Cambridge South East Transport (CSET) Scheme

Construction Environment Management Plan (CEMP)

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
1	24/12/2020	Samuel Okello	G Hayat	G Hayat	
2	29/4/2021		G Hayat	G Hayat	Various changes, App A added
3	08/03/2021	Samuel Okello	G Hayat	G Hayat	Addressed comments from MM Team
4	11/10/2021	Samuel Okello	G Hayat	G Hayat	Addressed comments on Rev 2
5	09/11/2021	Samuel Okello	G Hayat	G Hayat	Addressed comments on Rev 4
6	12/12/22	G Hayat	H Fenn	H Fenn	Updated to reflect Atkins design for TWA

MILESTONE INFRASTRUCTURE
A part of MGroupServices

Contents

GLOSSARY

Abbreviation	Meaning
CSET	Cambridge South East Transport
CEMP	Construction Environment Management Plan
COSHH	Control of Substances Hazardous to Health
GCP	Greater Cambridge Partnership
ES	Environmental statement
SCDC	South Cambridge District Council
NPPF	National Planning Policy Framework
NERC	Natural Environment and Rural Communities
BAP	Biodiversity Action Plan
HQPT	High-Quality Public Transport
CBC	Cambridge Biomedical Campus
PRoW	Public Right of Way
CWS	County Wildlife Site
EMS	Environmental Management System
RAMS	Risk Assessments and Method Statements
KPI	Key Performance Indicator
EHO	Environmental Health Officer
EA	Environmental Agency
AQMA	Air Quality Management Area
TMP	Traffic Management Plan
SSSI	Sites of Special Scientific Interest
SAC	Special Area of Conservation
LNR	Local Nature Reserve
HRA	Habitats Regulation Assessment
CoCP	Code of Construction Practice
SPI	Species of Principle Importance
GCN	Great Crested Newts

HSI	Habitat Suitability Index
NNSS	Non-Native Species Secretariat
BS	British Standard
SWMP	Site Waste Management Plan
EWC	European Waste Codes
WEEE	Waste Electrical and Electronic Equipment
MMP	Materials Management Plan
RC	Reinforced Concrete
NIA	Noise Important Areas
DEFRA	Department for Environment, Food & Rural Affairs
PPG	Pollution Prevention Guidelines
IBC	Intermediate Bulk Containers
EICP	Environment Incident Control Plan

1 Introduction

1.1 Aims and scope

1.1.1 The aim of this draft Construction Environmental Management Plan (CEMP) is to set out the guideline of responsibilities regarding compliance with legislation, statutory controls, Best Practice guidance and conformance with policy requirements in The Adopted Development Plans for South Cambridge District Council (SCDC) and the Cambridge City Council. The final CEMP is to be developed by the Principal Contractor upon award of works.

1.1.2 It further outlines the necessary communication and training requirement for the delivery of the project.

1.1.3 In addition to providing an implementation framework for management measures, the CEMP details the best practicable environmental management measures to minimise environmental impacts arising from the construction phase of the scheme.

1.1.4 This CEMP has been developed to avoid, minimise, or mitigate against any adverse construction effects on the environment and surrounding community. It also provides a monitoring and audit mechanism to determine effectiveness of compliance with environmental controls and how any necessary corrective actions will take place.

1.1.5 For higher standards of environmental performance, the CEMP should be considered a live document with reviews undertaken by the Project Environmental Lead and Project management team at specific intervals and new information added as appropriate. It should always be reviewed when activities or conditions onsite change.

1.2 Performance Evaluation

1.2.1 Once the TWAO application is approved this CEMP will need to be updated as part of the detailed design and construction planning works. The update will take into account all the requirements set out in the TWAO granted by the Secretary of State (including all mitigation set out in the Environmental Statement (ES) and planning conditions attached to the TWAO). The updated CEMP will need to be approved by GCP/CCC and relevant local planning authority officers.

1.2.2 The CEMP will be reviewed regularly to ensure that it remains valid and reflects the significant changes in equipment, scope of work, risks, organisational changes, circumstances, and arrangements for managing current activities on site.

1.2.3 Safety, Health and Environment performance reviews shall identify trends in accidents and incidents, with the aim to highlight target areas for improvement. The results of the performance reviews will be discussed in Projects board meetings, coordination meetings, senior project management meetings and team meetings.

1.3 Regulatory framework and planning conditions

1.3.1 The TWAO approved for the Scheme will include specific requirements to be implemented during construction and will be accompanied by planning conditions to be complied with before construction can commence.

1.3.2 The Principal Contractor shall take into account the requirements of the TWAO and all associated planning conditions when preparing the final CEMP prior to construction.

2 CSET Scheme Description and surrounding Areas

2.1.1 The CSET Scheme lies to the southeast of Cambridge, running for approximately 8.5km between the A1307/A11/A505 junction and the CBC skirting the eastern edges of Sawston, Stapleford and Great Shelford. In addition, it is proposed that active travel connections will be provided from the Travel Hub to Babraham, Babraham Research Campus and Granta Park. At the CBC the new route is proposed to run on dedicated public transport lanes on FCA, past the location of the proposed CSS on to the west of FCA, before connecting to the existing Guided Busway, enabling services to continue to Cambridge rail station and Cambridge City Centre via the Busway. The CSET Scheme will provide improved connectivity for peripheral communities such as The Abingtons, Babraham, Pampisford, Sawston, Stapleford, and Great and Little Shelford.

