	Amended to refer to works to be undertaken rather than demolition
14.11.13-16.11.13	Section 12	Further changes to Section 12 following discussion with EH
13.2.1	Section 13	Updated to reflect settlement commitments

Note: minor corrections etc are not listed

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## 0 Abbreviations

BS	British Standard
BPM	Best Practical Means ( <i>this means that every practical mitigation has been applied to reduce noise and vibration produced by the works to as low a level as possible</i> ).
CDM	Construction (Design and Management) Regulations
CoPA	Control of Pollution Act 1974
CoCP	Code of Construction Practice
EA	Environment Agency
EH	English Heritage
EHO	Environmental Health Officer
EMP	Environmental Management Plan
ES	Environmental Statement
GLA	Greater London Authority
LBL/LBS/LBW	London Borough of Lambeth / Southwark / Wandsworth (otherwise referred to as the boroughs or relevant local authority)
LFEPA	London Fire and Emergency Planning Authority
NL/E	Northern Line / Extension
OA	Opportunity Area
OAPF	Opportunity Area Planning Framework
S61	Prior consent from a council under the Section 61 of the Control of Pollution Act 1974 - for construction works where BPM has been demonstrated to be applied.
SEMP	Site Environment Management Plan
SI	Site Investigation
SWMP	Site Waste Management Plan
TCPA	Town & Country Planning Act(s)
TfL	Transport for London**
TMP	Traffic Management Plan
TWA/O	Transport & Works Act / Order
VNEB	Vauxhall, Nine Elms, Battersea

**\*\* Where appropriate to the context 'TfL' should be taken as including its subsidiaries London Underground and Tube Lines and also those acting on behalf of TfL including consultants and contractors appointed by TfL**

# **1. Introduction**

## **1.1 Document Status / Origin / Future Development**

1.1.1 The status of this document is DRAFT and it will remain so until agreed with LBL, LBS and LBW. It is a working document for discussion during the period leading up to the submission of a Transport and Works Act Order application in spring 2013. It is envisaged that the Code and compliance with it will be the subject of a proposed condition to be attached to the NLE TWAO and deemed planning permission. The Code will remain subject to review in order to reflect changes in construction industry practice, etc.; however, any changes made will be agreed between TfL and the boroughs.

1.1.2 The provisions of the Code are based on current good practice for major rail projects involving tunnelling in and around London.

1.1.3 It is acknowledged that the works will take place at a time when a number of other major construction projects are underway in the VNEB area. TfL would be willing to participate in any Forum that might be established by one or more of the boroughs to manage the cumulative impact of construction issues. Similarly, it is acknowledged that construction will affect the local community and TfL is willing to participate in any forum established for the purpose of community liaison.

## **1.2 Purpose, application and enforcement of the Code**

1.2.1 It is intended that this CoCP will apply so as to control possible impacts arising from the construction of NLE. During construction, TfL, through design and mitigation, will control the effects of noise and vibration from the works using BPM. These controls will be agreed with relevant councils in the form of a Section 61 consent for all construction sites under the Control of Pollution Act 1974. The CoCP will be applied to all construction works. Accordingly, TfL will ensure that all parties involved in the construction work (including Contractors, sub-Contractors and their suppliers) will observe the relevant provisions of the CoCP.

1.2.2 This CoCP sets out standards and procedures for managing the environmental impact of constructing the NLE. It covers environmental, public health and safety aspects of the project that may affect the interests of local residents, businesses, the general public and the surroundings in the vicinity of the proposed construction sites.

1.2.3 The CoCP is split into two parts. This document is Part A, which sets out:

- the context and underlying principles of the NLE CoCP.

- the principal obligations of Contractors and developers when undertaking work.
- the general measures to be used during construction, how they will be applied by the contract and enforced by TfL, and the relevant local authority.
- the details of the measures for each relevant environmental topic

1.2.4 Part B of the CoCP will be developed by TfL and its main Contractor when appointed to supplement Part A. Part B shall be developed to take account of the detailed design process and shall be developed within the framework provided by Part A. The CoCP Part B will identify detailed site-specific measures and take into account the environmental issues in the NLE area and each of the NLE constituent work sites (such as site set ups and servicing arrangements). Part B will be submitted by the Contractor (having been agreed with TfL) and approved by the relevant local planning authority in advance of the commencement of works at a construction worksite (or worksites) to which it relates. Part B would include all relevant site specific construction management measures for that worksite, such as:

- Environment Management produced by the main Contractor, examples of which are listed in 2.4.2 below;
- any consents obtained prior to commencement of works under Section 61 of the Control of Pollution Act (herein referred to as “Section 61”); and
- Traffic Management Plans

1.2.5 The purpose of the CoCP is to ensure that best practice is used so that adverse effects of construction on the environment are kept to a reasonable minimum. Overall, it aims to mitigate nuisance to the public and to safeguard the environment.

1.2.6 The CoCP may be revised from time to time in light of relevant legislation, discussions with the local planning authority and/or other affected parties. “Construction” in the Code includes site preparation (including remediation and / or ground treatment, where appropriate), demolition, scaffolding, material delivery, excavated material disposal, waste removal and all related engineering and construction activities. Testing and commissioning are NOT “Construction” activities. Site investigations carried out under the terms of permitted development or planning permission granted before the making of the TWA Order may be subject to different provisions where appropriate. Other advance works will be subject to the provisions of the CoCP except where carried out by an undertaker whose works are already covered by an established and accepted CoCP.

1.2.7 TfL and/or other parties exercising its functions will hold discussions with the local authorities and other statutory agencies as appropriate in advance of submissions for approval.

- 1.2.8 The TfL NLE Project Manager (PM) is responsible for compliance with the Code. TfL will apply its Environmental Management System approach. The PM will ensure that:
- the Contractor(s) submit reports regarding performance and other relevant matters sufficient to inform the PM regarding compliance with the CoCP;
  - arrangements for auditing are in place and are implemented; and
  - accountabilities and responsibilities, throughout the Client and Contractor organisations, are clearly allocated and identified.
- 1.2.9 Following the agreed planning conditions (if imposed by the Secretary of State), the Code will be enforced by the relevant local authority, as the local planning authority. This will be done in consultation with their Environmental Health departments.

### 1.3 The works – objectives and scope

- 1.3.1 The primary aim of the NLE is to encourage economic growth in London and the wider UK economy by facilitating the sustainable regeneration and development of the Vauxhall Nine Elms Battersea (VNEB) Opportunity Area. This includes the creation of a major new sustainable residential, business and leisure district in London's Central Activities Zone.
- 1.3.2 The scheme will help to meet a number of the goals for transport set out in the Mayor's Transport Strategy (MTS, 2010) ). The MTS sets six goals; while the sixth is specific to the 2012 Games, the others are relevant as secondary aims of the NLE. Those goals are enumerated below and each is followed by information on how the NLE will achieve them:
1. *Support economic development and population growth*  
By enabling the sustainable regeneration and development of the VNEB OA, the NLE will catalyse the creation of 16,000 new homes and 20-25,000 new jobs. In addition, it will enhance access to employment for local people in the surrounding area and integrate the VNEB OA with the remainder of central London.
  2. *Enhance the quality of life for all Londoners*  
As part of a wider package of transport and urban realm improvements, the NLE will bring economic and accessibility benefits to a wide area, including the existing and new communities around Nine Elms station.
  3. *Improve the safety and security of all Londoners*  
The Underground is a safe and secure transport mode whilst stations provide safe and attractive meeting points: the new stations at Battersea and Nine Elms will be modern, well-designed landmarks which will be integrated with high quality urban realm, benefiting new and existing communities in the area.



4. *Improve transport opportunities for all Londoners*

The NLE will transform accessibility across the VNEB OA and deliver standards available elsewhere in central London, assisting and complementing London's transport network. Both new stations will be step-free from street to train and will significantly enhance transport accessibility to all by creating new high quality access points to the Underground network.

5. *Reduce transport's contribution to climate change and improve its resilience*

The Underground is a sustainable transport mode and the NLE will be constructed to the most up-to-date design and environmental standards. The NLE will contribute to making the area more typical of central London in terms of providing alternatives to car travel.

1.3.3 THE NLE works comprise the construction of an underground railway to form an extension of the Northern line (Charing Cross branch) from Kennington to Battersea. It will diverge from the existing railway south of Kennington station from a section of track used by terminating trains (known as the Kennington loop) and will comprise the following:

- a railway approximately 3,150 metres long northbound and approximately 3,250 metres long southbound including overrun / stabling tunnels west of the terminus at Battersea, a crossover east of the terminus and junctions serving each of the tunnels to link with the existing railway at the Kennington Loop;
- a terminus at Battersea between Battersea Park Road and Battersea Power Station and an intermediate station at Nine Elms west of Wandsworth Road and north of Pascal Street, both providing step-free access from trains to street level;
- intervention and ventilation shafts with head houses at Kennington Green and Kennington Park to provide emergency access, tunnel ventilation and smoke control; and
- ancillary and mitigation works within the limits of deviation including (but not limited to) providing power supply, additional cross passages at platform level at Kennington station and works related to highways, footways and utilities.
- The NLE works also include:
- accommodation works for affected landowners / occupiers including (but not limited to):
  - temporary facilities for Battersea Dogs and Cats Home and Covent Garden Market Authority; and
  - the installation of a water tank for the benefit of the Beefeater Gin Distillery.
- temporary works including worksites at the locations of the proposed stations and shafts / head-houses and a temporary conveyor and associated alterations to the jetty at Battersea Power station to facilitate the transfer of material onto barges.

## **2 General Principles**

### **2.1 Construction Strategy**

2.1.1 A construction strategy has been developed with the following objectives:

- (a) to meet the requirements of all relevant legislation, codes of practice and latest standards;
- (b) having regard to latest standards to limit adverse impacts on the local community and the environment so far as reasonably practicable;
- (c) to implement a community liaison plan;
- (d) to minimise disruption to the highway network and bus services so far as is reasonably practicable;
- (e) to limit impacts on the operations of Network Rail, London Underground and other rail companies so far as is reasonably practicable;
- (f) to carry out the planning and delivery of the project in a cost effective manner; and
- (g) to co-ordinate with other relevant projects as far as reasonably practicable to reduce the combined impacts

### **2.2 Environmental Principles**

2.2.1 TfL is committed to ensuring that NLE is built, where reasonably practicable, in accordance with all relevant and current environmental legislation and best practice for minimising the environmental effects of construction.

2.2.2 TfL's arrangements for managing Contractors will include the selection of competent Contractors who must plan and implement appropriate Health, Safety, Quality and Environmental systems. This will require tenderers for the main construction contracts to have as a minimum an Environmental Management System (EMS) which is consistent with current legislation and best practice and which will deliver the works in accordance with the provisions of this Code.

### **2.3 Health and Safety Principles**

2.3.1 TfL is committed to ensuring the health, safety and welfare of its employees and people who may be affected by the conduct of its undertaking. TfL will apply appropriate industry standards for health and safety and will seek continuous improvement in safety performance.

