



# M4 Junctions 3 to 12 Smart Motorway

## Construction Environmental Management Plan

|                 |                   |                    |                         |
|-----------------|-------------------|--------------------|-------------------------|
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**Balfour Beatty VINCI Joint Venture**  
Working on behalf of Highways England

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## Approval, Distribution, Monitoring, Review and Continual Improvement

### i) Approval

|                                  | Name            | Signature | Date |
|----------------------------------|-----------------|-----------|------|
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| Approved by SMP leadership team* | Jerry Clarke    |           |      |

### ii) Distribution

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| 5       | Lionel Ravix    | JV Board Director                                                        | Visiting       |
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| 10      | Lynne Stinson   | Customer Sub-programme Manager                                           | Visiting       |
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| Revision | Author    | Reviewed by | Date       | Approved by Project Lead |
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| 00       | Dan Evans | Steve Pate  | 17/02/2017 |                          |
| 01       | Dan Evans | Steve Pate  | 30/06/2017 |                          |
|          |           |             |            |                          |
|          |           |             |            |                          |

### iii) Record of Project Quality Plan Monitoring Reviews and Amendments

| Revision | Amendment Details:                                |
|----------|---------------------------------------------------|
| 01       | Revised following formal comments from HE and SES |
| 02       |                                                   |

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# 1 INTRODUCTION

---

## 1.1 Background

This document is the Construction Environmental Management Plan (CEMP) for the improvement of the M4 motorway to a smart motorway between Junction 3 (Hayes) in west London and Junction 12 (Theale), near Reading, (the Scheme).

The CEMP details control measures and the standards to be implemented throughout construction of the Scheme, which have been developed through the Environmental Impact Assessment (EIA), as reported in the Environmental Statement (ES) submitted with the Development Consent Order (DCO) application as well as general processes for managing the construction work in line with Balfour Beatty VINCI's (BBV) Integrated Management System (IMS).

On 2<sup>nd</sup> September 2016 the Secretary of State granted the Development Consent Order for the Scheme, subject to 26 Requirements, to be discharged ahead of starting the main works. This included developing two documents submitted in draft form with the DCO application:

- Requirement 8: the CEMP. This CEMP forms that document, and;
- Requirement 18: the Construction Traffic Management Plan (CTMP). Annex E to this CEMP forms that document.

The Scheme extends across the administrative areas of West Berkshire Council, Reading Borough Council, Wokingham Borough Council, The Royal Borough of Windsor and Maidenhead, Bracknell Forest Council, Slough Borough Council, Buckinghamshire County Council, South Bucks District Council, London Borough of Hillingdon, London Borough of Hounslow and Greater London Authority. The CEMP provides a consistent approach to the management of construction activities along the entire route of the proposed works and with a wide range of key stakeholders.

## 1.2 Structure of this document

This document comprises the following sections:

- **Section 1** - Introduction
- **Section 2** - Scheme description
- **Section 3** - Environmental management and implementation; outlining measures and standards to protect communities and the environment during construction works;
- **Section 4** - Community relations; outlining the approach to community engagement;
- **Section 5** - General site operations; including mitigation of the impact of general site operations and construction activities, and the environment and pollution incident control measures;
- **Section 6 – 14** - General requirements by topic; setting out the measures that will be implemented to limit disturbance from construction activities, as far as reasonably practicable, in relation to the following topics which correspond directly to the Scheme Environmental Statement (ES)

- **Annex A** – Site Waste Management Plan (SWMP); used to plan, implement, monitor and review waste minimisation and management on construction sites. The SWMP has been based upon the Waste and Resources Action Programme's (WRAP) SWMP template. This will be finalised following completion of the GI survey and detailed design once material/waste properties and volumes are understood
- **Annex B**– Scheme's Materials Management Plan (MMP); detailing how all construction phase materials (material resources and waste) will be managed. This will be finalised following completion of the GI survey and detailed design once material properties and volumes are understood
- **Annex C** – Logistics Plan; a tool to manage all materials (including material resources and waste) from Scheme conception through to completion. The Logistics Plan will be designed to assist the Scheme in proceeding smoothly whilst achieving programme certainty and cost predictability; This will be finalised following completion of the GI survey and detailed design once material/waste properties and volumes are understood
- **Annex D** – Scheme Asbestos Management Plan (SAMP); outlines the process and programme in relation to locating, assessing and managing asbestos materials which may be encountered during the works; and
- **Annex E** - Construction Traffic Management Plan (CTMP); sets out the proposed traffic management and maintenance responsibilities during construction of the Scheme. Compliance with the Environmental Statement

The CEMP will remain a live document throughout the construction phase and will be reviewed and updated as necessary as the works progress. Review of the CEMP will be carried out at a minimum of 6 monthly intervals throughout the project. Each review will consider environmental performance on the project and progress against achieving project specific environmental objectives and environmental commitments. As there will be numerous updates to the CEMP, especially during construction, stakeholders will not be consulted on every amendment. However, where the construction planning identifies that works may adversely affect particular stakeholders, then they will be informed as appropriate

## 1.3 Compliance with the Environmental Statement

An EIA has been undertaken for the Scheme and an ES has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (EIA Regulations). In line with the requirements of these regulations, the ES contains the assessment of the potential impacts on the environment that may be caused during construction of the Scheme and describes proposed mitigation measures.

Planning information and the full ES is publically available from the National Infrastructure Planning Website (<https://infrastructure.planninginspectorate.gov.uk/projects/south-east/m4-junctions-3-to-12-smart-motorway/>). It is also available internally on the project Business Collaborator document control system.

The approach to be adopted by BBV to mitigate environmental impacts are set out within this CEMP.

Information on the environmental management process throughout the detailed design of the Scheme, through to construction and hand-over is included within the Environmental Management Plan (EMP), the updating of which is covered by Requirement 7 of the DCO.

## 1.4 Development of the environmental commitments

The environmental commitments, with which the construction works must comply, have been developed through the examination process from those identified in the ES to further measures agreed with the statutory authorities, consultees and (where appropriate) the affected landowners.

The key objective of the CEMP is to ensure that all environmental commitments made throughout the development of the Scheme and identified during the EIA are understood and discharged. This is to include any agreed post publication agreements, with the consultees and landowners, mitigation measures developed following the completion of pre-construction ecological surveys; and environmental commitments arising from BBV Environmental Management System (EMS).

## 2 M4 JUNCTIONS 3 TO 12 SCHEME DESCRIPTION

### 2.1 Overview of Scheme

The M4 J3- 12 SMP is 51km (32 miles) in length, between Junctions 3 (Hayes) and 12 (Theale). Along the Scheme, the main conurbations are Reading, Maidenhead, Slough, Hillingdon and Hounslow. Smaller, but notable urban areas include Wokingham, Bracknell, Windsor, West Drayton and Hayes.

The Scheme extends across the administrative areas of West Berkshire Council, Reading Borough Council, Wokingham Borough Council, Royal Borough of Windsor and Maidenhead, Bracknell Forest Council, Slough Borough Council, Buckinghamshire County Council, South Bucks District Council, London Borough of Hillingdon, London Borough of Hounslow and Greater London Authority.

The scheme has two distinctive sections. Junction 12 (Theale) – Junction 8/9 (Maidenhead), which is largely rural, skirting the southern edge of Reading and its suburbs, Winnersh and Wokingham (J10), through largely agricultural land to Maidenhead and Holyport at Junction 8/9. Throughout this section the scheme is being delivered largely within the boundaries of existing Highway England land.

Between Junction 8/9 and Junction 3, the scheme passes through the more urban settlements of Maidenhead, Slough, Hillingdon and Hounslow. The River Thames, Jubilee River and the River Colne are dominant sensitive receptors throughout this section within Green Belt areas between settlements. The scheme boundary throughout this section extends beyond Highways England land into areas compulsory acquired under the DCO, generally around existing structures which require demolition and rebuilding as part of the scheme.



Figure 1: Scheme Overview

## 2.2 Overview of the Scheme proposals

Preliminary design is complete and the Scheme comprises the following principal elements:

- conversion of 51km of the hard shoulder to a permanent running lane and, where no hard shoulder is in place at present, the construction of a new lane.
- replacement of 11 overbridge structures where portals are too narrow to accommodate the improved motorway;
- extension of 6 underbridges and 4 other structures such as culverts and subways to accommodate the improved motorway;
- changes to junctions and slip roads needed to accommodate traffic joining and leaving the improved motorway, and to allow use of the hard shoulder as a running lane, as well as allowing through junction running (TJR);
- provision of new gantries and signs to allow the motorway to function as a smart motorway with a variable speed limit, and to provide messages to road users; and
- other infrastructure needed for the improved motorway, such as emergency refuge areas, enhanced communication systems, closed circuit television and electrical supplies, as well as works to accommodate statutory undertakers' apparatus and other parties who may be affected by the Scheme.

The detailed design is ongoing and due for completion at the end of 2017. It will build on the preliminary design and also take into account the Government's Road Investment Strategy which was published in December 2014, which sets out the performance specification for Highways England – the public sector company, owned by the Government, which replaced the Highways Agency in April 2015.

A programme of advanced works to facilitate the most effective start to the permanent works is to be commenced in March 2017. The advanced works will include: archaeological and ecological surveys; environmental mitigation for badgers; installation of test piles at two locations to confirm settlement rates; initial treatment of invasive species (such as spraying Japanese Knotweed); trial pits to confirm the location for statutory undertaker plant and; minor site clearance to enable these works to be undertaken.

Main Construction is planned to commence in March 2018 and the Scheme will be operational in 2022.

## 3 ENVIRONMENTAL MANAGEMENT AND IMPLEMENTATION

---

### 3.1 Environmental objectives, targets and programme

Highways England is committed to “ensuring that all activity on the network is delivered in a manner that does not harm the environment; but instead delivers long term benefits to the natural and built environment creating a sustainable future for all” (Highways England Delivery Plan, 2015)

This project will comply with Highways England’s and BBV’s Environmental Objectives and Targets

The Scheme’s overall objectives defined within the Engineering Design Report are to:

- a) Reduce congestion, smooth the flow of traffic to improve journey times and make journeys more reliable;
- b) Support and enhance the role of the M4 as a major national and interurban regional transport artery;
- c) Support the economy and facilitate economic growth within the regions, by providing much needed capacity on the motorway;
- d) Continue to deliver a high level of safety performance of the network using smart motorway techniques; and
- e) Deliver environmental improvements and mitigation where appropriate and required.

The Scheme’s Environmental Objectives Include:

- a) Zero Pollution Incidents
- b) Minimise Waste Sent to Landfill
- c) Minimise Disruption to residents (and associated complaints)
- d) Protect & where possible enhance biodiversity

The BBV project objectives and targets are detailed within the project Sustainability Action Plan (SAP), which allows progress towards achieving the objectives and targets to be monitored, measured and reported on a monthly basis to Highways England and the two joint venture businesses making up BBV (Balfour Beatty and VINCI). An example of the SAP objectives and targets can be found in appendix 3. The SAP is reviewed in detail quarterly, internally with BBV senior management to ensure the objectives and targets are being met.

## 3.2 Legal and other environmental obligations

### 3.2.1 Relevant Legislation

A register of applicable legal and other requirements relevant to the operations of BBV is maintained as part of the project BMS. The Environmental Manager is responsible for reviewing the register and ensuring that the requirements of legislation are met on this project.

### 3.2.2 Contract & Other Requirements

The project will be carried out in accordance with Highways England guidance and project specific information including:

- M4 Junction 3 to 12 Smart Motorway: Development Consent Order as granted by the Secretary of State on 2<sup>nd</sup> September 2016
- M4 Junction 3 to 12 Smart Motorway: Environmental Statement & Related Documents submitted as Volume 6 of Highways England's Development Consent Order application, including but not limited to the following (or subsequent revisions):
  - Environmental Management Plan
  - Construction Environmental Management Plan
  - Environmental Masterplan
- Highways England Design Manual for Roads and Bridges (DMRB) and Interim Advice Notes (IAN)
- Highways England Business Plan 2015-2020
- Highways England– Our Plan to protect and increase biodiversity 2015
- Contract Requirements
- Any other licenses & Consents required to construct the scheme. Natural England and Environment Agency consents/licenses.

## 3.3 Significant Aspects & Impacts

An Environmental Aspect is defined as an element of the project that can interact with the environment. A significant environmental aspect is an environmental aspect that has or can have a significant environmental impact.

An Environmental Impact is defined as any change to the environment, whether adverse or beneficial, resulting from an aspect of the project

A register of Environmental aspects and impacts and an associated risk assessment for the construction of the scheme are contained within Appendix 1. The top 5 identified are detailed in table 1 below.

Table 1: Top 5 Significant Impacts

| Significant Risk                        | Relevant Activities                                                                                                 | Relevant legislation                                                                                                                                            | CEMP Section    |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Water Pollution                         | Concreting, Earthworks & Material Storage, Plant refuelling and operation adjacent to watercourses                  | Control of Pollution Act 1974<br>Water resources Act 1991<br>Water Act 2003<br>Environment Protection Act 1990<br>Environment Permitting Regulations 2010       | 5.7, 10, 11, 14 |
| Ecological Protected & Invasive Species | Earthworks & Site Clearance                                                                                         | Wildlife & Countryside Act 1981<br>Conservation (Natural habitats) Regulations 1994<br>Town & Country Planning Act 1990<br>Environmental Damage Regulation 2009 | 9               |
| Noise Nuisance                          | Includes most construction activities including Percussive piling, Demolition, Plant movements, Road surfacing etc. | Control of pollution Act 1974                                                                                                                                   | 6               |
| Dust Nuisance                           | Demolition activities, Earthworks & material storage areas                                                          | Control of pollution Act 1974<br>Environmental Protection Act 1990<br>Clean Air Act 1993<br>Control of Asbestos Regulations 2006                                | 12              |
| Archaeological Impacts                  | Earthworks & Site Clearance                                                                                         | Ancient Monuments & Archaeological Areas Act 1974<br>Burial Act 1859<br>Treasure Act 199<br>Planning (Listed Building & Conservation Areas) Act 1990            | 7               |

### 3.4 Interested Parties

The following stakeholders are key to successful delivery of the project. Work will be undertaken with clear communication with all parties and consideration to their needs given during the planning and implementation of construction activities.

- Highways England
- BBV
- Local Authorities
- Natural England
- Environment Agency
- Historic England
- Canal and Rivers Trust
- Archaeological bodies
- Emergency Services
- Statutory Undertakers & Utility Operators
- Network Rail
- Heathrow Airport Ltd
- Road Users, Local Residents and Local Businesses

## 3.5 Environmental Management Framework

### 3.5.1 Highways England

Highways England has established processes to ensure that relevant mitigation measures to be addressed through the construction phase by the Contractor are implemented. The Design Manual for Roads and Bridges Volume 11 Section 2 Part 5 outlines the reason why mitigation needs to be managed throughout the various stages, and Section 2 Part 6 related to the preparation of an Environmental Management Plan, of which the CEMP is a part. Interim Advice Note 183/14 'Environmental Management Plans' provides advice on managing the environmental effects of projects through Environmental Management Plans to demonstrate compliance with environmental legislation. Implementation of the CEMP is a Requirement of the DCO, breach of which would constitute an offence under s.161 of the Planning Act 2008.

### 3.5.2 Balfour Beatty VINCI Joint Venture (BBV)

This CEMP describes the core elements of the Environment Management System (EMS) that covers BBV activities and sets out the organisation and arrangements by which the company intends to fulfil its duties in accordance with the requirements and all relevant Environmental Legislation and contract requirements. It should be used in conjunction with the BBV IMS and the Project Management Plan (PMP) – the relevant procedures of which are listed in Table 2 below. Where reference is made to processes within IMS these should be accessed directly from the Balfour Beatty Group Intranet, 360 or VINCI VINFO system. Where processes have been modified to suit the specific requirements of this project, these are documented within this CEMP or within Business Collaborator. This CEMP is to be implemented for the whole of the scheme and updated prior to the main enabling and construction works.

*Table 2: Relevant BMS Procedures and Plans*

| Document Reference | Title                                       |
|--------------------|---------------------------------------------|
| Procedure          | Incident Investigation & Reporting          |
| Procedure          | Senior Management Tours                     |
| Procedure          | Site Establishment                          |
| Procedure          | Observation Cards                           |
| Procedure          | Environmental Risk Assessment               |
| Procedure          | Air Quality & Dust                          |
| Procedure          | Archaeology Cultural Heritage               |
| Procedure          | Ecology & biodiversity                      |
| Procedure          | Sustainable Timber Procurement              |
| Procedure          | Noise & Vibration                           |
| Procedure          | Management of Waste                         |
| Procedure          | Pollution Prevention Land and Water Courses |

| Document Reference | Title                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------|
| Procedure          | Site Waste Management Plans                                                                          |
| Procedure          | Noise Consents                                                                                       |
| Procedure          | Storage and Control of Harmful Liquids                                                               |
| Procedure          | Materials Management                                                                                 |
| Procedure          | Management Environmental Representatives                                                             |
| Procedure          | Emergency Arrangements                                                                               |
| Procedure          | Environmental Emergency Response                                                                     |
| Procedure          | Arranging Temporary or Permeant Electricity or Gas Metering or Supply Services with Power Efficiency |
| Procedure          | Sustainability Key Performance Indicator (KPI) Reporting                                             |
| Procedure          | Involved - Community Investment Programme                                                            |
| Plan               | Sustainability Action Plan                                                                           |
| Plan               | Stakeholder Engagement and Communications Plan                                                       |
| Plan               | Invasive Species Management Plan                                                                     |
| Plan               | Construction Noise & Vibration Management Plan                                                       |
| Plan               | Dust Risk Management Plan                                                                            |
| Plan               | Flood Risk Management Plan                                                                           |

## 3.6 Enforcement

The provisions of the CEMP will be imposed by Highways England on the Contractor by means of the works contracts. The contracts will incorporate both:

- general requirements; and
- site specific requirements.

The DCO will also require the Scheme to be constructed in accordance with the CEMP. Breach of this requirement is an offence under s.161 of the Planning Act 2008.

BBV will ensure that themselves and any sub-contractors, will comply with the terms of the CEMP and appropriate action will be taken by Highways England with the aim of ensuring compliance.

## 3.7 Leadership & Commitment

Our Project Leadership will implement management processes and briefings to ensure that the works are carried out in accordance with current legislation and guidance. We will achieve

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**Working on behalf of Highways England**

this by application of our BMS processes and also by applying the recognised BS-EN-ISO14001 standard.

BBV has an Environmental Policy that meets the requirements of ISO 14001. The policy statement will be displayed on the site notice boards, publicised to all site staff and operatives, and made available to interested parties upon request.

## **3.8 Project Roles & Responsibilities**

*ISO 14001:2015 S5.3*

Specific roles with environmental responsibilities are described in table 3.1 below:

Table 3: Project Roles &amp; Responsibilities

| Role                                    | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Director</b>                 | Overall responsibility for ensuring that the project fulfils its DCO obligations and commitments and the project's Environmental Management System (EMS) is compliant with the principles of ISO14001 and is implemented across the scheme and that adequate resources are provided to implement it effectively                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Engineering Manager</b>              | Responsible for co-ordination of environmental design information and construction information and coordination of Advanced Surveys to inform the detailed design. He is responsible for ensuring this is done in line with the project CEMP and EMS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Construction/Project Manager</b>     | <p>Responsible for the management of the construction of the Scheme. Has overall responsibility for the environmental performance of the Scheme and all staff. The Contractor's Project Manager will be required to:</p> <ul style="list-style-type: none"> <li>• provide information on contract requirements to the Environmental Manager following contract award and prior to start of works on site;</li> <li>• approve the CEMP and ensure that all controls specified within this CEMP are implemented by employees and sub-contractors;</li> <li>• ensure environmental and waste requirements are included on requisitions and in subcontracts and orders;</li> <li>• ensure that all required consents/licences are in place prior to work commencing on site;</li> <li>• log and monitor incidents and non-compliances. Report incidents and non-compliances to Highways England's Project Manager at the earliest possible opportunity;</li> <li>• ensure that Highways England is informed of all environmental complaints;</li> <li>• provide an initial point of contact for members of the public/local community who have queries regarding the works;</li> <li>• ensure employees and sub-contractors receive Induction Training (including environmental) and tool box talks, as appropriate;</li> <li>• verify actions resulting from non-compliances and observations raised during audits are completed by the deadlines set;</li> <li>• undertake inspections alongside the Construction Environmental Manager to ensure that the environmental controls as set out within the CEMP are in place and working effectively; and ensure all records are retained and readily available on Site.</li> </ul> |
| <b>Section Managers &amp; Engineers</b> | Responsible for ensuring that that site activities are compliant with the requirements of the CEMP, taking advice from the Environmental Manager and others as is appropriate. They are responsible for ensuring that the Work Package Plans (WPPs) and Risk Assessments are produced for each construction activity and that, where appropriate, environmental control measures are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Environmental Manager</b>                  | <p>Responsible for ensuring that the Scheme complies with all environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the DCO and Environmental Statement throughout its construction. The Environmental Manager will be required to:</p> <ul style="list-style-type: none"> <li>• Ensure provision of toolbox talks and environmental inductions are given to all staff involved in the construction of the Scheme;</li> <li>• Undertake site inspections to monitor and ensure environmental compliance with the BMS, legislation and licence requirements</li> <li>• Provide technical advice in relation to the environmental aspects;</li> <li>• Implement follow-up corrective actions to ensure compliance with UK regulations and legislation;</li> <li>• Approval of method statements and relevant permits</li> <li>• Maintaining and updating the CEMP during the works;</li> <li>• Provide appropriate professional and practical advice to contractors, consultants and project team members associated with environmental and ecological issues and where appropriate resolve issues in a practical and efficient way</li> <li>• Report to Environmental performance to HE and the Joint Venture businesses through monthly reports and regular meetings</li> </ul> |
| <b>General Foreman &amp; Site Supervisors</b> | <p>Responsible for ensuring that site works are carried out in accordance with the requirements of the CEMP and WPPs and ensure good environmental practice advice is taken from the Environmental Manager as is necessary. They are responsible for ensuring that operatives, plant and their areas of work are managed in accordance with the principles of good environmental practice, specifically ensuring that pollution control and waste management procedures are implemented effectively</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Site Materials &amp; Waste Manager</b>     | <p>Responsible for implementing the Site Waste Management Plan (SWMP) and Material Management Plan (MMP) and maintaining throughout the works, to ensure that waste and materials are managed sustainably, legally, economically and safely in line with the project SWMP, MMP and all relevant legislation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Traffic Manager</b>                        | <p>Will ensure compliance with the Contractor's traffic management plan. Additional responsibilities will include:</p> <ul style="list-style-type: none"> <li>• management and implementation of traffic management measures associated with the Scheme;</li> <li>• ensuring compliance with all relevant health and safety directives in liaison with the Contractor's Health and Safety Manager (HSM), relating to operations and live traffic;</li> <li>• management of the layout of site access and egress points for all construction sites and compounds;</li> <li>• arranging for site inspections at regular intervals and equipment attended to and maintained and in the case of accidents or incidents having replacement signs, cones, bollards and lights and the like erected without delay; and</li> <li>• maintaining a log of all complaints received in relation to traffic during Scheme construction.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stakeholder and Public Liaison Officer</b>     | Responsible for communications with the public and interested parties, outreach and education, where appropriate. The role will include the following responsibilities: <ul style="list-style-type: none"> <li>• responding to any concerns or complaints raised by the public in relation to the works;</li> <li>• to liaise with the Construction Manager and Environmental Manager on landowner and community concerns relating to the works;</li> <li>• ensure that the Client's Project Manager and the Environmental Manager are informed of any complaints relating to the environment; and</li> <li>• keep the public informed of project progress and any construction activities that may cause inconvenience to local communities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Ecologist</b>                                  | Responsible for advising and supervising works on site as per the mitigation required in the CEMP, relevant legislation and associated wildlife licences, to ensure no ecology and protected species are harmed or impacted during the works. This will include overseeing and reporting on mitigation such as species displacement, translocation and watching briefs for protected species as well as checks ahead of and vegetation clearance for nesting birds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Arborist</b>                                   | Responsible for advising and where necessary supervising vegetation clearance and tree protection arrangements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Archaeologist</b>                              | Responsible for co-ordinating any archaeological evaluation, investigation or monitoring in line with the archaeological design and project Written Scheme of Investigation. Liaising with Historic England (Where required) and the Local Authority Archaeologists                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Designer</b>                                   | Responsible for advising on overall environmental impact of works ahead of construction. Including Ecology, archaeology and landscape impacts of the works and providing a scope of mitigation to be implemented by the construction team. Any change to design will require full review by the design team to include an assessment of any environmental impact and associated mitigation requirements that result from that change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Clients Project Manager</b>                    | Responsible for ensuring compliance with all the relevant legal requirements, commitments and targets agreed for the Scheme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>All Site Staff (Including Sub-contractors)</b> | To receive the appropriate environmental awareness training, and undertake work in accordance with all works Method Statements and toolbox talks. Only trained personnel are to manage particular tasks such as refuelling plant and equipment, managing the stores, water quality monitoring and supervising the segregation and collection of waste. The responsibilities of all staff on site throughout the construction of the works will include the following: <ul style="list-style-type: none"> <li>• all staff are to be appropriately trained to carry out their respective tasks;</li> <li>• all environmental policies, procedures and rules as set out in the CEMP are to be adhered to;</li> <li>• adhere to legislation, codes of practice, guidance notes relevant to their work;</li> <li>• determine and implement good environmental methods of working as set out in the CEMP;</li> <li>• organise work to be carried out to the required standard with minimum risk to the environment. All Site personnel will receive instructions on their responsibilities to ensure correct environmental practice in line with the survey CEMP; and</li> </ul> all Site personnel will report environmental incidents and close calls immediately to the Construction Manager and the Environmental Manager who will be responsible for advising the Client's Project Manager and ensuring that corrective actions are completed. |

## **3.9 Monitoring**

Monitoring will be undertaken as outlined for each environmental topic (see sections 6 to 14 below), any additional consent requirements and the BBV EMS.

