Norwich Western Link

Environmental Statement

Chapter 3: Description of Scheme

Appendix 3.1: Outline Construction Environment Management Plan (OCEMP)

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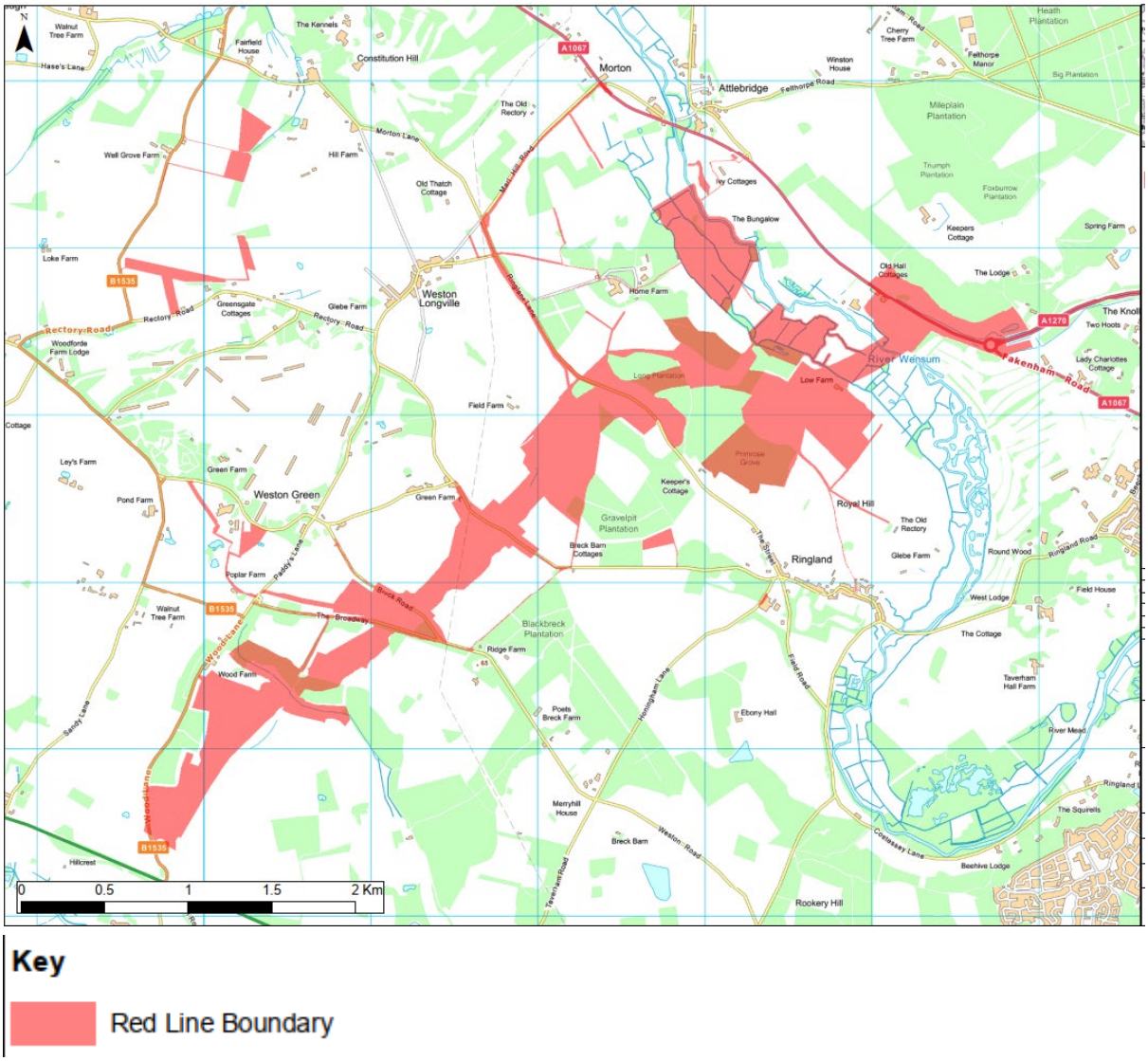
1 Background and Context

1.1 Introduction

1.1.1 This Outline Construction Environment Management Plan (OCEMP) has been produced to support the proposed Norwich Western Link (hereafter referred to as "the Proposed Scheme"). The Proposed Scheme is a proposed new highway to link the A1270 Broadland Northway, from its junction with the A1067 Fakenham Road (to the north) to the A47 trunk road near Honingham (to the south). A full description of the Proposed Scheme is detailed in **Chapter 3 Description of the Proposed Scheme** (Document Reference 03.03.00).

1.1.2 The proposed Red Line Boundary is shown on **Plate 1-1** below.

Plate 1-1 Red Line Boundary



1.2 Purpose of the OCEMP

1.2.1 This OCEMP has been designed to accompany the application for planning permission for the Proposed Scheme. The OCEMP is a live document, and the Principal Contractor will be responsible for developing this OCEMP document into a full Construction Environmental Management Plan (CEMP) and ensuring it is reviewed and updated on a regular basis throughout the construction phase as new environmental construction measures are identified and implemented.

1.2.2 This OCEMP sets out the overarching principles for construction management of the Proposed Scheme and aims to:

- Ensure that mitigation measures set out in the Environmental Statement submitted as part of the Planning Application are implemented during construction;
- Ensure that industry good practice standards are adopted throughout the construction of the Proposed Scheme; and
- Be a point of reference for the Project Team (includes all parties mentioned in Table 3-1), interested parties and site workers.

1.2.3 The OCEMP will be adopted by the Principal Contractor and developed with specific mitigation measures into the CEMP(s) (as there may be more than one CEMP to account for different parts of the Proposed Scheme) to be adhered to during the construction phase. The OCEMP will secure the environmental mitigation measures for the construction phase identified in the Environmental Statement. It is proposed that there is a planning condition requiring a detailed CEMP(s) to be approved by Norfolk County Council (in its capacity as the County Planning Authority (CPA)) prior to the commencement of construction. Legal Compliance.

1.2.4 Environmental legislation applies to the works to be undertaken. The expectation is that all relevant legislation, including requirements for licences, permits and / or consents shall be identified and complied with.

1.3 Structure of the OCEMP

1.3.1 This OCEMP is based on established good management practice through British Standards and Construction Industry Research and Information Association (CIRIA) guidance, and includes the following information:

- **General Environmental Requirements:** including an overview of general requirements, roles and responsibilities, competence and training requirements, communication protocols, method statement requirements and incident response protocol;
- **Environmental Control Measures:** methods for managing environmental risks; and
- **Monitoring:** procedures for recording and reporting monitoring results and taking remedial action in the event of any non-compliance, details of receptors, threshold values and analysis and reporting methods.

2 Site Information

2.1 Site and Surrounding Area

2.1.1 The Red Line Boundary is shown on **Plate 1-1**. The Red Line Boundary comprises an area of approximately 280 hectares (ha) and is located to the north-west of Norwich, running from the A47 at its junction with Wood Lane and Berrys Lane (southern end), to the A1067 Fakenham Road and its junction with the A1270 Broadland Norway (northern end).

2.1.2 The majority of the existing land use is agricultural / arable land and existing woodlands.

2.1.3 The Proposed Scheme crosses the River Wensum (a Special Area of Conservation and a Site of Special Scientific Interest), and its flood plain by means of a viaduct, located towards the northern end of the Proposed Scheme.

2.1.4 **Chapter 2: The Existing Site** (Document Reference: 3.02.00) of the Environmental Statement provides a full description of the existing site.

2.1.5 The Detailed CEMP(s) will append relevant design drawings to allow the CEMP readers to understand the scheme components.

2.2 Proposed Scheme Description

2.2.1 The Proposed Scheme is a highway scheme linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.

2.2.2 The Proposed Scheme, will comprise:

- Dualling the A1067 Fakenham Road westwards from its existing junction with the A1270 to a new roundabout located approximately 400m to the northwest;
- Construction of a new roundabout; and

- Constructing a dual carriageway link from the new roundabout to a new junction with the A47 near Honingham.

2.2.3 As part of a separate planned scheme, National Highways proposes to realign and dual the A47 from the existing roundabout at Easton to join the existing dual carriageway section at North Tuddenham. This scheme was consented in August 2022 and National Highways will construct the Honingham junction, connecting to the north-eastern side of that junction.

2.2.4 The Proposed Scheme will cross the River Wensum and its floodplain by means of a viaduct. In addition, other structures are proposed to cross minor roads and to provide habitat connectivity (e.g., underpasses and overbridges for bat crossings). The Proposed Scheme will include ancillary works such as provision for non-motorised users, necessary realignment of the local road network, including the stopping-up of some minor roads and the provision of environmental mitigation measures.

2.2.5 **Chapter 3: Description of the Proposed Scheme** (Document Reference: 3.03.00) of the Environmental Statement provides a full description of the Proposed Scheme.

2.3 Management Structure

2.3.1 This OCEMP will be reviewed, updated and adopted by the Principal Contractor for the construction phase. It will be the responsibility of the Principal Contractor following planning submission to take ownership for this document and develop it into a full CEMP(s), as discussed above in paragraphs 1.1.3 to 1.1.5. In the construction phase, the Principal Contractor may decide to implement more than one CEMP and tailor them for different construction activities/stages. The Principal Contractor will ensure any sub-contractors comply with the approved CEMP(s).

2.3.2 The anticipated roles and responsibilities of the parties involved in the construction works are set out below in Section 3.3. However, it should be noted that all those involved in the works are responsible for ensuring the requirements of the OCEMP are met. The roles outlined below may be undertaken by more than one individual.

2.4 Contact Information

2.4.1 The contact information for the relevant representative of NCC as Applicant and Principal Contractor, as well as other useful contacts will be appended to the CEMP for reference during the construction phase as appropriate.

2.4.2 A contact number that members of the public can use should be displayed prominently, such as on the site board and provided at site entrances or on perimeter hoardings and, where practicable, at community locations.

3 General Environmental Requirements

3.1 Requirements and Consents

Audits and inspections

3.1.1 Once work commences, internal environmental inspections and audits on the Proposed Scheme will be conducted on a regular basis. Audits will be carried out in accordance with the Principal Contractor's Environmental Management System (EMS) to assess the environmental performance of the Proposed Scheme and to check compliance with the legal and contractual requirements and the full CEMP(s).

Consents

3.1.2 A register of detailed consents requirements covering planning, highways and environment will be prepared and maintained by the Principal Contractor to keep track of the progress made. This will facilitate the consents to be applied for and obtained prior to the relevant works activity commencing.

3.1.3 The progress of the preparation, submission and internal approval of the consents identified as being required will be tracked using the consents register.

3.1.4 The CEMP(s) will be the overarching document(s) outlining and tracking the delivery and achievement of compliance with the consents on the consents register.

3.1.5 The consents that are to be detailed in the consents register will be subject to their respective legislative regimes and regulation by the appropriate regulatory body. The requirement to prepare consents register as part of the CEMP is for information only; the consents detailed therein would continue to be regulated under their respective legal regimes and would not be subject to duplication of control under the Town and Country Planning Act 1990 regime.

3.2 Roles and Responsibilities

3.2.1 Personnel with defined environmental responsibilities are detailed in **Table 3-1** below.

Table 3-1 Personnel with defined environmental responsibilities

Individual	Role
Client (NCC as the Applicant)	The Client will be responsible for providing all strategic infrastructure, surface water drainage, structural landscaping, and landscaping works. In order to achieve this, the Client has appointed a Principal Contractor. The Client may choose to appoint a suitably qualified Client Project Manager to monitor the Principal Contractor's compliance with the CEMP. The Client would also be the Licensee for the European Protected Species Mitigation Licenses

Individual	Role
Principal Contractor	The Principal Contractor will be responsible for directing the Environmental Manager on the delivery of the CEMP. This will include ensuring that the Environmental Manager has allocated sufficient resources to allow delivery of the CEMP, participating in communication with Local Authorities and other third parties, e.g. Environment Agency, as required and arranging for the periodic review and update of the CEMP. The Principal Contractor will regularly review the findings of the monitoring programme and direct the Environmental Manager as necessary. The Principal Contractor will also prepare and maintain a register of consents covering planning, highways and environmental to keep track of progress.

Individual	Role
Client Project Manager	The Client Project Manager will monitor the Principal Contractor's compliance with the CEMP (and compliance by any subcontractors) and advise the Client on environmental issues that arise during the construction phase. The Client Project Manager will: • Review and comment on the appointed Principal Contractor's detailed plan for managing and delivering the CEMP; • Oversee the agreed programme of environmental monitoring relevant to each construction activity; • Participate in Principal Contractor performance review meetings with the Client. These meetings should be held routinely to effectively review environmental performance (including incidents, complaints and KPIs); • Contribute to communication on environmental matters between the project stakeholders and any relevant statutory bodies; • Monitor implementation of any corrective action required by the Principal Contractor and communicate issues to the wider project team as necessary; • Monitor the Principal Contractor's management of environmental complaints; and • Monitor the Principal Contractor's site activities to ensure that all relevant environmental legal consents, licences and exemptions are in place in advance of relevant works commencing, and that the requirements of those consents, licences and exemptions are adhered to.

Individual	Role
Environmental Manager (Principal Contractor)	The Environmental Manager will: • Produce a detailed plan for managing the requirements of the CEMP prior to work commencing; • Periodically review and as necessary update arrangements for delivering the CEMP; • Act as the Principal Contractor's main point of contact in relation to environmental issues and liaison officer with the Environment Agency and other relevant statutory bodies; • Provide and arrange environmental awareness training; • Monitor the environmental performance of sub-Contractors and provide direction as necessary; • Ensure full co-operation with the site environmental inspection and audit programme; • Ensure that all environmental incidents and complaints, where they are directed to the Principal Contractor are investigated, recorded, and reported to the Client Project Manager; • Ensure that any required corrective and preventative actions are taken in line with the relevant procedures; • Keep records to demonstrate implementation of the CEMP; • Coordination of the Ecological Clerk of Works (ECoW); and • Ensure compliance with the ecological measures set out in the CEMP.

Individual	Role
Ecological Clerk of Works (Principal Contractor)	The Role may be undertaken by several individuals as required. Responsible for: • Reporting to and coordinated by the Environmental Manager; • Briefing site workers (anyone to undertake work within an area of ecological risk) on the ecological issues as appropriate; • Carrying out site inspection to audit the construction works requiring environmental supervision, including record keeping; • Coordination of any other ecologists involved during the construction phase; • Acting as a central point of contact between the construction and ecology teams; • Liaison with the licence holder and Named Ecologist on the required European Protected Species Mitigation Licences (EPSML); • Provide site workers with relevant Toolbox Talks; and • Keep records of Toolbox Talks and relevant site actions e.g. undertaking nesting bird checks. • Manage any specialist environmental staff required for delivery of the scheme. Where the Environmental Statement identifies risk to ecological receptors the ECoW will ensure a suitably qualified ecologist (SQE) will brief the work team on the relevant controls which must be implemented. Where vegetation and site clearance during the breeding bird season has been identified, the ECoW will ensure a suitably experienced ornithologist is present as per the methodology stated in section 4.3.

