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M11 Junction 7A

Essex County Council

Outline Environmental Management Plan

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integrated expertise

Essex County Council

M11 Junction 7A

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Executive Summary

Essex County Council (ECC) is proposing a new motorway Junction 7A on the M11 to deliver its objectives to improve the highway network across the county of Essex. An Environmental Impact Assessment (EIA) of the Proposed Scheme has been carried out and the results published in the Environmental Statement (ES). This current document, an outline Environmental Management Plan (EMP) has been produced to support the ES and to ensure all environmental commitments identified during the design phase within the ES and legislative guidance is followed through once planning permission has been granted. This is as set out in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 2, Part 5 and Part 6, and Interim Advice Note (IAN 183/14) (Highways Agency, 2014). This document also provides guidance for the approach to environmental management for the Proposed Scheme throughout its construction and operation.

The current document is an outline EMP and as such is designed to be a live document which would develop during detailed design and construction phases into a full Construction Environmental Management Plan (CEMP). Construction methodologies have been proposed during the EIA process, upon which the assessment has been based. As further details of the actual methodologies to be used become known, further assessment of the revised processes would need to be made and added to the CEMP. Once construction has been completed, the document would be refined to handover for the future maintenance and operation of the Proposed Scheme. New information would be incorporated into a Handover Environmental Management Plan (HEMP).

In each of the above documents, the roles and responsibilities would be designated for all staff for all legislation, guidance and good site working practices to be followed. Procedures for staff training and awareness and environmental monitoring and audit would be itemised within the documents. Generic environmental actions are addressed in this outline EMP to include (for example) energy efficiency measures, materials and waste management and water management along with pollution prevention control. More site specific actions are itemised within Table 5.1 the Register of Environmental Actions and Commitments (REAC). This table is designed to be improved and expanded in conjunction with the appointed Principal Contractor and relevant ECC advisors as construction methodologies and a construction Method Statement are developed.

1. Introduction

1.1 Overview

Essex County Council (ECC) has an objective to improve the highway network across the county as the Local Highway Authority. The project is for the provision of a new motorway Junction (7A) on the M11 between Junctions 7 and 8, a road linking the M11 to the existing B183 (Gilden Way) and the widening of Gilden Way. Henceforth this project is known as the Proposed Scheme.

An Environmental Impact Assessment (EIA) of the Proposed Scheme has been carried out by ECC and the results published in the Environmental Statement (ES). This outline Environmental Management Plan (EMP) supports the ES and has been produced to ensure all environmental commitments identified during the design phase (and documented within the ES) and all relevant legislative requirements are followed through post-consent (pre, during and post construction) and beyond. This document also provides guidance and direction for the approach to environmental management for the Proposed Scheme construction phase, as well as the operational phase. It is a 'live document' intended to be updated as more information becomes available in terms of the proposed project layout, construction methods, construction programme and the likely environmental effects.

1.2 Proposed Scheme Background and Objectives

1.2.1 The objectives of the Proposed Scheme

The main objectives of the Proposed Scheme include:

- to improve accessibility to and from Harlow;
- to reduce congestion primarily for the A414 corridor;
- to ensure the propose infrastructure is the appropriate scale for future traffic demands of the stated growth; and
- to facilitate future housing developments around Harlow and employment growth to the east of Harlow.

1.2.2 The Proposed Scheme

The Proposed Scheme layout is shown on Figure 1 below. Figure 2.1 Sheets 1-4 in Volume B of the ES provide more detail. It is recommended that the description of the Proposed Scheme that follows be read in conjunction with these figures. In addition, Figure 2.2 in Volume B of the ES shows the main environmental constraints along the Proposed Scheme.

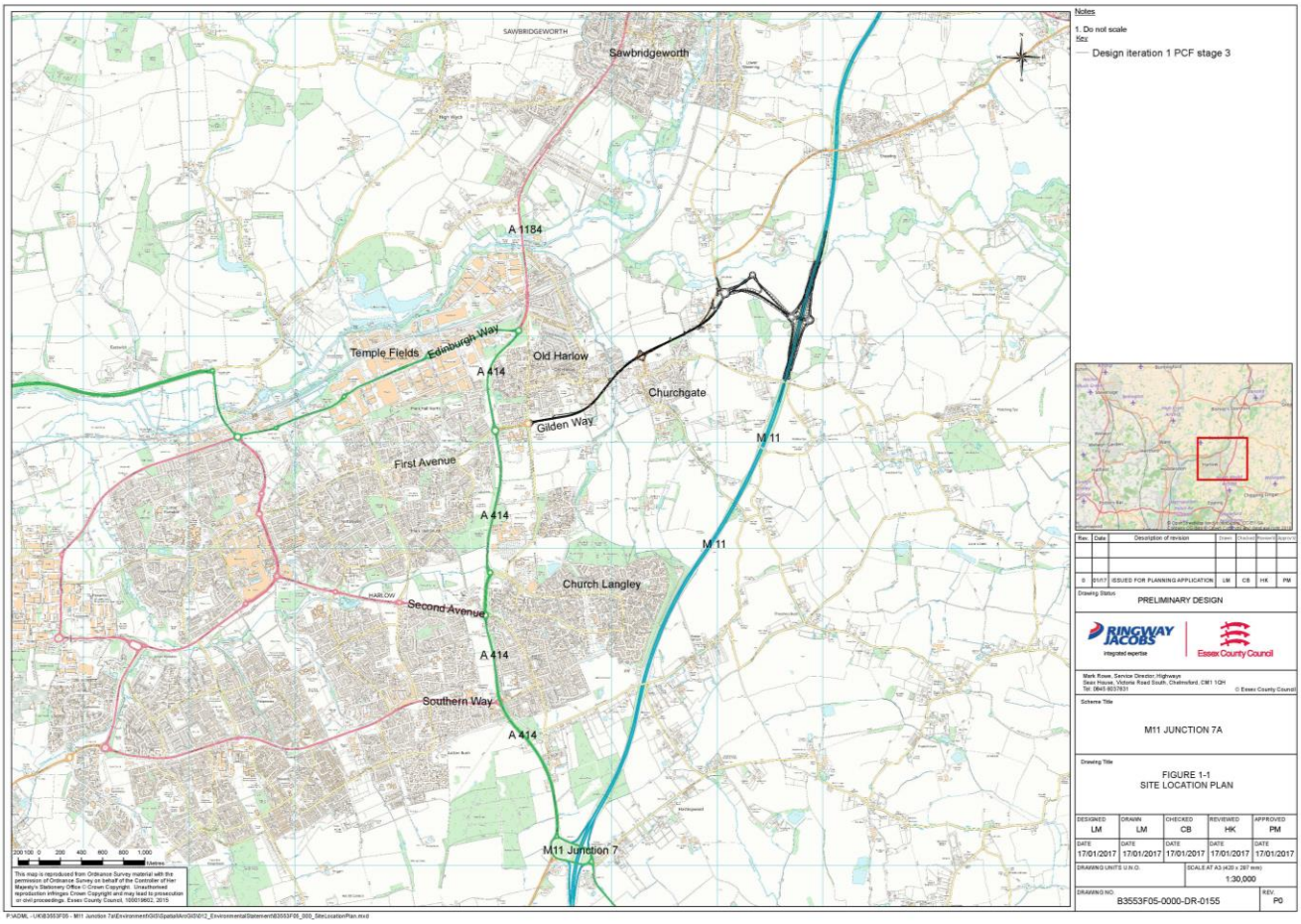

Figure 1: Site Location Plan

The M11 Junction 7A scheme begins, to the west, at the London Road Roundabout on Gilden Way (B183) and involves the widening of the existing two-lane road to three lanes. When completed, two of the lanes would take traffic in a westerly direction into Harlow Town and the third lane would take the outbound traffic towards Sheering and the new M11 Junction. Proposed improvements to Gilden Way include the construction of a combined footpath/cycleway. Two existing pedestrian crossings would be signalised and upgraded and three new pedestrian crossings have been proposed. Churchgate Roundabout would be upgraded to a 'hamburger' design roundabout to improve traffic flows along Gilden Way itself. As Gilden Way becomes Sheering Road in the east, it passes Marsh Lane on the left and Mayfield Farm on the right. Within the ES, the Proposed Scheme up to Mayfield Farm is known as "Gilden Way Area".

At Mayfield Farm, the proposed widened carriageway begins to veer offline to the right from its present route. Here a new carriageway would be built linking the existing Sheering Road with a new roundabout known as Sheering Road Roundabout. The existing Sheering Road would be converted into a local access road for use by residents of The Campions, linking with the realigned Sheering Road via a new junction to the south of the new Sheering Road Roundabout. A new access would be created for Mayfield Farm. Exiting the new Sheering Road Roundabout the proposed road heads towards the new M11 junction, becoming three lanes, one lane back towards the Sheering Road Roundabout and two carrying on until they reach another new roundabout known as Pincey Brook Roundabout.