Monitoring will assess the effectiveness of mitigation measures and the impact of construction works.

Monitoring, together with provisions for any corrective action required, will be implemented using the systems set out under this CEMP. Results of monitoring will be regularly reviewed and communicated in project review meetings.

The CEMP will remain a live document throughout the construction phase and will be reviewed and updated as necessary as the works progress. Review of the CEMP will be carried out at minimum of 6 monthly intervals throughout the project. As there will be numerous updates to the CEMP, especially during construction, stakeholders will not be consulted on every amendment. However, where the construction planning identifies that works may adversely affect particular stakeholders, then they will be informed as appropriate

## **3.10 Considerate constructors**

The project will be registered with the Considerate Constructors Scheme. The minimum target for the project will be an “Excellent” score (8/10 in each category).

## **3.11 Method statements**

Method statements will define any specific environmental control measures, to be implemented to meet the requirements of this CEMP, and will consider the cumulative effects of concurrent construction activities.

Each procedure and method statement (produced by BBV or a sub-contractor) will be reviewed by the project Environmental Manager/Advisor to ensure that environmental protection has been considered. All operatives on site are required to have a method statement briefing prior to starting work, which includes confirmation of having read and understood the requirements.

## **3.12 Emergency preparedness and response**

Details of the project emergency preparedness and response plan and incident reporting can be found in Sections 5.7 and 5.8. Detailed Emergency Response Procedures can be found in Appendix 2.

All staff will be briefed and trained on the requirements of the project emergency response plan. This will include practice drills on site to ensure that staff know how respond correctly and effectively

## **3.13 Training and awareness**

The training, awareness and competency levels that are required for all staff whose work may affect the objectives, targets and/or other environmental issues relevant to the project are identified by the Environmental Manager and detailed in the project Environmental Training Matrix detailed in Appendix 5.

All staff, sub-contractors and operatives will receive a Site Induction that will, provide an overview of the significant environmental aspects of the project and their controls, and will highlight relevant environmental policies.

At project level, competency requirements for specific activities will be described in relevant Method Statements and Procedures. Task briefings will be delivered prior to works taking place covering the key environmental issues on the site. Toolbox talks will be undertaken as required.

## **3.14 Communication**

Details of the communications strategy can be found in Section 4 of this CEMP, including Internal, external communication and enquires and complaints procedures

## **3.15 Non-conformance and corrective action**

The implementation of the CEMP will be audited at least 6 monthly intervals during the construction period.

Non-conformance will be dealt with in accordance with BBV IMS procedure. A Non-Conformance Report (NCR) will be raised to record environmental incidents and work that has not been carried out in accordance with the CEMP or Environmental Design.

Corrective and preventative action will be dealt with in accordance with BBV IMS Procedure. A Corrective Action Report (CAR) will be raised where a system deficiency has been identified during inspections, internal audits, third party audits or customer complaints

Environmental Incidents, Near Misses & Observations will be dealt with in accordance with BBV IMS Procedure and as described in Section 5.8 of this CEMP.

### **3.15.1 Evaluation of compliance**

The Environmental Manager is responsible for regular site surveillance to evaluate performance against the project specific objectives, legal requirements, environmental commitments and the requirements of the CEMP.

Where relevant in addition to those roles and responsibilities in Table 3 above, these include

- Monitoring compliance with working hours as specified or agreed by planning or by contract
- Monitoring of discharges against consent criteria
- Monitoring of compliance with requirements of waste duty of care
- Regular Site Inspections

- Review at Project Meetings
- Review of objectives & targets
- Internal ISO 14001 Environmental System Audit
- External ISO 14001 Environmental System Audit

### 3.15.2 Continual Improvement

Our approach to Continual Improvement centres on generating and sharing ideas for improvement, best practice and innovations. This is achieved through engagement with all stakeholders on the project, the broader Balfour Beatty Vinci community and across the sectors in which we operate.

Our process to ensure continual improvement includes the following:

- generating and building on best practice, lessons learnt and innovations from the BBV partners using the information and tools available through our on line Knowledge Centre
- utilising Lean Techniques to improve productivity in our methods and processes e.g. Visual Management, Collaborative Planning etc.
- periodic review of the CEMP and its controls to ensure these are current and effective
- review of customer feedback reports and development of any specific action plans
- reviews with our supply chain and their workforce to identify either process or product improvement measures
- review of audit/ inspection/ site visit feedback recommendations and findings – please see table 4 below for further details regarding the frequency and type of audit
- review of internal reports/meetings e.g. monthly project reviews, lessons learnt reviews, close calls and incidents

*Table 4: Audits & Inspections*

| Type                                            | Key Performance Indicator | Unit            | Frequency       | Report                                            |
|-------------------------------------------------|---------------------------|-----------------|-----------------|---------------------------------------------------|
| General environmental inspection by HSE Advisor | N/A                       | N/A             | Minimum Monthly | Reported in Project Review Meetings<br>Web Portal |
| Director's HS&E Tours                           | HS&E Tours                | Number of Tours | Monthly         |                                                   |
| Audits (External / Internal)                    |                           |                 | Minimum Annual  |                                                   |

| Type                          | Key Performance Indicator         | Unit                | Frequency                              | Report                                                                                     |
|-------------------------------|-----------------------------------|---------------------|----------------------------------------|--------------------------------------------------------------------------------------------|
| HE                            | CPF and Customer Satisfaction     | No. of tours        | As determined by HE                    | Inspection Report<br>Issues Reported in Project Review Meetings where necessary            |
| Site environmental inspection | N/A                               | N/A                 | Weekly                                 | Inspection Report<br>Issues Reported in Project Review Meetings where necessary            |
| Site environmental inspection | N/A                               | N/A                 | Daily<br>(In High Risk Locations Only) | Inspection Report<br>Issues Reported in Project Review Meetings where necessary            |
| Environmental Incidents       | Environmental Incidents           | Number of Incidents | As required                            | Reported in Project Review Meetings<br>Monthly Reports<br>Environmental Alerts / Bulletins |
| Enforcing Authorities         | Visits from Enforcing Authorities | Number of Visits    | Ad hoc                                 | Reported in Project Review Meetings<br>Monthly Reports                                     |
| Monitoring by Subcontractors  | Tbc                               | Tbc                 | tbc                                    | Tbc                                                                                        |
| Review and update SWMP        | N/A                               | N/A                 | Monthly                                | Monthly Reports                                                                            |
| Timber                        | Sustainable Materials Policy      | 100% FSC or PEFC.   | Monthly                                | Timber Tracker<br>Monthly Reports                                                          |

## 3.16 Document Control

Documents will be controlled using Business Collaborator document control system. The CEMP and associated documentation will be maintained in accordance with the project document control procedure

### 3.16.1 Control of Records

All key records required by this plan are listed below and in relevant procedures and method statements. For records that are required to be kept for legal reasons, the time for which they should be retained is also noted – although in practice, all records will be maintained within the Common Data Environment. These records will be retained on site and form part of the handover documents / Health and safety file and where necessary included in the Handover Environmental Management Plan (HEMP)

- Waste Transfer Notes - 2 years from when the notes are first produced
- Hazardous Waste Consignment Notes - 3 years from when the notes are first produced
- Waste carrier registration certificates of waste disposal contractors
- Waste Management Licences or Environmental Permits of waste disposal sites (e.g. waste transfer stations, materials recycling facilities, landfill sites)
- Flood Risk Activity Permits
- Protected Species Licences
- Site Inspection forms
- Senior Management Audits
- Any correspondence with environmental enforcement agencies and consultees
- Records of internal and external audits
- Minutes of project or other meetings including environmental management performance
- Environmental Consents Register
- Environmental Risk Assessments
- Incidents and Complaint records
- Non-Conformance and Corrective Action records
- Environmental training records

## 4 COMMUNICATION

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### 4.1 Communication Strategy

A Stakeholder Engagement and Communications Plan has been prepared, which meets the communications needs of all stakeholders, and detail procedures to ensure feedback is considered throughout the lifecycle of the project. The stakeholder and communication aspects of this CEMP form part of the Stakeholder Engagement and Communications Plan

### 4.2 Internal Communication

Regular internal communication will be maintained to ensure that everyone, including subcontractors are fully aware of Scheme environmental issues. Communication methods will include inductions, toolbox talks, briefings, letters, visual displays etc. and at review meetings.

BBV will ensure that all environmental issues and protocols related to the works are communicated to all staff, and that the staff on Site adhere to the contents of the CEMP.

Throughout the construction works, BBV will communicate any proposed amendments of the CEMP along with any environmental incidents to the Highways England Project Manager. The Scheme's environmental requirements, objectives and targets, environmental incidents and any non-compliances will be reviewed at the monthly contract review meetings.

### 4.3 External Communication

The Project Team will communicate with statutory bodies, local residents/businesses and other members of the public that may be affected by construction activities. Communication with these stakeholders will be monitored through the Stakeholder Engagement and Communications Plan and Communications log.

The project Stakeholder and Public Liaison Officer in collaboration with Highways England will consult and inform the affected individuals and communities, through face to face meetings, phone calls, letters, newsletters, website updates and where permissible social media.

Proactive communication with regulatory environmental bodies will be established to facilitate the efficient progression of the works. The Environmental Manager will liaise regularly with local authorities and their Environmental Health Departments.

The Environmental Manager will be the single point of contact for the environmental regulatory authorities. Responsibilities for interface with all stakeholders is defined in the Stakeholder Engagement and Communications Plan. BBV will provide the regulatory authorities with relevant contact details prior to the commencement of construction.

#### 4.3.1 Liaison with local planning authorities and statutory bodies

In collaboration with Highways England, BBV will set up procedures to liaise with the local planning authorities and regulatory authorities during the pre-mobilisation and construction phase. A list of these stakeholders, their areas of influence and preliminary project contact will be detailed in the Stakeholder Engagement and Communications Plan. Traffic management

clinics will also be held with local authorities and relevant developers to minimise conflict with adjacent schemes.

BBV will liaise with South East Water regarding their abstraction methodology in relation to the construction programme for Monkey Island Lane Overbridge at least three months before commencement of works.

#### **4.3.2 Engaging with communities**

BBV will use the Community Engagement Strategy devised by Highways England to maintain effective community engagement. Ongoing and continuing community engagement will be undertaken through establishing structured stakeholder engagement boards and community focus groups for the Scheme.

The Community Engagement Strategy will identify the local authorities, community groups, statutory and non-statutory bodies that may be affected by the works and how they will be engaged, informed, consulted on the planned programme and construction works. It will also detail enquiry and complaints procedures.

The strategy will include the following:

- details of regular meetings and public consultation events;
- methods for consulting with the project team regarding any issues related to the construction works;
- regular forums with the local authorities and local communities;
- written records of all meetings/discussions held as well as the identification of how actions have been addressed; and
- identification of how any issues identified have been incorporated in to the evolution of the CEMP.

Meetings will be attended by Highways England, BBV's Stakeholder and Public Liaison Officer and site team, and local authorities as may be necessary to cover the matters to be discussed.

During construction, a programme of high quality, effective and sustained communications will include:

- Online –Highways England's website and other digital media including relevant links to its partners' and stakeholders' websites. The website will include the latest information on the progress of construction works, areas affected by construction, any mitigation measures and any road closures or works recently completed.
- Newsletter – a Scheme newsletter will be issued on a regular basis and will provide information regarding construction progress and planned works;
- Provision of information on progress of construction works – the relevant local authority, district councils, parish councils, councillors, constituency and regional members of Parliament and other relevant persons will be kept informed of the progress and effects of construction works;

- Notification to local residents and key stakeholders – BBV will notify occupiers of nearby properties and businesses. As a guide this will be within 50m of the extremities of the works, however this may rise if particularly noisy or disruptive activities are taking place – this will be subject to a specific risk assessment for those works. A minimum of two weeks' notice in advance of the planned construction works will be given. Information included in the notifications will include, as appropriate:
  - i. the location and activities to be carried out;
  - ii. the duration of the planned works and the planned working hours.
  - iii. the anticipated effects of the planned works;
  - iv. the measures to be implemented in line with the CEMP to mitigate the impact of the planned works; and
  - v. enquiries and complaints procedure – as described in section 4.3.

#### **4.3.3 Aviation safeguarding**

A request will be made to local planning authorities, for Heathrow Airport Safeguarding and other relevant safeguarding maps, during the detailed construction planning stage and prior to commencement of the main works. Aerodrome specific protective (safeguarding) measures and consideration of viewpoints/issues from relevant aerodrome license holders and operators will be considered in the planned construction methodology and protective measures incorporated into the CEMP.

Heathrow Airport will be consulted when any tall structures are likely to be used during the construction phases. A craneage strategy for the Scheme will be developed in consultation with the National Air Traffic Services, (NATS) prior to the commencement of the main works and will include any restrictions imposed by NATS. In addition to provision within the CEMP, a register will be kept on the Scheme, throughout the construction stage, clearly highlighting all Civil Aviation Authority (CAA) Licensed Aerodrome restrictions that need to be adhered to.

If any cranes above 60m are required then they will be equipped with the necessary aviation warning lights in accordance with CAA guidance.

If the use of cranes on the site extend to 300ft or more, consideration will be given to notification for civil aviation purposes. Temporary structures such as cranes can be notified through the means of a Notice to Airmen (NOTAM). NOTAMs are arranged through the CAA (Airspace Regulation) at [ausops@caa.co.uk](mailto:ausops@caa.co.uk) / 0207 453 6599. The Contractor will provide an accurate location (degrees, minutes and seconds) an accurate maximum height (including any craneage) and a completion date.

BBV will notify the Defence Geographic Centre should a crane be required for a period in excess of 90 days.

#### **4.3.4 Rivers and canals**

For works that may require temporary closure of rivers or canals, these will be carried out in accordance with Article 16 of the DCO and BBV will plan these in advance and coordinate the

closures with the relevant stakeholders, including the Environment Agency and the Canal and Rivers Trust.

## **4.4 Enquiries and complaints procedure**

Highways England's information line will be used to deal with enquiries and complaints from the public. This consists of a phone line, email and website contact facility. The information line is staffed by Highways England staff 24 hours a day, 7 days a week. The relevant contact number, email and website addresses for the information line will be displayed on signs around the construction site.

The system and procedure will:

- 1) log enquiries and complaints in a register;
- 2) deal with enquiries and complaints appropriately, recognising that they may be due to the effect of construction works on the interests of, and impacts on persons and their properties;
- 3) pass on the enquiry or complaint to the correct person for review and appropriate action if the person recording it cannot do so;
- 4) take appropriate action and respond to enquiries or complaints; and
- 5) outline the process for the employer's representative to review enquiries and complaints regularly to assess the adequacy, efficiency and effectiveness of the enquiries and complaints system and procedure and the measures being taken to respond to any enquiries or complaints.

The extent of the action taken will depend on the nature of the complaint. All complaints will be investigated to establish the cause of the complaint and whether the works comply with the Scheme's environmental requirements and other relevant requirements such as legislation, standards and codes of practice.

## 5 GENERAL SITE OPERATIONS

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### 5.1 Introduction

This section of the CEMP addresses site management practices that should be employed throughout the works to ensure the safe and compliant operation of the Site and gives consideration of surrounding receptors in the general operation of the Site.

Procedures for material handling and storage on Site are specifically dealt with in section 11 of this CEMP and within the SMMP and SWMP (Annex A & B).

Throughout the duration of the works BBV will identify best practices on a regular basis and submit to Highways England for consideration and wider circulation. Where best practice is identified, the CEMP and method statements will be updated to reflect any changes to site procedures.

### 5.2 Licences and consents

BBV will seek to obtain consents from the relevant local authorities and environmental regulators.

Any conditions included in consents/ licences/ permits will be documented in further revisions of the CEMP and considered as part of the planning, design and construction process.

A copy of all relevant environmental applications and consents/authorisations is to be kept in a project environmental file and copies provided to Highways England of all applications and consents/authorisations as soon as practical after submission and receipt.

### 5.3 Site specific procedures

Throughout public consultation, design development and construction, specific local site procedures and mitigation measures are to be developed with local stakeholders where necessary. This section highlights details of these site specific requirements to date and will be updated where new requirements are agreed.

#### 5.3.1 Sipson Road Subway

The closures of Sipson Road subway will be of a short duration and kept to an absolute minimum, phased to be at periods of minimal usage, e.g. overnight, weekends and school holidays. Preferably the closures will not be in place just prior, during and just after the school day and availability of the subway will be maximised where safe to do so. This will ensure that there is minimal impact to school children and attendees of the Cherry Lane Children's Centre.

Operations requiring a closure include, but may not be limited to:

- Installing/relocating of piling plant;
- Installation/removal of the safety enclosures;
- Installation of precast concrete beams;
- Demolition/connection works between new and old sections of the structure; and

- Works to the access ramps/approaches.

The diversion route during the closures will be via Vine Close, linking to Holloway Lane either via Blossom Way and Cherry Lane, a distance of approximately 1.5km.

Highways England will provide two weeks' advance notice of any closure(s) of the Sipson Road subway, roads and footpaths/ Non-Motorised User paths. This will include prominent signage advising the public (including Cherry Lane Primary School and Cherry Lane Children's Centre) of dates and times of proposed closures with details of diversion directions and arrangements, as necessary. All notification and signage is to be clearly displayed 24 hours/ 7 days a week and will include contact details of key personnel at Highways England and the Contractor for the benefit of the public in case of enquiries or emergencies.

Pedestrian access will be maintained between Sipson Road and Vine Close.

It should be noted that the proposals described above are based on the preliminary design drawings and final clarification from the Statutory Undertakers of the work required to their plant and equipment is required. The Statutory Undertakers' work could have a significant impact on the detailed design and form of the works to this structure. Consequently, the method, sequencing and phasing of the works could change significantly. Highways England's intention regarding the continued use of Sipson Subway, as described above, will be updated in future versions of the CEMP if the proposals change.

### **5.3.2 Old Slade Lane**

Highways England intends to enter into a private agreement with Thames Water and Grondon Sand and Gravel Limited for the use of a section of Lakeside Road out with the Order limits as an access route during works to Old Slade Lane overbridge. Condition surveys will be undertaken before and after use of Lakeside Road and the road will be reinstated to its initial condition if any damage occurs.

### **5.3.3 Thames Bray Bridge**

The National Trail at Thames Bray will be maintained. This is likely to require diversion via a pontoon over the river and will require EA authority as well as consultation with other key stakeholders – such as ferry and river taxi.

### **5.3.4 Amerden Lane**

Use of Amerden Lane by construction traffic, beyond the DCO order limits will be avoided at all times, unless otherwise agreed with the landowners and neighbouring residents.

### **5.3.5 Myrke Allotments**

Access for allotment tenants, including occasional heavy goods vehicles will be maintained apart from a number of temporary short duration closures. These temporary closures will be co-ordinated so as to avoid preventing access in the day time during peak growing season. Main construction access for works on the motorway verge and Thames water crossing, will be from the motorway and not through the allotment site. Unless exceptions are otherwise agreed, excavations, access and working arrangements around the Thames Water culvert, on the eastbound verge, within the allotment land, will be restricted to the areas marked within

drawing TR010019- iii-01 in appendix of Highways England's response to Written Representation (Deadline III – 5 November)

### **5.3.6 Old Stubbs Lane**

An area of mature Black Poplar trees located on the north side of Oak Stubbs Lane, within the temporary works area for Marsh Lane Overbridge, will be protected and retained during construction. The working area at this location will be securely fenced off from the adjacent paddock to prevent access to the work site by horses.