2.3.2 TfL and those acting on its behalf will ensure that adequate arrangements are in place for the discharge of all duties as named parties under the current Construction (Design & Management) Regulations (CDM). TfL will assess the competence and resources for health and safety of organisations appointed as other duty-holders

under CDM, and will monitor compliance with discharge of its own and others' CDM duties throughout the project.

- 2.3.3 TfL will ensure the development of a health and safety management system. This system will include documentation defining TfL's internal arrangements for managing health and safety on the project and the specific requirements for health and safety applying to all designers and Contractors appointed to work on the project.
- 2.3.4 TfL will ensure that all Contractors appointed to carry out work on the TfL project produce a Health and Safety Plan defining how their work and associated risks to health and safety will be managed.
- 2.3.5 TfL's arrangements for health and safety will include a system for management of risks. At the time of contract appointment the Contractor will be presented with a Project Risk Register as part of the Client's Health & Safety File submission. Subsequently, the Contractor's responsibilities will include that all hazards are identified, on an ongoing basis throughout the life of the project, suitable and sufficient assessments are made of the associated risk, followed by adoption and execution of appropriate measures to eliminate the risk or to control the risk, so far as is reasonably practicable. Where risks to the public are involved, these will be reduced to as low as reasonably practicable, and will be managed in accordance with current guidance. Tunnelling works will be required to comply with the requirements of the Association of British Insurers Construction Code for risk management in tunnelling works.
- 2.3.6 TfL will continuously monitor the work of Contractors and will conduct a programme of audits and inspections to ensure compliance with the requirements of this Code and other project health and safety requirements.

## **2.4 Site Management**

### **General**

- 2.4.1 Contractual arrangements will require all NLE Contractors to provide suitably qualified staff to manage and execute works for which they are responsible. TfL will require that all Contractors demonstrate an appropriate awareness of local sensitivities, expected codes of conduct, working knowledge of the legislation, codes of practice, and guidance relevant to the various construction activities in which they are engaged.

### **Environmental Management Plans**

- 2.4.2 This CoCP requires the production of a number of environmental management plans (EMPs) throughout the lifetime of this project. The

plans do not need to be separate documents and will include, but are not limited to:

- Site environmental management plan(s)
- Noise and vibration management plan
- Traffic management plan(s)
- Heritage Management Plan(s)
- Site waste management plans
- Air quality and dust management plan
- Water conservation plan
- Green travel plan
- Energy management plan
- Ecology management plan
- Ecology reinstatement plan
- Lighting management plan(s) for any construction sites where potentially significant impacts are identified

These plans will set out the environmental objectives/targets of the project, how the project will deliver the environmental requirements, and how environmental issues that arise are to be handled to ensure compliance with relevant legislation, regulations, best practice and this Code. The requirement for EMPs will be subject to ongoing review with the relevant local authority and other statutory agencies. The plans will define the approach to address all relevant environmental issues and will set out how TfL intends to operate the construction and work sites and will set out the specific control measures necessary to deliver the requirements of the Code. The Contractor may not commence work until TfL is satisfied that all appropriate procedures and processes are in place.

### **Training and Competence**

- 2.4.3 TfL will require Contractors to employ an appropriately qualified workforce, which may include holding a card from an appropriate recognised competence scheme, such as the Construction Skills Certification Scheme or the appropriate TfL safety induction scheme for working on or close to the railway. TfL will require Contractors to operate induction schemes for all personnel to ensure that they are aware of their individual responsibility to comply with the Code. The Contractor will be responsible for identifying the training needs of its personnel and will ensure that appropriate training is provided. The training will include information on local considerations and the Client's expectations on site behaviours, "toolbox talks" for site operatives to maintain an appropriate level of awareness on health, safety and environmental topics and to advise employees of changing circumstances as work progresses. Records will be kept of attendance.

### **2.5 Community Consultation & Liaison / Helpline**

- 2.5.1 TfL and/or Contractors will be committed to providing community relations personnel who will be focussed on engaging with the

community to provide appropriate information and to be the first line of response to resolve issues of concern. TfL will take reasonable steps to engage with all residents including those who may be differentially affected by construction impacts. TfL will ensure that occupiers of nearby properties will be informed in advance of works taking place, including the duration. In the case of work required in response to an emergency, the local authority and local residents shall be advised as soon as reasonably practicable that emergency work is taking place.

- 2.5.2 TfL and its Contractors will implement a community liaison plan following further consultation with the boroughs and representatives of local residents and local businesses. TfL is seeking to address the concerns of residents and local business and especially to effective monitoring and mitigation of predicted and actual effects of the construction programme. TfL will, in consultation with the boroughs, establish and maintain a Community Liaison Group (or Groups) and this (or these) will meet regularly before and during the construction period.
- 2.5.3 TfL will maintain a telephone helpline service which includes a complaints option staffed 24 hours per day during the construction period to handle enquiries and complaints from the general public. It will also act as a first point of contact and information in case of an emergency. All calls will be logged, together with a record of the responses and action taken. Appropriate contacts and response times will be the subject of a detailed procedure to be agreed prior to the commencement of construction. Potentially affected occupiers will be notified of the helpline number and it will be widely advertised and displayed on site signboards.
- 2.5.4 A Complaints Register recording the nature of the complaint and action taken will be maintained. This register will record all complaints received (e.g. written, via the telephone helpline or direct to site personnel) and an updated copy will be provided to the relevant local authority each month (or such other interval as agreed with the relevant local authority). A summary of the Complaints Register (with all personal details removed) will be provided to others on request.
- 2.5.5 A Commitment Register, which includes relevant documents, will be provided as a component of, or accompaniment to, the CoCP Part B.

## **2.6 Approvals Process**

- 2.6.1 It is proposed to obtain approval for the NLE primarily by means of an Order under the Transport and Works Act 1992 (TWA) for the main part of the works together with planning permission for these works.
- 2.6.2 TfL will implement a project approval process to ensure that all other appropriate approvals and clearances are obtained before a specific element of the works is started.

### **3 General Site Operations**

#### **3.1 Construction Process**

3.1.1 The NLE is a major construction project and will involve many different types of construction activities. These activities will include: demolition; site clearance; site investigation; remediation (as necessary); tunnelling; piling; excavation; services diversion and new installations; highway works; and below ground and surface building works. It will also involve changes/modifications to existing TfL infrastructure.

#### **3.2 Working Hours**

3.2.1 Details of working hours will, with the exception of tunnelling works, be the subject of submissions under Section 61 CoPA 1974 which shall be made to the relevant local authority. Unless otherwise agreed with the relevant local authority, no construction works will be undertaken outside normal working hours unless formal consent under Section 61 has been obtained. Only general principles relating to the types of activity for which it is likely to be necessary to seek Section 61 consent for working outside normal working hours are set out here.

3.2.2 Normal working hours are planned to be from 0800 to 1800 on weekdays (Mon-Fri excluding Bank Holidays) and 0800 to 1300 on Saturdays. Where feasible, operations likely to cause disturbance and/or disruption will be limited to these hours.

3.2.3 In addition start up and shut down activities will take place for up to one hour before and after these times. Start up and shut down activities can include but are not limited to:

- maintenance
- site briefings, meetings and training

3.2.4 Start up and shut down activities will NOT include operation of plant or machinery giving rise to noise likely to exceed threshold levels for normal working hours. . The start up and shut down periods shall not be regarded as extensions to normal working hours and particular care will be taken to limit and control disturbance to local residents during such periods.

3.2.5 Non-disruptive preparatory work, repairs and maintenance may be carried out on Saturday afternoons or Sundays between 1000 and 1600.

3.2.6 TfL will generally adhere to normal working hours as far as reasonably practicable but in some circumstances it may be that some works would cause less disturbance and/or disruption if carried out wholly or partly outside normal working hours. Therefore, it may be proposed that some works be rescheduled outside normal working hours in which case permission will be sought. However, any such rescheduling of works will

not be proposed/ permitted if it would have a material adverse effect on local residents or other local occupiers.

- 3.2.7 Proposals for working outside normal working hours will be discussed with the relevant local authority in the context of the full information available in Section 61 applications.
- 3.2.8 Tunnelling works together with directly associated activities will normally be carried out on a 24 hours per day, 7 days per week basis. Once tunnelling has commenced it may need to continue uninterrupted for reasons of engineering practicability and safety. The Section 61 process may not be appropriate in the case of some types of tunnelling operations; however proposals for tunnelling will be discussed with the relevant local authorities in the context of noise and vibration management plan(s) to be provided as part of the CoCP Part B.
- 3.2.9 There are some types of work that necessarily have to take place outside normal working hours or, being non-disruptive, can reasonably be done. These include:
- The conveyor at Battersea will normally be operational on a 24 hours per day, 7 days per week basis as it will be necessary to load material including tunnel arisings on to barges every high tide (with some 'downtime' between each high tide).
  - Internal fit out works within the tunnels, stations and shafts including electrical, communications, ventilation and signalling works. This work involves complex and time consuming work but is non-disruptive. Also, because the works involve linking with the existing Northern line, some of it will have to take place at night (or at weekends) when the Underground is closed or during possessions (which are most likely to occur at night, at weekends and/or on Bank Holidays) or at other such times as are necessary for safety critical works.
  - In order to safeguard the works it may be necessary for certain items of construction plant and equipment particularly associated with the tunnelling operations to be kept running 24 hours per day, 7 days per week. This shall include pumps, ventilation fans, cranes, compressors, batching plants and possibly generators. Any such equipment will be shielded in order to provide appropriate noise attenuation.
  - Works which require temporary possession of roads and railways, or which need to take place during non-rail traffic hours or when volumes of road traffic are low, for reasons of safety, engineering practicability or operational requirements. Limiting disruption to the travelling public may also be a factor with regard to such works.
  - Works in connection with utilities which have to be undertaken when demand is low.
  - Operations which for reasons of engineering practicability must be completed once commenced and which cannot be completed

within a working day (e.g. a major concrete pour and certain piling operations).