Traffic exits the Pincey Brook Roundabout on one lane. The road widens out to two lanes as it approaches the Western Dumbell Roundabout on the western side of the M11. This stretch of road is known as the Eastbound Link. A new two-lane road, known as the Westbound Link, would take traffic in the opposite direction, from the M11 to the new Sheering Road Roundabout. Both the Eastbound and Westbound Links have been future-proofed to allow for the possible construction of a Northern Bypass in the future.

The new Eastbound and Westbound Links rise on an embankment (up to 10m high) close to the motorway to allow for the difference in elevation between Sheering Road and the M11.The Eastbound and Westbound Link roads would converge at a roundabout adjacent to the M11; this would be one of two new roundabouts to be constructed on either side of the M11 and connected by a new four-lane bridge over the existing M11 motorway (known as the Western and Eastern Dumbell Roundabouts and the Dumbell Link respectively, due to their combined dumbell-shaped configuration). North-bound and south-bound slip roads would be constructed connecting the M11 to the two new roundabouts. This would allow full access between the new link road and the motorway network without restricting traffic travelling in either direction on the M11 motorway.

The Proposed Scheme from Mayfield Farm towards the east including the M11 off- and on-slips is referred to as the ‘Link Area’ within this outline EMP.

1.2.3 Construction of the Proposed Scheme

Construction of the Proposed Scheme would be undertaken by an appointed Principal Contractor who would make proposals as to the methodology of the construction. The contractor would have to propose a methodology to build the Proposed Scheme whilst taking into account planning conditions laid out in the planning consent documentation. To carry out an assessment of the impacts arising from construction, assumptions have been made as to how the Proposed Scheme could be built. A possible construction methodology has been produced and detailed in a Construction Programme (Appendix 2.1 in the ES) and Construction Methodology Report (Appendix 2.2 in the ES).

Whilst the methodology in this section is based on good practice and within the constraints of the site and the design, it is indicative and therefore could be amended at a future date. For the purposes of this report we have based our assessment on the following methodology. If the contractor used a different methodology, a review of the impacts would need to be carried out, with an explanation of why any alternatives were preferred to those proposed here.

1.2.4 Scheme phases

Using the current methodology, construction of the Proposed Scheme would be spilt into three main phases based on the release of funding from the ‘Department for Transport (DfT)'. These main phases would be known as ‘Phase 1’, ‘Phase 2A’ and ‘Phase 2B’.

1.2.4.1 Phase 1

Phase 1 works would involve new construction as well as improvement works to the existing road on Gilden Way. The overall strategy would be to first widen the road to three lanes and then carry out improvement works. To conduct the works for this phase, a number of traffic management configurations would be required throughout the construction period. The speed limit would be reduced during the works when and where required. Where lane widths dropped below 3.25m a 20mph speed limit would be implemented according to guidance given in TAL 15/99 cyclists at Roadworks (DfT,1999). Traffic restriction such as traffic light systems, reducing lane widths etc. would be put in place to achieve this. Indicative construction activities and plant are contained in Appendix 11.2 in the ES.

Widening works in Phase 1 for the existing eastbound and westbound lanes would be carried out during normal day time working. Phase 1 surfacing works would be carried out during night time to have minimum impact to the current traffic flow along Gilden Way.

Construction of the local access road in Mayfield Farm would be carried out off-line with tie in works to the existing road conducted under the same traffic management as the widening works. Churchgate Roundabout would be modelled in a “hamburger” style to allow traffic to travel through the middle on an east/west trajectory.

For the purposes of this assessment it has been assumed that during construction at points where footpaths cross the road, a temporary diversion or closure order would be put in place for safety reasons if possible. Were this not possible, the crossing points would be manned at all times. Pedestrian crossing points would be reinstated at the end of Phase 1. The National Cycleway would maintain its crossing point throughout

construction in some form with appropriate traffic management and be reinstated at the end of Phase 1. Two new pedestrian crossings would be installed and a further two upgraded. Noise barriers would be erected towards the start of construction to gain the added benefit of screening out noise.

Two attenuation ponds would be installed during Phase 1: one to the east of the Gilden Way construction site and the other on the playing field east of Churchgate Roundabout, as shown on Figure 2.1 in the ES. In addition two retaining walls (at Long Barn Cottage) would be constructed.

Access to Phase 1 has been assumed to be on existing highways from M11 junction 7. This would be the responsibility of the contractor. However, as Phase 1 and Phase 2a would be run in parallel, it is programmed that a significant portion of construction traffic would access the site directly off junction 7a once the slips had been constructed.

1.2.4.2 Phase 2A

Phase 2A Section A would include the construction of a new carriageway between Mayfield Farm and new Sheering Road Roundabout. Phase 2A Section B would include the construction of the Westbound link, the M11 Eastern and Western Dumbell Roundabouts along with the installation of an overbridge over the existing M11 spanning between the two roundabouts and the construction of the northbound and southbound merge and diverge providing direct links to the existing M11.

As majority of these works are ‘off-line’, they would be carried out during normal day time hours. The tying in of the Link Roads to the old Sheering Road and Gilden Way would be conducted during night time. The tie in of the on and off slips to the existing M11 motorway would be carried out during normal day time hours but would be carried out under the influence of traffic management with the use of narrow lanes or similar on M11 motorway. Once the northbound and southbound merge and diverge slips had been built, a manned booth barrier control system would be installed at the site entry points (on-slips) to ensure that a clear line of demarcation was set between the construction traffic and the general traffic flowing on the existing M11 motorway. Launch of the overbridge beams above the existing M11 motorway would be carried out at night under a full closure; the deck of the bridge being constructed with normal traffic. Construction of the M11Junction 7A slips, northbound merge and diverge and the southbound merge and diverge would be carried out early in the programme to allow use of the slips as haul routes for the construction traffic. This would allow a large proportion of construction traffic to access and egress the construction site directly from the M11 motorway thus avoiding site traffic travelling through the middle of the congested Harlow Town along Gilden Way. Some traffic would initially need to access along Gilden Way to construct the site compound and more westerly works. Widening works would be carried out on the M11 to construct a ghost island for the southbound off-slip. Sheet piling on the eastern side of the M11 would be required for the widening works and installed from the underpass as far as the northern end of the Proposed Scheme. At the location of Pincey Brook, a reinforced earth embankment using soil nailing is proposed. This would avoid the use of sheet piling above the Pincey Brook

Phase 2A would also include construction of two drainage ponds; one to the north of the Sheering Road Roundabout and the second to the North West side of the M11 motorway, north of Sheering Hall Drive. A new uncontrolled crossing point would be located across the northern arm of the Sheering Road Roundabout.

1.2.4.3 Phase 2B

Phase 2B would include the construction of the Pincey Brook Roundabout, link to the Sheering Road Roundabout and the Eastbound Link between Pincey Brook Roundabout and the M11 Western Dumbell Roundabout.

The majority of Phase 2B construction would be off-line therefore the majority of construction could be carried out during normal daylight hours and without any traffic management. See Figure 2.3 Construction Site Layout in the ES for clarity.

1.3 Site and Study Area Location and Description

The Proposed Scheme location is shown in Figure 1 above.

The environmental study area has been derived using the Proposed Scheme route, and it crosses both the Harlow Council and Epping Forest District Council areas. The study area is appropriate for the majority of environmental disciplines, and is roughly bounded by:

- Moor Hall Road/Sheering Road and a line 200m from Gilden Way to the south;
- a strip of land directly to the east of the M11 motorway;
- a line approximately 200m to the north of Pincey Brook, extending towards Watlington Road/New Road and High Street to the north; and
- London Road to the west.

Some environmental disciplines (e.g. air quality, noise and vibration, and nature conservation) would have slightly different study boundaries based on their recommended study areas as set out in the DMRB (Highways England, 2009). More detailed information is provided within Section 4.3 of the ES.

The proposed motorway junction is currently located within Green Belt land in open, gently undulating countryside. The land is used predominantly for arable cultivation with some housing. The Pincey Brook bounds this area to the north with The Mores Wood to the south. The Gilden Way forms a green corridor into Harlow with mature hedgerows and trees along its length. Open countryside is replaced by houses and business premises towards Harlow town centre. The introduction of pavements, signal controlled pedestrian crossings and street lighting signals a change from rural to suburban character.

1.4 Purpose of this Document

The purpose of this outline EMP is to ensure that all the environmental commitments mentioned in the ES are carried out or actioned throughout all stages of the Proposed Scheme. This would include pre, during and post construction phases including maintenance and operation). The document also acts as an audit tool and a mechanism for monitoring and reviewing environmental performance and ensuring compliance of the Proposed Scheme with relevant environmental legislation and government policy objectives. This avoids environmental commitments of the Proposed Scheme being overlooked, diluted or their purpose misunderstood.

