A47 North Tuddenham to Easton Dualling

Scheme Number: TR010038

Volume 7
7.4 Environmental Management Plan

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

January 2022

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The A47 North Tuddenham to Easton Development Consent Order 202[x]

ENVIRONMENTAL MANAGEMENT PLAN

Regulation Number:	5(2)(a)
Planning Inspectorate Scheme Reference	TR010038
Application Document Reference	TR010038/APP/7.4
BIM Document Reference	HE551489-GTY-EGN-000-RP-LX-30020
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Version	Date	Status of Version
Rev 0	March 2021	Application Issue
Rev 1	January 2022	Deadline 7 Update

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1. Introduction and background

1.1.1. Highways England (the Applicant) has submitted an application under Section 37 of the Planning Act 2008 (the 2008 Act) to the Secretary of State via the Planning Inspectorate (the Inspectorate) for an order to grant development consent (DCO) for the A47 North Tuddenham to Easton Dualling Scheme (hereafter referred to as 'the Proposed Scheme').

1.1.2. This document is the Environmental Management Plan (1st iteration - design) for the Proposed Scheme. The purpose of the Environmental Management Plan (EMP) is to manage the environmental effects of the Proposed Scheme as identified within the Environmental Statement (ES) and to demonstrate compliance with environmental legislation. The environmental actions and commitments specified in the EMP will be secured by the requirements in the Development Consent Order (DCO) (**TR010037/APP/3.1**), ensuring that they will be provided as part of the Proposed Scheme.

1.1.3. This EMP is based on the current design of the Proposed Scheme presented in the DCO application. It has been prepared in accordance with the following:

- The ES (TR010037/APP/6.1).
- Design Manual for Roads and Bridges (DMRB) LA 120 Environmental management plans1.
- Asset Data Management Manual (ADMM) v11.0 Parts 2 and 3 (in particular for Environmental Information System (EnvIS) requirements)[2].

1.1.4. Galliford Try is the Principal Contractor for the Proposed Scheme, and will hereby be referred to as the Principal Contractor (PC) throughout this EMP.

1.1.5. The EMP is a live document that evolves with iterations. This iteration refers to outline environmental management plans which will be developed into full management plans, when the 2nd iteration is prepared. These include:

- Outline Site Waste Management Plan (Appendix 10.2 of the Environmental Statement **TR010038/APP/6.3**)
- Outline Traffic Management Plan (**TR010038/APP/7.5**)
- Outline Landscape and ecology management plan (Appendix B of this EMP)
- Outline Construction Noise and Dust Management Plan (Appendix B of this EMP)

[1] Highways England (2020) Design Manual for Roads and Bridges LA 120 Environmental management plans [online] available at: https://www.standardsforhighways.co.uk/dmrb/ (last accessed 30 September 2020).
[2] ADMM v11 Part 2 – Requirements and Additional Information https://www.standardsforhighways.co.uk/ha/standards/admm/docs/ADMMv11_Part_2_Requirements_and_Additional_Information_FINAL.PDF

1.1.6. Following the Secretary of State's approval of the DCO for the Proposed Scheme, the EMP will be updated, a minimum of two times, to reference specific requirements relating to the various phases of construction. The following environmental management plans will be prepared as part of the 2nd iteration:

- Annex B.1 Materials Management Plan (MMP)
- Annex B.2 Soil Handling Management Plan
- Annex B.3 Construction Noise and Dust Management Plan
- Annex B.4 Construction Communication Strategy
- Annex B.5 Landscape and Ecology Management Plan
- Annex B.6 Biosecurity Management plan[3]
- Annex B.7 Water Monitoring and Management Plan
- Annex B.8 Detailed Heritage Written Scheme of Investigation (WSI) (Mitigation Strategy)
- Annex B.9 Temporary Surface Water Drainage Strategy
- Annex B.10 Invasive Non-Native Species (INNS) Management Plan
- Annex B.11 Operational Unexploded Ordnance (UXO) Emergency Response Plan

1.1.7. The 2nd iteration (Construction) of the EMP will be updated by the PC once the design and construction plans have been finalised and prior to commencement of construction. The 3rd iteration of the EMP will be refined at the end of the construction stage to support future management and operation of the Proposed Scheme.

1.2. Purpose of this EMP

1.2.1. The EMP provides clear and concise information which states how the mitigation and management of environmental effects will be delivered and maintained and assigns responsibility for undertaking the described actions in this report and the ES.

1.2.2. The EMP:

- identifies roles and responsibilities
- identifies risks, their associated control measures, compliance and corrective actions
- establishes procedures for communication, monitoring, audit mechanisms and reporting of control measures

[3] The management of INNS will be included in the Biosecurity management plan or within its own management plan.

- would be reviewed regularly to ensure it is achieving the environmental protection required
- provides a clear audit trail outlining the modifications from any previous iteration

1.2.3. This EMP takes due consideration of the documents submitted to the Planning Inspectorate and assessments undertaken on behalf of Highways England, as well as the DCO for the Proposed Scheme itself. It identifies mitigation and environmental issues associated with the stages of the project. The EMP sets out the control of environmental effects through all lifecycle stages from the design stage. Table 1.1 outlines the requirements.

Table 1.1: Delivery schedule and update requirement of EMP

Project Stage	EMP iteration	Produced / refined
Design	First iteration of EMP (formerly outline EMP) produced during the design stage for the preferred option.	Produced
Construction (refined for the consented project)	Second iteration of EMP (formerly construction EMP) refined during the construction stage for the consented project, in advance of construction.	Refined
End of construction	Third iteration of EMP (formerly handover EMP) building on the construction EMP refined at the end of the construction stage to support future management and operation.	Refined

Source: Design Manual for Roads and Bridges, LA 120 Environmental management plan, table 2.2

1.3. The Proposed Scheme

Location

1.3.1. The Proposed Scheme is located between the villages of North Tuddenham and Easton, west of Norwich in Norfolk, where there is currently a section of single carriageway which is part of the main arterial highway route connecting Norwich and Great Yarmouth to King's Lynn and then on to Peterborough, Leicester and the Midlands.

1.3.2. The Proposed Scheme is an offline alignment running parallel to the north and south of the existing A47. It bypasses to the south of Hockering, to the north of Honingham and connecting to the existing A47 to the west of Easton.

Programme

1.3.3. The indicative construction programme for the Proposed Scheme has been informed by the PC. During the detailed design stage for the Proposed Scheme the PC will refine the construction programme.

1.3.4. Current start of works is scheduled for August 2022. Main works are scheduled to start in January 2023. Construction is anticipated to take approximately 23 months. Early ecological works will be required to be undertaken pre-construction.

1.3.5. Enabling and site preparation work would be largely carried out during Phase 0, with the main works carried out during Phases 1 to 7 before final compound removal in Phase 8.

Table 1.2: Construction phasing programme

Phase	Traffic management stage	Approximate programme	Key Construction Activities
0	Compound construction	One month (month 1)	Compound and welfare areas constructed for main works. Hardstanding areas will be constructed, topsoil stripped and sub-base installed. Areas for car parking will be surfaced as required. Clearance of vegetation undertaken as required to enable the works. National Grid to undertake high pressure gas main diversion before main works commence (Activity will take up to 6 months and will continue into Phase 1).
1	Offline construction, including overbridges, culverts, retaining walls	Eighteen months (months 1-18)	Construction of carriageway offline from existing A47. Activities including topsoil strip, cut / fill earthworks, drainage installation, carriageway construction including capping, sub-base and the bitumen bound layers. Construction of offline structures including new overbridges and retaining walls. Sheet piling, bored piling and concrete works will be undertaken as part of the structure construction works. Traffic management to side roads as required to enable offline A47 construction works.
2	Norwich Road junction - New A47 carriageway tie-in across existing A47 Traffic using new side roads to the south of the new Norwich Road junction before joining back into the existing A47	Two months (months 19-20)	Construction of 'tie-in' plug sections of the new A47 carriageway where it crosses over the existing A47 to join the newly constructed offline sections together. Activities include excavation of existing carriageway, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.
2A	Eastern tie-in - during Phase 2 – Traffic to use outside lanes only of existing Easton roundabout	One month (month 19)	Works undertaken to construct carriageway through the existing Easton roundabout. Activities include excavation of existing roundabout, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.

Phase	Traffic management stage	Approximate programme	Key Construction Activities
2B	Eastern tie-in - during Phase 2 – traffic to travel through site of Easton roundabout on new carriageway construction	One month (month 19)	Works undertaken to remove existing outer lanes of roundabout and complete new through A47 carriageway construction. Activities include excavation of existing roundabout, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.
3	Wood Lane junction – new A47 carriageway tie-in across existing A47 Traffic using new A47 carriageways from Easton to Wood Lane junction, then the at Wood Lane junction on / off new slip road to use new side road that that ties into the existing A47 to the east of Hockering	One month (months 20-21)	Activities include excavation of existing carriageway, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.
4	Western tie-in	One month (months 21-23)	Cross-overs will be constructed through the existing central reservation to enable phase 4a and 4b works.
4A	Western tie-in, traffic using existing alignment with contraflow to existing dual carriageway section	One month (months 21-22)	New eastbound alignment tied in. Activities include excavation of existing carriageway, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.
4B	Western tie-in, traffic moved to use new carriageway	One month (months 22-23)	New westbound alignment tied in. Activities include excavation of existing carriageway, earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.
5	Compound removal	One month (month 23)	Compounds and site welfare will be removed. Hardstanding areas will be removed and the site re-topsoiled. Area will be re-landscaped as required.

The need for the Proposed Scheme

1.3.6. The existing A47 provides a connection for people, places, businesses and enables access to employment, healthcare, education and other community assets.

1.3.7. The Proposed Scheme is located between the villages of North Tuddenham and Easton, in Norfolk, where there is currently a section of single carriageway forming part of the main arterial highway route connecting Norwich and Great Yarmouth to King's Lynn and then on to Peterborough, Leicester and the Midlands.

1.3.8. Studies have identified that the single carriageway section of the road no longer meets the needs of its users. It acts as a bottle neck, resulting in congestion that leads to longer journey times and has a poor safety record.

1.3.9. The Proposed Scheme will relieve congestion, improve safety, reduce journey times, encourage economic growth and improve our customers' experience.

Outline of proposed works

1.3.10. The Proposed Scheme comprises the dualling of the section of the A47 between North Tuddenham and Easton, including two grade separated junctions (Wood Lane junction and Norwich Road junction) and associated side road alterations with provision of walking, cycling and horse riding connections along the length of the Proposed Scheme.

1.3.11. The Proposed Scheme is an offline alignment running parallel to the north and south of the existing A47. It bypasses to the south of Hockering, to the north of Honingham and connects to the existing A47 to the west of Easton.

1.3.12. The Proposed Scheme comprises:

- 9km of new dual carriageway, running to the south of the existing A47 at Hockering and north of the existing A47 at Honingham
- two new junctions where the A47 passes over the local roads: one where of Berrys Lane meets Wood Lane (Wood Lane junction) and one where Blind Lane meets Taverham Road (Norwich Road junction)
- removal of the existing roundabout at Easton to create a free-flowing road
- building four bridges carrying: the A47 over the new Mattishall Lane Link Road, the proposed Wood Lane junction over the A47, the A47 over the River Tud and the proposed Norwich Road junction over the A47
- Sandy Lane connecting to the A47 via a new side road providing access to Wood Lane junction
- two new lay-bys on the A47 between Fox Lane and the proposed Wood Lane junction
- closure to through traffic of: Church Lane (East Tuddenham), Berrys Lane, Blind Lane and Church Lane (Easton), north the of A47
- widening of the junction of Rotten Row and Church Lane (East Tuddenham)
- alterations to existing public rights of way and provision of new segregated routes for walkers and cyclists, including:
  - a new route for walkers and cyclists linking Honingham with St Andrew's Church across the A47 via the proposed Honigham Church underpass
  - a new route for walkers and cyclists linking Easton with Lower Easton across the A47 via the proposed Easton footbridge
- new drainage systems, including:

  - new outfalls to the River Tud
  - dry culverts to maintain overland flow paths
  - new attenuation basins, with pollution control devices, to control discharges to local watercourses
- compounds, material storage areas and temporary vehicle parking located within the scheme boundary when construction is taking place
- diverting or installing new utilities infrastructure, such as gas pipelines, electricity cables, water pipelines and electronic communications cables
- environmental measures embedded into the Scheme design to reduce the environmental effects and deliver wider benefits, such as noise barriers, low noise road surfaces, permanent mammal crossings and new wetland habitats
- temporary closure of access (exit and entry) to Honingham Lane at the junction with Taverham Road, Weston Road and Telegraph Hill until NWL opens.

1.3.13. A detailed description of the Proposed Scheme is provided within ES Chapter 2 'The Proposed Scheme' of the **Environmental Statement (TR010038/APP/6.1)**.

1.3.14. An **Environmental Masterplan (TR010038/APP/6.7)** has been prepared for the Proposed Scheme. Works must be implemented in accordance with the Environmental Masterplan, to minimise the effects associated with landscape and visual, cultural heritage setting, noise and biodiversity. The Proposed Scheme once operational will reflect the environmental design.

Objectives of the Proposed Scheme

1.3.15. The Proposed Scheme aims to meet the following objectives:

Supporting economic growth

1.3.16. Reduce congestion related delay, improve journey time reliability and increase the overall capacity for future traffic growth to help enable regional development and growth in Norwich and its surrounding area.

A safer and reliable network

1.3.17. Improve safety for all road users and those living in the local area by improving safety issues at junctions along the A47. Improve user satisfaction by quicker and more reliable journeys.

A more free-flowing network

1.3.18. Increase resilience in coping with incidents such as collisions, breakdowns, maintenance and extreme weather. Support the smooth flow of traffic and

improve journey times reliability by maximising the operation capability at the junctions and along the 9km carriageway.

Improved environment

1.3.19. Protect the environment by minimising adverse impacts and, where possible, deliver benefits.

An accessible and integrated network

1.3.20. Ensure the new road layout considers local communities and safe access to the A47. Provide a safer route between communities for cyclists, walkers, horse-riders and other vulnerable users of the network, taking into consideration how their requirements can be addressed with improved connectivity

Value for money

1.3.21. Ensure that the Scheme is affordable and delivers good value for money.

2. Team roles and responsibilities

2.1.1. This EMP has been prepared by environmental professionals as part of the Principal Designer team. The authors are appropriately qualified and have a demonstrable knowledge, experience and competence in the environmental management field.

2.2. Site roles and responsibilities

2.2.1. The site-based roles and the organisation of responsibilities in relation to environmental management are summarised below. The PC will be required to delegate responsibilities to onsite personnel within key areas of the site and compounds. The delegation of responsibility will be clearly identified within relevant documents and site files and will be allocated to a suitably qualified person. Key role personnel will be approved by Highways England.

2.3. Project management organisation

2.3.1. Overseeing management of the Proposed Scheme will be directed by Highways England and any appointed Employer's Agent for the Proposed Scheme. Highways England will delegate some site supervision roles and procure specialist consultants to supervise, monitor or check the PC's Method Statements and sensitive activities where required. The key scheme roles for Highways England and the PC are listed in Table 2.1. Individual names and contact details will need to be confirmed and inserted where applicable by Highways England and the PC once appointed and confirmed.

Table 2.1: General site contacts and responsibilities

Role	Stage of Proposed Scheme involvement	Contact and Organisation	Telephone	Email
Highways England Project Manager	All	[NAME REDACTED] Project Manager Highways England	[DETIALS REDACTED]	[DETIALS REDACTED]
PC Design / Technical Manager	PCF (Highways England Project Control Framework) Stage 3 (Preliminary Design) – Stage 6 (Construction, commissioning and handover)	[NAME REDACTED] Project Manager Galliford Try	[DETIALS REDACTED]	[DETIALS REDACTED]
PC Senior Site Manager	PCF Stage 5 (construction Preparation) – Stage 6	[TBC] Galliford Try	[TBC]	[TBC]
PC Site Supervisors	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
PC Regional HS&S Manager	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
PC Regional Environmental & Sustainability Manager	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
PC HS&S Advisor	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
Community Relations Officer	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
Waste Champion	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
Spill Responders	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]
PC Environmental Specialist(s)	Stage 5 - 6	[TBC] Galliford Try	[TBC]	[TBC]

2.4. Environmental management responsibilities

2.4.1. The PC is responsible for producing the full EMP once the design and construction plans have been finalised.

2.4.2. Highways England and delegated consultants acting on their behalf, PC and subcontractors are all responsible for complying with the Proposed Scheme's environmental policies, relevant environmental legislation and regulations. It is a requirement that all persons on site will be made aware of their duty of care to the environment and will be provided with sufficient training, supervision or instruction through Site Inductions, toolbox talks (TBTs) and specific Method Statements as necessary.