Individual	Role
Suitably Qualified Ecologist (SQE)	A person who has suitable experience in a particular species to manage, supervise and advise on works that may impact that species. Work activity requiring SQE are outlined in this OCEMP
Named Ecologist(s) (EPSML) (Principal Contractor)	Each EPSML will require a Named Ecologist as part of the licence. The named ecologist may be different for each EPSML. They will be responsible for ensuring the relevant activities are undertaken in accordance with the EPSML alongside the Environmental Manager and Licensee.
Accredited Agent	A suitably trained and experienced person who is able to carry out work under a licence without the personal supervision of the Named Ecologist
Designer(s) (Principal Contractor)	Responsible for: • Ensuring that environmental aspects are considered and incorporated into the design as appropriate, and that all residual issues or impacts are communicated to the Client / Principal Contractor.
Community Liaison Officer (Client)	The Community Liaison Officer will communicate and coordinate between the Project Team and the local community to maintain community relations and investigate any enquiries.

Individual	Role
Site Manager	Responsible for: • Managing works to agreed plans, methods and procedures to limit environmental impacts; • Managing and taking accountability for worker behaviour in regard to environmental risks and agreed working methods; • Ensuring awareness across site staff of the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact; • Reporting all environmental incidents to the Environment Manager where appropriate; • Being aware of any ecology and archaeology activities which need to be considered; • Monitoring the workplace for potential environmental risks and alert the immediate line manager if any are observed; and • Leading site team co-operation, as required, with site inspections and audits.

Individual	Role
All Site Based Staff	Responsible for: • Working to agreed plans, methods and procedures to limit environmental impacts; • Understanding the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact; • Reporting all environmental incidents immediately to their line manager to escalate to the Environment Manager where appropriate; • Being aware of any ecology and archaeology activities which need to be considered; • Monitoring the workplace for potential environmental risks and alert the immediate line manager if any are observed; and • Co-operating as required, with site inspections and audits.

3.2.2 Contact details for the relevant staff will be included in the CEMP(s).

3.3 Competence, Training and Awareness

3.3.1 The Principal Contractor shall identify the training needs of their employees and subcontractors so that they can implement the requirements of this OCEMP (and updated CEMP) into briefings and construction method statements. The Principal Contractor will engage and use appropriately trained and competent subcontractors and staff suited to their works. All Site Based Staff will be made aware of the environmental risks associated with

their scope of works. The Environmental risks and constraints will be included in the project induction for which attendance will be a pre-requisite for all staff.

3.3.2 Specific training needs will be developed for individuals to reflect the work to be carried out on the Proposed Scheme and the significant risks and opportunities identified.

3.3.3 The requirement is for all personnel to be aware of their general environmental management responsibilities, and for those whose work may cause, or have the potential to cause, a significant impact on the environment, to receive specific environmental toolbox talks and a site induction covering the environmental considerations. Environmental awareness should be reinforced through information, such as poster campaigns, environmental/sustainability performance indicator reports and environmental alerts available on-site notice boards.

3.3.4 In the event that environmental training is needed for staff (for instance site-specific toolbox talks), the Environmental Manager is responsible for ensuring this requirement is fulfilled. Any training provided to members of the Project Team will be logged and any certification documents will be produced by the relevant members of staff as evidence that they hold the required competencies.

3.3.5 The Environment Manager will ensure that it:

- Appoints a trainer with appropriate knowledge, skills and experience;
- Ensures the trainer makes training specific to the audience;
- Post key environmental issues relating to the construction programme/phases on notice boards or in communal areas can keep awareness raised to all the workforce;
- Ensures the trainer makes training engaging and relevant;
- Ensures there is follow up and refresher training for Site Based Staff to keep abreast of changes in legislation and codes of practice;

- Uses refresher training and inductions as a response to corrective actions raised (e.g. misuse of spill kits, incorrect refuelling methods);
- Checks the understanding of the training with the attendees through tests, discussions, inspections and audits etc.; and
- Maintains records of all training undertaken and planned.

3.3.6 Site and activity specific inductions (where required) for all staff new to the Proposed Scheme will include reference to the key sensitivities outlined in this OCEMP (and detailed CEMP) and the ES.

3.3.7 The site-specific induction will include training regarding the importance of the surrounding habitats and environment, which will identify the required preventative steps the site operatives are required to take to minimise the risk of damage to these habitats. Specific reference shall be made to the adjacent water bodies as they are highly sensitive habitats.

3.4 Internal Communication

3.4.1 Environmental incidents identified by any member of the Project Team will be entered into an Environmental Log (a log of incidents that can be inspected by the client or others as appropriate, including external parties), communicated to the relevant personnel to ensure any required actions are carried out, and closed out within an appropriate timeframe. Dissemination of information will take place in several forms as appropriate, including meetings to discuss particular project issues, method statements, task/activity briefings, toolbox talks, inductions, environmental notices and environmental alerts. Records that these have been carried out and who received them will be recorded on briefing registers and collated by the Environmental Manager. The Environmental Manager will ensure policies and procedures on display are up to date. Supervisors will also be notified of any legislation changes which may affect working practices on site.

3.4.2 Copies of the EPSML will be available at suitable site compound locations where they can be available to all site staff.

3.4.3 The detailed CEMP(s) will set out the incident reporting protocols to be implemented.

3.5 External Communication

Communication with the Client

3.5.1 The Principal Contractor will liaise regularly with the Client and their representatives regarding the programme of works, nature of the operations, complaints management, monitoring reports and the methods to be employed to minimise adverse environmental impacts. This will include progress meetings as well as the production and submission of progress reports which will cover environmental/sustainability issues. The Principal Contractor will also supply all relevant supporting information and documentation to the Client for matters concerning consents and the environment in accordance with the appropriate timescales.

Public Relations

3.5.2 A minimum of 14 days prior notification by letter drop to those properties likely to be impacted before works are due to commence will be adhered to. The letter will outline the location of the works that are taking place, what activities are involved, timescales for the work and potential impacts. The process for distributing letters to the public is anticipated to be as follows:

- Draft letter written by Principal Contractor;
- Draft letter submitted to the Client for approval;
- Final letter returned to the Principal Contractor with appropriate distribution list; and
- Letter delivered to residents by the Principal Contractor a minimum of 14 days prior to works commencing.

Complaints Procedures

3.5.3 The indicative approach to the complaint's procedure is outlined below. This will further be refined and developed by the Principal Contractor in advance of

the construction phase to be agreed and approved by the Client. This will be outlined in the detailed CEMP(s). During construction, the Complaints Procedure will be managed by the Community Liaison Officer.

3.5.4 Complaints may be made by email, telephone, by using an online form, in writing or in person and acknowledged by phone, letter or email. Final responses to complaints will be in writing (letter or email), unless this format is not appropriate for the complainant.

3.5.5 Where a complaint is particularly complicated and requires extensive investigation, complainants will be informed as to how long the process will take and when they can reasonably expect a final response.

3.5.6 A communications plan will be drafted by the Principal Contractor and agreed by the Client in advance of the construction phase. The communication plan will include the complaints procedure, the overarching communication strategy for the Proposed Scheme and the processes for engagement with key stakeholders and the general public.

3.6 Construction Information

Works Programme

3.6.1 The anticipated construction date for the Proposed Scheme is 2026 and continue until the road opening in 2029.Working Hours and Restrictions.

3.6.2 The standard core working hours for all construction activities are outlined below:

Day Period	**Time Period**
Weekday	07:00 – 19:00
Saturday	08:00 – 13:00
Sunday/Bank Holiday	No working

3.6.3 The anticipated access to site will be from the A1067, Ringland Lane, Paddy's Lane, Wood Lane and the A47 when direct access is available.

3.6.4 There will be some instances where works will continue after 19.00 close down for exceptional circumstances where additional time is required. Furthermore, outside of these hours there may be specific requirements for 24/7 access or night works which include but are not limited to:

- Viaduct works: 24/7 available access off the A1067 for the delivery of materials; and
- A1067 Works: These works will be mainly during the daytime and with working at night only occurring when deemed necessary for some traffic management that requires lower traffic flows.

3.6.5 In advance of the commencement of the works on site, Section 61 consent (in line with the Control of Pollution Act, 1974) will be sought from Broadland District Council. The purpose of the Section 61 consent will be to agree appropriate noise and vibration controls and additional mitigation measures, once greater details are known about the construction working methods that will be adopted on site. The Section 61 will also include details of any out of hours works.

3.6.6 Night working where required must also comply with the requirements of the EPSMLs.

3.7 Site Compound, Site Office, Welfare Facilities And Material Storage

3.7.1 The proposed works will include site compounds including welfare and material storage. The main construction compound and material storage area is intended to be located directly south of Breck Lane at the Broadway Over Bridge location to the centre of the site. Further detail of the anticipated compound arrangements are outlined in Chapter 3 Description of the Proposed Scheme (Document Reference 3.03.00).

3.7.2 The Principal Contractor will ensure that materials are stored efficiently to reduce the risk of damage, environmental incidents, injury to site-based staff and theft. The following measures shall be considered when determining the storage of materials:

- The location of sensitive receptors;
- Store valuable materials, or those that are hazardous or attractive to thieves, in a secure area, out of sight of the public; and
- Plant and equipment will be stored in areas that are less susceptible to possible pollution incidents. Appropriate processes will be in place to mitigate the potential for pollution events. These include but are not limited to the availability of spill kits, spill trays for use when refuelling, regular inspections and implementation of maintenance regimes.

3.7.3 Further details on the management of materials and waste are outlined in section 5.9 below.

3.7.4 There will be a change of use of Low Farm as part of the Planning Application, from residential Use Class E, to enable use as a site office during the construction phase of the Proposed Scheme. The site office will be office base for a maximum of 5 site based staff. As part of this use there will be no material changes made to the property internally or externally. The Grade II Listed Building associated with Low Farm Barn will not be used as part of the office. Use of the property excludes use or entry into the attic space. The Low Farm office will be used for the duration of the construction phase, with operating hours between 07:00 – 19:00 Monday to Friday, with the potential for 07:00 – 13:00 on Saturday. The property will be accessed via existing routes (Back Lane & The Street).

3.8 Security

3.8.1 Site security is an important component of good environmental management, and every effort shall be made to ensure the safety of the site and local community. Only authorised persons will be allowed on site.

3.9 Incident Response and Emergency Procedures

3.9.1 In development of the detailed CEMP(s) for approval, the Environmental Manager shall develop an Incident Response Plan in line with the sensitive receptors identified in the Environmental Statement and its own environmental management system and risk assessments. The incident response plan shall include the following measures and information.

3.9.2 In the event of an accidental release of hazardous materials, information regarding those materials, spill containment materials and spill response equipment shall be clearly stated on site and submitted to the Site Manager. A procedure for a general response shall be included in the Principal Contractor's Health and Safety Plan, stating the chain of command and standby operatives, and clearly advised to all staff.

3.9.3 A list of all nearby residential properties, downstream abstractors and other sensitive receptors as identified in the Environmental Statement that could be affected by an environmental incident shall be compiled and maintained by the Principal Contractor. This shall be submitted to the Site Manager before the start of the works.

3.9.4 The site staff and/or adjacent landowners (if at risk of being affected) must be informed about the environmental incident at the time, if felt necessary by the Principal Contractor, depending on the nature of the incident.

3.9.5 Environmental incidents shall be recorded by the Principal Contractor including:

- Nature of spill/leak/incident;
- Time/date;
- Exact location;
- Type of material released;
- Approximate volume released;

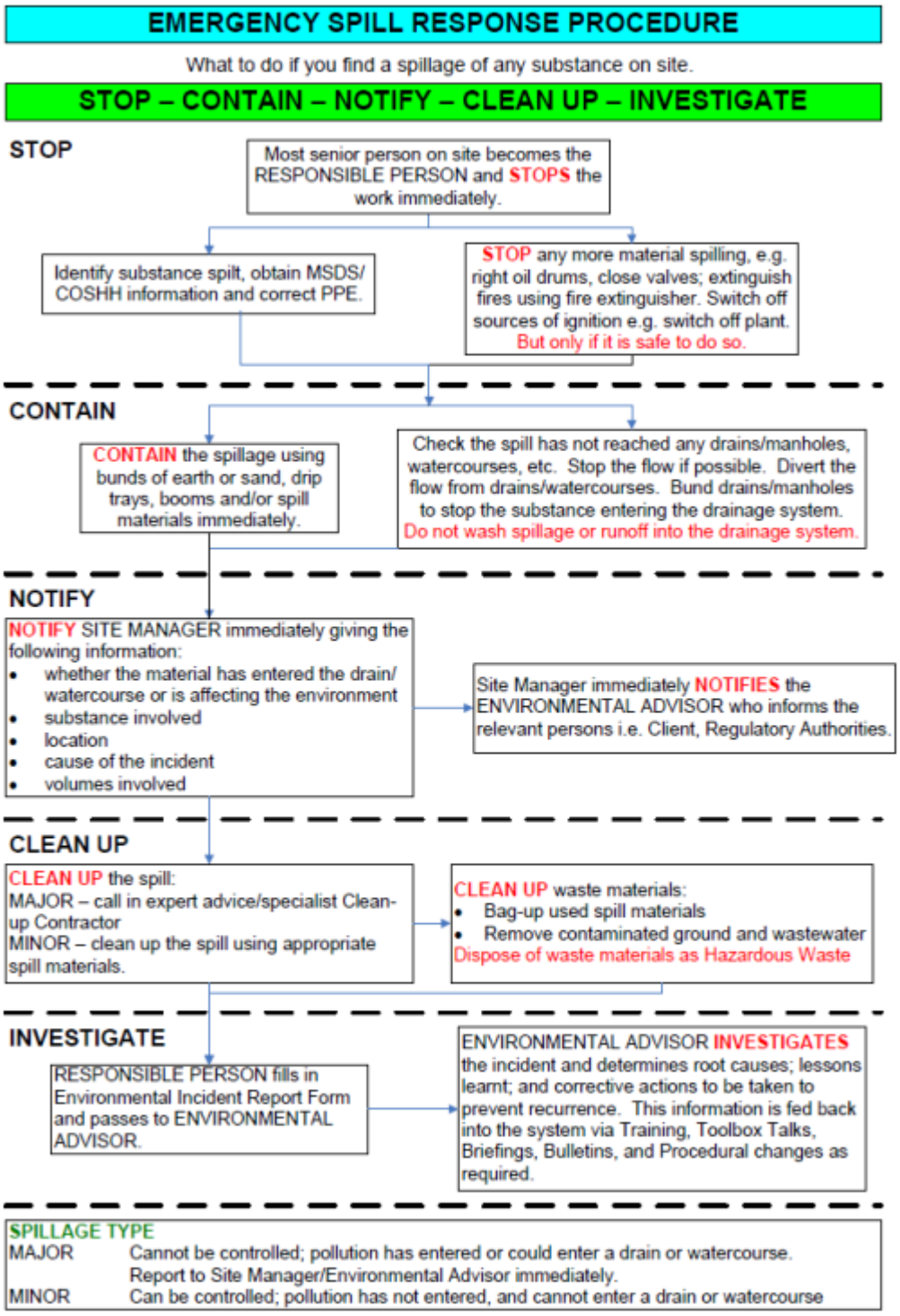
- Actions taken to prevent contamination;
- Individuals reported to;
- Lessons learnt; and
- Method Statements.