This outline EMP supports the ES as required by the (DMRB Vol 11 and is a ‘product’ (or deliverable) within Stage 3 of the Highways England PCF - a framework for managing and delivering major projects. This document follows the general process for the management of environmental effects of road schemes as set out in the DMRB Volume 11, Section 2, Part 5, HD295/08, Part 6, HD48/08 (Highway Agency, 2008) and more specific advice in the Interim Advice Note (IAN 183/14) (Highways Agency, 2014).

This outline EMP is a ‘live document’ intended to act as an outline to the Construction Environmental Management Plan (CEMP) or form the basis for the development of the CEMP as more information becomes available with more certainty in terms of the proposed project layout, construction methods, programme and likely environmental effects. Towards the end of the construction, the CEMP would then be refined into a Handover Environmental Management Plan (HEMP) containing essential environmental information needed by the body responsible for the future maintenance and operation of the Proposed Scheme. All site works and maintenance would be undertaken in accordance with this document and future environmental management plans.

2. Project Team Roles and Responsibilities

2.1 Scheme Stages

This section describes the organisational structure and responsibilities for the implementation of the EMP at each stage of the Proposed Scheme.

2.1.1 Detailed design

Throughout the Preliminary Design Stage 3 processes, an Environmental Team (commissioned by ECC) was responsible for ensuring that design iteration meetings were held to discuss the detailed design of the Proposed Scheme as it progressed. Where engineering design changes have been proposed, the environmental team have ensured that the revised designs have been reviewed against the findings of the EIA and the mitigation set out within the ES and this outline EMP. Where detailed design results in a need for changes to proposed mitigation, this document and its components would be updated accordingly. It would continue to remain as a live document. Material changes to the mitigation set out in the ES and this outline EMP would be discussed, where appropriate, with key stakeholders and statutory bodies.

2.1.2 Construction

During construction, ECC and/or its main contractor would engage with local communities, local authorities and others to develop the CEMP prior to the construction phase. The CEMP would set out in advance of the construction a series of measures and standards of work as identified by the EIA. These would be applied by ECC's appointed contractor throughout the construction period to:

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

The Proposed Scheme would be required to comply with applicable environmental legislation at the time of construction, together with any additional environmental controls imposed by the Local Planning Authority (LPA) and certified to ISO 14001.

As part of the CEMP, the Principal Contractor would be required to plan their works in advance. This would ensure that measures to reduce environmental effects were integrated into the construction methods, and commitments from the ES and LPA complied with. Procedures for monitoring construction processes against the project environmental objectives would be proposed by the contractor and agreed with ECC. Specific individuals and their roles would be identified in the construction team within the CEMP as well as mitigation measures, control measures, training procedures, monitoring systems and emergency procedures to be employed throughout the works. Key roles and responsibilities that would be included in the CEMP are highlighted in Table 2.1.

Table 2.1: Roles and responsibilities for the construction environmental management plan

Roles	Responsibilities
Construction Manager	Responsible for management of the construction phase of the project. Overall responsibility for the environmental performance of the project.
Site Materials & Waste Manager	Responsible for implementing the Site Waste Management Plan (SWMP) during the construction phase to ensure that waste was disposed of legally, economically and safely.
Construction Environmental Manager	Compliance with environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the ES and outline EMP.
Site staff	To receive general environmental awareness training, and undertake work in accordance with Method Statement Briefings and toolbox talks. Trained personnel to manage particular tasks such as refuelling plant and equipment, managing the stores, water quality monitoring and supervising the segregation and collection of waste.
ECC Project Manager	To ensure that the Principal contractor complied with all the relevant legal requirements, commitments and targets agreed for the Proposed Scheme.
Principal Designer	To provide information relevant to construction that could assist the contractor to manage environmental aspects of the Proposed Scheme.
Community Liaison Officer	Communications with the public and interested parties, outreach and education, where appropriate.

The CEMP would also be a 'living document' evolving over the life of the Proposed Scheme and would be reviewed periodically and updated as appropriate to respond to the development of the site and conditions throughout the construction phase.

2.1.3 Handover, maintenance and operation

As the construction phase nears completion, a HEMP would be developed for the final two stages of the process of delivering the Proposed Scheme (i.e. the handover and maintenance & operation). The HEMP would be produced by the relevant Principal contractor in consultation with ECC. Towards the end of the construction period, the CEMP would form the basis for the HEMP. The document would then be passed on to the organisation responsible for the long term management of the Proposed Scheme.

The HEMP would be a further development of the CEMP, setting out the proposed strategy for the future maintenance and management of all environmental mitigation, especially the planting schemes, such that mitigation objectives were achieved in the long-term. It would provide relevant information on existing and future environmental commitments that would need to be honoured and ongoing actions and risks in need of management. It would include as-built information and other details in a form that could be utilised by the body responsible for long term management. They could then update their environmental management plans for the operational phase.

The delivery of the HEMP would be secured by way of contractual responsibility placed by ECC upon the Principal Contractor.

2.2 Information, Training and Awareness

The Principal Contractor would be responsible for identifying the training needs of its personnel and engaging suitability qualified and experienced professionals to provide training. Site staff would be competent to perform tasks with the potential to cause a significant environmental impact. Project specific training would be undertaken and the training would include:

- site induction, including relevant environmental issues;
- environmental posters and site notices;
- method statement and risk assessment briefings;
- toolbox talks, including instruction on incident response procedures; and
- key project specific environmental issues briefing.

The training would need to equip relevant staff with the necessary level of knowledge on health, safety, community relations and environmental topics. Method Statements would be prepared for specific activities prior to the works commencing, including environmental protection and mitigation measures and emergency preparedness appropriate to the activity covered.

2.3 Emergency Procedures

An emergency preparedness and response plan to cover accidents on site, environmental hazards (flooding, heavy rain, high winds), and other risks that could occur during the construction and operation phases of the Proposed Scheme would be prepared by the ECC Principal Contractor.

A spill response plan, which all staff would be made aware of, would be implemented in the event of an environmental incident. This plan should take into account any Agency specific requirements.

As a minimum, the plan would include:

- 24 hour contact details for all emergency response personnel and the emergency services;
- the location of the nearest hospitals and GP practices including direction and travelling time from site;
- the procedures for reporting and documenting emergency incidents;
- the responsibilities of all staff during an emergency event; and
- the location of all hazardous materials located on site and within the site compounds.

2.4 Monitoring and Reporting

Daily inspections of all construction sites and activities would occur throughout the duration of the works to ensure compliance with the EMPs and to minimise the risk of damage to the environment. Daily logs would be maintained by the Construction Manager. Where inspections identified environmental incidents, these would be reported to the ECC's Project Manager and the Contractor's Environmental Advisor. It is typical for client to set out performance indicators for example KPIs for the Principal contractor.

Periodic audits of the Proposed Scheme's environmental performance against the CEMP/HEMP would also be carried out by the Contractor's Environmental Advisor. A monthly report would be produced detailing environmental issues and non-compliance, and informing the ECC's Project Manager of all findings.

2.5 Complaints Procedures

Details of the complaints procedure would be put in place in the CEMP/HEMP to receive and act upon complaints. A complaints log would be maintained, and a monitoring system implemented by the Principal Contractor throughout the works. This would ensure that all complaints were addressed and a satisfactory outcome reached for all parties involved.

2.6 Reviews

The EMP process would be subject to review periodically throughout the detailed design, construction and handover periods. The timing of reviews would be agreed with the ECC's Project Manager.

3. Consents and Permissions

Throughout the development of the EMP process, the records listed below should be updated/ amended as appropriate.

To be completed once ECC appointed Principal Contractor is in place.

4. Generic Environmental Actions

4.1 General Housekeeping

Activities on site would be managed and undertaken in a manner, as far as reasonably practicable, to minimise impact on the surrounding environment. Working areas would be kept to the minimum practical and clearly marked out or fenced. The working area would be laid out and works programmed in a manner to minimise the requirement of vehicle movements and generation of excess waste. Site cleanliness would be of paramount importance and all measures to minimise potential pollution and nuisance to the surrounding environment would be regularly monitored.

A ‘good housekeeping’ policy would be adopted across the site, including the following requirements:

- no fires on site;
- considerate behaviour of all site staff, including on the highways;
- regular maintenance of suitable staff welfare facilities;
- removal of food waste and other rubbish at frequent intervals or placed in enclosed skips to minimise risk of pest or vermin infestation; and
- segregation of waste for recycling purposes.