2.4.3. Responsibilities for the site environmental management will be delegated to key personnel by the PC who will manage all reporting and monitoring of environmental mitigation during the contract period. Where required, environmental specialists will be consulted to provide advice on specific issues or site activities, in consultation with the PC. The main environmental roles and responsibilities are shown in Table 2.2.

Table 2.2: Overview of role responsibilities

Role	Responsibility
Highways England (HE) Project Manager	Oversee implementation of Proposed Scheme and the individuals undertaking specific roles and duties. To be reported to as per Contract requirements and internal organisation EMS.
PC Design / Technical Manager	Ensure that designs are carried out in compliance with the relevant legislation, the PC's Environmental Policy and Standards, guidelines, approved codes of practice and other requirements including adherence to HE standards and the commitments in the EMP. Ensure that regular design reviews and assessments are jointly undertaken with the design and operational staff, as appropriate. Ensure competency assessments are carried out where design consultants are employed
PC Senior Site Manager	Be aware of the environmental statutory requirements affecting site activities and seek further advice, if necessary. Ensure that all site environmental permissions are obtained and conformance of the conditions defined within these permissions. Ensure that environmental risk assessments are effectively monitored, reviewed and communicated. Organise and plan workplaces so work is conducted in accordance with PC's Environmental Standards. Identify the environmental requirements within method statements and ensure that they are produced and reviewed on time. Identify method statements' required distribution (e.g. foremen, supervisors, operatives) and ensure that they are followed and controlled, as appropriate. Ensure adequate supplies of environmental control equipment (e.g. spill response equipment) are available and are appropriately used. Accompany all Regulatory enforcement officers during any site visits. Ensure all new employees, contractors and visitors, including delivery drivers, are instructed on project specific environmental requirements. Ensure site specific environmental training needs are identified and training programmes are undertaken for all levels of site staff and contractors. Ensure all Supervisors and contractors are aware of their environmental responsibilities. Report any significant environmental incidents, disciplinary action or enforcing bodies' visits to the HS&S Advisor.
PC Site Supervisors	Be aware of the environmental statutory requirements affecting operations and seek further advice, if necessary. Ensure all new employees, contractors and visitors, including delivery drivers, are instructed on project specific environmental requirements.

Role	Responsibility
	Ensure that all relevant persons are briefed on the contents of environmental risk assessments / method statements and monitor operatives (including contractors) for compliance. Ensure that an adequate supply of environmental control equipment (e.g. spill response equipment) is kept on the site and implement disciplinary procedures against any employee who abuses or does not make full use of this equipment, when required. In conjunction with the Senior Site Manager plan environmental standards into work activities. In conjunction with the Senior Site Manager discuss environmental matters with all supervisors, including contractors, on a regular basis. Ensure all PC inspections are carried out as prescribed in the Company HS&S management system. Make full use of the services of the HS&S Advisors and co-operate with them to achieve PC's Environmental Standards. Follow PC's Environmental Standards and report any problems in achieving these standards to the Senior Site Manager and HS&S Advisor. Ensure that the requirements of all environmental risk assessments are brought to the attention of all operatives involved, including contractors. Actively encourage employees to report environmental problems as soon as they are discovered or if they are anticipated in the future. Ensure compliance with HE standards for the commitments within this EMP.
PC Regional HS&S Manager	Liaise with Business Unit Managers on operational environmental issues. Assist project management to ensure that the Proposed Scheme meet PC's Environmental Standards. Ensure the collation of environmental performance information, as provided by workplace management. Where working practices are observed that pose a significant environmental risk, ensure that, where possible, the activity is stopped; inform Site and Business Unit management immediately; provide appropriate support, advice and assistance in identifying and implementing the necessary remedial actions. Ensure that the relevant manager is advised if operations are not achieving PC's Environmental Standards, and further advise the Operations Director, Business Unit Managing Director and C&I Head of Health and Safety, as appropriate. Assist Business Units in the environmental performance management of contractors. Ensure that significant environmental incidents are reported promptly to the Business Unit Directors, C&I Head of Health and Safety and regulators, as appropriate. Investigate all environmental incidents as required by PC's Environmental Standards and make known and discuss any significant findings / recommendations within the Business, as appropriate. In conjunction with the operational staff, identify areas / operations that require specific environmental improvement and assist in the organising or undertaking of such improvements, as appropriate.

Role	Responsibility
	Provide feedback to the C&I Environmental Manager on the effectiveness of the C&I's HS&S management systems and any improvements necessary. Assist Head of Health and Safety and C&I Environmental Manager in maintaining high corporate environmental management standards across the C&I.
PC Regional Environmental & Sustainability Manager	Where working practices are observed that pose a significant environmental risk, ensure that, where possible, the activity is stopped; inform Site and Business Unit management immediately; provide appropriate support, advice and assistance in identifying and implementing the necessary remedial actions. Provide specialist environmental input to operational staff through advice, guidance and support e.g. on environmental legislation and industry best environmental practice. Provide detailed support / guidance in the planning stages of a new project e.g. review the adequacy of environmental risk assessments. Liaise with Business Unit Managers on operational environmental issues. Provide information in the form of instructions, Best Practice Guidance, Codes of Practice, Environmental Information Sheets etc. as appropriate, and ensure operational staff are provided with C&I communications on effective environmental working practices and alerts. Assist operational staff in the review of environmentally high-risk contractors' method statements, provide appropriate assistance in assessing other environmentally related method statements, and monitor the implementation of the same in the workplace, as appropriate. Ensure that the relevant manager is advised if operations are not achieving GT's environmental standards, and further advise the Operations Director, Business Unit Managing Director and C&I Head of Health and Safety, as appropriate. Assist project management through advice, information, training and encouragement as appropriate to ensure that the Proposed Scheme continually meet GT's environmental standards. Promote involvement in environmental management of all operational staff by discussion, briefings, training sessions and effective communication. Assist in the investigation of all environmental incidents as required by GT's Environmental Standards and make known and discuss any significant findings / recommendations. Ensure that significant environmental incidents are reported promptly to the Business Unit Directors, C&I Head of Health and Safety and regulators, as appropriate. Ensure communication with the regulators regarding all relevant environmental inspections and incidents. In conjunction with the operational staff, identify areas / operations that require specific environmental improvement and assist in the organising or undertaking of such improvements, as appropriate.
PC HS&S Advisor	Where working practices are observed that pose a significant environmental risk, ensure that, where possible, the activity is stopped; inform Site and Business Unit management immediately; provide appropriate support, advice and assistance in identifying and implementing the necessary remedial actions.

Role	Responsibility
	Liaise with Business Unit Managers on operational environmental issues. Provide detailed support / guidance in the planning stages of a new project e.g. preparing the project environmental plans. Provide information in the form of instructions, Best Practice Guidance, Codes of Practice, Environmental Information Sheets etc. as appropriate, and ensure operational staff are provided with C&I communications on effective environmental working practices and alerts. Collate environmental information, as provided by workplace management, for monthly reports. Assist operational staff in the review of environmentally high-risk contractors' method statements, provide appropriate assistance in assessing other environmentally related method statements, and monitor the implementation of the same in the workplace, as appropriate. Ensure that the relevant manager is advised if operations are not achieving PC's environmental standards, and further advise the Operations Director, Business Unit Managing Director and C&I Head of Health and Safety, as appropriate. Assist project management through advice, information, training and encouragement as appropriate to ensure that the Proposed Scheme continually meets PC's environmental standards. Promote involvement in environmental management of all operational staff by discussion, briefings, training sessions and effective communication. Ensure induction instructions are reviewed regularly for relevance to current operations and ensure that they are being effectively communicated. Ensure that all staff, including office based personnel, receives appropriate environmental training and instruction. Monitor the Business Units to ensure that all staff, including office based personnel, receive appropriate environmental training and instructions. Assist Business Units in the environmental performance management of contractors. Ensure that significant environmental incidents are reported promptly to the Business Unit Directors, C&I Head of Health and Safety and regulators, as appropriate. Assist in the investigation of all environmental incidents as required by GT's Environmental Standards and make known and discuss any significant findings / recommendations. Ensure communication with regulators regarding all relevant environmental inspections and incidents. Carry out environmental inspections at all workplaces on a regular basis, as appropriate, to ensure compliance with the GT Environmental Policy and Standards. In conjunction with the operational staff, identify areas / operations that require specific environmental improvement and assist in the organising or undertaking of such improvements, as appropriate. Provide feedback to the C&I Environmental Manager on the effectiveness of the HS&S management system and any improvements necessary.

Role	Responsibility
Community relations officer	Communications with the public, stakeholders and other interested parties, outreach and education, where appropriate. Respond to any concerns or complaints raised by the public in relation to the works. Communication with local residents during construction to highlight potential periods of disruption. Liaise with the PM on landowner and community concerns relating to the works and act as the main interface with these stakeholders Maintain a log of complaints relating to the environment and ensure the PM is aware of any complaints. Engaging with local schools and colleges to inform pupils and students about the Proposed Scheme. Ensuring that the needs of groups with protected characteristics as identified within the Equality Act 2010 are considered during the construction process.
Waste Champion	Drive waste performance improvement including on-site materials and waste management practices. Verify the validity of disposal site permits, licenses and / or exemptions. Ensure that the GT waste transfer note (HS&S-FRM-W01-03) is completed in full for all non-hazardous waste streams removed from site for reuse, recycling and / or disposal. Ensure that hazardous waste consignment notes are fully completed for hazardous waste streams removed from site.
Spill Responders	Ensure spill response equipment is available and well maintained. Respond to any spill incident that occurs on-site as long as it is safe to do so. Complete an Environmental Incident Report (HS&S-FRM-A01-02) following any spill incident.

Role	Responsibility
PC Environmental Specialist(s)	**Contamination and Remediation Specialist** • To provide specialist spill response services to the Proposed Scheme in the event of a significant spill incident. • To remove waste spill clean-up materials and to provide the site team with all waste duty of care paperwork associated with the disposal of waste spill clean-up materials. **Waste Contractor** • Refer to the Site Waste Management Plan (SWMP). **Ecologist** • Conduct Phase 1 Habitat Survey(s) where the presence of protected ecological resources are known / suspected. • Conduct extended Phase 2 Habitat Survey(s) to assess the potential presence of protected fauna and / or flora; if required as a result of a Phase 1 Habitat Survey, pre-construction. • Conduct protected faunal species surveys where their presence has been identified. • Develop / review method statement(s) for the management of protected species that includes all relevant recommendations made within ecological surveys. • Liaise with ecological regulatory bodies to ensure the suitability of method statements. • Obtain and fully implement the conditions of a European Protected Species Licence i.e. Development Licence, if required. • Implement with the assistance of the site team all physical and management controls, defined with method statements and licences, to protect known flora / fauna. • Monitor site works to assure conformance with method statements and / or licences. • Regularly discuss progress and issues with the Senior Site Manager. **Archaeologist** • Develop and submit a mitigation strategy (Detailed Heritage Written Scheme of Investigation) to regulatory bodies for works that may impact known or suspected cultural heritage assets. This should include site-specific mitigation, general watching briefs where necessary and protocols for dealing with unexpected discoveries of cultural heritage assets during construction. • Preparation of method statements for the work specified in the agreed Detailed Heritage Written Scheme of Investigation • Obtain in conjunction with the Senior Site Manager all relevant regulatory permissions.

Role	Responsibility
	• Implement with the assistance of the site team all physical and management controls, defined with method statements and licences, to protect known or suspected cultural heritage assets from construction activities. • Report the identification of any unexpected cultural heritage asset to the relevant regulatory body. • Recommend site works be suspended if necessary, where any unexpected cultural heritage assets are identified. • Regularly discuss progress and issues with the Senior Site Manager. **Arboricultural Consultant** • Prepare an Arboricultural Method Statement. • Conduct tree felling / surgery works as per the scope of contract and BS5837:2012 Trees in Relation to Design, Demolition and Construction. • Ensure permission (i.e. section 211 Notice / Tree Felling Licence) is in place for works to protected trees. • Secure Tree Felling Licences with the Forestry Commission where required. • Regularly discuss progress and issues with the Senior Site Manager.

3. Record of environmental actions and commitments

3.1. Introduction

3.1.1. The Record of Environmental Actions and Commitments (REAC) contained in Table 3.1 identifies the environmental commitments included within the Environmental Statement (ES) (**TR010038/APP/6.1**) to address the potential environmental effects of the Proposed Scheme.

3.1.2. The REAC will be updated as the Proposed Scheme progresses. Monthly reviews will be undertaken where additional mitigation measures will be considered. On completion of the Proposed Scheme the 3rd iteration of the EMP (end of construction) will be finalised. This is the main vehicle for passing essential environmental information and crucially to the body responsible for the future maintenance and operation of the asset.

Table 3.1: Record of Environmental Actions and Commitments

Ref	Source of Objective Document Ref	Objective	Action (including specific location if applicable)	Assumption (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented / achieved	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
General (G)									
G1	General (ES Chapter 2)	Hours of working	Construction works will take place mainly during the daytime. Construction works outside of normal construction hours of 07:00-19:00 weekdays and 07:00-19:00 on Saturdays shall be minimised as far as practicable. Where works outside of these hours are unavoidable, the PC will consult with the local planning authority, and agree appropriate methods of mitigation that account for the location of works, hours of work and expected duration.	Indicative Information from the PC EIA - noise and vibration assessment	Regular site audits	Contractual responsibilities between Highways England and the PC	PC Senior Site Manager	P C	Signed: Date:
G2	General ES	Reduce light disturbance for sensitive receptors	**During works:** Lighting shall be at the minimum luminosity necessary and use low energy consumption fittings. Lighting shall comply with the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN016 and the provisions of BS 5489 Code of practice for the design of road lighting, where applicable. Lighting will be directional, and positioned sympathetically, to minimise light spill and disturbance for sensitive receptors. Night lighting will only take place in areas that have had vegetation cleared during the daytime. **During operation:** All proposed operational mitigation will be designed to minimise light spill onto residential properties and habitats which support commuting and foraging bats. Where lighting columns back onto residential properties and/or sensitive receptors, backlight shields or similar mitigation will be required to mitigate significant effects. Lighting at the junction will be designed with backlight shields and LED bulbs to reduce light spill onto habitats which support commuting and foraging bats.	Sensitive receptors within the vicinity of the site (as identified in Appendix 7.7 Lighting Assessment (**TR010038/APP/6.3)**	Regular site audits and compliance with EMP (**TR010038/APP/7.4**)	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
G3	General ES	Avoidance of double handling of materials	Material deliveries shall be programmed in advance and on an “as required” basis to avoid temporary storage and double handling, where possible.	Not applicable	Compliance with a Materials Management Plan	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
G4	General ES	Ensure traffic flows on the existing A47 and local roads are maintained during construction	The PC will prepare a Traffic Management Plan to manage the routing of construction traffic based on the outline Traffic Management Plan (**TR010038/APP/7.8**). Consultees including Norfolk CC and Royal Mail need to be acknowledged as a consultee on construction traffic management document and referenced in the list of parties that will be notified on closures and diversions during the construction period. Appropriate traffic management measures will be put in place to ensure that traffic flows on the existing A47 and other local roads are maintained, whilst allowing safe working at the interface between the existing road network and the Proposed Scheme. Routing of deliveries where possible and practicable will be along the existing A47. The PC will seek to reduce worker vehicle movements and HGV movements, particularly at peak periods.	Local road and existing A47 is used regularly	Compliance with the Traffic Management Plan (**TR010038/APP/7.5**)	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:

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G5	General ES	To reduce the visual impacts of the construction works for nearby sensitive receptors	To reduce visual effects of the Proposed Scheme during construction The PC will employ considered approach to minimise visual impact, for example: • keeping a tidy and organised site • temporary storage of soil mounds in linear bunds in locations where this would be beneficial to the visual screening of construction works • soil storage mounds managed in accordance with series 600 to assist visual integration of earthworks • protection of retained vegetation in accordance with British Standard (BS) 5837:2012	Construction works can be visually intrusive	Compliance with the Environmental Masterplan (**TR010038/APP/6.8**)	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
G6	General ES	Protection of protected species during construction	During construction, toolbox talks and other briefings will be carried out to ensure operatives can: • Identify habitats suitable for protected species, individual species themselves, and understand measures required when these species are encountered. In the event that any protected or priority species which were not previously identified in the ES (or any nesting birds) are found during construction, the work in the vicinity of the identified species must cease and it reported immediately to the Ecological Clerk of Works (ECoW).	Ecology surveys have indicated the presence of protected species	The PC will update the EMP with Toolbox talks. The PC will comply with the requirements of the EMP (**TR010038/APP/7.4**)	Contractual responsibilities between Highways England and the PC	PC	C	Signed: Date:
G7	General ES	Ensure positive community relations	Communication with local residents will take place during construction to highlight potential periods of disruption. This will be via appropriate and expedient means of communication, and an appointed Community Relations Officer. The Highways England Customer Contact Centre will be available to deal with queries and complaints from the public. An information line will be staffed and a complaint management system in place, used on other major infrastructure projects, to ensure complaints are investigated, action is taken and the complainant receives a response. A Community Relations Officer will be appointed who will be responsible for these specific tasks will prepare a community relations strategy to outline how these tasks will be undertaken. A forum will be established to disseminate construction information to the consultees. The Community Relations Officer will maintain regular, on-going communications with affected landowners and local residents prior to and during construction to minimise the disturbance and severance effects. The Community Relations Officer will be a point of contact for landowners to arrange access through the construction works / temporary compound areas to maintain land management activities on unaffected areas within or outwith the DCO boundary (e.g. to undertake woodland and hedgerow management).	Consultation with the local community	National Considerate Constructor's Scheme and establish a forum to disseminate construction information to the consultees. A community relations strategy is to be produced at the pre-construction stage.	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
G8	General ES	To ensure all proposed embedded environmental mitigation elements	Construction to take place in accordance with the Environmental Masterplan (**TR010038/APP/6.8**) and actions of the EMP which will be submitted as part of the DCO application.	Potential for mitigation bunds to lose their function as noise / landscape / visual	Compliance with the Environmental Masterplan (**TR010038/APP/6.8**)	Contractual responsibilities between Highways England and the PC, and the requirements of the DCO	PC	P C	Signed: Date:

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		retain their function not withstanding any design amendments within the vertical and horizontal limits of deviation.	Where design amendments within the vertical and horizontal limits of deviation are required, environmental mitigation measures such as noise bunds and barriers will undergo the same vertical and horizontal changes to ensure mitigation measures are still effective.	screening	submitted as part of the DCO application				
G9	General ES	EMP iteration	The PC will further develop the EMP prior to commencement of works based on the current EMP. It will include the implementation of industry standard practice and control measures for environmental impacts. Any design changes which require an update to mitigation proposed (e.g. noise bunds) will be updated in the 2nd iteration of the EMP.	Not applicable	The EMP will be updated by the PC once the design and construction plans have been finalised and prior to commencement of construction. The 3rd iteration of the EMP will be refined at the end of the construction stage to support future management and operation of the Proposed Scheme.	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
G10	Not applicable	Protection of local network	Wheel washing facilities will be installed at all compounds and material storage areas to mitigate the risk of construction material fouling the local network. This may involve a simple coarse gravel running surface or jet wash, or in the case of a heavily used exit point, wheel washers.	The local road network is used by construction traffic	Installation and use of facilities.	Contractual responsibilities between Highways England and the PC	PC	C	Signed: Date:
G11	Equality Impact Assessment	Screening of sensitive receptors	Additional landscape screening considerations to be included in the detailed design of the Proposed Scheme to screen the area of consecrated land at St Peter's Church.	Visual intrusion of the Proposed Scheme	Compliance with the Environmental Masterplan (**TR010038/APP/6.8**) submitted as part of the DCO application	Contractual responsibilities between Highways England and the PC, and the requirements of the DCO	PC	A	Signed: Date:
Air quality (AQ)									
AQ1	Air quality (ES Chapter 5)	To limit and control emissions to air during construction on sensitive receptors	Based on a construction dust risk potential of high for the project, the following activities are recommended to monitor the effectiveness of the proposed mitigation measures which will be included in the EMP: 1. Development of dust management plan with measures to monitor effectiveness of mitigation as part of the EMP 2. Daily onsite and off-site inspections to be included in EMP 3. Record of complaints/exceptional dust events to be included in EMP	Community receptors and ecological designated sites sensitive to changes in dust within the vicinity of the Proposed Scheme (as identified in Chapter 5 of the ES (**TR010038/APP/6.1) and presented in ES Figure 5.1** (**TR010038/APP/6.2).**	No justified complaints of dust nuisance from receptors in the vicinity of the Proposed Scheme.	Regular Site Audits Compliance with the **Construction Noise and Dust Management Plan**	PC	P C	Signed: Date:
Cultural heritage (CH)									
CH1	Cultural Heritage (ES Chapter 6)	To limit impacts on the setting and location of heritage assets and historic landscape	Sensitive vegetation planting design along the route corridor and proposed junctions to screen and enhance the setting of heritage receptors (such as St Peter's Church, St Andrew's Church, Berry Hall, and Church Farm House and Barn).	EIA - Cultural heritage assessment	Compliance with the Environmental Masterplan (**TR010038/APP/6.8**) submitted as part of the DCO application	Environmental Masterplan Landscape and planting design	PC will liaise with specialist	P C	Signed: Date:

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CH2	Cultural Heritage (ES Chapter 6)	Protection of heritage assets during construction	Certain assets in the DCO boundary are to be excluded from the works and will be recorded and protected during construction (for example fencing). These assets include the milestone opposite St Andrew's Church (MNF62797) and the milestone (MNF62796) on the southern boundary of St Peter's Church. Condition surveys and structural risk assessments shall be undertaken for assets in close proximity to construction works to obtain a baseline for regular condition monitoring. These assets include St Peter's Church (NHLE 1305921) and St Andrew's Church (NHLE 1170701). Protocols will be established following best practice guidance to ensure vibration levels are kept within acceptable tolerances(as defined in BS 5228-2), to avoid damage, and to halt or alter works methodology should tolerances be exceeded. The gateway piers and southern boundary of Honingham Park (MNF49020) between St Andrew's Church and Taverham Road will be recorded prior to any works taking place and the gate piers will be protected during construction works. The boundary will be reinstated after construction.	EIA - Cultural heritage assessment	Regular monitoring and inspection to ensure the assets are protected Condition surveys of the buildings Assets will be fully recorded, conserved, and restored. An appropriate specialist will be consulted on the methodology to record, conserve, and restore The scope of protection of heritage assets during the construction will be agreed where appropriate with Norfolk County Council (NCC) Environmental Services, Broadland District Council Conservation Officer and Historic England before construction	EMP Condition surveys and structural risk assessments Construction noise and vibration management plan Detailed Heritage Written Scheme of Investigation (Mitigation Strategy)	PC will liaise with specialist	P C	Signed: Date:
CH3	Cultural Heritage (ES Chapter 6)	Preservation in-situ of known and potential archaeological resources during the final design phase	The final layout for temporary structures, services, haul routes, storage methods etc. shall take into account the location of the known and potential archaeological resources within the footprint of the Proposed Scheme identified during the EIA cultural heritage assessment. Where possible known and potential archaeological remains should be preserved in-situ where reasonably practicable by avoidance. Where impacts cannot be avoided appropriate mitigation for preservation by record shall be included in the Detailed Heritage Written Scheme of Investigation (Mitigation Strategy).	EIA - Cultural heritage assessment	Scope of mitigation required to be included in the Detailed Heritage Written Scheme of Investigation(Mitigation Strategy) and agreed with Norwich County Council Environmental Services (NCCES)	Highways England chosen Archaeological specialist will liaise with PC Detailed Heritage Written Scheme of Investigation (Mitigation Strategy)	PC, Design Team	P	Signed: Date:
CH4	Cultural Heritage (ES Chapter 6)	To deal with unexpected archaeological discoveries during construction	During and prior to construction, a protocol for unexpected archaeological discoveries will be developed as part of the WSI (Mitigation Strategy). This protocol will be agreed with Historic England and NCCES in advance and is likely to include: • Toolbox talks or other instruction methods to allow operatives to identify potential archaeological remains • Protocols for protection, recording and archiving of relevant finds, plus associated reporting and publication • Protocols and communications plans for temporarily halting works and consulting with the relevant stakeholders in the event of unexpected remains of high or very high value / sensitivity. Protocols and communications plans will be included in the WSI (Mitigation Strategy). • Monitoring of any protection measures would be undertaken during construction to ensure that they remain effective including regular inspections of temporary fencing. During construction, works to the north of St Peter's Church churchyard will be archaeologically monitored during	EIA - Cultural heritage assessment	Protocol to be included in the DHWSI (Mitigation Strategy) and agreed with Norfolk County Council Environmental Services, Broadland District Council Conservation Officer and Historic England Archaeological monitoring at St Peter's Church to be included in the DHWSI (Mitigation Strategy) and agreed with Norfolk County Council Environmental Services,	Highways England chosen Archaeological specialist will liaise with PC Detailed Written Scheme of Investigation (Mitigation Strategy)	PC, Highways England	P C	Signed: Date:

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			construction to deal with the occurrence of unexpected burials outside the current boundary of the churchyard.						
CH5	Cultural Heritage (ES Chapter 6)	To protect the potential heritage value of peat samples confirmed near the River Tud	Peat deposits affected by crossing of the River Tud will be archaeologically sampled prior to construction, and analysis will be carried out to mitigate the impact any cores identified as having high archaeological potential. Norfolk County Council Environmental Services (NCCES) will be consulted on the sampling required. An archaeological watching brief will be required for areas of peat with any archaeological remains being excavated and recorded. The sampling strategy will be included in the Detailed Heritage Written Scheme of Investigation.	EIA - Cultural heritage assessment	The method of sampling will be agreed with Norfolk County Council (NCCES).	Detailed Heritage Written Scheme of Investigation (Mitigation Strategy)	PC will liaise with specialist	P	Signed: Date:
CH6	Cultural Heritage (ES Chapter 6)	Mitigation of impact on known and potential archaeological remains	A Detailed Heritage WSI (Mitigation Strategy) will be prepared by an archaeological specialist and will include the methodology for all archaeological mitigation required All recording and conservation measures will be captured within the DHWSI which will be agreed NCCES The heritage value of the known and potential archaeological resource within the footprint of the Proposed Scheme lies in its potential to contribute to the regional research framework objectives. Preservation by record will be an appropriate method to mitigate adverse effects. Identified remains are not of such complexity and sensitivity that preservation in situ would be necessary. However, good practice dictates that where remains need not be disturbed, they shall be protected to ensure they are preserved for the future. A strategy and a starting point for preservation by record for zones of identified archaeological potential includes: • Pre-construction excavation for direct impacts in Zones 1-7 (as defined in Chapter 6 of the ES). These zones contain the main locations of known sensitive heritage assets. Sampling levels will be agreed in advance of works but, will require flexibility to adapt to the emerging archaeological remains in consultation with Norwich County Council Environmental Services (NCCES). Advance excavation will limit the risk to the subsequent construction phase programme. • Archaeological monitoring with potential construction integrated recording in all other parts of the scheme (Zone 8). This work will focus on the mapping of archaeological features related to zones recovering dating evidence to clarify the results of previous excavation in those areas. The monitoring will also provide a safety net to catch any unexpected remains of archaeological value. The monitoring would be targeted on areas of impact defined during detailed design of temporary works during construction.	EIA - Cultural heritage assessment	Consultation with the Local Authority Archaeology Advisor (Norfolk County Council) and Historic England. Appropriate mitigation to be included in the DHWSI (Mitigation Strategy) and agreed with Norfolk County Council Environmental Services,	Contractual responsibilities between Highways England and the PC Detailed Heritage Written Scheme of Investigation (Mitigation Strategy) Appointment of an archaeological subcontractor to undertake the agreed works	PC, Design Team	P C (reporting may continue into the operation phase)	Signed: Date:
CH7	Cultural Heritage (ES Chapter 6)	Monitoring of archaeological mitigation strategy	Due to the potential for significant adverse effects to archaeological remains and heritage assets, monitoring of any protection measures would be undertaken during construction to ensure that they remain effective including regular inspections of temporary fencing. Monitoring measures and protocols for managing any disturbance or removal of archaeological remains and heritage assets will be detailed within the WSI (Mitigation	EIA - Cultural heritage assessment	Monitoring to be included in the DHWSI (Mitigation Strategy) and agreed with Norfolk County Council Environmental Services, Broadland	Contractual responsibilities between Highways England and the PC, and the Requirement 9 of the DCO (**TR010038/APP/3.1**)	PC, Highways England	P C	Signed: Date:

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			Strategy) and compliance will be secured by Requirement 9 to the Draft DCO (**TR010038/APP/3.1**).		District Council Conservation Officer and Historic England				
CH8	Cultural Heritage (ES Chapter 6)	To limit the visual impact during construction activities	Due to the sensitive setting impact, existing vegetation is to be retained where possible, and in line with the Environmental Masterplan, during the construction around the listed buildings (St Andrew's Church and St Peter's Church).	EIA - Cultural heritage assessment	Environmental Masterplan	Contractual responsibilities between Highways England and the PC	PC	C	Signed: Date:
Landscape and visual effects (LV)									
LV1	Landscape and visual (ES Chapter 7)	Protection and enhancement of the landscape character and sense of place	The measures that have been identified in the landscape and visual assessment and set out in the Environmental Masterplan (**TR010038/APP/6.8**) are as follows: • Creation of new areas of tree and woodland planting to compensate for losses • Integrating Proposed Scheme through appropriate use of planting • Reinforcing the existing linear and geometric character with woodland planting where this is consistent with the surroundings • Reinforcing existing field boundaries with individual trees and hedgerows where the field pattern is a notable component of the landscape • Retaining or replacing and reinforcing existing vegetation where this contributes to the distinctive qualities of the landscape • Selecting plant and grass species appropriate to the locality to maintain consistency with the appearance of the area. • The alignment of fence lines to accommodate the extent of proposed planting areas. • The alignment of fences for noise bunds and noise fences for noise mitigation. • The location and extent of drainage soakaways and attenuation basins to avoid existing vegetation; to accommodate the extent of proposed planting locations; and to maximise biodiversity gain. • The lighting proposed will help maintain the distinction between urban and rural areas. • Consideration of future maintenance with inclusion of pull in lay-bys and gated access points and the selection of plant and grass types that would require limited maintenance resources. • Building in resilience for climate change by including diversity within the plant and grass species mixes to ensure that a range of species types suitable for a range of conditions are incorporated. Also taking into consideration the creation of soil conditions favourable to plant establishment under either dryer or wetter conditions.	EIA - Landscape and visual impact assessment	Environmental Masterplan All proposed landscape and visual mitigation measures to be implemented by the year of opening with planting to have established by year 15	Regular site inspections and audits	PC Senior Site Manager PC Environmental Specialist	A	Signed: Date:

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			• Sourcing plant and grass species of local provenance where possible in the interests of extending local flora and construction sustainability.						
LV2	Landscape and visual (ES Chapter 7)	To ensure the establishment of the landscape character and visual effects	The maintenance of mitigation such as planting, and seeding will be the responsibility of Highways England (as part of the 5 year maintenance period) ensuring all proposed mitigation reaches maturity and reflects the assessment at year 15. Planting and seeding, proposed as mitigation for landscape and visual effects, will be maintained in order to achieve their full establishment throughout the construction contract. This will be detailed in the landscape and ecology management plan produced during detailed design and reported in the 2nd iteration of the EMP (Construction)	Sensitive landscape and visual receptors and ecology receptors within close proximity to the Proposed Scheme.	Successfully implement Environmental Masterplan Sheets 1-7 and compliance with the Landscape Management Plan (LEMP).	To be implemented by Highways England, the PC and Sweco.	PC, Detailed Design team and Highways England	O	Signed: Date:
LV3	Landscape and visual (ES Chapter 7)	To limit the impact of construction on existing trees and vegetation to be retained	The PC will engage an arboricultural consultant to: • complete an arboricultural method statement. The method statement shall include, but not limited to the following: o Tree protection measures in compliance with BS5837:2012 (Trees in relation to design, demolition, and construction – Recommendations) during the construction phase. o Maintenance and monitoring requirements of the tree protection measures o Schedule of trees to be removed and retained in compliance with Environmental Masterplan (**TR010038/APP/6.8**) and Appendix 7.7 Arboricultural Impact Assessment (**TR010038/APP/6.3**). o Tree root protection zones o Contingency plan (chemical spillage, collision, emergency access to the root protection zone) • monitor tree protection measures on site. This shall include, but are not limited to the following: o Checking the robustness and positioning of tree protection fencing. o Checking that no materials or plant are stored within the tree root protection zones o The veteran tree (T13) will be specifically monitored to avoid it being affected. All trees to be retained or removed are identified within the Arboricultural Impact Assessment.	Arboricultural Impact Assessment. Trees to be retained are within close proximity to the works.	Regular site audits and adherence to the Arboricultural Method Statement.	To be implemented by the PC and the Proposed Scheme Arboriculturalist	PC and the specialist	C	Signed: Date:
LV4	Landscape and visual (ES Chapter 7)	Protection and enhancement of the landscape character and sense of place Replanting to mitigate loss of trees	Retain or replace and reinforce existing vegetation where this contributes to the distinctive qualities of the landscape, indicated by the Environmental Masterplan (**TR010038/APP/6.8**). Select plant and grass species appropriate to the locality and with consideration of seasonal variations. Refer to Environmental Masterplan (**TR010038/APP/6.8**) for detail of planting proposals.	EIA – Landscape and visual impact assessment	Environmental Masterplan	Regular site inspections and audits	PC Senior Site Manager	P C	Signed: Date:

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LV5	Landscape and visual (ES Chapter 7)	Site restoration	Pre-works photography to be undertaken to prior to any construction works to provide a detailed baseline record (including, where relevant, the tree setting and condition prior to and post felling). Photography to be used during and following site restoration works to make the conditions match the baseline record. The photographs will further be used to demonstrate site restoration and replanting has been successful once vegetation has been established.	Site restoration	Monitoring and comparison of the site restoration post construction	Undertaking of pre-works photography by PC	PC	C O	Signed: Date:
Biodiversity (BD)									
BD1	Biodiversity (ES Chapter 8)	To avoid disturbance on wintering birds and breeding birds	Timing of vegetation clearance works is to take place outside of the bird nesting season (March to end of August inclusive), as far as practicable. If it goes into nesting season, the areas to be cleared will be checked by an ECoW immediately prior to clearance. Any nests or young must be avoided until the birds have fledged. Birds may be nesting in trees, hedgerows, grassland, arable and on water. The oLEMP will be developed into the LEMP which will detail the areas to clear and where pre-clearance ecological surveys need to be undertaken. Construction areas located away from bird nesting habitat. Compound 3 (to the south of Honingham roundabout) is situated 190m from a schedule 1 nest site, and suitable mitigation (including lighting requirements) will be required to ensure there is no direct disturbance to these birds. Areas of temporary land clearance will be remediated with hedgerows, native trees, shrubs, wetland areas, ponds, and species-rich grassland. Bird boxes will be installed on remaining trees at a density of between 10 and 40 nest boxes per hectare. Any gaps created in hedgerows will be infilled and additional hedgerow, woodland, scrub habitat will be included in the landscape plans to help mitigate the loss of suitable habitat. To minimise risk of mortality to birds, new and continuous habitat in the form of hedgerows, scattered broadleaved trees to include individual 'parkland' trees and species-rich grassland will be provided on both sides of the road as a refuge. Implementation and adherence to the Construction Noise Management Plan will mitigate any potential noise and vibration disturbance. Night lighting during construction will be directed away from sensitive biodiversity resources (EMP Ref: G2), as far as possible. Disturbance from noise will be mitigated including, but not limited to the following: • using temporary noise barriers, • quieter plant, • leaving a buffer zone around sensitive receptors • reducing time on noisy activities. Real-time noise monitoring shall be provided on sites where there as sensitive biodiversity resources such as breeding birds, barn owls and wintering birds. Vibration will be reduced with early warning, pre-condition surveys, short work durations, and vibration monitoring (Chapter 11 (Noise and vibration))	EIA – Biodiversity assessment and ecological surveys	Pre-clearance ecological surveys Construction noise management plan Environmental Masterplan LEMP	On-site monitoring	PC will liaise with specialist	P C	Signed: Date:

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			(**TR010038/APP/6.1**). Works should not exceed ambient noise levels of 56dB during construction works.						
BD2	Biodiversity (ES Chapter 8)	To avoid disturbance to species during site clearance and construction activities	Pre-construction ecological surveys are required prior to any site clearance by an Ecological Clerk of Works (ECoW) and prior to vegetation clearance. If any protected species are found, they will be moved to a safe suitable area. Timings will be stipulated in the **Landscape and Ecology Management Plan** (LEMP). Tool-box talks will be given by the on-site ECoW to contractors and site operatives to raise awareness. Areas of temporary land clearance will be replanted with native trees and shrubs and species-rich grassland as per the Environmental Masterplan (**TR010038/APP/6.8**). Excavations to be covered at night or a ramp left in so animals can climb out. Necessary measures to safeguard excavations to be undertaken in accordance with best practice construction measures.	EIA –Biodiversity assessment	Pre-clearance ecological surveys	On-site monitoring LEMP	Ecological Clerk of Works (ECoW)	P	Signed: Date:
BD3	Biodiversity (ES Chapter 8)	To prevent or minimise the introduction or spread of Invasive Non Native Species (INNS) during construction	The introduction or spread of INNS during construction will be mitigated by implementation of an INNS Management Plan. This will contain knowledge of appropriate treatment methods to ensure that construction proceeds within the legal framework to ensure prevention of spread both within and beyond the DCO boundaries.	EIA - Biodiversity assessment and surveys	Pre-construction surveys	INNS Management Plan	Ecological Clerk of Works (ECoW) and PC	P C	Signed: Date
BD4	Biodiversity (ES Chapter 8)	To prevent or minimise the impact of nuisance or pollution impact during construction activities	Construction best practice in relation to pollution prevention and water management as set out in Construction Industry research and Information Association (CIRIA) Guidelines ((Soubry (2001), Murnane et al. (2006), Charles and Edwards (2015)), and the Environment Agency's approach to groundwater protection (Environment Agency, 2017) and groundwater protection guides (Environment Agency, 2017 a), as required under the Water Framework Directive. Drainage around the main compound will follow construction good practise to minimise or prevent risk of pollution incident. Construction vehicles will be excluded from driving over species rich grassland (as shown on Figure 8.1 (Designated Sites) (**TR010038/APP/6.2**)). If this is not possible, heavy duty ground protection shall be installed to protect the soil and turf. Night lighting during construction will be directed away from sensitive biodiversity resources (EMP Ref G2), as identified in the LEMP. Where possible, lighting will be designed with backlight shields and LED bulbs, directional, and positioned sympathetically, to minimise light spill and disturbance for sensitive receptors including notable habitats. Any hedgerow deemed species rich or 'important' will be translocated and not lost, with locations provided in the LEMP. During the detailed design of the Proposed Scheme, it will be investigated if works can be altered to avoid impact to important hedgerows. Species poor hedgerows will be gap filled to increase species diversity and quality across the site. New species rich hedgerows with trees will be planted in addition to deciduous woodland.	EIA - Biodiversity assessments	Pre-construction surveys	EMP Dust management plan LEMP	PC will liaise with specialist	P C	Signed: Date

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BD5	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected Species and habitat for barn owl	To mitigate the loss of a nest box, two alternative nest boxes will be installed within 200m of the existing box (as outlined in the LEMP). After these boxes are erected, the existing nest box shall be checked by a suitable licensed ecologist and removed during the winter period. This removal will be undertaken no earlier than 30 days from when the new boxes were erected. The installation of two mitigation nest boxes at site three (south of Honingham roundabout) are only a temporary solution. A more permanent solution shall be sought through the introduction of an internal barn owl box. The external boxes will be retained as potential roost sites. Creation of areas of rough grassland will be included as part of the landscape plans to mitigate the loss of suitable foraging habitat. Installation of five barn owl boxes close to suitable rough grassland in the wider landscape will help in enhancing the wider area for the species and provide additional nesting capacity. The locations of these will be provided in the LEMP. Low-flight prevention screening, in the form of appropriate landscape planting shall be installed in accordance with the Environmental Masterplan (high hedges or tree screens being planted on raised banks (bunds)) to help prevent barn owl road casualties. All remaining nest sites within the DCO boundary will have a buffer zone to reduce disturbance from noise during construction. Night lighting during construction will be directed away from sensitive biodiversity resources and foraging habitat. Bird and barn owl boxes will be monitored and managed for five years after they have been installed. Further barn owl surveys shall be conducted in years 1, 3 and 5 post development undertaking monitoring of the existing barn owl nesting sites and the proposed barn owl boxes.	EIA – ecological surveys	Barn owl boxes will continue to be monitored during the operational phase and road kill surveys undertaken post construction to monitor the effectiveness of the mitigation.	Regular monitoring LEMP	PC will liaise with specialist	A	Signed: Date
BD6	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected Species and habitat for bats	Habitat creation in the form of artificial roosting habitat will be installed prior to the start of construction. The tree felling will be undertaken to avoid sensitive seasons for bats. It will be soft felled with supervision from a registered bat licence holder with Natural England under licence and under a fully detailed precautionary method statement. Works near trees and that may disturb roosting bats in buildings as identified by the suitably qualified ecologist or ECoW will be undertaken under supervision from a registered bat licence holder. Bat crossing points will be provided within the wider general extents of planting. **Four** proposed bat hops consisting of tall trees either side of the new road to guide bats upwards over the wider highway at the existing crossing points used by bats (as shown in the Environmental Masterplan (**TR010038/APP/6.8**)). High tree line for bats - both north and south of the proposed A47 and existing A47. The heavy standard trees to be planted at bat crossing points will be at least 4.25m high. Copses of trees and woodland grassland mosaics are proposed along the Proposed Scheme to act as ‘stepping stones’ between	EIA - ecological surveys	Precautionary method statement Crossing points to be monitored during operation and if required, changes to the EMP can be made.	Licence requirements LEMP	PC will liaise with specialist	A	Signed: Date:

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			suitable roosting and foraging habitat. Hop-overs and targeted planting at underpasses and overpasses have been designed to encourage use by bats to maintain connectivity and raise flight height above the carriageway. The bridge over the River Tud is low (2.7m) headroom, so bats currently flying over the road will be encouraged to fly high above traffic by planting high trees on the approach to the bridge and fencing along the bridge. Lighting will be directional, and positioned sympathetically, to minimise light spill and disturbance for sensitive receptors including foraging bats. Implementation and adherence to the Construction noise management plan will mitigate any potential noise disturbance. Habitat loss and severance from the larger footprint of the new road will be mitigated in a phased manner as construction progresses. For example, on completion of one part of the Proposed Scheme the section will be planted up upon completion. This will be outlined in the detailed Landscape and Ecological Management Plan. The Schwegler 1FF bat boxes recommended in the licence are self-cleaning, but the bat boxes will be checked for bat use by a licensed ecologist for the first five years of operation. Monitoring surveys of bat crossing points at the four locations where the full eight surveys were undertaken in 2020, plus the new bridge over the River Tud and the three underpasses and the overbridge to be created will be undertaken in years 1, 3 and 5 of operation. If a reduction in numbers crossing is observed, further mitigation may be required.					
BD7	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected Species and habitat for Great Crested Newts (GCN)	Trapping and translocation of GCN into a suitable receptor sites that are located within the DCO boundary but outside of the working areas will be undertaken. In some cases, this will be into newly created habitats. This will be done under licence from Natural England prior to construction in specific areas identified during surveys. Location of the sites are provided in the following works plans **TR010038/APP/2.4B, TR010038/APP/2.4D, TR010038/APP/2.4L, TR010038/APP/2.4N** and **TR010038/APP/2.4S.** Great crested newt fencing, pitfall traps and refugia are to be installed and removed at times and in locations specified in the licence method statement only. A licensed ECoW will supervise the installation and removal process and hand search the areas for newts first. Enhancement of the site to encourage this species back into the area includes the creation of tree lines, hedgerows, copses, species-rich grassland, and ponds with newly created wetland areas (as shown on the Environmental Masterplan (**TR010038/APP/6.8**)). All excavations to be covered at night or a ramp left in so animals can climb out. Great crested newt presence or absence (eDNA) surveys will be undertaken for two years post construction as part of the	EIA - ecological surveys	EMP All pollution events will be managed though best practice guidance and continued monitored throughout construction as part of the water drainage strategy and dust management plan within the EMP	Licence requirements	PC will liaise with specialist	A	Signed: Date:

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			monitoring required in the mitigation licence. Pond habitats created for this species will be monitored also.						
BD8	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected and Notable Species and habitat for mammals (otter, brown hare, and common toad) and fish	Vegetation clearance will be undertaken under the supervision of an ECoW. Tool-box talks will be given by the ECoW. Where possible, construction areas to be fenced off and excavations will either be covered at night, or a ramp left in, so animals can climb out. Implementation and adherence to the construction noise management plan will mitigate any potential noise disturbance. Construction will take place mainly throughout the daytime, and night lighting will only take place in areas that have had vegetation cleared during the daytime. Permanent fencing systems will be installed in key targeted areas to mitigate for operational traffic mortality for otters. New bridges and culverts have been designed to include an otter ledge. The bridge over the river has a 5m bank for otters to walk upon. Where works are to be undertaken in water, for the works to the culverts, the ECoW will be present to check for fish. If fish are detected a fish rescue will be required prior to works in water. Fish rescue would include electrofishing. Prior to fishing, stop nets will be deployed manually upstream and downstream of each survey site location. The electric fishing team will work systematically along the survey section of the watercourse with all fish captured identified, counted, and measured to the nearest mm (fork length) prior to being released. Full details on these requirements will be provided in the 2nd iteration of the EMP. Light spill will increase around the new road and overbridges. Woodland planting around these areas have been included in the detailed design to reduce the effects of permanent lighting in these areas. Lighting will be designed with backlight shields and LED bulbs to reduce light spill onto identified habitats. New underpasses in the design will provide safe access to the other side of the road.	EIA - ecological surveys	EMP	Regular monitoring and surveys as required Construction noise management plan	PC will liaise with specialist	P C	Signed: Date
BD9	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected Species and habitat for water vole	Works must be more than 5m from the top of the banks of the River Tud (if works are not directly in the river). Riparian planting in water vole receptor areas will be undertaken at least one growing season before the water voles are dispersed or translocated. Where water voles will be disturbed through the works (during the installation of outfalls) they will be displaced using habitat manipulation between 15th February and 15th April under supervision of a licensed ecologist. In the area where the proposed route crosses the river, the water voles will be trapped out and translocated under Natural England licence. The water voles will be trapped out and translocated by suitably qualified ecologists in springtime to a receptor area that has previously been enhanced with vegetation and allowed to mature so the site is suitable to receive the water voles. This will be undertaken in accordance with the Water vole licence method statement.	EIA - ecological surveys	EMP (2nd iteration)	Licence requirements Water vole licence method statement	PC will liaise with specialist	A	Signed: Date:

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			Water vole mesh fencing will be erected in the area of the river where the water voles have been moved from during the duration of the works there. Water vole fencing will be checked weekly and repairs undertaken as necessary. Fencing will be removed from these areas as soon as works have finished. The location of fencing required will be outlined in the Water vole licence method statement. Light spill will increase around the new road and overbridges. Woodland planting around these areas have been included in the detailed design to reduce the effects of permanent lighting in these areas. Lighting will be designed with backlight shields and LED bulbs to reduce light spill onto habitats which are used by water vole. As part of the water vole licence, post relocation of the water voles into the on-site receptor area, water vole monitoring surveys will commence the same year for a minimum of three years, or longer if necessary, to confirm an overall conservation benefit. If a reduction is observed, further mitigation may be required.						
BD10	Biodiversity (ES Chapter 8)	To avoid disturbance on Protected Species and habitat for badger	Two badger tunnels will be installed on the realigned minor road and beneath the new dual carriageway. The first tunnel crosses the road between the existing A47 east of Hockering and Wood Land junction northern dumbbell roundabout, at approximately Chainage 322; and the second tunnel crosses the mainline at approx. Chainage 4298. Badger specific fencing will be installed temporarily on both sides of the Scheme between Sandy Lane and Wood Lane junction and permanently at the location of the badger tunnel and 500m either side to mitigate for operational traffic mortality. Prior to construction an ECoW will conduct a full resurvey of the site to identify any changes in the conditions on site. Work will be done under a Natural England licence that will involve the permanent closure of one sett and the temporary closure of another sett. Signage and Herras fencing will be installed around Sett 4 to provide a suitable buffer zone for this sett. An ECoW will conduct a toolbox talk for all site personnel (including sub-contractors) prior to commencement of works. All excavations to be covered at night or a ramp left in so animals can climb out. Night lighting during construction will be directed away from sensitive features and should not affect this species. Badgers will be surveyed after operation commences to ensure all the licence conditions are met.	EIA - ecological surveys	EMP (2nd iteration)	Licence requirements	PC will liaise with specialist	A	Signed: Date:
BD11	Biodiversity (ES Chapter 8)	To ensure data on Protected Species is valid and robust	European Protected Species surveys remain valid for a period of two years after completion. Where a protected species survey was undertaken over this time period and construction works has not yet commenced, the PC will appoint a suitably qualified ecologist to update the survey information and undertake a pre-construction site survey to identify the presence of potential protected species on site.	Protected Species will move around site and survey information greater than two years may not reflect current situ.	If updated surveys are required, the suitably qualified ecologists shall prepare an updated report including mitigation (if required). The report shall be agreed with Natural England and a copy provided to the Local Authority	Contractual responsibilities between Highways England and the PC	PC will liaise with specialist	P	Signed: Date:

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					Biodiversity Officer.				
BD12	Biodiversity (ES Chapter 8)	To minimise effects on County Wildlife Sites (CWSs) and create a diverse botanical population	The reduction in use of nutrient rich topsoil across the site will enable a more diverse botanical population to colonise newly created bare ground. Sensitive work within County Wildlife Sites (CWSs) will ensure sensitive habitats are retained and work will focus on improvement of habitat. Habitats lost will be compensated for by restoration of existing habitats and creation of habitats that will be like for like or better and good for biodiversity. Aim of planting strategy for the area will be to increase coverage and extent of habitats (e.g. wetland plants) that are found in other more biodiverse areas that have led to the site being designated a CWS. Landscaping materials will be obtained from site-won materials within the bounds of the CWS, to increase the likelihood of species of local provenance flourishing. No topsoil will be imported into the site for the construction of the wetland drainage basins. Mitigation and enhancement recommendations for the River Tud to be agreed with the Environment Agency and informed by the river condition survey carried out in October to December 2021.	EIA –Biodiversity assessment	EMP Landscape and Ecology Management Plan to be developed in consultation with the Local Authority Biodiversity Officer and Environment Agency.	Landscape and Ecology Management Plan	PC will liaise with specialist	C O	Signed: Date:
BD13	Biodiversity (ES Chapter 8)	To protect reptiles	Suitable habitats will be searched by an Ecological Clerk of Works (ECoW) prior to vegetation clearance. If any are found, they will be moved to a safe suitable area. The suitable area for relocation will be provided in the detailed LEMP. Tool-box talks will be given by the on-site ECoW to contractors Areas of temporary land clearance will be replanted with native trees and shrubs and species-rich grassland. All excavations to be covered at night or a ramp left in so animals can climb out.	EIA –Biodiversity assessment	Pre-clearance ecological surveys	Contractual responsibilities between Highways England and the PC Environmental Masterplan LEMP	PC will liaise with specialist	P C	Signed: Date:
Geology and soils									
GS1	Geology and soils (ES Chapter 9)	To ensure identified risks associated with contamination are appropriately managed and minimised	Measures will include (but not be limited to): • Ensuring adequate space for storage of topsoil and subsoil which must be segregated during excavation. • Protection of watercourses from entry of polluting matter. • Stripping, storing, and reinstating of soils using best practice measures to minimise the risk of degradation to soils. • Controls during construction for identification of unexpected contamination (these controls will be determined during the 2nd iteration of the EMP). • Suppression of odour and dust using best practice measures.	EIA – Geology and soils assessment	On-site monitoring	On-site monitoring	PC will liaise with specialist	P C	Signed: Date:
GS2	Geology and Soils (ES Chapter 9)	To manage the potential risks associated with made ground and organic	Measures will include (but not be limited to): • Monitoring of potential ground-gases and vapours in confined spaces during construction.	EIA – Geology and soils assessment	On-site monitoring	Health Safety Method Statements	PC	P C	Signed: Date:

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		deposits underlying the Proposed Scheme	• Design of in-ground structures to appropriate concrete design class. • Suitable Personal Protective Equipment (PPE) and hygiene practices for construction and maintenance workers.						
GS3	Geology and Soils (ES Chapter 9)	To manage the impacts on soils from temporary and permanent land take	Measures will be secured in a SMP and will include (but not be limited to): • Best practice measures for soil stripping, handling and storage • Stripping, storing and reinstating of soils with regard to BS 3882:2015 using best practice measures to minimise the risk of degradation to soils. • Specific areas of soils identified shall be protected from earthworks and construction activities. These will be identified in the SMP • Clear demarcation of the construction compound and working areas to prevent and minimise access onto adjacent areas of agricultural land Measures will be secured in a Materials Management Plan (MMP) and will include (but not be limited to): • Minimisation of over-excavation of soils • Ensure that soils from permanent land take areas are reused within the Proposed Scheme where possible, as identified in the MMP • Where there are excess soils generated, these will be saved and reused outside the Proposed Scheme where there are opportunities to do so, in accordance with the MMP • Restoration of temporary land take areas to their former condition, based on pre-construction site surveys. • Construction vehicles will be confined to designated haul routes where possible	EIA – Geology and soils assessment	On-site monitoring	Soil Management Plan (SMP) including a Soil Resource Plan and a Soil Handling Strategy Materials Management Plan (MMP)	PC will liaise with specialist	P C	Signed: Date:
GS4	Geology and Soils (ES Chapter 9)	The protection of soil structure and quality – to prevent degradation of soils both within and outside the permanent and temporary development areas	Where necessary for protection from earthworks and construction activities, agricultural soils will be stripped, stored and replaced to their baseline condition, as far as practicable. Stripping, storing and reinstating of soils with regard to BS 3882:2015 using best practice measures to minimise the risk of degradation to soils.	Not applicable	Detailed in the SMP	Contractual responsibilities between Highways England and the PC	PC	C	Signed: Date:
GS5	Geology and Soils (ES Chapter 9)	To manage unexploded ordnance (UXO)	Following mitigation measures will be secured in the Operational UXO Emergency Response Plan: 1. Operational UXO Emergency Response Plan. Appropriate site management documentation shall be held on site containing procedures and guidance for the actions that will be taken in the event of a suspected or real UXO is discovered. 2. UXO safety and awareness briefings. All personnel working on the Proposed Scheme shall receive a briefing on the identification of UXO and actions that will be taken (see point 1). Information shall be held on site and displayed on	Not applicable	On-site monitoring	Soil Management Plan (SMP) including a Soil Resource Plan and a Soil Handling Strategy Materials Management Plan (MMP) Operational UXO Emergency Response Plan	PC and On-call EOD engineer	P C	Signed: Date:

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			notice boards. 3. On-call engineer. An on-call explosive ordnance specialist shall be retained to identify UXO and to provide advice on the appropriate course of action in the event of suspected or identified UXO finds.						
GS6	Geology and Soils (ES Chapter 9)	To protect agricultural land and soils	Construction compound and working areas will include a clear demarcation (fence) of the construction area and prevent access onto adjacent areas of agricultural land that could result in further compaction or damage of soils as far as practicable. Construction vehicles will be confined to designated haul routes to reduce the potential risk of compaction of soil.	Construction works can damage soils or cause compaction	Compliance with the EMP and Traffic Management Plan.	Contractual responsibilities between Highways England and the PC	PC	P C	Signed: Date:
Material assets and waste (MA)									
MA1	Material assets and waste (ES Chapter 10)	Responsible sourcing of materials	Design for re-use and recovery by identifying, securing and using materials that already exist on the Proposed Scheme, or can be sourced responsibly from other projects. Maximising the use of renewable materials and materials with recycled content. Design for offsite construction by maximising the use of prefabricated structures and components, where feasible, encouraging a process assembly rather than construction on the site. Use of material logistics planning to manage procurement, storage and use of material assets and minimise damage, over ordering and wastage.	EIA –Material assessment	Appropriate project key performance indicators (KPI) to be set. A construction and demolition waste recovery and or recycling rate of 70% will be set. Use of renewable materials and materials with recycled content in line with the east of England region's 31% target. Measures to encourage local and responsible resourcing of material assets (for example through adoption of Buildings Research Establishment (BRE) developed BES 6001). Where required, import of clean naturally occurring soils and stones from another development site would be undertaken in accordance with a Materials Management Plan (MMP).	EMP (2nd iteration) to provide detailed information on the duty of care documents that will be needed, such as the waste transfer notes and consignment notes, as well as strategies to be implemented to minimise waste generation and increase re-use and recycle. MMP (developed in accordance with the CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2, 2011 to monitor and track the movement, storage and placement of imported soils and stones.	PC will liaise with specialist	P C	Signed: Date
MA2	Material assets and waste (ES Chapter 10)	To adopt good waste management practices and follow the waste hierarchy	The adoption of best practice to promote the re-use of construction, demolition and excavation waste over transport off-site for re-use or disposal. Use of construction, demolition and excavation waste (with treatment) within the Proposed Scheme DCO boundary that meets the appropriate Waste and Resources Action Programme (WRAP) Quality Protocols.	EIA - Waste assessment	Appropriate project KPI set in MA1. A CDW recovery and or recycling rate of 70% will be set in the EMP. Use of site-won construction, demolition and excavation waste	As detailed in MA1 plus MMP (developed in accordance with the CL:AIRE DoW CoP) as detailed in MA1. Monitoring of waste generation during construction via the SWMP including the quantities and types of waste generated,	PC will liaise with specialist	P C	Signed: Date:

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			Use of site won recycled material assets within the Proposed Scheme DCO boundary without the need for treatment, and without the need for waste exemption (https://www.gov.uk/government/collections/waste-exemptions-using-waste), or the application of the CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2, 2011. Re-use of site won excavated materials within the Proposed Scheme DCO boundary minimising the need for treatment, and by meeting waste exemption, or CL:AIRE DoW CoP criteria. Management of waste in accordance with the Site Waste Management Plan (SWMP). A requirement for waste to be appropriately segregated and stored or stockpiled onsite by waste type, to ensure waste remains in a suitable condition to be re-used. Use of local waste management facilities to manage waste as close to the point of generation as possible.		(with treatment) in accordance with WRAP best practice and quality Protocols. Use of site won recycled material assets without the need for treatment, and without the need for waste exemption or the application of the CL:AIRE DoW CoP. Re-use of site won excavated materials without the need for treatment by meeting waste exemption, or CL:AIRE DoW CoP criteria. Implementation of the SWMP.	as well as the duty of care information for the contractors transferring the waste and the sites the waste is taken to for management.			
MA3	Material assets and waste (ES Chapter 10)	To explore all options for reuse of surplus material	Consider re-use of suitable surplus excavated material outside of the Proposed Scheme construction boundary where permitted and practicable. For example, on local developments concurrent to the construction phase of the Proposed Scheme, such as the Block Fen and Langwood Fen restoration schemes and quarry restoration. Consider use of surplus recycled or recovered materials in community projects. For example, utilising recycled mulch from tree felling on any adjacent community facilities. Wastes that cannot be reused or recycled on site to be transported only to appropriately permitted recycling or disposal sites. Engineering plan configurations and layouts that show how the most effective use of materials assets (including site-won arisings) can be achieved.	EIA - Materials assessment	Appropriate project KPI set in MA1. Where required, export of site-won clean naturally occurring soils and stones to another development site would be undertaken in accordance with the MMP. Implementation of the SWMP.	EMP as detailed in MA1. MMP (developed in accordance with the CL:AIRE DoW CoP) as detailed in MA1. Monitoring of waste generation during construction via the SWMP as detailed in MA2.	PC will liaise with specialist	P C	Signed: Date:
Noise and vibration (NV)									
NV1	Noise and vibration (ES Chapter 11)	Reduction of construction noise	The PC will develop a construction noise management plan to manage likely significant environmental effects. This plan will feature limits on noise and vibration from construction. In support of limiting and controlling noise during construction, the PC may use, *inter alia*, the following good working practices to minimise potential impacts: • Restrict construction working hours to 07:00-19:00 on weekdays and 07:00-19:00 on Saturdays as far as practicable. Night-time and weekend working hours to be determined in consultation with the LPA (including Section 61 prior consent applications where necessary) • Temporary noise barriers at specific construction phases and receptors as detailed in Table 11.11 in Chapter 11 of the ES (**TR010038/APP/6.1**) and summarised below:	EIA - Noise impact assessment	On-site monitoring	Real time noise and vibration monitoring EMP Traffic Management Plan Construction Noise Management Plan Construction Communication Strategy	PC will liaise with specialist	P C	Signed: Date:

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			- Stage 1 (Pre-construction works) - Merrywood House, Berry Hall, Rosemary Cottage, Tanglewood Barn, 1 & 2 Berry Hall Cottages - Stage 17 to 25 (Drainage basin works) - Acorn Barn, Oak Tree Barn, Oak Farm - Stage 26 to 31 (highway mainline works) - Oak Farm - Stage 32 to 50 (junction works) - 3 & 9 Hall Drive, Church Lodge, Church Farm Cottage & Church Farm House, St Andrew's Church - Stage 51 to 65 (side road and access track works) - The Yard Plots 1 and 2, Hillview Cottage & 1 to 6 Mattishall Lane, St Michaels Church, West Grove, 1, 3, 5, 7, 9, 8, 10, 12, & 14 Hall Drive, 38a, 38, 40, 42, 44, & Corner Cottage, The Street; St Andrew's Church; Church Lodge; Church Farm Cottage, Church Farm Barn & Church Farm House; St Peter's Church; 116, 120 & 122 Dereham Road. • Temporary noise barriers shall have a minimum mass per unit of area of at least 7 kg/m^2 with no gaps at the joints or perimeter. The height of the temporary noise barrier shall be sufficient to completely hide the construction noise source from the receptors, where practicable. The precise locations of the temporary barriers is to be determined by the PC through discussions with the local authority. • Permanent noise barriers (NV2) to be built as early as possible in the construction programme. • Real-time noise monitoring at a location representative of Acorn Barn, during the drainage basin works. • Pursue and implement best practice construction techniques including: - Select quieter plant where possible. - Ensure equipment is maintained, in good working order, and is used in accordance with the manufacturer's instructions. - Use equipment that is fitted with silencers or mufflers. - Set time restrictions to certain noisy and vibratory activities such as earthworks and surfacing. - Manage deliveries as far as practical to prevent queuing of site traffic, as far as practicable. - Do not leave plant running unnecessarily. - Plant with highly directional sound emissions shall be angled so that the direction of highest sound emissions does not face towards receptors where possible. - Materials to be lowered instead of dropped from height. - Alternative reversing warning systems such as white noise alarms shall be employed. - The PC shall promote as far as practical and advise members of the construction team during toolbox talk briefings on quieter working methods.						

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			- Any fixed plant such as generators shall be positioned at least 20m or another suitable distance if not practical, from nearest receptor and shall have temporary/mobile noise screens erected around them where possible and necessary. • Effective communication with local community receptors especially in advance of planned noisy and vibratory activities. • Use more than one temporary traffic diversion routes for different closures and use A roads for HGV traffic, as far as practicable. • Limit the number of construction related traffic as far as practicable and use the existing A47, the proposed roads, and Berrys Lane as required. Avoid local roads as far as practicable. • Where certain vibration creating activities (such as piling activities) occur within 30m of residential properties: - carry these works out only during the daytime. - inform the occupiers of the likely times and duration of works at least one week prior to works commencing. - monitor the vibration levels. - carry out a building condition survey to identify any sensitive aspects of the building and to ensure the current status of the building is recorded. • For construction works in the field adjacent to Merrywood House, the following specific measures would apply: - accessing the field from Berrys Lane as far north as possible without impacting the woodland north of the field; - placing other activities as far as possible away from Merrywood House, such as far north within the field as feasibly possible; and - installing a temporary noise barrier along the southern side of the works area, which will also provide a visual screen.						
NV2	Noise and vibration (ES Chapter 11)	Reduction of operational noise	Permanent environmental noise barriers to be constructed, at four locations as shown on the Environmental Masterplan (**TR010038/APP/6.8**).	Design intervention	Adherence to Detailed Design drawings and Specification. Airborne sound insulation category B2 in accordance with BS EN 1793-2:2012.	Environmental Masterplan	PC	C	Signed: Date:
NV3	Noise and vibration (ES Chapter 11)	Reduction of operational noise	The A47 dual carriageway as shown on the Environmental Masterplan (**TR010038/APP/6.8**) shall be surfaced with a low-noise road surface. The surface material shall be specified to reduce road traffic noise when compared with conventional surfacing. The low-noise road surface will be extended (from start coordinates: 613145, 310952; to end coordinates: 612659, 210996) to the east of the tie in works at Easton to reduce noise levels at the noise important area NIA5202.	Design intervention	Adherence to Detailed Design drawings and Specification.	Environmental Masterplan	PC Senior Site Manager	C	Signed: Date:

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Population and human health (PH)									
PH1	Population and human health (ES Chapter 12)	To minimise disruption to access for local residents during construction and to keep them informed	Traffic management measures, including footway diversions will be in place to maintain safe access whilst construction is underway. The PC will agree all temporary diversion routes with Norfolk County Council. Appropriate signage for all closures or diversions will be used to provide sufficient notice of such closures or diversions. The local community will be kept informed during construction and to highlight potential periods of disruption. This will be agreed in advance via an appointed Community Liaison Officer.	EIA – Population and human health assessment	Community Liaison Officer checks	Traffic Management Plan Highways England scheme web-page	PC and Community Liaison Officer	P C	Signed: Date:
PH2	Population and human health (ES Chapter 12)	To prevent any disruption and severance of existing accessibility	Provision of either new or improved combined footways/cycleways to provide continuous links for WCH and maintaining connectivity between communities. Inclusion of a new underbridge to provide safe crossing (part of the Mattishall Lane Link Road) Crossing facilities will also be provided where required to facilitate connections to existing infrastructure.	EIA – Population and human health assessment	Approval as part of DCO process	Design intervention	PC	P	Signed: Date:
Road drainage and the water environment (RD)									
RD1	Road drainage and the water environment (ES Chapter 13)	To minimise the potential to impact of accidental spillages and leakages on sediment-sensitive surface water features and protect the aquatic environment during construction.	Appropriate storage of construction materials, including bunding of storage tanks, use of silt fencing and covering stockpiles. Spill kits will be located on sites near to ordinary watercourses or drainage ditches and within the works compounds and staff shall be trained in their use. Emergency response procedures to handle any leakages or spillages of potentially contaminating substances. No pollution pathways will be created between the construction sites, including material lay down areas, and ordinary watercourses or drainage ditches. The installation of outfalls into the River Tud will have in-river sediment controls to reduce sedimentation.	EIA – Geomorphological assessment	EMP Temporary surface water drainage strategy Surface water monitoring prior to, during and after the construction phase due to the presence of sensitive ecological receptors and sediment sensitive water bodies. Requirements to be confirmed with the Environment Agency.	Surface water monitoring. Adhere to CIRIA guidelines on control of water pollution on linear construction sites (C648) and environmental best practice on site (C741) EMP (to be updated with emergency response procedures and temporary surface water drainage strategy).	PC will liaise with specialist	P C	Signed: Date:
RD2	Road drainage and the water environment (ES Chapter 13)	To prevent increased flood risk to people and property and to prevent water pollution and impacts on the aquatic environment during construction.	All construction activities within, over or adjacent to a watercourse, and the construction of scheme drainage will minimise adverse changes to existing surface water environment including flood risk. The compensatory flood storage area upstream of the River Tud Crossing and scheme drainage including interceptor drainage will be constructed in the early stages, where practicable, to maintain flood flow pathways and minimise increase in flood risk. Prevention of surface water run-off containing suspended solids and other pollutants originating from construction reaching main rivers or ordinary watercourses at any time. No pollution pathways will be created between the construction sites, including material lay down areas, and ordinary watercourses or drainage ditches Temporary drainage systems will include appropriate Sustainable Drainage Systems (SuDS) to attenuate runoff to existing rates as well as provide water treatment; this will be incorporated into the EMP.	EIA - Flood risk assessment and geomorphological assessment	EMP Surface water monitoring prior to, during and after the construction phase due to the presence of sensitive ecological receptors and sediment sensitive water bodies. Construction method statements and other requirements to be approved by the Environment Agency, Norfolk Rivers District Internal Drainage Board and Norfolk	Surface water monitoring. Adhere to CIRIA guidelines on control of water pollution on linear construction sites (C648) and environmental best practice on site (C741) EMP (to be updated with emergency response procedures and temporary surface water drainage strategy).	PC will liaise with specialist	P C	Signed: Date:

Ref	Source of Objective Document Ref	Objective	Action (including specific location if applicable)	Assumption (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented / achieved	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
					County Council (the Lead Local Flood Authority) as required by their respective consenting and approvals.				
RD3	Road drainage and the water environment (ES Chapter 13)	To minimise the potential to impact on either groundwater supply or groundwater quality (as outlined in ES Appendix 13.4 Groundwater assessment) (**TR010038/APP/6.3**)	Below ground construction (e.g. foundation piles, ground improvements and sheet piles) and retaining structures shall be appropriately designed as far as is practicable to minimise adverse changes to existing hydrogeological regime which may affect applicable receptors. Piling design will ensure appropriate methods are selected to prevent creation of preferential pathways between aquifer units and for artesian groundwater to rise to surface. The piling method will minimise the generation of suspended solids that may impact nearby indirect receptors. A Piling Risk Assessment will be prepared in consultation with the Environment Agency. Environment Agency to be consulted on the construction method statements directional drilling used for utilities crossings and any groundworks with the potential to disrupt vertical hydraulic gradients. Construction materials (including slurries used in directional drilling) shall be chosen appropriately to minimise groundwater contamination via direct contact. Where groundwater control is required, the design will consider alternatives to dewatering where-ever possible. A Foundation Works Risk Assessment (FWRA) shall be undertaken prior to commencement of any foundation construction. Design of below ground structures and associated assessments to be updated once supplementary GI / additional groundwater monitoring data is made available. Groundwater monitoring prior to, during and after the construction phase due to the presence of sensitive potable water supply and ecological receptors. This will require a water features survey to confirm details of unlicensed abstractions / additional water features in vicinity of below ground structures.	EIA - hydrogeological assessment	Construction method statements Piling risk assessment Construction method statements and risk assessments to be approved by EA in high risk areas (i.e. where intercept sensitive aquifers / near or upgradient of potable water supplies) and for directional drilling. Groundwater monitoring	PC Piling design & construction method statements. Piling risk assessment Monitoring.	PC will liaise with specialist	P C	Signed: Date:
RD4	Road drainage and the water environment (ES Chapter 13)	To minimise the potential impact of accidental spillages and leakages on groundwater quality in areas of high or increased aquifer vulnerability (as outlined in Chapter 13 (Road drainage and the water environment)) (**TR010038/APP/6.1**) and shown in ES Figure 13.3 – Aquifer	Appropriate storage of construction materials in areas of high or increased aquifer vulnerability (bunding, silt fencing and covering of stockpiles if required), provision of spill kits adjacent to excavation areas, and inclusion of emergency response procedures for spillages of potentially contaminating substances. Existing road drainage soakaways no longer required as part of the Proposed drainage design shall be backfilled.	EIA - hydrogeological assessment	EMP	On-site monitoring	PC will liaise with specialist	P C	Signed: Date:

Ref	Source of Objective Document Ref	Objective	Action (including specific location if applicable)	Assumption (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented / achieved	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
		and environmental designations (**TR010038/APP/6.2**).							
RD5	Road drainage and the water environment (ES Chapter 13)	To protect potable water supplies, designated sites and the groundwater environment	Obtain an abstraction licence from the Environment Agency for any unavoidable construction dewatering at rates of: • >50m^3/d if the dewatering works for the whole scheme will last for 6 consecutive months or less. • >20m^3/d if the dewatering works for the whole scheme will last in excess of 6 consecutive months. A discharge consent may also be required, depending on the receiving waterbody for discharge water.	EIA – hydrogeological assessment	Confirmation of inflow rates, groundwater level & quality information and production of a hydrogeological impact assessment report required as part of the abstraction licence application process – to be approved by the Environment Agency (process can take >12 months). This will require a water features survey to confirm details of unlicensed abstractions / additional water features in vicinity of dewatering activities.	Licence requirements (including groundwater monitoring)	PC will liaise with specialist	P C	Signed: Date:
RD6	Road drainage and the water environment (ES Chapter 13)	To protect the River Tud	Obtain a Flood Risk Activity Permit from the Environment Agency for works planned within 8m of the River Tud and undertake water quality monitoring prior to and during the construction period.	EIA – and supporting assessments	On-site monitoring	Permit requirements	PC will liaise with specialist	P C	Signed: Date:
RD7	Road drainage and the water environment (ES Chapter 13)	To protect Internal Drainage Board (IDB) watercourses	Obtain an Internal Drainage Board Consent for works within 9 metres of a Board Adopted Watercourse (Norfolk Rivers District IDB).	EIA – and supporting assessments	On-site monitoring	Consent requirements	PC will liaise with specialist	P C	Signed: Date:
RD8	Road drainage and the water environment (ES Chapter 13)	To protect ordinary watercourses	Obtain an ordinary watercourse consent from the Lead Local Flood Authority (Norfolk County Council) for any works associated with ordinary watercourses.	EIA – and supporting assessments	On-site monitoring	Consent requirements	PC will liaise with specialist	P C	Signed: Date:
RD9	Road drainage and the water environment (ES Chapter 13)	To minimise any operational increase in flood risk and deterioration of aquatic environment / Water Framework Directive status during operation.	Highway runoff from proposed impermeable areas will be attenuated to greenfield runoff rates up to and including a 1 in 100 year pluvial event (including a 40% allowance for climate change) using oversized pipes, wetlands and vegetated detention basins. The drainage has been designed for an extreme pluvial event (1 in 100 year plus 40% climate change to ensure there would be no increase in flood risk to others. Flood flow pathways that are intercepted by the Proposed Scheme will be maintained to allow natural overland drainage	EIA – and supporting assessments	Surface water monitoring prior to, during and after the construction phase due to the presence of sensitive ecological receptors and sediment sensitive water bodies. Drainage Strategy and Flood Risk Assessment	Detailed design, EMP and Environmental Masterplan	PC will liaise with specialist	O	Signed: Date:

Ref	Source of Objective Document Ref	Objective	Action (including specific location if applicable)	Assumption (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented / achieved	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			through the construction of 'dry culverts' or cross-drains designed to 1 in 100-year plus 65% climate change allowance. Newgate House (Hockering) culvert to be designed with a natural sediment bed, mammal ledges above the design flood level, and a freeboard of at least 600mm with a 1 in 100-year fluvial event (including a 65% climate change allowance). Measures to minimise changes in velocity within the culvert will be implemented to maintain fish passage. A trash screen (or equivalent) will be installed to avoid blockage and flood risk impacts upstream and will be maintained by Highways England. West culvert to be extended using a similar aperture to the existing to avoid transfer of flood risk downstream. The new west culvert must be constructed to similar dimensions, a circular orifice or similar structure will be constructed at the inlet and a bund will be installed upstream to prevent flooding of downstream receptors and the local access road. Debris and blockage management measures will be incorporated into the design and will be maintained by Highways England. The Proposed Scheme, including the River Tud Crossing, to been designed to estimated extreme fluvial conditions (1 in 100-year plus 65% climate change allowance). River Tud Crossing abutments to be located at least 5m from the river bank and structure will include a dry passage for mammals during the design flood. Floodplain loss for the River Tud Crossing will be mitigated through compensatory floodplain storage. Areas of riparian planting and re-meandering on Oak Farm tributary and Hockering tributary (including the River Tud nearby) as indicated on the Environmental Masterplan (**TR010038/APP/6.8**) (these measures will be provided on a length for length basis to offset impacts of additional culverting). Riparian planting to river banks adjacent to outfalls. Outfalls will not impact on flow conveyance (set back from the bank) and will include soft-engineered erosion protection measures.		including hydraulic modelling to be approved by the Environment Agency, Lead Local Flood Authority (Norfolk County Council) and Norfolk Rivers Internal Drainage Board. Construction method statements and detailed design drawings to be approved by the Environment Agency, Norfolk Rivers District Internal Drainage Board and Norfolk County Council (the Lead Local Flood Authority) to support consenting and approvals prior to construction works. Environment Agency to review and agree the detailed design of the compensatory flood storage.				
RD10	Road drainage and the water environment (ES Chapter 13)	To minimise the potential impact of routine runoff and accidental spillages on the waterbodies, watercourses, potable water supplies and aquatic environment during operation.	The Proposed Scheme design incorporates treatment of road drainage prior to discharging to the River Tud or its tributaries, which could include filter drains and vegetated detention basins or wetlands. Filter drains shall not be used in areas identified as source protection zone (SPZ) 1 (inner zone) for licensed abstractions, or in areas where groundwater levels are less than 1m below the drainage system.	EIA - water quality assessment, drainage strategy, hydrogeological assessment	Surface water and groundwater monitoring prior to and during and after the construction phase due to the presence of sensitive ecological receptors and sediment sensitive water bodies. Drainage design developed in consultation with the Environment Agency, Lead Local Flood Authority (Norfolk County Council) and Norfolk Rivers Internal Drainage Board.	Groundwater monitoring Surface water monitoring after the construction phase.	PC will liaise with specialist	A	Signed: Date:

Ref	Source of Objective Document Ref	Objective	Action (including specific location if applicable)	Assumption (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented / achieved	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
Climate									
C1	Climate (ES Chapter 14)	Reduce carbon emissions	The largest carbon areas of the Proposed Scheme include Earthworks, Pavement and Drainage. The design team will investigate lower carbon options can be made prior to construction. Lower carbon options should be explored during detailed design. To reduce emissions, low carbon solutions (including technologies, materials, and products) will be applied throughout the project, where appropriate. Construction will be efficient, using techniques that minimise resource consumption throughout construction and operation. As far as practicably possible the project will try to reduce carbon emissions considering measures such as offsetting or sequestration if required.	Carbon calculations using the HE carbon tool	Carbon savings to be reported	The Design team will review the Carbon calculations at detailed design stage	Design team in consultation with the PC and Highways England	P	Signed: Date:
C2	Climate (ES Chapter 14)	Evaluate the final carbon emissions	In accordance with the DMRB LA 114, projects shall seek to minimise carbon emissions as far as possible in all cases in order to contribute to the UK's net reduction in carbon emissions. Mitigation of effects on climate (i.e. carbon emissions associated with the Proposed Scheme) take place throughout the design process in accordance with the principles of PAS 2080: Carbon Management in Infrastructure, i.e. baselining, target setting and monitoring. Monitoring of carbon emissions associated with the construction of the Proposed Scheme will be undertaken as per Highways England requirements to meet their key performance indicator "Carbon dioxide equivalents (or CO2e) in tonnes associated with the Supply Chain's activities" (Highways England 2019).	Carbon calculations using the HE carbon tool	Carbon savings to be reported	The Design team will review the Carbon calculations at detailed design stage. Once on site, recording of construction activity, material deliveries, plant used and fuel consumption.	PC	A	Signed: Date:

4. Consents and permissions

4.1. Consents and agreement position statements

4.1.1. A Consents and Agreements Position Statement **(TR010038/APP/3.3)** has been submitted as part of the DCO application, which sets out the Highways England's intended strategy for obtaining the consents and associated agreements needed to implement the Proposed Scheme. It lists the consents and agreements which are expected to be necessary to implement the Proposed Scheme and confirm how these consents will be obtained (subject to the Proposed Scheme attaining development consent).

4.1.2. This chapter outlines the consents, permissions and agreements that will be, or will likely be, sought by the Highways England or the PC, so far as they relate to the environmental aspects of the Proposed Scheme.

[Note: This chapter will need to be updated for the 2nd Iteration EMP (construction) to cover developments through the detailed design and construction planning phase, and throughout the construction phase, in order to capture all relevant items.]

4.2. Consents and permission

4.2.1. As outlined in the Consents and Agreements Position Statement **(TR010038/APP/3.3)**, the principal consent for the Proposed Scheme will be the DCO. The DCO process provides development consent for the works and enable land acquisition, along with other consents and powers to be dealt with at the same time.

4.2.2. Several additional consents and permissions that may also need to be sought separately from the DCO are outlined in the Consents and Agreement Position Statement **(TR010038/APP/3.3)**. These additional consents and permissions are noted in Table 4.1. It is the responsibility of the PC and the appropriate appointed specialist to obtain these licences and in sufficient time to accord with the programme and prevent unavoidable delays.

Table 4.1: Consents and Permissions that may be required to deliver the EMP

Type	Consent / Licence Agreement and Legislation	Consenting Authority	Requirement
Protected Species Licence Bat, GCN, water vole and badger	European Protected Species Licence under The Conservation of Habitat and Species Regulations 2017 (the Habitats Regulations); Wildlife and Countryside Act 1981 (as amended)	Natural England	Chapter 8: Biodiversity of the Environmental Statement (**TR010038/APP/6.1**) confirms the presence of bat roosts, GCN, water voles and badgers. Draft licences have been prepared and will be submitted to Natural England, in order to obtain a letter of no impediment
Diversion of watercourses	Water Resources Act 1991	Environment Agency	Construction activities planned for the diversion of watercourses prior to works starting.
Flood Risk Activity Permit (temporary and permanent works affecting a main rivers)	Environmental Permitting (England and Wales) Regulations 2016 Act (as amended) Flood and Water Management Act (2010)	Environment Agency	Construction activities are planned within 8m of the River Tud and its floodplain (a main river) PC or subcontractor to apply for permit prior to works starting. Licence must be applied for 12 months in advance of the works.
Ordinary Watercourse Consent (temporary and permanent works affecting ordinary watercourses)	Flood and Water Management Act (2010) Land Drainage Act 1991 Section 23	Lead Local Flood Authority (Norfolk County Council)	Construction activities are planned adjacent to and over ordinary watercourses and adjacent to a watercourse managed by a Norfolk County Council. PC to confirm whether required and PC or subcontractor to apply for consent prior to works starting.
Land Drainage Consent (temporary and permanent works affecting internal drainage board watercourses)	Flood and Water Management Act (2010) Land Drainage Act 1991 Section 23	Norfolk Rivers IDB	Discharge of surface water into Norfolk Rivers IDB district (directly or indirectly) (Bylaw 3) Works within 9m of Norfolk Rivers IDB adopted watercourse of other drainage or flood risk management infrastructure (Byelaw 10) Alterations to a watercourse (including infilling, culverting, or amending) (byelaw 4 and Section 23, Land Drainage Act 1991) PC or subcontractor to apply for permit prior to works starting.
Impoundment of water bodies	Water Resources Act 1991	Environment Agency	An impoundment licence may be required from the Environment Agency for structures within inland waters that can change water levels and flow.