- 3.2.10 Times at which such works could need to take place may include Saturday afternoons, night-times, Sundays and/or Bank Holidays from time to time.
- 3.2.11 If TfL intend undertaking works as specified in paragraph 3.2.8, all such works will be the subject of a Section 61 Application to the relevant local authority unless it is a type of tunnelling operation for which the Section 61 process is not appropriate. The noise levels in Section 61s will be determined by the application of BPM (best practical means).
- 3.2.12 In the case of work required in response to an emergency or which, if not completed, would be unsafe or harmful to the permanent works, the local authority will be informed as soon as reasonably practicable of the reasons for, and likely duration of, the works. The local authority will provide a telephone number and nominate an officer to receive such notification; this will be reviewed regularly. Examples of the type of work envisaged might include where pouring concrete takes longer than planned due to equipment failure or where unexpected poor ground conditions encountered whilst excavating require immediate stabilisation.
- 3.2.13 Where work has to be rescheduled for reasons not envisaged and is expected to extend beyond the agreed or normal working hours or exceed the agreed limits and dispensation to the Section 61 consent, the Contractor will apply for a variation to the section 61 consent to the relevant local authority at least 14 days in advance of the start of those works (or within an appropriate timescale to be agreed with the local authority).
- 3.2.14 Where rescheduling relates to work of a critical nature (such as key activities likely to delay other key activities) applications will be made where practicable 48 hours in advance and no fewer than 7 days in advance if the work is expected to last for a period of 5 days or more. The variation will be sought by means of an application setting out the revised construction programme or method and the relevant noise calculations.
- 3.2.15 Where such working outside normal hours has been discussed and accepted, nearby occupiers who are likely to be affected by the works will be informed by letter to their postal address as soon as reasonably practicable by TfL about the nature and likely duration of the works.
- 3.2.16 Deliveries will be arranged to minimise impacts on the road system as far as reasonably practicable, although loading and unloading will normally take place during normal working hours. However, there are good reasons why it may sometimes be necessary for this activity to take place at other times (e.g. large loads or to minimise disruption).



Each case will be considered on its merits and will be the subject of prior agreement with the relevant local authority. A procedure for obtaining prior agreement will be established.

### **3.3 Site Layout and Facilities**

- 3.3.1 TfL will ensure, as far as reasonably practicable and appropriate, that site layouts and appearance will be designed using the following principles:
- (a) the sites will be screened and fully secured;
  - (b) storage sites, fixed plant, machinery, equipment and temporary offices will be located to limit environmental effects, as far as reasonably practicable, and having due regard to neighbouring accommodation, as far as allowed by the constraints of the site(s);
  - (c) site lighting will be located and directed so as not to intrude into occupied residential properties or disturb wildlife on sensitive areas or constitute a road hazard; and
  - (d) fixed site plant and facilities will be powered from mains electrical sources
- 3.3.2 TfL will ensure, as far as reasonably practicable, that the visual intrusion of construction sites on nearby residents and users of local facilities and amenities is contained and limited. TfL will display the helpline number and a contact name and address at appropriate locations on the boundaries of the sites.
- 3.3.3 The type of hoarding or fencing used and vehicle access and egress points will be agreed with the relevant local authority. Signage, decoration or enhancement, for information or aesthetic purposes, on the hoarding will be in accordance with TfL's corporate requirements.
- 3.3.4 The construction sites at Kennington Park and Kennington Green are in Conservation Areas. The special qualities of these are fully recognised and proposals for hoardings will be developed with this in mind and in consultation with the local authorities and the local communities.
- 3.3.5 TfL will promote and enforce a "good housekeeping" policy on the construction sites to ensure that they are clean, tidy and safe. Arrangements will be implemented to provide effective preventative pest control and prompt treatment of any pest infestation.
- 3.3.6 TfL will ensure that appropriate welfare facilities are provided for construction personnel including toilets, showers, locker rooms and first aid posts. The facilities will be connected to mains services and drainage, where reasonably practicable.

### **3.4 Site Security**

- 3.4.1 TfL will ensure that the construction site(s) are secure and staffed for security on a 24 hour basis. Access to the sites will be limited to specified entry points only and all personnel entries/exits will be recorded and monitored for both security and health and safety purposes.
- 3.4.2 The site boundaries will be secured and constructed such that it minimises opportunities for unauthorised entry. The boundary will be monitored both directly and remotely (by CCTV) by the Contractor/Contractor's security team. Should the site boundary suffer damage then it will be immediately rectified by the Contractor to the satisfaction of TfL and in accordance with the reasonable requirements of the relevant Borough.

### **3.5 Site Lighting**

- 3.5.1 Site lighting and signage will be provided to ensure the safety and security of the construction sites and will be at the minimum luminosity necessary. Where appropriate, lighting to site boundaries will be provided and illumination will be sufficient to provide a safe route for the passing public and the lux levels on footways shall be at least equal to those provided by the existing street lighting. In particular, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas.
- 3.5.2 Appropriate industry standard procedures will be implemented at all construction sites for site lighting. Lighting will also be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings, wildlife sites and land uses and so as to prevent unnecessary interference with local residents, railway operations, passing motorists, or the navigation lights for air or water traffic and wildlife breeding seasons. The contractor shall consult the ecologist appointed to carry out the bat survey in accordance with paragraph 11.2.1(b) to ensure the design for the site lighting will not disturb or adversely affect bats in the area. This provision will apply particularly to sites where night working will be required. In addition, at construction sites where potentially significant impacts are identified, a lighting management plan will be prepared, implemented and reviewed by relevant authorities, including the Environment Agency.
- 3.5.3 The lighting will be designed to comply with the provisions of current guidance and good practice. The lighting will be designed to comply with the provisions of BS5489, Code of Practice for the Design of Road Lighting, where applicable. Further guidance is contained within Guidance Notes for the Reduction of Obtrusive Light GN01:2011 by the

### **3.6 Emergency Planning and Response**

#### **Emergency Procedures**

- 3.6.1 TfL will ensure that emergency procedures for each work site are developed. The procedures will be standardised as far as possible across the work sites and will be appropriate to the anticipated hazards and the specific layout. The emergency plan will include Emergency Services, Police, etc., and will include notification procedures so that the Services can act accordingly in the event of an incident. The emergency plan will include emergency pollution control measures that will take into account EA guidelines. The emergency plan will contain emergency phone numbers and the method of notifying local authorities and statutory authorities. Contact numbers for the key TfL and Contractor's staff will also be included.

#### **Emergency Access**

- 3.6.2 TfL will ensure that the requirements of the London Fire and Emergency Planning Authority (LFEPA) will be followed for the provision of site access points. Where appropriate, the accesses will be designed to the requirements of current LFEPA guidance. . In accordance with procedures and processes agreed prior to start of construction, the emergency services will be notified of any variations of the accesses. In all cases the arrangements put in place will also be suitable for and agreed with the London Ambulance Service (LAS).

### **3.7 Fire Prevention and Control**

- 3.7.1 All construction sites and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires. The site fire plans will be prepared, regularly reviewed, and updated as necessary, and will have due regard to relevant current guidance.
- 3.7.2 During detailed construction planning and design development stages, TfL will look to reduce fire risk and potential fire load applicable to the works and the operating station. The specification of non-combustible materials, products and packaging will be pursued wherever reasonably practicable. The project will also have to comply with any third party requirements as may be appropriate at specific sites.

### **3.8 Cranes**

- 3.8.1 Crane arcs will be confined within the site boundary unless agreed otherwise with the local authority and property owners/occupiers whose air space is affected. TfL will obtain the relevant permissions from the

highway authority (TfL or the relevant local authority as appropriate) for cranes located adjacent to roads. Cranes will be operated in accordance with the requirements the current Code of Practice for Safe Use of Cranes.

### **3.9 Unexploded Ordnance**

3.9.1 A risk assessment will be completed for the possibility of unexploded ordnance being found on the sites and a response process will be included in the emergency procedures. An emergency response procedure will be prepared and implemented to respond to unexploded ordnance.

### **3.10 Electromagnetic Interference**

3.10.1 TfL will consider the effects of electromagnetic interference on wireless telecommunication systems during the design and construction of NLE, which will include site specific effects from the installation of tower cranes.

### **3.11 Green Travel Plan**

3.11.1 TfL will produce a green travel plan for the project. The plan will be developed to encourage the use of public transport by those working on the project.

### **3.12 Construction Camps**

3.12.1 None are proposed

## **4 Public Access and Highway**

### **4.1 General Requirements**

4.1.1 TfL will ensure that legal requirements for works affecting highways are implemented and shall undertake the works in such a way as to maintain, as far as reasonably practicable, existing public access routes and rights of way during construction. TfL will limit undue inconvenience to the public as far as reasonably practicable whilst carrying out the works. Detailed proposals will be set out in a Traffic Management Plan (TMP). The NLE TWAO will include any necessary provisions for stopping up and diversion of highways, together with protective provisions for highway authorities.

### **4.2 Traffic Management Plan**

4.2.1 A TMP (or TMPs) will be produced, co-ordinated and then implemented by the main Contractor. The plan(s) will address pedestrian issues and diversion routes as appropriate and will be prepared in consultation with highway and traffic authorities and the emergency services. The TMP(s) will include:

- site boundaries and the main access/egress points for the worksites;
- temporary and (if any) permanent closures and diversions of highways;
- the strategy for traffic management including parking; and
- local routes to be used by lorries generated by construction activity, including: lorry holding areas, lorry route signing strategy, means of monitoring lorry use and any routes prohibited from use by Contractors' vehicles.

### **4.3 Works Affecting Highways and Public Rights Of Way**

4.3.1 TfL and its Contractor will comply with any relevant requirements that may be detailed in the NLE TWAO before commencing works that will involve interference with the highway. All necessary consents and licences will be obtained in advance. [NOTE: 'Highway' includes all land vested in the relevant local authority or TfL for highway purposes including footways]. All temporary closures of highways and public rights of way will be for as short a time as reasonably practicable. Pedestrian access to premises will be maintained. As far as reasonably practicable, diversion routes will be provided prior to the commencement of the relevant parts of the works and will be maintained to a comparable standard of those that they replace. Suitable signage and barriers will be provided. Local residents and businesses will be informed in advance of the dates and durations of closures and, with the exception of emergency works as referred to above, will be provided with details of

diversion routes a minimum of two weeks in advance (or when final details are available).

#### **4.4 Highway Reinstatement**

4.4.1 Where temporary alterations to the highway are required, the highway will be restored to the reasonable satisfaction of the relevant highway authority. Surveys will be used to establish the condition of the highway prior to the commencement and after the completion of the NLE works. The locations where surveys will be undertaken will be identified in the TMP.

#### **4.5 Road Cleanliness**

4.5.1 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 could include:

- hardstandings at the access and egress points which will be cleaned at appropriate intervals;
- vehicle wash 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; and
- the use of mechanical road sweepers combined with water sprays for the suppression of dust to clean site hardstandings and roads and footpaths in the vicinity of the site.

4.5.2 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.

#### **4.6 Lorry Controls**

4.6.1 Details of local routes to be used by construction lorries will be set out in the TMP. As far as reasonably practicable, there will be no parking of lorries on the highway in the vicinity of any worksite except in specified holding areas for delivery or removal of materials from the site. An appropriate control system will be implemented for the dispatch of all vehicles containing excavated material, demolition materials or other waste material. Waste will be controlled and deposited in accordance with relevant legislation. Signs identifying the NLE project and Contractor contact numbers will be displayed in a prominent position on vehicles carrying project waste on public roads.

#### **4.7 Access for Persons with Restricted Mobility during Construction**

4.7.1 TfL will, where reasonably practicable, ensure that persons with restricted mobility (PRM) and those with other forms of disability, as

specified in the Disability Discrimination Act 2005, continue to have access to services and buildings where existing access and services are temporarily disrupted during the NLE construction works. Where the normal means of access has to be diverted or blocked off, alternative safe routes for persons with restricted mobility will be identified, taking into account existing hazards and obstructions such as pavement kerbs and street lighting standards (poles). Where particular difficulties are identified, arrangements will be made on a site by site basis.