### **5.3.7 Compound 5**

At construction compound 5 (located on the west side of the A330 Ascot Road), the perimeter vegetation between the adjacent residential properties on the A330 Ascot Road and the perimeter of the site will be retained and protected. Top soil bunds will be located along the east and north edge of the site to provide a buffer to the adjacent properties. These bunds will not adversely affect the root protection zone of the adjacent retained vegetation.

### **5.3.8 Compound 9**

At construction compound 9 (located at the south east edge of Brands Hill, north of the A4 Colnbrook Bypass), The perimeter vegetation between the adjacent residential properties on the A4 and the perimeter of the site will be retained and protected. The height of the offices, workshops, plant and storage elements within construction will be limited to no more than 3m in height to ensure minimal visual disruption on the adjacent residential properties. Concrete Batching Plants will not be included within this compound.

### **5.3.9 Datchet Road Overbridge**

The trees between the west-side of the B376 and the properties of The Myrke. Will be retained wherever possible.

## **5.4 Working hours**

### **5.4.1 Core working hours**

Core working hours as defined by the DCO will be from 08:00 to 19:00 on weekdays (excluding bank holidays) and from 07:00 to 16:00 on Saturdays. Core working hours will be adhered to for each site as far as is reasonably practicable. Particular consideration will be given to the impacts of Saturday morning working by minimising noisy activities as far as practicable.

Guidance on the site specific variations to core hours and/or additional hours likely to be required will be summarised within this CEMP and included within the Construction Noise and Vibration Plan, following consultation with the relevant local authorities.

Night time working will be required for certain construction activities where overnight lane closures will be required to provide additional safe working space. Examples of construction activities undertaken at night include but will not be limited to the following:

- Installation of bridge beams;

- Installation and removal of temporary works that could affect the safe operation of the M4;
- Bridge demolition;
- Traffic Management installation;
- Installation, reconfiguring and removal of traffic management;
- Resurfacing works to the M4;
- Underbridge joint replacements;
- Erection of gantries and associated technology;
- Cross carriageway ducts and drains; and
- Delivery and removal of large items of plant into the works.

Except in the case of an emergency, any work required to be undertaken outside core hours (not including repairs or maintenance) will be notified to the relevant local authorities prior to undertaking the works.

Certain operations such as earthworks are season and weather dependent. In these instances core working hours and/or days will be extended for such operations to take advantage of daylight hours.

Certain other specific construction activities will require extended working hours for reasons of engineering or environmental practicability. These activities include, but are not limited to surveys, e.g. for wildlife or engineering purposes which may need to be carried out outside of core working hours although given the nature of these works it is considered unlikely that they would affect surrounding receptors materially.

Repair or maintenance of construction equipment that is required to be carried out outside of core working hours will be agreed with the local authority and included within Section 61 Consents.

In the event that work is required either in response to an emergency or to prevent unsafe conditions or harm to staff, the general public or the environment, the relevant local authority will be informed as soon as reasonably practicable of the reasons for, and likely duration of, those works. A log of such instances will be maintained in the Common Data Environment.

#### **5.4.2 Start up and close down periods**

To maximise productivity within the core hours, a period of up to one hour before and up to one hour after normal core working hours for start-up and close down of activities. This will include but not be limited to deliveries, movement to place of work, unloading, maintenance and general preparation works. It will not include operation of plant or machinery likely to cause a disturbance to local residents or businesses. Furthermore, these periods will not be used to otherwise extend core working hours.

#### **5.4.3 Abnormal deliveries**

Abnormal loads or those that require a police escort (e.g. delivery of prefabricated bridge beams or heavy plant) may be delivered outside core working hours.

## 5.5 Construction compound selection

Construction of the Scheme requires the establishment of a main office compound (Compound 5) and seven smaller section compounds (Compounds 2, 4, 6-9 & 11) to accept material deliveries, provide distribution of plant and equipment and provide office and welfare facilities for workers and a base for vehicle recovery.

Eight principle compounds sites have been identified as potentially suitable, provision for which has been included in the DCO. The sites have been selected on the basis of:

- location - A suitable compound location will be necessary to service the works in the local area. This minimises travelling time and associated carbon output
- construction schedule – Subject to development of the detailed construction programme, other than compound 5 (which is required for the full duration of the Scheme), other compounds may only be required for part of the overall construction period (while the works in the adjacent area are undertaken);
- access – some of the compounds have previously been used as construction compounds or are contiguous with the M4. Access details will be discussed and agreed with the relevant local authorities with the aim of securing suitable safe access routes and minimising traffic flows on local roads where practicable;
- environmental issues – Consideration of environmental impact of proposed sites (e.g. presence and maintenance of any sensitive ecology).

Table 5 overleaf summarises the current compound strategy and associated environmental risks associated with each, this is subject to change as detailed design and programme progresses. The locations of the compounds are provided in appendix 4

Table 5: Construction Compounds

| Compound | Location                          | Size (ha) | Approx. Duration | Access Arrangements                              | Key Facilities                                                                                          | Electricity Supply | Drainage Arrangements | Potential Environmental Risks                                          |
|----------|-----------------------------------|-----------|------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------|-----------------------|------------------------------------------------------------------------|
| 2        | North J12 – Off Dorking Way       | 2.57      | TBC              | Works access to be constructed off Dorking Way   | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material, Plant Storage<br>Concrete Batching Plant | Grid Connection    | TBC                   | Statutory Nuisance<br>Ecology<br>Archaeology                           |
| 4        | Within J10                        | 7.44      | TBC              | Chapter 8 Vehicles only from Motorway            | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material, Plant Storage<br>Earthwork Storage       | Generators         | TBC                   | Ecology                                                                |
| 5        | North J8/9 – Off A330             | 5.2       | TBC              | Works access to be constructed off A330          | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material Storage<br>Batching Plant                 | Grid Connection    | TBC                   | Statutory Nuisance<br>Ecology<br>Archaeology<br>Water Quality/Flooding |
| 6        | Within J7                         | 3.06      | TBC              | Chapter 8 Vehicles only from Motorway            | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material Storage<br>Earthwork Storage              | Generators         | TBC                   | Ecology                                                                |
| 7        | South of J6 – Off A355            | 1.35      | TBC              | Existing works access off A355                   | Car Parking, Office & Welfare<br>Material Storage<br>Material Processing                                | Grid Connection    | TBC                   | Ecology<br>Archaeology<br>Water Quality/Flooding                       |
| 8        | South M4 between J6-J5 – Off B376 | 2.0       | TBC              | Works access to be constructed off B376          | Car Parking, Office & Welfare<br>Material Storage<br>Material Processing                                | Grid Connection    | TBC                   | Statutory Nuisance<br>Ecology<br>Archaeology                           |
| 9        | South J5- Off Sutton Ln           | 3.4       | TBC              | Works access to be constructed off Sutton Lane   | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material Storage                                   | Grid Connection    | TBC                   | Statutory Nuisance<br>Ecology<br>Archaeology<br>Historic Land use      |
| 11       | North J4 – Off Stockley Rd        | 2.0       | TBC              | Works access to be constructed off Stockley Road | Car Parking, Office & Welfare<br>Vehicle Recovery<br>Material Storage                                   | Grid Connection    | TBC                   | Statutory Nuisance<br>Ecology<br>Archaeology<br>Historic Land use      |

## 5.6 Construction site layout and appearance

Prior to development BBV will provide method statements to the relevant local authorities, with regard to compound layout and appearance. The method statements will provide for:

- the parking of vehicles of site operatives and visitors;
- loading and unloading of plant and materials;
- storage of plant and materials used in constructing the development;
- the erection and maintenance of security hoarding including decorative displays and facilities for public viewing, where appropriate;
- wheel washing facilities;
- measures to control the emission of dust and dirt during construction (see Section 6) and
- a scheme for recycling/disposing of waste resulting from demolition and construction works.

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

- prohibition of open fires, and a requirement to take preventative measures to reduce the likelihood of fires;
- removal or stopping and sealing of drains and sewers taken out of use;
- no discharge of site runoff to ditches, watercourses, drains, sewers or soakaways without consultation with the appropriate authority;
- maintenance of wheel washing facilities or other containment measures;
- provision of dust suppression facilities where required;
- location of storage, machinery, equipment and temporary buildings to reduce environmental effects and where practicable, outside flood risk areas;
- use of modern well maintained plant;
- the use of modern specification noise alarms that meet the particular safety requirements of the site, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- controls on lighting/illumination to reduce visual intrusion or any adverse effect on sensitive ecology and neighbouring residential properties;
- the location of site accommodation to avoid overlooking residential property;
- containing and limiting visual intrusion of construction sites, as far as reasonably practicable;
- provision of maps showing sensitive areas and buffer zones where no pollutants are to be stored or used;

- where reasonably practicable, maintenance of public rights of way (including diversions) for pedestrians, cyclists and equestrians affected by the Scheme, including reasonable adjustments to maintain or achieve inclusive access;
- adequate welfare facilities for staff; and
- smoking areas at site offices/compounds or work sites equipped with containers for smoking wastes - these would not be located at the boundary of working areas or adjacent to neighbouring land.

In addition to the general measures for construction sites set-out above the following additional restrictions are placed on specific compound sites:

- use of one way systems within compound areas to minimise reversing noise;
- Scheme inductions/briefing for all personnel to include specific consideration of both night work and working in compounds during all to minimise disturbance to adjacent residents; and
- agreement of fencing provision at each compound with local authorities giving consideration to the proximity of local residents.

Prior to the commencement of construction full details of all plant to be used, including manufacturers' specifications, will be discussed with the relevant local authorities.

#### **5.6.1 Unexploded ordnance**

BBV will raise awareness of hazards from unexploded ordnance (UXO) through the site induction process and toolbox talks. This would assist in establishing appropriate actions to take in the event that a suspect item is uncovered.

Should it be considered likely that UXO could be encountered during the works an emergency response procedure will be prepared in accordance with Unexploded ordnance, A guide for the construction industry CIRIA C681 (CIRIA, 2009) and implemented. This emergency response procedure will include notifications to the relevant local authorities and emergency services.

#### **5.6.2 Lighting**

Site lighting and signage will be provided to enable the safety and security of the construction sites. Lighting will be designed, positioned and directed so as not to intrude unnecessarily on adjacent buildings, ecological receptors and other land uses to prevent unnecessary disturbance, interference with local residents, railway operations, or passing motorists. This provision will apply particularly to sites where night working will be required. In addition, at construction sites where potentially significant impacts are identified, additional lighting controls will be sought and implemented. Where appropriate, lighting to site boundaries will be provided.

#### **5.6.3 Temporary site accommodation and welfare facilities**

Accommodation, offices, welfare (canteen and washing facilities), fleet parking and material storage areas will be located within compounds.

#### **5.6.4 Occupational healthcare**

Provision will be made for either access to on-site or near site occupational healthcare. This will include pre-work medical assessments, drugs and alcohol testing, health surveillance and lifestyle/wellbeing advisory services.

#### **5.6.5 Security**

BBV will carry out site specific assessments of the security and trespass risk at each site and implement appropriate control measures.

The measures to prevent unauthorised access to the site, may include:

- use of high perimeter fencing or hoarding but only where necessary for site security and public safety;
- lighting at site perimeters (designed as per the lighting specification set out above);
- security guards and patrols;
- CCTV and infrared surveillance and alarm systems where required;
- communications initiatives for local schools to warn of dangers;
- consultation with neighbours on site security matters;
- consultation with local crime prevention officers on security proposals for each site with regular liaison to review security effectiveness and response to incidents; and
- immobilisation of plant out of hours, removing or securing hazardous materials from site, securing fuel storage containers and preventing unauthorised use of scaffolding to gain access to restricted areas and neighbouring properties.

### **5.7 Pollution prevention and incident control measures**

The project will implement and communicate the site environmental emergency response procedures detailed in appendix 2. Site specific emergency response plans will be produced that will detail and implement appropriate measures to control the risk of pollution due to construction works, materials and extreme weather events.

#### **5.7.1 Pollution Prevention – General Mitigation measures**

In particular, the following measures will be adopted to manage the risk of pollution incidents:

- provision of maps showing the locations, together with address and contact details, of local emergency services facilities such as police stations, fire authorities, medical facilities and other relevant authorities;
- ensure that site drainage plans and flood risk management plans are available on site and are kept up-to-date;
- statement of appropriate information which will be held on site and to be provided immediately in the event of any incident such as a spillage or release of a potentially hazardous material;

- ensure staff competence and awareness in implementing plans and using pollution response kit through toolbox talks, site training and induction;
- provision of contact details for the relevant authorities, such as the EA, and the persons responsible on the construction site and within the Contractor organisation for pollution incident response;
- provision of contacts with a competent spill response company which can be contacted at short notice for an immediate response;
- notification of relevant statutory bodies, environmental regulatory bodies, local authorities and local water and sewer providers of pollution incidents, where required; and
- notification of appropriate emergency services, authorities and personnel on the construction site.

### **5.7.2 Fuel and Control of Substances Hazardous to Health (COSHH) Handling**

Fuel and oil (including mould oil) will be stored in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 and fuels and oil will be handled in such a way that risk of pollution is minimised, specifically:

- Fuel and / or oil storage tanks will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 and will be locked when not in use i.e. outside working hours.
- Central refuelling facilities will have access controlled by smart card, code or electronic fob, to better manage and control distribution of fuel
- Fuel storage areas will not be located within 10m of site drainage.
- No refuelling will be permitted within 50m of a watercourse or within 10m of a drainage gully unless at designated fuelling points where appropriate protection is provided to capture any potential spillage to prevent contamination
- Mobile bowsters will be bunded and will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 and will be locked when not in use i.e. outside working hours.
- Trained operatives will carry out refuelling of plant and equipment.
- Drums will be stored in bunded areas with a minimum capacity of 25% of the total volume contained within the bund, or 110% of the largest container, whichever is the greater. Where possible these bunds will be fitted with roofs to prevent the collection of rainwater. Individual drums in use will be stored on a drip tray sufficient to contain 25% of the full capacity of the drum.
- Drums will be maintained in a good condition, fitted with lids and labelled to indicate the contents.
- Static combustion engine plant (e.g. compressors, lighting sets) will be integrally bunded or placed on drip trays.

- Plant will be regularly checked for leaks and will be regularly maintained.
- Spill kits will be provided within close proximity to fuel and oil storage areas and operatives will be trained in their use.

### **5.7.3 Concrete Washout**

Concrete washout water will be managed and controlled on site. Untreated concrete wash water will not be allowed to enter the ground, site drainage or adjacent water environment. The Environment Agency will be consulted regarding the management, treatment and disposal of concrete wash waters.

### **5.7.4 Plant Maintenance**

Maintenance of plant, vehicles and equipment will be carried out at least 50m from a watercourse and 10m away from a drain unless at designated maintenance point, where appropriate protection is provided to capture any potential spillage to prevent contamination. Spill kits will be provided and a drip tray will be used to contain any leakage of oil. Where emergency repair is necessary within 10m of a drain, a drain seal will be used to ensure that no contamination enters the drainage system.

Any plant, equipment or other vehicle considered a pollution risk will be either repaired or removed from site

### **5.7.5 Mud, dust and silt control**

Roads will be maintained and cleaned using sweepers and the use of wheel washes, rumble strips and jet washers as deemed necessary to prevent soil and mud spreading off site. Where deemed necessary any Stockpiles will be sheeted, seeded or sealed. Sensitive receptors (drains, watercourses, roads) will be protected from silty runoff through the use of, silt traps, silt fencing, bunds and settlement lagoons/equipment. Furthermore, excavation activities within the proximity to watercourses will implement specific controls agreed with the EA where necessary.

### **5.7.6 Pollution Control Equipment**

Spill kits will be located at compounds, alongside fuel storage areas, security cabins, close to areas where plant is operating and in sensitive locations such as adjacent to watercourses. All site plant will carry spill absorbents where there is a risk of spills occurring as a result of the work being undertaken.

Typical contents will be as follows, but will vary depending on local circumstances:

- Absorbent granules
- Absorbent mats
- Protective gloves.
- Heavy-duty plastic sacks.

The following may be included depending on the work in the area of the spill kit:

- Absorbent booms.
- Drainage gully seals

Relevant project personnel will be trained in the general use of spill kits during the site induction and through regular 'toolbox' talks. Practice spillage drills will be conducted on site to ensure that staff know how to use spill response equipment correctly and effectively. This process will also be used to help identify potential areas of weakness in incident response provisions. Learning points from any incidents will be identified and disseminated to help prevent recurrence.

#### **5.7.7 Emergency call out services**

The Environmental Manager will ensure that emergency call-out services are established where appropriate e.g. vacuum tanker for removal of oily water from sumps/drains.

In the event of a serious spillage, which cannot be contained and/or cleaned-up by the project team, contact will be made with **Darcy Spillcare** on 01622 715100 and quote 'VINCI' and provide details of the incident. A specialist response unit will be dispatched within a maximum of 4 hours to contain and clean-up the fuel and/or chemical spillage

#### **5.7.8 Emergency access**

BBV will ensure that the requirements of the relevant fire authority will be followed for the provision of site access points. The accesses may vary over time and will be updated as required, and should also be suitable for emergency services.

#### **5.7.9 Fire prevention and control**

Appropriate plans and management controls will be in place at all construction sites, associated accommodation and health and safety welfare facilities, with the aim of preventing fires.

## **5.8 Investigating and reporting environmental incidents**

An **Environmental Incident** is defined as - an unplanned, undesired event that results in: harm or damage to the environment or the potential for enforcement action relating to environmental legislation, consents and consent conditions.

**Harm or damage to the environment** includes (but is not limited to): pollution of, or damage to, surface water, groundwater, or land; spills or leaks of oil and chemicals; damage to archaeology or heritage (listed and non-listed); damage to wildlife; including protected species and habitats; excessive noise, dust and/or other air pollutants, vibration or light pollution; or

failure to control waste or excavated material in accordance with the regulations. Incidents are classified as Level 1, 2, 3, 4 or 5 (1 = close call – 5 = major incident).

**Level 1** – An incident resulting in Minimal environmental impact e.g. minor oil drips

**Level 2** – An incident resulting in Local impact requiring management response, but from which there is natural recovery e.g. recovery of fly tip waste, low levels of silt into spawning river

**Level 3** – An incident resulting in moderate environmental impact requiring management response to aid recovery Reportable to authorities e.g. fuel tank spillage

**Level 4** – Major environmental incident resulting in significant impact requiring management by external authorities and/or high level of resources for response and remedy Environmental incident managed by external authorities e.g. contamination of potable water

**Level 5** - Extreme environmental incident resulting in irreversible, long term or widespread harm

An Environmental Incidents Register of all Environmental incidents and Close Calls, including close out actions will also be kept on site and provided to Highways England within monthly reports.

In the case of a Level 4 or 5 environmental incident a written Root Cause Analysis investigation report will be produced, and reported on an incident report form. An interim report will be produced within 7 days of the event occurring and a full investigation completed within 14 days and issued within 21 days. The investigation team will be appointed by the project director for a level 4 incident or the Managing director for level 5 incidents. Any incident of level 3 or greater will be notified to Highways England as soon as practicable and within 24 hours.

The Environmental Manager will be the main point of contact with Highways England, regulatory authorities and will maintain records of telephone conversations and all written communication relating to environmental issues.

## 5.9 Site documentation

Copies of the following documents will be held on site:

- the DCO (at all times);
- the CEMP (at all times);
- any licence required
- travel plan;
- Stakeholder Engagement and Communications Plan
- Communications register
- the pollution spillage response plans and all site emergency procedures (at all times);
- monitoring records
- staff training records (at all times).

## 6 AIR QUALITY

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### 6.1 Introduction

This section of the CEMP applies to the management of emissions to the atmosphere during the construction of the Scheme. Typical emissions arising from plant operating during construction works are nitrogen dioxide (NO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and particles measuring 10µm or less (PM10).

Dust nuisance has the potential to occur more readily during prolonged dry weather and times of strong winds. Dust becomes more difficult to suppress once it is airborne and consequently, the ability to respond quickly to such conditions is essential. Therefore, measures will be implemented to minimise the creation of dust at source as detailed in Sections 6.2 and 6.3.

### 6.2 Mitigation measures

Mitigation measures, as listed in table 5 overleaf, will be applied at works along the entire Scheme route, at all construction compounds and for all overbridge and underbridge works.

### 6.3 Additional mitigation measures

Those sites with sensitive receptors (properties within 200m) are considered to be of a higher risk and require additional mitigation measures. The proposed higher risk sites refer to all overbridge and underbridge works and construction compounds 2,4,5,6,8 and 9. The additional mitigation measures to be undertaken are detailed in table 6.

### 6.4 Monitoring

BBV will implement "inspection and monitoring procedures" to assess the effectiveness of measures to prevent dust and air pollutant emissions. The relevant local authorities will be consulted regarding the monitoring procedures and the following measures implemented:

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

Monitoring may also be required around sites using dust deposition, dust flux, real-time PM10 continuous monitoring. BBV will document all corrective actions and will keep all dust monitoring records on site.