4.2 Site Compounds

Site compounds would be designed and laid out in a logical manner to limit the number of vehicle movements required and reduce reversing manoeuvres. Compounds would be managed in line with good practice to minimise noise disturbance, dust creation and potential impacts on adjacent watercourses, ecology and air quality (refer to individual sections in Table 5.1 below for further details).

4.3 Traffic and Vehicle Movements

Site layout would be designed, as far as reasonably practicable, to eliminate the need for excessive vehicle movements. Requirements for reversing of vehicles would be minimised for safety reasons preventing disturbance to local residents and wildlife.

Roads would be maintained in good order across the site. Passing places would be established to minimise damage to road verges due to vehicular movements. Wheel washing facilities would be provided at all exits from the site to the public road and all vehicles leaving the site would be required to use these.

Sustainable drainage methods for roads, including systems of silt traps, would be implemented and maintained in accordance with the site specific drainage scheme to minimise silt pollution in the terrestrial and aquatic environments.

4.4 Energy Efficiency Measures

The Principal Contractor would prepare an energy management plan or equivalent to manage and monitor energy use during construction. Where feasible, construction related measures to reduce energy consumption would be considered and implemented:

- select construction plant and machinery with a high efficiency (%) i.e. the percentage of output rating achieved under typical operating conditions;
- select plant, machinery and ancillary equipment with timers and other automatic controls during construction leading to efficiency gains by avoiding additional work being carried out and reduction in the time taken to complete a task;
- consider the applicability of lighting curfews and automated controls to save higher levels of lighting for when absolutely needed;
- switch off the lighting during daylight or curfew hours in outdoor areas;
- consider opportunities for energy efficient and low carbon temporary lighting solutions;
- implement campaigns or working practices that promote switching off machinery and services promptly when no longer required;
- use on-site energy generation from renewable sources; and
- use alternatives to fossil fuels including reduction of diesel use.

4.5 Materials and Waste Management

Good construction site management would be implemented to avoid generation of excessive waste throughout the site. There would be a presumption towards the reuse of waste material on site and where this was not possible recycling off site in accordance to the Waste Hierarchy. If this was not possible, waste would be removed off site in a controlled manner with an appropriate waste facility. Waste management on site would be covered separately in the SWMP.

Where possible, the availability of responsibly sourced local and recycled materials would be considered to minimise potential environmental effects, such as from transport emissions.

4.6 Water Management

The contractor would prepare a water management plan to measure, monitor and minimise water use and to have a formal project level policy regarding water use in place. This would identify measureable targets for reducing water use during construction.

Methods to minimise water consumption should follow the following hierarchy:

- eliminate water wastage on site;
- improve efficiency of water-using processes; and
- off-set consumption of mains water with alternative sources such as rainwater harvesting.

4.7 Public Access

Public access would be maintained across the site as far as reasonably practicable for safety purposes and in accordance with Health and Safety Executive (HSE) guidance (available at http://www.hse.gov.uk/construction/safetytopics/publicprotection.htm).

4.8 Site Reinstatement

On completion of the works, as far as is practicable, all disturbed areas would be restored to their original condition. Where there had been disturbance to vegetation types of negligible conservation value, consideration could be given to habitat enhancement subject to consultation with statutory consultees.

4.9 Pollution Prevention and Control

4.9.1 Legislation and guidance

A pollution control and contingency plan would be developed and included within the CEMP/HEMP. This would provide details of the measures to be implemented to prevent pollution of the aquifer, and the actions to be taken in the event of an environmental incident or emergency.

Appropriate measures to prevent pollution including from silt, cement and concrete, oils and fuels, waste materials and effluent/waste water releases would be proposed by the principal contractor. This would be detailed in the CEMP following the Environment Agency Pollution Prevention Guidelines:

- PPG 1 ‘General guide to the prevention of pollution’.
- PPG 5 ‘Works and maintenance in or near water’.
- PPG 6 ‘Working at construction and demolition sites’.
- PPG 18’ Managing fire-water and major spillages’.
- PPG 21 ‘Pollution Incident Response Planning’.
- PPG 22 ‘Dealing with spillages on Highways’.

4.9.2 Dust and air pollution

4.9.2.1 Dust

Measures to prevent the generation of dust would be adopted during construction of the Proposed Scheme. These would include the following:

- use water spray when weather conditions caused excessive dust;
- shield/ damp down cutting and grinding operations;
- reduced site speed limits to 20mph to reduce potential for dust;
- provision of adequate protection for fine or dry materials from wind (i.e. cover up materials and lorries);
- minimising drop heights into haulage vehicles;
- screening plant where necessary;
- prevention of burning of waste on site; and
- use of wheel washers as and when required.

4.9.2.2 Air quality

All construction vehicles would comply with the relevant European Standards for emission levels. All vehicle drivers would be required to switch off their vehicle engines when stationary to prevent exhaust emissions, and to keep their engines in tune and catalysts and / or particulate filters working efficiently. All vehicles would comply with emission standards at all times.

4.9.3 Wastewater and contaminants

4.9.3.1 Wastewater

The site materials and waste manager would be required to provide a statement on the arrangement for the disposal of controlled wastes arising from construction activities. The Principal Contractor would be responsible for disposal of wastewater from any welfare and toilet facilities provided for the workforces. It is likely that this would be transported off site and disposed of at an appropriate waste handling facility.

4.9.3.2 Oil and other contaminants

All oil or other potential contaminants stored on the site would be controlled in accordance with the Control of Substances Hazardous to Health Regulations (COSHH) (HSE, 2002). These would be isolated, placed on drip trays or bunded such that no oil or other contaminants could reach watercourses or groundwater. Storage of such materials would be located in a secure area, at least 10m away from any watercourses and 50m from any spring, well or borehole and outwith any flood zones.

All static plant such as generators would contain appropriate secondary containment or be placed on drip trays at all times.

Relevant spill kits would be located at strategic locations and personnel trained in their use.

Records of all hazardous substance would be in keeping with the COSHH Regulations.

4.9.3.3 Cement, concrete and grout

Cement, concrete and grouts are highly alkaline and corrosive and could cause serious pollution to the ground and watercourses. Measures to prevent pollution from these materials would include:

- Surplus dry concrete and grout would be used elsewhere on site if suitable, or as inert rubble. Where this was not possible it would be disposed of off-site at a suitable facility and transported using a registered waste carrier.
- If concrete was mixed on site this would be carried out on an impermeable designated area located at least 10m from any watercourse or surface water drain to reduce risk of run-off entering a watercourse.
- All equipment used for working with cement would be washed out in a designated washout area that had been specifically designed to contain wet concrete/ wash water. The concrete wash-out area would be located well away from any watercourses, drain or other elements sensitive to contamination.
- Wash waters would be stored to allow solids to settle out and would be recirculated to minimise the risk of pollution and reduce water usage. Contaminated wash water would be collected for authorised disposal off-site.
- Concrete mixing and delivery lorries would return to the batching plant for washout.
- Silt fences would be set up at the edge of the construction site near watercourses to protect water quality. Mitigation such as hay bales would be on standby to prevent sediment entering the water channels.
- Excess concrete would be returned to the batching plant where possible.

5. Proposed Scheme Specific Environmental Risks and Requirements

5.1 Register of Environmental Actions and Commitments

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
Air Quality								
Pre-Construction								
A1.1	Ensure that a high level of communication with the community and stakeholders is maintained throughout the construction period.	Develop and implement a stakeholder communications plan including community engagement before work commences on site.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.1	Before construction	
A1.2	Reduce disturbance from construction dust and pollution to local residents and working population.	Develop a Dust Management Plan (DMP), including measures to control other emissions, approved by the Local Authority. The level of detail depends on the risk, and should include as a minimum the highly recommended measures in ES Appendix 5.5.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.1	Before construction	
A1.3		Plan site layout so that machinery and dust causing activities are located away from receptors, as far as practicable		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.4	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A1.4	Determine air quality monitoring locations.	Determine dust deposition, dust flux, or real-time PM10 continuous monitoring locations. Where possible commence baseline monitoring at least three months before work commences on site.	Agree monitoring locations with the Local Authority.	Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.3	Before construction	Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
A1.5	Reduce impacts from emissions of heavy construction machinery and staff vehicles.	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.5	Before construction	
A1.6		Produce a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) for workers travelling to site.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.5	Before construction	
During Construction								
A2.1	Ensure maintenance of a high level of communication with the community and stakeholders throughout the construction period.	Display the head or regional office contact information on the site boundary.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.1	During construction	
A2.2		Display the name and contact details of person(s) accountable for air quality and dust issue on the site boundary.		Environment manager/engineer or the site manager (to be appointed)		ES Appendix 5.5, note 1.1.1	During construction	
A2.3		Make a complaints log available to the local authority when		Principal Contractor		ES Appendix 5.5, note	During	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		asked.		(to be appointed)		1.1.2	construction	
A2.4	Reduce disturbance from construction dust and pollution to local residents and working population.	Follow measures within DMP. The DMP could include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.3	During construction	
A2.5		Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.2	During construction	
A2.6		Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.2	During construction	
A2.7		Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans co-ordinated and dust and particulate matter emissions minimised.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.2	During construction	It is important to understand the interactions of the offsite transport/ deliveries using the same strategic road network routes.