## **5 Noise and Vibration**

### **5.1 General**

- 5.1.1 TfL will, as far as reasonably practicable, seek to control and limit noise and vibration levels so that affected properties and other sensitive receptors are protected from excessive or prolonged noise and vibration associated with construction activities. TfL will apply Best Practicable Means (BPM), as defined under Section 72 of the Control of Pollution Act 1974 to all activities.
- 5.1.2 TfL will obtain consents from the relevant local authority under Section 61 (which will include noise and vibration limits where relevant) for the proposed construction works, but as noted in 3.2.8, the Section 61 process may not be appropriate in the case of some types of tunnelling operations. Site specific management and mitigation requirements for noise and vibration, both on and off-site, will be further defined in the Section 61 consents. By exception, TfL may agree with the local authority that, for certain activities not anticipated to be noise sensitive, such as normal site investigation and site set up (subject to these being in accordance with this Code), that a Section 61 will not be necessary.

### **5.2 Procedures Monitoring**

- 5.2.1 TfL will undertake appropriate noise and vibration monitoring as agreed in advance with the relevant local authority, including agreeing appropriate threshold levels before works start, having regard to the TfL NLE Construction Noise and Vibration Mitigation Scheme.
- 5.2.2 The results of any noise and vibration monitoring will be made available, as required, to the relevant local authority. Access to the sites 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.

### **5.3 Specific Provisions**

#### **Selection and Use of Equipment**

- 5.3.1 Each item of plant used on the project will comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 The Noise Emission in the Environment by Equipment for Use Outdoors Regulations (as amended).
- 5.3.2 TfL will adopt the recommendations for the control of noise, as set out in BS 5228-1:2009 section 8, and for the control of vibration, as set out in BS 5228-2:2009 section 8. Where alternative authoritative guidance and



procedures are thought to be more reasonable and have been agreed in advance with the relevant local authority, these may be adopted in place of the aforementioned.

- 5.3.3 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. The use of barriers to absorb and/or deflect noise away from noise sensitive areas will be employed where required and reasonably practicable.
- 5.3.4 All plant, equipment, and noise control measures applied, shall be maintained in good and efficient working order and operated such that noise emissions are minimised as far as reasonably practicable. Any plant, equipment, or items fitted with noise control equipment found to be defective will not be operated until repaired.
- 5.3.5 Where reasonably practicable, fixed items of construction plant shall be electrically powered in preference to being diesel or petrol driven.
- 5.3.6 Vehicles and mechanical plant utilised on site for any activity associated with the construction works will be fitted with effective exhaust silencers and shall be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable.
- 5.3.7 Machines in intermittent use will be shut down or throttled down to a minimum during periods when not in use. Static noise-emitting equipment operating continuously will be housed within suitable acoustic enclosure, where appropriate.
- 5.3.8 For underground activities, and also for conveyors above surface level, the following measures will be adopted, where reasonably practicable and appropriate:

### **Conveyors**

- (a) The mounting for any conveyors used to remove excavated material from the works (underground, sub-surface or surface) will be designed and installed so as to mitigate the transmission of noise and vibration;
- (b) A maintenance programme will be implemented to ensure that the noise generation of any conveyor does not deteriorate over time.
- (c) The surface conveyor systems will be of similar standard to underground conveyors and will be acoustically enclosed where they run through, or adjacent to, noise sensitive areas. They too will be subject of a maintenance programme. (Note: the conveyor will be covered throughout its length to prevent material spillage.)

## **Temporary Construction Railway**

- (a) The alignment, jointing and mounting of the temporary construction railway will be installed, maintained and operated in a manner so as to minimise the transmission of vibration and ground borne noise from the passage of rail vehicles.
- (b) Any diesel locomotives used will be fitted with efficient exhaust silencers.

## **Temporary Tunnel Ventilation**

All tunnel ventilation plant with connections to the atmosphere in any noise-sensitive location will be subject to mitigation measures appropriate to its local environment.

## **Notifications**

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

## **Provision of Noise Insulation and Further Mitigations**

- 5.3.10 Noise insulation (or a grant therefore) or further mitigation may be offered where the predicted or actual noise levels exceed the prescribed levels defined in the TfL NLE Construction Noise and Vibration Mitigation Scheme.

## **5.4 Reversing Alarms**

- 5.4.1 TfL will, as far as reasonably practicable, ensure that the noise from reversing alarms is controlled and limited. This will be managed through the following hierarchy of techniques:
- (a) the site layout will be designed to limit, and where reasonably practicable, avoid the need for the reversing of vehicles. TfL will seek to ensure that drivers are familiar with the worksite layout;
  - (b) banksmen will be utilised to avoid, as far as reasonably practicable, the use of reversing alarms;
  - (c) reversing alarms incorporating one or more of the features listed below or any other comparable system will be used where reasonably practicable;
    - i. highly directional sounders;
    - ii. use of broadband signals;
    - iii. self adjusting output sounders; and
    - iv. flashing warning lights.

- (d) reversing alarms will be set to the minimum output noise level required for health and safety compliance.

#### **5.5 References – Noise and Vibration**

- (a) Control of Pollution Act 1974
- (b) TfL NLE Construction Noise and Vibration Mitigation Scheme
- (c) European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 The Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (as amended)
- (d) BS5228: Code of practice for noise and vibration control on construction and open sites:
  - Part 1 (2009) Noise
  - Part 2( 2009) Vibration

## **6 Air Quality**

### **6.1 General**

6.1.1 TfL will, as far as reasonably practicable, seek to control and limit emissions to the atmosphere in terms of gaseous and particulate pollutants from vehicles and plant used on the site, and dust from construction, demolition, vehicles and plant activities. TfL will identify potential sources and apply appropriate control techniques, and these will be documented in an Air Quality and Dust Management Plan.

### **6.2 Vehicle and Plant Emissions**

6.2.1 TfL will ensure that the adverse effects of vehicle and plant emissions are controlled. Measures to be considered for limiting emissions and avoiding nuisance will include the following as appropriate and as far as reasonably practicable:

- (a) ensuring that the engines of all vehicles and plant on site are not left running unnecessarily;
- (b) using low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices;
- (c) using ultra low sulphur fuels in plant and vehicles;
- (d) requiring that plant will be 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;
- (e) requiring that all project vehicle, including off-road vehicles, will hold current MOT certificates, where required due to the age of the vehicle, (or to be tested to an equivalent standard) and that they will comply with exhaust emission regulations for their class (a procedure for checking this to be set out in the Air Quality and Dust Management Plan);
- (f) siting plant away from potential sensitive receptors;
- (g) avoiding the use of diesel or petrol powered generators and using mains electricity or battery powered equipment (NB an emergency diesel generator will be required during tunnelling works);
- (h) maximising energy efficiency [this may include maximising vehicle utilisation by ensuring full loading and efficient routing];
- (i) In compliance with the London Low Emissions Zone, all vehicles, cars and vans shall meet or exceed the following CO<sub>2</sub> limits and European emission standards (Euro standards):
  1. Cars - maximum certified CO<sub>2</sub> emissions of 95 g/km and a minimum of Euro 5 emission standards
  2. Vans equal to or less than 1,205 kg kerb weight – maximum certified CO<sub>2</sub> emissions of 105 g/km CO<sub>2</sub> and a minimum of Euro V emission standards

3. Vans between 1,205 and 1,660 kg kerb weight – maximum certified CO<sub>2</sub> emissions of 145 g/km CO<sub>2</sub> and a minimum of Euro V emission standards
  4. Vans greater than 1,660 kg kerb weight – maximum certified CO<sub>2</sub> emissions of 205 g/km CO<sub>2</sub> and a minimum of Euro V emission standards
- (j) In compliance with the London Low Emission Zone, all heavy duty road vehicles and non-road diesel engines shall meet or exceed the following emission standards:
1. Heavy duty road vehicles >3500 kg kerb weight – Euro VI European emission standards
  2. Non road diesel engines between 19 and 36 kW – Stage 3A European emission standards
  3. Non road diesel engines between 37 and 55 kW – Stage 3B European emission standards
  4. Non road diesel engines between 56 and 560 kW – Stage 3B European emission standards
- (k) If any road vehicles or non road diesel engines are due for replacement during the period of the works, TfL shall ensure that the replacement vehicle/engine meets or exceeds the European emission standards and CO<sub>2</sub> limits (if applicable) for that year in which it is introduced into the fleet. Standards and the years in which they apply are shown in the tables 1-3 below. If vehicles that meet the requirements are not available by the specified deadline, then TfL will consider an alternative standard until such time as those vehicles become available. The contractual requirement to meet these standards applies to all Contractors and sub-Contractors' vehicles.
- (l) In line with Mayoral environmental strategies and commitments to reduce carbon dioxide emissions, Contractors are also encouraged to include zero or ultra low carbon vehicles in their fleet such as electric, plug-in hybrid or biomethane vehicles where possible.
- (m) All members of the Contractor's staff who drive vehicles under this Contract shall undertake a fuel-efficient driver training course within three months of the commencement of the contract. The training course shall consist of theoretical training and practical implementation skills and shall be a minimum duration of one hour. Throughout the duration of the Contract, any new staff employed by the Contractor who drives for work shall also be required to undertake fuel-efficient driver training. The Contractor shall encourage its sub-Contractors to undertake similar fuel efficient driver training. The Employer will request evidence of the training from time to time.

**Table 1:**

	European Emission Standards for Road Vehicles					
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Cars	Euro 5	Euro 6	Euro 6	Euro 6	Euro 6	Euro 6
Vans ≤ 1205kg kerb weight	Euro 5	Euro 6	Euro 6	Euro 6	Euro 6	Euro 6
Vans 1205-1660kg kerb weight	Euro V	Euro V	Euro VI	Euro VI	Euro VI	Euro VI
Vans >1660kg kerb weight	Euro V	Euro V	Euro VI	Euro VI	Euro VI	Euro VI
Heavy Duty Vehicles >3500kg	Euro VI	Euro VI	Euro VI	Euro VI	Euro VI	Euro VI

**Table 2:**

	European Emission Standards for Non Road Diesel Engines					
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Non road diesel engines 19-37kW	Stage 3A	Stage 3A	Stage 3A	Stage 3A	Stage 3A	Stage 3A
Non road diesel engines 37-56kW	Stage 3B	Stage 3B	Stage 3B	Stage 3B	Stage 3B	Stage 3B
Non road diesel engines 56-560kW	Stage 3B	Stage 4	Stage 4	Stage 4	Stage 4	Stage 4

**Table 3:**

	Certified CO <sub>2</sub> Limits (g/km)					
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Cars	95	90	85	80	75	70
Vans ≤ 1205kg kerb weight	105	100	95	90	85	80
Vans 1205-1660kg kerb weight	145	140	135	130	125	120
Vans >1660kg kerb weight	205	200	195	190	185	180

### 6.3 Dust

#### General

- 6.3.1 TfL will ensure that all Contractors comply with the provisions of all legislation relevant to the control of dust and emissions.
- 6.3.2 TfL will recognise that the duration of operations and the proximity of receptors cannot be significantly altered since the location and other site criteria will be dictated by issues such as availability of land, spatial requirements of the project and techniques available for specific construction activities. TfL will require that measures to reduce the impact of dust are designed and implemented in an appropriate and timely manner. The Supplementary Planning Guidance 'The Control of Dust and Emissions from Construction and Demolition' will form the basis of the site specific plans for the control of dust.