Type	Consent / Licence Agreement and Legislation	Consenting Authority	Requirement
Abstraction licence for construction dewatering	Water Resources (Abstraction and Impounding) Regulations 2008 & Water Abstraction and Impounding (Exemptions) Regulations 2017). Discharge of water from dewatering operations (Environmental Permitting (England and Wales) Regulations 2016, as amended).	Environment Agency	Works within the saturated aquifer may require dewatering. Dewatering volumes above 100m^3/day require a transfer or abstraction licence. A licensing exemption limit may be reduced to 50m^3/day (for 6 or less consecutive months) or >20m^3/day (for over 6 consecutive months), depending on whether there are conservation sites within 500m or springs, wells or boreholes used to supply water for any lawful use within 250m of the proposed abstraction. Licensing will be subject to further impact assessments on any identified receptors. PC to confirm whether required and PC or subcontractor to apply for consent prior to works starting.
Water discharge permit	Water Resources (Abstraction and Impounding) Regulations 2008 & Water Abstraction and Impounding (Exemptions) Regulations 2017). Discharge of water from dewatering operations (Environmental Permitting (England and Wales) Regulations 2016).	Environment Agency	Discharging of dewatered volumes may also require a bespoke discharge permit. Treatment measures may be required depending on the quality of water abstracted, and the receiving waterbody. PC or subcontractor to apply for permit prior to works starting.
Waste	Environmental permit or registered exemption The Environmental Permitting (England and Wales) Regulations 2016 (as amended)	Environment Agency	For the treatment or re-use of waste on site. PC or subcontractor to apply for permit or exemption prior to works starting.
Waste	Mobile plant permit The Environmental Permitting (England and Wales) Regulations 2016 (as amended)	Environment Agency	If the PC or sub-contractor does not have their own mobile plant permit.
Waste	CL:aire Materials Management Plan. CL:aire (2001) Definition of Waste: Development Industry Code of Practice (V.2) (DoW COP).	Environment Agency	It is considered that the majority of soil materials excavated during the works could be reused within the Order Limits following guidance in CL:aire (2001) Definition of Waste: Development Industry Code of Practice (V.2) (DoW COP).

Type	Consent / Licence Agreement and Legislation	Consenting Authority	Requirement
Noise and vibration during the construction stage	Section 61 prior consent for work on construction sites Control of Pollution Act 1974.	Local authority	Consent would provide Highways England from protection from subsequent action by the local authority under Section 61 of the Control of Pollution Act 1974 or under Section 80 of the Environmental Protection Act 1990. The prior consent is required if a construction phase is expected to exceed the duration which would cause an adverse impact to the identified receptor.
Tree Felling	Consent for felling of trees Felling Licence – Forestry Act 1967	Local authority/Forestry Commission	Requirement will be confirmed pre-construction

5. Environmental asset data and as built drawings

5.1. Introduction

5.1.1. The requirements for the Highways England environmental information system (EnvIS) for the Proposed Scheme are identified in the Asset Data Management Manual (ADMM) version 11 part 2 Requirements and additional information April 2020[4].

5.1.2. This document specifies requirements for asset data management, detailed guidance, information and descriptions of each highway asset type including environmental assets. ADMM part 2.1 Generic asset data requirements section 2.1.7 describes it as:

"a system for defining and categorising the man-made or natural assets within and surrounding the Strategic Road Network (SRN). EnvIS contains environmental data and is displayed in the Highways Agency Geographical Information System (HAGIS)."

5.1.3. The data within EnvIS identifies the asset, location, condition and broad management requirements. It is also used in the review and reporting of the environmental performance of both Highways England and its service providers.

5.1.4. In accordance with DMRB LA120 Environmental management plans, this section has been refined to include relevant data as specified in the design stage EMP.

5.2. Environmental data types

5.2.1. ADMM part 2.2 Asset class specific requirements section 13 Environmental, environmental inventory data describes each environmental asset on the Proposed Scheme in terms of what it is, where it is and what it does.

5.2.2. The full asset data requirements for each asset sub-class can be found in ADMM section 13.4 Environmental inventory data.

5.2.3. The environmental inventory asset data should be broken down by point, line or polygon features into GIS environmental inventory.

[4] Highways England Asset Management Development Group – ADMM Part 2 – Requirements and Additional Information https://www.standardsforhighways.co.uk/ha/standards/admm/docs/ADMMv11_Part_2_Requirements_and_Additional_Information_FINAL.PDF

5.3. Collection and submission of EnvIS data

5.3.1. ADMM states that environmental data will be collected and amended over time in a cycle of continual improvement.

5.3.2. Achieving this continual improvement requires adherence to regular and specific data submission targets, ensuring those data submissions are of the required standard. The phasing of data submissions is to be agreed by the PC with Highways England. It is proposed that environmental data is submitted on completion of:

- site surveys for example ecological and arboricultural
- site clearance
- construction activities including for example seeding and planting

5.3.3. Prior to the preparation and submission of as-built data Galliford Try must request an extract of the existing environmental data. To do this a shapefile polygon of the scheme extents shall be supplied to the EnvIS support mailbox identified in the ADMM. This extract should then be used to identify any assets that have been removed or amended by the scheme to inform the central database accordingly.

5.3.4. For major projects aligning with the Highways England Project Control Framework (PCF), the key milestone to be achieved for data handover is Milestone 2 - Stages 6 (Construction, commissioning and handover) and 7 (closeout).

5.3.5. Final as-built environmental inventory should be submitted by the end of PCF Stages 6 and 7. The EMP for handover will not be signed off by the Highways England Environment Group regional environmental advisor without confirmation that environmental data has been submitted and fully validated.

5.3.6. Full details can be found in the ADMM.

5.4. Protected species surveys

5.4.1. The following species surveys have been undertaken to information the environmental assessment (**TR010038/APP/6.1**):

- Phase I habitat and update survey (2016, 2019)
- Terrestrial invertebrates (2017, 2019)
- Aquatic invertebrates (2017, 2019)
- White-clawed crayfish (2017, 2018, 2019)

- Great crested newts (2016, 2017, 2019)
- Reptiles (2016, 2019)
- Birds - breeding; migratory; and wintering (2016, 2017, 2019)
- Barn owl (2020)
- Bats (2016, 2017, 2019, 2020)
- Otter and water vole (2017, 2019, 2020)
- Badger (2016, 2017, 2019)

5.5. Further surveys to be obtained prior to construction

5.5.1. The following surveys will be required to be undertaken prior to construction:

- Arboricultural detailed surveys
- Condition surveys and structural risk assessments for St Andrew's Church and St Peter's Church
- Pre-construction excavation for direct impacts in Zones 1-7 (as defined in Chapter 6 of the ES)
- Peat deposits affected by crossing of the River Tud will be archaeologically sampled prior to construction
- Archaeological trenching over the remaining identified areas
- Pre-works photography for site condition
- Pre-construction ecological surveys including
  - Wintering birds
  - Breeding birds
  - Vegetation clearance
  - Barn owl
  - Great Crested Newts (GCN)
  - Badger
  - Water Vole
  - Otter
  - Reptile
- Surface water monitoring
- Groundwater monitoring
- Supplementary ground investigation
- Agricultural Land Classification survey
- Soil Resource survey

6. Details of maintenance and EMP monitoring activities

6.1.1. The section sets out the systems required for monitoring, inspecting, reporting and auditing the environmental requirements set out in the ES and EMP REAC submitted at DCO.

6.1.2. In accordance with DMRB LA 120 Environmental management plans, this section also refines the following aspects of maintenance and EMP for construction monitoring activities where known as follows:

- procedures for monitoring and reviewing compliance including inspection, audit frequency and reporting
- assessment criteria to identify success (evaluation)
- procedures for rectification of breaching or failings of EMP for construction measures (correction)

6.2. Environmental monitoring activities

6.2.1. The ES (**TR010038/APP/6.1**) and REAC set out a number of requirements for environmental monitoring to ensure that the identified mitigation measures and actions can be tracked and closed out when completed. Some of these are specific such as noise monitoring, others are more general and will be covered by regular inspections and audits.

6.2.2. Full details are shown in the updated REAC at section 3 Table 3-1. A summary of the environmental monitoring requirements including inspection, auditing and reporting requirements is presented at Table 6.1 below.

Table 6.1: Environmental monitoring requirements

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
AQ1	Limit impacts to air quality	IAQM Guidance on the assessment of dust from demolition and construction and Section 79 (9) of the Environmental Protection Act 1990	Regular site audits Compliance with **Construction dust management plan** (Annex B.3 of this EMP).
CH6	Preservation by record or protection of archaeological remains	All recording and conservation measures will be secured through DCO requirements and captured within a WSI (Mitigation Strategy) which will be agreed with Historic England, NCCES and the Breckland District Council Conservation Officer, Broadland District Council Conservation Officer and	Monitoring requirements identified in the Written Scheme of Investigation. Toolbox talks that include instruction methods to allow operatives to identify potential archaeological remains. Regular site audits during construction. Publication of results of archaeological works.

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
		South Norfolk District Council Conservation Officer as appropriate. Appointment of an archaeological subcontractor to undertake the agreed works (which will include monitoring).	
CH2	Protection of heritage assets during construction phase	Three assets in the DCO boundary are to be excluded from the works and will be recorded and protected during construction. These assets include the milestone opposite St Andrews Church (MNF62797), the milestone (MNF62796) on the south boundary of St Peters Church and the gateway piers and southern boundary of Honingham Park (MNF49020) between St Andrews Church and Taverham Road.	Regular monitoring and inspection to ensure the assets are protected. Condition surveys of the buildings and structural risk assessments. The scope of preservation by record will be agreed with Norfolk County Council.
CH5	Protection of peat near the River Tud	Peat deposits affected by crossing of the River Tud will be archaeologically sampled prior to construction.	Sampling strategy to be agreed with Norfolk County Council in advance of the peat analysis and any mitigation strategy required thereafter.
LV4	Protection of retained vegetation	Trees to be retained as presented in the Appendix 7.7 Arboricultural Impact Assessment (**TR010038/APP/6.3**).	The Principal Contractor shall appoint an arboricultural consultant to complete an arboricultural method statement. The method statement will outline tree protection measures and monitoring requirement.
LV5	Landscape planting and creation of new and replacement habitat	Mitigation included in ES Chapter 7 Landscape and visual and Chapter 8 Biodiversity (**TR010038/APP/6.1**), plus the Environmental Masterplan (**TR010038/APP/6.8**) and Landscape and Ecology Management Plan in Annex B.5 of this EMP.	Newly created or enhanced habitats will be managed and monitored for five years after planting. Post-development monitoring will be required for newly created habitats and protected species as per licence commitments. Habitats, bird and bat boxes will be monitored and managed for five years after they have been created.
BD6	Protection of bat roosts	Mitigation included in the ES Chapter 8 Biodiversity (**TR010038/APP/6.1**)	The tree felling of mature trees identified as 'with bat roost' and 'with bat roost potential' will be undertaken as per a **precautionary method statement.** Works near retained trees with bat roosts and that work that may disturb roosting bats in buildings will be undertaken under supervision from a registered bat licence holder with appropriate mitigation in place.

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
BD1	Protection of breeding birds	Mitigation included in the Chapter 8 Biodiversity (**TR010038/APP/6.1**)	Timing of vegetation clearance to outside of the breeding season which runs from March to August (inclusive) to minimise the risk of mortality of breeding birds. If inside of this season, vegetation clearance will be undertaken under the supervision of an Ecological Clerk of Works (ECoW).
BD1, BD2, BD3, BD4, BD5, BD6, BD7, BD8, BD9, BD10, BD11	Vegetation clearance	Mitigation included in the ES Chapter 8 Biodiversity (**TR010038/APP/6.1**)	Vegetation clearance will be supervised by an ECoW and timings stipulated in the **Landscape and Ecology Management Plan** in Annex B.5 of this EMP**.**
BD1, BD2, BD3, BD4, BD5, BD6, BD7, BD8, BD9, BD10, BD11	Protection of newly created habitat	Mitigation included in the ES Chapter 8 Biodiversity (**TR010038/APP/6.1**)	Post-development monitoring will be required for newly created habitats and protected species and will be detailed in the **Landscape and Ecology Management Plan (LEMP)** in Annex B.5 of this EMP. Habitats, bird and bat boxes will be monitored and managed for five years after they have been created. Further details will be identified as part of a LEMP.
BD6	Monitoring protected bat species	Mitigation included in the ES Chapter 8 Biodiversity (**TR010038/APP/6.1**)	The bat crossing points that have been mitigated with bat hops of large trees will be monitored by re-surveying in years one, three and five after operation of the proposed road commences. The monitoring scope will reflect the final detailed design and construction strategy, taking into account the requirements of DMRB LA 108 Biodiversity. Further details will be identified as part of a **Landscape and Ecology Management Plan (LEMP)** in Annex B.5 of this EMP.
GS2	To manage the potential risks associated with made ground and organic deposits	Mitigation included in ES Chapter 9 Geology and soils (**TR010038/APP/6.1**)	Monitoring of potential ground-gases and vapours in confined spaces during construction. Health & Safety Method Statements
GS4	Protection of site soils	Mitigation included in ES Chapter 9 Geology and soils (**TR010038/APP/6.1**)	Soil stripping, handling and storage will be monitored / audited to ensure that it follows procedures outlined in the **Soil Management Plan (SMP)** in Annex B of this EMP.
MA2	Monitoring waste	Mitigation included in ES Chapter 10 Material assets	The PC shall develop a **Site Waste Management Plan**. The SWMP shall

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
	recovery rate and proportion of secondary and recycled aggregate	and waste (**TR010038/APP/6.1**)	include procedures for monitoring the overall construction waste recovery rate and the proportion of secondary and recycled aggregate used in the Proposed Scheme, in order to confirm the assessment of materials impacts.
NV1	Reduce noise and vibration at sensitive receptors	Mitigation included in ES Chapter 11 Noise and vibration (**TR010038/APP/6.1**)	The Principal Contractor will develop a **Construction Noise and Dust Management Plan** to manage likely significant environmental effects. Construction noise shall be limited to less SOAEL values presented in the ES Appendix 11.5 Construction noise assessment (**TR010038/APP/6.3**) Likely significant environmental effects from noise and/or vibration during construction shall be monitored.
NV2 and NV3	Protection of sensitive noise receptors	Mitigation included in the ES Chapter 11 Noise and Vibration (**TR010038/APP/6.1**)	The likely significant environmental effects from noise during operation shall be monitored and include: • Ensuring mitigation measures included within the design are incorporated with the as-built project. Where they are not included, measures will be taken to ensure resultant noise levels, taking account of any additional mitigation installed but not included in the assessed design, are no higher than those set out in this assessment. • Ensuring specifications of noise mitigation measures, including barriers and low noise surfaces, meet design specifications.
RD1, RD2, RD3, RD4, RD5, RD6, RD7, RD7, RD8, RD9, RD10	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	Mitigation included in the ES Chapter 13 Road Drainage and the Water Environment (**TR010038/APP/6.1**)	Inspections and audits along with general monitoring and reporting of effectiveness of control measures to be carried out throughout the construction programme shall be incorporated into the **Water monitoring and management plan** in Annex B.7 of this EMP. The mitigation strategies implemented will be reviewed regularly to best suit the practices currently being undertaken on site. Monitoring of the River Tud, Oak Farm and Hockering ordinary watercourses and aquifers at risk from pollution and changes to groundwater levels and flow must be carried out prior to and during the construction phase.

6.3. Inspection, reporting and auditing requirements

6.3.1. The PC shall ensure compliance with the requirements of the ES, REAC, the EMP for construction and associated management plans and method

statements, environmental legislation and regulations as well as any Highways England or statutory obligations.

6.3.2. The environmental performance of the monitoring requirements identified in Table 3-1 will be continuously inspected, reported and audited by the PC via the following methods:

- Regular site audits and monitoring will be undertaken by the environmental manager, the ecological clerk of works (ECoW), archaeological clerk of works or the arboricultural consultant (as appropriate).
- Ecological activities under licence and works with European protected species can only be undertaken by a suitably licensed ecologist.
- Site safety and environmental reviews (SSERs) will be carried out by members of the construction team. There will be a requirement to complete a specified number of SSERs per month depending on the type of work ongoing.
- PC general foremen and engineers will inspect their work areas on a daily basis.
- Spot checks by the PC construction team will be undertaken of supply chain briefings, risk assessments, method statements, check sheets and permits.
- Periodic audits and checks by the PC regional environmental advisor and environment and sustainability manager.
- Periodic reviews will be undertaken by PC construction team of all relevant management plans, method statements and risk assessments.