Table 6: Air Quality Mitigation Measures

| Mitigation Type             | Construction Activities                                       | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Mitigation Measures | All Activities                                                | <ul style="list-style-type: none"> <li>- Development and operation of a Dust Risk Management Plan</li> <li>- Operations will be fully enclosed where there is high potential for dust production.</li> <li>- Where practical, generators will be avoided, and mains electricity or battery powered equipment used instead.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                             | All works within reasonable proximity to sensitive receptors. | <ul style="list-style-type: none"> <li>- Where required, frequent site inspections will be undertaken to monitor and measure emissions.</li> <li>- Proactive and early engagement with local stakeholders.</li> <li>- Where practical, Haul routes will be distant from sensitive properties and watered regularly.</li> <li>- Fencing barriers and scaffolding will be kept clean using wet methods where appropriate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 |
|                             | Compounds, Plant & Vehicles                                   | <ul style="list-style-type: none"> <li>- Where practical, dust-prone materials will be removed from site as soon as possible.</li> <li>- Materials will be stored so as to prevent wind whipping and material slippage.</li> <li>- Material handling areas will be limited to a minimal area to constrain dust emissions;</li> <li>- A maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas will be implemented.</li> <li>- Vehicles and plant will be no more than 4 years old, be well maintained, use Ultra Low Sulphur Diesel as a fuel type and be switched off at all times when stationary.</li> <li>- Plant will be positioned to ensure effective dispersal of exhaust emissions, away from receptors.</li> <li>- Ensure an adequate water supply for dust mitigation.</li> </ul> |
|                             | Traffic                                                       | <ul style="list-style-type: none"> <li>- Construction traffic movements will be kept to a minimum, and site access point design to avoid queuing.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Demolition                  |                                                               | <ul style="list-style-type: none"> <li>• Where required, effective water suppression will be used.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Mitigation Type         | Construction Activities                                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Bridges, gantries, road surfaces.                               | <ul style="list-style-type: none"> <li>- Explosive blasting will be avoided and appropriate alternatives used.</li> <li>- Comply with measures set out in the Asbestos Management Plan (Annex D)</li> </ul>                                                                                                                                                                                                                                                                            |
| Earthworks              | Soil stripping, soil restructuring and compacting, landscaping. | <ul style="list-style-type: none"> <li>- Re-vegetate earthworks and exposed soils and stockpiles, as soon as practicable.</li> <li>- If re-vegetation isn't possible, use hessian or cover top soil, as soon as practicable.</li> <li>- Compact deposited materials (exc. Top Soil), as soon as possible, after deposition.</li> <li>- Only remove the cover in small areas during work, and not all at once.</li> </ul>                                                               |
| Surfacing               | Road surfacing (e.g. planing)                                   | <ul style="list-style-type: none"> <li>- Surfacing equipment (e.g. planer) will only be operated with manufacturers dust abatement measures set in place.</li> </ul>                                                                                                                                                                                                                                                                                                                   |
| Construction Activities | General construction activities.                                | <ul style="list-style-type: none"> <li>- Avoid scabbling (roughening of concrete surfaces) if possible.</li> <li>- Ensure aggregates are stored in bunded areas and do not dry out, unless a particular process requires otherwise. Ensure additional control is set in place.</li> <li>- Where drilling is used for the purposes of excavating within rock, the exposed surfaces will be watered to limit dust emissions as necessary.</li> </ul>                                     |
| Track Out               | Transportation, processing and storage of materials.            | <ul style="list-style-type: none"> <li>- A water-assisted dust sweeper will be used to remediate any material tracked out of the site.</li> <li>- Where practical, dry sweeping large areas will be avoided.</li> <li>- Vehicles entering and leaving site will be covered to avoid loss of any materials.</li> <li>- A log book will be used to record all inspections of haul routes.</li> <li>- a wheel washing system will be implemented where reasonably practicable.</li> </ul> |

Table 7: Additional Air Quality Mitigation Measures

| Mitigation Type             | Construction activities           | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication Measures      |                                   | <ul style="list-style-type: none"> <li>- A stakeholder engagement and communications plan will be implemented.</li> <li>- The Stakeholder Manager's contact details will be displayed on construction site boundaries, along with the head or regional office contact information.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| General Mitigation Measures | Stakeholder Engagement            | <ul style="list-style-type: none"> <li>- Appropriate measures will be taken to record all complaints in a log book. The resulting emissions will be measured and actions taken to reduce these emissions.</li> <li>- A complaints log will be made available for to the local authority.</li> <li>- Regular liaison meetings will be held with nearby construction sites to ensure all works are coordinated, and emissions minimised.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                             | Site Operations                   | <ul style="list-style-type: none"> <li>- Where required, continuous dust monitoring will be implemented. Where possible, baseline monitoring will be carried out at least three months before works start.</li> <li>- Solid screens or barriers as high as any stockpile will surround any dusty activities.</li> <li>- Measures will be taken to reduce site run off or mud distribution.</li> <li>- All on-road vehicles will comply with the London Low Emission Zone and London NRMM standards within greater London.</li> <li>- Sustainable delivery of goods and materials will be implemented through careful programming of delivery and removal of materials. A sustainable travel plan will be implemented to encourage sustainable travel.</li> <li>- Dust producing plant will be provided with shielding or filters to minimise dust.</li> <li>- Enclosed chutes, conveyors and covered skips will be used. Drop heights of materials will be minimised, and fine water sprays will be used where appropriate.</li> <li>- Dust-producing plant will be used with suitable dust suppression techniques</li> <li>- Bonfires and burning of waste materials is not permitted.</li> </ul> |
| Demolition Measures         | Bridges, gantries, road surfaces. | <ul style="list-style-type: none"> <li>• As detailed in Section 6.2.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction Measures |  | <ul style="list-style-type: none"> <li>- Fine powdered materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material. For smaller supplies of fine powder materials, the bags will be sealed after use.</li> </ul>                                                                                                                                                                                                                                                                                            |
| Track-off Measures    |  | <ul style="list-style-type: none"> <li>- On-site haul routes will be maintained and inspected regularly.</li> <li>- Where possible, hard surfaced haul routes will be installed, and regularly dampened down a water distribution system.</li> <li>- Where possible, an adequate area of hard surfaced road will be provided between the wheel wash facility and site entrances and exits. NB: Areas without hard standing ground, may mean it is necessary to clean vehicle bodies also.</li> <li>- access gates will be located at least 10m from receptors where possible.</li> </ul> |

## 6.5 Site documentation

In addition to the documentation set out in 5.8.1, copies of the following documents will be held on site:

- Log of complaints in relation to dust with the identified source and details of corrective action taken;
- Plant inspection, maintenance and defect reports

# 7 CULTURAL HERITAGE

## 7.1 Introduction

The objective of this section of the CEMP is to ensure that all construction works are carried out in such a way as to avoid or minimise potential damage and disturbance to archaeological sites and deposits.

## 7.2 Cultural heritage general provisions

The impact of construction works on cultural heritage assets will be minimised, including:

- designated assets - scheduled monuments; listed buildings; registered parks and gardens; conservation areas and registered historic battlefields; and
- undesignated assets - archaeological and palaeoenvironmental remains including geological deposits that may contain evidence of the human past, historic landscapes, historic buildings and the built environment (this includes locally designated assets).

The location of designated and undesignated heritage assets are provided in the ES at the following locations:

- Junctions 12 to 11 - paragraphs 7.5.1 to 7.5.13, Drawing 7.1 (sheets 1 to 3);
- Junctions 11 to 10 - paragraphs 7.6.1 to 7.6.9, Drawing 7.1 (sheets 3 to 5);
- Junctions 10 to 9/8 - paragraphs 7.7.1 to 7.7.7, Drawing 7.1 (sheets 6 to 9);
- Junctions 9/8 to 7 - paragraphs 7.8.1 to 7.8.14, Drawing 7.1 (sheets 9 and 10);
- Junctions 7 to 6 - paragraphs 7.9.1 to 7.9.5, Drawing 7.1 (sheets 10 and 11);
- Junctions 6 to 5 - paragraphs 7.10.1 to 7.10.9, Drawing 7.1 (sheets 11 to 13);
- Junctions 5 to 4b - paragraphs 7.11.1 to 7.11.2, Drawing 7.1 (sheets 13 and 14);
- Junctions 4b to 4 - paragraphs 7.12.1 to 7.12.5, Drawing 7.1 (sheet 14); and
- Junctions 4 to 3 - paragraphs 7.13.1 to 7.13.9, Drawing 7.1 (sheets 15 and 16).

### 7.2.1 General management measures for cultural heritage assets include:

- potential impacts to any sub-surface archaeological remains will be mitigated by maintaining archaeological watching briefs during topsoil stripping and excavations into previously undisturbed ground during the construction phase. Any archaeological watching brief should be followed by an appropriate programme of assessment, analysis and reporting;
- provision to BBV of locations and descriptions of all known cultural heritage assets within and adjacent to construction works;
- a programme detailing the implementation of cultural heritage investigation works prior to and during construction;

- monitoring of compliance against the above programme of cultural heritage investigation works using appropriately qualified environmental management staff;
- Facilitation of archaeological and built heritage specialists undertaking the cultural heritage investigation works (including purposive investigation);
- all cultural heritage intervention, recording, analysis, dissemination and archiving will be undertaken by suitably qualified and demonstrably experienced persons in accordance with an approved Written Scheme of Investigation (WSI); and
- consultation through all stages of the implementation of the programme of cultural heritage investigation works, including final publication and archiving, with the relevant local authority archaeologist and Historic England (where appropriate).

## **7.3 Heritage assets**

Suitable Scheme-wide measures and procedures, will be developed in consultation with Historic England (where appropriate), and the relevant local authorities, will include the following, as appropriate:

- development of procedures for topsoil stripping and excavation before commencement of such works and the interface of those works with archaeological investigations, including procedures to be adopted in the event of a potentially nationally significant unanticipated discovery or disturbance of significant archaeological remains;
- procedures adopted to preserve archaeological remains in situ beneath earthworks; and

### **7.3.1 Metal detectors**

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

### **7.3.2 Unknown Archaeological finds**

If unknown archaeological assets, such as buried remains or artefacts, are exposed during the course of construction, pursuant to the DCO Requirement 15, works will stop and these will immediately be reported to BBVs project manager, who will ensure the following actions are taken -

- Fence off the immediate area to protect the find from damage and sign to indicate “Archaeologically Sensitive Area – No Unauthorised Access”.
- No activities to take place within 10m of the find and limit any activities which cause high levels of vibration in the area
- Highways England and Local Authority Archaeologist must be notified by phone, email or personally and in the case of human remains must be confirmed in writing within 24hrs.

The finds will be investigated, recorded and reported to the secretary of state, Highways England, Local Authority and Historic England by means of a technical report. All work within 10m of the find is to stop until agreed otherwise with the secretary of state following consultation with the local authority and Historic England.

### **7.3.3 Human remains**

Should human remains be located during construction either during archaeological works or as part of construction activity, works will stop and will immediately be reported to BBVs Project Director, BBV will comply with all relevant legislative requirements and record the discovery of any such remains.

The removal of human remains will be undertaken in accordance with the Burial Act 1857 and an exhumation licence obtained from the Ministry of Justice (MoJ) prior to the removal of any remains. Excavation of human remains will consider guidance contained in Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England (English Heritage and the Church of England, 2005).

### **7.3.4 Treasure Act**

Should artefacts be located during the course of construction that are deemed by their material content or context to be treasure, as defined by the Treasure Act 1996, then all necessary measures to comply with the requirements of the Act, including reporting such finds, and following the procedure outlined in 7.3.2

### **7.3.5 Written Scheme of investigation**

A Scheme-wide WSI and where necessary site specific WSIs, will be prepared in advance of site preparation and construction, in consultation with the relevant local authority and Historic England (where appropriate). This document will detail the principles, standards, methods and techniques to be employed on the project for cultural heritage investigation works.

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

## **Construction compound 5**

A programme of archaeological work, including a WSI is to be prepared in relation to construction compound 5, pursuant to Requirement 16 of the DCO and completed prior to works commencing. The WSI will include:

- a) a programme and methodology of site investigation and recording;
- b) a programme for post investigation assessment;
- c) provision for analysis of the site investigation recording;
- d) provision for publication and dissemination of the analysis and records of the site investigation;
- e) provision to be made for archive deposition of the analysis and records of the site investigation; and

- f) nomination of a competent person or persons/organisation to undertake the works set out within the WSI.

## 7.4 Measures in the event of unexpected discoveries of national significance

In case unexpected cultural heritage assets of potential national significance are identified during construction, a procedure for dealing with the assets will be agreed by the Contractor with Historic England and the relevant local authority and implemented. Mitigation may include the following, as appropriate:

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

## 7.5 Mitigation of potential impacts on cultural heritage assets

Given the location of proposed construction compound 5 in the vicinity of the Mesolithic site at Bray, a scheduled monument, there is some potential for unknown archaeological remains to be present. Geophysical survey and archaeological evaluation trenching will be undertaken prior to establishment of this construction compound. Once the nature and extent of the actual archaeological remains are established it will be possible to finalise mitigation impacts to any archaeological remains present in the area by designing the compound over or around the remains, or recording them via archaeological excavation, or a combination of the two.

The following features are located in the vicinity of known archaeological remains:

- gantries G8-20, G8-17, G8-11, G8-09 and G8-05;
- gantries G6-20 to G6-08 and the widening of the junction 8/9 slip roads and Monkey Island overbridge;
- gantries G5-10 to G5-02 and the widening at junctions 7 and 6, Oldway Lane overbridge and Wood Lane overbridge;
- gantries G4-18 to G4-02, Windsor Branch Railway underbridge, Datchet Road overbridge, Recreation Ground overbridge and construction compounds 7 and 8;
- gantries G3-01 to G2-01 and the widening of the junction 4 slip roads;
- gantries G1-12 to G1-01 and the widening of the junction 4 slip roads;
- gantries G9-14 to G9-02 and the widening of the westbound junction 11 slip road and construction compounds 2 and 3; and

- gantries G7-29 to G7-23, G7-07 to G7-06 and the proposed widening of the junction 8/9 slip roads, and construction compound 4.

In these locations there is potential for the Scheme to cause direct physical impacts to currently unknown archaeological remains. If such works are likely to disturb previously un-excavated ground, archaeological watching briefs will be undertaken during topsoil stripping and excavations. Any archaeological watching briefs will be followed by an appropriate programme of assessment, analysis and reporting.

Fencing and hoarding will be provided as may be necessary to protect cultural heritage assets and their amenity within or adjacent to the construction site, including unknown sites discovered during construction.

If archaeological investigations or works to protect cultural heritage features are required on land which is to be occupied temporarily or land adjacent to the construction site/compounds, the owners and occupiers of that land, and the relevant local authority (where appropriate) will be consulted in advance of the works being undertaken.

As appropriate and as required by the site wide or site specific WSI watching briefs and archaeological monitoring during construction will be undertaken adjacent to sites of archaeological or cultural heritage interest and during topsoil stripping.

The nature, extent and frequency of monitoring will be appropriate and determined in consultation with the local authority archaeologist and Historic England (where appropriate), taking into consideration the nature of the planned construction works and proximity of the relevant site.

## **7.6 Monitoring**

Appropriate monitoring of the consequences of construction work on all cultural heritage assets (designated and non-designated) will be implemented. Visual assessment and monitoring of the works will be carried out in accordance with the management controls and inspection regime agreed with appropriate personnel and detailed in the WSIs.

## **7.7 Site documentation**

In addition to documentation set out in 5.9, copies of the following documents will be held on site:

- Records of all archaeological remains found and copies of any mitigation measures determined in consultation with the local authority archaeologists and/or Historic England throughout the works.

## 8 LANDSCAPE

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### 8.1 Introduction

This section provides information regarding the landscape management and maintenance of landscape reinstatement works.

### 8.2 Site specific procedures

The procedures and mitigations outlined below intend to minimise the landscape impact of the works and to set out the procedures that will be followed during the construction of the Scheme and its subsequent restoration. The procedures addressed incorporate best practice measures for the protection of the landscape and visual receptors.

### 8.3 Landscape management – general provisions

Existing vegetation within the Order limits shall be retained wherever reasonably practicable. Where possible and relevant, in order to reduce visual impact on receptors adjacent to the scheme, perimeter vegetation will be retained and buffer zones created. Temporary earth bunds from excavated soil within compound areas or the installation of, palisade or solid timber hoarding around compound perimeters will be provided.

Controls to protect landscape character and visual amenity during construction will include, as appropriate:

- a) areas of existing vegetation (within the EM drawings and Appendix 8.4 of the ES) to be retained and protected for the duration of the construction phase
- b) at detail design the Designer will prepare, at a suitable scale, a plan showing areas of existing trees and vegetation to be retained within the Order limits. The plan will also show the respective root protection zone and protection measures for the retained vegetation as well as identifying the existing vegetation to be removed. This plan will be adhered to during construction
- c) any completely new areas identified to be cleared will need to be assessed for visual/ ecological impact by a suitably qualified Landscape Architect and Ecologist
- d) an arboricultural and/ or ecological specialist will be consulted as required, in relation to vegetation clearance, tree works and the creation of new wildlife habitats;
- e) where vegetation is to be removed and protected species have been identified, or where clearance is not to be undertaken within the relevant breeding season, a suitably qualified ecologist should inspect the area prior to the commencement of clearance and any actions identified should be taken;
- f) provision of appropriate temporary protective fencing to reduce the risks associated with vehicles trafficking and/or material stock piles and other temporary works over root systems or beneath tree canopies and adjacent landscape features;

- g) a programme and specification for undertaking all forms of landscape works will be followed;
- h) protection of existing and new areas of planting and other vegetation;
- i) inspection, maintenance and management of existing and new landscape areas;

## **8.4 Mitigation of potential impacts on the landscape or landscape resources**

Locations for landscape measures will be detailed in the Landscape Scheme, and will ensure the protection and mitigation of adverse effects on sensitive and valued landscape features and characteristics.

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

Access to the construction site will be controlled in accordance with the requirements of the Outline CTMP (refer to Annex E). Potential impacts on trees or other mature vegetation will be avoided, when positioning site access and egress points.

The procedures set out in section 10 relating to the handling of soils will be applied equally in relation to soils used in areas to be seeded or planted. The sourcing, testing, stripping, handling, storage and spreading of site-won and imported topsoil will comply with BS 6031: 2009 Code of practice for earthworks (BSI, 2009). Further, imported topsoil will comply with the BS 3882: 2007 Specification for topsoil and requirements for use (BSI, 2007).

In order to ensure the replacement tree and shrub areas establish planting is to be maintained for a five year period from the date of completion of the works. All planting defects will be rectified during this period. This will be carried out on an annual basis.

The protection of habitats and ecological features (Section 9) will be integrated with the landscape works and will adhere to the requirements of BS 42020:2013 Biodiversity. Code of practice for planning and development (BSI, 2013).

## **8.5 Protection of trees**

Where necessary an arboricultural consultant will oversee works relating to the protection of trees. The Scheme also includes locations where there are trees within the Order limits or which lie immediately adjacent to it, which are covered by Tree Preservation Order (TPO) or are within a Conservation Area. The protection of these trees also refers to the protection of the trees root system. A schedule of the TPOs is provided in Schedule 8 of the DCO and in table 8 below.

Table 8: Schedule of Tree Protection Orders

| Jnct.    | Verge     | Ch. / location                                           | TPO Name                      | Risk and mitigation                                                                                                                                                     |
|----------|-----------|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J12 - 11 | Eastbound | 56400 - 56000                                            | Group TPO 239/1983            | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |
| J10-J8/9 | Eastbound | J10 Slip 45900 - 45700                                   | Group TPO 576/1993            | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |
|          | Eastbound | 39300 - 39150                                            | Group TPO 432                 | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |
| J8/9-J7  | Both      | Adjacent to Compound 5/Southern Abutment of Ascot Bridge | Individual Trees TPO 13/1979  | Trees within scheme Boundary. Possible need for lopping or felling, but to be avoided where possible and protection provided                                            |
|          | Eastbound | Thames Bray Bridge East Abutment                         | Group TPO 1962                | Felling of small part of TPO where it overlaps with scheme boundary. Followed by protection of offsite retained vegetation                                              |
|          | Eastbound | 30800                                                    | Individual (Lime) TPO 14/2000 | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |
| J6 - 5   | Eastbound | 24300 (North of M4 adjacent to OB limits)                | Group TPO 12 of 2006          | Trees within scheme Boundary. Possible need for lopping or felling, but to be avoided where possible and protection provided                                            |
| J5 - 4   | Westbound | 18500 - 18300                                            | Group TPO 7 of 1952           | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |
|          | Westbound | 17600                                                    | Individual Trees TPO 3        | Trees within scheme Boundary. Possible need for lopping or felling, but to be avoided where possible and protection provided                                            |
| J4 - 3   | Eastbound | 13300 - 13200                                            | Group TPO 549                 | Adjacent to site - risk of disturbance to roots or overhanging branches. Possible need for lopping or felling, but to be avoided where possible and protection provided |

The tree survey undertaken at detailed design, will provide a full schedule of trees to be retained, TPOs and root protection areas to be protected. The protection requirements in these areas will be adhered to throughout construction

Where it is not possible to retain the vegetation or full tree, consideration will be given to coppicing the vegetation. Coppiced trees and new growth will then be protected during the construction period. During vegetation clearance, where ever possible all large individual trees (defined as semi-mature trees with a trunk circumference of 200mm at 1m above ground level) will be protected and retained.

Tree protection will be based on recommendations in BS5837:2012 Trees in relation to design, demolition and construction. Trees will be considered to be those covered by BS5837 with stem diameter greater than 75mm measured at 1.5m above ground level. The trees to be protected will be identified by the arboricultural consultant during detailed design and during construction where necessary.

The type of protection will be selected from options based on the risk of damage to the retained vegetation, including their root protection areas and the nature of the construction works planned. It may include the following

- Chestnut pale fencing secured to timber posts (or similar) with signage at regular intervals, where retained or sensitive on and off-site vegetation, such as woodlands, TPOs and large trees are in close proximity to construction works and at risk of damage
- Netlon fencing with regular signage, for plantation areas, including retained original planting and landscape features, where there is risk from damage

Physical barriers will not be provided where retained vegetation is in a location where there is little or no risk of accidental damage being caused. E.g. at the top of a steep cutting, where the cutting provides sufficient protection.

Where other temporary fencing is provided e.g. herptile fencing or another barrier present such as the interrupter cable on mounted posts, this may provide suitable protection, although further signage will be added.

Any tree surgery operations will comply with the recommendations in BS 3998: 2010 Tree work and will be carried out taking appropriate consideration of the Forestry Commission's Forest and Water Guidelines (Forestry Commission, 2003) to mitigate risks from felling of trees on the freshwater environment. Where there are no windthrow or visual issues, tree felling will be reduced to that necessary to allow the safe construction and operation of the Scheme. Where appropriate, tree surgery, e.g. crown reduction, pollarding etc., will be employed in preference to felling so as to maintain the maximum biodiversity/ landscape interest. Tree surgery or felling operations will consider roosting bats and breeding birds (refer to section 9).

The arboricultural and ecological consultant should liaise with the Contractor to identify the quantities of cut timber and brash that should be retained on site for habitat creation measures (e.g. the creation of log piles and hibernacula).

## **8.6 Tree planting and replacement**

Any trees intended to be retained which are felled or die as a consequence of construction works will be replaced. Where reasonably practicable, the size and species of replacement

trees will be selected to achieve to the greatest extent possible, a close resemblance of the original trees most effectively using locally occurring native species of local provenance and taking cognisance of any management plans for areas of woodland immediately adjacent.

Where a tree which is covered by a TPO or located within a Conservation Area is either affected by the works (i.e. such as root damage or felled), the planning authority will be immediately notified and replacement tree species and tree size will be agreed.

Supply, storage, handling, planting and maintenance of Trees, seeding, and other landscape works will comply with the recommendations of the latest British Standards, BS 3936 - 1: 1992 Nursery stock and BS4428: 1989 Code of practice for general landscape operations - excluding hard surfaces, the UK Forestry Standard and the UK Woodland assurance standard.

## **8.7 Monitoring**

Inspection, monitoring and maintenance of landscaping and planting provided as part of the Scheme will be undertaken to facilitate the effective establishment of vegetation and record the effectiveness of landscaping proposals.

## **8.8 Site documentation**

In addition to documentation set out in 5.8.1, copies of the following documents will be held on site:

- photos and other records taken of the site prior to the works commencing.