3.9.6 The Principal Contractor will log any incidents of non-compliance with the CEMP with the log available to the Client.

3.9.7 The formal procedure for handling environmental incidents will be developed and agreed by the Client and the Environment Manager. An environmental incident would be an event where an environment receptor is unintentionally adversely impacted from a construction activity and a response is required. For example, an accidental spillage.

3.9.8 In the event of a spill or leak, the following process shown in **Plate 4-1** will be followed (or equivalent process). This will be included in each Incident Response Plan, and this will be briefed to the workforce and displayed on site notice boards.

Plate 3-1 Spill response procedure



3.9.9 All appropriate staff will be trained and made aware of the spill response procedure set in place, following Environment Agency Pollution Prevention Guidelines 21 (EA (2009). Pollution Prevention Guidelines Incident Response Planning: PPG 21) and 22 (EA (2011). Pollution Prevention Guidelines Incident Response Dealing with Spills: PPG 22) as best practice. In the event of any incident the Client will be notified. Additionally, the Environment Agency and any other affected parties will be notified if required.

3.9.10 Procedures will also be set in place to respond to any emergency incidents which may occur on site. As the works progress the Incident Response Plan will be updated to reflect the progress of the construction stage.

4 Environmental Control Measures

4.1 Air Quality

Mitigation Methods for the Site

4.1.1 The Principal Contractor will be required to ensure the use of Best Practicable Means (BPM) at all times during the works in mitigating emissions from construction sites and activities so as to avoid causing a statutory nuisance (Part III, section 79, Environmental Protection Act 1990) and mitigate impacts on human and ecological receptors.

4.1.2 In line with the BPM to be implemented at the site and Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction, January 2024, and in order to minimise the nuisance and impact arising from dust, before commencing each phase of works, the Principal Contractor will be required to prepare a Dust Management Plan (DMP). The DMP will clearly identify the sensitive receptors within 200m of the works, mitigation measures to be applied and procedures for their implementation and management. The DMP will detail the name and contact details of person(s) accountable for air quality and dust issues on the site.

4.1.3 Measures to be used wherever practicable include (but are not necessarily limited to) the following:

- The Principal Contractor will be required to routinely monitor the effectiveness of dust mitigation. Regular inspections will be undertaken to monitor dust. The frequency of monitoring will be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. The choice of mitigation will be tailored to the activity and impacts expected throughout the construction phase:
- Dust generating activities (e.g., cutting, grinding, and sawing) will be minimised and weather conditions considered prior to conducting potentially dust emitting activities;

- Open-air storage mounds or stockpiles of potentially dusty materials including sand, aggregates, soil, spoil, and waste shall be minimised order to prevent exposure to wind and/or dust nuisance. Such storage within 200m of any sensitive receptor is to be avoided as far as is practicable;
- Surfaces of storage mounds or stockpiles are to be maintained in a damp condition where practicable to minimise the risk of dust;
- Storage mounds and stockpiles are to be carefully profiled to avoid collapse;
- Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site;
- All waste must be stored in appropriate containers to prevent any fugitive emissions of dust or odour;
- Roads and accesses will be kept clean;
- Surfaces of unpaved haul roads and site areas routinely crossed by vehicles and plant are to be regularly compacted and maintained in a damp condition to minimise the risk of dust mobilisation by the wind or passage of vehicles/plant;
- Where possible, plant will be located away from construction site boundaries that are close to residential areas;
- Vehicles / Skips transporting waste or construction materials will be securely covered;
- Material or waste will not be burnt on-site;
- Earthworks operations shall be organised to avoid double handling of potentially dusty materials where practicable;
- Re-vegetate earthworks and other exposed areas to stabilise surfaces as soon as is practicable;

- All loads of potentially dusty materials are to be covered/contained before transport on the public highway to prevent the escape of materials;
- Maximum speed-limits of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas are to be signposted and enforced. If long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the acceptance of the Client Project Manager;
- All vehicles/plant/equipment used in construction are to be well maintained in accordance with manufacturers' specifications and not be left running when not in use;
- Vehicles/plant/equipment emitting visible smoke except on first start-up are not to be used;
- Water-assisted dust sweeper(s) are to be employed to remove, as soon as practicable, any accumulations of mud and debris from hard standing areas within the site and public highway due to trackout;
- Wheel wash facilities will be installed at major construction site exits. Prior to leaving the site all vehicles are to be inspected and, if necessary, cleaned to prevent the track-out of mud and debris onto the public highway;
- Vehicle cleaning facilities are to be provided before the site egress (where required to avoid mud on the public roads) with appropriate drainage arrangements to prevent pollution of surface and ground waters;
- On dry working days a record of weather and ground conditions at the site is to be maintained. This will include an account of visual inspections of all site areas and safely accessible off-site areas including the public highway and verges along construction traffic routes within 100m of the site egress. Any clearly visible deposits of

mud or debris on paved surfaces, off-site dust soiling, or plumes of dust crossing the Site Boundary shall be noted along with any investigative and remedial actions taken;

- All dust and air quality complaints are to be logged and investigated to identify cause(s) and ensure remedial measures are put in place and that these are effective. The complaints log and record of investigation and remedial action is to be made available to the Local Authority on request; and
- Materials deliveries and vehicle access to the site will be timed to avoid the need to queue outside the site prior to opening or whilst other deliveries are completed where practicable.

Monitoring and Reporting

4.1.4 Regular monitoring (e.g. site walkovers) should be carried out by the Environmental Manager, a site supervisor or clerk of works when dust generating activities are occurring.

4.1.5 All dust and air quality complaints are to be logged and investigated to identify cause(s) and ensure remedial measures are put in place and that these are effective. The complaints log and record of investigation and remedial action is to be made available to the Local Authority on request.

4.2 Cultural Heritage and Archaeology

Mitigation Methods for the Site

4.2.1 The scope of the archaeological mitigation strategy will need to be agreed with the County Planning Authority (CPA)'s archaeological advisor. The location and extent of archaeological mitigation (including archaeological protection measures during construction) will be determined in consultation with the CPA's archaeological advisor.

4.2.2 It is anticipated that this would likely comprise the following measures:

- Targeted excavation to record archaeological remains of high significance prior to the commencement of any site preparation works (e.g. topsoil stripping, haul road construction) in areas evaluated containing Iron Age, Romano-British, medieval and post-medieval activity will require investigating in TT05, TT07, TT10 and TT20 (see **Appendix 8.4: Written Scheme of Investigation for Archaeological Mitigation Works** (Document Reference: 3.08.04)) and **Appendix 8.8 Figure 2** (Document Reference: 3.08.08).
- Monitoring of ground works under archaeological supervision and control (watching brief) in Water Framework Directive Mitigation areas where channel and bank reprofiling is proposed near a possible medieval moated homestead and in the area of the Foxburrow stream. Monitoring of works under archaeological supervision and control within woodland at the Attlebridge Airfield may be required to record WW2 remains on land currently wooded.
- Archaeological trial trenching is required in an area previously inaccessible due to land use constraints and development to the Red Line Boundary. Once access is granted, an appropriate mitigation strategy for any significant archaeological remains will then be formulated in consultation with the CPAs archaeological advisor.
- The Deposit Model **Appendix 8.5** (Document Reference 3.08.05) demonstrates potential for palaeoenvironmental remains to be preserved. The recommendation of a purposive borehole survey within the Wensum Valley is confirmed through consultation with the CPA's archaeological advisor.
- All archaeological work will be completed in accordance with Written Scheme of Investigation(s), which will be approved by the CPA's archaeological advisor.

4.2.3 It is proposed that these matters are secured by a condition in the planning permission for the Proposed Scheme. Built heritage assets can be affected by construction dust, noise, vibration and vehicle strikes. This OCEMP aims to prevent, reduce and mitigate the potential for adverse impacts to built heritage assets. Measures to minimise the construction phase impacts on heritage assets are set out in the Environmental Control Measures sections for Air Quality, Noise and Vibration, and Landscape and Visual.

4.2.4 The Grade II listed Barn 50m north west of Low Farm, together with the dairy barn and farmhouse (presumed to be curtilage listed for assessment purposes) comprise the above ground heritage assets closest to the Proposed Scheme. The Applicant would monitor potential construction impacts from noise, vibration and construction traffic through the installation of Tell-Tale crack monitors and, if necessary, carry out remedial action.

4.3 Biodiversity

Overview

4.3.1 A full list of biodiversity features considered to be present to varying degrees within or near the Proposed Scheme that will potentially be impacted during the construction and operation phases of the Proposed Scheme is provided in the ES.

4.3.2 This plan provides a list of protection measures for undertaking works associated with the Proposed Scheme, and specifically deals with the protection of habitats and species during the construction phase only.

4.3.3 Information concerning the creation, management and maintenance of ecological habitats and features will be detailed in a separate Landscape and Ecological Management Plan (LEMP) for the Proposed Scheme, building on the **Appendix 10.32 Ecological Mitigation Strategy** and **Appendix 11.6 Outline Bat Monitoring Strategy,** and **Landscaping Design Plans** (Document Reference 2.07.00) submitted with the planning application.

4.3.4 Habitats within the Proposed Scheme are variable in their importance and range from low to high ecological value and include hedgerows, grasslands, woodland and scrub. After completion of specific ecological surveys, the following habitats or habitat features are considered to be present to varying degrees within or near the Proposed Scheme and will be potentially impacted during the construction phase of the Proposed Scheme:

- Ancient woodland (comprising Primrose Grove and Mouse Wood);
- Purple Moor Grass and Rush Pasture Habitat of Principal Importance (HPI);
- Lowland Mixed Deciduous Woodland HPI;
- Coastal and Floodplain Grazing Marsh HPI;
- Hedgerow HPI;
- Watercourses; and
- Notable, veteran and ancient trees.

4.3.5 Impacts and mitigation pertaining to notable, veteran and ancient trees are considered separately from ancient woodland in this document.

4.3.6 Habitats within the Proposed Scheme and surrounding area are known to support a number of notable and protected species. After completion of specific ecological surveys, the following species/species groups have been identified to be present or considered likely to be present within or near the Proposed Scheme and will be potentially impacted during the construction period:

- Bats (foraging, commuting and roosting);
- Badger (*Meles meles*);
- Otter (*Lutra lutra*);
- Water Vole (*Arvicola amphibius*);

- Breeding birds;
- Wintering birds;
- Barn Owl (*Tyto alba*);
- Reptiles (specifically Common Lizard, Grass Snake and Slow Worm);
- Great Crested Newt (*Triturus cristatus*);
- Fish;
- Aquatic macroinvertebrates;
- Terrestrial Invertebrates;
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*);
- Aquatic macrophytes; and
- Additional Species of Principal Importance.

4.3.7 The following Statutory Designated sites are present within the Study Area of the Proposed Scheme (as defined within the Environmental Statement) and will potentially be impacted during the construction period:

- River Wensum Special Area of Conservation (SAC) / Site of Special Scientific Interest (SSSI).

4.3.8 The following Non-Statutory Designated Sites are present within the Study Area of the Proposed Scheme (as defined within the Environmental Statement):

- River Wensum Pastures County Wildlife Site (CWS);
- Attlebridge Hills CWS;
- Broom & Spring Hills CWS;
- Wensum Pastures at Morton Hall CWS;
- Primrose Grove CWS;

- Gravel pit Plantation and Church Hill CWS;
- Land adjoining Foxburrow Plantation CWS;
- Old Covert, Wood Lane CWS;
- Mouse Wood CWS; and,
- Fakenham Road Roadside Nature Reserve (RNR).

4.3.9 The Proposed Scheme will result in a loss of habitat and the potential degradation to retained habitats (as defined within document reference: 3.10.00). In the absence of mitigation, habitat loss and degradation could have negative effects on notable and protected habitats and species.

4.3.10 This section sets out the mitigation measures to be implemented during construction to enable compliance with relevant nature conservation legislation and planning policy.

4.3.11 Consideration of Invasive non-native species (INNS) has been included as measures may be required during construction to avoid infringing the legislation intended to prevent their spread by human activities.

4.3.12 The Environmental Statement should be consulted for full details of the ecological baseline of the Proposed Scheme.

Mitigation methods for the site

4.3.13 Ecological mitigation measures are required to avoid and reduce potential effects that could occur during the construction phase of the Proposed Scheme.

4.3.14 The measures detailed below are based on the recommendations included in the following documents:

- **Chapter 10: Biodiversity** (Document Reference: 3.10.00);
- Ecological Mitigation Strategy (Document Reference: 3.10.32);

- Outline Bat Mitigation Strategy (Document Reference: 3.11.06); and
- Outline Bat Monitoring Strategy (Document Reference 3.11.07.

4.3.15 This section should be read in conjunction with **Appendix D** – **Outline Arboricultural Method Statement** (Document Reference: 3.03.01d), and **Chapter 11 Appendix E – Tree Felling Protocol** (Document Reference 3.11.06e) which detail approaches to the removal and protection of individual trees and groups of trees.

4.3.16 It should also be read with the Outline Bat Mitigation Strategy, which has been developed to inform a draft European Protected Species Mitigation Licence (EPSML) application which was made to Natural England (NE) for NE to review the proposed approach to licensable activities pertaining to these species, with the intention to secure a Letter of No Impediment (LONI) or similar as part of the planning application process.

4.3.17 That strategy will be updated to account for the final measures set out in the approved detailed CEMP(s), Construction Lighting Management Plan and Landscape and Ecology Management Plan in order to apply for and secure the full EPSML from Natural England. The Principal Contractor will carry out construction in accordance with that EPSML as well we as the detailed CEMP(s).