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A2.8		Undertake daily onsite and offsite inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results.	This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary. Record inspection results in an inspection log.	Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.3	During construction	
A2.9		Keep site fencing, barriers and scaffolding clean using wet methods. Avoid site runoff of water or mud.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.4	During construction	
A2.10		Cover, seed or fence stockpiles where required to prevent wind whipping.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.8	During construction	
A2.11		Ensure dust causing equipment and machinery is kept away from sensitive receptors locations when in use.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.1	During construction	
A2.12		Erect solid screens or barriers around dusty activities or the		Principal Contractor (to be appointed)		ES Appendix 5.5, note	Before certain construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		site boundary of the same or greater height as any stockpiles on site.				1.1.4	activities commence	
A2.13		Carry out regular site inspections to monitor compliance with the DMP.	Record inspection results in an inspection log.	Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.3 DMP	During construction	
A2.14		Increase the frequency of site inspections by the person accountable for air quality and dust issues on site. This should be particularly the case when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Environment manager/engineer or the site manager (to be appointed)	Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.3	During construction	
A2.15		Fully enclose site or specific operations where a high potential for dust production has been identified and the site is active for an extensive period.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.4	During construction	
A2.16		Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.4	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A2.17		Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.6	During construction	
A2.18		Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.6	During construction	
A2.19		Use enclosed chutes and conveyors and covered skips.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.6	During construction	
A2.20		Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.6	During construction	
A2.21		Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.6	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A2.22		Avoid scabbling (roughening of concrete surfaces) if possible.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.9	During construction	
A2.23		Ensure sand and other aggregates are stored in bunded areas and that they are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures in place.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.9	During construction	
A2.24		Ensure bulk cement and other fine powder materials delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.9	During construction	
A2.25		For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.9	During construction	
A2.26	Reduce impacts from dust specifically during earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.8	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A2.27		Use hessian, mulches etc. where not possible to re-vegetate or cover with topsoil, as soon as practicable.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.8	During construction	
A2.28		Only remove the vegetation cover in small areas during work and not all at once.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.8	During construction	
A2.29	Reduce impacts from dust specifically during trackout.	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This could require the sweeper being continuously used.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.30		Avoid dry sweeping of large areas.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.31		Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.32		Inspect onsite haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
A2.33		Record all inspections of haul routes and any subsequent action in a site log book.	Record in site log book.	Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.34		Install hard surfaced haul routes, regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.35	Reduce impacts from dust emissions of heavy construction machinery and staff vehicles.	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.36		Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.10	During construction	
A2.37		Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.5	During construction	
A2.38		Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.		Principal Contractor (to be appointed)		ES Appendix 5.5, note 1.1.5	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
Post-Construction								
A3.1	None Required							
Cultural Heritage								
Pre-Construction								
B1.1	Reduce impacts to archaeological remains.	All cultural heritage mitigation should be undertaken in accordance with a Written Schemes of Investigation (WSI) which should be agreed in writing with the Historic Environment Consultant to ECC prior to the start of construction. These measures would also be included in the CEMP.	Agreed in writing with the Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		CEMP	Before construction	
B1.2		Further geophysical survey or archaeological trial trenching carried out prior any construction works.	Agreed in writing with the Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		WSI for trial trenching and CEMP	Before construction	
B1.3		Archaeological excavation work and recommendation of investigating and recording any archaeological remains present at Assets 17 and 98. (Dependent on results of trial trenching above and consultation with Historic	Dependent on results of trial trenching and consultation Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		WSI for excavation work and CEMP	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		Environment Consultant to ECC).						
B1.4	Reduce impacts to the setting of Assets.	Photographic survey to record the current setting of Assets 5, 6, 7, 8, 29, 31, 32, 49, 71, 76, 77, 85, 99, 107, 112, 113 and 114.	Agreed in writing with the Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		WSI for photographic survey and CEMP	Before construction	
B1.5	Reduce impacts on Historic Buildings.	Carry out a level 2 Historic Landscape survey on the site of Moor Hall (Asset 17).	Agreed in writing with the Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		WSI for level 2 Historic Landscape survey and CEMP	Before construction	Survey based on guidance contained in Understanding the Archaeology of the Landscape – A guide to good recording practice (English Heritage, 2007)
During Construction								
B2.1	Prevent impacts to historic building.	Mayfield Farm (Asset 31) to be protected to prevent accidental damage.	Protection measures to be agreed in writing with the Historic Environment Consultant at ECC.	Principal Contractor (to be appointed)		WSI for protection measures and CEMP	During construction	
Post-Construction								
B3.1	Reduce impacts to	Landscape planting (Hedgerow)	Planting design to	Principal Contractor		Landscape	Once	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	Historic landscape.	put in place along the Proposed Scheme to aid its integration into the surrounding landscape.	be agreed with landscape and heritage officers at ECC.	(to be appointed)		Management Plan	construction of the proposed scheme complete.	
Nature Conservation								
Pre-Construction								
C1.1	Protection of breeding birds.	Produce a construction Method Statement with a section relating to breeding birds which would identify/ demonstrate how damage or disturbance to birds' nests could be avoided.		Principal Contractor (to be appointed)		Construction Method Statement	Before construction	
C1.2	Protection of bats.	Undertake pre-commencement surveys. Obtain a European Protected Species (EPS) Licence from NE. Produce a detailed bat mitigation strategy.		Principal Contractor (to be appointed)			Detailed design	
C1.3	Protection of Great Crested Newts (GCN).	Undertake pre-commencement surveys (if required). Obtain an EPS Licence from NE.		Principal Contractor (to be appointed)		EPS Licence	Detailed design	
C1.4		Exclude, trap and translocate any GCN within 250m of the GCN pond		Principal Contractor (to be appointed)		EPS Licence	Before construction commences	
C1.5	Protection of otters.	Carry out pre-commencement surveys	Surveys scheduled at least	Principal Contractor (to be appointed)			Detailed design	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
			12 weeks in advance of works.					
C1.6		Obtain necessary consents and licenses if above surveys identify any holts or couches within 30m of the Proposed Scheme.				EPS Licence	Before construction commences	
C1.7		Produce a Construction Method Statement with a section developed to ensure protection of otters.		Principal Contractor (to be appointed)		Construction Method Statement	Before construction	