## 9 NATURE CONSERVATION

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### 9.1 Introduction

Over the duration of the project, the various ecological constraints will be clearly presented on an Ecological M4 Schematic which will depict the exact locations of all constraints across the Scheme. This schematic will be readily available and used to advise construction works, identify any ecological constraints and determine the need for any briefings or tool box talks.

### 9.2 General provisions

A programme of Preconstruction Surveys are being completed by the designer as required by Requirement 13 of the DCO to determine, the current status and distribution of protected and notable species across the scheme. The relevant Local Authorities, Natural England, the Environment Agency and relevant wildlife trusts have been consulted through the development of the outline CEMP and continue to be as necessary, during the ongoing preparation of this CEMP. Their input to date, along with internal expertise and client requirements support the following: -

Vegetation removal will be minimised as far as possible and fenced off to prevent accidental incursions by construction plant and equipment.

- 1) Land cleared of vegetation for temporary construction works will be replanted using native species as soon as reasonably practicable, in line with the agreed landscape design.
- 2) Species and habitat management plans are provided and are covered in section 9.3 Protected Species.
- 3) Best practice pollution prevention and control measures will be adopted and are detailed in section 5.7 and appendix 2.
- 4) A qualified ecologist will oversee the implementation of any ecological mitigation.

General measures to be implemented on the Scheme include:

- Where practicable night time working will be avoided– particularly in the vicinity of sensitive habitats such as woodland, hedgerows and watercourses;
- The use of construction lighting in compliance with the IoL Professionals GN01 (2011) and BS 5489 code of practice for the design of road lighting (BSI 2013a).
- Avoid the use of generators (and other noisy equipment) at night in proximity to sensitive habitats.
- All excavations will be covered overnight (where practicable) or means of escape e.g., a scaffold plank or similar will be provided. Covered excavations will be checked for wildlife prior to works starting.
- Where practicable, the severance impact of vegetation removal will be minimized by maintaining the feature for as long as possible.

- Soil storage areas will be managed to maximise their future value in landscape planting and to dissuade badgers and other burrowing animals from colonising them in the interim.
- Measures that cover Dust and Air Quality, Noise and Vibration, and Protection of the Water Environment will be implemented and are covered in sections 6, 12 and 14 respectively.

## 9.3 Protected species

The programming of construction works includes seasonal constraints for a range of species and their habitats (e.g. great crested newt breeding ponds, reptile hibernation habitat and bat breeding roosts).

Highways England is committed to preserving biodiversity as part of 'The Highways England Biodiversity Plan (2015)'. Under this Strategy, the M4 junctions 3 to 12 smart motorway Scheme will implement actions to protect and enhance the value of Highways England's estate and to maximise the contribution to biodiversity. The long term safeguarding of mitigation and compensation provisions will be undertaken by Highways England's maintenance service providers post-construction, through the development of a Handover Environmental Management Plan (HEMP) at completion of the scheme.

### 9.3.1 Great crested newts

Great Crested Newts (GCN) are protected by the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats, &c) Regulations 1994. There are a number of ponds with GCN populations within 500m of the Scheme. Grassland and scrub on the verge may be used by GCN for foraging and hibernating. Between November and March GCN are likely to be hibernating under log piles, debris, within the verge and at the base of trees. The actions required during main construction works are indicated below.

*Table 9: GCN areas. NOTE - J5 - 7 are yet to still to be surveyed.*

| Link       | Verge     | MP      | MP                    | Length | Mitigation |
|------------|-----------|---------|-----------------------|--------|------------|
| J 12 - 11  | Westbound | 70/3+50 | 71/3+60               | 1010   | PMoW       |
|            | Eastbound | 67/5+50 | 68/9                  | 1450   | PMoW       |
|            | Westbound | 67/2    | 69/2+20               | 2020   | Licence    |
|            | Westbound | 66/0+50 | 67/4                  | 1350   | Licence    |
|            | Eastbound | 65/3+20 | 67/9+50               | 2630   | PMoW       |
| J11 - 10   | Eastbound | 64/0+80 | 65/1                  | 1020   | PMoW       |
|            | Westbound | 59/4    | 60/3 + 20             | 920    | PMoW       |
|            | Westbound | 58/4+90 | 57/3+80               | 1110   | Licence    |
|            | Westbound | 55/6+80 | 56/6+50 + J10/A329(A) | 1500   | Licence    |
| J 10 - 8/9 | Eastbound | 54/8+80 | 55/8+50               | 970    | Licence    |
|            | Westbound | 52/9+50 | 54/5                  | 1550   | PMoW       |
|            | Eastbound | 50/8    | 52/3                  | 1500   | Licence    |
|            | Westbound | 48/3    | 48/7                  | 400    | PMoW       |
|            | Westbound | 47/0    | 47/7+60               | 760    | PMoW       |
|            | Westbound | 45/1    | 45/7+50               | 650    | PMoW       |

| J8/9 - 5 | Surveys to be completed from March 2017 |            |            |      |         |
|----------|-----------------------------------------|------------|------------|------|---------|
| J5-4B    | Compound 9                              | Compound 9 | Compound 9 |      | PMoW    |
|          | Eastbound                               | 029/7      | 028/6      | 1100 | Licence |
|          | Westbound                               | 027/4      | 027/7+50   | 350  | Licence |
| J4B- J4  | Westbound                               | 025/0      | 026/1      | 1100 | Licence |
| J4 - 3   | Eastbound                               | 021/4      | 022/4      | 1100 | Licence |

### 9.3.1.1 Great Crested Newt Precautionary Working Method

Areas in the table 9 above indicated as requiring a Precautionary Method of Working (PMoW) have been identified as areas which have low suitability or low potential to disturb, injure or kill great crested newts or their habitats. Phased vegetation clearance will be completed under the supervision of a qualified ecologist prior to the start of the great crested newt hibernation period in these areas (between October to February, inclusive):

- Vegetation will be cut down to 150mm above ground level. The arisings will be raked off and removed from the footprint of the works. The cleared area will be left undisturbed for at least 24 hours; and
- If a significant density of vegetation remains, this vegetation will then be cleared to ground level. The arisings will be raked off and removed from the footprint of the works. The cleared area will be left undisturbed for at least 24 hours.
- Features which may be used as refuges will be removed by hand by a qualified ecologist and searched for the presence of great crested newts. A destructive search, of any larger features suitable for use by newts, will be undertaken by hand or using a small excavator, under ecological supervision

### 9.3.1.2 Great Crested Newt Licensed Areas

In those areas identified in table 9 as requiring a licence, no work will take place until a licence is approved by Natural England to disturb, capture and translocate great crested newts.

In these areas the requirements of the licence will be adhered to at all times and is likely to include the installation of fencing and translocation between March – October, followed by the PMoW described in 9.3.1.1, before construction works can commence.

Licence applications are planned to be submitted mid-2017 to allow mitigation August – October 2017 ahead of construction works. This section will be updated once licences have been approved and mitigation measures agreed.

### 9.3.2 Reptiles

Reptiles are protected by the Wildlife & Countryside Act 1981. Reptiles are considered to be present throughout the scheme. Grassland and scrub on the verge may be used by reptiles for foraging and hibernating. Between November and March reptiles are likely to be hibernating under log piles and debris within the verge and at the base of trees. During the main construction works reptiles will be managed by avoiding or minimising vegetation clearance where possible, avoiding damage to log piles, debris or other potential refuges and avoiding unnecessary breaking of ground and tracking of machinery on the verges.

A reptile mitigation strategy is in preparation during detailed design. This will identify the areas sensitive to reptiles and the mitigation methods that should be followed. Where areas are identified as suitable and which have suitable areas of habitats adjacent to the site, the reptiles will be dispersed through phased vegetation clearance, following the PMoW detailed in 9.3.1.1.

Where no suitable adjacent habitat is available translocation of reptiles by hand to a pre-defined receptor site will be undertaken as an alternative to displacement, dependent on the size of the reptile populations recorded and the size of the habitat area concerned. The exact details are to be confirmed by the designer at the detailed design stage, at which point the most suitable method for mitigation at each location will be confirmed and this section updated.

### **9.3.3 Breeding birds**

Bird nesting season is generally taken to be the period from 1<sup>st</sup> March to 31<sup>st</sup> August, although this is weather dependent and can be extended at either end if weather conditions are favourable for nesting. Clearance of vegetation will be carried out outside these periods where possible. Where clearance is required during the bird nesting season, the vegetation will be checked for the presence of nesting birds at least 24 hours prior to clearance works. If an active nest is found (or suspected), works will stop, a cordon of approximately 10m will be placed around the nest and no works permitted within that area until the chicks have fledged.

### **9.3.4 Bats**

Bat roosts are thought to be present throughout the scheme, residing in trees, culverts and structures. These roosts have been categorised into confirmed presence, high, medium, and low potential. A European Protected Species licence will be required wherever intrusive works impact on a confirmed bat roost. Where works take place in proximity to a known roost, unless licenced, works will avoid the core active season for bats.

Locations identified as high to low potential for roosting bats will require an assessment to be made by a qualified ecologist ahead of intrusive works. Where a roost is confirmed but disturbance is assessed as being minimal, works will be carried out under a Precautionary Method of Working, under supervision of an ecologist.

During works, directional lighting will be used to avoid disturbance of roosts, particularly during May to September.

All invasive works to structures will adhere to the best practice guidelines in 'Bats in Bridges' from the Bat Conservation Trust.

Details of the known bats roosts, those that require license and precautionary method of working will be included in this CEMP following completion of pre-construction surveys in 2017.

### **9.3.5 Water voles and Otters**

Water voles and Otters are protected under schedule 5 of the Wildlife and Countryside Act 1981. Despite the identification of a number of suitable habitats, no water voles are currently present, but the status will be updated in 2017 following further pre-construction surveys. Mitigation measures included within this section of the CEMP where deemed necessary.

### 9.3.6 Badgers

Badgers are protected under the Badger Act 1991. There are currently approximately 37 Licensable Badger Setts across the scheme, of which 3 are Main setts. At every location, current best practice will be adopted from Natural England's (NE), 'Badger and Development: A guide to Best Practice and Licensing' (Version 11/09). Where applicable, a licence from NE will be required for any works that disturb a particular badger sett, detailing the measures to be implemented and the programme of work to follow. Due to the confidential nature of badger information a full list including specific locations is available from the scheme Ecologist or Environmental Manager. Following 2017 pre-construction surveys, this will be updated.

## 9.4 Species licensing

Protected species licenses will be issued to NE to obtain approval to proceed with construction works, where identified as necessary following the pre-construction surveys. Once consent is granted, work package plans and methods statements will comply with all requirements of the protected species license and mitigation details included within this CEMP.

## 9.5 Control of invasive and non-native species

During the survey works, the invasive and non-native species shown in table 9 were identified across the scheme.

Full details of locations, controls and management during construction works will adhere to the EA best practice guidance and Environmental Protection Act 1990. Full details are detailed in project invasive species management plan.

*Table 10: Extent of Invasive Species*

| <b>Junction</b>   | <b>Invasive Species</b> |
|-------------------|-------------------------|
| <b>J12-J11</b>    | Indian Balsam           |
|                   | Virginia Creeper        |
|                   | Giant Hogweed           |
| <b>J11 -J10</b>   | Indian Balsam           |
|                   | Cotoneaster             |
| <b>J10 – J8/9</b> | Rhododendron            |
|                   | Giant Hogweed           |
|                   | Indian Balsam           |
| <b>J8/9 - J7</b>  | Japanese Knotweed       |
|                   | Giant Hogweed           |
|                   | Indian Balsam           |
| <b>J7 – J6</b>    | Japanese Knotweed       |
|                   | Giant Hogweed           |
|                   | Indian Balsam           |
| <b>J6 - 5</b>     | Japanese Knotweed       |
|                   | Rhododendron            |
| <b>J5 – J4B</b>   | Montbretia              |
|                   | Japanese knotweed       |
| <b>J4B-J3</b>     | Indian Balsam           |
|                   | Japanese Knotweed       |
|                   | Giant Hogweed           |

## 9.6 Monitoring

The environmental team will monitor all works by reviewing all work package plans across the scheme. Furthermore, during all ecological sensitive work an environmental representative will be present to monitor construction works, advise and direct on mitigation. A permit to dig and clear system will be implemented to ensure that any operations that could impact on a protected area of the scheme follow the correct control measures detailed in this CEMP and the invasive species management plan

Regular Environmental inspections will take place on site to ensure measures are in place.

## 9.7 Site documentation

The following documentation will be stored on site:

- Copies of All Protected Species Licences.
- All Preconstruction Survey Reports.
- Construction Environmental Management Plan
- M4 Scheme Ecological Constraints Schematic.

# 10 GEOLOGY AND SOILS

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## 10.1 Introduction

It is considered that the proposed M4 J 3 – 12 Smart Motorway works have the potential to impact upon areas of contamination and areas underlain by groundwater source protection zones. This section details the appropriate mitigation necessary for the above constraints.

## 10.2 Ground investigation

Pursuant to Requirement 12 of the DCO a programme of ground Investigation is being undertaken. Findings from these surveys will inform the Geotechnical Design Report (DCO Requirement 12), which will where necessary detail a scheme to mitigate and remediate any issues resulting from contaminated land. Findings from this report will be used to further update this section of the CEMP.

Where remediation is necessary, the Environment Agency, local authority and any relevant water undertaker will be consulted prior to the submission of a written scheme and programme, to render the land fit for its intended purpose, for approval by the Secretary of State. In addition, it may be necessary to install gas and leachate control systems in order to ensure their migration pathways are controlled and do not adversely affect the environment and the scheme.

All ground investigation works will be undertaken in accordance with UK best practice, including BS 5930:1999 Code of Practice for site investigations (BSI, 1999) and BS 10175:2011 Investigation of potentially contaminated sites Code of Practice (BSI, 2011).

## 10.3 Mitigation of potential impacts

Appropriate measures will be put in place when preparing Work Package Plans, to assess and control risks to humans, including disturbance of contaminated land and the effects from contaminated dust, soils, groundwater and the presence of ground gas and/or vapours. If ground gas issues are identified, appropriate mitigation measures and monitoring will be provided.

All excavated soils will be assessed to identify any potential risks due to the reuse of such soils as engineering fill. All soils will be carefully excavated, separated, and stored to ensure that any contaminated soil is not mixed. Where practicable, excavations will not break the groundwater table and be as shallow as possible. Careful management of construction site drainage (e.g. sediment traps, and settling lagoons) will also mitigate the risks.

Existing top soil at temporary construction compound locations will be stripped and stockpiled for later reinstatement following the decommissioning and removal of the construction compounds.

Where significant contamination is encountered which was not previously identified work in the vicinity of the area will stop and it shall be reported to the EA, relevant water undertaker

and the local authority. A risk assessment of the contamination with agreed mitigation, remedial strategy will be developed and agreed, prior to work continuing.

## **10.4 Construction on or adjacent to land affected by contamination and within groundwater source protection zones**

At areas near contaminated land (to be defined in association with work to discharge DCO Requirement 12) or groundwater protection zones (table 13), the following control measures will be adhered to:

- Traffic site movements will be minimised and additional wheel wash facilities provided.
- Redundant services will be isolated to prevent migration pathways for contamination.

Any potential contaminated materials will be segregated and stored in an impervious bunded area of a suitable nature to prevent contamination of ground water or land. Known or suspected contamination stockpile areas will be tested adequately prior to and after use to ensure that no cross-contamination has occurred;

- Pre-classification of soils will be undertaken prior to reuse of site-won materials.
- The soil and soil leachate acceptance criteria will adhere to the acceptance criteria established in the detailed design stage.
- Appropriate measures will be implemented to mitigate the likely effects on the groundwater.
- A site specific environmental risk assessment will be developed for works located within 50m of contaminated land or source protection zones.
- Appropriate guidance, including the Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention, (National Groundwater and Contaminated Land Centre, 2001); will be adhered to
- Buried services will be protected from the ingress of mobile and aggressive contaminants. In the case of drainage runs, infiltration of contaminated ground will be prevented and clean or lined service corridors will be installed to provide a suitable barrier to migrating ground gases adjacent to known/potential sources.
- Materials used for the Scheme will be proven 'suitable for use' by adoption of acceptance criteria and will be deposited under either environmental permitting regulations or the Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011);
- Construction activities will follow best practice guidelines to avoid contamination from leaks, spillages and inappropriate storage of materials on site, as detailed in Section 5.7.
- Emergency preparedness and response plans will provide a full list of protocols and communication channels with the EA and any relevant water undertaken in the event of a pollution incident.

## 10.5 Monitoring

A surface water and/or groundwater monitoring plan, particularly in relation to works that could affect aquifers or drilling works will be implemented. Where deemed necessary following ground investigation findings, a monitoring programme for groundwater levels and quality will take place prior to, during and following completion of the works.

Site activities and the prevention of pollution will be controlled by adopting measures to comply with relevant Pollution Prevention Guidelines: temporary construction methods and Construction Industry Research and Information Association (CIRIA) publications

## 10.6 Specific Provisions

Liaison will take place with South East Water and other relevant water authorities in relation to construction activities that could have the potential to impact water quality.

## 10.7 Site documentation

In addition to documentation set out in 5.9, copies of the following documents will be held on site:

- copies of Daily Logs identifying any issues relating to contamination.

# 11 MATERIALS

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## 11.1 Introduction

This section of the CEMP refers to the storage and handling of excavated materials during the works, and the methods for dealing with waste arising throughout the construction programme.

## 11.2 Site specific procedures

The SWMP (Annex A) will be regularly updated, implemented and adhered to throughout the programme of construction works.

The MMP (Annex B) provides a framework by which all of the Scheme's materials (material resources and waste) will be managed. It will be developed throughout detail design and construction to ensure the efficient and sustainable procurement, handling and management of all materials associated with the Scheme.

The Logistics Plan (Annex C) will be developed throughout detail design and construction to effectively manage all movements of materials on and offsite. In order to improve the safety and reliability of deliveries to the Scheme, reduce congestion and minimise the environmental impacts.

## 11.3 General provisions

The project aims to maximise reuse of site-won materials (either onsite or offsite), segregating construction and demolition materials onsite and ultimately maximise diversion from landfill by reuse, recycling and recovery.

## 11.4 Management of excavated materials and waste arisings

All waste will be managed in accordance with the waste hierarchy (i.e. prevention, preparing for reuse, recycling, other recovery and disposal as set out in the Waste (England and Wales) Regulations 2011) and in such a way as to prevent harm to human health, amenity and the environment.

BBV will be responsible for the storage and management of the earthworks material excavated from the Scheme. This material will be used wherever practicable to construct the engineering earthworks and to mitigate the environmental effects of the Scheme. The reuse of site-won materials will be maximised through the further development and delivery of the MMP.

BBV will be responsible for the reduction of waste arising from the Scheme where reasonably practicable. This will include measures such as careful storage of materials on site and 'just in time' deliveries which will be secured through the development and implementation of the MMP and Logistics Plan.

There will be dedicated areas for handling and storing excavated material. The earthworks material excavated will be tested for its chemical and engineering properties to ensure it is suitable for re-use.

Due to the dynamic nature of the Scheme's construction, opportunities to reuse excavated materials (within areas of the Scheme which have a requirement for these excavated materials to be reused as fill) will have to be addressed on an ongoing basis.

A project SWMP has been prepared in accordance with industry best practice WRAP guidance and will be updated throughout construction.

The SWMP sets a framework to facilitate good practice to:

- identify the volume and tonnes of excavated materials and other waste streams and volume and tonnes (for example wood, brick, concrete, soils, plastics) likely to be produced during construction and demolition, to establish the potential for reuse (onsite or offsite) and recycling;
- identify opportunities for waste minimisation and management;
- identify possible options for designing out waste;
- identify the most significant opportunities to increase reuse and recycling rates (termed Waste Recovery Quick Wins) and the realistic recovery rates for each waste type;
- identify suitable waste management contractors and record appropriate licences, permits, waste transfer notes and hazardous waste consignment notes;
- consider appropriate site practices such as how waste materials will be segregated and the measures that will be used for raising awareness among site operatives for waste reduction, reuse and recycling; and
- set out the method for measuring and auditing Construction, Demolition and Excavation (CD&E) waste to enable more effective waste management through the setting of performance targets for segregation, recycling, and monitoring sub-contractors.

Opportunities will be considered and measures will be implemented in the design and construction of the Scheme to reuse waste or surplus materials, as appropriate. Wherever possible reuse will be maximised, and where this is not possible it will be recorded. BBV will investigate, secure and record where the reuse of materials and waste has been used elsewhere offsite.

A register for primary materials used on the Scheme will be held to inform potential future reuse opportunities.

Collection points will be provided at site offices and compounds with appropriate segregation and transfer to recycling and disposal facilities as appropriate.

Highways England has reviewed and updated where necessary the waste capacity records for landfill and waste management facilities capacity within Buckinghamshire, from that submitted with the DCO application, and the capacity of waste infrastructure sites that could potentially receive CD&E waste arisings from the Scheme. This information will also be used to develop the MMP further and will continue to be updated as the Scheme design and construction planning progresses.

Waste management permits will be obtained, or applications to the EA or local authority will be made, for registration of any relevant exemption from permitting waste that is necessary during construction works.

## **11.5 Identification and classification of waste**

The SWMP will identify the specific types and quantities of waste likely to arise during the construction process. Where generated, waste will be classified in accordance with the statutory controls governing the management of inert, non-hazardous and hazardous wastes.

## **11.6 Segregation and storage of waste**

Waste materials will be sorted into separate waste groups, (according to the waste streams generated by the scope of the works), either onsite or offsite by a licensed contractor for reuse, recycling or recovery.

Onsite hazardous excavated material or other hazardous waste arisings will be kept separate from other materials and managed in accordance with the SWMP and MMP.

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

## **11.7 Duty of care**

All legal 'duty of care' requirements will be adhered to. BBV will manage material use with the aim of maximising the environmental and development benefits from the use of surplus material and reducing the adverse environmental effects and risks associated with disposal offsite.

All waste arisings will be appropriately transported and disposed of by BBV (or their sub-contractors) at permitted or designated sites.

The SWMP will include detailed procedures for compliance with the requirements for waste transfer notes, in accordance with the Waste (England and Wales) Regulations 2011, and arrangements for auditing the actions of other parties in the waste handling chain.

The arrangements for registering the Scheme, consigning, handling and transporting hazardous wastes will be followed in the context of duty of care and the specific consignment note procedures applicable under the Hazardous Waste (England and Wales) Regulations 2005 (SI 2005 No.894) or any succeeding relevant legislation.

## **11.8 Use of materials**

Supported by the further development and implementation of the MMP, the Contractor will where practicable implement measures to manage material resources use during construction including:

- using sustainably sourced materials;
- using recycled or secondary materials; and

- minimising the use of materials that have the potential to harm human health or the environment.