4.3.18 The following measures are to be implemented as part of detailed CEMP.

General Construction Measures

4.3.19 The following general measures will be followed during the construction phase of the Proposed Scheme to ensure the avoidance and reduction of killing/injury of notable and protected species as well as the protection of retained habitats and designated sites.

General Site Management

4.3.20 General environmental protection measures must be implemented during the construction phase of the Proposed Scheme. Such measures include best environmental practice guidance outlined in the Government's Pollution

prevention for businesses (DEFRA, 2019) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2015). The following minimum standards must be adhered to prevent negative ecological effects beyond the Proposed Scheme boundary:

- Measures must be taken to prevent dust and other emissions from construction affecting the retained habitats and land beyond the Proposed Scheme such as irreplaceable habitats.
- Chemicals and fuels must be stored in secure containers located away from watercourses or water bodies. Spill kits must be available.
- Implementation of appropriate drainage arrangements to intercept, capture and attenuate surface water runoff.
- Retained trees and hedgerow must be protected in accordance with Sub Appendix 3.1D: Outline Arboriculture Method Statement (Document Reference 3.03.01d).
- Any holes that are excavated on site will be covered overnight to prevent animals falling in. Open pits, open pipes and other excavations will need to be covered at the end to prevent mammals being trapped. If this is not possible, a broad plank can be placed in excavations to allow animals to escape. Excavations should be checked first thing each morning, prior to the start of works that day. Any animals found within excavations should be allowed to escape and move off, or carefully removed and placed within suitable habitat cover before site works commence.
- Noise and vibration must be controlled and kept to the minimum necessary (see section 5.7).
- Where practicable construction compounds and on-site working areas should be sited away from sensitive features such as known roosts of conservation significance, watercourses and running water habitats to

avoid/minimise the risk of disturbance and polluted run-off/ wastewater entering these habitats from the compounds.

- Safeguards during construction will be implemented prior to the start of work and will remain in place until the end of the construction period.
- Fencing will be installed around all construction works to protect the surrounding retained habitats. This may include the surrounding of construction compounds by hoardings to reduce visual effects due to the presence of construction traffic, plant and equipment.

Construction Lighting Management Plan

4.3.21 Night works should be avoided where practicable to reduce the lighting of sensitive habitats and potential disturbance to species. Lighting levels will be kept to the minimum necessary for security and safety.

4.3.22 Where this cannot be avoided, any temporary lighting during construction will adhere to a Construction Lighting Management Plan (CLMP), which will detail the mitigation measures that are to be implemented to reduce adverse effects from on-site lighting. The CLMP will be subject to approval alongside the detailed CEMP(s).

4.3.23 This strategy will be produced for bats and will follow guidance produced by the Institution of Lighting Professionals (ILP) in conjunction with the Bat Conservation Trust (BCT). The lighting strategy will also include measures for other nocturnal species such as badger, crepuscular birds and invertebrates. The lighting strategy may include the following recommended measures:

- Temporary lighting used for construction will be switched-off when not in use;
- Avoid, light spill onto known roosts, trees, woodland edge and hedgerows, and Temporary Flightlines (detailed below); minimised through good design, with physical shields installed where necessary, and maintain dark corridors along retained areas of retained woodland and hedgerows, to ensure continued connectivity;

- Creation of a 'buffer zone' of very low illuminance (if any) adjacent to established or proposed key habitats, such as adjacent to treelines;
- Landscaping measures in the form of shrubs and tree planting to further act as secondary mitigation to screen and soften the effects of installed artificial construction light sources;
- Use the minimum light levels necessary for the relevant task / function, this may equate to reducing light intensity, and/or using the minimum number or light sources or minimum column height;
- Use hoods, louvres or other luminaire design features to avoid light spill onto retained and newly created areas of vegetation;
- Use narrow spectrum light sources where practicable to lower the range of species affected by lighting, specifically avoiding shorter wavelength blue light, using instead warm/neutral colour temperature lighting; and,
- Use light sources that emit minimal ultra-violet light to avoid attracting night-flying invertebrate species.

Designated Sites

4.3.24 See 'General Construction Measures' above and 'Aquatic Ecology' and 'Invasive non-native species below.

4.3.25 For mitigation against increased flood risk, see **Appendix 12.2: Flood Risk Assessment** (Document Reference: 3.12.02).

Habitats

4.3.26 See 'General Construction Measures' above and 'Aquatic Ecology' and 'Invasive non-native species' below.

4.3.27 Retained trees and hedgerows must be protected in accordance with British Standard BS5837:2012 Trees in Relation to Construction - see Sub Appendix 3.1D: Outline Arboriculture Method Statement (Document Reference 3.03.01d) which details approaches to the removal and protection of individual trees and groups of trees.

Bats

4.3.28 Measures to be undertaken for the protection of bats during the construction phase are detailed within Appendix 11.6 (Document Reference 3.11.06), and as follows:

- A European Protected Species Mitigation Licence (EPSML) will be required from Natural England prior to the start of vegetation clearance works, due to roost loss, roost resource loss, severance and fragmentation. Where necessary confirmed roosts, and moderate and high suitability trees, included as part of the woodland resource, will be felled under licence, pursuant to a final tree felling protocol approved as part of the EPSML, developed from the outline submitted as part of the Outline Bat Mitigation Strategy;
- A toolbox talk will be provided by the Named Ecologist to the Principal Contractor (and sub-contractors as required) where there is a risk of site staff encountering bats, to outline the proposed works, actions to take if a bat is encountered and their legal responsibility regarding bats and their roosts;
- Disturbance to bats will be minimised during installation of green bridges. One of the mechanisms that will reduce impacts is minimising the time between vegetation clearance and the subsequent replanting;
- Disturbance will be minimised during installation of underpasses. One of the mechanisms that will reduce impacts is avoiding night-time working to prevent nocturnal noise and light pollution along the bat flight path, where feasible and minimising the time between vegetation clearance and the time prior to subsequent replanting, where possible;

- The principled approach to the use of Temporary Flightlines (TFLs) and what they will include is detailed within **Appendix 11.6 the Outline Bat Mitigation Strategy** (Document Reference 03.11.06). During construction works the principles detailed within the EPSML application in respect of these TFLs will be adhered too. Flexibility in design is crucial and will be led by the EPSML Named Ecologist at time of installation, in liaison with the Contractor. TFLs will be installed at each of the green bridge and underpass locations, with further TFLs added during sight clearance where the EPSML Named Ecologist sees fit. The TFLs will be secured through the EPSML application, as will ensuring their use during the construction period until vegetation along permanent commuting features shown on the Landscaping Plans have matured;

- The EPSML will include details of the provision of bat boxes to be installed, and veteran features to be created, to provide replacement roosting features. The locations of these will be within areas of existing woodland shown on the **Essential Environmental Mitigation Plan** (Document Reference 2.11.00). Bat boxes will need to be installed in advance of clearance works under the discretion of the Named Ecologist for the EPSML; and

- Measures to mitigate potential killing/injury and disturbance of bats during the construction phase of the Scheme will also be included within the EPSML. This will include measures such as:

    - All confirmed roosts, and trees of low, moderate and high suitability included within the woodland resource will be felled under an EPSML. All capture and exclusion methods would be detailed within the EPSML application documents, including a tree felling protocol, in line with the outline protocol set out in the Outline Bat Monitoring Strategy;

- The EPSML will also include timings for which works can occur on different trees, to avoid sensitive periods for roosts (i.e. hibernation or maternity);
- The tree felling protocol, within the EPSML, will also include additional mitigation measures for temporary retained roosts, during the construction period. Where a roost will be lost but is required to be temporary retained to avoid sensitive periods (i.e. hibernation or maternity) buffers and temporary flightlines will be required;
- One structure (Structure 11A3) has been identified as requiring the temporary exclusion of bats during construction works (which include earthworks and piling), due to the disturbance risks to hibernating bats. This exclusion will be completed under the EPSML;
- An Bat Noise Monitoring and Management Plan (BNMMP) will be produced as part of the EPSML, and works will be carried out in accordance with this document. The BNMMP will include relevant measures to avoid and / or reduce effects of noise on bats, from activities such as piling. This will include timing of works to either set a level of disturbance before sensitive periods for roosts (i.e. hibernation or maternity) or to avoid works during these periods. The Named Ecologist will work with the Environmental Manager to develop this plan in line with the requirements within the EPSML and to ensure consistency with the detailed CEMP(s) submitted for approval;
- All temporary lighting during construction will be in accordance with the CLMP, which will be developed with input from the Named Ecologist, and which will be referred to in the EPSML application;

- Where structures and trees identified as confirmed roosts and are to be retained, suitable buffer zones to those structures and trees will be defined within the EPSML. These buffers will also include areas of connective vegetation to be retained leading to / from the roost. Any works within the buffers of these trees will be at the discretion of the Named Ecologist or their accredited agent;
- Temporary lighting controls, as detailed in the CLMP. These controls will be designed at the time of construction, with consultation between the EPSML Named Ecologist and contractor;
- At compound locations located between the Northern Woodlands and the River Wensum, buffer stockpiles will be installed at the edge of compounds between retained hedgerows and blocks of woodlands. The soil bunds will be approximately 2m in height and will be designed to create a barrier to reduce light spill and attenuate noise to minimise disturbance;
- An assessment of the potential effects of noise upon bats will be made within 50m of piling activities (the activity most likely to create higher levels of noise audible to bats). This assessment will be completed as part of the BNMMP, which will inform the EPSML. Across the majority of the Site Boundary, either no roosts are present within the 50m buffer, or the roosts present will have been removed prior to piling works commencing. The exceptions to these locations include:
    - two common pipistrelle day roosts, and two soprano pipistrelle day roosts, in buildings located near to the River Wensum Viaduct; and

- one soprano pipistrelle day roost located in a tree in the Northern Woodlands.

- To avoid and/or reduce impacts, the timing of the piling works within Nursery Woodland and woodland adjacent to the Broadway, Foxburrow Plantation will be considered alongside relevant data on roost status and locations, at the time of construction, with consultation between the Named Ecologist and contractor.

4.3.29 Felling methodologies for all negligible suitability trees are not included within **Chapter 11 Appendix 6E – Tree Felling Protocol** (Document Reference 3.11.06e) and will be covered by a Precautionary Working Method Statement (PWMS) for the Scheme and completed under direction of the Ecological Clerk of Works (ECoW).

4.3.30 A number of maternity roosts, two confirmed (ES34, ES15) and two assumed (ES12, ES13) are present within 50m of the Site Boundary at the location of temporary storage shown in Appendix 11.9: Temporary Storage Area Bat Survey Report.

4.3.31 Given this, embedded mitigation measures with respect to the use of this area (temporary storage shown in Appendix 11.9: Temporary Storage Area Bat Survey Report only) will be mandated by their inclusion in the Proposed Scheme. Practical measures will include:

- The use of a 50m buffer to protect known roosts and roosting resource;
- The height of stockpiles to be reduced as much as possible within the available area (outside of the buffers);
- Buffering of potential flightlines with the use of protective fencing and stockpiles adjacent to hedgerows;

- A 50m buffer zone between these storage areas and retained woodland within Primrose Grove; and
- The use and inclusion of targeted and controlled lighting.

Badger

4.3.32 A draft licence for Badger was submitted to Natural England in 2022 for their review with the intention of receiving a LONI with respect to Badgers).

4.3.33 A full licence will be sought from Natural England and a summary of the mitigation measures to be included in the licence provided below.

4.3.34 The draft Badger licence lists the setts that will require closure under the final Natural England licence. Those setts that fall within the 30m of bored pile locations will need to be closed prior to piling activities within this exclusion zone.

4.3.35 Artificial sett(s) are usually required prior to the planned closure or destruction of a main sett. Required artificial setts will be constructed prior to the closure of setts near Ringland Lane and Long Plantation, in accordance with the methodology to be included in the licence. Artificial setts will be protected throughout construction and remain protected in-situ post construction.

4.3.36 Vegetation clearance works are planned to take place prior to some active setts being excluded. The Badger Licence will also include measures to minimise the risk of damage or disturbance to retained setts, methods to close setts that are not currently in use, and best practice protocols.

4.3.37 The following measures have also been identified to mitigate any potential impacts on Badger populations located within and adjacent to the site which will be impacted by the Proposed Scheme, and will be included in the Badger Licence:

- A pre-construction badger survey will be carried out at least three months in advance of site clearance in areas of potential badger habitat commencing to ensure any new information is obtained.

- A further survey would be completed within one week prior to site clearance commencing. These surveys would reconfirm levels of badger activity in advance of site clearance commencing. This would allow identification of any additional mitigation required, to be agreed with Natural England,, in the unlikely event levels of activity had increased or locations had changed in the three months prior to site work commencing.
- Where badger setts are to be retained and construction works are required nearby, a buffer zone will be established around setts. Requirements for buffer zones and the restrictions of works within buffer zones will be identified and enforced on site by the Named Ecologist on the licence.
- All vegetation clearance works within 20m of known Badger setts will be completed under the direct supervision of a SQE. Prior to the start of vegetation clearance, an area within a minimum distance of 10m of any Badger sett entrance that displays signs of current use by a Badger must be clearly marked using coloured tape, string, paint or other markers. Any further setts which are discovered during vegetation clearance must be similarly marked as soon as their presence becomes known.
- Badgers use the wider area for foraging and commuting purposes and therefore measures need to be put in place during the construction phase to minimise effects upon badger movement and foraging activity. These measures will be set out in the detailed CEMP(s) used to inform the licence, and should be read in conjunction with the measure stated in the ‘Noise and Vibration’ section of this document, and include the following:
    - Fencing off or covering dangerous areas of the construction site (e.g., deep excavations) with Badger proof fencing; or providing

a means of egress from shallow excavations, such as animal ladders;

- Avoidance of storage of plant and materials on areas of potential foraging habitat (e.g., retained grassland);
- Enforcements of appropriate speed limits for on site traffic to minimise the risk of collisions with Badgers;
- Avoidance of night works where practicable, unless specifically required, to avoid disturbance by artificial lighting; and
- Where required use of lighting hoods, cowls or shields to avoid light spill onto setts or Badger paths.

- If any potential badger setts are identified these should be checked by the Named Ecologist prior to any clearance works to confirm their status. The Named Ecologist should be consulted should an active sett be identified to determine whether an amendment to the licence is required.

Otter

4.3.38 In addition to the 'General Construction Measures' above the following measures would be completed specifically in relation to Otter and set out in the detailed CEMP(s):

- Pre-construction surveys to reconfirm the status of Otter habitat usage of the site and surrounding watercourses up to 250 m from the Proposed Scheme;
- Avoidance of any obstructions to established Otter paths and access to open water; and
- The marking of, and adherence to, 30 m exclusion zones around any holts and shelters identified as a result of updated survey prior to site clearance and construction activities occurring. If Otters are known or suspected to be breeding, the exclusion zone could be extended to a

200 m radius. However, it could be reduced to 100 m depending on the nature of the works, topography, and natural screening. This would require judgement from a Suitably Qualified Ecologist (SQE).