### **Dust Control**

- 6.3.3 TfL will ensure that an Air Quality and Dust Management Plan is prepared and implemented for the worksite(s), which details controls to limit dust emissions, including the consideration of using green walls, screen and other green infrastructure to minimise the impact of dust and pollution and also to improve the local ambience during construction. Three levels of control for dust impacts are planned, with the standard level, Tier 1, as the minimum that will be implemented on any site. A risk-based approach will be used to identify construction sites with potential to generate significant quantities of dust near sensitive receptors and which require additional levels of control (Tiers 2 and 3). This will be addressed in the Air Quality and Dust Management Plan.
- 6.3.4 In the event of a pollution incident arising from dust, the Contractor will be required to agree remedial mitigation measures for implementation with the relevant local authority.

### **Dust monitoring**

- 6.3.5 TfL will ensure that, unless agreed with the relevant local authority as inappropriate, dust monitoring is carried out during construction at all medium and high-risk sites. A risk-based approach will be used to identify the type of dust monitoring to be used at each worksite by looking at the details of the specific packages of work within the site boundaries, the dust raising potential of those construction activities, proximity to potential receptors and the duration of construction activities at each location.
- 6.3.6 Where sites have a risk score that assigns them to the low risk category, no dust monitoring will be carried out. Where sites have a risk score that is in the medium risk category, passive deposition monitoring techniques (glass slides/Frisbee gauges/sticky pads) will be adopted at appropriate locations (site boundaries/local receptors) according to specific site conditions as outlined further below. Where sites have a risk score that is in the high risk category, additional monitoring

techniques will be adopted according to specific site conditions as outlined subsequently.

### **Standard Dust Control Procedures (Tier 1)**

- 6.3.7 The standard dust control procedures, Tier 1, will include, as appropriate, site controls to:
- (a) ensure no burning of waste materials takes place on site;
  - (b) ensure an adequate water supply on the site;
  - (c) ensure water suppression is used during demolition operations;
  - (d) ensure appropriate disposal of run-off water from dust suppression activities, in accordance with legal requirements;
  - (e) maintain all dust control equipment in good condition and record maintenance activities;
  - (f) keep site fencing, barriers and scaffolding clean;
  - (g) provide easily cleaned hardstanding for vehicles;
  - (h) ensure regular cleaning of hardstandings;
  - (i) not allow dry sweeping of large areas;
  - (j) provide and ensure the use of wheel cleaning facilities near the site exit wherever there is a potential for carrying dust or mud off the site;
  - (k) clean the public highway using wet sweeping methods when necessary;
  - (l) ensure vehicles working on site have exhausts positioned such that the risk of re-suspension of ground dust is minimised (exhausts should preferably point upwards), where reasonably practicable;
  - (m) ensure all vehicles carrying loose or potentially dusty material to or from the site are fully sheeted;
  - (n) ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
  - (o) mix large quantities of cement, bentonite, grouts and other similar materials in designated areas which will be enclosed or shielded;
  - (p) store materials with the potential to produce dust away from site boundaries where reasonably practicable;
  - (q) ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out;
  - (r) minimise the amount of excavated material held on site;
  - (s) sheet, seal or damp down unavoidable stockpiles of excavated material held on site, where required;
  - (t) avoid double handling of material wherever reasonably practicable;
  - (u) ensure that any crushing or grinding plant used on the site has an appropriate permit or exemption issued by the EA, and is maintained according to the permit or exemption;
  - (v) ensure that any plant identified above is operated in accordance with the conditions set out in the permit and a copy of the permit is held on site;



- (w) use enclosed rubble chutes and conveyors where reasonably practicable or use water to suppress dust emissions from such equipment;
- (x) sheet or otherwise enclose loaded bins and skips;
- (y) minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- (z) use design/prefabrication to reduce the need for grinding, sawing and cutting on site wherever reasonably practicable;
- (aa) only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction;
- (bb) carry out site inspections regularly to monitor compliance with dust control procedures set out above and record the results of the inspections, including nil returns, in a site log book;
- (cc) increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- (dd) record any exceptional incidents causing dust episodes on or off the site and the action taken to resolve the situation in the site log book referred to in (bb) above.

### **Enhanced Dust Control Procedures for Sites/ Operations with an Risk of Dust Emissions (Tier 2)**

6.3.8 These procedures are relevant where there is a medium risk of emissions of dust due to the proximity of receptors, the type of activity on site or the duration of operations. In such cases a higher standard of dust control will be adopted, which will incorporate all relevant Tier 1 techniques as set out above, as well as additional relevant measures as outlined below. Alternatives may be proposed to suit specific circumstance providing the resulting control is at least as effective as that arrived at using the specified measures.

- 6.3.9 In the event that enhanced dust control procedures are required, these will include, as appropriate, site controls to:
- (a) strip insides of buildings, as far as reasonably practicable, before demolition;
  - (b) bag and remove biological debris (such as birds nests and droppings) or damp down such material prior to demolition;
  - (c) wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
  - (d) screen buildings, where dust producing activities are taking place, with debris screens or sheeting;
  - (e) avoid carrying out earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water sprays to control dust;

- (f) seed or seal medium or long term excavated materials and soil stockpiles;
- (g) ensure slopes on stockpiles are no steeper than the natural angle of repose of the material and maintain smooth profile;
- (h) ensure appropriate equipment is readily available on site and clean up any spillages as soon as reasonably practicable after the event using wet cleaning methods;
- (i) ensure mixing of cement, bentonite, grout and other similar materials takes place in enclosed areas remote from site boundaries and potential receptors;
- (j) where appropriate use increased hoarding height to protect receptors; and
- (k) consider full enclosure of sites or specific operations where there is a high potential for dust production and the site is active for an extensive period.

6.3.10 For such Tier 2 sites, and in addition to the monitoring outlined above, a comprehensive site survey will be undertaken to determine the prevailing wind direction (using available meteorological data) and a minimum of two permanent PM10 monitoring stations will be installed along the transect of the average wind direction and to make data readily available to the local authority.

6.3.11 Dust monitoring will be continued until the site has a risk score that assigns it to the lower risk category. Any cessation of monitoring will be subject to consultation with, and the agreement of, the relevant local authority that the Tier 2 risk level no longer applies, provided that such agreement is not unreasonably withheld.

### **Advanced Dust Control Procedures for Sites /Operations with a High Risk of Dust Emissions (Tier 3)**

6.3.12 These procedures are relevant where there is a high risk of significant adverse impact from dust emissions due to the proximity of receptors, the type of activity on site or the duration of operations. In such cases the highest standard of dust control reasonably achievable will be adopted, which will incorporate all relevant Tier 1 and Tier 2 techniques as set out above, as well as additional relevant measures as outlined below. Measures to be used will be site specific and will be proportionate to the level of risk arising, such as having personnel on site to monitor and manage dust emissions. Techniques such as total enclosure of certain operations to protect vulnerable receptors would be implemented where appropriate.

6.3.13 For such Tier 3 sites, and in addition to the monitoring outlined above, existing baseline dust levels will be established prior to the commencement of any potentially significant dust-creating activities. Where practicable, such baselines will make reference to data sourced from local background PM<sub>10</sub> concentrations (such as measured by the Automatic Urban and Rural Network (AURN) monitoring sites and

appropriate local authority automatic monitoring sites and those established by dust monitoring in the neighbourhood) and will ideally refer to data from the preceding 12 month period.

6.3.14 As part of this baseline work, the Contractor will be required, as far as is reasonably practicable, to ensure that:

- (a) Monitoring data is available for a suitable duration prior to construction.
- (b) Data is collected as  $PM_{10} \mu g.m^{-3}$ , the same units as suggested for the site action level in the SPG.
- (c) Any unusual activity in the vicinity of monitoring sites that may affect monitoring results and/or create a false baseline (eg local construction activity) are avoided or noted by local monitoring site operators.
- (d) Dust monitoring commences as soon as reasonably practicable to provide localised data to augment the data obtained from the AURN/local authority sites.

6.3.15 During the “high risk” construction events themselves, particulate monitoring will be undertaken using appropriate survey instruments such as Osiris, Topaz, DustScan or similar devices sited at appropriate locations such as site boundaries, potential receptors or in a transect orientated to the prevailing wind, as required by specific site characteristics.

6.3.16 The survey instruments used will operate an alarm (PC based or mobile phone) should a predetermined site action level be reached. This level will be established in consultation with the relevant local authority and by reference to both local authority and AURN PM10 monitoring data. Subject to such consultation, a preliminary site action level of  $250 \mu g.m^{-3}$  (15 minute average) is proposed for both Total Suspended Particulates (TSP) - a leading indicator of PM10 - and PM10.

6.3.17 If the alarm is triggered the following actions will be taken:

- (a) The nominated person or someone delegated by the nominated person will as quickly as reasonably practicable investigate activities on the site to ascertain if any visible dust is emanating from the site or activities are occurring that are not in line with dust control procedures.
- (b) Any identified causes will be rectified where practicable. Actions will be recorded in the site logbook and the relevant local authority notified of the incident and actions by telephone or e-mail as soon as practicable after or during the incident.
- (c) If no source of the incident is identified the local authority and/or AURN monitoring sites will be contacted to establish if there is a wider area increase in particulate concentrations.
- (d) If the cause of the alarm is not related to site operations the outcome of any investigation will be recorded in the site logbook and reported to the relevant local authority at an appropriate time.

6.3.18 Dust monitoring will be continued until the site has a risk score that assigns it to the lower risk category. Any cessation of monitoring will be subject to consultation with, and the agreement of, the relevant local authority that the Tier 3 risk no longer applies, provided that such agreement is not unreasonably withheld.

6.3.19 In the event that all monitoring indicates that the above measures have not prevented a material increase in dust leaving the site, and this gives rise to a problem that is reported via the Helpline or the Community Liaison Group, TfL will take reasonable steps to ensure the parties affected are compensated.

6.3.20 To ensure plans are co-ordinated and dust and particulate matter emissions are minimised, regular liaison meetings with site managers and /or environmental managers of other high risk construction sites within 500m of the site boundary will occur.

#### **6.4 Odour**

6.4.1 It is not anticipated that the TfL works will give rise to any odour nuisance, but if necessary TfL will adopt appropriate measures so as to avoid the creation of statutory nuisance from odours.

