A47 Blofield to North Burlingham Dualling

Scheme Number: TR010040

Volume 7
7.7 Environmental Management Plan

APFP Regulation 5(2)(q)

Planning Act 2008

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December 2021

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Infrastructure Planning

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

A47 Blofield to North Burlingham Development Consent Order 202[x]

ENVIRONMENTAL MANAGEMENT PLAN

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Rev 3	August 2021	Deadline 3
Rev 4	September 2021	Deadline 4
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Rev 6	December 2021	Deadline 9

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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 Blofield to North Burlingham Dualling Scheme (hereafter referred to as 'the Proposed Scheme').

1.1.2. This document is the Environmental Management Plan (EMP)(1st iteration - design) for the Proposed Scheme. The purpose of the EMP (design) 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 are be secured by Requirement 4 in the Development Consent Order (DCO) (**TR010040/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 for which DCO is being applied. It has been prepared in accordance with the following:

- The Environmental Statement (ES) (**TR010040/APP/6.1)**
- Design Manual for Roads and Bridges (DMRB) LA 120 Environmental management plans[1]
- Asset Data Management Manual (ADMM) v11.0 Parts 2 and 3 (in particular for Environmental Information System (EnvIS) requirements)[2]

1.1.4. 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, and also indicates plans that will need to be developed by the Principal Contractor prior to construction. These include:

- Outline Site Waste Management Plan **(TR010040/APP/6.2)**
- The outline Traffic Management Plan **(TR010040/APP/7.8)**

1.1.5. If the DCO for the Proposed Scheme is made, the EMP will be updated to reference specific requirements relating to the various phases of construction. The following environmental management plans will be prepared:

- Annex B.1 Water monitoring and management plan

[1] Highways England (2020) Design Manual for Roads and Bridges LA 120 Environmental management plans [online] available at: [redacted] (last accessed 30 September 2020).

[2] ADMM v11 Part 2 – Requirements and Additional Information [redacted]

- Annex B.2 Biosecurity management plan[3]
- Annex B.3 Materials Management Plan (MMP)
- Annex B.4 Soil Handling Management Plan
- Annex B.5 Construction Noise and Dust Management Plan
- Annex B.6 Construction Communication Strategy
- Annex B.7 Landscape and Ecology Management Plan

1.1.6. The 2nd iteration (Construction) of the EMP will be updated by the Principal Contractor (Galliford Try) once the design and construction plans have been finalised. The 3rd iteration of the EMP will be refined at the end of the construction stage to support future management and operation.

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 Environmental Statement.

1.2.2. The EMP:

- provides a clear audit trail outlining the modifications made from any previous iteration
- 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.

1.2.3. This EMP takes due consideration of the documents submitted to the 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 following phases of construction:

- Prior to construction (for example, advanced works, site preparation and vegetation clearance)
- During construction

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

1.3. The Proposed Scheme

Location

1.3.1. The A47 from Blofield to North Burlingham, comprising of a single carriageway, is located approximately 9km to the east of Norwich and forms part of the main arterial highway route connecting Norwich and Great Yarmouth.

1.3.2. The area surrounding the Proposed Scheme is generally flat and elevations vary between 10m and 20m above sea level. The dual carriageway reduces to a single carriageway at approximately National Grid References (NGR) TG 34675 09939 and widens into a dual carriageway at approximately NGR 37101 00905. The speed limit along the single carriageway is 50mph. This returns to the national speed limit of 70mph when the road returns to a dual carriageway.

1.3.3. The area surrounding the Proposed Scheme is predominantly rural with arable farming representing the major land use practice. There are few features of interest in the landscape. Fields are large in size with hedgerow or fencing along the boundaries. Woodland is limited, although north of North Burlingham there are locally important areas of plantation and semi-natural woodland. South of the A47 around the farm at Lingwood Road, community woodland has been planted.

1.3.4. Blofield and North Burlingham lie within the boundaries of Norfolk County Council and Broadland District Council. Housing tends to be concentrated in the villages of Blofield, Lingwood and Acle, although the area surrounding the Proposed Scheme between Blofield and North Burlingham contains a number of domestic properties and businesses along the minor road network. A significant number of these are associated with farms which is the key industry.

1.3.5. The land required temporarily and/or permanently for the construction, operation and maintenance of the Proposed Scheme is shown on Figure A.1 in Appendix A.

Programme

1.3.6. The indicative construction programme for the Proposed Scheme has been informed by the Principal Contractor. During the detailed design stage for the Proposed Scheme the Principal Contractor will refine the construction programme.

1.3.7. Anticipated start of works is 2022. Construction is anticipated to take approximately 22 months. This would be carried out in phases, so not all sections of the Proposed Scheme would be under construction for the full period.

1.3.8. The proposed phases of construction are set out in Table 1-1 (Construction phasing programme). 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 1-1 : Indicative construction phasing programme

Phase	Traffic management stage	Approximate programme	Key Construction Activities
0	Site preparation and utility diversions	Six months (month 1 to 6)	Utility diversionary works completed including BT Openreach, Cadent Gas, Vodafone, Anglian Water, UKPN, Virgin media and Vodafone. Compound and welfare areas constructed for main works. Hardstanding areas will be constructed topsoil stripped and subbase installed. Areas for car parking will be surfaced as required. Clearance of vegetation undertaken as required to enable the works.
1	Offline construction, including overbridges and retaining wall	Twelve months (month 6 to 17)	Construction of carriageway offline from existing A47. Activities including topsoil strip, cut / fill earthworks, drainage installation, carriageway construction including capping, subbase 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.
2	Construct the realigned Waterlow	Four months (month 9 to 12)	Realigned Waterlow involves topsoil strip, cut / fill earthworks, drainage installation, carriageway construction including capping, sub-base and the bitumen bound layers.
3	Traffic using realigned Waterlow and construct further section of new carriageway	Six months (month 12 to 17)	Main works will involve completion of carriageway pavement and road restraint systems. Landscaping will commence. Road lighting installed where required.
4	Construct cross-overs either end of existing east bound dual carriageway. Small sections of contraflow used to enable new west bound carriageway to tie-in to existing A47. Traffic to remain on existing single carriageway.	Two months (month 16 to 17)	Cross-overs will be constructed by removing existing central reservation and road restraint at either end of the Proposed Scheme. Central reservation will have carriageway construction inlaid.
5	Weekend and overnight closures (as required) to finalise tie-in to new westbound dual carriageway	One month (month 17)	Tie-ins will require existing carriageway to be cold milled and new overlays installed that join the new carriageway to the existing carriageway at either end of the Proposed Scheme.
6	Traffic using new westbound carriageway as single carriageway. Construct connecting roads over now disused A47, remainder of approach ramps and east bound carriageway tie-ins completed.	Five months (month 17 to 21)	Completion of east bound carriageways. Construction of new approach ramps to new overbridge structures. Activities include topsoil strip, cut/fill earthworks, drainage installation, carriageway construction including capping and subbase and the bitumen bound layers. Road restraint installed. Road lighting installed where required. Landscaping works will continue.
7	Final tie-ins and finishing works. Overnight closures used as required to tie-in new eastbound carriageway.	Two months (month 20 to 21)	Final tie-ins will require existing carriageway to be cold milled and new overlays installed that join the new carriageway to the existing carriageway at either end of the Proposed Scheme. On completion of final surfacing works traffic use new carriageways, temporary cross-overs will be removed, permanent road markings will be

Phase	Traffic management stage	Approximate programme	Key Construction Activities
			installed, and road restraint systems will be completed at the temporary cross-over locations.
8	Compound removal	Two months (month 21 to 22)	Compound 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

1.3.9. Whilst around half of the A47 is already dual carriageway, the Blofield to North Burlingham section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users. Sandwiched between two dual carriageway sections, the Blofield to North Burlingham stretch of the A47 acts as a bottleneck, resulting in congestion and leading to longer and unreliable journey times.

1.3.10. The section also has a poor safety record, with a total of 40 collisions recorded on the section between 2013 and 2017 (giving an average of 10 collisions per year).

1.3.11. The greater Norwich area is set to see major housing and employment growth by 2021.

1.3.12. There are a number of reasons for these delays within the Proposed Scheme extents and investigations have highlighted these reasons as:

- difficulty of accessing and crossing the A47
- standard of the road and junctions
- traffic levels outgrowing the capacity of the road, causing tailbacks and delays
- limited opportunities for overtaking slower moving vehicles
- development in the local area

1.3.13. In developing the Proposed Scheme, Highways England aim to address these issues by improving the traffic flow, reducing journey times on the route, increasing the route safety and resilience and improving the environment. The Proposed Scheme is also intended to support economic growth by making journeys safer and more reliable.

Outline of proposed works

1.3.14. The Scheme comprises:

- 2.6km of dual carriageway on the A47

- de-trunking of the existing A47 section between Blofield and North Burlingham
- improvements at Yarmouth Road Junction, including closure of the central reserve, closure of High Noon Lane direct access, merge lane, realignment of Waterlow and local access improvements at the Sparrow Hall properties
- introduction of a compact grade separated junction at B1140 junction, including the B1140 Overbridge
- a new overbridge at Blofield traversing the proposed A47 dual carriageway, connecting Yarmouth Road with the existing A47
- provision of new drainage systems including an infiltration basin and retention of existing drainage systems where possible
- a retaining wall in the western extents
- introduction of lighting at the Yarmouth Road junction and new lighting layout at the B1140 Junction
- closure of an existing layby and provision of a new layby
- walking and cycling routes connecting Blofield and North Burlingham via the Blofield Overbridge to the west and the B1140 Overbridge to the east
- provision of North Burlingham Access
- an agricultural access track
- fencing, safety barriers and signage
- environmental mitigation
- diversions of an intermediate pressure gas main and other utilities

1.3.15. A detailed description of the Proposed Scheme is provided within Chapter 2 (The Proposed Scheme) of the Environmental Statement (**TR010040/APP/6.1**).

1.3.16. An Masterplan (**TR010040/APP/6.8**) has been prepared for the Proposed Scheme. Works must be implemented in accordance with the Masterplan, to minimise the effects associated with landscape and visual, cultural heritage setting noise and biodiversity. The Proposed Scheme once operational should reflect the environmental design.

Objectives of the Proposed Scheme

Supporting economic growth

1.3.17. The Scheme aims to reduce congestion related delay, improve journey time reliability and increase the overall capacity of the A47. This will help contribute to sustainable economic growth by supporting employment and residential development opportunities.

Making a safer network

1.3.18. Improving road safety for all road users by designing to modern highway standards appropriate for a major A road.

A more free-flowing network

1.3.19. Increasing the resilience of the junction in coping with incidents such as collisions, breakdowns, maintenance and extreme weather. The improved A47 from Blofield to North Burlingham will be more reliable, reducing journey times and providing capacity for future traffic growth.

Protected environment

1.3.20. We will protect the environment by minimising adverse impacts and where possible, improving the environmental effects of transport on those living along the route of the new and existing road. We will do this by reducing the impact on the natural and built environment by the new road and any associated works.

An accessible and integrated network

1.3.21. To ensure the proposals consider local communities and access to the road network, providing a safer route between communities for cyclists, pedestrians, equestrians and vulnerable users where a need is identified.

Value for money

1.3.22. To 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 Principal Contractor (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.

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 roles for Highways England and the PC are listed in Table 2-1.

Table 2-1 : General site contacts and responsibilities

Role	Stage of Proposed Scheme Project involvement	Name	Telephone	Email
Highways England Project Manager	All	Nikki Rowley-Todd	[redacted]	[redacted]@highwaysengland.co.uk
PC Design / Technical Manager	PCF (Highways England Project Control Framework) Stage 3 (Preliminary Design) – Stage 6 (Construction, commissioning and handover)	Nathan Crabtree	[redacted]	[redacted]@gallifordtry.co.uk
PC Senior Site Manager	PCF Stage 5 (construction Preparation) – Stage 6	[TBC]	[TBC]	[TBC]
PC Site Supervisors	Stage 5 - 6	[TBC]	[TBC]	[TBC]
PC Regional HS&S Manager	Stage 5 - 6	[TBC]	[TBC]	[TBC]

Role	Stage of Proposed Scheme Project involvement	Name	Telephone	Email
PC Regional Environmental & Sustainability Manager	Stage 5 - 6	[TBC]	[TBC]	[TBC]
PC HS&S Advisor	Stage 5 - 6	[TBC]	[TBC]	[TBC]
Waste Champion	Stage 5 - 6	[TBC]	[TBC]	[TBC]
Spill Responders	Stage 5 - 6	[TBC]	[TBC]	[TBC]
PC Environmental Specialist (s)	Stage 5 - 6	[TBC]	[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 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 Principal Contractor's Environmental Policy and Standards, guidelines, approved codes of practice and other requirements including adherence to HE standards and the commitments in the EMP.