4.3.39 If breeding was confirmed and exclusion zones of the size set out above were not possible, works would be undertaken in accordance with a ESPML to derogate the legislation protecting otter (except during periods of active breeding). As part of the licence, appropriate compensation would be provided to ensure that alternative habitat is provided in advance of the impact occurring.

Water Vole

4.3.40 A Natural England mitigation licence will be required to conserve individuals for the duration of construction.

Water vole mitigation during piling activities

4.3.41 Piling activities in proximity of the River Wensum during the construction period have the potential to temporarily impact water voles indirectly (i.e. via noise and vibration). It is not known if the piling works will result in a level of disturbance that will cause Water Voles to disperse, however it is estimated that there is the potential for indirect impacts to this species within 100m of piling works. This radius will be refined as part of the detailed CEMP(s) for this location and ecologist named on the Water Vole licence following the completion of the detailed design and confirmation of the works specifications and duration.

4.3.42 In addition to the ‘General Construction Measures’ above, the following precautionary working methods will be implemented during piling activities in proximity to the River Wensum floodplain.

4.3.43 These methods, to be in the detailed CEMP(s) and Water Vole licence application, will include:

- An update water vole population assessment to be undertaken at least 12 months prior to piling activities (this would ideally comprise a survey in mid-April – June and a second survey in July – September);
- A period of monitoring of water vole burrows identified during the update water vole population assessment using trail cameras immediately prior to piling works to confirm water vole presence or likely absence;
- The protection of any water vole habitat via the use of clearly demarcated exclusion zones using Heras fencing (or similar), to be installed between the works area and water vole habitat and be a minimum of 3m from the edge of each watercourse but 5m where practicable, (to be positioned under the supervision of the Named Ecologist named on the Water Vole licence); and
- Water vole burrow monitoring by a SQE during the piling works.

4.3.44 Should the SQE identify any evidence of disturbance to water voles then works must cease and Named Ecologist on the Water Vole licence contacted to review the methodology.

4.3.45 Any temporary fencing to protect water vole habitat will be installed with clear signage to state the function of the fence. Fencing will be used to demarcate a construction exclusion zone. These protection measures will remain in place until the completion of piling activities.

Wintering Birds

4.3.46 The BPM mentioned in this document will be employed to minimise the effects of noise pollution, dust and air pollution and visual intrusion during construction.

4.3.47 The current landscaping proposals include for a range of different habitats that will provide a foraging resource for wintering birds as shown on the **Landscaping Plans** (Document Reference 2.07.00) and described in the Ecological Mitigation Strategy. This includes the creation of wet swales, woodland, orchard and scrub habitat. Plant species will include berry bearing shrubs and trees to provide suitable foraging resource.

Breeding Birds

4.3.48 If carried out during the breeding season (considered to be from March to August inclusive), vegetation and site clearance could cause the destruction or damage of active nests and any eggs or live young present. The following measures would therefore be implemented to ensure compliance with the Wildlife and Countryside Act (1981, as amended):

- Vegetation and site clearance will take place between September and February inclusive, i.e., outside the main bird breeding season, wherever practicable. Should it be deemed necessary to remove habitats suitable for breeding birds during the breeding season, these would be subject to a pre-clearance watching brief by a SQE who is an appropriately experienced ornithologist. The watching brief will be undertaken a maximum of 48 hours prior to the vegetation removal taking place (unless otherwise stated by the SQE who is an appropriately experienced ornithologist); and
- In the event any active nests are found or suspected, clearance works would be halted within a minimum distance of 5m from the nest. This buffer distance would be varied on the advice of the ornithologist SQE, dependent on the nature of affected habitats and the species of bird involved. Clearance works would not recommence until any young had fledged and left the nest, with a re-inspection by the SQE who is an appropriately experienced ornithologist required to confirm the absence of active nests.

4.3.49 Surveys identified Red Kite, listed on Schedule 1 on Wildlife and Countryside Act (1981), as possibly breeding on site although no active nest was located. Red Kites usually nest in the canopy of tall trees. Should tree clearance be undertaken during nesting bird season, then pre-clearance checks would be undertaken as described above. If Red Kite, or any other Schedule 1 bird species is identified during the pre-clearance checks, then works should cease and the SQE who is an appropriately experienced ornithologist contacted to determine an appropriate course of action. Monitoring of any nest of a Schedule 1 species will require a specific licence. If any active nests are recorded, to avoid the risk of intentional or reckless disturbance the SQE who is an appropriately experienced ornithologist will determine an appropriately sized buffer around the active nest.

4.3.50 The proposals for reinstatement, enhancement and compensatory habitat as set out in the Ecological Mitigation Strategy would provide replacement habitat for breeding and wintering birds.

4.3.51 Piling activities (regarding the construction of the River Wensum Crossing) will be timed to avoid the dawn chorus during the nesting season in accordance with guidance provided by the SQE who is an appropriately experienced ornithologist. Mitigation detailed in the Noise and Vibration section of this document will be adhered to.

Barn Owl Occupied Breeding Sites

4.3.52 Previous surveys did not identify any confirmed Occupied Breeding Site (OBS) within the Site Boundary.

4.3.53 The detailed CEMP(s) will provide for the following measures:

4.3.54 All active OBS identified within 150m of the Proposed Scheme boundary will be capped or removed to prevent barn owls from accessing them to ensure that this Schedule 1 bird is not disturbed while nesting and that construction works are compliant with legislation. Exclusion measures will be undertaken at these OBS during September to February inclusive (outside of the typical nesting season). This may involve removing and relocating the nest box to an

appropriate location away from construction works outside the breeding season and in advance of works. Otherwise, compensatory nest sites should be in place prior to exclusion measures and at least 30 days prior to the commencement of construction works. It is best practice for any OBS exclusion measures undertaken outside of the breeding season to be undertaken by a SQE who holds a barn owl licence. OBS identified during previous surveys are presented in **Table 5-1** (**confidential appendix** Document Reference: 3.10.28 for full location information):

Table 4-1 Barn Owl Occupied Breeding Sites identified during previous surveys

Feature number	**Feature**
Tree number 15	Barn owl box
Tree number 2	Tree
Building number 6	Agricultural buildings

4.3.55 Should a new OBS be identified during clearance works outside of the barn owl breeding season, then a suitably experienced and licenced ecologist would be contacted to undertake nest exclusion measures at the OBS and an alternative nesting box should be provided.

4.3.56 If a new OBS is identified during clearance works within the barn owl breeding season, the following guidelines should be followed:

- A Protection Zone should be defined based on the potential for disturbance due to works to be undertaken;
- Should it not be possible to implement the required Protection Zone distance, a verification survey should be carried out to confirm the current status of the OBS;
- The presence of an OBS will require a Protection Zone until such a time that the young birds have fledged and is independent of the nest. A secondary verification survey, following the end of the breeding

season, should be undertaken by the SQE who holds a barn owl licence to confirm the status of the OBS;

- Inactive OBS should only be marked for closure during the breeding season if no other alternative mitigation options are possible and leaving it open would likely result in the disturbance of nesting barn owls. A compensatory box should be provided prior to closure of the OBS under the guidance of a SQE who holds a barn owl licence; and
- Best practice guidelines, as described in Shawyer (2011) should be followed. Close inspection of occupied nest sites requires a SQE who holds a barn owl licence and should be avoided during the months of March, April and May when barn owls are typically in the process of selecting nest sites or beginning to lay eggs. There is an increased risk of permanent nest abandonment during this period.

Barn Owl Potential Nest Sites

4.3.57 Potential Nest Sites (PNS) identified during previous surveys are presented in **Table 4-2**.

Table 4-2 Barn Owl Potential Nest Sites identified during previous surveys

Feature	Feature
Tree number 13	Tree
10	Agricultural buildings
Tree number 20	Barn Owl Box
Tree number 16	Tree
Tree number 3	Tree
Tree number 19	Tree
Tree number 5	Tree
Tree number 14	Tree

Feature	Feature
Tree number 1	Tree
Building number 13	Agricultural buildings
Tree number 9	Tree
Tree number 10	Tree
Tree number 6	Tree

4.3.58 Prior to any construction works commencing, a pre-works check for nesting Barn Owls will also be carried out on PNS within the Proposed Scheme by a SQE who holds a barn owl licence, prior to the felling of these trees. The SQE who holds a barn owl licence will determine areas where additional survey is required at this time.

4.3.59 All potential barn owl nest sites identified within 150m of the Proposed Scheme will be capped, netted or relocated to ensure nesting barn owls are not disturbed during construction. To prevent barn owls from accessing the PNS and ensure that works are compliant with legislation and that this ecological constraint avoided, a SQE who holds a barn owl licence will undertake nest exclusion measures. This may involve removing and relocating the nest box to an appropriate location away from construction works, or capping the PNS, outside the breeding season and in advance of works. This work should take place September to February inclusive (outside of the typical nesting season). Compensatory nest sites should be in place at least 30 days in advance of the commencement of works, where practicable. Temporary mitigation measures such as capping or netting should remain in place for the duration of the construction period and removed (subject to landowner agreement) in the winter prior to commencement of the operational phase of the Proposed Scheme.

4.3.60 Should a new PNS be identified within 150m of the Proposed Scheme during clearance works outside of the barn owl breeding season, then a SQE who holds a barn owl licence should be contacted to undertake nest exclusion

measures and an alternative nesting box should be provided. Compensatory nest sites should be in place at least 30 days in advance of the commencement of works, where practicable.

4.3.61 If a new PNS is identified during clearance works within the barn owl breeding season, or if any identified PNS are unable to be capped, netted or relocated prior to the commencement of works, then the following guidelines should be followed:

- A SQE who holds a barn owl licence should be consulted prior to the commencement of works to survey the PNS for evidence of Barn Owl breeding activity;
- Should the PNS be identified as an OBS, then a Protection Zone should be defined based on the potential for disturbance due to works to be undertaken, to be determined by the SQE who holds a barn owl licence;
- Should it not be possible to implement the required Protection Zone distance, a verification survey should be carried out to confirm the current status of the OBS;
- The presence of an OBS will require a Protection Zone until such a time that the young birds have fledged and is independent of the nest. A secondary verification survey, following the end of the breeding season, should be undertaken by the SQE who holds a barn owl licence to confirm the status of the OBS; and
- Best practice guidelines, as described in Shawyer (2011) should be followed. Close inspection of occupied nest sites requires a SQE who holds a barn owl licence and should be avoided during the months of March, April and May when barn owls are typically in the process of selecting nest sites or beginning to lay eggs. There is an increased risk of permanent nest abandonment during this period.

4.3.62 Where the set approach cannot be followed, a suitable alternative that avoids the risk of disturbance to Barn Owls will be determined by the SQE who holds a barn owl licence and followed (e.g. Shawyer, 2011).

Reptiles

4.3.63 A Precautionary Method of Working (PMoW) stated in this section will comprise the mitigation measures for reptile species listed within the Environmental Statement as part of the detailed CEMP(s). This PMoW will detail methods to be used by the Principal Contractor to minimise and avoid any adverse impacts to reptiles during the construction of the Proposed Scheme. The following recommendations will ensure the risk of disturbance or damage to reptiles is minimised during this period.

4.3.64 The details of the PMoW will be explained to the Contractor prior the commencement of works via a toolbox talk delivered by a SQE. The Contractor will then be responsible for ensuring the measures recommended are adhered to under the supervision of an SQE where relevant.

4.3.65 Habitats such as tussocky grassland, woodland, scrub, wetland, field margins and boundary features such as ditches and hedgerows identified within the Red Line Boundary were identified as suitable to support reptiles. All areas of suitable reptile habitat will be treated as potentially supporting reptiles.

4.3.66 Any site or vegetation clearance in areas of suitable reptile habitat will be undertaken during the period March – September, which is outside of the sensitive hibernation season (indicatively November-February inclusive, but weather dependent). Site or vegetation clearance in areas of suitable reptile habitat will follow a phased process unless otherwise directed by the supervising SQE.

4.3.67 Where vegetation is cleared during the active season (March – September inclusive), reptiles will be persuaded to migrate into retained habitat under a precautionary method of working (PMoW) comprising a two-stage vegetation clearance, and works will be supervised by a SQE.

4.3.68 The clearance of vegetation in suitable reptile habitat during the active season will be undertaken in two stages over at least two consecutive days (unless otherwise recommended by the supervising SQE). A SQE will hand search the area of suitable reptile habitat proposed for clearance, before supervising tall or dense vegetation being cut down to 150mm from the furthest extent of the area of suitable habitat to be cleared, and towards the retained habitat. This will be followed by an additional hand search by the SQE. A cut to ground level will then be undertaken on the following day under the supervision of an SQE. Any potential existing refugia on site (e.g., log piles) will be dismantled by hand by a SQE and relocated to a retained area. Works will be temporarily halted, in the immediate vicinity, if individual reptiles are encountered to allow the animal to disperse from the work site. Alternatively, any reptiles found will be moved by the SQE to a suitable location identified prior to the commencement of clearance works.

4.3.69 Construction works within areas of habitat suitable for supporting reptiles will not be permitted to start until the hand searching and phased clearance of vegetation has been completed and the SQE has advised that the area is clear for works to proceed.

4.3.70 Vegetation within areas of suitable reptile habitat will be maintained to a height of 30mm through regular mowing or strimming for the duration of the construction period to minimise the risk of reptiles returning.

4.3.71 Should the removal of any rubble, brash or log piles be required as part of the Scheme then this will only be undertaken outside of the reptile hibernation period (considered to be November to February inclusive) under a PMoW. This will include the stone and aggregate elements installed by the Principal Contractor to facilitate the construction of the Proposed Scheme.

4.3.72 Works should cease, within the immediate vicinity, and the advice of a SQE sought if any reptiles are discovered during the works and the SQE is not present.

Amphibians (including Great Crested Newt)

4.3.73 The site supports Common Toad, an SPI species, as well as other common amphibian species.

4.3.74 Pond 15 (as defined in the Great Crested Newt eDNA Survey Report 2021), to the south-west of the Site Boundary was found to contain a low population (max count of 1) of Great Crested Newt. Common Toad are expected to be present across the site.