6.3.3. There will be a central filing system in place for any checklists, inspection reports, monitoring records, consents, permits, waste transfer notes and consignment notes in line with the PC's business management system. This documentation will be used to demonstrate compliance with the requirements of this EMP for construction.

6.4. Evaluation and control process

6.4.1. There will be an evaluation process established by Highways England and the PC to review the success of all monitoring and mitigation requirements identified in Table 6-1 and any other requirements arising.

6.4.2. The evaluation process will include a description of any difficulties encountered in the delivery of measures to mitigate and manage the environmental effects. It will also include the main uncertainties arising from any forecasting of measures to mitigate and manage the environmental effects.

6.5. Corrective actions

6.5.1. There will also be the establishment of procedures for control measures and correction actions. Any findings and environmental data will be shared with the appropriate team on a periodic basis to ensure that any corrective and remedial action required is undertaken in a timely manner with a date of completion agreed. The health and safety team will also analyse the findings and data for any arising trends. Pro-active actions such as methodology reviews, re-briefings and toolbox talks will be implemented based on the trends of the data.

6.5.2. The PC site staff will produce site diaries which will include the recording of corrective actions. In addition, the health and safety site advisor will complete a monthly site safety and environment report which are kept on the internal shared Viewpoint document management system.

6.5.3. The PC's standards shall be rigorously implemented and incorporate the following requirements shown at Table 6-2 under ISO 14001. The Galliford Try Environmental Standards within Galliford Try's Environmental Management Systems are also provided in Table 6.2.

Table 6.2: ISO 14001 Standards

ISO14001 Standard	Principal Contractor Standard
HS&E-STD-E03	Ecological management
HS&E-STD-E04	Environmental emergency preparedness and response
HS&E-STD-E05	Project environmental design
HS&E-STD-E06	Environmental risk assessment

7. Induction, training and briefing procedures for staff

7.1.1. The PC will ensure that all personnel conducting environmental tasks are suitably qualified and experienced for the roles and responsibilities that they are employed to undertake.

7.1.2. The PC will be responsible for site inductions and training of all personnel including visitors, full time staff and supply chain providers.

7.1.3. The PC will work in accordance with their business management system to ensure compliance with the International Organisation for Standardisation (ISO) 14001 requirements as listed at Table 6-2.

7.1.4. The PC environment policy statement will be clearly displayed, and all personnel will be made aware of it, along with the relevant environmental legislation and the contents of the REAC.

7.1.5. In accordance with DMRB LA 120 Environmental management plans, this section of the EMP for construction is required to refine the following aspects of induction, training and briefing:

- A summary of the environmental aspects of the Proposed Scheme
- Awareness of EMP for construction contents
- Site induction
- On-site training

7.2. Site induction

7.2.1. Prior to commencing work on site, all personnel will be required to attend a site induction where the PC will communicate the environmental objectives and requirements of the scheme, as well as the responsibilities of the workforce.

7.2.2. The site induction will cover the topics relating to the environment to a level of sufficient detail for the workforce and appropriate to the work being undertaken. Topics would include but are not limited to:

- A summary of the environmental aspects of the Proposed Scheme
- An introduction to the EMP for construction
- Environmental site rules
- Preventing nuisance (noise, dust, vibration and odours)
- Communication with road users, affected landowners and stakeholders
- Earthworks and excavations

- Site traffic protocols
- Spill kit use and locations
- Refuelling, mechanical repairs and site maintenance
- Chemical handling and storage
- Emergency spill procedures
- Tree root protection areas
- Waste and energy management
- Reporting of environmental observations and suggestions
- Biodiversity protection and enhancement
- Works in the vicinity of the watercourse
- Heritage and archaeology assets

7.3. On-site training

7.3.1. Those undertaking any activities that could result in an adverse environmental impact will receive additional training which shall be led by the Environmental Manager or environmental or ecological clerk of works (ECoW). This training will include reference to the importance of adhering to the contents of this EMP for construction and the potential consequences of departure from any specified method statements.

7.3.2. The PC will establish a regime of toolbox talks in agreement with the supply chain. An indicative list of appropriate toolbox talks is provided in Table 7-1. More topics will be added to the list as necessary as construction progresses.

Table 7.1: Indicative toolbox talk titles

Principal Contractor – Toolbox talk reference	Toolbox talk title
HS&S-TBT-C04-301	Archaeology
HS&S-TBT-E03-301	Tree protection
HS&S-TBT-E03-302	Japanese knotweed
HS&S-TBT-E03-303	Himalayan balsam
HS&S-TBT-E03-304	Giant hogweed
HS&S-TBT-E03-305	Bats
HS&S-TBT-E03-306	Badgers
HS&S-TBT-E03-307	Great crested newts
HS&S-TBT-E03-309	Slow worms

Principal Contractor – Toolbox talk reference	Toolbox talk title
HS&S-TBT-E03-310	Water voles
HS&S-TBT-E03-311	Birds
HS&S-TBT-E03-312	New Zealand pygmy weed
HS&S-TBT-E03-317	Hazel dormice
HS&S-TBT-E03-319	Bees
HS&S-TBT-E04-301	Spill control
HS&S-TBT-E04-302	Petrol, diesel and oils
HS&S-TBT-L03-301	Re-useable soil resources on-site
HS&S-TBT-L03-302	Soil planning and management
HS&S-TBT-L03-303	Stripping topsoil
HS&S-TBT-L03-304	Stripping sub-soil
HS&S-TBT-L03-305	Stockpiling soil
HS&S-TBT-L03-306	Spreading soil
HS&S-TBT-L03-307	Sourcing topsoil
HS&S-TBT-L03-308	Manufacturing topsoil
HS&S-TBT-L03-309	Soil aftercare
HS&S-TBT-L03-310	Use of surplus soil
HS&S-TBT-L03-311	Working with previously developed land
HS&S-TBT-N02-301	Dust and air quality
HS&S-TBT-N02-302	Noise and vibration
HS&S-TBT-N02-303	Be a good neighbour
HS&S-TBT-R02-301	Materials management and housekeeping
HS&S-TBT-R02-302	Energy conservation – construction site good practice
HS&S-TBT-R02-303	Timber procurement
HS&S-TBT-W01-301	Waste management
HS&S-TBT-W01-302	Storage of waste
HS&S-TBT-W01-303	Waste segregation
HS&S-TBT-W05-301	Water pollution prevention
HS&S-TBT- W05-302	Water pollution – silt

Principal Contractor – Toolbox talk reference	Toolbox talk title
HS&S-TBT- W05-303	Water pollution – cement and concrete
HS&S-TBT- W05-304	Pumping and overpumping
HS&S-TBT- W05-305	Washing down plant and machinery
HS&S-TBT- W05-306	Bentonite

7.3.3. Any members of workforce disregarding any health, safety or environmental rules and arrangements detailed in this EMP will (in the first instance) receive a written warning from the project director and re-briefed as appropriate.

7.4. Criteria for evaluation of training effectiveness

7.4.1. Continuous monitoring of environmental performance will take place via regular Site Safety and Environmental Reviews (SSERs), which establishes employees' and subcontractors' compliance to the requirements of the EMS, this EMP, and the Client and statutory obligations.

[Note: This section should be updated at the next milestone stage (Development phase (Construction Preparation)) to describe the construction staff training procedures which should include providing staff with a summary of the environmental aspects of the projects; awareness of EMP contents; a site inductions; and on-site training.]

8. References and glossary

8.1. References

8.1.1. References are included as footnotes in the text.

8.2. Glossary

Table 8.1: Glossary

Terms or abbreviation	Definition
ADMM	Asset Data Management Manual (Highway England)
CDM 2015	The Construction (Design and Management) Regulations 2015
CLRA	Contaminated land risk assessment
COSHH	Control of Substances Hazardous to Health Regulations 2002 as amended
DCO	Development consent order
DIP	Delivery integration partner
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
ECoW	Ecological clerk of works
EHO	Environmental health officer
EIA	Environmental impact assessment
EMP for construction	Environmental management plan for the construction stage
EnvIS	Highways England environmental information system
EPS	European protected species
ES	Environmental Statement
GT	Galliford Try
HE	Highways England
HS&S	Health site and safety
ISO 140001	International Organisation for Standardisation Standard for Environmental management systems
MCHW	Manual of Contract Documents for Highways Works
MMP	Materials management plan
NCCES	Norwich County Council Environmental Services
NE	Natural England

Terms or abbreviation	Definition
PC	Principal Contractor
PCF	Project Control Framework – Highways England's process for managing projects
PRoW	Public rights of way
RDP	Regional delivery partnership
REAC	Record of environmental actions and commitments
RNAS	Royal naval air station
RPG	Registered park and garden
SAC	Special area of conservation
SMP	Soil management plan
SoS	Secretary of State for Transport
SRN	Strategic road network
SSER	Site safety and environmental records
SSSI	Site of special scientific interest
SWMP	Site waste management plan
TBT	Toolbox talk – A short presentation to the workforce on any aspect pf the scheme including health, safety, wellbeing or environment.
WSI	Written scheme of investigation

Appendix A. Constraints maps

Appendix B. Relevant management plans

To be produced prior to construction (in the 2nd EMP iteration) by the Principal Contractor. This section will include:

- Annex B.1 Materials Management Plan (MMP)
- Annex B.2 Soil Handling Management Plan
- Annex B.3 Construction Noise and Dust Management Plan
- Annex B.4 Construction Communication Strategy
- Annex B.5 Landscape and Ecology Management Plan (LEMP)
- Annex B.6 Biosecurity Management Plan
- Annex B.7 Water monitoring and management plan
- Annex B.8 Detailed Heritage Written Scheme of Investigation (DHWSI) (Mitigation Strategy)
- Annex B.9 Temporary Surface Water Drainage Strategy
- Annex B.10 INNS Management Plan
- Annex B.11 Operational UXO Emergency Response Plan

NOTE: that the outline Site Waste Management Plan (**TR010038/APP/6.3**) and outline Traffic Management Plan (**TR010038/APP/7.5**) are separate documents as part of the DCO submission. These are to be progressed as part of the second iteration of the EMP in parallel with the annexes listed above.

B.3 Construction Noise and Dust Management Plan

The Institute of Air Quality Management (IAQM)[5] recommends that the following hierarchy principles (drawn from similar well-established mitigation hierarchies used for EIA development and for dealing with pollution exposure in workplace/occupational situations) be used as the basis for mitigating the operational air quality impacts associated with general development schemes. This hierarchy is suitable both for impacts caused by a potentially polluting new development, and for the impact of exposure of new occupants of a development proposed in an area of existing poor air quality.

I. Preference should be given to preventing or avoiding exposure/impacts to the pollutant in the first place by eliminating or isolating potential sources or by replacing sources or activities with alternatives. This is usually best achieved through taking air quality considerations into account at the development scheme design stage.

II. Reduction and minimisation of exposure/impacts should next be considered once all options for prevention/avoidance have been implemented so far as is reasonably practicable (both technically and economically). To achieve this reduction/ minimisation, preference should be given first to:

    a. mitigation measures that act on the source; before

    b. mitigation measures that act on the pathway, which in turn should take preference over

    c. mitigation measures at or close to the point of receptor exposure all subject to the efficacy, cost and practicability of the available solutions. In each case, measures that are designed or engineered to operate passively are preferred to active measures that require continual intervention, management or a change in people's behaviours.

III. Off-setting a new development's air quality impact by proportionately contributing to air quality improvements elsewhere (including those identified in air quality action plans and low emission strategies) should only be considered once the solutions for preventing/avoiding, and then for reducing/minimising, the development-specific impacts have been exhausted. Even then, offsetting should be limited to measures that are likely to have a beneficial impact on air quality in the vicinity of the development site. It is not appropriate to attempt to offset local air quality impacts by measures that may have some effect remote from the vicinity of the development site.

IV. These will be progressed by the contractor when implementing the Construction Noise and Dust Management Plan

[5] IAQM. (2018). *Mitigation of Development Air Quality Impacts.* Available: http://iaqm.co.uk/text/position_statements/mitigation_of_development.pdf. Last accessed 18.02.2021.

B.5 Landscape and Ecological Management Plan

A Landscape and Ecological Management Plan (LEMP) is to be produced by the appointed Landscape Architect and Ecologist prior to construction. This should take the form of a Series 3000 Landscape and Ecology[6] drawings. The Series 3000 specifies the landscape construction and maintenance works required for the contracted works.

Specified elements within the Series 3000 should include timings, frequency, preparatory works, materials, tools, reference drawings, procedures, responsibilities and exclusions required for the contractor to implement, establish and maintain the Scheme. It is recommended that the Series 3000 document is made up of the following aspects detailed within Table B.1:

Table B.1: LEMP Structure

Chapter	Indicative contents / aim of chapter

Introduction	• Scheme description
	• Objectives of the LEMP
	  ○ The LEMP will provide information on the management of landscape and ecological elements within the site boundary during its operation. The LEMP will identify the landscape and ecological mitigation measures set out in the Environmental Statement for the Scheme and provide information on how the measures will be delivered through landscape works and management in the future to ensure the objectives of the Scheme are achieved. It should be noted that the LEMP is intended to be a "live" document and to evolve during the construction process.
	  ○ The LEMP will identify the management types and maintenance objectives for the five-year aftercare period as well as providing a long-term management strategy with the long-term aim of creating a sustainable landscape and habitat areas.
	• Roles and responsibilities

ENVIS requirements	This section will address EnvIS (Environmental Information System) as Highways England's primary tool for the recording of environmental assets, and the prescription of environmental management actions. Environmental design data will be submitted to Highways England in accordance with IAN 84/10 to provide a useful mechanism to review the progress and performance of environmental objectives in the future.
Landscape and Ecological Context	Landscape Character and Visual Context and general mitigation approach. Ecological Context and general mitigation approach.
Landscape and Environmental objectives and functions	Definition of landscape elements and landscape and environmental function in line with LD 117 for each element (planting type or other environmental mitigation feature) relevant to the Scheme for example Species Rich Grassland or ecological feature such as hibernacula.

[6] Highways England (2001) Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works: Series 3000 Landscape and Ecology [online] available at: http://www.standardsforhighways.co.uk/ha/standards/mchw/vol1/pdfs/series_3000.pdf (last accessed February 2021).

Chapter	Indicative contents / aim of chapter

Landscape and Ecological Management	• Reference to Series 3000 for detailed specification of actions to be undertaken during implementation and maintenance of planting during aftercare period.
	• Landscape Management
	• Management actions and frequency of actions required for each landscape element within scheme boundary.
	• Pre-construction and construction phase habitat and species mitigation measures, including those required under Natural England development licences. These include:
	  ○ Pre-construction or update surveys;
	  ○ Creation or enhancement of habitats as receptor areas for species, to include installation of features such as wildlife boxes and hibernacula;
	  ○ Exclusion of species such as great crested newts, reptiles barn owls and badgers from the works area, where necessary;
	  ○ Sensitive timing and method of habitat removal, to include destructive searches where appropriate and retention of soils for seedbank translocation of sensitive habitats;
	  ○ Implementation of temporary mitigation measures, such as fencing/ demarcation of retained habitats and buffers around sensitive receptors;
	  ○ Implementation of measures to ensure continued habitat connectivity during construction, such as dead hedging;
	  ○ Ecological Clerk of Works responsibilities;
	  ○ Toolbox talks to site personnel;
	  ○ Supervision of installation of permanent mitigation features such as the badger tunnel; amphibian ladders; wildlife boxes (additional to those mentioned above) and bat house;
	• Post construction management actions and frequency of actions required for ecological mitigation interventions, to include
	  ○ Creation of habitat areas;
	  ○ Management of retained and created habitats up to 5 years post Scheme construction to optimise benefits for protected and notable species;
	  ○ Monitoring of species for up to 5 years post Scheme construction including great crested newts, water voles, bast, reptiles, barn owls and badgers.

Appendix C. Environmental method statement

To be produced prior to construction by the Principal Contractor. This section will include:

- Precautionary method statement – bats
- Precautionary method statement – great crested newts
- Precautionary method statement - badgers
- Arboricultural method statement
- Health and safety method statement
- Foundation works risk assessment
- Water vole licence method statement

Appendix D. Emergency procedures and record and environmental incidents

To be produced prior to construction by the Principal Contractor. This section will include:

- Confirmation of procedures in the event of an environmental emergency.

A record of environmental incidents (in table format) if occurred to include the following information:

- Date and location of the incident
- Details of the reporting procedure followed
- Description of the incident and relevant legislation
- Remedial actions
- Lessons learnt
- Details of any contact with enforcing bodies.

Appendix E. Copy of evaluation of change register

Appendix F. Final environmental investigation and monitoring reports

To be produced prior to construction by the Principal Contractor. This section should include:

- Copies of relevant reports (relating to protected species/ habitats and cultural heritage investigations, and any environmental monitoring reports) or cross reference to the locations of these easily if accessible elsewhere.