#### **6.5 References - Air Quality / Dust Control**

- Department for the Environment Food and Rural Affairs: Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007.
- Supplementary Planning Guidance "The Control of Dust and Emissions from Construction and Demolition"
- Mayor's Air Quality Strategy
- Borough Air Quality Actions plans
- Institute of Air Quality Management - Air Quality Monitoring in the Vicinity of Demolition and Construction Sites 2012

## **7 Water Resources**

### **7.1 General**

- 7.1.1 TfL will undertake the works and implement working methods which will be developed 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.
- 7.1.2 TfL will ensure that the design of the site layout and facilities referred to in Section 3.3 above and management of construction operations will take account of the guidance contained within the relevant EA Pollution Prevention Guides and Construction Industry Research and Information Association (CIRIA) documents and will be based on accepted industry practice. This will be detailed in the SEMP.
- 7.1.3 Contingency plans to deal with major pollution incidents at the work sites will be included within the overall emergency planning. EA guidance on pollution incident response planning will be reflected in the emergency plans.

### **7.2 Water Conservation**

- 7.2.1 TfL will implement working methods that reduces water consumption and continually improves water-use efficiency on site. TfL will ensure a water conservation plan based on the water hierarchy, is prepared and implemented for the worksite(s). The plan will include but not limited to:
- (a) Water audits that identify all water-using processes, activities and equipment on site (aligned with significant changes in site(s) activities through the project life cycle)
  - (b) Action plan, including staff engagement and training, to reduce water consumption by all water-using processes, activities and equipment on site
  - (c) Monitoring regime that assess the effectiveness of water conservation measures in the plan
  - (d) Reporting effectiveness of plan annually
- 7.2.2 The water hierarchy is as follows and sets out the options in order of preference; the highest option(s) that is/are reasonably practicable will be adopted but usually a combination of (a) plus one or more of the others will be appropriate:

- (a) **Eliminate** - Eliminate water use by identifying if the water-using process or activity really necessary and/or if there is a cost effective alternative to using water.
- (b) **Substitute** – Identify and use alternative ‘non-potable’ sources and eliminate inappropriate use of drinking (potable) water. Asses whether rainwater or grey water can be used for the activity/process.
- (c) **Reduce** - Explore options to improve efficiency, e.g. by regular maintenance of water using equipment (to ensure they are working to maximum efficiency), metering and monitoring supplies, updating fittings and/or processes.
- (d) **Reuse** – Identify whether water can be treated/filtered for reuse in a process or activity, e.g. wheel washing.
- (e) **Recycle** – Identify if water can be recycled for use offsite
- (f) **Disposal** - Dispose of excess water legally and responsibly to ensure there is no flooding, pollution or inconvenience to stakeholders.

### 7.3 Site Drainage

7.3.1 Site drainage, including surface runoff and dewatering effluents, will be discharged to sewers where appropriate and relevant permissions will be obtained from the sewerage undertaker. Surface water run off will be controlled to achieve run off rates of 50% of those of the site as previously developed.

7.3.2 TfL will ensure that the site drainage meets the effluent standards required by the sewerage undertaker, or EA, as appropriate, and will provide holding or settling tanks, separators, and other measures as may be required. TfL will ensure that access is provided to the undertaker so that samples of discharge can be obtained and analysed and the flows verified as required. The relevant sections of BS 6031:2009 Code of Practice for Earthworks for the general control of site drainage will be followed.

### 7.4 Protection of watercourses

7.4.1 TfL will seek to control flood risk to appropriate levels set by the Environment Agency, using mitigation, compensation and/or monitoring where required. Approval will be obtained in advance for all crossings of, diversions to, and work affecting watercourses from the EA as set out in the protective provisions.

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

7.4.3 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, borehole, aquifer or catchment area, arising from work operations. The measures will accord with the principles set out in industry guidelines, including the EA's note 'PPG05: Works in near or liable to affect water courses' 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.

## **7.5 Control of Pollution of Surface Water**

7.5.1 TfL will ensure that protection measures to control the risk of pollution to surface water will be adopted and will include, where appropriate and reasonably practicable:

- (a) 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% of the maximum stored volume. Areas for transfer of contaminating substances, or delivery of materials, will be similarly protected;
- (b) 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;
- (c) 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;
- (d) all wash down of vehicles and equipment will take place in designated areas and will comply with EA's PPG13 'Vehicle Washing and Cleaning';
- (e) as far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in, on or over watercourses; and
- (f) appropriate measures to be taken to protect erodible earthwork surfaces.

## **7.6 Control of Pollution of Groundwater**

7.6.1 TfL will ensure that protection measures to control the risk of pollution to groundwater will be included within the overall strategy and in compliance with relevant legislation.

7.6.2 Where reasonably practicable, TfL will avoid using materials in the permanent or temporary works that could pollute groundwater. This will include special consideration for the use of substances listed in relevant legislation.

## **7.7 Control of Water Ingress**

7.7.1 It is not anticipated that dewatering will be necessary as part of the works. Some measures may be necessary to control the ingress of water into the works. All such measures will be implemented in accordance with the provisions of section 7.1 above.

## **7.8 Dredging**

7.8.1 TfL will follow Port of London Authority guidance for dredging in the tidal Thames and its tributaries. As far as is practicable, during the critical period of June to August planned, non-emergency dredging will be avoided (and it is to be noted that this is a locally significant spawning area for Smelt, between April and May). This will be achieved through programming capital dredging outside this period, and implementing a monitoring program to identify future maintenance dredging. Where practicable, TfL will undertake a single maintenance dredge prior to the critical period.

7.8.2 TfL reserves the right to undertake emergency dredging within the critical period of June to August should there be a requirement to do so. Dredging in response to an unforeseen event or occurrence outside of the control of TfL or its contractors and which could not be reasonably expected or planned and which jeopardises the operation of the barge loading facilities constitutes an emergency.

7.8.3 So far as is practicable, to assist with minimising water quality and aquatic ecology impacts, the TfL will undertake capital and maintenance dredging using techniques that limit the dispersal of inter-tidal sediments.

## **7.9 References - Water Resources**

- BS 6031: Code of Practice for Earthworks
- EA Pollution Prevention Guidance Notes (PPG 2, PPG5, PPG6, PPG 7 PPG13 etc.)
- CIRIA C532, Control of water pollution from construction sites: Guidance for consultants and contractors
- CIRIA Report 169 Inland Dredging – guidance on good practice
- CIRIA's C547 'Scoping the assessment of sediment plumes from dredging'
- CIRIA C697 The SUDS Manual
- CIRIA/Environment Agency Joint Guidelines:
- Concrete Bunds for Oil Storage Tanks
- Masonry Bunds for Oil Storage Tanks
- EA Guidance Note: Piling into Contaminated Sites
- Strategic Forum for Construction – Water Guidance



## **8 Contaminated Land**

### **8.1 Introduction**

8.1.1 TfL will apply all relevant statutory and industry best practice guidance in relation to contaminated land and will develop remediation measures in accordance with relevant legislation and guidance. If contaminated land is identified, the statutory guidance and industry best practice will be applied to ensure that where it is reasonable to do so, remediation is carried out so that the land no longer presents a significant risk of harm being caused.

### **8.2 Site Assessment and Remedial Practice**

8.2.1 TfL will carry out site assessments, investigations and/or risk assessments wherever construction work is planned in order to assess the potential for contamination in both the land and groundwater. The necessary measures will be agreed with the Environment Agency and the Local Authority as part of the construction planning process, in accordance with industry best practice.

8.2.2 A set of criteria for site investigation will be developed prior to the commencement of any intrusive works. Where site investigation reveals the presence of contaminated land, and groundwater, an appropriate remedial strategy will be developed to identify the most appropriate option for dealing with the presence of the contamination. This strategy would include the following:

- (a) TfL will liaise with the relevant local authority, the EA and other relevant statutory bodies, with a view to addressing their requirements and will agree control or protection measures necessary to provide appropriate mitigation. This may involve the sealing, excavation and disposal of contaminated materials or on-site remedial works;
- (b) TfL will also give consideration to alternatives to landfill disposal as the solution to treating contaminated soil. This may include the use of remedial technologies (in-situ and ex-situ) to reduce the quantity of materials requiring disposal, and/or treatment of materials to a standard, such as the CL:AIRE –‘The Definition of Waste: Development Industry Code of Practice’, such that they can be re-used at a site or be disposed of as non-hazardous waste. On-site remedial works will be carried out in accordance with relevant regulations;
- (c) Monitoring of excavation works will be undertaken by TfL to check for unexpected or unusual materials with a contaminative potential. This material could consist of buried drums, tanks or containers, soil, groundwater or liquids with an unusual colour or odour, or other evidence of contamination. If this type of material is encountered, then work at that particular site, and directly

affected by the contaminating agent, will be stopped until the material has been properly identified and suitable precautions taken. This approach will be included in the Health and Safety Plan;

- (d) TfL will ensure that there are designated areas on site where contaminated materials can be separated from clean ones and stored in an appropriate environment. Storage of contaminated materials may require specific facilities to prevent contaminants from leaching into the ground, nearby sewers or neighbouring properties;
- (e) TfL will follow guidance provided in, but not limited to, the Environment Agency's Pollution Prevention Guidance Notes (PPG's) in respect of water pollution (in particular PPG01, PPG02, PPG05, PPG06, PPG07 and PPG21 will be followed as far as reasonably practicable) and further guidance is provided in Defra/Environment Agency's Model Procedures for the Management of Contamination (CLR11) and the CL:AIRE –'The Definition of Waste: Development Industry Code of Practice' for all excavated materials; and
- (f) On completion of any remedial works, a record will be kept by TfL of the works undertaken to comply with the remedial strategy.

### 8.3 References – Contaminated Land

#### 8.3.1 Contaminated Land

- CIRIA (1996) A guide to safe working on Contaminated Sites Report 132
- BSI (2001) *Investigation of Potentially Contaminated Sites. Code of Practice*. 10175.
- Defra/Environment Agency's Model Procedures for the Management of Contamination (CLR11).
- CL:AIRE –'The Definition of Waste: Development Industry Code of Practice'

#### 8.3.2 Asbestos

- Asbestos: Exposure Limits and Measurement of Airborne Dust Concentrations (EH10 and MDHS 39/4).
- HSE guidance MDHS100: Surveying, sampling and assessment of asbestos containing materials.

#### 8.3.3 Environment Agency Pollution Prevention Guidance Notes (PPG's)

- PPG01 General guide to the prevention of water pollution.
- PPG02 Above ground oil storage tanks.
- PPG05 Works near or liable to affect watercourses.
- PPG07 Refuelling Activities
- PPG06 Working at construction or demolition sites.
- PPG21 Pollution incident response planning.
- PPG23 Maintenance of structures over water.
- EA Guidance Note: Piling into Contaminated Sites.

## 9 Materials and Waste Management

### 9.1 Materials and Wastes - General

9.1.1 Within the SEMP, TfL will demonstrate how it will undertake material resource management and minimise waste creation. Where the method of procurement may involve design, the role of design in ensuring reduction in material and waste will be demonstrated. This will also be reflected in the construction strategy.