4.3.75 The following measures have been identified and will be included in the detailed CEMP(s) to mitigate any potential impacts on amphibian populations located within and adjacent to the site which will be impacted by the Proposed Scheme:

- The clearance of suitable terrestrial habitat within 500m of Water Body 15 will proceed under a non-licenced Method Statement to be presented alongside the detailed CEMP;
- Such Method Statement will likely suggest a two-stage vegetation clearance. Vegetation will be cut outwards from any suitable habitat to the extent of the retained habitat, down 150mm on one day followed by down to ground level on the following day. Any potential existing refugia on site (e.g., log piles) will be dismantled by hand and relocated to the retained area. Works will be temporarily halted, within the immediate vicinity, if individual animals are encountered to allow the animal to disperse from the work site. This activity will be supervised by an ecologist to minimise the risk of killing or injury to amphibians, who will hand search vegetation for Great Crested Newt and other amphibians prior to clearance each day; and

- Vegetation clearance of 0.75ha of terrestrial habitat within 500m of Water Body 15 will be completed outside of Great Crested Newt breeding season (indicatively July to September/October inclusive, depending on weather conditions) to ensure Great Crested Newt are mobile and able to migrate away from the works area into retained suitable habitat.

Aquatic Ecology

4.3.76 All site based staff should be made aware of the need to protect watercourses from contamination, including EA and CIRIA guidance and legal obligations.

4.3.77 Appropriate measures to protect the water environment should be implemented during the construction phase of the Proposed Scheme in order to eliminate or minimise risk to aquatic flora and fauna.

4.3.78 These measures are detailed in full within Road Drainage and Water Environment section. In addition to those measures stated within the Road Drainage and Water Environment section, the following would be implemented during the construction phase and set out in the detailed CEMP(s):

- Sediment management and water quality monitoring should be implemented during any construction works with the potential to affect any watercourse, and a plan for appropriate remediation measures to ameliorate any adverse effects should they occur should be prepared;
- When construction activities, including stock piling and plant and vehicle washing, occur near a watercourse they should be separated from the watercourse with barriers (e.g. sediment fences) to prevent surface runoff from these sites entering the watercourse. Construction activities should be as far from the bank top of a watercourse and/or connected hydrological pathways where practicable. Works within 8m require an environmental permit from the Environment Agency (or relevant authority), which will be obtained prior to commencement of works;

- The extent of vegetation clearance should be limited as far as practicable near to watercourses. Where possible, any vegetation removed should be managed carefully to limit the extent of bare soil on site at any given time, to limit the potential for sediment run-off during wet weather;
- Impacts to vegetation within the riparian zone during the enabling works and construction phase should be monitored for recovery and suitably reinstated;, along with delivery of the target BNG net gain enhancements (Document reference: 3.10.33), these enhancements will be detailed in the LEMP for the Proposed Scheme;
- Works should avoid being carried out on soft riverbanks where feasible to avoid compaction, erosion, and sediment release. Where temporary crossings or permanent structures are being constructed on watercourses, these works should remain localised within close proximity to the structure;
- Activities such as concrete pouring will be carried out in line with industry best practise, such as concrete washout points to avoid lorries and pumps runoff contamination and temporary works procedures to avoid spillages, as set out elsewhere in this document;
- Timing of construction works around the River Wensum should consider key fish migration periods in consultation with Environment Agency Fisheries Officer to agree appropriate measures to avoid the obstruction of passage or disturbance to fish moving to upstream reaches for spawning;
- Sensitivity (to noise and vibration) of those fish species present should be considered to ensure that appropriate construction methods can be implemented to minimise and avoid disturbance. Construction will comply with measures set out in Section 5.8 Noise and Vibration of this document. Soft-start piling method will be implemented for sheet piling in close proximity to watercourses. Timing of piling works near

watercourses should allow for fish dispersion and be of a short duration to allow migratory fish a window to move upstream;

- A 3m construction exclusion zone from the water's edge of the River Wensum will be enforced to reduce potential impacts to the SAC and SSSI watercourse. The exception is the temporary bailey bridge that spans the River Wensum, though the bridge abutments will be at least 3m away from the river;
- Should any part of a watercourse need to be impounded during the works, then a fish translocation should be carried out to remove fish from the impoundment. Fish translocation operations will require a permit from the EA in order to use electric fishing and ancillary equipment (such as hand nets).. Any such operation will need careful co-ordination with the Principal Contractor to set-up and drain any coffer dam or impounded area;
- Culverting of WC5 will require temporary dewatering and diversion of a section of the existing watercourse. This will require a licence from the Environment Agency, and authorisation to allow fish removal by a trained ecologist to avoid fish entrapment as described above. As an IDB managed drain and given its proximity to the Wensum SSSI/SAC, it will also require IDB consent and engagement with NE.
- Culverts should be placed so that the invert level is below the existing bed level, to prevent impedance of fish movement;
- Any floodplain areas modified or created should be designed to allow fish passage back into watercourses following flood events, avoiding fish entrapment;
- Following removal of temporary culverts on WC5, banks will be allowed to return to a natural state and recovery monitored;

- The temporary bailey bridge over the River Wensum will be removed upon completion of the construction phase. Following removal, it is expected that vegetation will recover naturally, however this recovery will be monitored during the 12-month maintenance period following construction (separately to BNG monitoring) and any deterioration or loss of vegetation as a result of shading from the temporary crossing within the riparian zone will be returned to its previous state; and
- The Construction Lighting Management Plan will provide that lighting used for construction must be switched-off when not in use and, where possible, positioned so as not to spill on to watercourses. A dark corridor should always be maintained within the watercourse to allow fish passage.

Terrestrial Invertebrates

4.3.79 Should the removal of any rubble, brash or log piles be required as part of the Scheme then a PMoW should be employed.

4.3.80 Mitigation will entail the careful clearance of suitable habitat. Where any deadwood habitat is removed, this will be retained and incorporated within the areas of proposed landscaping for the Proposed Scheme.

Desmoulin's Whorl Snail

4.3.81 PMoW will be implemented during construction activities in proximity to the River Wensum floodplain to mitigate against any potential impacts on Desmoulin's whorl snail, alongside the detailed CEMP(s). These measures will include the protection of bankside habitat via the use of Heras fencing (or similar), to be installed a minimum of 3m from the watercourse, and a distance of 5m where practicable (to be positioned under the supervision of an SQE).

4.3.82 Desmoulin's Whorl Snail were identified within watercourse 1 (WC1), WC3 and WC4 during previous surveys. Mitigation for this species is focussed on ensuring no net loss in supporting habitat, as well as providing habitat enhancements for the populations present to ensure their favourable

conservation status is maintained in the long-term. The enhancement and creation of new habitat across the Wensum floodplain will create a larger area suitable to support this species. This will be detailed in the LEMP for the Proposed Scheme in line with what is shown on the Essential Environmental Mitigation Plan and discussed in the Ecological Mitigation Strategy.

4.3.83 A SQE will supervise any enhancement works to these watercourses to ensure that habitat conditions remain of a standard that provides the necessary conditions to support Desmoulin's Whorl Snail. The SQE will also deliver a toolbox talk regarding this species to all Site Based Staff. The integrity of the population of Desmoulin's Whorl Snail across the floodplain will be maintained by taking measures, including habitat creation, to safeguard this species in this area.

Additional Species of Principal Importance

4.3.84 In addition to the 'General Construction Measures' above, mitigation for Additional Species of Principal Importance such as Harvest Mouse (*Micromys minutus*), Brown Hare (*Lepus europaeus*), Hedgehog (*Erinaceus europaeus*) and Common Toad (*Bufo bufo*) will comprise the following measures, to be set out in the detailed CEMP(s):

- Clearance works will avoid the hibernation period (indicatively November-February inclusive, but weather dependent);
- Ecological supervision will be required during animal burrow excavations and vegetation clearance activities;
- Animal burrows on site will be inspected by the supervising SQE to confirm the likely absence of protected species or habitat, and then carefully excavated in a manner that allows animals to safely escape before works commence;
- Any potential existing refugia on site (e.g. log piles) will be dismantled by hand and relocated to the retained area.

- Works, within the immediate vicinity, will be temporarily halted if individual animals are encountered to allow the animal to disperse from the work site. If toads do not disperse from the work site, they can be carefully moved by hand by either the SQE or an appointed Contractor representative, taking care to any avoid injury, and relocated in a suitable area in close proximity.
- This activity will be supervised by a SQE to minimise the risk of killing or injury to Species of Principal Importance, who will hand search vegetation for these species prior to clearance each day.

4.3.85 Ecological supervision will be required during animal burrow excavations. Animal burrows (excluding badger setts) on site will be carefully excavated in a manner that allows animals (e.g. rabbits or foxes) to safely escape before works commence.

Invasive Non-native Species

4.3.86 Construction activities within the Proposed Scheme could potentially result in the spread of invasive non-native species into areas they do not currently occupy. The invasive species Himalayan balsam (*Impatiens glandulifera*), Rhododendron (*Rhododendron ponticum*) and Variegated Yellow Archangel (*Lamium galeobdolon*) were recorded within the Survey Area of the Proposed Scheme. The non-native American signal crayfish (*Pacifastacus leniusculus*) was recorded in the River Wensum, and a single American Mink (*Neogale vison*) was also identified.

4.3.87 To address the risk of spreading invasive non-native plant and animal species an invasive species strategy would be produced by the Principal Contractor alongside the detailed CEMP(s). This strategy should include the following measures:

- A pre-construction ecological survey would be completed in the active growing season (approximately April to August inclusive) prior to vegetation and site clearance commencing in any part of the site.

- Measures to present the spread of any invasive species across and beyond the site. Exclusions zones around identified areas of invasive species where no works are to take place will be implemented to ensure these species are not disturbed by works. The invasive species removal will be carried out by a specialist contractor.
- Briefing and training of workers on good biosecurity practices appropriate to their role.
- Equipping workers with the necessary equipment, Personal Protective Equipment (PPE) and substances to implement biosecurity control measures, including effective hygiene and sanitation practices. This will most frequently comprise disinfectant tablets, sprayers and brushes to clean and disinfect equipment and PPE prior to leaving site.
- Ensure that Defra's "Check, Clean, Dry" principles are followed and ensure that all PPE and survey equipment is clean and dry (and if necessary, disinfected) prior to going to and from site.
- Survey for mink presence across the floodplain to assess the risk of Water Vole predation, prior to the translocation activities.

4.4 Monitoring

4.4.1 Table 4-3 summarises the recommended monitoring of ecological mitigation measures during the construction of the Proposed Scheme. These recommendations will be further refined as part of the production of the detailed CEMP(s) for the Proposed Scheme. Monitoring beyond the construction period will be detailed in the Landscape and Ecological Management Plan (LEMP) for the Proposed Scheme.

Table 4-3 Ecological Mitigation Monitoring during the construction period

Feature	Construction Monitoring
Habitats	Monitoring of planted vegetation to ensure it establishes successfully. Regular checks of implemented mitigation measures by a SQE.
Aquatic Habitats	Impacts to vegetation within the riparian zone should be monitored for recovery and suitably reinstated. Regular water quality monitoring.
Bats	Monitoring to align with the monitoring strategy as part of the EPSML, further to the measures set out in the **Appendix 11.7 Outline Bat Monitoring Strategy**. The monitoring of alternative roosting opportunities. Regular checks of tree protection fences by the Named Ecologist, accredited agent or an appropriate person, appointed by the Named Ecologist.
Badger	Monitoring as stated in the Badger licence. Monitoring will be required to confirm badgers have relocated to the artificial sett prior to construction. Checking for new burrows for badgers or other burrowing animals within or adjacent to the Scheme extent. Regular checks of implemented mitigation measures by a SQE.

Feature	Construction Monitoring
Water vole	Water vole monitoring will be undertaken during the construction period and into the post-construction period to assess the areas of habitat in proximity to the piling activities. This would align with monitoring requirements in the ESPML. Surveys will be undertaken in May or September to identify signs of water vole use in areas of habitat in proximity to the piling activities.
Breeding birds	Regular checks for breeding birds and of tree protection measures during the breeding season by a SQE.
Reptiles	Regular checks for reptiles and of implemented mitigation measures by a SQE.
Amphibians	Regular checks of implemented mitigation measures by a SQE.
Terrestrial Invertebrates	Regular checks of implemented mitigation measures by an appointed person.
Additional Species of Principal Importance	Checking for new burrows for burrowing animals within or adjacent to the Scheme extent. Regular checks of tree protection fences by an appointed person. Regular checks of implemented mitigation measures by a SQE.
Vegetation	It is expected that vegetation will recover naturally, however this recovery will be monitored during the 12-month maintenance period following construction (separately to BNG monitoring).

4.5 Climate Greenhouse & Resilience

Mitigation Methods for the Site

Greenhouse Gases

4.5.1 The Principal Contractor has committed to the following measures to reduce carbon emissions further during the construction phase of the Proposed Scheme:

- Adopting the London Low Emission Construction Partnership requirements for vehicles involved in construction activities;
- Following the Non-Road Mobile Machinery (NRMM) Practical Guidance which sets the emission standards for carbon monoxide, hydrocarbons, oxides of nitrogen and particulate matter for diesel engines;
- Promoting the use of start-stop technology plant on site;
- Implementation of a network of electricity sockets to feed a fleet of electric site vehicles where practicable;
- Maximising the re-use of site won materials for earthworks and pavements;
- The majority of earthworks materials that are non-hazardous surplus excavated arisings would be reused off-site (recycle);
- Using solar panels for site lighting where practicable;
- Showing preference for energy providers that use 100% renewable sources of electricity;
- Minimise energy consumption including fuel usage by, for example, minimising plant use and idling;
- Maximising the use of local suppliers; and
- Producing a Carbon Management Plan.

4.5.2 The Principal Contractor is actively exploring the feasibility of the following measures to reduce carbon emissions further during the construction phase of the Proposed Scheme. These measures have not been taken into account in the residual effects reported in **Chapter 15: Climate Greenhouse Gasses** (Document Reference: 3.15.00) but provide further opportunities to reduce the impacts reported. The detailed CEMP(s) will include measures or similar measures to these, which will be developed by the Principal Contractor to continue to minimise the greenhouse gas impact of the Proposed Scheme. The measures ultimately employed will be dependent on practicability and effectiveness and also be updated with developments in best practice.

Traffic and vehicles

- Where possible, further proportionate design optimisation of elements of the Proposed Scheme to reflect the carbon reduction hierarchy.
- Promoting the use of Hydrotreated Vegetable Oil fuel by the supply chain.

Materials

- Use of sustainable concrete such as Ground Granulated Blast-Furnace Slag or Concrete (graphene-enhanced concrete) where practicable and subject to design specification compliance.
- Use of low or cold application asphalts where practicable and subject to design specification compliance.
- Use of re-cycled construction materials for haul roads and temporary working areas or platforms where practicable and subject to design specification compliance.
- Subject to the Principal Contractor's Detailed Quantitative Risk Assessment outputs, bituminous materials cold milled during the works could be reused where they do not present a pollution hazard in the permanent works and subject to design acceptance. For example, a substitute for type 1 subbase in footways and hard standings.