Where reasonably practicable, the intention to generate its own aggregate for the Scheme from recycling of inert CDE waste from demolition of the existing Scheme and sourcing recycled or secondary materials from the relevant local area. As more Scheme-specific information becomes available during detailed design, further details of where and how aggregates will be generated and managed will be included in the MMP, and communicated with the relevant local authorities.

## **11.9 Monitoring**

Regular audits and inspection of waste management activities to ensure compliance with the requirements of this CEMP, statutory controls and BMS procedures relevant to the management of surplus excavated material and waste, will be undertaken.

The types, quantities and destination of waste arisings from the Scheme will be identified, measured and recorded in the SWMP. This information will be reported on a periodic basis.

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

## **11.10 Site documentation**

In addition to documentation set out in 5.9, copies of the following documents will be held on site:

- copies of the SWMP; MMP and Logistics Plan
- all relevant duty of care documentation, including waste transfer notes and consignment notes;
- a Control of Substances Hazardous to Health (COSHH) Register will be maintained for each site compound and updated throughout the works as required; and
- copies of the Site compound plan, clearly indicating where potentially polluting substances and COSHH stores are to be located.

# 12 NOISE AND VIBRATION

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## 12.1 Introduction

The procedure addressed in this section applies to the management of noise and vibration throughout the works for the Scheme.

## 12.2 Measures to reduce potential noise and vibration impacts

Parts 1 and 2 of the BS 5228 2009+A1:2014 Code of Practice for noise and vibration will be implemented along with requirements of the CEMP through Best Practicable Means (BPM).

BPM will be implemented at all times throughout the construction of the Scheme in accordance with Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990. Details of site specific BPM will be agreed within the Section 61 consents

Application of BPM during construction works will be identified and shared across this scheme and other highway projects.

## 12.3 Noise and vibration management

The scheme will manage noise and vibration across 11 Local Authorities. All Local Authorities will be consulted with regard to Section 61 (S61) consents and detailed working hours. All out of hours working will be discussed and agreed with the relevant local authorities prior to construction works. Further to this, locations of necessary noise monitoring and measurement will be agreed.

In order to effectively manage this process and as required through Requirement 21 of the DCO a Written Scheme of Noise Management during construction has been developed, setting out the details of how the project will manage and monitor noise from construction.

It will include information to achieve the following: -

- integration of noise control measures into the preparation of all method statements for the works;
- preparation of details and locations of all site hoardings, screens or bunds that will provide acoustic screening during construction;
- development of noise and vibration monitoring protocols including a monitoring locations and stages during construction for which monitoring will be undertaken;
- the preparation and submission of all s61 consent applications required;
- A programme of noise reports to be provided to all relevant local authorities.
- processes to ensure ongoing compliance with all controls and consent for the works and any improvement and rapid corrective actions that are required to avoid any potential non-compliance; and

- a piling strategy for any piling works close to sensitive receptors is developed and implemented.

## 12.4 Section 61 consents

All local authorities will be consulted individually prior to, and during construction works, and an agreed method of working will be established through a S61 consent. All S61 applications will be submitted in accordance with BS 5228, to the relevant planning authority at least 28 days before works are due to start. Each S61 will include the following:

- details of construction activities;
- prediction methods;
- location of sensitive receivers;
- noise and vibration levels in accordance with BS 5228's and
- noise and vibration mitigation.

Where works requiring a S61 consent are re-scheduled or modified, a dispensation or variation from the appropriate local authority will be sought, before commencing those works. Dispensations will be sought by means of an application to vary the agreed matters, setting out the revised construction programme or method and the relevant noise calculations.

## 12.5 Noise Mitigation

As a minimum, the following noise mitigation measures will be implemented for the construction works. Additional noise mitigation measures will be considered on completion of background noise monitoring and the Section 61 noise predictions:

- Where practicable, deliveries to site will be conducted during normal working hours;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good effective order. Plant will be inspected on arrival to site;
- Machines in intermittent use will be shut down in intervening periods of non-use or, where this is impracticable, they will be throttled down to a minimum;
- The only piling operations that may take place during night time hours would be bored piling but only at locations greater than 100m from property;
- All plant enclosures will be kept closed when in use;
- Air lines will be maintained to reduce leaks;
- Methods of construction and plant will be selected so as to minimise noise and vibration and reduce the use of percussive and vibratory equipment, particularly for night time working;
- Static plant will be located so as to optimise screening and/or distance attenuation in relation to occupied residential properties and fitted with suitable enclosures where practicable;
- Where practicable, concrete pours will be programmed to avoid overruns and enable work to be carried out within core hours;

- All relevant plant will comply with permissible noise levels set out in the relevant European Directives;
- In addition to the above, where it is identified that static items of plant are likely to generate relatively high noise levels, portable noise screens will be sourced and introduced to provide additional noise attenuation when working closes to residential properties;
- Good practice guides will be provided to all operatives through the provision of tool box talks and an appropriate induction routine. The induction will inform operatives of good practice to be employed outside normal working hours including, amongst other issues, ways of limiting unnecessary noise during the night-time working; and
- Plant will be fitted with broadband reversing alarms.

Where existing noise barriers are removed to facilitate construction works, they will be reinstalled, or replaced if in poor condition, as early as possible in the construction process. Whilst the permanent barriers are not in place, temporary noise barriers will be installed where practicable

Prior to the start of construction, the contractor will draw up a detailed schedule for the removal and reinstallation / replacement of existing acoustic barriers, and the installation of proposed new barriers

## 12.6 Vibration thresholds and actions

BBV will agree vibration thresholds and actions with Local Authorities during the S61 process based on the principles set out below.

During development of Section 61, activities that are likely to cause vibration will be reviewed and where there is potential for these activities to cause damage or nuisance within 50m any old buildings, or buildings that may be unusually vulnerable to vibration, or due to their proximity to other sensitive receptors, prediction of the likely levels will be undertaken, to inform the relevant actions.

The thresholds identified below are levels at which a set of actions will be carried out. Except where stated otherwise, they are not designed to be maximum permitted levels.

*Table 11: Vibration Action Levels*

| Vibration level<br>(PPV at foundations) | Action                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| >1mm/s Residential<br>>3mm/s Commercial | Those potentially affected will be notified as soon as practicably possible in advance of the works. The notification will describe the nature and duration of the works and any associated proposals for vibration monitoring.                                                                         |
| >5mm/s at sensitive buildings           | Review Methodology to reduce vibration impact<br>Where no reasonable or predictable means to reduce levels- <ul style="list-style-type: none"> <li>• Ensure monitoring during works</li> <li>• Undertake Condition survey of effected building</li> <li>• Consult owners and Local Authority</li> </ul> |
| >10mm/s                                 | Review Methodology to reduce vibration impact                                                                                                                                                                                                                                                           |

|  |                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Where no reasonable or predictable means to reduce levels -</p> <ul style="list-style-type: none"> <li>• Agree with HE and notify and consult it and the relevant local authority</li> <li>• Ensure monitoring during works</li> <li>• Consult Occupiers, with regard to requirements of works and any mitigation, monitoring</li> <li>• Undertake Condition survey of effected properties</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Should condition and vibration monitoring surveys demonstrate that vibration from the works has given rise to building damage then the damage will be made good.

BBV will endeavour to avoid any impact on sensitive equipment. Any actions to control or mitigate impacts will be agreed between its contractors and the operator of the equipment. Detailed vibration specifications for any “vibration-sensitive equipment” will need to be provided by the owner of the equipment so that the risk can be assessed and mitigated.

## 12.7 Monitoring

BBV will undertake and report noise and vibration monitoring as is necessary to ensure and demonstrate compliance with all noise and vibration commitments and any S61 consent(s).

The planned monitoring strategy will be set out in the Construction Noise & Vibration Management and provided in further detail within Section 61s

Regular onsite observation monitoring and checks/audits will be undertaken to ensure that BPM is being employed at all times. The site reviews will be logged and any remedial actions recorded. Such checks will include:

- Hours of working;
- Presence of mitigation measures, equipment and screening
- Number and type of plant;
- Construction method; and
- Where applicable, any specific s61 consent conditions.

The S61 applications will include a detailed description of the monitoring and monitoring locations proposed for the particular works covered by the consent application.

## 12.8 Site documentation

In addition to documentation set out in 5.9, copies of the following documents will be held on site:

- noise and vibration monitoring records;
- details of corrective action taken if complaints are received or excessive noise is identified; and

- All relevant Section 61 Consents.
- plant maintenance records.

# 13 EFFECTS ON ALL TRAVELLERS

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## 13.1 Introduction

This section includes general details on traffic management; however, reference should be made to the Construction Traffic Management Plan (CTMP) (Annex E) for detailed traffic management measures.

## 13.2 General provisions

BBV will implement traffic management measures during the construction of the Scheme on all public roads and non-motorised user (NMU) paths as detailed within the CTMP. General measures include, but are not limited to the following:

- TM works and temporary signs erected during the works will be consistent with permanent signs (as per the requirements of the Traffic Signs Manual Chapter 8).
- Relevant stakeholders will be consulted where and when BBV identify the potential for significant construction disruptions.
- BBV will log any complaints and provide Highways England with updates regarding any disruption caused by construction works on the road network.
- A Traffic Management Working Group (TMWG) will be formed, including representation from the emergency services, Traffic Officers, Local Authorities, Local Network Managers and any other relevant stakeholders. The TMWG will agree with TM procedures during construction
- The CTMP will include all details listed in section 13.2.6 and 13.2.7 of the Outline CEMP.

## 13.3 General measures to reduce construction traffic impacts

Where practical, haul routes through the works for use by construction vehicles will be provided in order to reduce the potential for impacts upon the public road network. Site access points will be positioned to enable the use of haul routes to be maximised throughout the works.

Requirements of the national and local roads authorities regarding the layout and positioning of site accesses will be adhered to.

Traffic management measures will be provided where crossing of public roads are required at site compounds and construction site.

All roads will be kept free from mud and other loose materials arising from the works, as far as reasonably practicable, in order to reduce the potential for nuisance impacts.

## **13.4 Construction workers' travel**

Where practical, the use of sustainable modes of transport will be encouraged and changes to workforce travel anticipated to reduce their impact on local and strategic road networks and associated communities. This will be detailed in project green travel plans or the relevant section of the CTMP. It will be used to promote cycling routes in vicinity of the compounds, increase awareness of local public transport routes, car sharing opportunities and locations of electric charge points. Furthermore, it will develop solutions to minimise workforce travel around site, through the use of mini-vans and shared transport.

## **13.5 Traffic safety and control**

Relevant local authorities, Highways England, Emergency Services, and other relevant organisations identified by the Stakeholder and Public Liaison Officer will be consulted to provide the following:

- To ensure safe passage of all traffic through the required road works;
- to reduce the likelihood of 'rat running' onto local roads, which may have result in adverse impacts upon the local community;
- to mitigate impacts on the local road network and communities and to keep delays and disruptions to traffic to a minimum; and
- to mitigate the effects of the authorised development on traffic in combination with the effects of the concurrent construction of any other major developments, including but not limited to, the expansion of Bray Water Treatment Plant and HEX.
- Traffic control on local roads will be implemented as necessary as part of the traffic management schemes.
- When necessary during construction a vehicle recovery system will be in operation to minimise the impact of breakdowns or accidents on the flow of traffic.
- Where deemed necessary with the relevant authorities (including police force) speed cameras will be provided within the temporary TM schemes.
- CCTV systems will be implemented by the Contractor at agreed locations throughout the works to monitor the traffic management schemes.

## **13.6 Temporary or permanent closure or diversion**

Where BBV provide a temporary or substitute road or access or the like, the width and standard of construction and any lighting and signage required will be suitable for the traffic anticipated to use the route.

Temporary or substitute road access will be maintained by BBV throughout the works to provide adequately for the traffic using the affected routes.

Where temporary road closures are required to facilitate construction works, BBV will consult with, and comply with the requirements of Highways England, the relevant local authority and the police.

## **13.7 Public transport, pedestrian, equestrian or cycle routes**

Liaison will be undertaken by BBV with relevant local authorities and public transport operators regarding the proposed traffic management procedures along the length of the Scheme.

Where separate footpaths or bridleways used by pedestrians and other NMUs are affected, BBV will provide alternative routes within the traffic management Scheme being implemented.

The specific right of way affected will need to be scheduled with appropriate nomenclature and diversion routes suitably signposted throughout the works. Diversion works will require to be confirmed in consultation with the relevant local authority and consent applied for under s257 of the Town and Country Planning Act 1990

The national Trail at Thames Bray will be maintained. This is likely to require diversion via pontoon over the river and will require EA authority.

Where the Scheme works impact directly on existing Public Rights of Way (PRoW) or private roads, they will be properly reinstated and returned to their pre-construction condition.

## **13.8 Access routes for construction traffic**

During the development of the CTMP, the local highways authorities will be consulted regarding construction site access routes. Final agreed routes will be detailed within the CTMP. The final CTMP will be consulted upon with the relevant authorities to ensure that agreement is reached regarding any timing restrictions on the use of roads.

Access routes for construction traffic will be via special and trunk road network(s) and main roads on the local road network unless it is considered necessary for other local roads to be used. If required, residential roads will be used following liaison with local residents.

BBV will keep site access points clear at all times and will design and construct site access points to a suitable standard to enable the smooth access and egress of vehicles in a forward direction to limit disruption to road users due to use of the access points.

## **13.9 Monitoring**

BBV will monitor traffic levels on roads and site accesses and public roads adjacent to access points to maintain their effectiveness and condition throughout the works and to provide for the safety of traffic, the public and construction staff during traffic management works. BBV will provide information regarding any traffic delays on the M4 due to construction works to Highways England.

## **13.10 Site documentation**

In addition to documentation set out in 5.9, copies of the following documents will be held on site:

- copies of the latest CTMP will be held on site at all times.

# 14 ROAD DRAINAGE AND THE WATER ENVIRONMENT

## 14.1 Introduction

This section presents the mitigation required to control the impacts associated with road drainage and the water environment during construction, focusing on the effects of highway drainage on the quality and hydrology of receiving waters. 22 Watercourses cross the scheme along its length and section of the scheme also pass through a number of groundwater protection zones and 1-100year flood zones, as summarised in the table below.

Table 12: Proximity to Water Resources

| Location          | Chainage | Intercepting Water Courses | Groundwater Status (SPZ)                        | Sites in 1-100year flood Zone 3                                                                                                                                                                       |
|-------------------|----------|----------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Junction 12 - 11  | 61250    | Kennet & Holy Brook        | Zone 2: 54080-60500                             | E9-A1                                                                                                                                                                                                 |
|                   | 61100    | Kennet & Avon Canal        |                                                 |                                                                                                                                                                                                       |
|                   | 59800    | Clay Hill Brook            |                                                 |                                                                                                                                                                                                       |
|                   | 56500    | Foundry Brook              |                                                 |                                                                                                                                                                                                       |
| Junction 11 - 10  | 50400    | Barkham Brook              | Zone 2: 45550 – 46950                           | Sites Adjacent to River Loddon                                                                                                                                                                        |
|                   | 50400    | River Loddon               | Zone 3: 443500 - 46950                          |                                                                                                                                                                                                       |
|                   | 46500    | Emm Brook                  |                                                 |                                                                                                                                                                                                       |
| Junction 10 – 8/9 | 35500    | The Cut                    | Zone 1: 33300 – 33350<br>Zone 3: 34200 - 43500  | None                                                                                                                                                                                                  |
| Junction 8/9 - 7  | 33800    | The Bourne                 | Zone 1: 31100 – 31980                           | ERA E6-B2<br>Compound 5 (Partially)<br>Ascot Road OB (Partially)<br>Widening sites at<br>33045 – 33890 EB/WB<br>30820-31765 EB inc. Monkey Island and Thames Bray Bridge work sites<br>30580-30715 EB |
|                   | 32100    | The Cut                    | Zone 2: 31980 - 32580                           |                                                                                                                                                                                                       |
|                   | 31250    | River Thames               | Zone 2: 30100 – 31100                           |                                                                                                                                                                                                       |
|                   | 30300    | The Jubilee River          | Zone 3: 27990 - 34200                           |                                                                                                                                                                                                       |
|                   | 30000    | Round moor Ditch           |                                                 |                                                                                                                                                                                                       |
| Junction 7 - 6    | 27100    | Salthill Stream            | Zone 2: 26100 – 27600                           | 27235-27375WB inc<br>Wood Lane OB<br>26505-27095 EB/WB                                                                                                                                                |
|                   | 26850    | Chalvey Ditch              |                                                 |                                                                                                                                                                                                       |
| Junction 6-5      | 21550    | Datchet Common Brook       | Zone 1 : 23200 – 24400<br>Zone 2: 21300 - 26100 | Sites between J6 – Windsor Rail Bridge (Partially)<br>Riding Court OB (Partially)<br>Compound 7 (Partially)                                                                                           |
| Junction 5-4      | 17200    | Colne Brook                | Zone 1: 17850 – 18200<br>Zone 2: 17750 - 18700  | 17450-17600 EB/WB                                                                                                                                                                                     |
|                   | 16400    | Bigley Ditch               |                                                 |                                                                                                                                                                                                       |
|                   | 16100    | Wrasbury River             |                                                 |                                                                                                                                                                                                       |
|                   | 16000    | River Colne                |                                                 |                                                                                                                                                                                                       |
| Junction 4-3      | 12500    | Frogs Ditch                |                                                 | None                                                                                                                                                                                                  |
|                   | 11000    | River Crane                |                                                 |                                                                                                                                                                                                       |

## 14.2 General provisions

Measures will be implemented by BBV during construction for any works within or close to Water Framework Directive water bodies, other watercourses, lakes, reservoirs, or groundwater.

General measures that will be implemented include, but are not limited to the following:

- compliance with the Drainage Strategy Report submitted as part of the DCO application and updated as part of Requirement 14;
- preventing access to adjacent areas to avoid impacts on watercourses and water bodies;
- excavations will be kept to as shallow a depth as possible, and above the groundwater table, in order to mitigate the risk of causing turbidity within the groundwater;
- ensuring that manageable parcels of land are only cleared of vegetation at times to allow time for land/topsoil to stabilise;
- ensuring that demolition waste is contained either for re-use or recycling or disposed of immediately to an agreed landfill site (to avoid a build-up on site) as per the requirements of the SWMP; and
- maintaining access and maintenance widths (as appropriate) on all watercourses.

BS 6031 Code of Practice for earthworks (BSI, 2009c), the relevant PPGs and CIRIA Guidance will be complied with, in regard to control of site drainage and pollution on construction sites, unless otherwise agreed by the employer's representative.

### 14.2.1 Dewatering Excavations

Where de-watering activities are anticipated early consultation will take place with the EA/Sewage Undertaker as necessary. De-watering of excavation will take place in line with the EA Regulatory Position Statement. Particular attention needs to be given to areas where dewatering will occur including, estimating surrounding area potentially impacted, identification of all receptors susceptible to groundwater level changes (public and private) and containment of poor quality discharge water and treatment prior to appropriate disposal following one of the following measures:

- 1) Pumping to an area of open vegetated ground / excavation / soakaway away from the excavation. Water must be uncontaminated and depending on the location silt may need to be removed using a settlement tank, straw bales or a geotextile membrane / filter or similar. The Environment Agency will be consulted to agree general principles for discharge to ground.
- 2) Pumped into the existing highways drainage system with consideration to the final discharge point. Water may need treatment as 1) above.
- 3) Pumped to sewer. Consent will be required from the sewerage undertaker for discharge to sewer and conditions may be imposed on the water quality that is acceptable.

- 4) Removed from site by vacuum tanker where water is contaminated and the methods above are not suitable. This will be carried out in accordance with the SWMP.

#### **14.2.2 Dewatering underground ducts and chambers**

Water that has accumulated in underground ducts and chambers can contain contamination. Where water is heavily contaminated with silt or oil, discoloured or has an unusual odour it will be removed using a vacuum tanker and disposed off site.

Light contamination by oil can be removed from the surface using absorbent materials. Water can then be pumped to an open vegetated area away from the duct / chamber.

Uncontaminated water will be pumped to an open vegetated area away from the duct / chamber. Care will be taken to avoid disturbing silt settled in the base of the duct / chamber, which can be removed once the water has been removed.

Guidance provided in the Environment Agency Pollution Prevention Guideline PPG20 “Dewatering of Underground Ducts and Chambers” will be followed as good industry practice.

#### **14.2.3 Permit to Pump**

Except for pumping between fully sealed containers, pumping may not be carried out unless authorised by the Environmental Manager or Environmental representative on a permit to pump

### **14.3 Surface water, groundwater and waste water**

The EA (and any other relevant statutory authorities) will be consulted regarding the measures to be implemented to contain and manage surface water runoff from the construction of the Scheme. In-stream works in main rivers will avoid periods that will impact on fish populations (to be agreed with the EA).

Where in-stream works are required specific method statements will be agreed and consent sought with the relevant authority.

The following measures will implemented, as appropriate:

- Use of best practice controls and pollution prevention measures will be implemented as described in Section 5.7.1
- Provision of suitable construction site drainage system including cut-off ditches or drains and Sustainable Drainage Systems (SuDS), or equivalent, where necessary;
- Following completion of the ground investigation the need for a surface or groundwater monitoring plan will be reviewed and if necessary implemented

The measures set out in Section 6 (Air Quality) to limit adverse dust and air pollution effects associated with construction works will apply equally in relation to limiting the likelihood of polluted surface water run-off being generated.

## **14.4 Storage and control of oils and chemicals**

The Control of Pollution (Oil Storage) (England) Regulations 2001 PPG2 which sets out requirements including those relating to positioning, specification, capacity, secondary containment and ancillary equipment for storage tanks and PPG 26 (Drums & Intermediate Bulk Containers) will be adhered to.

Stationary plant used by the Contractor will be accompanied by or fitted with measures such as drip trays to retain any leakage of oil or fuel and spill kits will be stored at key locations on site and in particular at refuelling areas and at worksites adjacent to watercourses.

The EA will be consulted with regards to establishing and operating concrete and road surfacing material batching plants on site. Wash water from any batching plants will not be discharged to the water environment, unless fully treated and agreed with the EA.

The Scheme is located within a Surface Water Safeguard Zone safeguarded for pesticides. Workers within the Safeguard Zone will take care if pesticides are used, as their use could cause pollution which may result in the need for additional, costly treatment. The use of any pesticides will be monitored and best construction practice will be followed.

## **14.5 Control and management of foul drainage**

Management and disposal of foul water and sewage effluents from site facilities will comply with PPG 4: Treatment and disposal of sewage (EA et al., 2006). Where no foul sewer is available and the following measures, as appropriate:

- Containment by temporary foul drainage facilities and disposed off-site by a licensed contractor
- Treatment and discharge to a watercourse or soakaway with prior authorisation from the EA.