C1.8	Protection of badgers.	Pre-construction checks for badgers within a 50m buffer of the construction footprint (and an application for a sett-closure licence if required).		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	Before construction commences	
C1.9	Protection of reptiles.	Habitat manipulation to distance reptiles from the Proposed Scheme boundary.		Principal Contractor (to be appointed)		Construction Programme ES Appendix 2.1	Before construction commences	
C1.10	Prevention of spreading invasive plant species.	Undertake pre-construction surveys to record the location and extent of controlled species.		Principal Contractor (to be appointed)			Before construction commences	
C1.11		Produce a Method Statement detailing control and eradication methods of the invasive species present.	Follow good practice guidance publications Agreement with	Principal Contractor (to be appointed)		Method Statement	Before construction commences	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
			NE.					
C1.12		Obtain waste licence to remove any soil contaminated with Himalayan Balsam.		Principal Contractor (to be appointed)		Waste licence	Before construction commences	
C1.13	Protect vegetation assemblage including Betony from Protected Wildlife Verge (PWV).	Obtain seed, soils and plants from PWV and hold in storage.		Principal Contractor (to be appointed)		ES Chapter 8 paragraph 8.6.1.1	Before construction commences	
During Construction								
C2.1	Protection of protected birds.	Remove vegetation (excluding potential bat roost trees) outside bird nesting season.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.2		Appoint an Ecological Clerk of Works (ECoW) during sensitive works.		ECoW (to be appointed)		ES Chapter 8, paragraph 8.7.2	During construction	
C2.3	Protection of bats.	Appoint an Ecological Clerk of Works (ECoW) during sensitive works.		ECoW (to be appointed)		ES Chapter 8, paragraph 8.7.2	During construction	
C2.4		Undertake a sensitive felling programme for any bat roost trees.		Under Ecological Protection Species (EPS) licence			During construction	
		Provision of compensatory roosting habitat, most likely in the form of bat boxes.		Principal Contractor (to be appointed)		ES Chapter 8, paragraph 8.7.2	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		Install 5m high bat hop-over fence near the Mores Woodland and realigned stream.		Principal Contractor (to be appointed)			During construction	
C2.5		Construct two large multi-species underpasses under each link road.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.6		Construct solid hoarding around the construction compound for Phase 1 and construct fencing along the Pincey Brook near to Sheering Road Bridge Phase 2A Section A to reduce noise and lighting impacts.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.7		Create new landscape planting to establish a new flight line and foraging areas for bats.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.8		Use dust suppression and air quality monitoring to prevent disturbance to trees confirmed as bat roosts through air pollution.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.9	Protect GCNs.	Use sensitive combination of vegetation removal and ground works programme for areas with GCN (if necessary, exclusion fencing and trapping and translocation programme installed).		Under Ecological Protection Species (EPS) licence		ES Chapter 8, Table 8.7	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
C2.10		Appoint an ECoW during sensitive works.		ECoW (to be appointed)		ES Chapter 8, table 8.7.2	During construction	
C2.11	Protection of Otter.	Construct two large multi-species underpasses under each link road.		Principal Contractor (to be appointed)		ES Chapter 8, Table 8.7	During construction	
C2.12		Adopt good practice construction methods to reduce the risk of water pollution during construction. Follow emergency procedure in a construction Method Statement if a water pollution incident occurred.		Principal Contractor (to be appointed)		CEMP	During construction	
C2.13	Protection of protected species habitat.	Use sensitive combination of vegetation removal and ground works programme for areas with potential protected species habitat.		Principal Contractor (to be appointed)			During construction	
		Employ appropriate standoffs between retained habitats (i.e. badger setts, bat roost trees) and the construction zone.		Principal Contractor (to be appointed)			During construction	
C2.14	Ecological enhancement.	Use native landscape planting (including diverse vegetation structure, erection of bat boxes in retained trees and construct reptile/amphibian refugia).		Principal Contractor (to be appointed)			During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
C2.15	Prevent spreading of invasive plant species.	Appoint an Ecological Clerk of Works (ECoW) during construction.		Principal Contractor (to be appointed)			During construction	
C2.16	Establish colony of Betony.	Seed and relay soils from PWV onto southern slopes of Link Roads.		Principal Contractor (to be appointed)			During construction	
Post-Construction								
C3.1	Protect breeding birds.	Manage arable fields to the north and south of the Link Area to increase their carrying capacity for Skylark.	Provide Skylark nest plats within areas of crops.			ES Chapter 8, paragraph 8.7.1.2	During operation	
C3.2	Protection of bats.	Monitor bat activity.	Survey to replicate the static detector surveys undertaken to compile the baseline within the Link Area.	ECC		ES Chapter 8, paragraph 8.7.1.3	During operation	
C3.3		Lighting levels could be reduced if monitoring showed that there is a reduction in bat activity due to light levels. This could be achieved by reducing the speed limit as the number of lighting columns depends on the speed limit.	Base lighting would be based on the five second rule as advocated by the International Commission on Illumination (CIE 115/2010) and the Institute of			ES Chapter 8, paragraph 8.7.1.3.	During operation	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
			Lighting professionals (PLG02).					
C3.4	Protection of protected species.	Post-construction monitoring to ensure the efficacy of mitigation measures.		ECC		ES Chapter 8, paragraph 8.7.2	During operation	
C3.5	Prevention of spreading invasive plant species.	Post-construction monitoring to confirm that non-native invasive species have not spread as a result of the Proposed Scheme.		ECC		Results to be reported in an ecological monitoring report	During operation	
Landscape and Visual								
Pre-Construction								
D1.1	Reduce visual impacts from construction compounds.	Screening to be provided around these areas to reduce impacts on surrounding residents.	Screening must comply with noise threshold.	Principal Contractor (to be appointed)		Landscape management plan	Before construction	
During Construction								
D2.1	Mitigate visual impacts as a result of the Proposed Scheme.	Woodland planting and tree and shrub belts would generally consist of native species. Existing roadside vegetation lost on parts of Gilden Way restored along new highway verges. Install close board fencing with wires to support climbing plants. Restore amenity planting either		Principal Contractor (to be appointed)			Majority of planting would be carried out towards the end of the construction period.	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		side of Gilden Way. Plant climbing plants over the new retaining structure at Mayfield Farm. Construct new landscaping mounds. Screen new roundabouts with dense deciduous woodland. Planting to protect bats that fly along and above the realigned stream near the Mores Woodland. Planting along embankments and cutting slopes.						
D2.2	Retain vegetation where possible.	Retain trees and shrubs on embankment slope of the M11 south bound off-slip.		Principal Contractor (to be appointed)				
Post-Construction								
D3.1	Ensure successful development of landscape planted areas.	Long term maintenance, monitoring and management.		Client			During operation	
Arboriculture								
Pre-Construction								
E1.1	Ensure protection and retention of as many existing trees	Produce Arboricultural Method Statement (AMS) detailing protection and mitigation		Principal Contractor (to be appointed)		AMS	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	as possible.	measures for trees to be retained. Include details of low impact hard surfacing technique and no dig fencing required to reduce risk of damaging Root Protection Areas (RPAs) at Phase 1 site compound.						
E1.2		Install protective measures around retained trees to provide construction exclusion zone.	Measures should preferably follow those in BS5837:2012 Section 6.2.					
E1.3		Locate site storage areas, cement mixing, washing points and fuel mixing areas outwith RPAs.						
E1.4		Route underground utility services outside the RPAs.						
E1.5		Agree works to be monitored throughout the construction period with a competent arboriculturalist.	To be carried out at a pre-commencement site meeting.	Principal Contractor (to be appointed) and nominated arboriculturalist (to be appointed)				
E1.6	Set up Phase 1 Site Compound.	Remove any deadwood overhanging the Phase 1 site compound.		Principal Contractor (to be appointed)				