Pavement Analytical Design and Site Won Material re-use

- Pavement design is being developed using a fully analytical/performance approach that will result in a considerable reduction in pavement thickness with the associated CO2e reduction. Furthermore, there is an ongoing investigation, testing campaign and design work to demonstrate that the sub-base can be constructed and stabilised using site won material reducing the requirements for importing aggregate to virtually zero.

Site Arrangements and Energy Supply

- The Principal Contractor will be encouraged to use solar power and facilities to reduce water use where practicable e.g. charging of traffic signal and sign batteries if applicable.
- Procuring sustainable welfare cabins.

Supply Chain

- Maximise the use of local waste management facilities.
- Identification of synergies among suppliers during the procurement stage.
- Incentivisation of carbon reduction practices within the supply chain via procurement strategies.

4.5.3 All these initiatives are currently under evaluation and will need to comply with all applicable policies and project requirements before implementation, including design requirements, cost efficiency and environmental standards.

Climate Resilience

4.5.4 The following mitigation has informed the climate resilience assessment and will be required for resilience during the construction phase where appropriate:

- Use of admixtures to maintain water/cement ratio during construction, thus enabling increase in consistency.

- Identify opportunities to use CEM 1 (cement grade using unblended cement) during construction to increase the rate and heat of hydration and reduce curing time, although careful consideration and testing must be given to reduction in concrete strength but under certain situations this may be an applicable approach.
- Risk during construction of reduced working periods and delays from extreme temperature events is deemed to be very low, with no legal maximum temperature in the UK. However, efforts will be made to manage site working hours to avoid working in hotter times of day during construction during extreme weather.
- Provide appropriate protection to all UV resistant materials during construction.
- Provide appropriate curing methods for concrete during construction.
- Carry out site testing of materials during construction to optimise moisture content and therefore ensure stability of any structures / embankments.
- Ensure welfare facilities are cooled. Periodic rest breaks to be taken during the hottest part of the day.
- Provide shade for workers in exposed areas during hot weather.
- Use personal protective equipment to reduce exposure to UV radiation – light coloured, long-sleeved clothing, sun cream, sun hats.
- Review weather forecast and manage construction works to avoid working at heights, during high wind or storm events when conditions are unsuitable.
- Use localised water pumps to pump water off site and ensure water levels in excavations do not exceed critical levels.

4.6 Landscape and Visual

Mitigation Methods for the Site

4.6.1 The following measures shall be considered during the construction works to ensure protection of the existing landscape setting and views to the site, to be confirmed in the detailed CEMP(s):

- No materials of any kind to be stored, dumped or discharged outside of designated construction areas;
- Mitigation measures will be put in place to prevent spread of mud or stones from the construction traffic on local roads as described in the Air Quality section above;
- Clearly mark trees and vegetation that are to be retained and included within the CEMP(s) which can be shown and communicated to staff during construction;
- Trees and vegetation to be retained are to be protected in line with the methods references in **Appendix D Outline Arboricultural Method Statement** (Document Reference: 3.03.01d);
- No storage of equipment or materials in areas of retained vegetation or in the Root Protection Area of retained trees, as identified by a suitable qualified arboriculturist.;
- No fires on site;
- Use of hoardings of a suitable colour to integrate into the surrounding landscape shall be considered to provide screening of main construction works from any residential receptors and PRoW users;
- Tidy site management to reduce visual clutter associated with the works;
- The use of construction lighting (when required) to involve the use of well located, modern light fittings in accordance with best practice to

minimise light intrusion to surrounding sensitive receptors, including consideration of the direction of the lighting;

- Monitoring the effectiveness and suitability of root protection fencing ensuring no impacts to trees that are to be retained;
- Plant to be located in a site compound or in a suitable secured area when not in use;
- Work cabins to be sited as to minimise visual impact on nearby receptors;
- Any landscape management to be delivered as part of the Proposed Scheme to be carried out by competent and qualified individuals; and
- Appropriate location, organisation and phasing of construction activities. Measures will be applied to clear areas for construction as close as possible to works commencing and top soiling, seeding and planting will be undertaken as soon as practicable, within seasonal constraints, after sections of work are complete. As far as practicable, plant and material storage areas will be sited to avoid landscape and visual impacts.

4.7 Geology and Soils

Mitigation Methods for the site

4.7.1 The following general mitigation methods should be implemented during construction, where required, to ensure the safety of construction workers, visitors and to avoid any potential pollution of surface and ground water:

- Surface water management methods will be detailed within a Surface Water Management Plan document, which will be provided by and monitored by the Principal Contractor;
- Construction workers would be required to wear Personal Protective Equipment (PPE) such as gloves and face masks (where appropriate) to prevent dermal contact and inhalation or ingestion. Appropriate site

hygiene facilities will be put in place and the presence of contaminants, and the associated risks will be explained to ground workers before they begin work;

- The presence of contaminants and the associated risks will be explained to ground workers before they begin;
- Fuel storage on-site to be carried out under best practice;
- Dust suppression measures (e.g., damping down) will be implemented to minimise the potential for dust generation. Water will be sprayed onto material being worked to damp down any potentially contaminated dust and prevent it from becoming airborne where it may affect construction workers;
- Wheel washing of site vehicles will be implemented to prevent tracking of contaminated material off-site and to minimise the potential for dust generation of contaminated soils;
- The Principal Contractor shall employ dust and odour (hydrocarbons) suppression techniques in all working areas (including access roads) to reduce potentially contaminated soils being wind-blown to off-site receptors during construction works to minimise off-site impacts;
- Within areas determined to be “Medium” risk within the Detailed UXO Risk Assessment Peer Review, a UXO Engineer should be retained on-site in order to detect for excavations and earthworks and safely manage UXO items, prior to and during construction;

- All workers on-site will be made aware of potential contamination issues on the site and will use best practice techniques during the construction phase. The operation of construction vehicles and the handling, use and storage of hazardous materials will be undertaken as follows:
    - Construction vehicles and plant will be regularly maintained and supplied with spill kits and drip trays to reduce the risk of hydrocarbon contamination;
    - Refuelling would be undertaken in specified areas where there is non-permeable hardstanding where practicable and drainage passes through an oil interceptor prior to discharge. Where this is not possible, suitable pollution prevention measures would be required. Drip trays will be installed to collect leaks from diesel pumps;
    - The Principal Contractor will provide provisions for the protection of surface water drains and catchments of surface run-off to reduce the risk of contaminated run-off and high-suspended solids moving off-site;
    - Adequate bunded and secure areas with impervious walls and floors, with a capacity of 110% of substance volume, are to be provided for the temporary storage of fuel, oil and chemicals on site during construction;
    - Oil interceptor(s) will be installed on discharge points from any temporary oil storage/refuelling areas;
    - Pollution control procedures will be developed on the site in line with “Pollution Prevention Guidance 6 – Working at Construction and Demolition Sites”, all relevant licences will be obtained, and appropriate training provided to all construction staff;

- Spill containment equipment such as absorbent material on site is to be provided;
- The Principal Contractor will ensure the management of stockpiles of recycled (crushed) construction aggregates and contaminated soils awaiting off-site disposal and/or on-site treatment to minimise the potential for generation of contaminated run-off and dust;
- As part of construction monitoring, audits must be carried out by the Environmental Manager to ensure compliance and correction action is implemented; and
- Hazardous materials already present on-site or proposed to be used during the construction works will be identified and an appropriate Control of Substances Hazardous to Health (COSHH) Assessment carried out.

Unexpected Contamination and Contaminated Waste

4.7.2 A watching brief for ground contamination will be maintained. In the event of the discovery of unexpected contamination during construction, construction works shall cease until a method statement, identifying, assessing the risk and proposed remediation measures, together with a programme, is submitted to and approved in writing by Norfolk County Council as the CPA.

4.7.3 A phased approach to contaminated land assessment would be undertaken if contaminated ground was identified. The approach would be in accordance with the Environment Agency Land Contamination Risk Management guidance. If required, this would comprise further ground investigation and generic quantitative risk assessment. Additional measures may be required following the interpretation of the ground investigation if contaminant pathways are identified which may include remediation and validation of any remedial works. All site work would be carried out under the provisions of the Health and Safety at Work Act 1974.

4.7.4 Any contaminated material encountered on-site should be handled, stored and removed appropriately in line with suitable method statements. The Principal Contractor will comply with relevant legislation, technical guidance and regulations in the identification, handling, storage, recovery and disposals of waste.

4.7.5 Provision will be made for a suitably qualified consultant to advise on the management of "hazardous waste" should unexpected contamination be encountered so that materials can be appropriately managed and disposed of during works.

4.7.6 Any remediation or removal of contaminated waste shall be undertaken by a suitably licensed contractor. Disposal sites and routes will be identified by the Principal Contractor in consultation with Norfolk County Council as the County Planning Authority and the Environment Agency. Consideration should be given to transportation modes and alternatives to reduce the adverse environmental effects, times, landfill capacity and license conditions.

Material Reuse

4.7.7 Any site-won material which is to be reused across the Proposed Scheme, should be undertaken in accordance with the Materials Management Plan (MMP), in accordance with CL:AIRE Definition of Waste: Code of Practice. An Outline Materials Management Plan can be found in **Sub Appendix C – Outline Materials Management Plan** (Documents Reference: 3.03.01c).

Soil Handling

4.7.8 A Soil Handling Management Plan will be required to manage the handling of soil resources along the scheme. An Outline Soils Resources Handling Plan can be found in **Sub Appendix A - Outline Soil Management Plan** (Document Reference: 3.03.01a). Measures outlined within Annex E and Appendix K of the IEMA 'A New Perspective on Land and Soil in Environmental Impact Assessment' guidance should also be followed by the Principal Contractor.

4.8 Noise and Vibration

Mitigation Methods for the Site

4.8.1 Construction will comply with BS 5228-1:2009+A1:2014 and BS 5228-1:2009+A2:2014 Noise and Vibration Control on Construction and Open Sites (Ref 1.1), and should apply the following mitigations measures and adopt Best Practicable Means (as defined in the Control of Pollution Act 1974) in order to minimise noise and vibration from construction activities affecting sensitive receptors in the area of the Proposed Scheme:

- All construction plant used on the site will be in good working order and certificates of inspection and maintenance will be held on site and available on request;
- All plant items should be properly maintained and operated according to manufacturers' recommendations and in such a manner as to avoid causing excessive noise and vibration;
- As far as reasonably practicable, all plant items should be located/orientated so that noise and vibration at nearby sensitive properties is minimised;
- All plant items operating intermittently on the site should be shut down in the intervening periods;
- All pneumatic tools should be fitted with silencers or mufflers where practicable;
- No loud music or loud radios will be played on the site;
- Construction vehicles should not idle on local roads waiting to enter the site;
- Works (including deliveries) would be programmed such that the requirement for working outside normal working hours is minimised;

- Where construction works are occurring within 50m of a residential property, if appropriate, temporary environmental noise barriers will be installed around plant items to provide screening;
- The importance of noise and vibration and its potential to affect those living and working nearby will be included in the general induction training for the site and specific training will be given to staff who will have particular responsibility for managing noise and vibration during construction;
- The external communications approach is outlined in section 3.5 above.

Monitoring and Reporting

4.8.2 Should any noise complaints be raised during the construction period, this should be flagged with the CLO and be addressed appropriately in line with the complaint's procedure detailed in **Section 3.6** above.

4.8.3 The Principal Contractor shall review the need for and scope of any noise and vibration monitoring and reporting that is necessary (agreed by the Principal Contractor through discussion with the Local Authority through its Section 61 consent(s)) to ensure and demonstrate compliance with all noise and vibration commitments and any Section 61 consent(s).

4.9 Population and Human Health

4.9.1 This section sets out the mitigation measures in minimising potential effects on private property and housing; community land and assets; development land and businesses; agricultural land holdings; walkers, cyclists and horse-riders; and human health.

4.9.2 The measures incorporated into the design proposals and to be adopted by the Principal Contractor to avoid, reduce or remedy potential impacts include:

- Access to residential properties will remain open, where practicable. Alternative access will be provided throughout construction phase if current access is inhibited. Access protocols will be discussed in advance between the Principal Contractor and affected residents to ensure safe passage and will be added to a Construction Traffic Management Plan (CTMP).
- Where there would be any temporary or permanent diversions or closures to public rights of way during construction, the Applicant would seek to identify an alternative. The Applicant will consult with the local authority access officer and Traffic Regulation Orders (TRO) will be applied for where traffic regulation is necessary.
- The Applicant would seek to provide alternative access to Mid Norfolk Shooting Ground and Khora Yoga if existing access is inhibited, with discussion to be organised by the Principal Contractor with the business premises to determine alternative access if required. Access measures regarding temporary supervised traffic control to the business premises would be added to a Construction Traffic Management Plan (CTMP). The Applicant will aim to ensure visitors and users can access Mid Norfolk Shooting Ground and Khora Yoga.
- A section of the Marriott's Way circular (on-carriageway leisure route) will be diverted away from the Site Boundary during construction and reconnect to the rest of the on-carriageway leisure route where

possible. The diversionary route will incorporate good practice with regards to safety where possible and seek to maintain the same standards of accessibility for users. Contractor should seek to identify a safe diversionary route based on the requirement stated in the LTN 1/20 Cycle infrastructure design.

- No further mitigation beyond what is outlined within **Section 5.1: Air Quality**, **Section 5.5: Landscape and Visual Effects, Section 5.7: Noise and Vibration, Section 5.10: Road Drainage and the Water Environment and Section 5.11: Traffic and Transport** is recommended.

4.10 Materials and Waste

4.10.1 The disposal of construction waste has the potential to have a significant environmental impact due to the nature of the material, the limited future capacity at local landfills, the increased heavy vehicle traffic movements and the consumption of virgin raw materials. Furthermore, the nature of the material and limited local disposal capacity will result in the need to transport waste substantial distances to waste treatment / disposal locations.