9.1.2 TfL will manage demolition / construction / fit out and excavation wastes generated at worksites in accordance with the waste hierarchy (see below) and within the relevant regulatory controls. Further details will be set out in the SEMP and will include the requirements of the site waste management plan regulations which will be delivered through the Site Waste Management Plan(s) (SWMP).

9.1.3 TfL will follow, if reasonably practicable to do so, the:

- CL:AIRE The Definition of Waste: Development Industry Code of Practice for all excavated materials produced onsite during the works.
- WRAP and/or Environment Agency Quality Protocols for materials, e.g. the WRAP Quality Protocol for the Production of Aggregates from Inert Waste.
- Institution of Civil Engineers (ICE) Demolition Protocol for all demolition works required during the works.

9.1.4 The waste hierarchy is as follows and sets out the options in order of preference; the highest option(s) that is/are reasonably practicable will be adopted but usually a combination of (a) plus one or more of the others will be appropriate:

- (a) **prevent** the generation of excavated materials and other wastes through efficient design;
- (b) **reduce** generation of excavated materials and other wastes through efficient materials resource management;
- (c) **re-use** excavated materials and other waste within the TfL project;
- (d) **re-use** excavated materials and other waste through environmentally beneficial use at sites out-with the TfL project;
- (e) **recycle** excavated materials and other wastes
- (f) **recover** value, e.g. energy generation or beneficial land use, from waste materials
- (g) **dispose** of surplus excavated materials and other waste at permitted landfill sites.

9.1.5 TfL will ensure that the requirements of the waste hierarchy are enforced and the duty of care placed on all parties to take responsibility

for protecting the interests and safety of others from the potential effects of handling, storing, transporting and depositing of excavated materials and wastes. TfL will ensure that waste is managed in accordance with Policy 5.3 Sustainable Design and Construction of the London Plan 2011, the Mayor's Business Waste Strategy as well as all relevant legislation and best practice guidance.

## 9.2 Materials and Wastes - Procedures

### Site Waste Management Plan (SWMP)

9.2.1 TfL will be responsible for the development and maintenance of a Site Waste Management Plan (SWMP). The plan will be developed following best practice and, as a minimum, meet all the requirements of the legislation and Waste Resource Action Programme (WRAP) SWMP template.

9.2.2 The **Principal Contractor** is responsible for:

- ensuring all decisions taken during design that minimise waste are obtained from the designer and recorded in the SWMP
- ensuring the SWMP meets the requirements of the WRAP template
- complying with the SWMP
- obtaining relevant information from sub-Contractors
- updating the SWMP at least every three months as the project progresses
- keeping the SWMP on site during the project
- ensuring that other Contractors know where the SWMP is kept
- allowing other Contractors and the Client access to the SWMP during the project
- handing the completed SWMP, including the lessons learnt review, back to the Client at the end of the project
- keeping a copy of the SWMP for three years

9.2.3 The plan will include an audit programme to be undertaken to demonstrate compliance with statutory requirements.

9.2.4 Waste treatment sites will be identified in consultation where appropriate with the relevant LPAs, Defra and the EA. With the dynamic nature of disposal sites it is imperative to maintain a regular dialogue with the waste management treatment/disposal operators, or other relevant party, to explore options for beneficial re-use of the excavated materials and uphold validity of the robust case for disposal of the excavated material.

### Duty of Care

9.2.5 TfL will comply with the 'duty of care' to protect the interests and safety

of others from the potential effects of handling, storing, transporting and depositing of excavated materials and demolition/construction waste arising from the project. Such compliance will include the implementation and monitoring of accepted industry practices for the control of dust, mud and other debris on site.

9.2.6 TfL will also comply with its waste 'duty of care' responsibilities to ensure that waste is produced, stored, transported and treated or disposed of in a responsible manner and in compliance with all relevant legislation. Where it passes responsibility for waste management onto Contractors, the duty of care will be transferred as appropriate.

9.2.7 The SWMP will include detailed procedures for compliance with the requirements for waste transfer and consignment notes, in accordance with relevant legislation, and arrangements for auditing the actions of other parties in the waste handling chain. A sample waste transfer and consignment note documents, together with details of the administrative arrangements for record keeping, will be included in the SWMP.

### **Specific Provisions**

9.2.8 Littering on site by any individual under the control of TfL will be dealt with under a disciplinary procedure to be set out in the SWMP.

TfL and its Contractor will:

- Develop storage, segregation, transportation and other management procedures for contaminated or hazardous materials;
- Obtain any necessary permits and/or exemptions for the storage treatment and disposal of waste (including dewatering discharge);
- Use registered waste carriers/brokers or seek registration as a waste carrier for the handling of all waste, including contaminated materials; and
- Ensure that removal and disposal of hazardous waste complies with duty of care procedures and that delivery is to appropriately permitted facilities.

9.2.9 Provision will be made for a suitable environmental specialist to identify any Hazardous Waste, so that it can be suitably managed and disposed of during the works.

9.2.10 Other specific provisions/measures available for the handling of excavated materials and demolition/construction waste will be reflected in the SEMP and in the contractual requirements imposed by TfL to meet the procedures outlined above.

### **9.3 Asbestos**

9.3.1 A management system will be established, which will adopt measures complying with the Legislation and Codes of Practice, to manage the risk from release of asbestos during alteration and demolition works and excavation work.

9.3.2 Measures for managing asbestos in alteration, demolition and excavation works will include:

- (a) employing competent Contractors to carry out alteration and demolition works;
- (b) Contractors implementing a procedure for dealing with potentially suspect materials exposed requiring sampling and analysis by an independent specialist consultant;
- (c) formal exchange of information before start of work, including relevant information from the Asbestos Register to clearly identify location of asbestos-containing materials; and
- (d) method statements for any works in the vicinity of asbestos-containing materials to avoid any disturbance to such materials.

9.3.3 Measures for managing work involving asbestos-containing materials encountered in construction will include:

- (a) consideration of the appointment of a specialist consultant independent of the asbestos treatment Contractor;
- (b) ensuring any work with asbestos-containing materials is notified to the Health & Safety Executive;
- (c) ensuring any work with asbestos-containing materials is carried out by licensed specialist asbestos treatment Contractors;
- (d) method statements defining detailed control measures to be produced by the specialist asbestos treatment Contractor and approved by the Client/independent specialist consultant;
- (e) air sample monitoring of work to ensure required air quality standards are achieved; and
- (f) disposal of asbestos-containing materials to permitted waste sites.

### **9.4 References – Materials and waste management**

- The London Plan, 2011, published by the Mayor of London.
- CL:AIRE –‘The Definition of Waste: Development Industry Code of Practice’
- ICE Demolition Protocol
- The Mayor of London’s Business Waste Strategy

### **9.5 References – Asbestos**

- Asbestos: Exposure Limits and Measurement of Airborne Dust Concentrations (EH10 and MDHS 39/4).
- HSE guidance MDHS100: Surveying, sampling and assessment of asbestos containing materials.

## **10 Energy Management**

### **10.1 General**

10.1.1 TfL will implement working methods that reduces energy consumption and continually improves energy efficiency on site. This will include but not be limited to:

- (a) Avoiding unnecessary day and night time site, accommodation and office lighting
- (b) Installing energy efficient security and task lighting, e.g. LED
- (c) Providing well insulated site accommodation
- (d) Metering, data collection, communication and reporting

10.1.2 TfL will ensure that energy management considerations are integral to the design of the works and to the construction strategy and consequent energy impacts.

### **10.2 Energy Management Plan, Construction**

10.2.1 TfL will develop an energy management plan to demonstrate how energy consumption during construction will be minimised. This plan will complement the Green Travel Plan (see 3.11 above) and will include but not limited to:

- (a) Energy audits that identify all energy-using processes, activities and equipment on site (aligned with significant changes in site(s) activities through the project life cycle)
- (b) Action plan, including staff engagement and training, to reduce energy consumption by all energy consuming processes, activities and equipment on site and in the site offices
- (c) Monitoring regime that assess the effectiveness of energy efficiency measures in the plan
- (d) Reporting effectiveness of the plan annually

### **10.3 References - Energy Management**

- Strategic Forum for Construction – Carbon Guidance (produced in conjunction with the Carbon Trust).

## **11 Ecology and Nature Conservation**

### **11.1 General**

- 11.1.1 TfL will ensure that procedures are implemented to control and limit disturbance to areas of nature conservation interest and protected species and habitats in accordance with relevant legislative requirements and accepted industry practice, including allowing sufficient time to obtain the required licenses or consents.
- 11.1.2 TfL will produce site specific ecological management plan as required, for consultation with relevant local authorities, Natural England and the Environment Agency, as appropriate. The plans will include a programme for any outstanding ecology surveys, methods for watching briefs, measures to be adopted in the event of the discovery of protected species and measures for the relocation of certain species.
- 11.1.3 TfL will produce site specific ecology reinstatement plan, as required, for consultation with relevant local authorities, the Environment Agency wildlife bodies, as appropriate. The plans will implement the TfL Biodiversity Action Plan, as well as relevant borough Biodiversity Action Plans.

### **11.2 Specific Provisions**

- 11.2.1 Mitigation measures to protect species and habitats will be considered on a site by site basis and will include the following general principles which will be applied where applicable:
- (a) wildlife habitats which will be disturbed by construction work will be surveyed by an ecologist approved by TfL prior to commencement of works to inform restoration work, if required and where appropriate;
  - (b) prior to work commencing, sites will be checked (including bat surveys) for protected species by an ecologist approved by TfL. Where protected species are identified, either prior to the works (through surveys), or during the works, Natural England will be contacted to agree appropriate measures for implementation;
  - (c) appropriate control measures will be adopted in the event that legally controlled and alien invasive species are found on site to ensure that they will not be , are not knowingly introduced or caused to grow in the wild;
  - (d) temporary work areas including site access will be situated, as far as reasonably practicable, on previously used sites or amenity grassland of low conservation value;
  - (e) where practicable habitat removal (particularly woodland and other trees) will take place outside the breeding bird season (approximately 1st March to the 31st July) to avoid impacts on nesting birds. Where this is not practicable, all woodland and scrub will be checked by a specialist for nesting birds before removal. If



- any are identified, appropriate mitigation measures will be agreed with Natural England and implemented;
- (f) after construction, habitats or ecological features that have been affected by construction activities will be reinstated or allowed to recolonise so that (so far as is reasonably practicable), habitat will be of better quality than its pre-construction condition;
  - (g) where appropriate, landscape planting (other than ornamental and specimen tree planting) will be undertaken using native species typical of the area, as far as reasonably practicable obtained from local sources;
  - (h) impacts on adjacent wetland habitats and watercourses will be avoided by appropriate design of site drainage and by use of construction techniques to maintain existing drainage patterns along appropriate sections of the route;
  - (i) where required, topsoil and subsoil will be stripped and stored separately and reinstated appropriately as soon as reasonably practicable to minimise adverse impacts to the soil structure;
  - (j) topsoil and the seed bank which it contains will be replaced along the works as close as reasonably practicable to the location from which it was taken. This is particularly important for areas of nature conservation interest;
  - (k) appropriate construction management practices will be adopted on site to minimise the risk of indirect impacts to adjacent habitat (for example pollution);
  - (l) where appropriate, construction activities will be screened to protect nature conservation sites; and
  - (m) where open spaces, sport and recreation facilities have been used as worksites during construction, as far as reasonably practicable, those sites will be reinstated to their former use in consultation with the local authority or other responsible statutory agency.