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
E1.7		Facilitation pruning of T223, T225 and T226.	Compliant with BS3998 – 'Tree Work, Recommendations'.					
During Construction								
E2.1	Ensure protection of group of trees within woodland W156.	Employ protection and mitigation measures set out in the AMS to area adjacent to Sheering Road Works at W156.		Principal Contractor (to be appointed)			During construction	
E2.2	Ensure protection of trees at Phase 1 Site Compound.	Employ root and canopy protection measures for offsite large mature and over-mature trees surrounding the compound site on the east, south and west side during construction and occupation of the compound.						
E2.3	Protect and retain as many trees possible within areas to the east of Sheering Road.	Follow mitigation and protection measures within AMS when undertaking tree clearance works at G183, W184 and W182 to protect trees closest to works. Follow protection measures for the RPAs of T155, T169, and T171.						
E2.4	Mitigate tree loss at M11 embankment	Replacement planting following the completion of construction in						

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	areas.	this area.						
E2.5	Prevent unanticipated tree loss.	Works should be supervised by a competent arboriculturalist. No materials stored or dumped and no movement of plant and machinery within the RPA. Avoid excavations within the RPA. If required, works should be limited to hand tools. Lay down temporary ground protection suitable for pedestrians, and/or plant where required.		Principal Contractor (to be appointed) and nominated arboriculturalist (to be appointed)				
Post-Construction								
E3.1		Remove protective fencing from trees retained during construction.		Principal Contractor (to be appointed)			After construction	
Geology and Soils								
Pre-Construction								
F1.1	Protection of abstraction borehole from potential contaminants.	Ensure barriers in place around the borehole housing. The routes of any utilities and pipework would be established,		Principal Contractor (to be appointed)		CEMP	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		marked and protected and potential contamination sources kept well t away from the area. Decommission any boreholes not required during construction.						
F1.2	Prevent existing contamination from impacting highways infrastructure.	Undertake additional GI in any areas not assessed as part of the EIA. Prepare CEMP to manage any contamination found during works not identified in the Ground Investigation.		Principal Contractor (to be appointed)		CEMP	Before construction	
F1.3	Mitigate risk of potential contamination at proposed compound site on Gilden Way (former nursery site).	Undertake additional GI at this site. Undertake a contaminated land risk assessment at the site, including soil sampling. Undertake a pilling risk assessment if piling required. Follow contaminated land procedures in CEMP.		Principal Contractor (to be appointed)		CEMP	Before construction (before setting up compound)	
F1.4	Identify reason for elevated ground gas flow rates in BH20 and BH30 and prevent gas accumulation in voids.	Collect and analyse laboratory gas sample from each borehole.		Principal Contractor (to be appointed)			Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
F1.5	Assess for possible gas migration from gravel pit and prevent gas accumulation in voids.	Install gas monitoring well along Gilden Way. If groundwater is encountered, a sample should be taken from the well.		Principal Contractor (to be appointed)			Before construction	
F1.6	Management of soil resources to prevent unnecessary loss or damage of resources.	Undertake Soil Resource Survey (SRS) and present results in a soil resources plan. Produce Soil Management Plan (SMP). Add information about soil options for re-use, import or export to Materials Management Plan (MMP).		Appoint suitably qualified and experienced soil scientist or practitioner to undertake soil resource survey. Principal Contractor (to be appointed)		SMP MMP	Before construction	
F1.7	Mitigate risk of encountering Unexploded Ordnance (UXO).	Undertake targeted investigation for UXO to further reduce risks for the Proposed Scheme.		Principal Contractor (to be appointed)			Before construction	Further details are provided in the 1st Line Defence Ltd Report on UXO, Non-Intrusive Magnetometer Survey, Report Reference OPN2825NIS, 27th November 2015.
F1.8	Deal appropriately with any suspect	Representative samples should be taken by a suitably qualified		Principal Contractor		CEMP	Before and during	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	contaminated ground.	person and sent for laboratory analysis in order to assess the risk to potential receptors. If significant contamination is found, the material should be removed for treatment or disposal and replaced with clean material prior to groundwork re-commencing.		(to be appointed)			construction	
F1.9	Prevent contamination to ground, groundwater or surface water.	Install protective measures to ensure that drainage and surface water courses did not receive run-off from excavation works, stockpiles or spillages.		Principal Contractor (to be appointed)		CEMP	Before and during construction	
During Construction								
F2.1	Limit potential impacts from concrete preparation.	Ensure pre-mixing of the required concrete undertaken offsite if feasible. Where not feasible, the mixing and handling of wet concrete on site would be limited to designated areas where the release of runoff could be controlled and contained.		Principal Contractor (to be appointed)		CEMP	During construction	
F2.2	Prevent contaminated or unsuitable fill materials being used	Representative chemical contamination testing on samples of imported materials and materials excavated for re-		Principal Contractor (to be appointed)		CEMP	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	for the construction of the Proposed Scheme.	use.						
F2.3	Ensure competent mitigation measures.	Monitor mitigation measures throughout construction.		Principal Contractor (to be appointed)			During construction	
F2.4	Prevent the introduction of contaminants to deep strata from piling activities.	Undertake pilling risk assessment where piling potentially impacts aquifers.		Principal Contractor (to be appointed)		CEMP		Undertake works in accordance with the Environment Agency's 'Piling into Contaminated Sites' guidance.
F2.5	Manage soil resources to prevent unnecessary loss or damage of resources.	Follow good practice measures for soil management and measures in the SMP.		Principal Contractor (to be appointed)		SMP Defra, 2009, Construction Code of Practice for the Sustainable Use of Soil on Construction Sites.	During construction	
F2.6	Reduce risk of workers encountering	Identify locations and types of contaminants present beneath the route of the road during		Principal Contractor (to be appointed)		Health and safety file	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	contaminated materials if excavation required.	construction works and log in a health and safety file.						
Post-Construction								
F3.1	Reduce risk of maintenance workers encountering contaminated materials if excavation required.	Follow information in Health and Safety file Ensure appropriate precautions taken during any works likely to disturb the material. Wear appropriate PPE.		Client			During operation	
F3.2	Reduce risk of contamination and exposure of human receptors to contamination.	Undertake monitoring once operational to ensure adequate protective measures and to quickly identify any corrective action.		Client			During operation	
Materials								
Pre-construction								
G1.1	Minimise wastes arising from construction of the Proposed Scheme.	Pre-demolition audit to identify wastes. Produce SWMP incorporating targets for waste recycling and waste minimisation. Identify appropriate waste and recycling facilities. Materials and waste inventories produced.		Principal Contractor (to be appointed)		SWMP	Before Construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		Construction staff trained in waste minimisation and recycling.						
G1.2	Minimise the volume of imported materials required to construct the Proposed Scheme.	Identify materials and their volumes needed to be imported. Use the proximity principle to source additional materials and consider options in close proximity to the Proposed Scheme. Identify methods of importation. Determine transport routes and discuss with Highways Authority.		Principal Contractor (to be appointed)		CEMP SWMP	Before and during construction	
G1.3	Ensure safe removal of hazardous wastes generated during construction of the Proposed Scheme.	Identify appropriate facilities that accept hazardous waste and their locations. Determine volumes of hazardous waste produced during construction of the Proposed Scheme.		Principal Contractor (to be appointed)		SWMP	Before construction	
G1.4	Minimise carbon footprint of materials, their associated transport and use.	Re-use of onsite materials and use of secondary/recycled materials locally and responsibly sourced. If additional off-site materials required, use locally sourced materials.		Principal Contractor (to be appointed)		CEMP	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
During Construction								
G2.1	Minimise volume of materials required for construction of the Proposed Scheme.	Maximise the use of on-site material wherever practicable. Use as much recycled content as practicable. When off-site materials are required, use locally sourced materials.		Principal Contractor (to be appointed)		CEMP	During Construction	
G2.2	Minimise wastes arising from construction of the Proposed Scheme by maximising opportunities for reuse and recycling.	Provide separate contained storage locations/bins for re-usable materials. Store and re-use suitable soils for construction of the Proposed Scheme and landscaping. Excess soil taken off site for re-use or recycling. Chip green waste and use on site for landscaping purposes. Excess green waste to be taken off-site for use or composting On-site use of demolition materials where practicable. Recycle the majority of wastes where practicable. Conduct regular materials and waste audits.		Principal Contractor (to be appointed)		SWMP CoCP	During construction	
Post Construction								

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
G3.1	Minimise waste from littering and other waste produced along the highway.	Litter picking along the highway verges, landscaped areas, attenuation ponds and other areas within the highways boundary. Procedures to be put in place to provide for the segregation and recycling of waste where practicable.		Principal Contractor (to be appointed)		SWMP	During operation	
Noise and Vibration								
Pre-Construction								
H1.1	Determine noise control measures for construction works.	Develop noise mitigation measures or effective noise management during construction. Produce schedule of construction noise and vibration monitoring and include in the CEMP.	Agree mitigation measures with the Environmental Health Department of Harlow Council and Epping Forest District Council.	Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1.	Before construction	
H1.2		Establish agreement with the local authority on appropriate controls for undertaking significantly noisy works or vibration-causing operations close to receptors.	Agree measures with the Environmental Health Department of Harlow Council and Epping Forest District Council.	Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
H1.3	Determine vibration control measures for construction works.	Develop vibration measures for effective vibration management during construction. Produce schedule of construction noise and vibration monitoring to include in CEMP.	Agree mitigation measures with the Environmental Health Department of Harlow Council and Epping Forest District Council.	Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	Before construction	
During Construction								
H2.1	Reduce noise and vibration impacts to receptors.	Follow noise and vibration mitigation measures outlined in the CEMP.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.2		Follow 'best practicable means' during all construction activities.	Contained in BS 5228	Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.3		Construct acoustic barriers at the start of the construction programme.		Principal Contractor (to be appointed)		ES Chapter 11, table 11.11	During construction	
H2.4		Switch off plant and equipment when in use for long periods of time.						
H2.5		Programme works such that the requirement for working outside normal working hours was	Take into account the highway authority's statutory duties	Principal Contractor (to be appointed)		ES Chapter 11, paragraph	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		minimised.	under the Traffic Management Act 2004.			11.6.1		
H2.6		Use of low noise and vibration emission plant where possible.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.7		Use temporary noise screens around particularly noisy activities.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.8		Undertake regular plant maintenance.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.9	Construction activities causing nuisance to local residents.	Inform local resident when specific noise activities that could have vibration impacts, would be likely to occur.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	
H2.10	Reduce noise impacts during construction at night.	Best Practice Means mitigation measures applied to minimise impacts wherever possible. Particular mitigation such as temporary hoardings could be required to minimise potential of sleep disturbance. Follow measures in CEMP.		Principal Contractor (to be appointed)		ES Chapter 11, paragraph 11.6.1	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
Post-construction								
H3.1	None required							
People and Communities								
Pre-Construction								
I1.1	Provide access to private assets affected by the Proposed Scheme.	Agree realignments or improvements of accesses to two businesses and one private property along Gilden Way with property owners.	Agreement with property owners	Client/ Principal Contractor		Agreement with property owners	During accommodation works	
I1.2		Produce detailed construction methodologies to minimise disruption to access to properties along Gilden Way and Sheering Road.		Principal Contractor		Construction methodologies	Before construction	
I1.3	Mitigate disruption to access community facilities during construction.	Determine diversions and traffic management measures.	Agreement with local highway authority	Principal Contractor		Traffic Management Plan		
I1.4	Mitigate disruption to local bus route 59.	Organise and implement location and design of temporary or permanent new bus shelters and laybys.	Agreement with local highway authority	Principal Contractor		Traffic Management Plan		
I1.5	Mitigate levels of driver stress for drivers using existing Gilden Way.	Organise traffic management for Gilden Way.	Agreement with local highway authority	Principal Contractor		Traffic Management Plan		