Role	Responsibility
	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 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 Principal Contractor'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 specific environmental requirements. 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 Principal Contractor 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 Principal Contractor s Environmental Standards. Follow Principal Contractor T 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.

Role	Responsibility
	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 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 Principal Contractor'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 Principal Contractor'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 Principal Contractor'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. 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.

Role	Responsibility
	Assist project management through advice, information, training and encouragement as appropriate to ensure that the Proposed Scheme continually meet Galliford Try'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. 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 Principal Contractor'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 Principal Contractor'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 Galliford Try's Environmental Standards and make known and discuss any significant findings / recommendations.

Role	Responsibility
	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.
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 Galliford Try 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.
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 • 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

Role	Responsibility
	• Develop and submit a method statement to regulatory bodies for works that may impact known or suspected cultural heritage assets. • Obtain in conjunction with the Senior Site Manager all relevant regulatory permissions. • 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. • Conduct an archaeological Watching Brief to monitor construction activities in areas of known or suspected cultural heritage assets. • Report the identification of any cultural heritage asset to the relevant regulatory body. • Recommend site works be suspended if cultural heritage assets are identified. • Regularly discuss progress and issues with the Senior Site Manager. Arboriculturist • Conduct tree felling / surgery works as per the scope of contract. • Ensure permission (i.e., section 211 Notice / Tree Felling Licence) is in place for works to protected trees; otherwise, do not proceed with works. • Ensure a Tree Felling Licence is in place for the felling of more than $5m^3$ of non-protected trees; otherwise, do not proceed with works. • 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)(**TR010040/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 and will be finalised at the end of construction on completion of the Proposed Scheme where it will be developed into the 3rd iteration of the EMP (end of construction). 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	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
General (G)									
G1	ES – CH2	Hours of working	Construction works will take place within the standard working hours of: 1. 07:00–19:00 Mondays to Fridays and 2. 07:00–12:00 on Saturdays except for - (a) night-time works for bridge installation and cross overs; (b) any oversize deliveries or deliveries where daytime working would be excessively disruptive to normal traffic operation; (c) junction, access (including works accesses) and highway tie-in works (including works required to tie in to the existing A47) on existing highways (d) installation of temporary or permanent line markings on existing highways; (e) installation or alteration of traffic management measures; (f) site clearance of vegetation adjacent to live carriageways;Enviro (g) works associated with the diversion of existing utilities; (h) site clearance of signs, street furniture and lighting columns adjacent to live carriageways; (i) cases of emergency; or (j) as otherwise agreed by the relevant planning authority in advance. Any works outside of the standard working hours will be minimised as far as practicable. Except for works under paragraphs (i) and (j) where works outside of the standard working hours are required, the Contractor will consult with the local planning authority regarding appropriate measures to minimise noise impacts, taking into account the location of works, extended hours of work and their expected duration. Where works are required under paragraph (i) the Contractor will notify the local planning authority in writing as soon as reasonably practicable after the works start. Except in cases of emergency, working on Sundays and Bank Holidays will only be permissible with the prior agreement of the local planning authority.	Indicative Information from the Principal Contractor	Regular site audits	Contractual responsibilities between Highways England and the Principal Contractor	The Principal Contractor	P C	Signed: Date:
G2	ES - CH9	Reduce light disturbance for sensitive receptors	**During works:** Lighting will be at the minimum luminosity necessary and use low energy consumption fittings. It will 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 over areas of vegetation that have been cleared during the daytime. **During operation:** All proposed operational lighting will be designed to minimise light spill onto residential properties and habitats which support commuting and foraging bats.	Sensitive receptors within the vicinity of the site.	Regular site audits	Contractual responsibilities between Highways England and the Principal Contractor.	The Principal Contractor	P C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			Where lighting columns back onto residential properties and/or sensitive receptors, backlight shields or similar mitigation will be required to mitigate significant effects. By no later than the expiry of 3 months of Work No.1 being completed and fully open to traffic (excluding use as a diversionary route during works to construct the authorised development) the lighting columns on the existing A47 Trunk Road between a point 58.5 metres west of Lingwood Lane and a point 250 metres east of the B1140 South Walsham Road must be removed.						
G3	ES - CH9	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. • instruction methods to allow operatives to identify potential archaeological remains In the event that any protected or priority species which were not previously identified in the Environmental Statement (ES) (or any nesting birds) are found during construction activities works in the vicinity of the identified species must cease and it be reported immediately to the Ecological Clerk of Works.	Ecology surveys have indicated the presence of protected species	Agree methods with Natural England where applicable.	Contractual responsibilities between Highways England and the Principal Contractor, and Requirement 7 of the Draft DCO (**TR010040/APP/3.1**).	The Principal Contractor	P C	Signed: Date:
G4	ES – CH2	Avoidance of double handling of materials	Material deliveries will be programmed on an “as required” basis to avoid temporary storage and double handling as far as is practicable.	Not applicable	Regular site audits	Contractual responsibilities between Highways England and the Principal Contractor.	The Principal Contractor	P C	Signed: Date:
G5	ES – CH2	Ensure traffic flows on the existing A47 and local roads are maintained during construction	The Principal Contactor will prepare a Traffic Management Plan to manage the routing of construction traffic based on the outline Traffic Management Plan **(TR010040/APP/7.8)**. Appropriate traffic management measures would be put in place to ensure that traffic flows on the existing A47 and other local roads are maintained where practicable, 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.	Local road and existing A47 is used regularly	Compliance with the Traffic Management Plan (**TR010040/APP/7.8**)	Contractual responsibilities between Highways England and the Principal Contractor	The Principal Contractor	P C	Signed: Date:
G6	ES – CH7	To reduce the visual impacts of the construction works for nearby sensitive receptors	To reduce visual effects of the Proposed Scheme during construction The Principal Contractor 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 Masterplan (**TR010040/APP/6.8**) .	Contractual responsibilities between Highways England and the Principal Contractor	The Principal Contractor	P C	Signed: Date:

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G7	ES Chapter 12 Population and Human Health	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. Construction vehicles will be confined to designated haul routes to reduce the amount of compaction of soil.	Construction works can damage soils or cause compaction	Compliance with the EMP and Traffic Management Plan (**TR010040/APP/7.8**).	Contractual responsibilities between Highways England and the Principal Contractor	The Principal Contractor	P C	Signed: Date:
G8	ES Chapter 2 and Chapter 12 Population and Human Health	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. Due to the anticipated accumulation of construction activity near the properties at Yarmouth Road, Poplar Farm and the Parish Council and Blofield Allotments, the likely timings of the works will be communicated with the affected parties.	Sensitive residential and community receptors within the vicinity of the Proposed Scheme.	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.	Contractual responsibilities between Highways England and the Principal Contractor	The Principal Contractor	P C	Signed: Date:
G9	Not applicable	To ensure all proposed embedded environmental mitigation elements retain their function not withstanding any design amendments within the vertical and horizontal limits of deviation.	Construction to take place in accordance with the Masterplan (**TR010040/APP/6.8**) which is submitted as part of the DCO application.	Potential for mitigation bunds to lose their function as noise / landscape / visual screening.	Compliance with the Masterplan (**TR010040/APP/6.8**) Sheets 1 to 7 submitted as part of the DCO application.	Contractual responsibilities between Highways England and the Principal Contractor, and the requirements of the Draft DCO (**TR010040/APP/3.1**).	The Principal Contractor	P C	Signed: Date:
G10	EMP	EMP iteration	The principal contractor 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.	Not applicable	Prior to commencement of each phase	Contractual responsibilities between Highways England and the Principal Contractor.	The Principal Contractor	P C	Signed: Date:
G11	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 Principal Contractor.	The Principal Contractor	C	Signed: Date:
Air Quality (AQ)									

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AQ 1	ES – CH5	To limit and control emissions to air during construction on sensitive receptors.	Works will be carried out in accordance with the Best Practicable Means (e.g. CIRIA guidance C692), and as described in IAQM Guidance of the assessment of dust from demolition and construction Version 1.1[4] and Section 79(9) of the Environmental Protection Act 1990, to reduce fumes or emissions which may impact upon air quality. Compliance monitoring including regular onsite and offsite inspections may be required and included in the Construction noise and dust Management Plan which will be created by Principal Contractor. A record of all dust and air quality complaints will be recorded to identify cause(s) of dust, take appropriate measures to reduce emissions in a timely manner, and record the measures taken. The record logbook will be made available to a local authority when asked. The record logbook will log exceptional incidents that cause dust and / or air emissions, on- or offsite, and the action taken to resolve the situation.	Community receptors and ecological designated sites sensitive to changes in NOx concentrations within the vicinity of the Proposed Scheme	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 (Annex B.5)**	Principal Contractor	P C	Signed: Date:
Cultural Heritage (CH)									
CH 1	ES – CH6	Preservation by record or protection of archaeological remains.	All recording and conservation measures identified in ES Chapter 6 (Cultural Heritage) will be secured through DCO Requirement 9 then captured within a Written Scheme of Investigation (WSI) which will be agreed with Historic England, NCCES and the Broadland District Council Conservation Officer as appropriate The Applicant will make the reporting and data available to Norfolk County Council and Broadland District Council.	Based on the results of the geophysical surveys this locality has the potential for high value buried archaeology.	Consultation with the Local Authority Archaeology Advisor (Norfolk County Council) and Historic England. Production of a WSI. Appointment of an archaeological subcontractor to undertake the agreed works.	Contractual responsibilities between Highways England and the Principal Contractor,	Detailed design consultant and the Principal Contractor	A (Reporting may continue into the operation phase)	Signed: Date:
CH 2	ES – CH6	To promote the understanding and appreciation of historic buildings	Historic building recording of the structures within **Poplar Farm** group would be carried out to Level II of Historic England's guidance for investigating and recording historic buildings (Historic England, 2016).	To promote and preserve understanding of historic buildings	Report approved by the overseeing authority and disseminated.	Contractual responsibilities between Highways England and the Principal Contractor, and the requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor will liaise with specialist	P	Signed: Date:
CH 3	ES – CH6	To protect historical assets	The milestone on **Yarmouth Road** (MNF62994) and milestone at the junction of **Main Road** and the A47 (MNF62995) will be protected from the works. An appropriate specialist will be consulted on the methodology to conserve and restore. Conservation actions may require temporary removal of the historical assets from site. The assets will then be proposed for listing to Grade II to enhance its future protection. The guidepost on **Acle Road** (BLO21) will be removed from the works site and conserved to ensure its safety. At an appropriate point during works, it will be reinstated as close as possible to its original location. An appropriate specialist will be consulted on the methodology to remove, conserve or restore, store and reinstate the asset. The asset will then be proposed for listing to Grade II or incorporation into the Norfolk HER	Listed milestone and guidepost requires protection during construction	Consultation on protection methodology with Norfolk County Council archaeological advisor and Historic England. Protection measures installed, maintained and removed in line with agreed methodology.	Highways England chosen Archaeological specialist will liaise with Principal Contractor	Principal Contractor, Highways England	P C O	Signed: Date:

[4] [redacted]

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CH 4	ES – CH6	Preserving known and potential archaeological resources	The final layout for temporary structures, services, haul routes, storage methods etc should have regard to heritage value of the known and potential archaeological resource within the footprint of the Proposed Scheme and preserve remains where reasonably practicable by excluding open areas from works with appropriate fencing. 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 would 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 should be protected to ensure they are preserved for the future.	Potential for asset to be damaged during construction due to proximity to the Proposed Scheme.	Information to be included in the WSI and agreed with Norwich County Council Environmental Services and Historic England.	Highways England chosen Archaeological specialist will liaise with Principal Contractor	Principal Contractor, Design Team	P	Signed: Date:
CH 5	ES – CH6	Site Clearance and excavation	Series 0200 Site Clearance drawings will include the archaeological zones as presented in ES Figure 6.4 (**TR010040/APP/6.3**). The site will be subject to archaeological excavation and recording by various methods. The precise scope of this work will be agreed with Norfolk County Council Environmental Services (NCCES). Archaeological methods may need to adapt to changing conditions and discoveries throughout the works. Recommendations are set out below: Pre-construction excavation for zones 1, 5, 7 and 8. These zones contain the main locations of sensitive remains and will likely require the most time to excavate appropriately. Sampling levels should be agreed in advance of works but, will require flexibility to adapt to the emerging archaeological remains in consultation with NCCES. Advance excavation will limit the risk to the subsequent construction phase programme. Construction-integrated recording for zones 2, 3 and 6. These zones are less archaeologically dense and complex than zones 1, 5, 7 and 8. The time required for adequate recording will be less and it may be more efficient to schedule the works during topsoil stripping for construction. This could take the form of archaeological monitoring of topsoil stripping by the civils contractor with programme allowance for recording of exposed remains before further earth moving. Construction-integrated recording for Zone 4. This zone is potentially as complex and densely packed with archaeological remains as zone 5 but, the presence of multiple services means that it would be difficult to design pre-construction works that can be undertaken safely and, in a manner, which allows coherent recording of the fragmentary archaeological remains. Archaeological recording here should be undertaken after the removal/deactivation of buried and overhead services and before the main civils engineering works. This may require multiple phases of work as individual services are taken offline and clearances granted. Archaeological monitoring in all other parts of the Proposed Scheme other than the above and areas known to be archeologically sterile as described in ES Chapter 6 Paragraph 6.4.47. Monitoring should contribute to the context of archaeological features within zones 1-8 recovering dating evidence to clarify the results of previous excavation in those areas.	Protection and reinstatement of heritage asset	Information to be included in the WSI and agreed with Norfolk County Council Environmental Services and Historic England.	Highways England chosen Archaeological specialist will liaise with Principal Contractor	Principal Contractor, Highways England	P C	Signed: Date:

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			The monitoring will also provide a safety net to catch any unexpected remains of archaeological value. Monitoring would be targeted on areas of groundworks defined during detailed design of temporary works at PCF stage 5.						
CH 6	ES – CH6	To limit and protect archaeological remains during construction	Prior to construction, a protocol for unexpected archaeological discoveries will be developed as part of the written scheme of investigations. This protocol will be agreed with Historic England and NCCES 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 • 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.	Based on the results of geophysical surveys, this locality has the potential for high value buried archaeology.	Information to be included in the WSI and agreed with Norfolk County Council Environmental Services, Broadland District Council Conservation Officer and Historic England.	Highways England chosen Archaeological specialist will liaise with Principal Contractor	Principal Contractor, Highways England	P C	Signed: Date:
CH 7	ES – CH6	To limit and protect archaeological remains and heritage assets during construction	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 would be detailed within the WSI and compliance will be secured by Requirement 9 to the Draft DCO (**TR010040/APP/3.1**).	Based on the results of geophysical surveys, this locality has the potential for high value buried archaeology.		Contractual responsibilities between Highways England and the Principal Contractor, and the Requirement 9 of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Highways England	P C	Signed: Date:
CH 8	ES – CH6	Name layby “Burlingham Park Layby”	The proposed layby will create a new viewpoint from which North Burlingham Park MNF61984 will be visible. A sign naming the layby as “Burlingham Park Layby” is to be installed. The location will include an interpretation board for heritage but, the need for and content of this will be determined in consultation with NCCES following the results of mitigation excavations across the Proposed Scheme.	Based on consultation with NCCES following the results of mitigation excavations.	A sign and interpretation board to be installed at layby.	Highways England chosen Archaeological specialist will liaise with Principal Contractor and detailed consultees.	Principal Contractor, Highways England	C	Signed: Date:
Landscape and Visual (LV)									
LV1	ES – CH7	Planting	The maintenance of mitigation such as planting, and seeding will be the responsibility of Highways England ensuring all proposed mitigation reaches maturity and reflects the assessment at year 15. Planting and seeding, proposed as mitigation for landscape and visual effects, would 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 Masterplan (**TR010040/APP/6.8**) Sheets 1-7 and compliance with the Landscape and Ecology Management Plan.	To be implemented by Highways England, the Principal Contractor and design team	Principal Contractor, Detailed Design team and Highways England	O	Signed: Date:
LV2	ES – CH7 and TR010040/ APP/6.8 Masterplan	To limit the impact of construction on existing trees and vegetation to be retained	The Principal Contractor will engage an arboricultural consultant to complete the following in advance of works: • complete an arboricultural method statement. The method statement shall include, but are not limited to the following:	Trees to be retained are within close proximity to the works.	Regular site audits and adherence to the Arboricultural Method Statement, Masterplan (**TR010040/APP/6.8**) and ES Appendix 7.7 Arboricultural	To be implemented by the Principal Contractor and the Proposed	Principal Contractor and the Proposed Scheme Arboriculturist	C	Signed: Date:

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			○ Tree protection measures in compliance with BS5837:2012 (Trees in relation to design, demolition, and construction – Recommendations) during the construction phase. ○ Maintenance and monitoring requirements of the tree protection measures ○ Schedule of trees to be removed and retained in compliance with the Masterplan (TR010040/APP/6.8) and ES Appendix 7.7 Arboricultural Impact Assessment (**TR010040/APP/6.2**). ○ Tree root protection zones ○ 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: ○ Checking the robustness and positioning of tree protection fencing. ○ Checking that no materials or plant are stored within the tree root protection zones All trees to be retained or removed are identified within the Arboricultural Impact Assessment (ES Appendix 7.7 (**TR010040/APP/6.2**)).		Impact Assessment (**TR010040/APP/6.2**)	Scheme Arboriculturist			
LV3	ES – Appendix 7.7	Complete BS5837 Arboricultural survey	Arboricultural survey and assessment to be completed for identified trees (non-BS5837) in ES Appendix 7.7: Arboricultural Impact Assessment Plan (APP-084) in accordance with British Standard 5837 2012 prior to construction.		Complete assessment report	To be implemented by the Principal Contractor and the Proposed Scheme Arboriculturist	Principal Contractor and the Proposed Scheme Arboriculturist	P	Signed: Date:
Biodiversity (B)									
B1	ES – CH9	To ensure data on protected species is valid and robust	Ecological 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 Principal Contractor will appoint a suitably qualified ecologists to review 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 the Overseeing organisation and Local Authority Biodiversity Officer.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor and suitably qualified ecologist	P	Signed: Date:
B2	ES-CH9	To protect habitat connectivity	The parts of the two species-rich important hedgerows located on the Masterplan at the west side of Lingwood Lane that would be lost under the Proposed Scheme will be translocated to the area around the soakaway in the field to the west. All other hedgerows and trees to be retained will have root protection zones in place before work commences. Root Protection Zones are detailed in the ES Appendix 7.7 Arboricultural Impact Assessment (**TR010040/APP/6.2**) and will be presented in the Arboricultural Method Statement (LV2). Any trees or hedgerows to be removed will be presented in the Series 0200 Site Clearance drawings. Plant mix and approach to LEMP to be developed in consultation with Norfolk County Council.	Loss of habitat connectivity as a result of the Proposed Scheme.	Compliance with the Masterplan (**TR010040/APP/6.1**) and compliance with the LEMP.	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Design team and Highways England	P C	Signed: Date:

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B3	ES- CH9	To mitigate the effects of the Proposed Scheme on flying species.	The trees to be planted at bat crossing points will be at least 4.5m high and encourage birds and barn owls to cross higher above the road. (see the Masterplan (**TR010040/APP/6.8**)). Scattered broadleaved trees are proposed in a woodland structure to compensate for the loss of trees throughout the Proposed Scheme during construction	Surveys indicate that existing bat commuting routes will be severed by the Proposed Scheme.	Compliance with the Masterplan (**TR010040/APP/6.8**) Sheets 1-7 and compliance with the LEMP.	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Design team and Highways England	P C	Signed: Date:
B4	ES- CH9	To limit impact on Terrestrial Invertebrates and protect habitat connectivity	To compensate for the loss of trees and hedgerows tree planting is proposed along the length of the Proposed Scheme boundary and hedgerows are to be remediated with species-rich native ones as shown on the Masterplan. Planting to contribute to physical separation of the existing and proposed A47, to enhance habitat connectivity along the original A47 corridor, providing a high tree flight line for bats crossing the road. New planting will be used where applicable to create new linkages between habitats to mitigate for severance of bat commuting routes as illustrated on the Masterplan. To minimise risk of mortality to birds, new and continuous habitat in the form of hedgerows, scattered broadleaved trees to include individual 'parkland' trees adjacent to Blofield Overbridge. and species-rich grassland will be provided on both sides of the road as a refuge. This planting will also aid the visual screening from the proposed Scheme. The higher tree flight line will additionally provide a safer road crossing option for birds and barn owls. Species-rich grassland is proposed between the A47 and **High Noon Lane.** (see TR010040/APP/6.8 Masterplan) Species rich grassland is proposed between the A47 and the farm access track (to include scrub in this area). (see TR010040/APP/6.8 Masterplan) Grassland tolerant of damp conditions to contribute to landscape integration and with an added value contribution to species diversity. Habitat piles with dimensions of 1m by 1m are proposed at various points of the Proposed Scheme boundary throughout the design. The management of created habitat will be detailed in the Landscape and Ecology Management plan which will be produced at detailed design and included in the 2nd iteration of the EMP	Loss of habitat as a result of the Proposed Scheme.	Compliance with the Masterplan (**TR010040/APP/6.8**) and compliance with the LEMP.	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Design team and Highways England	P C	Signed: Date:
B5	ES – CH9	To limit impact on protected species - Bats	Habitat creation in the form of artificial roosting habitat (12 bat boxes) (see the Masterplan (**TR010040/APP/6.8**)) will be installed prior to the start of construction under a precautionary method statement. (describes the safety precautions to be put in place to control risks and impacts identified in the ES. 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 and under a fully detailed precautionary method statement. Works near trees and that may disturb roosting bats in buildings will be undertaken under supervision from a registered bat licence holder. As a first principle, the Contractor will seek to avoid disturbance to the trees identified within bat roosts. This will be explored in the detailed design stage and a licence will be applied for prior to activities if required.	Loss of habitat as a result of the Proposed Scheme. Impact on protected species.	Compliance with the precautionary method statement and Masterplan (**TR010040/APP/6.8**).	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Highways England	P C	Signed: Date:

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B6	ES – CH9	To limit impact and protect breeding birds	Prior to vegetation clearance, provision of alternative artificial refuges(as shown on the Masterplan (**TR010040/APP/6.8**)) will be provided for bird species to mitigate loss of habitat will be completed. Species specific bird boxes for kestrel, turtle dove, swift and tawny owl and barn owl are proposed in addition to general open-fronted nest boxes for all other breeding birds. Bird boxes (artificial refuges) will be erected prior to vegetation clearance. 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). Alternatively, construction can be phased so that construction activities can commence in areas unsuitable for supporting any breeding birds. Suitable planting will be used to provide opportunities for above ground habitat, and foraging habitat for other species. Four skylark scrapes will be provided, where grassland is maintained to provide nesting habitat for skylark. This will mitigate the effect of the arable habitat loss that will occur as a result of the construction of the new road. Enhancement for birds includes the addition of an attenuation pond incorporating wetland planting. The extra heavy and heavy standard trees to be planted at bat crossing points will be at least 4.25 high respectively at initial planting and encourage birds and barn owls to cross higher above the road. Locations are indicated in the Masterplan (**TR010040/APP/6.8**).	Loss of habitat as a result of the Proposed Scheme. Impact on protected species.	Compliance with Masterplan (**TR010040/APP/6.8**) and the LEMP	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the Draft DCO (**TR010040/APP/3.1**).	Principal Contractor, Highways England	P C	Signed: Date:
B7	ES – CH9	To limit the impacts of construction on protected species	Vegetation clearance will be supervised by an ECoW and timings stipulated in the **Landscape and Ecology Management Plan** (LEMP). Tool-box talks will be given by the ECoW and excavations will either be covered at night, or a ramp left in, so animals can climb out.	Animals are likely to move within the redline boundary	Regular site audits and supervision of vegetation clearance	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
B8	ES – CH9	To limit transfer of diseases during construction	The risk of transfer of diseases during construction will be mitigated by implementation of a Biosecurity Management Plan which will be provided by the Principal Contractor prior to construction commencing works on site.	Not applicable.	Compliance with Biosecurity Management Plan in the LEMP.	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the DCO.	Principal Contractor	P C	Signed: Date:
B9	ES – CH9	To manage and mitigate the spread of Invasive Non-Native Species (INNS)	The risk of introduction 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 site boundaries. The INNS plan will also cover animal biosecurity if necessary. The INNS will be provided by the Principal Contractor prior to the commencing works on site.	INNS must be contained in order to reduce risk of spreading and damage.	Compliance with INNS Management plan in the LEMP.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor and suitably qualified ecologist	P C	Signed: Date:

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B10	ES – CH9	To protect GCN	Prior to construction works, a suitably qualified ecologist will undertake a GCN survey to determine the presence of the species on the site. (Due to Covid-19 Restrictions, GCN surveys were partially incomplete). If a GCN is identified within 500m of the works, then they would need to be undertaken in those parts of the site affected under a Natural England mitigation licence. It would be necessary to find or create suitable receptor sites that include both breeding and terrestrial habitat. Newts would be removed from the area of works prior to commencement.	A complete survey of GCN was not completed prior to DCO submission due to restrictions during Covid-19.	A GCN survey and associated report will be undertaken by a suitably qualified ecologist. eDNA GCN surveys must be undertaken between 15 April and 30 June.	Contractual responsibilities between Highways England and the Principal Contractor, and the Requirements of the DCO.	Principal Contractor and suitably qualified ecologist	P C	Signed: Date:
B11	ES – CH9	To monitor protected species – post mitigation	Post-development monitoring will be required for newly created habitats (as identified on the Masterplan (TR010040/APP/6.8) and protected species and will be detailed in the LEMP. (LEMP will be created during detailed design and will be included in the 2nd iteration of the EMP (Construction). 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.	The design of the Proposed Scheme has incorporated new habitat, bird and bat boxes	Compliance with the Landscape and Ecology Management Plan	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor, Detailed Design team and suitably qualified ecologist	O	Signed: Date:
B12	ES – CH9	To mitigate impacts on bats	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. Further details will be identified as part of a **Landscape and Ecology Management Plan** (LEMP).		Compliance with the Ecology Management Plan	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor, Highways England and suitably qualified ecologist	O	Signed: Date:
Geology and Soils (GS)									
GS 1	ES - CH10	The protection of soil structure and quality – to prevent degradation of soils both within and outside the permanent and temporary development areas	The Principal Contractor will prepare a Soil Management Plan (SMP) incorporating guidance provided by the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009), will be produced to ensure the use of best practice measures for soil handling. The SMP will include a Soil Resource Plan and a Soil Handling Strategy, based on a soil resource survey. The re-use of excavated soils (on or off the site) during construction shall be governed by a materials management plan (MMP) prepared by the Principal Contractor. The MMP shall be developed in accordance with the CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2, 2011. This approach offers the most effective method of ensuring materials can be re-used on or off the Proposed Scheme. Suitability for re-use requires chemical and geotechnical assessment to demonstrate that surplus materials do not constitute waste. The MMP will detail the procedures and measures to be implemented to classify, track, store, re-use and dispose of all excavated materials encountered during the construction phase. The SMP and MMP would outline areas of soil to be protected from earthworks and construction activities; the areas and types of topsoil and subsoil to be stripped, haul routes, stockpile locations; the methods for stripping, stockpiling, re-spreading and ameliorating landscape soils and restoring temporary land take areas, and a cut and fill balance to ensure as much material as possible is re-used in the Proposed Scheme. All affected soil will be stripped, including topsoil and subsoil, and stored separately. Soil stripping, handling and storage will be monitored/audited to ensure that it follows the procedures outlined in the SMP. Following the reinstatement of the temporary land take, there would be a programme of monitoring of soil conditions to identify if there are soil problems which need to be remediated. This would include an assessment of the problem and design of a suitable	Not applicable.	Completion of SMP and MMP	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			remediation strategy such as subsoiling or drainage followed by crop establishment. Appropriate Site Management documentation shall be held on Site to guide and plan for the actions which shall be undertaken in the event of a suspected or real UXO discovery. The Principal Contractor will prepare earthwork construction specification which will set out appropriate actions and methods for dealing with any unforeseen occurrences of soil.						
GS 2	ES - CH10	To maximise the re-use of suitable geological resources while minimising waste generated	Where there are excess soils generated, these will be saved and reused outside the Proposed Scheme where there are opportunities to do so.	Not applicable	Detailed in the MMP	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
GS 3	ES - CH10	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 no worse than the baseline condition. The Agricultural Land Classification survey will establish the baseline condition and will be completed prior to construction.	Not applicable	Detailed in the SMP	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P	Signed: Date:
GS 4	ES - CH10	To mitigate waste	The following mitigation measures with respect to material assets and waste have been considered to date. They will be further considered and implemented where applicable during the detailed design phase and subsequent construction work: • Design for re-use and recovery by identifying, securing and using materials that already exist on the Proposed Scheme, or can be sourced from other projects. A CDW recovery and or recycling rate of 70% will be set in the environmental management plan (EMP). • Design for materials optimisation by simplifying layout and form to minimise material use. Using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content in line with the 31% target (to be set in the Material Management Plan) for the east of England region as provided in the National and Regional Guidelines for Aggregates Provision in England 2005 and 2020[5]. • Design for offsite construction by maximising the use of prefabricated structures and components, encouraging a process assembly rather than construction on the site.	Not applicable	Detailed in the MMP	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:

[5] National and regional guidelines for aggregates provision in England 2005-2020 (2009) Ministry of Housing, Communities and Local Government.

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			• Design for the future by considering extent to which key materials can be demounted and recycled. • Design for waste efficient procurement. • Engineering plan configurations and layouts that show how the most effective use of materials assets (including site-won arisings) can be achieved						
Materials and Asset Waste (M1)									
M1	ES - CH10	To maximise the re-use of suitable geological resources while minimising waste generated	The Principal Contractor shall develop a Site Waste Management Plan. The SWMP shall 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. An outline SWMP for the Proposed Scheme is provided within Annex B.2 The EMP and SWMP require the principal contractor to adopt best practice in the management of construction waste to reduce waste generation and subsequent landfill disposal. Mitigation measures shall include: Consideration, in accordance with the waste hierarchy, to the re-use of waste generated onsite before it is transported off-site for re-use or disposal. Use of site won materials or recycled material assets within the Proposed Scheme redline boundary that meet the appropriate Waste and Resources Action Programme (WRAP) Quality Protocols. The adoption of good practice in construction waste management in accordance with the principles outlined in WRAP guidance document Achieving good practice Waste Minimisation and Management, Guidance for construction clients, design teams and contractors. Re-use and recycling of materials offsite where re-use within the Proposed Scheme redline boundary is not possible. Use of material logistics planning to manage procurement, storage and use of material assets and minimise damage, over ordering and wastage. Measures to encourage local and responsible resourcing of material assets (for example through adoption of BES 6001 Responsible Sourcing of Construction Products and efficiencies by minimal ordering of materials. 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. A requirement for wastes that cannot be reused or recycled on site to be transported only to appropriately permitted recycling or disposal sites.	Not applicable	Completion of the SWMP	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
M2	ES - CH10	To facilitate waste disposal	Where material must be taken to a recycling or disposal site, these sites must have the appropriate permits and should be located as close to the works as possible.	Assumed waste infrastructure has capacity locally.	Compliance of the SWMP (Live document)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
Noise and Vibration (N)									
N1	ES - CH11	To limit and control noise and vibration	The Principal Contractor will develop a **Construction Noise and Dust Management Plan (Annex B.5)** to manage likely significant environmental effects.	Sensitive receptors within the vicinity of the Proposed Scheme.	Compliance with construction noise and dust management plan	Contractual responsibilities between Highways England and the	Principal Contractor	P C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
		during construction	Construction noise shall be limited to less than the noise SOAEL (Significant Observed Adverse Effect Level) values presented in the ES Appendix 11.5 Construction noise assessment (TR010040/APP/6.2). Likely significant environmental effects from noise and/or vibration during construction shall be monitored. Monitoring of likely significant effects where relevant, shall include: • Measurement of noise during construction at locations representative of R12 (**Hornbeam Cottage**) and R13 (**The Lindens**) during earthworks and road formation. • Measurement of vibration at locations representative of R19 (**The White House, White House Lane**) during vibratory compaction works. • Verification that specific noise and vibration mitigation measures are in place for activities where there is potential for significant effects to occur • checking that noise and vibration management procedures and practices are sufficient to ensure that significant adverse effects are avoided. During construction, **Poplar Farm** will be monitored for vibration which may affect the structure. Protocols will be established following best practice guidance to ensure vibration levels are kept within acceptable tolerances to avoid damage and to halt or alter works methodology should tolerances be exceeded.			Principal Contractor			
N2	ES - CH11	To limit and control noise and vibration during construction at sensitive receptors	The 4 permanent noise barriers (locations shown in the Masterplan (TR010040/APP/6.8) that form part of the embedded mitigation for operational noise shall be built as early as possible in the construction programme so that they can offer noise mitigation during the construction phase. This would be of particular benefit to receptors: • (R12) **Hornbeam Cottage Lingwood Road North Burlingham Lingwood And Burlingham Norwich NR13 4ST** • (R13) **The Lindens, Lingwood Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4ST** • (R20) **The Coach House, White House Lane, North Burlingham, Beighton, Norwich, NR13 4EL** Temporary noise barriers shall be provided at residential receptor locations described below where construction activity in the vicinity of the receptor will exceed 10 days or nights in any 15 consecutive days or nights; or for a total number of days exceeding 40 in any six consecutive months. Temporary noise barriers shall have a minimum mass per unit of area of at least 7 kg/m2 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. Receptor locations include: R2- 97 **Melai, Yarmouth Road, Blofield, Norwich, NR13 4LQ** • Phase 4 – surfacing • Phase 7 – road formation surfacing R3-109 **Milestone Piece, Yarmouth Road, Blofield, Norwich, NR13 4LQ** • Phase 4 – surfacing • Phase 7 – road formation surfacing R7-**Sunny Acres, Yarmouth Road, Blofield, Norwich, NR13 4LH**	Community sensitive receptors	Mitigation measures to be included in the EMP	Regular Site Audits	Contractual responsibilities between Highways England and the Principal Contractor	P C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			• Phase 5 – road formation surfacing • Phase 6 – earthworks road formations R8-**Sparrow Hall Bungalow, Yarmouth Road, Blofield, Norwich, NR13 4LH** • Phase 1 – earthworks • Phase 3 – earthworks • Phase 6 – earthworks R9-**Brienz, Waterlow, Blofield, Norwich, NR13 4LJ** • Phase 1 – earthworks road formation R11-**The Old Post Office, Norwich Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4SU** • Phase 1 – earthworks road formation R12-**Hornbeam Cottage Lingwood Road North Burlingham Lingwood And Burlingham Norwich NR13 4ST** • Phase 1 – earthworks road formation R13-**The Lindens, Lingwood Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4ST** • Phase 1 – earthworks road formation R14-4 **Main Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4TA Phase 4 – surfacing** • Phase 1 – earthworks road formation R15-18 **Island House, Main Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4TA** • Compound set up- earthworks • Phase 1 – earthworks road formation, structures surfacing R20-**The Coach House, Acle Road, North Burlingham, Beighton, Norwich, NR13 4EL** • Compound set up- earthworks • Phase 1 – earthworks surfacing Real-time noise monitoring will be undertaken by the contractor at positions that represent receptors R12 and R13. Where levels are found to be in excess of those predicted in the ES, Chapter 11 **(TR010040/APP/6.1)**, further mitigation measures will be implemented in discussion with affected property owners.						
N3	ES - CH11	To limit and control noise and vibration during construction	Where piling and/or vibratory compaction is required, the method will be agreed in advance with the relevant planning authority where the works are within 15m of residential receptors. The contractor will assess these activities in greater detail and with more certainty at the next design stage and demonstrate that significant effects are avoided, otherwise the contractor shall: 1. carry these works out only during the daytime; 2. inform the occupiers of the likely times and duration of works;	Sensitive receptors within the vicinity of the Proposed Scheme.	Regular site audits Compliance with construction noise and dust management plan (Annex B.5)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			3. monitor the vibration levels. Real-time alerts can be provided to notify the Contractor when vibration from works approaches the defined SOAEL levels, at which time methods of work can be altered; and 4. carry out a building condition survey at relevant properties to identify any sensitive aspects of the building and to ensure the current status of the building is recorded. During construction, Poplar Farm will be monitored for vibration which may affect the structure. Protocols will be established following best practice guidance.						
N4	ES - CH11	To limit and control noise and vibration during construction	The likely significant environmental effects from noise during operation shall be monitored and include: • Ensuring mitigation measures included within the design are incorporated within 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.	Sensitive receptors within the vicinity of the Proposed Scheme.	Compliance with construction noise and dust management plan (Annex B.5)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
N5	ES - CH11	To limit and control noise and vibration during construction	In support of limiting and controlling noise and dust during construction, the Principal Contractor may use, inter alia, the following good working practices to minimise impacts on community and ecological receptors: Select quieter plant than those assumed within this assessment where practicable; • 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 on certain noisy and vibratory activities such as earthworks and surfacing; Manage deliveries to prevent queuing of site traffic; 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; • Materials to be lowered instead of dropped from height; • Materials shall be delivered so noise impacted is mitigated as far as practicable consistent with best guidance • Alternative reversing warning systems such as white noise alarms shall be employed where practicable. • The Contractor shall advise members of the construction team during toolbox talk briefings on quieter working methods; • Any fixed plant such as generators shall be positioned at least 20m from nearest receptor.	Sensitive receptors within the vicinity of the Proposed Scheme.	Compliance with construction noise and dust management plan (Annex B.5)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
N6	ES - CH11	To limit and control noise and vibration during construction	In order to avoid potential significant effects, construction related traffic can use the A47 as required, provided that the maximum number of HGV movements described in ES Chapter 2 (**TR010040/APP/6.1**) Table 2-4 are not exceeded. Multiple diversion routes should be used when full carriageway closures are required at night to mitigate the adverse noise impact on receptors along these routes where proportionate and practicable.	Sensitive receptors within the vicinity of the Proposed Scheme.	Compliance with traffic management plan	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
N7	ES - CH11	To limit and control noise and vibration during construction	The new A47 dual carriageway shall be surfaced with a low-noise road surface. For this high-speed carriageway, the surface material shall be specified to reduce road traffic noise by 3.5dB $L_{A10,18hr}$ when compared with conventional surfacing.	Sensitive receptors within the vicinity of the Proposed Scheme.	Mitigation measure to be included in the EMP.	Contractual responsibilities between Highways England and the	Principal Contractor	C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			This surface material specification shall be installed and maintained thereafter throughout the lifespan of the Proposed Scheme.			Principal Contractor			
N8	ES - CH11	To limit and control noise and vibration during operation of the Proposed Scheme	Noise barriers have been included as part of the Proposed Scheme design at the locations described in ES Chapter 11 (**TR010040/APP/6.1**) Table 11-11 and as presented in ES Figure 11.2 Operational noise barriers (**TR010040/APP/6.3**) and Masterplan (**TR010040/APP/6.8**). The locations of the noise barriers are presented in ES Figure 11.2 (Operational noise barriers) (**TR010040/APP/6.3**). The barrier heights within ES Table 11-11 must be regarded as the height difference between the top of the acoustic barrier and the local height of the carriageway.	Sensitive receptors within the vicinity of the Proposed Scheme.	Compliance with Masterplan (**TR010040/APP/6.8**) Sheets 1-7 and General Arrangement Plans (**TR010040/APP/2.6**)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
N9	ES - CH11	To limit and control noise and vibration during operation of the Proposed Scheme	Existing A47 mainline to be resurfaced with low noise road surfacing at the area impacting the noise important area 5206 before year of opening of the Proposed Scheme.	Sensitive receptors within the vicinity of the Proposed Scheme.	Mitigation measure to be included in the EMP.	Highways England	Highways England	P C	Signed: Date:
Population and Human Health (PHH)									
PH H1	ES – CH12	To maintain accessibility during construction	The Proposed Scheme shall be constructed to reduce the need to close and divert footways, PRoW and cycle facilities. Where a closure of a WCH route is required, safe and appropriate alternative routes would be provided to ensure access is maintained during construction and closure would be agreed with the local authority The principal contractors would agree all temporary diversion routes with the local highway authority. Appropriate signage for all closures or diversions would be used to provide sufficient notice of such closures or diversions.	Local traffic and Walkers, cyclists and horse-riders will still require access around the area.	Implementation of measures outlined in the TMP (**TR010040/APP/7.8**)	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
Road Drainage and the Water Environment (W)									
W1	ES – CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	During construction, best practice methods for pollution prevention and water management would be implemented as part of a **water monitoring and management plan** (prepared by the Principal Contractor). Guidance on best practice in relation to pollution prevention and water management is set out in CIRIA guidelines (Charles and Edward, 2015; Gaba et al. 2017; Murnane et al., 2006) and the Environment Agency's approach to groundwater protection (Environment Agency, 2017a) and groundwater protection guides (Environment Agency, 2017b).	Watercourses and sensitive ecological sites within the vicinity of the Proposed Scheme.	Compliance with a water monitoring and management plan.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	P C	Signed: Date:
W2	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	The potential for impacts to occur as a result of contamination from accidental spillages should be minimised by construction best practice guidance.	Sensitive ecological sites within the vicinity of the Proposed Scheme	Compliance with a water monitoring and management plan.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
W3	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the	There are construction activities planned immediately adjacent to a number of ordinary watercourses or drainage ditches. As such, consent from Norfolk County Council may be required. There are no works proposed within 8m of a designated main river and as such, no consent (in the form of a Flood Risk Activity Permit) would be required from the Environment Agency. In addition to this, there are no works proposed	sensitive ecological sites within the vicinity of the Proposed Scheme	Agreement with Norfolk County Council regarding the construction activities in close proximity to the ordinary watercourses	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
		construction phase.	immediately adjacent to a watercourse managed by an Internal Drainage Board, and therefore no consent is required from the Internal Drainage Board.						
W4	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	As far as is practicable, no pollution pathways should be created between the construction sites, including material lay down areas, and ordinary watercourses or drainage ditches. Measures shall be implemented to prevent surface water runoff containing suspended sediment reaching ordinary watercourses or drainage ditches through overland flow during rainfall events. This shall include an appropriate treatment train to prevent accidental spillages reaching groundwater, remove sediment and other contaminants as well as attenuating runoff. This shall be specified as part of a temporary surface water drainage strategy within the EMP prepared by the Principal Contractor.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Compliance with a water monitoring and management plan and temporary surface drainage strategy.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
W5	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	Where works will lead to temporary changes in the surface water runoff regime by the alterations of ground elevations and overland flow pathways, including compounds, temporary drainage shall ensure that there will be no increase in runoff or pollutant load to groundwater during construction. Temporary drainage will be reported in the temporary surface drainage strategy.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Compliance with the drainage strategy	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
W6	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	During construction, increased flood risk and negative impacts on surface water receptors can be caused by: • extreme rainfall events • by the compaction of soils • pond infilling • an increase in hard standing areas • alteration of ground elevations and alteration of overland flow pathways. A temporary surface water drainage strategy shall be incorporated into the EMP to prevent increased flood risk to people and property elsewhere, and to manage pollution risks most commonly associated with increased sediment loading. Permanent drainage systems will be constructed in the early stages of the Proposed Scheme as far as is practicable.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Compliance with a water monitoring and management plan and temporary surface drainage strategy.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor	C	Signed: Date:
W7	Not used								
W8	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	The potential impact from the loss of a water feature due to the in filling of the pond at Lingwood Road shall be mitigated by the provision of a replacement pond shown on Masterplan (TR010040/APP/.8). The pond mitigation shall include: • area of 0.08ha or larger • pond profile to include variously graded banks • pond margins to be shelved or shallow graded • water depth should include both deep and shallow areas • pond to include one or more islands suitable for nesting birds • vegetation planting around the pond to include a mosaic of longer grasses and scrub with denser groups of shrubs and occasional individual trees for cover • located away from large/tall groups of vegetation planting to avoid leaf litter accumulation and shading	sensitive ecological sites within the vicinity of the Proposed Scheme.	GCN survey to be carried out to determine presence at the site.	Contractual responsibilities between Highways England Principal Contractor	Principal Contractor and Design Team	P C	Signed: Date:

Ref	Doc Ref	Objective	Action (including specific location if applicable)	Assumptions (on which the action is based)	Achievement criteria and reporting / monitoring requirement (if applicable)	How the action is to be implemented	Responsible person(s)	When P = Pre-construction C = Construction O = Operation A = All	Completion Record
			Surveying for great crested newts at the Lingwood Road pond will be completed as part of pre-construction surveys. The survey will be undertaken by a suitably qualified ecologist.						
W9	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	The design and construction of all below ground structures, including piling works and other foundation works, should aim to minimise the potential to impact on either groundwater supply or groundwater quality affecting relevant and applicable receptors. Specific mitigation measures to achieve this include: • The piling design should be selected to appropriately minimise disturbance to groundwater flows and thus supply to indirect receptors. • The piling method should minimise the generation of suspended solids that may impact nearby indirect receptors. • A piling risk assessment shall be undertaken prior to commencement of the works. Environment Agency guidance on minimising pollution risk due to piling should be adhered to (Environment Agency, no date; 2001; and Westcott et al., 2001). • Construction materials should be chosen appropriately to minimise groundwater contamination via direct contact, as far as is practicable.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Mitigation to be reviewed at detailed design stage. A piling risk assessment to be prepared.	Contractual responsibilities between Highways England and the Principal Contractor	Principal Contractor and Design Team	P C	Signed: Date:
W 10	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	Although excavations for the gas main diversion are not anticipated to encounter the saturated aquifer, construction design and site management should include measures to minimise the risk of the creation of a contamination pathway from within the open excavation. Furthermore, no materials hazardous to controlled waters shall be included in backfill material.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Regular site audit Compliance with Materials Management Plan and water monitoring and management plan.	Contractual responsibilities between Highways England and the Principal Contractor	Contractual responsibilities between Highways England and the Principal Contractor	P C	Signed: Date:
W 11	ES - CH13	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase.	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 EMP. The mitigation strategies implemented will be reviewed regularly to best suit the practices currently being undertaken on site. As there are no anticipated discharges to surface water (drainage ditches and ordinary watercourses), it is anticipated that monitoring of these features will not be required. This is subject to further discussion with the Environment Agency.	sensitive ecological sites within the vicinity of the Proposed Scheme.	Inspections and audits with general monitoring will be incorporated a water monitoring and management plan.	Contractual responsibilities between Highways England and the Principal Contractor	Contractual responsibilities between Highways England and the Principal Contractor	P C	Signed: Date:
W 12	ES – APP13.2	To mitigate potential adverse effects upon surface waters and groundwater during the operational phase.	To secure the long term management and maintenance of the drainage system in accordance with the drainage strategy (TR010040/APP/6.2).	sensitive ecological sites within the vicinity of the Proposed Scheme	Compliance with the drainage strategy	Highways England to implement	Highways England	O	Signed: Date:
Climate (C)									
C1	ES – CH14	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	Not applicable.	As built and construction activity data.	Recording of construction activity, material deliveries, plant used and fuel consumption.	Principal Contractor	P C	Signed: Date:

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			key performance indicator "Carbon dioxide equivalents (or CO2e) in tonnes associated with the Supply Chain's activities" (Highways England 2019).						
C2	ES – CH14	Reduce carbon emissions	The largest carbon areas of the Proposed Scheme include Earthworks, Pavement and Drainage series of the bill of quantities. These areas will be communicated with the design team to ensure efficiencies can be made before the Proposed Scheme reaches detailed design.	Carbon calculations		The Design team will review the Carbon calculations at detailed design stage.	Design team in consultation with the Principal Contractor and Highways England.	P	Signed: Date:
C3	ES – CH14	Evaluate climate change projections	No significant adverse effects as a result of climate have been identified therefore no monitoring is required. However, it is noted that climate change projections are likely to change within the appraisal period of the Proposed Scheme, therefore the vulnerability of the Proposed Scheme to such changes should be reviewed as and when updated projections become available	Climate change projections are anticipated to change.		The Design team will review the climate change projections at detailed design stage.	Design team in consultation with the Principal Contractor and Highways England	P	Signed: Date:

4. Consents and permissions

4.1. Consents and licences position statements

4.1.1. A Consents and Licences Position Statement (**TR010040/APP/3.3**) has been submitted as part of the 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 confirms 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 Principal Contractor (PC), insofar as they relate to the environmental aspects of the Proposed Scheme.

[Note: This chapter will need to be updated for the EMP 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 licences

4.2.1. As outlined in the Consents and Licences Position Statement (**TR010040/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 Licences Position Statement (**TR010040/APP/3.3 Rev 2**). It is the responsibility of the Principal Contractor and the appropriate appointed specialist to obtain these licences.

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[6].

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:

5.1.3. “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).”

5.1.4. 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.

5.1.5. 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.

[6] Highways England Asset Management Development Group – ADMM Part 2 – Requirements and Additional Information

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 Principal Contractor 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 Proposed 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 Proposed 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. Species surveys obtained until this point

5.4.1. The following species surveys have been undertaken to information the environmental assessment (**TR010040/APP/6.1-6.4**):

- Bat survey (2018, 2020)
- Wintering bird survey (2019)
- Breeding bird survey (2018, 2020)
- Terrestrial invertebrates survey (2020)
- Reptile survey (2020)
- Phase 1 Habitat survey (2016, 2017)

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 (**TR010040/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 Noise and Dust Management Plan** (Annex B.5)
CH1-6	Preservation by record or protection of archaeological remains	Consultation with the Local Authority Archaeology Advisor (Norfolk County Council) and Historic England to agree Written Scheme of Investigation Production of a WSI. Appointment of an archaeological subcontractor to undertake the agreed works (which will include monitoring)	Monitoring requirements identified in the Written Scheme of Investigation Toolbox talks that include instruction methods to allow operatives to identify potential archaeological remains Publication of results of archaeological works.