4.10.2 Waste produced on-site will be subject to the Duty of Care under the *Environmental Protection Act (1990)* and the *Waste (England and Wales) Regulations (2011).*

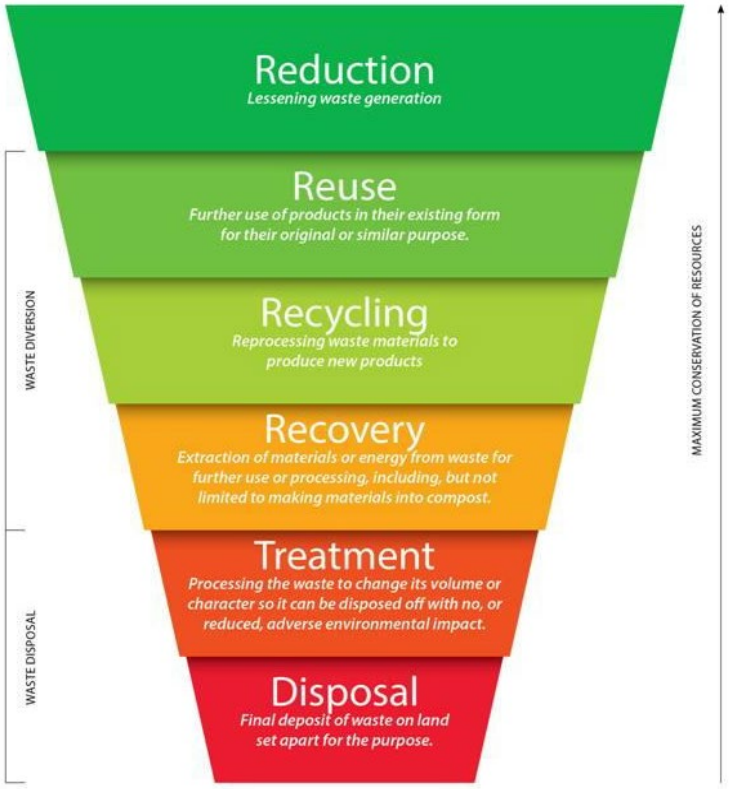
4.10.3 The waste stream will be managed so far as is reasonably practicable to maximise the reuse of surplus materials and to ensure any adverse environmental effects are minimised. Waste will be segregated on site into key waste streams such as excavated soil and stones, metals, wood/timber and general construction waste.

4.10.4 The transportation of waste to and from the site will comply with the Duty of Care requirements. These include ensuring waste is transported by registered carriers, disposal to appropriately licensed sites and maintenance of appropriate waste transfer documentation.

4.10.5 The Environment Manager will audit waste carriers and disposal facilities and maintain documentary evidence that these requirements are being met, including a register of waste carriers, disposal sites (including transfer stations) and relevant licensing details for each waste stream. Waste contractors who remove waste will be registered with the Environment Agency.

4.10.6 A core requirement in mitigating impacts from construction waste will be the inclusion of the mitigation measures. The waste hierarchy (**Plate 4-1**) will promote legal compliance and provide guidance on best practice, monitoring and reporting of construction and demolition waste.

Plate 4-1 Waste Hierarchy (Ref 1.2)



Waste Management

4.10.7 Within the site compound, it is expected that the Principal Contractor shall provide bins and vessels for specific types of waste that will be sorted on site to maximise recycling opportunities.

Waste and materials – control measures

4.10.8 Materials and waste management is approached from the point of view of sustainable development. The drivers inherent to this approach are:

a) Establishment of a circular economy in terms of materials and waste where products and materials are recovered and regenerated at the end of each service life;

b) Waste as a resource which underpins the drive for a circular economy. This involves changing a mindset from managing waste to one of increasing resource productivity;

c) The Waste Hierarchy set out by the Waste Framework Directive (2008/98/EC) which outlines and details the action to reduce the production and disposal of waste; and

d) The Proximity Principle highlighting the need to manage, treat and/or dispose of wastes in reasonable proximity to their point of generation.

4.10.9 These drivers lay the foundation for the following details on the management of Materials and Waste for the Scheme.

Waste Disposal and Source of Materials

4.10.10 The Principal Contractor will implement a Site Waste Management Plan (SWMP), to ensure that all hazardous wastes are collected, transported, stored and disposed of in a manner that protects human health and the environment.

4.10.11 Details for management of contaminated arisings and hazardous materials and waste can be found in the Design Site Waste Management Plan (SWMP) in **Sub Appendix B** (Document Reference: 3.03.01b) which gives further information on methods and best practice. Excavated arisings will be managed according to the CL:AIRE Designing out Waste Code of Practice (CoP) which ensures environmental benefits such as promoting the use of the waste hierarchy and reducing resource consumption.

4.10.12 Materials will be sourced locally where practicable. The design incorporates reuse of excavated arisings as fill in embankments and in environmental bunds for the Proposed Scheme. The cut and fill balance on the Proposed Scheme produces a surplus of excavated earthworks; these arisings will be recovered and reused in high value applications on other (off-site) construction schemes where feasible.

4.10.13 In addition, a proportion of the excavated arisings will be treated on site and reused in the form of stabilised sub-base to further reduce the requirement for imported fill. Beyond this, the Principal Contractor is actively exploring the potential for site-won arisings to be reused as structural fill at some locations, in order to achieve an earthworks balance and to reduce, as far as practicable, the import of aggregate and disposal of waste to landfill. It should be noted that this approach is subject to final design development and specifications compliance. Opportunities to utilise material in other local schemes will be explored where appropriate.

4.10.14 An Outline Materials Management Plan can be found in **Appendix C** (Document Reference: 3.03.01c).

Responsible Purchasing and Sustainability

4.10.15 The following principles of sustainability, as relevant to materials and waste, are to be adhered to during construction works where practicable:

- Encouraging the use of materials with low embodied impacts;
- Giving preference to the use of locally sourced materials;
- Use of recycled materials and aggregates particularly in the construction of roads, footpaths, cycleways and hard landscaping;
- Sourcing timber used in construction from sustainable sources, which includes verifiable sustainably managed forests (sources registered with the Forest Stewardship Council, Pan European Forest Certification or the UK Woodland Assurance Scheme);

- Providing sustainability and environmental awareness training for staff involved in construction; and
- Suppliers of materials should register to take part in the Excess Materials Exchange (a marketplace where companies can exchange any excess materials and products, thus turning waste into a revenue stream.

4.11 Road Drainage and Water Environment

Mitigation Methods for the Site

4.11.1 The following general mitigation measures for the water and sediment environment should be in place during the construction phase to reduce or eliminate potential adverse impacts:

- The preliminary earthwork drain (PED) network, the infrastructure for the management of surface water runoff, should be installed at the start of the construction phase. These should include suitable measures to deal with sediment settlement generated as part of the construction phase;
- Vehicles and construction plant will be refuelled away from any drains or watercourses and in a controlled manner;
- Spill kits and drip trays will be available for use when refuelling;
- Bunds and interceptors will be used to prevent run-off carrying sedimentation or construction material into the PED network, ditches or local watercourses;
- Bunded trays for standing pumps and chemical storage containers will be used as anti-pollution measures for site compounds located at/near potential sources of contamination;
- Construction vehicles will be maintained, and construction materials managed to minimise the risk posed to the aquatic environment;

- No foul drainage or contaminated surface water run-off will be discharged into any borehole, well, spring, soak away, lake or watercourse (including dry ditches having a connection with a watercourse);
- Any contaminated water is to be treated and disposed of in accordance with environmental legislation;
- No bentonite or any other piling support fluid must be allowed to reach the ground or surface waters of the River Wensum. In stakeholder discussions it has been agreed that a pipe can be used to transport bentonite piling support fluid across the River Wensum with appropriate mitigation. The mitigation measures shall be included within the Risk Assessment Method Statement (RAMS) produced by the Principal Contractor which will form part of the Flood Risk Activity Permit (FRAP) sought from the Environment Agency;
- Cut-off ditches will be used for entrance and exit from site to avoid sediment dispersion. Wheel washing facilities will be incorporated. These will require suitable containment of wash water, and sediment settlement provided if the wash water is to be discharged to a grass swale or similar;
- The Principal Contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will provide details of the response to an impending flood;
- A Piling Risk Assessment (PRA) will be required due to groundwater and surface water sensitivity within the River Wensum floodplain. This shall be produced by the Principal Contractor based on the detailed piling design. This will need to consider and ensure that no contamination becomes entrained into the shallow or deeper chalk aquifer, because of pile installation. This will need to be submitted to the Environment Agency as part of an application for a flood risk activity Environmental Permit associated with the works and if granted

would be regulated under the Environment Permitting (England and Wales) Regulations 2016;

- Flood risk activity permits will be required for the construction of elements of the Scheme within 8m of the River Wensum or those elements within the floodplain. Appropriate methods statements will be required as part of the permit applications. These will need to set out site access requirements including the temporary works proposals within the River Wensum floodplain. The temporary works platform is situated above the River Wensum floodplain and will be used to store materials and plant during the construction phase. Restrictions on working areas and types of activities to be undertaken on this working platform should be put in place to minimise the risk of pollution events. For example, areas for washing down vehicles and storage of fuels should be avoided where possible);
- Supervision by an ecological clerk of works for high-risk works within proximity of the River Wensum, including vegetation clearance and installation of temporary structures;
- If required within the floodplain, any bentonite processing plants and associated pumping stations must be bunded, to contain any leaks or spills, with an impermeable membrane or surface to avoid any impacts to ground or water;
- Any wheel washing facilities would need suitable containment of wash water, and sediment settlement will need to be provided if the wash water is to be discharged, via a grassed swale if feasible;
- Fuel tanks or COSHH storage areas to be bunded to 110% of contents volume;
- All project plants are to be maintained according to the manufacturer's standards;
- Spill kits to be stored at selected locations;

- There should be no uncontrolled run-off of water or mud from the site;
- All machinery will be regularly checked for oil leaks or similar, which, if found, must be prevented from entering the drainage ditches or watercourses either through immediate repair of the machinery or by a drip tray/spill kit or similar;
- Pollution control measures in place on-site, including silt barriers, allocated re-fuelling areas, and spill response measures in place (e.g., spill kits, emergency contractor). This would also need to consider runoff from any temporary bridges required for construction;
- In the event of a spillage on site, the material should be contained (using an absorbent material such as sand or soil or commercially available booms). Sorbents will be used to soak up a spill and stop it from spreading on hard surfaces. Using sorbents generates waste and this method will only be used on small spills, or where a spill has been contained to stop further spread. All used sorbents will be disposed of at an accredited site for disposal;
- If it is not possible to stop the spill at the source, significant attempts will be made to stop it as close to the source as possible. If possible, the spilling material will be safely moved into another container to limit the size of the spill. The use of a suitable container and pump may be required;
- Fuel, oil, and chemicals will be stored in secondary containment and located a minimum of 10m from any watercourse. The secondary containment system must provide storage of at least 110% of the tank's maximum capacity and ensure that any valves, filters, sight gauges, vent pipes or other ancillary equipment are also situated within the secondary containment system and arranged so that any discharges are contained;

- Temporary works de-watering (groundwater abstraction) is likely to be required locally. A dewatering management plan (dewatering strategy) will need to be developed and agreed with the Environment Agency to obtain suitable abstraction licenses and discharge permits. In particular in proximity to the River Wensum significant groundwater inflows into excavations should be avoided as much as practicable to reduce the need for comprehensive water management;
- De-watering and contaminated land control measures should be in place: particularly with reference to the management of excavated material from excavations which may be contaminated;
- Principal Contractor is to sign up for flood warnings and check online warnings regularly;
- Appropriate thresholds and flood warning systems should be identified beyond which working on the temporary works platform should be avoided because there is unacceptable risk associated with high flow events;
- Site compounds should not be placed within an area at high risk of surface water flooding as identified on Environment Agency mapping, most notably the surface water flow paths that run between:
    - Weston Road and Ringland Lane, in close proximity to the Ringland Road site compound; and
    - Along the alignment of the Foxburrow Stream between Honingham and Weston Green, where the Broadway Green Bridge is proposed.
- Attenuation features that control additional surface water runoff resulting from the PED network and associated changes to the natural topographic catchment should be put in place at the start of the construction phase; and

- If a flood warning is issued, move all machinery and equipment out of the floodplain. If this cannot be completed in a safe time, secure equipment to prevent it from being washed away.

Monitoring Methods for the Site

4.11.2 The following are location-specific monitoring requirements for the River Wensum area:

- Monitoring of implementation of specific WFD mitigation control measures as set out in the WFD report, Sub Appendix F: WFD Mitigation (Document Reference: 3.12.03f) which includes;
    - Monitoring of water quality during and following the works;
    - Sediment management and water quality monitoring should be implemented during any construction works with the potential to affect any watercourse, and a plan for appropriate remediation measures to ameliorate any adverse effects should they occur should be prepared;
    - Monitoring of planted vegetation to ensure it establishes successfully; and
    - Regular water quality monitoring.
- Scheduled ecological survey work during and following the works related to WFD / SAC features of the River Wensum; and
- Maintain records of any incidents (including spills or non-compliance with controls) and report to regulators (if required by conditions of consents or other agreement).

4.12 Traffic & Transport

4.12.1 To mitigate the traffic and transport effects of the construction of the Proposed Scheme the CEMP will include a Construction Traffic Management Plan (CTMP). This will set out measures that the Principal Contractor will be required to comply with, including:

- Construction traffic routing restrictions;
- Hours of operation;
- Vehicle cleaning facilities;
- Site access and amenities plan;
- Contractor parking;
- Construction Worker Travel Plan – this will set out a strategy to encourage sustainable travel by construction workers and visitors travelling to / from the Proposed Scheme;
- Temporary diversion impacts on driver delay;
- Construction period, phasing and hours of site operation;
- Laydown areas;
- Scheduling; and
- Monitoring and review.

4.12.2 Consideration will be given to the localised temporary widening of Marl Hill Road during construction phase if required, to enable Heavy Goods Vehicles to pass each other safely.

4.12.3 Ringland Lane would be mitigated with a parallel haul road, so would halve the impact (compared with not implementing the haul road) and prevent collisions as the haul road would operate as a one-way loop with the existing carriageway catering for the opposite direction.

4.12.4 PRoW diversions or closures for FP1 and RB1 can be temporarily closed via the Local Highway Authority. Any temporary PRoW closures would need to be timed appropriately with the construction phasing. The detail of arrangements to be made for diversion or temporary closure of PRoW crossing the scheme at the appropriate time would take forward via the temporary traffic regulation order process.

4.12.5 Marl Hill Road would have localised widening to accommodate sufficient width to enable two HGVs to pass safely. Chicane features or single lane sections would be included to prevent the need for tree removal at pinch points.

4.12.6 A Variable Message Sign system will be in place on the wider road network on the approaches to the construction site to inform users in advance of restrictions and temporary changes to access as a result of the various schemes being constructed in the vicinity.

5 References

- Ref 1.1: BSI Standards Publication - Code of practice for noise and vibration control on construction and open sites. Available online at: BSI Standards Publication - Code of practice for noise and vibration control on construction and open sites [Accessed: 11/01/2022]
- Ref 1.2: Green Neighbourhoods (n.d.) Available online at: Greener Neighbourhoods - Waste Hierarchy [Last accessed 06/10/2021].