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
I1.6	Maintain access to footpaths.	Determine diversion route for Footpath 204_30.	Agreement with Essex PRoW Officer	Principal Contractor				
I1.7	Reduce levels of disruption to traffic during construction.	Produce traffic management plan and site traffic management plan.	Agreement with local highway authority	Principal Contractor				
During Construction								
I2.1	Provide access to private assets affected by the Proposed Scheme.	Realign or improve accesses to two businesses and one private property along Gilden Way. Construct new access to Mayfield Farm off Sheering Road. Ensure access to agricultural land.	Agreement with property owners	Principal Contractor			During construction	
I2.2	Maintain NMU access.	Divert Footpath 204_30. Construct an NMU route following Gilden Way/ Sheering Road between the London Road Roundabout and Footpath 204_17. This would create an NMU route all the way from Gilden Way to Pincey Brook without breaks. Provide temporary diversion routes, where suitable for all Public Rights of Way (PRoW) potentially affected during	Agreement with Essex PRoW Officer	Principal Contractor				

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		construction.						
I2.3	Reduce construction effects on nearby receptors and traffic.	Use screening, low noise equipment and temporary traffic management.		Principal Contractor		CoCP CEMP		
Post-Construction								
I3.1	None required.							
Road Drainage and Water Environment								
Pre-Construction								
J1.1	Reduce risk of unnamed watercourse 1 from flooding.	The lengths of watercourse proposed to be culverted on the unnamed watercourse 1 would be designed in accordance with good practice, including: • Allowing for the passage of water and sediment for a range of flows (including low flow conditions). This could mean introducing a low flow channel into the bed of the culvert to retain sufficient depths of flow during low flow periods; • Depressing the invert of culverts to allow for formation of a more natural bed; • Using a culvert of a similar/larger cross-section		Principal Contractor (to be appointed)			Detailed design	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		size to existing (where applicable); • Increasing the roughness of culvert inverts to help reduce water velocities; and • Ensuring culverts wide enough to allow ledges for passage of animals such as otters where appropriate.						
J1.2	Reduce risk of pipe busts.	Identify locations of services to avoid pipe bursts during construction.		Principal Contractor (to be appointed)			Detailed design	
J1.3	Reduce risk of surface water flooding during construction.	Add construction standard good practice measures into the CEMP.		Principal Contractor (to be appointed)		CEMP	Before construction	
J1.4	Ensure legal compliance.	Ensure all necessary consents and licenses are in place.	Follow CoCP	Principal Contractor (to be appointed)		CoCP	Before construction	
J1.5	Mitigate risk of reducing water quality.	Construct adequate temporary storage lagoons to contain surface runoff and silt during construction. Implement sediment bunding or fencing where required.		Principal Contractor (to be appointed)			Beginning of construction	
J1.6	Mitigate risk of a pollution incident.	Prepare an incident response plan. Arrange toolbox talk onsite throughout construction informing all site workers of		Principal Contractor (to be appointed)		Incident response plan	Before construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		required actions in the event of a pollution incident.						
J1.7	Reduce risk of pollution to groundwater.	Additional GI information to be obtained on soil and groundwater quality testing.		Principal Contractor (to be appointed)			Before construction	
During Construction								
J2.1	Reduce risk of surface water flooding during construction.	Follow construction standard good practice measures within the CEMP.		Principal Contractor (to be appointed)		CEMP	During construction	
J2.2	Reduce risk of pollution.	Adopt good working practices and implement a CoCP (if required).	Adhere to EA's PPG and CIRA Reports	Principal Contractor (to be appointed)		CoCP	During construction	
J2.3	Reduce sediment input into watercourses.	Provide sediment fences and sediment-trapping matting/bunds. Limit extent of vegetation clearance.		Principal Contractor (to be appointed)			During construction	
J2.4	Reduce risk of scour and erosion around proposed structures	Construct structures during periods of low flow (usually summer months) or by creating		Principal Contractor (to be appointed)			During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	or to the disturbed river bed.	a dry working area.						
J2.5	Reduce risk of polluting surface water or groundwater.	Use drip trays under mobile plants. Separate construction activities (including stock piling and vehicle washing) from the watercourse. Provide oil spill clean-up equipment (including absorbent material and inflatable booms) for use in the event of an oil spill or leak. Use construction materials free from contamination. Ensure wet cement never contacts with a watercourse or groundwater. Test made and reworked soils to identify contamination. Discharge point would include treatment if required to ensure no pollution.		Principal Contractor (to be appointed)		EA's PPG	During construction	
J2.6	Reduce risk of pollution to groundwater.	If required, an appropriate level of water quality monitoring and treatment would be put in place to ensure no pollution at location of discharge.		Principal Contractor (to be appointed)		CoCP	During construction	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
		Follow CoCP. Operate in accordance with the EA's PPGs. All fuel, oil and chemicals stored in accordance with the requirements of the Control of Pollution (Oil Storage) Regulations 2001.						
J2.7	Reduce risk of fluvial flooding.	Construct two over widened culverts on unnamed watercourse 1. Realign watercourse 1 into an open channel.		Principal Contractor (to be appointed)			During construction	
J2.8	Reduce risk of surface water flooding.	Construct attenuation storage measures.		Principal Contractor (to be appointed)			During construction	
J2.9	Protect 8m Environment Agency buffer zone along main watercourses.	No construction compound to be located within 8m buffer. Where practical, area to be fenced off from live work.		Principal Contractor (to be appointed)			During construction	
Post-Construction								
J3.1	Prevention of flooding.	Maintain surface water drainage system by regularly removing sediments/organic matter to maintain optimal capacity of the drainage system.		Client			During operation	
J3.2	Protect against water	Water quality monitoring and		Local Highways			During	

No. (A unique ref.)	Objective (a brief statement)	Action	Achievement criteria	Responsible person (name and contact details)	Contract reference	Consent/ mitigation reference	Completed (Date)	Notes/ further action
	pollution at the discharge point.	treatment to be put in place.		Authority			operation	
J3.3	Protect 8m Environment Agency buffer zone along main watercourses.	No inappropriate maintenance to be carried out within 8m buffer e.g. close mowing.		Principal Contractor (to be appointed)			During operation	

6. Register of variations

(A tabular format document to record changes to construction methods design and mitigation and the implications of these changes and authorising personnel)

Where any amendments and variations to the environmental management plan were required these would be recorded in Table 6.1.

Table 6.1: Records of amendments and variations to the environmental management plan

No.	Variation Description	Authorising Personnel	Completion Date

7. Technical schedules

To be completed when a Principal Contractor has been appointed.

References

Department for Transport (1999), Traffic Advisory Leaflet 15/99 Cyclists at Road Works. http://webarchive.nationalarchives.gov.uk/20120606202850/http://assets.dft.gov.uk/publications/tal-15-99/tal-15-99.pdf. [Accessed October 2016].

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Glossary

Glossary	Definition
Bunding	Constructed retaining wall around storage where potentially polluting substances are handled, processed or stored, for the purposes of containing any unintended escape of material from that area until such time as remedial action can be taken."
Environmental incident'	Defined as an event, activity or condition that cause, or has the potential to cause harm to people, or damage to property or the environment
Hamburger-style roundabout	A roundabout where the main road passes through the centre of the roundabout.
Method Statement	A document that details the way a work task or process is to be completed. The method statement should outline the hazards involved and include a step by step guide on how to do the job safely.
Pollution	The presence in or introduction into the environment of a substance which has harmful or poisonous effects.
Refugia	A habitat created for relocated species to inhabit
Trackout	Dirt and mud adhered to the underside of a vehicle
Waste hierarchy	A ranking of waste management options according to what is best for the environment

Acronyms

Acronym	Meaning
AMS	Arboricultural Method Statement
CEMP	Construction Environmental Management Plan
CoCP	Code of Construction Practice
COSHH	Control of Substances Hazardous to Health
DMP	Dust Management Plan
ECC	Essex County Council
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPS	European Protected Species (licence)
ES	Environmental Statement
GCN	Great Crested Newts
GI	Ground Investigation
HEMP	Handover Environmental Management Plan
HSE	Health and Safety Executive
LPA	Local Planning Authority
MMP	Materials Management Plan
PPE	Personal Protective Equipment
PRoW	Public Right of Way
PWV	Protected Wildlife Verge
RPA	Root Protection Area
SMP	Soil Management Plan
SRS	Soil Resource Survey
SWMP	Site Waste Management Plan
UXO	Unexploded Ordnance
WSI	Written Schemes of Investigation