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
L1	Ensuring planting reaches maturity	Mitigation included in the ES Chapter 7 Landscape and Visual (**TR010040/APP/6.1**)	The maintenance of mitigation such as planting and seeding will be the responsibility of Highways England ensuring all proposed mitigation reaches maturity and reflects the assessment at year 15. Planting and seeding is covered by the 12 month defect period post opening. Further details will be identified as part of a **Landscape and Ecology Management Plan** (LEMP).
L2	Protection of retained vegetation	Trees to be retained as presented in the Appendix 7.7 Arboricultural Impact Assessment (**TR010040/APP/6.2**)	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.
B5	Protection of bat roosts	Mitigation included in the ES Chapter 8 Biodiversity (**TR010040/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.
B6	Protection of breeding birds	Mitigation included in the Chapter 8 Biodiversity (**TR010040/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).
B7	Vegetation clearance	Mitigation included in the ES Chapter 8 Biodiversity (**TR010040/APP/6.1**)	Vegetation clearance will be supervised by an ECoW and timings stipulated in the **Landscape and Ecology Management Plan.**
B11	Protection of newly created habitat	Mitigation included in the ES Chapter 8 Biodiversity (**TR010040/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).** 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.
B13	Monitoring protected bat species	Mitigation included in the ES Chapter 8 Biodiversity (**TR010040/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. Further details will be identified as part of a **Landscape and Ecology Management Plan (LEMP).**
GS1	Protection of site soils	Mitigation included in the ES Chapter 9 Geology and Soils (**TR010040/APP/6.1**)	Soil stripping, handling and storage will be monitored / audited to ensure that if follows procedures outlined in the **Soil Management Plan.**

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
M1	Monitoring waste recovery rate and proportion of secondary and recycled aggregate	Mitigation included in the ES Chapter 10 Materials and Waste (**TR010040/APP/6.1**)	The Principal Contractor shall develop a **Site Waste Management Plan**. The SWMP shall 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.
N1	Protection of sensitive noise receptors	Mitigation included in the ES Chapter 11 Noise and Vibration (**TR010040/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 (TR010040/APP/6.2 Appendix 11.5 Construction noise assessment) Likely significant environmental effects from noise and/or vibration during construction shall be monitored. Monitoring of likely significant effects where relevant, shall include: • Measurement of noise during construction at locations representative of R12 (Hornbeam Cottage) and R13 (The Lindens) during earthworks and road formation. • Measurement of vibration at locations representative of R19 (The White House, White House Lane) during vibratory compaction works. • Verification that specific noise and vibration mitigation measures are in place for activities where there is potential for significant effects to occur • checking that noise and vibration management procedures and practices are sufficient to ensure that significant adverse effects are avoided. During construction Poplar Farm will be monitored for vibration which may affect the structure. Protocols will be established following best practice guidance to ensure vibration levels are kept within acceptable tolerances to avoid damage and to halt or alter works methodology should tolerances be exceeded.
N4	Protection of sensitive noise receptors	Mitigation included in the ES Chapter 11 Noise and Vibration (**TR010040/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.

REAC Reference	Objective	Source of Monitoring requirements	Summary of individual inspection, auditing and reporting requirements
W11	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 (**TR010040/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 EMP. The mitigation strategies implemented will be reviewed regularly to best suit the practices currently being undertaken on site. As there are no anticipated discharges to surface water (drainage ditches and ordinary watercourses), it is anticipated that monitoring of these features will not be required. This is subject to further discussion with the Environment Agency.

[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 induction; and on-site training].

6.3. Inspection, reporting and auditing requirements

6.3.1. The Principal Contractor 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 Principal Contractor via the following methods:

- Regular site audits and monitoring will be undertaken by the environmental manager, the ecological clerk of works, 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.
- Principal Contractor general foremen and engineers will inspect their work areas on a regular basis.
- Spot checks by the Principal Contractor construction team will be undertaken of supply chain briefings, risk assessments, method statements, check sheets and permits.
- Periodic audits and checks by the Principal Contractor regional environmental advisor and environment and sustainability manager.

- Periodic reviews will be undertaken by Principal Contractor 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 Principal Contractors 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 Principal Contractor 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 Principal Contractor 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 Principal Contractors standards shall be rigorously implemented and incorporate the following requirements shown at Table 6-2 under ISO 14001.

Table 6-1 : ISO 14001 Standards

ISO14001 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 Principal Contractor 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 Principal Contractor will be responsible for site inductions and training of all personnel including visitors, full time staff and supply chain providers.

7.1.3. The Principal Contractor 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 Principal Contractor 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 Principal Contractor will communicate the environmental objectives and requirements of the Proposed 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:

7.2.3. 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

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

Table 7-1 : Toolbox talks titles

Principal Contractor – Toolbox talks reference	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
HS&S-TBT-E03-310	Water voles

Principal Contractor – Toolbox talks reference	Title
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-W01-303	Waste segregation
HS&S-TBT-W05-301	Water pollution prevention
HS&S-TBT- W05-302	Water pollution – silt

Principal Contractor – Toolbox talks reference	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
HS&S-TBT-E03-302	Japanese knotweed

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 induction; and on-site training].

8. References and glossary

8.1. References

8.1.1. References are included as footnotes in the text.

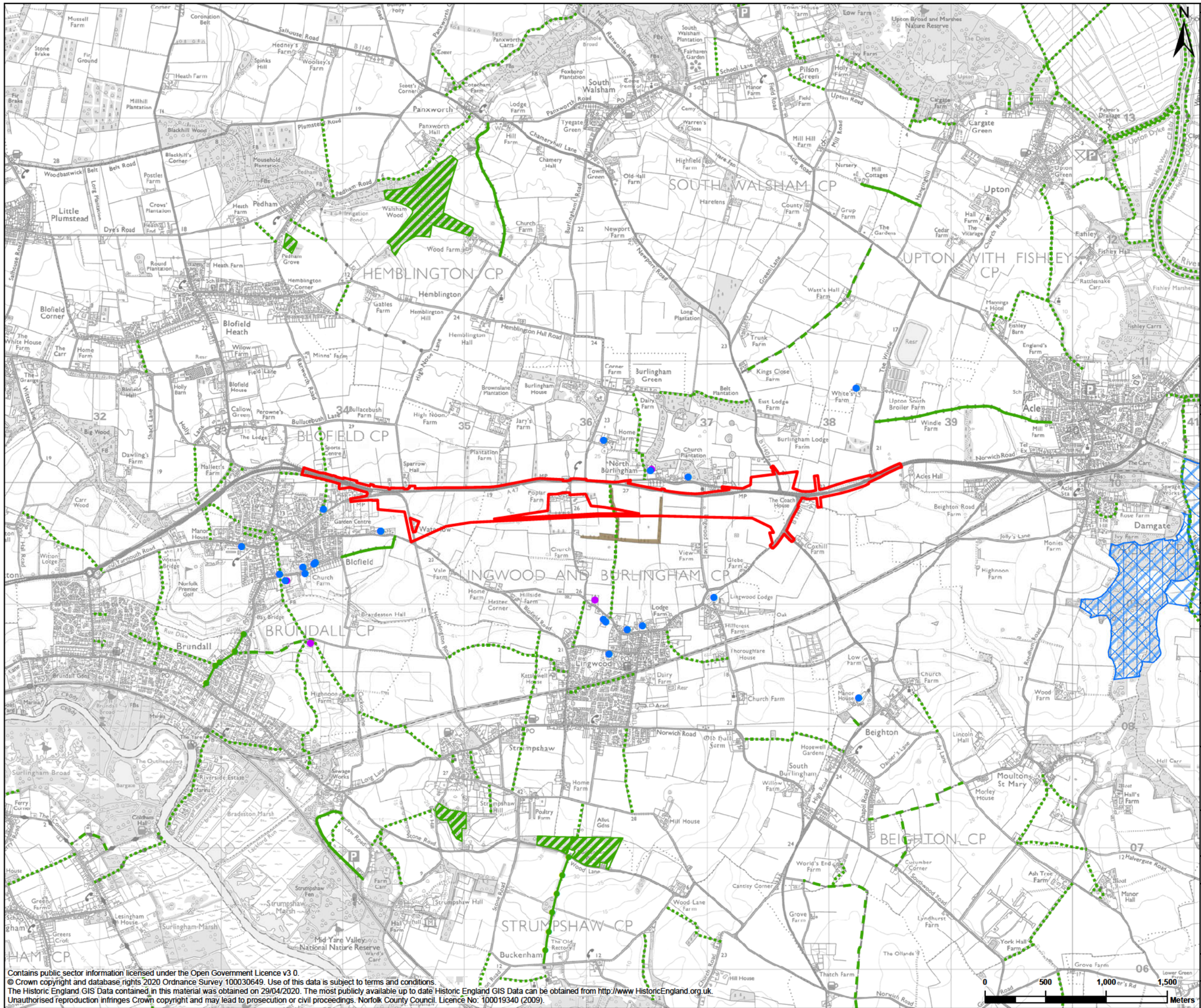
8.2. Glossary

Table 8-1 : Glossary

Terms or abbreviation	Definition
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
DIO	Defence Infrastructure Organisation
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
EPS	European protected species
ES	Environmental Statement
HE	Highways England
ISO 140001	International Organisation for Standardisation Standard for Environmental management systems
MMP	Materials management plan
NE	Natural England
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

Terms or abbreviation	Definition
RPG	Registered park and garden
SAC	Special area of conservation
SHMP	Soil handling and management plan
SoS	Secretary of State for Transport
SRN	Strategic road network
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 Proposed Scheme including health, safety, wellbeing or environment.
WSI	Written scheme of investigation

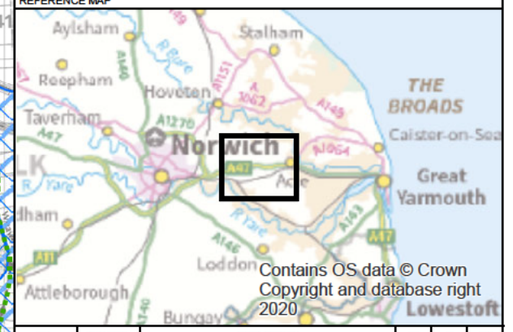
Annex A. Constraints maps



LEGEND

- Red line boundary
- Statutory Designated Sites
- International Designated Sites
- Ramsar site
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- National Designated Sites
- Site of Special Scientific Interest (SSSI)
- Ancient woodland
- Lingwood Community Woodland
- Bridleway (PRoW)
- Byway open to all traffic (PRoW)
- Footpath (PRoW)
- Restricted byway (PRoW)
- Listed building grade I
- Listed building grade II

REFERENCE MAP



REV	DATE	REVISION NOTE	ORG	CHK'D	APP'D
P01	02/11/2020	FIRST EDITION	PC	IC	DW

DESIGNER: SWECO

CONTRACTOR: GallifordTry

CLIENT: highways england

PROJECT TITLE: A47 BLOFIELD TO NORTH BURLINGHAM

PROJECT STAGE: PCF STAGE 3

DRAWING TITLE: ANNEX A - ENVIRONMENTAL CONSTRAINTS PLAN

SUITABILITY: FOR INFORMATION

SHEET SIZE	SCALE	STATUS
A3	1:30,000	S2

DRAWING NUMBER: HE551490-GTY-EGN-000-DR-GI-30011

Annex B. Relevant management Plans

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

- Annex B.1 Water monitoring and management plan
- Annex B.2 Biosecurity Management Plan
- Annex B.3 Materials Management Plan (MMP)
- Annex B.4 Soil Handling Management Plan
- Annex B.5 Construction Noise and Dust Management Plan
- Annex B.6 Construction Communication Strategy
- Annex B.7 Landscape and Ecology Management Plan

NOTE: that the outline Site Waste Management Plan (**TR010040/APP/6.2**) and outline Traffic Management Plan (**TR010040/APP/7.8**) 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.1 Outline Water Monitoring and Management Plan

1. Introduction and background to the Scheme

1.1. Introduction

This document is the outline Water Monitoring and Management Plan, (hereafter referred to as WMMP) for the A47 Blofield to North Burlingham Dualling Scheme (hereafter referred to as the Scheme).

This Plan has been prepared by Galliford Try, Highways England's Delivery Integration Partner (DIP), appointed to the A47 east under the Regional Delivery Partnership (RDP) Framework.