## **14.6 Private water supplies**

The scheme passes through Groundwater Source Protection Zones for the entire length (See table 13). Use of best practice and pollution prevention measures described in Section 5.7.1, will minimise the risk of an incident that could lead to contamination of aquifers and private water supplies. In addition to these the following measures will be followed

- Effective design of storage, refuelling and stock piling areas;
- Appropriate design of temporary drainage systems

- special measures to prevent groundwater contamination will be addressed in method statements for activities that may interact with groundwater/aquifer, such as deep excavations, piling and exploratory boreholes;
- Should GI works identify a requirement groundwater quality and level monitoring will be put in place

Where observation boreholes may be affected by the works, the Contractor will protect the boreholes using appropriate protection measures, such as concrete rings.

Should any deterioration of groundwater occur monitoring strategy will be implemented in order to identify appropriate corrective action.

There are only a few cuttings on the Scheme and groundwater is anticipated to be below these cuttings. In the event that groundwater is encountered, the need to establish a baseline and construction phase monitoring programme will be agreed.

## **14.7 Flood risk**

Construction activities will avoid any increase in flood risk. Appropriate measures, such as keeping watercourses clear of obstructions and debris to reduce blockage risk, will be implemented throughout the works. Suitable access and safe refuges will be identified for use in the event of a flood and these will be communicated to all site personnel as part of the site induction. Appropriate maintenance access will be made available to watercourses and associated flood risk structures, if required.

The relevant flood risk management authorities will be consulted on in areas at risk of flooding and the project will register with the EA's Floodline warning service for these areas

Realignment of ditches and watercourses will only be considered if other options, such as maintaining the existing alignment or culverting, are not possible

### **14.7.1 Flood risk management plans**

The Flood Risk Assessment (FRA) for the Scheme and the Flood Compensation Scheme pursuant to Requirement 23 of the DCO, will be used to prepare site specific flood risk management plans, which will take consideration of the source-pathway-receptor concept, for those areas of the site at risk of flooding. These plans will include all work sites within the 1 in 100 year plus climate change floodplain (table 13) as well as areas susceptible to groundwater flooding, and other flood risk sources, such as sewer flooding and areas at risk of reservoir flooding.

Works at the Ascot Road, Monkey Island Lane, Riding Court Road and Wood Lane overbridges, the Windsor Rail Bridge, Bray Bridge, several carriageway widening sites and two Emergency Refuge Areas will encroach into the Zone 3 floodplain. Construction compounds 5 and 7 are also partially (4% and 27% of total compound areas respectively) located in the Zone 3 floodplain. In order to avoid flood risk impacts existing ground levels will be maintained within these areas of the compounds and the use of these areas to

accommodate welfare or office facilities will be avoided. So far as practicable, the storage of material within the floodplain will also be prohibited at these compounds.

The Flood Risk Management plans will summarise:

- any applications made for flood defence consent, where required, for temporary and permanent works and the status of the works;
- any specific requirements or conditions of the approval that will be obtained from the relevant consenting bodies;
- any flood risk management or mitigation measures implemented in support of temporary and permanent works proposals; and
- a statement on the cumulative flood risk impact of temporary and permanent works.

## 14.8 Monitoring

Following the completion of the ground investigation works consultation will be undertaken with the EA over any requirements for water quality monitoring of watercourses or groundwater potentially affected by construction works or discharge of surface water run-off, including the following, as appropriate:

- pre-construction monitoring to establish baseline water quality conditions;
- monitoring during construction works to enable the effectiveness of mitigation measures to limit pollution risk to be monitored and any pollution incidents to be identified; and
- monitoring of watercourses receiving surface water run-off during construction to enable the effectiveness of treatment and other SuDS measures to be determined.

Monitoring will be undertaken as appropriate throughout constructions appropriate to identify:

- pollution risks that are unacceptably high;
- spillages and leakages;
- non-compliance with the CEMP; and
- suspected pollution incidents, depending on the nature of the potential pollution, this may consist of daily site inspections of site drainage or ad hoc inspections in the event of a reported incident.

## 14.9 Site documentation

In addition to documentation set out in 5.9, copies of flood defence consent documentation will be retained on site.

## APPENDIX 1 – Environmental Aspect & Impact Risk Assessment

### Construction Services UK

| Project:       |                      | M4 J3 - 12 SMP                            |                                                                            | Pre Mitigation                                               |             |            |            |             |         |                                         |                                                                                                                                                                                                                                                                            | Post Mitigation                                             |            |            |             |         |                |   |                               |
|----------------|----------------------|-------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------|-------------|------------|------------|-------------|---------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------|------------|-------------|---------|----------------|---|-------------------------------|
| Date Assessed: |                      | 23-Jan-17                                 |                                                                            | <div><div>R</div><div>O</div><div>Y</div><div>G</div></div>  |             |            |            |             |         |                                         |                                                                                                                                                                                                                                                                            | <div><div>R</div><div>O</div><div>Y</div><div>G</div></div> |            |            |             |         |                |   |                               |
| Risk Assessor: |                      | Daniel Evans                              |                                                                            | <div><div>8</div><div>0</div><div>13</div><div>1</div></div> |             |            |            |             |         |                                         |                                                                                                                                                                                                                                                                            | <div><div>0</div><div>7</div><div>8</div><div>7</div></div> |            |            |             |         |                |   |                               |
| Ref .          | Environmental Aspect | Activity                                  | Environmental Impact                                                       | Pre Mitigation                                               |             |            |            |             |         | All Options Considered to Mitigate Risk | Post Mitigation                                                                                                                                                                                                                                                            |                                                             |            |            |             |         | Responsibility |   |                               |
|                |                      |                                           |                                                                            | Severity                                                     |             |            | Likelihood | Risk Factor | Trigger |                                         | Severity                                                                                                                                                                                                                                                                   |                                                             |            | Likelihood | Risk Factor | Trigger |                |   |                               |
|                |                      |                                           |                                                                            | Corporate                                                    | Environment | Commercial |            |             |         |                                         | Corporate                                                                                                                                                                                                                                                                  | Environment                                                 | Commercial |            |             |         |                |   |                               |
| 4              | Air                  | Traffic Management and Employee Commuting | Air Pollution from vehicle emissions Nuisance                              | 1                                                            | 1           | 1          | 4          | 4           |         | Y                                       | Refer to Standard and Additional Mitigation Measures as stated in the CEMP Section 6.2 & 6.3 Air Quality. E.g. Construction traffic movements will be kept to a minimum.                                                                                                   | 1                                                           | 1          | 1          | 3           | 3       |                | G | Project Lead/ Traffic Manager |
| 5              | Air                  | Demolition, Scening and Crushing          | Demolition causing Dust pollution (asbestos, PM etc.) - Third party impact | 2                                                            | 4           | 3          | 5          | 20          | R       |                                         | <u>Normal &amp; abnormal condition</u><br>Refer to Standard and Additional Mitigation Measures as stated in the CEMP Section 6.2 & 6.3 of Air Quality. E.g. Operations will be fully enclosed within high risk areas.<br><u>Emergency</u><br>Stop work and Refer to ERP 08 | 2                                                           | 4          | 3          | 2           | 8       | O              |   | Project Lead                  |
| 6              | Air                  | Mechanical Plant                          | Air pollution - excessive exhaust fumes causing Third party impact         | 2                                                            | 2           | 2          | 3          | 6           |         | Y                                       | Refer to Standard and Additional Mitigation Measures as stated in the CEMP Section 6.2 & 6.3 of Air Quality. E.g. Plant will be positioned to ensure effective dispersal of emissions.                                                                                     | 2                                                           | 2          | 2          | 1           | 2       |                | G | Project Lead                  |

**Balfour Beatty VINCI Joint Venture**  
**Working on behalf of Highways England**

|    |                   |                                                                                   |                                                                                                      |   |   |   |   |    |   |                                                                                                                                                                                                                                                                                                                  |   |   |   |   |   |   |                                    |
|----|-------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---|---|---|---|----|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|------------------------------------|
| 13 | Air               | Poor Handling and Storage of materials i.e. stockpiling sand spoils and aggregate | Deterioration of ecological communities and human health                                             | 2 | 3 | 3 | 5 | 15 | Y | <p><u>Normal/Abnormal Condition</u><br/>Refer to Standard and Additional Mitigation Measures as stated in the CEMP Section 6.2 &amp; 6.3 of Air Quality. E.g. Plant will be positioned to ensure effective dispersal of emissions.</p> <p><u>Emergency</u><br/>Refer to Emergency Preparedness and Response.</p> | 2 | 3 | 3 | 2 | 6 | Y | Project Lead/<br>Materials Manager |
| 15 | Archaeology       | Excavation                                                                        | Accidental damage archaeological site during earthworks                                              | 2 | 4 | 3 | 4 | 16 | R | <p><u>Normal &amp; abnormal condition</u><br/>Refer to WSI. Refer to Standard Mitigation Measures as stated in the CEMP, Section 7.5 of Cultural Heritage.</p> <p><u>Emergency</u><br/>Refer to CEMP ERP 12</p>                                                                                                  | 2 | 4 | 3 | 2 | 8 | O |                                    |
| 19 | Contaminated land | Excavation and disposal of contaminated land                                      | Contamination of Ground / Groundwater / cross contamination of soil / Reduction in Landscape Quality | 2 | 3 | 2 | 5 | 15 | Y | <p><u>Normal/Abnormal Condition</u><br/>Refer to Mitigation of potential impacts as stated in the CEMP, Section 10.3 of Geology and Soils.</p> <p><u>Emergency procedure</u><br/>Stop work, Refer to the CEMP and follow ERP 05 and 06</p>                                                                       | 2 | 3 | 2 | 2 | 6 | Y |                                    |
| 21 | Ecology           | Invasive and Protected Species                                                    | Contamination of local environment, Spread of invasive species, harm dealt to Protected species.     | 3 | 4 | 2 | 5 | 20 | R | <p><u>Normal/Abnormal Condition</u><br/>Follow requirements of Invasive species management plan, ecology mitigation report &amp; CEMP. Where previously unidentified plant or species found, quarantine area (at least 7 metres in all directions)/</p> <p><u>Emergency</u><br/>Stop work and follow ERP 07</p>  | 3 | 4 | 2 | 2 | 8 | O |                                    |
| 22 | Ecology - Trees   | Site Clearance                                                                    | Removal/Damage of trees with a Tree Preservation Order                                               | 2 | 4 | 3 | 5 | 20 | R | <p><u>Normal/Abnormal Condition</u><br/>Protect trees with fencing as per retained vegetation drawings and arboriculturist's advice</p>                                                                                                                                                                          | 2 | 4 | 3 | 1 | 4 | Y |                                    |

|    |              |                                                                                                                                      |                                                   |   |   |   |   |    |   |                                                                                                                                                                                                                                                           |   |   |   |   |   |   |                                        |
|----|--------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---|---|---|---|----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|----------------------------------------|
| 26 | Fuel Storage | Spillage of Diesel through either a damaged tank or drips                                                                            | Contaminates ground / groundwater / surface water | 2 | 2 | 2 | 3 | 6  | Y | <u>Normal / Abnormal Conditions</u><br>Refer to pollution prevent and incident control measures as stated in the CEMP, Section 5.7 of General Site Operations.<br><u>Emergency</u><br>Follow Emergency Response Procedure (ERP) 01, 03 and 04.            | 2 | 2 | 2 | 2 | 4 | G | Project Lead                           |
| 37 | Noise        | Night Time Working                                                                                                                   | Nuisance to neighbours - noise                    | 2 | 3 | 2 | 5 | 15 | Y | <u>Normal/Abnormal Condition</u><br>Refer to Noise Mitigation as stated in the CEMP, Section 12.5 of Noise and Vibration. E.g. Plant will be fitted with broadband reversing alarms.<br><u>Emergency</u><br>Stop work immediately, and follow ERP 09      | 2 | 3 | 2 | 2 | 6 | Y | Project Lead                           |
| 38 | Noise        | Percussive piling & Demolition - Breakout of Concrete Grinding / Cutting of Concrete Gritblasting Drilling / Coring, Hydrodemolition | Noise Pollution - Third party impact              | 2 | 4 | 3 | 5 | 20 | R | <u>Normal &amp; abnormal condition</u><br>Refer to Noise Mitigation as stated in the CEMP, Section 12.5 of Noise and Vibration. E.g All plant enclosures will be kept closed when in use.<br><u>Emergency</u><br>Stop Work immediately, and follow ERP 09 | 2 | 4 | 3 | 2 | 8 | O | Project Lead/<br>Environmental Manager |
| 40 | Noise        | Mechanical Plant                                                                                                                     | Noise Pollution - Third party impact              | 2 | 3 | 3 | 5 | 15 | Y | <u>Normal &amp; abnormal condition</u><br>Refer to Noise Mitigation as stated in the CEMP, Section 12.5 of Noise and Vibration. E.g All plant enclosures will be kept closed when in use.<br><u>Emergency</u><br>Stop Work immediately, and follow ERP 09 | 2 | 3 | 3 | 2 | 6 | Y |                                        |

|    |           |                                                   |                                                                                                       |   |   |   |   |    |   |                                                                                                                                                                                                                                                                                                   |   |   |   |   |   |   |
|----|-----------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------|---|---|---|---|----|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 42 | Noise     | Site Operations, Loading and Unloading Deliveries | Nuisance to neighbours - noise                                                                        | 2 | 2 | 2 | 3 | 6  | Y | Normal & Abnormal Condition<br>Refer to Noise Mitigation as stated in the CEMP, Section 12.5 of Noise and Vibration. E.g Where practicable, deliveries to site will be conducted during normal working hours.<br><u>Emergency</u><br>Stop Work                                                    | 2 | 2 | 2 | 2 | 4 | G |
| 47 | Vibration | Vibration works                                   | Third party impact Nuisance resulting from works such as Piling, Vibration rolling, Breaking out etc. | 2 | 2 | 2 | 4 | 8  | Y | Normal & abnormal condition<br>Refer to Vibration thresholds and actions as stated in the CEMP, Section 12.6 of Noise and Vibration. E.g Where practicable, deliveries to site will be conducted during normal working hours.<br><u>Emergency</u><br>Stop Work                                    | 2 | 2 | 2 | 2 | 4 | G |
| 49 | Waste     | Material Storage                                  | Litter/Waste pollution of local environment                                                           | 2 | 2 | 2 | 5 | 10 | Y | Normal/Abnormal Condition<br>Refer to Management of Excavated materials and Waste arisings as stated in the CEMP, Section 11.4 of Materials. E.g. by reducing the level of waste arising where reasonably practicable.<br><u>Emergency Procedure</u><br>In certain cases, refer to ERP 13 and 14. | 2 | 2 | 2 | 3 | 6 | Y |
| 52 | Waste     | Transport of waste                                | Exhaust emissions to air / Noise and dust generation to local community                               | 1 | 2 | 2 | 2 | 4  | G | Normal/Abnormal Condition<br>Refer to Management of Excavated materials and Waste Arisings as stated in the CEMP, Section 11.4 of Materials. E.g. by awarding waste brokerage contracts to local businesses.                                                                                      | 1 | 2 | 2 | 1 | 2 | G |
| 53 | Waste     | Waste generation                                  | Loss of landfill space / Reduction in landscape quality                                               | 2 | 2 | 2 | 4 | 8  | Y | Normal/Abnormal Condition<br>Refer to Management of Excavated materials and Waste Arisings as stated in the CEMP, Section 11.4 of Materials. E.g. by identifying options for designing                                                                                                            | 1 | 2 | 2 | 2 | 4 | G |

|    |              |                                                                                            |                                                                                                                               |   |   |   |   |    |   |  |                                                                                                                                                                                                                                                                                                              |   |   |   |   |   |   |  |                                  |
|----|--------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|----|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|----------------------------------|
|    |              |                                                                                            |                                                                                                                               |   |   |   |   |    |   |  | out waste.<br><u>Emergency</u><br>Contact Environmental Manager.                                                                                                                                                                                                                                             |   |   |   |   |   |   |  |                                  |
| 55 | Water        | Concreting activities, hydro demolition                                                    | Contamination of groundwater and / or surface waters with wash-out of delivery trucks or high pH demo material                | 1 | 4 | 2 | 5 | 20 | R |  | <u>Normal &amp; Abnormal Condition</u><br>Refer to General Provisions as stated in the CEMP, Section 14.2. Ensure suitable washout facilities are in place and built into works procedures<br><u>Emergency</u><br>Refer to ERP 10 and 11.                                                                    | 1 | 4 | 2 | 2 | 8 | O |  |                                  |
| 58 | Water        | Accidental fuel & silt spillages, Working in and adjacent to Water Course Material Storage | Pollution to natural watercourse or surface water drains                                                                      | 2 | 4 | 3 | 5 | 20 | R |  | <u>Normal &amp; Abnormal Condition</u><br>Refer to General Provisions as stated in the CEMP, Section 14.2. Ensure suitable control and temporary drainage measures are in place e.g. silt fencing, settlement tanks. Restrictions in refuelling locations<br><u>Emergency</u><br>Refer to ERP 02, 10 and 11. | 2 | 4 | 3 | 2 | 8 | O |  |                                  |
| 45 | Nuisance     | Night Time Working                                                                         | Nuisance to neighbours - light                                                                                                | 2 | 3 | 2 | 5 | 15 | Y |  | <u>Normal/Abnormal Condition</u><br>Refer to Lighting as stated in the CEMP, Section 5.6.2 of General Site Operations. E.g Lighting will be designed, positioned and directed so as not to intrude unnecessarily on adjacent buildings.<br><u>Emergency</u><br>Stop works immediately                        | 2 | 3 | 2 | 2 | 6 | Y |  |                                  |
| 46 | Material Use | Construction activities                                                                    | Use of a non-renewable resource or illegally sourced materials / Environmental damage caused during extraction and production | 3 | 3 | 2 | 3 | 9  | Y |  | <u>Normal/Abnormal Condition</u><br>Refer to the Materials Management Plan (MMP) as stated in the CEMP, Annex B.<br><u>Emergency</u><br>Stop work, do not use the material in question and contact the Project Lead/ Materials Manager                                                                       | 3 | 3 | 2 | 1 | 3 | Y |  | Project Lead / Materials Manager |

## **APPENDIX 2 – Emergency Response Procedures**

- ERP 01 – Fuel, oil or chemical spill to watercourse or drainage system
- ERP 02 – Silty runoff to watercourse or drainage system
- ERP 03 – Fuel, oil or chemical spill to ground
- ERP 04 – Fuel, oil or chemical spill to highway
- ERP 05 – Unexpected discovery of contaminated land
- ERP 06 – Discovery of potential asbestos containing material
- ERP 07 – Unexpected discovery of protected species or habitat
- ERP 08 – Uncontrolled release of dust
- ERP 09 – Complaint due to construction noise
- ERP 10 – Enforcement action by LPA / EHO / EA / Police
- ERP 11 – Flooding of worksite
- ERP 12 – Unexpected archaeological discovery outside planned archaeological works
- ERP 13 – Fly tipping
- ERP 14 – Illegal disposal of Waste