### **11.3 Protection of Trees**

11.3.1 TfL will use reasonably practicable measures to minimise the loss of trees. Any essential remedial or protective work to trees adjacent to construction activity will be carried out by suitably trained or qualified personnel using recognised methods in accordance with BS 5837 "Guide for trees in relation to construction".

11.3.2 The site specific Ecology Reinstatement Plans will include suitable mitigation measures for specific worksites where mature tree loss is possible. The plan will be discussed with the local planning authority and in preparing the plans the TfL will take into account their observations. The plan will cover such issues as tree protection measures, monitoring during construction, replanting and post-construction monitoring.

### **11.4 References - Ecology and Nature Conservation**

- BS 3837:1991 Guide for Trees in Relation to Construction
- London Underground Biodiversity Action Plan

- Lambeth Biodiversity Action Plan
- Wandsworth Biodiversity Action Plan
- Southwark Biodiversity Action Plan

## 12 Historic Environment

### 12.1 General Procedures

- 12.1.1 The historic environment consists of heritage assets (cultural heritage resources) that are of significance both individually and collectively for our understanding and appreciation of the past. It includes all aspects of the environment resulting from the interaction between people and places through time including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.
- 12.1.2 TfL shall carry out the works in accordance with all requirements of the TWAO relating to the historic environment including all relevant legislation, planning conditions and good industry practice.
- 12.1.3 The procedures apply to all heritage assets, whether or not subject to statutory or other designation; including those already identified in the Environmental Statement and any which are identified subsequently (including during the course of the works).
- 12.1.4 Where heritage assets may be affected by the works the contractor shall obtain all necessary consents and licences, and provide supporting documentation. This includes the preparation of a Heritage Management Plan (HMP), where such has been identified as necessary, and would be submitted as part of the CoCP Part B. TfL would consult with English Heritage about the HMP.
- 12.1.5 The HMP shall indicate how the contractor intends to protect the historic environment in a consistent and integrated manner during the works. It shall include general standards of good practice across the project (under Part A of the CoCP) and specific measures, in relation to individual work sites (under Part B of the CoCP).
- 12.1.6 Heritage mitigation measures shall include the permanent preservation and retention of heritage assets where appropriate (*preservation in situ*) and/or – where that is not feasible – investigation and recording prior to development (*preservation by record*). This includes suitable physical protection and working practices to safeguard any retained assets during the contractor's works. Mitigation also includes measures for the dismantling, storage and reinstatement of any assets temporarily removed during construction.
- 12.1.7 The HMP shall address potential effects on heritage assets from all enabling and construction activity (permanent and temporary); for example demolition, site preparation, access routes, site compounds, ground consolidation and excavation works, foundations, utilities and river works such as dredging. The HMP shall include details of:

- a) How unexpected discoveries of built or buried heritage assets would be dealt with during construction, including notification of English Heritage and the Local Planning Authority, so that suitable mitigation may be agreed as appropriate..
- b) site security to prevent unauthorised access to heritage assets and damage to or theft from them, including the use of metal detectors
- c) the discovery of human remains
- d) the discovery of any artefacts covered by the Treasure Act 1996 and its Code of Conduct
- e) accidental damage to heritage assets including emergency repair to historic buildings. Where any damage to buildings does not require emergency repair it shall be made good as part of the construction process. Repairs to listed buildings must be carried out in consultation with English Heritage.

## 12.2 Detailed Procedures: Archaeology

- 12.2.1 No buried archaeological remains of sufficient significance to merit *preservation in situ* have been predicted in the Environmental Statement. The proposed mitigation strategy is therefore for archaeological investigation and recording prior to and during development (*preservation by record*). This shall include archaeological evaluation, excavation, recording, publication and archiving as appropriate.
- 12.2.2 Field evaluation techniques may include archaeological trial trenches, geotechnical and geoarchaeological borehole analysis and buried terrain modelling.
- 12.2.3 Archaeological investigation and recording may be full or sample-based depending upon the results of field evaluation and the nature of development impacts.
- 12.2.4 Areas of less significance or development impact may be addressed via archaeological watching briefs during construction.
- 12.2.5 *Preservation by record* mitigation shall include an appropriate level of off-site assessment, analysis, reporting, public dissemination and archiving of the investigation results.
- 12.2.6 In relation to dredging or barge beds works in the river, consideration shall be given to the foreshore so as to protect (where possible and appropriate) any potentially sensitive archaeological resources that may be found.

## 12.3 Detailed Procedures: Built Heritage

12.3.1 The works will require works to be carried out within the curtilage of Battersea Power Station (BPS), a building of historical and architectural interest (a Grade II\* "listed building"). The works will involve works to the BPS jetty and cranes (although these works are likely to be carried out by others in advance of the NLE works). Also works will be undertaken at platform level at Kennington station (Grade II listed). No other listed buildings are predicted to be materially affected although there are a number of listed buildings close to some of the Kennington worksites. Some of these and other listed buildings are within the settlement contours as identified in the NLE Ground Settlement Report (Appendix I2 to the NLE ES). Settlement matters are covered in the next section of this CoCP

12.3.2 The NLE construction sites at Kennington Green and Kennington Park are both in Conservation Areas. At both it will be necessary to demolish an existing building or structure and to remove or lop trees. Kennington Park is a designated Grade II Registered Park whilst Kennington Green is designated under the London Squares Preservation Act 1931. TfL acknowledges and will have regard to the special qualities of the Conservation Areas.

12.3.3 Proposals for works (or any currently unforeseen proposals) directly affecting listed buildings or comprising the demolition of a building in a conservation area are (or shall be) the subject of applications for listed building or conservation area consent (LBC/CAC).

12.3.4 Recording of listed buildings or buildings in conservation areas will be in accordance with the requirements of the LBC or CAC or, if not specified therein, in accordance with Table 8-12 of the NLE ES. Recording of other buildings of heritage value as set out in Table 8-12 of the NLE ES shall be in accordance with that Table except that in the case of the Banham building the following shall apply:

- In the first instance it shall be recorded to EH Level 1-2
- The extent to which further recording is needed shall be assessed in consultation with EH

12.3.5 Specific provisions will be addressed in the applications for LBC and CAC and the Heritage Management Plan(s) to be produced as part of Part B of the CoCP. The provisions will include the following as necessary and/or appropriate:

- (a) Alterations to listed buildings will be undertaken in line with the listed building consents.
- (b) Where necessary, suitable screening and other protective measures will be erected around listed buildings within and adjacent to works areas.
- (c) Procedures will be established and agreed with LBL, LBW, LBS and / or EH as appropriate for the emergency repair of damage to listed buildings.

- (d) Condition surveys will be undertaken to define appropriate vibration limits for cultural heritage resources that may be potentially affected by vibration from construction works.
- (e) Where cultural heritage resources are very close to worksites, or attached to buildings or structures that form parts of worksites, detailed assessment will be undertaken prior to commencement of works to inform the selection of specific items of plant and working methods.
- (f) For listed buildings that are attached or contiguous to buildings that require works to be undertaken, the techniques will be agreed with LBL, LBW, LBS and / or EH as appropriate, before any such works commence.
- (g) Where necessary, appropriate vibration monitoring regimes will be adopted during demolition or other major activities. This would, to provide full safeguarding, in the worst case, allow cessation of works should vibration levels exceed relevant limits.

#### 12.4 References

- Planning (Listed Buildings and Conservation Areas) Act 1990;
- Ancient Monuments and Archaeological Areas Act 1979;
- The Burial Act 1857;
- Treasure Act Code of Conduct 1997;
- Treasure Act 1996; and
- National Planning Policy Framework, Department of Communities and Local Government, March 2012
- Relevant English Heritage and GLAAS Guidance.

## **13 Settlement**

### **13.1 General**

13.1.1 TfL will design and undertake construction of the scheme in a manner that will minimise the damage to land and property as a result of ground movement.

13.1.2 Techniques for the assessment and control of settlement of buildings and protecting buildings from irreparable damage due to tunnel construction are well developed and are set out in Clause 3.6 of TfL document 'London Underground's Category 1 standard S 1050'. This document is appended the NLE Settlement Deed, copies of this are available on request or at <http://www.tfl.gov.uk/assets/downloads/corporate/appendix-i6-nle-settlement-deed.pdf>.

13.1.3 Appropriate techniques will be implemented in order to control and limit, as far as is reasonably practicable, the effects of settlement based on other tunnelling projects within London such as Crossrail, the Jubilee Line Extension and Channel Tunnel Rail Link.

13.1.4 Where potential harm (i.e. more than slight damage) to a listed building is identified LBL, LBW, LBS and /or EH shall be consulted as appropriate.

### **13.2 Specific Provisions**

13.2.1 Initial studies of the route suggest that the predicted settlement caused by the tunnelling to build the NLE will, at most, cause only slight damage to some residential properties. To ensure risk to properties is minimised specific provisions will be developed as an ongoing part of the design process in accordance with the document referred to above. These provisions shall be developed in accordance with the following:

- Prior to any carrying out any intrusive survey or fixing monitoring equipment to a listed building, the need for listed building consent shall be considered and LBL, LBW, LBS and / or EH shall be consulted as appropriate. The need for such surveys or fixing of equipment shall be assessed when Heritage Management Plan(s) are produced as part of Part B of the CoCP;
- all owners of property within the 'limits' which includes those properties predicted to experience 10mm or more of settlement (identified as part of TfL's Transport & Works Act Order Application for the Northern line Extension, April 2013) will receive a building defects survey by a qualified chartered building surveyor or engineer commissioned by TfL at TfL's cost;
- a settlement monitoring regime will be put in place before, during and after the works;

- owners will be contacted shortly before construction is due to start in their area so a defects survey can be conducted;
- this will record property condition immediately prior to tunnel construction. There will be a written and photographic record and a copy will be available to the property owner;
- on completion, where necessary a second survey will establish the difference between the two assessments. The owners will be entitled to claim full compensation in accordance with the Compensation Code, to cover the reasonable costs of remedying defects that result from the works;
- TfL is also willing to enter into a 'Settlement Deed' at the property owner's request. The Deed would regulate the timescales relating to the survey process and the rectification of any damage, as set out above; and
- If the Transport & Works Act Order is granted to TfL, TfL will then write to all property owners within the 'limits' to offer them a Settlement Deed.

13.2.2 For properties outside the 'limits', TfL will carry out the above procedure on a case by case basis. This will be determined by the property location and exact details of the proposed works at the start of tunnelling.