Galliford Try have appointed Sweco to undertake the preliminary design and application for a Development Consent Order.

Galliford Try are the appointed Principal Designer (PD) and Principal Contractor (PC) for the Scheme, as defined under the Construction (Design and Management) Regulations 2015.

This WMMP has been produced to an appropriate level of detail to supplement the DCO submission, submitted in December 2020.

1.2. Purpose of this Outline Water Monitoring and Management Plan.

The purpose of this WMMP is to set out the construction measures to prevent the risk of pollution and contamination to ground and surface water. The contractor will manage risk in accordance with best practicable means which include general site management procedures, and control and measures to mitigate any effects of potential adverse effects caused by the construction works.

1.3. Structure and Scope of the Outline Water Monitoring and Management Plan.

This WMMP is based on the preliminary design of the Scheme, at the time of the submission of the DCO in December 2020

This WMMP will remain a live document throughout construction of the Scheme and will be reviewed and updated at regular intervals.

The final WMMP will consider all drainage required during the construction phase and will reference all industry and regulatory pollution prevention guidelines. It shall describe the design of each element of surface water management system required to manage surface water runoff during construction and potential risks to surface waters. This shall include consideration of temporary storage and settlement requirements to manage sediment load of waters.

The final WMMP shall be developed prior to construction by using Early Contractor Involvement from specialist supply chain providers and appointed sub-contractors, as the works programme and methodology is further enhanced throughout the detailed design stage.

Towards the end of the construction phase, Galliford Try will prepare a final version of the WMMP for the operational and maintenance phase of the Scheme. This will be included within the Handover Environmental Management Plan (HEMP). The HEMP will be implemented by the maintenance authority responsible for the maintenance of the Scheme during its operational phase.

1.4. Scheme description

The A47 Forms part of the strategic road network and facilitates a variety of local, medium and long-distance journeys between the A1 and the eastern Coastline. The corridor connects the cities

of Peterborough and Norwich, the towns of Wisbech, Kings Lynn, Dereham, Great Yarmouth and Lowestoft and a succession of villages in what is a largely rural environment.

The A47 Blofield to North Burlingham improvement scheme is a dualling scheme with aims to improve safety and manage current and future congestion creating a free-flowing network whilst supporting economic growth.

The scheme realises the dualling of 4km of the A47 carriageway between Blofield and North Burlingham to link two sections of the existing dual carriageway at either end of the proposed scheme. Two junctions are to be included at the ends of the scheme, one by Yarmouth Road which also provides a link from Blofield via a bridge to the existing A47. The second junction provides a link over the new dual carriageway between the South Walsham Road and Acle Road. All other routes will be severed for safety reasons but will have alternate access to the new A47 via upgraded junctions.

2. Project team roles and responsibilities

2.1. Site roles and responsibilities

Competent managers and key team members will be appointed to work on this plan and support it along the project duration. Additional roles and responsibilities will be developed as the detailed design progresses.

The site based roles and the organisation of responsibilities in relation to environmental management are summarised in the table below.

Galliford Try will delegate responsibilities to personnel within key areas of the construction site and compounds. The delegation of responsibility will be clearly identified within relevant documents and site files.

The key Scheme contacts for Highways England and Galliford Try are listed in the table below:

Role	Contact	Organisation	Email
Senior Project Manager	Gemma Malone	Highways England	
Project Manager	Nikki Rowley	Highways England	
Project Manager	Tim Sayers	Galliford Try	
SHE Advisor	Mark Roberts	Galliford Try	
Group Environmental Manager	Paul Thomas	Galliford Try	
Ecological / Environmental Clerk of Works (ECOW)	TBC	Galliford Try	TBC
Environmental Manager	TBC	Galliford Try	TBC
Environmental Specialists	TBC	Galliford Try	TBC

Role	Contact	Organisation	Email
Stakeholder and Communications Lead	Leonie Owens	Galliford Try	

3. Consents and permissions

The treatment of waters arising from construction activities, including point source discharges resulting from the treatment of materials regulated by mobile plant licence will require regulation by the EA. An application for an environmental permit (Discharge Consent) will be submitted prior to works commencing. The permit will regulate the discharge of treated contaminated waters to ground, via re-injection (or possibly soakaway). A separate environmental permit will be required for each location.

An Ordinary Watercourse Consent is required for all works carried out over, under or near an ordinary watercourse. Ordinary watercourses include non-main rivers and all ditches, drains, cuts, culverts, dikes, sewers (other than public sewers) and passages through which water flows. The consenting authority for this scheme will be Broadland District Council.

The principal consent for the Scheme will be the DCO.

The DCO process provides development consent for the works and enables land acquisition, along with many consents and powers to be dealt with at the same time.

Some additional consents and permissions may need to be sought separately from the DCO. These are listed in the table below, however none of these consents are required for the Start of Works:

Consent / Permission	Issuing Authority	Requirement
Lead Local Flood Authority (LLFA) Approval	Lead Local Flood Authority (LLFA)	A Sustainable Drainage Strategy (surface water) is a Local List Planning Application Requirement. It should include the detailed design, management and maintenance of the surface water management system including Sustainable Drainage Systems (SuDS).
Water Discharge Permit	Environment Agency	Must be obtained if there is a need to discharge to surface or groundwater.

The above consents and permissions are largely dependent on finalisation of the detailed design, the construction site setup and methodology, and discussions with affected stakeholders

4. Mitigation Measures

4.1. Introduction

On commencement of site mobilisation, Galliford Try will be the site owner and will be responsible for site inductions and ensuring compliance with any required training, of all personnel including visitors, full time staff and supply chain.

Galliford Try will work in accordance with their Business Management System to ensure compliance with the International Organisation for Standardisation (ISO) 14001 requirements.

4.2. General Mitigation Measures

General mitigation measures will be fully developed along with the construction programme and future input from specialist supply chain members. An outline of the main work activities to be

carried out throughout the scheme as well as relevant water management proposals currently being considered are described in Annex 1.

Options that are currently being developed with the programme are discussed below.

- Where possible, if programme and existing services permit, the permanent surface water management systems that are part of the final design, will be installed early in the construction sequencing. The four residences on Waterlow are a good example of where early installation will be of benefit. Subject to the development of the final construction programme, the proposed soakaway systems could be installed early in the programme, with temporary cut off ditches and/or earth bunds around the perimeter of the properties providing additional protection. Temporary grips and/or ditches can be excavated to collect and guide surface run off into the soakaway network. Silt fencing would be installed in strategic locations to reduce infiltration of silt into the newly constructed soakaway system.
- The proposed infiltration basin could also be constructed at the same time. A combination of selected permanent and some temporary interceptor ditches could then be excavated to carry surface water to the infiltration basin. The infiltration basin would be subject to a schedule of silt removal, still to be determined.
- At the eastern extent of the scheme, where the new B1140 overbridge is to be constructed a similar approach could be taken using the proposed permanent drainage systems in that area.
- In areas along the length of the scheme where early installation of permanent drainage is not feasible or available, then temporary surface water management systems will be considered. Temporary infiltration basins can be constructed at strategic locations, based on topography, with temporary grips and ditches cut from the works area. Silt fencing would be placed in select locations to reduce velocity of water flow and volume of silt into the temporary drainage systems and to prevent localised flooding or pollution of surface and groundwater from silt and other contaminants. Any temporary infiltration basins would be subject to a schedule of silt removal, still to be determined.
- North of the scheme, there is a ditch that runs parallel to the existing A47. Silt fencing would be employed where required, to reduce any impact of surface run off and silt to the ditch network.

Permanent drainage is naturally one of the first activities to be installed, so as the construction of the scheme progresses, more of the permanent drainage can be utilised to continually reduce the impact of surface and ground water on the surrounding areas.

4.3. Emergency Response Planning

An emergency response plan will be developed in accordance with EA Guidance PPG21- Pollution Incidence Response Planning. The plan will be communicated to all personnel. Emergency spill control equipment such as spill kits, oil booms and absorbent materials, will be held at appropriate locations on site and within site compounds.

4.4. Climate Change Resilience Planning

Galliford Try will consider the potential impacts of extreme weather events during construction. To ensure resilience of the scheme to such extreme weather events, Galliford Try will use a short to medium-range weather forecasting service from the Met Office or other approved weather forecast provider to manage climate-related risks and inform programme management and impact mitigation measures. Galliford Try will register with the Environment Agency's Floodline Warnings Direct service. Galliford Try will implement an Environmental Management System (EMS) which will consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements.

4.5. Environmental Competencies

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

4.6. Training and site inductions

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

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 and will emphasise the sensitivity of the watercourses, surrounding habitat and methods and working practices employed to protect the water environment.

Those undertaking any activities that could result in an adverse environmental impact will receive additional training, to be led by the Environmental Manager or Environmental/Ecological Clerk of Works.

This training will include reference to the importance of adhering to the contents of this WMMP, and the potential consequences of departure from any specified method statements.

4.7. Toolbox talks and induction supporting materials

Galliford Try will establish a regime of toolbox talks in agreement with the supply chain. GT will target a minimum of one toolbox talk on an environmental topic per month, records of attendance to monitor compliance will be kept.

An indicative list of appropriate toolbox talks, relevant to managing ground and surface water, is provided in the table below, more topics will likely be added to this list as construction of the Scheme progresses.

BMS Reference	Toolbox Talk Title
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
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

Annex 1

Item	Objective	Action (including specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible organisation	When Pre-construction Construction Operation All
1	Minimise impact of Site Compound Facilities (including Car Parks)	Site compounds will be located away from all surface water features and watercourses and outside of the flood plain. A site drainage plan will be prepared in advance of construction works to identify the location of all watercourses and drains/drainage paths. All drainage on site will be identified and colour coding will be used to distinguish between surface water, foul sewer and combined drainage. This will ensure that all those working on site are aware of the type of drain in the event of a pollution incident. Appropriate pollution control measures such as the use of oil interceptors, the placement of bunds or silt traps will be used to prevent silt run-off entering drains.	Impact of long term presence of site compounds on local environment.	Installation and use of control measures. SHE audits. Planned compound layouts.	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction
2	Protection of the 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 regularly	Installation and use of facilities	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction
3	The protection of ground and surface waters during excavation and foundation works	Where piling or penetrative ground improvement is required, the works will be carried out in accordance with the Environment Agency guidance. If contaminated land is identified in areas of piling or penetrative ground improvement, a foundation works risk assessment will need to be undertaken to determine the likely effects relating to the driving of piles through any contaminated made ground or landfill materials, and to identify what mitigation measures are appropriate for the site.	Not applicable	Consultation with the Environment Agency	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction

		The batching of concrete to only be undertaken in designated impermeable areas with a segregated drainage system, placement of temporary bunds down-slope to contain any spillages, and the development of a spill response protocol. The discharge of potentially contaminated groundwater will be appropriately managed by Galliford Try, through the use of appropriate treatment prior to discharge.					
4	The protection of site soil and groundwater quality with respect to plant and working methods	Working method statements to be in place during construction, to ensure environmentally safe working practices on site with respect to the underlying ground and groundwaters. These may include (but not be limited to): • The storage of oil, fuel and other potentially hazardous substances will be within a secure site compound located on a hardstanding area. Storage of these substances will be within an appropriately bunded area (110% of total capacity volume); • There will be designated refuelling and maintenance areas and concrete batching areas located on impermeable hardstanding with drainage treated appropriately. Placement of temporary bunds down-slope of potentially polluting activities will contain any spillages. A spill response procedure will be developed. • Regular inspections of site plant will be carried out and the use of drip trays and training in the location and use of spill kits and emergency spillage procedures will be provided for site workers. Action Plans will be in place to effectively deal with any contamination issues during construction for example for spillages and leaks from construction plant; and • Haul routes will be regularly inspected and maintained to minimise silty run-off.	Absence of GI data.	Production of working method statements. Daily site audits	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Pre-construction and Construction

5	Obtain Land Drainage Consent for excavations and dewatering activities	Discharge to surface waters will require a Land Drainage Consent for activities such as the following examples: • Renewal of any existing gateway crossing by means of a culvert or bridge; • Creation of any new gateway crossing by means of a culvert or bridge; • Piping a watercourse for a length of 8 metres or less; • All structures or modifications in or within 9 metres of a watercourse (Headwalls, Sluices and Fencing); and • Any Temporary Works in or within 9 metres of a watercourse, that will be in place for less than 6 months.	Excavations and dewatering would be required for certain aspects of the Scheme	Consultation with the relevant Drainage Board.	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction
6	Surface water run-off/Silt from earthworks and bridge abutment works.	Where possible permanent drainage will be incorporated into the works at the earliest opportunity in preference to temporary drainage systems. Oil interceptors, bunds or silt traps will be used to prevent polluted run-off entering drains.. Areas of exposed sediment deemed at risk of erosion during heavy rainfall or flood inundation should be protected using either temporary measures (eg. sheeting) or semi-permanent measures (for example coir matting) until vegetation is able to establish on these surfaces. If appropriate, the use of cut-off drains or ditches to channel water around the site and/or prevent silty water entering excavations and watercourses. These should discharge to settling ponds/tanks. Silty water treated to allow suspended solids to settle out before disposal.	Certain construction activities have potential to create increased water run off and silt.	Daily site audits	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction

		Infiltration ponds or tanks should be constructed to promote the removal of silt from site runoff. Ponds should be designed for the maximum predicted site runoff using a 1 in 100 year event and should be large enough to ensure sufficient residence time for particulates to settle out, prior to discharge of the water. All water pumped from excavations would be pumped via a pipe and gravel sump in order to prevent silt being agitated from the base of the excavation and to provide rudimentary filtration to the water prior to abstraction. For low volume pumping, water would either be pumped into a vegetated area remote from surface water drainage or into a small attenuation lagoon prior to being directed into the drainage system. For high volume pumping (100mm or above) water would be passed through an attenuation tank with a capacity of not less than 8m3. The outlet from the tank could be placed directly into site drainage, provided the water is free from silt contamination.					
7	Topsoil Stripping and Storage	Wherever possible, topsoil will be left in place to minimise the amount of unprotected ground exposed to runoff. Where topsoil removal is required it would take place as late as possible prior to other works in the area. Topsoil will be stored outside of the floodplain. In advance of vegetation clearance and soil stripping operations commencing within 10m of a watercourse, appropriate control measures would be implemented to prevent contamination. Topsoil stockpiles would be created and managed in accordance with best practice guidance. The sides of stockpiles would be graded to prevent ponding and to help shed rainwater.	Removal of topsoil and formation of topsoil stockpiles may create surface water management challenges.	Daily site audits	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction

		Silt fencing would be installed around the margins of topsoil mounds to minimise the risk of sediment-laden runoff reaching watercourses.					
8	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase	Construction activities must be managed in accordance with CIRIA Guidelines. Guidance on best practice in relation to pollution prevention and water management is set out in the following documents: • CIRIA's Environmental good practice on site; • CIRIA's Control of water pollution from linear construction projects; Technical Guidance; and • Environment Agency's Protect groundwater and prevent groundwater pollution.	Watercourses and sensitive ecological sites within the vicinity of the Scheme	Daily site audits	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction
9	To mitigate potential adverse effects upon surface waters and groundwater during the construction phase	All construction workers to be briefed on the importance of maintaining water quality, the location of surface water features, and the location and use of spill kits as part of the site induction; The construction drainage network to incorporate measures (for example interceptors) to prevent the discharge of hydrocarbons to surface or groundwater systems.; In areas where there is increased risk of hydrocarbon / chemical spillage and around hazardous substance stores, additional precautions to be taken. These include bunding, impermeable bases, suitable drainage systems, and siting away from any open drainage channels; Any stockpiled materials to be stored within enclosed areas to enable the runoff to be stored and treated where required; It is advised that soil storage is kept a minimum of 12 metres away from a watercourse to avoid unnecessary pollution run-off into the watercourses; Any concrete works to be carefully controlled and where required, any concrete tankers will be washed out in controlled areas;	Watercourses and sensitive ecological sites within the vicinity of the Scheme	Daily site audits TBT's Briefing records Plant maintenance records	Contractual responsibilities between Highways England and Galliford Try	Galliford Try	Construction

		Plant and machinery to be maintained in a good condition and any maintenance required will be undertaken within safe areas; Pollution prevention and spill response procedures (in the form of an Incident Control Plan) to be developed by the contractor and a spill kit and clean up equipment maintained on site; Wheel washers and dust suppression measures to be used to prevent the migration of pollutants; Monitoring of the surface watercourses to be carried out before, during, and after construction to ensure no adverse impact on water quality; and Manually operated penstocks to be provided immediately prior to all outfalls leading to a watercourse and upstream of attenuation pond flow control devices.					

B.5 Construction Noise and Dust Management Plan

The Proposed Scheme is assessed to be 'High Risk' for potential impacts from construction dust, as reported in the air quality ES chapter (**TR010040/APP/6.1**), in accordance with DMRB LA 105[7]. During the detailed design stage more detailed information will be available on construction phasing and methodology.

Guidance on the assessment of dust from demolition and construction[8] by the Institute of Air Quality Management (IAQM) outlines mitigation measures for construction sites depending on the potential risk category. Appropriate mitigation measures as defined in the IAQM guidance will be applied by the contractor based on the detailed design information for construction of the Proposed Scheme.

Mitigation measures are included for:

- Communication
- Site Management
- Monitoring
- Preparing and maintaining the site
- Operating vehicle/ machinery and sustainable travel
- Operations
- Waste management

[7] Highways England. (2019). LA 105 Air quality. Available: [redacted]
Last accessed 25.02.2021.
[8] IAQM. (2014). Guidance on the assessment of dust from demolition and construction. Available: [redacted]

B.7 Outline Landscape and Ecological Management Plan

Scope and purpose of Outline LEMP

This Outline Landscape and Ecology Management Plan (OLEMP) provides a framework for achieving the 'vision' of the Environmental Masterplan (**TR010040/APP/6.8**) for the A47 Blofield to North Burlingham Dualling (the Proposed Scheme).

The management plans within this OLEMP are a draft and would be further developed during detailed design and described within the final Landscape and Ecology Management Plan (LEMP).

The A47 corridor is located within a largely rural landscape characterised by agricultural land use and dispersed settlement linked by a network of local roads. Settlement within the extents of the study area is characterised by villages, clusters of houses and isolated farmsteads.

The OLEMP forms part of the strategy for successfully integrating the Proposed Scheme within this landscape and ensuring the mitigation of many of the related impacts identified within the Environmental Statement (ES).

Schedule 2 of the draft DCO includes Requirements relevant to Landscape and Ecology, namely:

- Requirement 3 (Detailed Design)
- Requirement 4 (Environmental Management Plan)
- Requirement 5 (Landscaping)
- Requirement 11 (Fencing)
- Requirement 12 (New Pond)

These Requirements have been used to inform the management and monitoring plans as detailed within this OLEMP.

Following completion of construction, the detailed landscape management proposals shall be set out by the contractor in an updated version of the EMP, and responsibility for maintenance would be taken on by Highways England.

The OLEMP should be read in conjunction with the following:

- The EMP and associated annexes
- Appendices 30/1 to 30/11 of the Manual of Contract Documents for Highway Works (MCHW) Specification for Landscape Works[9]
- Highways England Routine and Winter Service Code[10]

[9] Highways England, Manual of Contract Documents for Highways Works, Volume 1 Specification for Highways Works, Series 3000 Landscape and Ecology, May 2001: [redacted] accessed March 2021

[10] Highways England, Design Manual for Roads and Bridges, Routine and Winter Service Code, 2009: [redacted] accessed March 2021

- Highways England Network Management Manual[11]
- Highways England DMRB LD 117 Landscape Design[12]
- Highways England DMRB LD 118 Biodiversity Design [13]

This document begins by setting out the approach and a summary of the landscape and ecological requirements within the context for the Proposed Scheme. Three sections then discuss the pre-construction plans, construction / habitat creation plans and post-construction / monitoring and maintenance plans required for landscape and biodiversity across the Proposed Scheme. These plans range from ground preparation to long-term management, maintenance and monitoring, including safeguarding flora and fauna, legal compliance, habitat creation and wildlife structures.

Approach

The Proposed Scheme offers the opportunity to create an attractive setting for the dual carriageway, reflecting valued landscape characteristics which would better integrate within the landscape and respect the National Character Areas (NCA) for which the Proposed Scheme and its landscape context are located within.

Highways England's The Road to Good Design[14] outlines ten design principles for roads. Design principle no.4 – 'fits in context' states: "The aesthetic quality of a road and its design in relation to the places through which it passes, is integral to its function and the experience of those that use it. Good road design demonstrates sensitivity to the landscape, heritage and local community, seeking to enhance the place while being true to structural necessities. It builds a legacy for the future."

The OLEMP has been prepared to address mitigation requirements for both ecology and landscape assets in combination with the EMP and Masterplan (**TR010040/APP/6.8**). The design rationale has focused on replacement of vegetation lost during construction, enhancing natural habitats, providing screening vegetation and integrating the Proposed Scheme into the landscape. Where planting is proposed, it would include native species reflecting those currently on site and would be of local provenance.

This design rationale also sits in line with the requirements of Norfolk County Council's Design Guide (2008)[15] where new planting is proposed for landscaping this would be native hedgerow and tree species.

[11] Highways England, Design Manual for Roads and Bridges, Network Management Manual, Issue 1, Amend No. 8, July 2009: [redacted] accessed March 2021

[12] Highways England, LD 117 – Landscape Design, March 2020: [redacted] 2021

[13] Highways England, LD 118 Biodiversity Design: [redacted], accessed March 2021

[14] Highways England, The Road to Good Design, 2018: [redacted] accessed March 2021

[15] North Norfolk District Council, Design Guide (2008): [redacted] accessed March 2021

The overarching objectives of the OLEMP are:

- To promote the conservation, protection and improvement of the physical, natural and historic environment within the Proposed Scheme and its setting.
- To diversify ecological value through the retention, so far as reasonably practicable, of the existing hedgerows, trees and habitats and to enhance these through restoration and creation of diverse habitats offering greater botanical and faunal interest to the Proposed Scheme.
- To ensure design and maintenance of landscape components that preserve and enhance the character of the landscape and the local distinctiveness through creation of a mosaic landscape features and habitats, including woodland areas, hedgerows, biodiversity ponds and scattered trees, species-rich grasslands.
- To provide a positive road user experience and appreciation of the surrounding landscape.
- To create new structural planting which links with existing habitats and to take account of species that are locally appropriate.
- To use indigenous species of local provenance wherever appropriate.
- To provide a variety of foraging, nesting and roosting opportunities for protected and notable species, including bats, reptiles and birds.
- To create floristically rich habitats, to support a greater assemblage of species and give rise to enhanced foraging opportunities.
- To translocate the species-rich important hedgerows impacted by the Proposed Scheme.
- To provide a framework for monitoring and reviewing the landscape implementation and establishment.

The final mitigation measures during construction would be detailed within the next iteration of the EMP which would include the LEMP.

Roles and Responsibilities

A full-time Environmental Manager would be responsible for developing the next iteration of the EMP and implementing during construction.

The effective implementation of the OLEMP requires that roles and responsibilities are clearly defined and understood. Specific job titles, roles and responsibilities will be defined by the contractor. The key environmental management roles involved in the delivery of the OLEMP are identified in Table 1-1.

Table 1-1 Environmental management key site personnel

Role	Contact	Organisation
Environmental Manager	TBC	Highways England/Contractor
Environmental Clerk of Works	TBC	Highways England/Contractor
Environmental Specialists	TBC	Highways England/Contractor

The Ecological Clerk of Works (ECoW) would be responsible for ensuring construction mitigation measures are correctly deployed, monitored and maintained, including vegetation clearance, species exclusion, dead hedging, light spill and pollution prevention.

At the start of the works contractors would be informed what to look for during works via Toolbox Talks by the ECoW. Should any protected or notable species be found during any tree planting activities works would stop immediately and an ecologist / ECoW would be contacted. The ecologist would advise how the works should proceed and measures to be taken to minimise disturbance to protected or notable species and hence avoid potential legal infringement, and as set out in Requirement 4 of the draft DCO.

LEMP Structure

The LEMP will included the following structure and will be populated in the next iteration of the EMP:

- **Requirements**
- **Summary of landscape context and mitigation**
- **Summary of ecology context and mitigation**
- **Pre-Construction Measures, including:**
  - Surveys
  - Permits and licences
  - Protection plans
  - Habitat creation
- **Construction Measures, including:**
  - Surveys
  - Permits and licences
  - Protection plans
  - Habitat creation
  - Landscape planting
- **Post-Construction Measures, including:**
  - Monitoring and Maintenance
  - Handover of Maintenance Obligations

Annex C. Environmental method statement

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

- Precautionary Method Statement – bats

Annex D. Emergency procedures and record and environmental incidents

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

Annex E. Copy of evaluation of change register

To be produced at detailed design by the design team. This section should include:

- A record of any design changes after the completion of the Environmental Statement.
- A description as to how these design changes have been assessed and any environmental actions required as a result of these changes (e.g. further environmental survey required).

Annex 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.