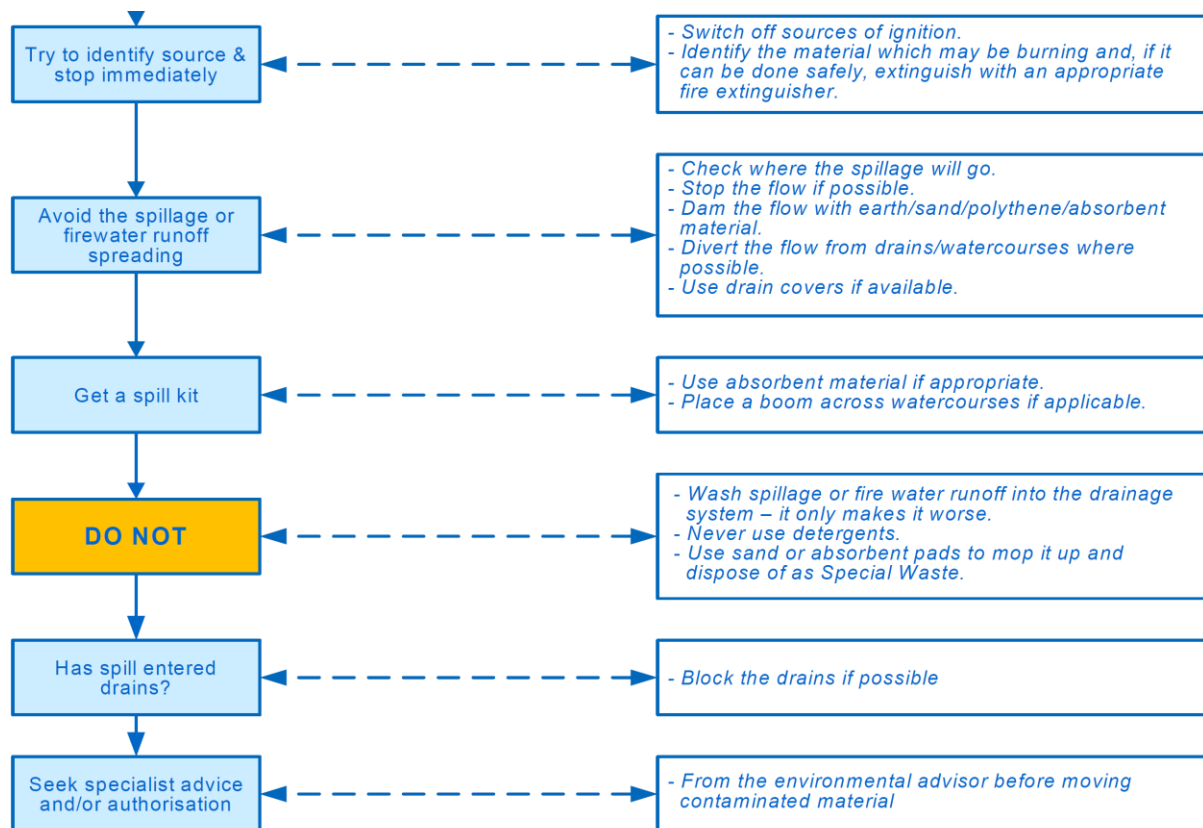
| <b>ERP 01</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Fuel, oil or chemical spill to watercourse or drainage system</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Establish nature of substance spilled, considering personal safety before beginning any action to stop or clean up spillage. Use appropriate PPE e.g. gloves.</li> <li>3. Identify the source of spillage and stop flow immediately. Switch of sources of ignitions.</li> <li>4. Prevent spillage spreading by diverting the flow, creating a dam with earth or blocking drains.</li> <li>5. Locate the nearest spill kit and use absorbent booms, pads and granules as appropriate to soak up the spillage.</li> <li>6. Do not wash spillage into drains and do not use detergents, as this will make things worse.</li> <li>7. Call in emergency vacuum tanker / gully gulper if required to remove spillage.</li> <li>8. Collect all used spill kit materials and contaminated soil for disposal as hazardous waste.</li> <li>9. Record incident on footprint</li> <li>10. Replace any spill kit used.</li> </ol> |
| <b>Notification:</b>    | <p>Supervisor / Works Manager</p> <p>Site Manager</p> <p>Environmental Manager</p> <p>Corporate EHS Manager</p> <p>Environment Agency where spillage is likely to enter controlled water</p> <p>Canal River Trust where spillage is likely to enter Canal</p> <p>Sewerage undertaker where spillage is likely to enter sewers or drains</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Severity Rating:</b> | Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| <b>ERP 02</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Silty runoff to watercourse or drainage system</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Identify cause of silty runoff and stop flow where possible and safe to do so e.g. dewatering of excavations.</li> <li>3. Block drains, create settlement ponds to enable settlement of solids, establish silt fence and / or place straw bales to filter runoff.</li> <li>4. Establish controlled discharge allowing for settlement of solids and filtration using straw bales or silt fencing as appropriate.</li> <li>5. Record incident on footprint</li> </ol> |
| <b>Notification:</b>    | <p>Supervisor / Works Manager</p> <p>Site Manager</p> <p>Environmental Manager</p> <p>Corporate EHS Manager</p> <p>Environment Agency where a large volume of silty runoff has entered or is likely to enter controlled water</p> <p>Canal River Trust where spillage is likely to enter Canal</p> <p>Sewerage undertaker where a large volume of silty runoff has entered or is likely to enter sewers or drains</p>                                                                                                                                                   |
| <b>Severity Rating:</b> | Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| <b>ERP 03</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Fuel, oil or chemical spill to ground</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Establish nature of substance spilled, considering personal safety before beginning any action to stop or clean up spillage. Use appropriate PPE e.g. gloves.</li> <li>3. Identify the source of spillage and stop flow immediately. Switch of sources of ignitions.</li> <li>4. Prevent spillage spreading by diverting the flow, creating a dam with earth or blocking drains.</li> <li>5. Locate the nearest spill kit and use absorbent booms, pads and granules as appropriate to soak up the spillage.</li> <li>6. Do not wash spillage into drains and do not use detergents, as this will make things worse.</li> <li>7. Call in emergency vacuum tanker / gully gulper if required to remove spillage.</li> <li>8. Collect all used spill kit materials and contaminated soil for disposal as hazardous waste.</li> <li>9. Record incident on footprint.</li> <li>10. Replace any spill kit used.</li> </ol> |
| <b>Notification:</b>    | <p>Supervisor / Works Manager</p> <p>Site Manager</p> <p>Environmental Manager</p> <p>Corporate EHS Manager</p> <p>Environment Agency where spillage is likely to enter controlled water or large spillage in groundwater protection zone</p> <p>Canal River Trust where spillage is likely to enter Canal</p> <p>Sewerage undertaker where spillage is likely to enter sewers or drains</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>ERP 04</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Fuel, oil or chemical spill to highway</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Establish nature of substance spilled and risk of road traffic accident, considering personal safety before beginning any action to stop or clean up spillage. Use appropriate PPE and traffic management.</li> <li>3. Identify the source of spillage and stop flow immediately. Switch of sources of ignitions.</li> <li>4. Prevent spillage spreading by diverting the flow or blocking drains.</li> <li>5. Locate the nearest spill kit and use absorbent booms, pads and granules as appropriate to soak up the spillage.</li> <li>6. Do not wash spillage into drains and do not use detergents, as this will make things worse.</li> <li>7. Call in emergency vacuum tanker / gully gulper if required to remove spillage.</li> <li>8. Collect all used spill kit materials and contaminated soil for disposal as hazardous waste.</li> <li>9. Record incident on footprint.</li> <li>10. Replace any spill kit used.</li> </ol> |
| <b>Notification:</b>    | <p>Supervisor / Works Manager</p> <p>Site Manager</p> <p>Environmental Manager</p> <p>Corporate EHS Manager</p> <p>Environment Agency where spillage is likely to enter controlled water or large spillage in groundwater protection zone</p> <p>Canal River Trust where spillage is likely to enter Canal</p> <p>Sewerage undertaker where spillage is likely to enter sewers or drains</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Spill Response Flow Chart



| ERP 05               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>     | <b>Unexpected discovery of contaminated land</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Action:</b>       | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately</li> <li>2. Establish nature of contaminated material and risk to personal safety before implementing control measures to prevent the escape of contamination. Control measures may involve backfilling or covering the excavation or the use of absorbent spill kit materials.</li> <li>3. Fence the affected area off and signpost to indicate "Contaminated Area – No Unauthorised Access".</li> <li>4. Record incident on footprint</li> <li>5. Agree requirements for continuing works in the area with the Construction Manager and the Environmental Manager.</li> </ol> |
| <b>Notification:</b> | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                         |                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|                         | Environment Agency and Local Authority Environmental Health Officer where significant risk of pollution from contaminated land |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                     |
|                         |                                                                                                                                |

| <b>ERP 06</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Discovery of potential asbestos containing material (ACM)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately</li> <li>2. Establish nature of contaminated material and risk to personal safety before implementing control measures to prevent the escape of contamination.</li> <li>3. Fence the affected area off and signpost to indicate "Contaminated Area – No Unauthorised Access".</li> <li>4. Record incident on footprint.</li> <li>5. Call in licensed asbestos contractor to sample potential ACM.</li> <li>6. Develop method statement for removal and disposal to licensed facility if confirmed to be asbestos.</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Environment Agency and Local Authority Environmental Health Officer where significant risk of pollution from contaminated land                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| <b>ERP 07</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Unexpected discovery of protected species or habitat</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately</li> <li>2. Contact Ecologist to assess the area for the location of the protected species and their habitat</li> <li>3. Develop a mitigation approach with the Ecologist (e.g. translocation/ segregation) and agree those mitigation measures and working methods with Natural England before recommencing work.</li> <li>4. Record incident on footprint.</li> <li>5. Work may only restart with authorisation of Ecologist/ Natural England.</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Ecologist<br>English Nature if advised by Ecologist                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Severity Rating:</b> | Intermediate, Major depending on degree of disturbance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| <b>ERP 08</b>           |                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Uncontrolled release of dust</b>                                                                                                                                                                                                                                                                                                                                                           |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Damp down working area before recommencing work.</li> <li>3. Review working methods to ensure best practicable means is being used.</li> <li>4. Review weather forecasts to confirm whether additional control measures are required.</li> <li>5. Record incident on footprint</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Community Relations Officer if dust released beyond site boundary<br>Local Authority Environmental Health Officer if significant release of dust outside site boundary                                                                                                                                                 |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                    |

| <b>ERP 09</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Complaint due to construction noise</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Contact Vinci Environment Manager.</li> <li>3. Inform Network rail Community Relations Team</li> <li>4. Review working hours and Section 61 consent to confirm that work has been agreed with Local Authority Environmental Health Officer.</li> <li>5. Review working hours and methods and investigate potential for improvement.</li> <li>6. Record incident on footprint</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Community Relations Officer<br>Local Authority Environmental Health Officer                                                                                                                                                                                                                                                                                                                                          |
| <b>Severity Rating:</b> | Low, Intermediate                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| <b>ERP 10</b>           |                                                                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Enforcement action by LPA / EHO / EA / Police</b>                                                                                                                                                                                  |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Record incident on footprint</li> <li>3. Do not restart work until agreement has been reached with enforcing authority</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Corporate EHS Manager<br>Community Relations Officer                                                                                                           |
| <b>Severity Rating:</b> | Major                                                                                                                                                                                                                                 |

| <b>ERP 11</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>        | <b>Flooding of worksite</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Consider personal safety before attempting to access flooding worksite.</li> <li>3. Remove potentially polluting materials from worksite e.g. fuel, oils, chemicals and cement.</li> <li>4. Remove floating materials from work area e.g. timber.</li> <li>5. Remove plant and equipment from work area.</li> <li>6. Use floating booms to contain and absorb any floating contaminants.</li> <li>7. Do not pump contaminated water out of area as flooding recedes, contain and use spill kit to absorb pollutants before pumping or removal by vacuum tanker.</li> <li>8. Record incident on footprint.</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Corporate EHS Manager<br>Environment Agency if significant flooding or pollution of watercourse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Severity Rating:</b> | Minor, Intermediate, Major                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| <b>ERP 12</b>        |                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incident:</b>     | <b>Unexpected archaeological discovery outside planned archaeological works</b>                                                                                                                                                                                                                                                                       |
| <b>Action:</b>       | <ol style="list-style-type: none"> <li>1. Stop work and contact supervisor immediately.</li> <li>2. Notify Archaeologist and Environment Manager.</li> <li>3. Agree mitigation requirements with Archaeologist, Highways England Archaeologist and County Archaeologist prior to restarting work.</li> <li>4. Record incident on footprint</li> </ol> |
| <b>Notification:</b> | Supervisor / Works Manager<br>Site Manager                                                                                                                                                                                                                                                                                                            |

|                         |                                                                                                                                                                                                                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Environmental Manager<br>Archaeologist                                                                                                                                                                                                                                                       |
| <b>Severity Rating:</b> | Minor, Intermediate                                                                                                                                                                                                                                                                          |
| <b>ERP 13</b>           |                                                                                                                                                                                                                                                                                              |
| <b>Incident:</b>        | <b>Fly tipping</b>                                                                                                                                                                                                                                                                           |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Notify supervisor immediately.</li> <li>2. Contact Environmental Manager / Waste Manager to arrange disposal of fly tipped material.</li> <li>3. Ensure site is secured to prevent recurrence.</li> <li>4. Record incident on footprint</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Waste Manager                                                                                                                                                                                                         |
| <b>Severity Rating:</b> | Intermediate                                                                                                                                                                                                                                                                                 |

|                         |                                                                                                                                                                                                                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ERP 14</b>           |                                                                                                                                                                                                                                                                                     |
| <b>Incident:</b>        | <b>Suspected illegal disposal of waste</b>                                                                                                                                                                                                                                          |
| <b>Action:</b>          | <ol style="list-style-type: none"> <li>1. Notify supervisor immediately.</li> <li>2. Notify Environmental Manager / Waste Manager so that full Duty of Care check / waste audit can be carried out on supplier / subcontractor.</li> <li>3. Record incident on footprint</li> </ol> |
| <b>Notification:</b>    | Supervisor / Works Manager<br>Site Manager<br>Environmental Manager<br>Waste Manager                                                                                                                                                                                                |
| <b>Severity Rating:</b> | Intermediate, Major                                                                                                                                                                                                                                                                 |

## Appendix 3 – Example Extract from M4 Smart Motorway Scheme Sustainability Action Plan



Document Owner: Kieran McGibbon

Project: M4 Junction 3 to 12 SMART MOTORWAY

## Sustainability Action Plan

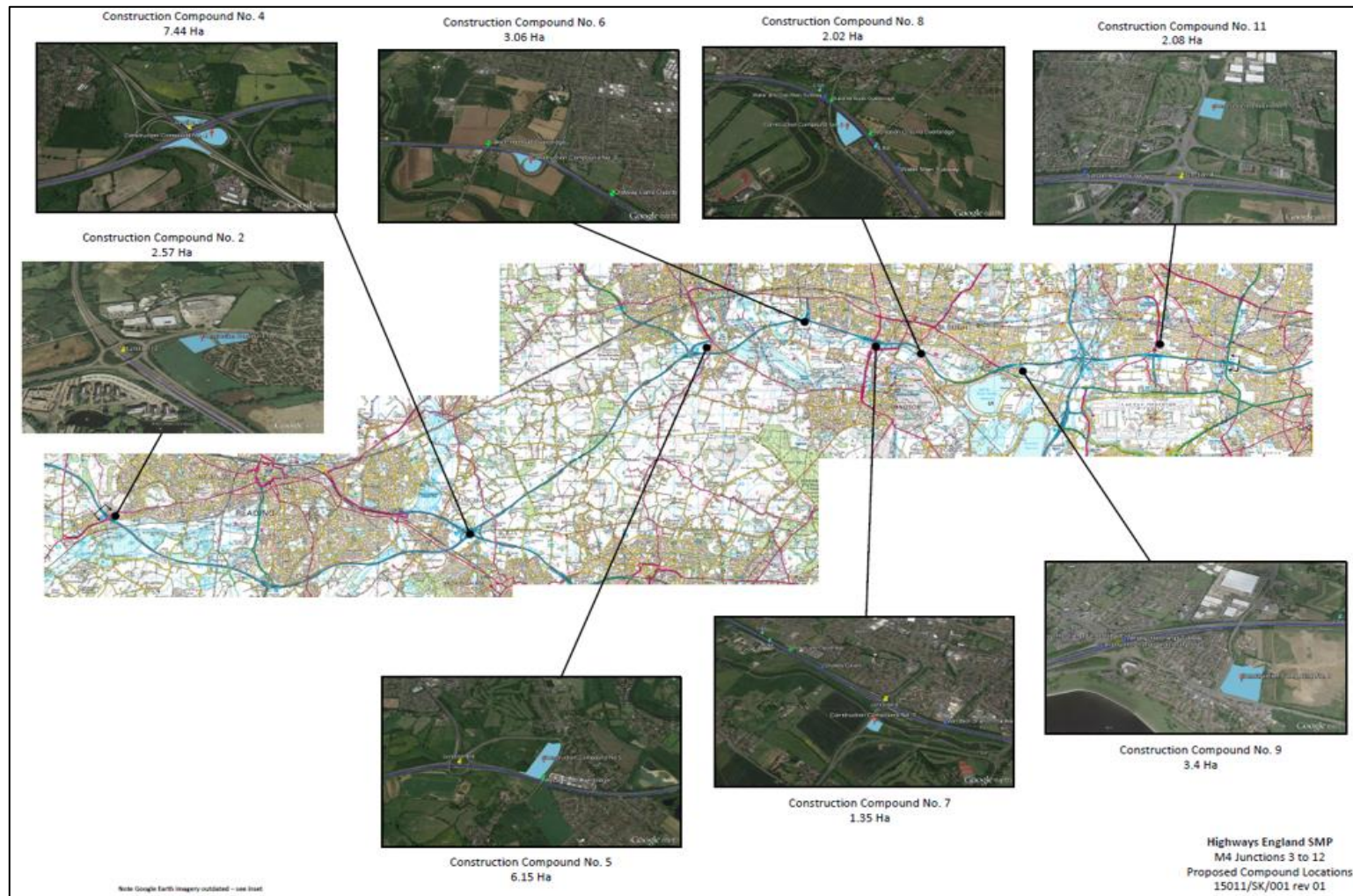
Date of last review: 04/01/2017

Document Control Number:

| Objective                                                    | What we Measure                                                               | 2017 Target                                                                  | Project Specific Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Responsible Person                                                | Next Steps                                                                                                                                                                                         | Documentation                                                                                          | Progress                                           | Comments                                                                                                                                                                                                                    |
|--------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reduce Energy & Fuel Use<br>(Scope 1 and 2 Carbon emissions) | Electricity (kwh)/natural gas (kwh)/fuel used in generators and plant (l)     | Obtain Baseline, identify trends and raise awareness to minimise consumption | <b>Site Energy Management</b> <ul style="list-style-type: none"> <li>Report and manage sustainability data on a monthly basis</li> <li>Complete CCT Highways England Carbon Report</li> <li>Produce an Energy Management Plan for the Project considering the following for example: <ul style="list-style-type: none"> <li>Implement switch off campaign. (Cabin/accommodation and site)</li> <li>Appoint Energy Champion</li> <li>Make use of IT facilities such as conference calls, WebEx and video conference.</li> <li>Ensure site operatives are made aware of energy efficiency and</li> </ul> </li> </ul>                                 | Environment Manager                                               | Appoint Energy Champion<br>Produce Energy Management Plan                                                                                                                                          | Energy Management Plan                                                                                 | 0%                                                 | Reviewing Compound Energy Set ups including Ground Source Heat pump, Hybrid and Solar PV feasibility                                                                                                                        |
| Reduce Waste Generated and waste to Landfill                 | Waste Produced (tonnes)<br>Waste Sent to Landfill (tonnes)                    | 95% diversion from Landfill                                                  | <b>Site Waste Management:</b> <ul style="list-style-type: none"> <li>Report sustainability data on a monthly basis</li> <li>Report and display on a monthly basis waste statistics and reduction successes to the customer and project stakeholders</li> <li>Develop a Waste Plan to identify waste streams, manage waste and record and report waste data.</li> <li>Deliver a Materials Management Plan to ensure minimal excavation waste is sent to landfill.</li> <li>Request an Optimisation Report from Reconomy to identify how we could make improvements on our waste to landfill diversion rates by segregating waste on site</li> </ul> | Buyer / Environmental Manager / Materials Manager                 | Develop Waste Management Plan and Materials Management Plan. Display monthly Stats.                                                                                                                | SWMP / MMP / Utilities Record                                                                          | Ongoing<br>Diversion from Landfill to date = 99.3% | Design/Development Stage Minimal Waste being produced. Waste from Jetting, treated and partly recovered for sale as material and reused as daily cover. Recycling facility in place at compound including haz waste station |
|                                                              |                                                                               |                                                                              | <b>Reduce Waste Generated and Waste to landfill:</b> <ul style="list-style-type: none"> <li>Design out waste – look at value engineering to reduce/eliminate waste generation</li> <li>Increase waste to landfill diversion rates by segregating waste on site.</li> <li>Consider the feasibility of working with local charities/organisations that will take waste/ surplus materials for reuse</li> <li>Adequately store and protect materials to prevent them being damaged</li> <li>Segregate materials on site for reuse and recycle.</li> </ul>                                                                                             | Buyer / Environmental Manager / Materials Manager / Works Manager |                                                                                                                                                                                                    |                                                                                                        |                                                    | Investigate purchase of Aerosol degasser                                                                                                                                                                                    |
| Reduce Mains and Abstracted Water Use                        | Water Usage (m3)                                                              | Obtain Baseline and Raise Awareness                                          | <b>Site Water Management</b> <ul style="list-style-type: none"> <li>Report sustainability data on a monthly basis to obtain a baseline</li> <li>Raise awareness of good water management</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                | Environmental Manager                                             | Report monthly statistics to obtain a baseline. Display monthly Stats and raise awareness about efficient water use.                                                                               | Monthly Utilities Record.                                                                              | Ongoing                                            |                                                                                                                                                                                                                             |
| Sustainability Training                                      | Hours spent training per 100,000 Hrs                                          | 1.4 Days per 100,000 Hrs (VGCP KPI Led)                                      | <b>Training Needs</b> <ul style="list-style-type: none"> <li>Identify training needs and deliver / procure training / provide mentors / sustainability school / Lunch and Learn etc.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Environmental Manager / Project Director                          | Identify Training Needs                                                                                                                                                                            | Training Needs Analysis                                                                                | 0                                                  | Training needs not identified but 8no. staff have attended SEATS and Project Environmental Awareness introduced in April 2016. 4No. New starts have attended to date.                                                       |
| Ecology: Working with protected species and habitats/BT1:J11 | No. of instances where knowledge has been shared.<br>Positively scored on CCS | 3no. Instances                                                               | <b>Raise knowledge about local biodiversity</b> <ul style="list-style-type: none"> <li>Share how the local ecology is being preserved or enhanced to the local community; and</li> <li>Identify how to engage the community in protecting or enhancing the local ecology e.g. providing bird/bat boxes, creating 'bug hotels', select plants and trees that will encourage UK native wildlife.</li> </ul>                                                                                                                                                                                                                                          | Communications Manager/ Environment Manager                       | Prepare HE Newsletter Article for Local Residents about the wildlife on the project.<br><br>Identify avenues to share information in the local community about how they can enhance local wildlife | 2 knowledge sharing instance to date. Bee Orchard Junction 6 June 2016, Pyramidal Orchard August 2016. | 2 of 3                                             | Planned Newsletters include: GCN Hibernacula Creation and Bee Hotels.                                                                                                                                                       |
| Green Travel Plan                                            | Prepare and Implement a Green Travel Plan                                     | Obtain Baseline and Raise Awareness                                          | <b>Green Travel Plan</b> <ul style="list-style-type: none"> <li>Obtain baseline of modes of transport to the office / site</li> <li>Prepare a Green Travel Plan for the scheme</li> <li>Implement and monitor improvements.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                             | Environment Advisor / Office Manager                              | Send out questionnaire to all site staff regarding modes of transport                                                                                                                              | Green Travel Plan                                                                                      | 0%                                                 |                                                                                                                                                                                                                             |

**Balfour Beatty VINCI Joint Venture**  
Working on behalf of Highways England

## Appendix 4 – M4 Smart Motorway Proposed Principle Compounds



**Balfour Beatty VINCI Joint Venture**  
**Working on behalf of Highways England**

## Appendix 5 – M4 Smart Motorway Environmental Training Matrix

### M4 SMP BBV Environmental Training Matrix

Rev 1

30/06/2017

|   |                       |
|---|-----------------------|
| ✓ | Training Required     |
| ✓ | Training Complete     |
|   | Training Not Required |

| Role                               | Induction | Environment & Sustainability Briefing | Waste Training | SWMP Briefing | Dust Management Briefing | Noise Management & Control briefing | TBTs | Lunch & Learns | SEATS | Environmental Awareness Online |
|------------------------------------|-----------|---------------------------------------|----------------|---------------|--------------------------|-------------------------------------|------|----------------|-------|--------------------------------|
| Senior Management                  | ✓         | ✓                                     |                |               |                          |                                     |      | ✓              | ✓     | ✓                              |
| Section Managers                   | ✓         | ✓                                     |                |               | ✓                        | ✓                                   |      | ✓              | ✓     | ✓                              |
| Engineers                          | ✓         | ✓                                     |                | ✓             | ✓                        | ✓                                   | ✓    | ✓              | ✓     | ✓                              |
| General Foreman & Site Supervisors | ✓         | ✓                                     |                | ✓             | ✓                        | ✓                                   | ✓    | ✓              | ✓     | ✓                              |
| Site Materials & Waste Manager     | ✓         | ✓                                     | ✓              | ✓             | ✓                        | ✓                                   | ✓    | ✓              |       | ✓                              |
| Operatives (inc. Sub-contractors)  | ✓         | ✓                                     |                | ✓             | ✓                        | ✓                                   | ✓    | ✓              | ✓     | ✓                              |
| Office Staff                       | ✓         | ✓                                     |                |               |                          |                                     | ✓    | ✓              |       | ✓                              |

**Balfour Beatty VINCI Joint Venture**  
Working on behalf of Highways England