2.1.2 The majority of the CSET Scheme will run on a new off-road alignment for the segregated carriageway. This alignment will be on land used for agricultural purposes (largely arable) and some land that is occupied by grassland, woodland or scrub. The Travel Hub and the length of the route until the CBC Boundary is within the Cambridge Green Belt.

2.1.3 There will be four stops along the route for local residents to gain access to the public transport service, three stops will be located where the route crosses existing public roads (near Great Shelford, Stapleford and Sawston) and one stop will be on CBC near the proposed new station location (Cambridge South Station (CSS))

2.1.4 The CSET Scheme will affect six highways and six PRoW which will remain open during operation but may require temporary closure or diversions during construction.

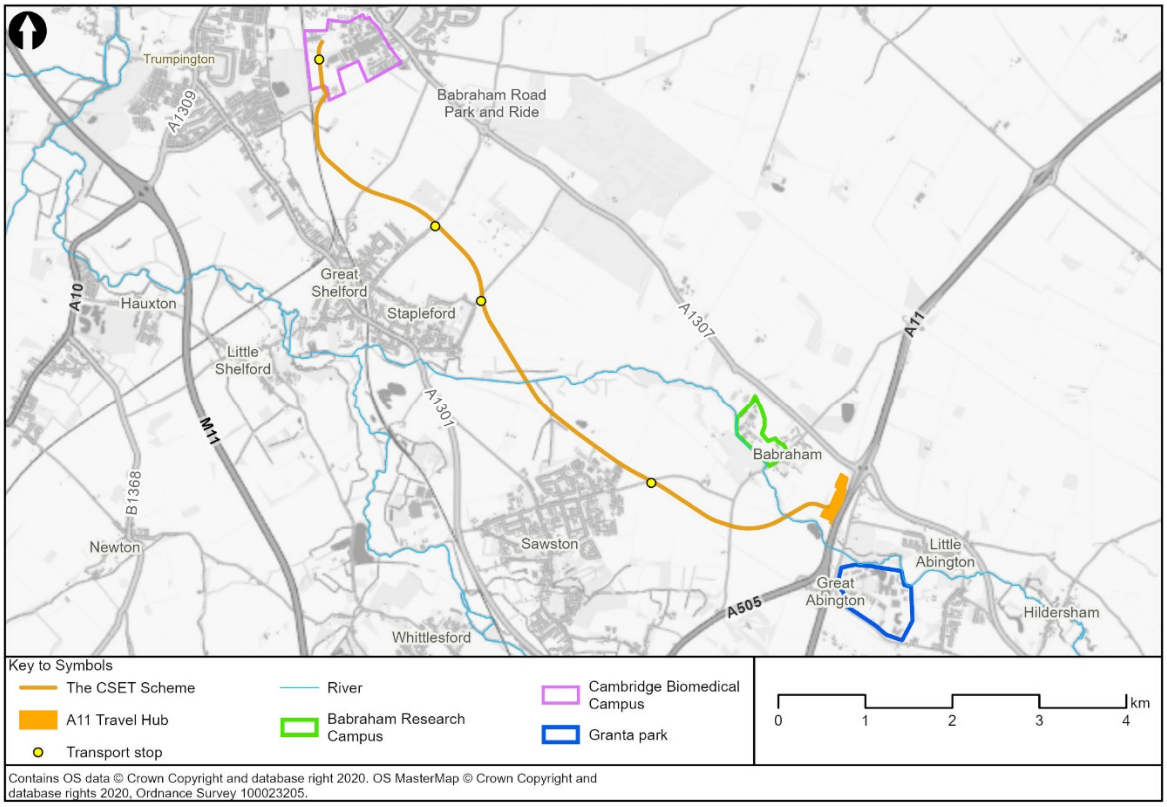
2.1.5 The six highways are: FCA (including the roundabout at the junction of FCA, Dame Mary Archer Way and Addenbrooke's Road), Granham's Road, Hinton Way, Haverhill Road, Sawston Road, The High and Street south of Babraham.

2.1.6 The CSET Scheme will cross Hobson's Brook once and the River Granta in two locations. A number of un-named ditches will be crossed along the route as well

2.1.7 The PRoW crossed are:

- 39/47 footpath running along FCA and Dame Mary Archer Way
- 212/2 bridleway from Stapleford to Babraham to north of the River Granta at Stapleford
- 12/10 restricted bridleway running northeast from Sawston towards the River Granta
- 12/9 footpath from Sawston to Babraham to south of Sawston Road
- 12/4 footpath from Babraham to the centre the A11 pedestrian bridge (this is also a permissive cycleway)
- 4/3 from the centre of the A11 pedestrian bridge to Newmarket Road (this is also a permissive cycleway)

Figure1: Scheme location Map



2.1.8 The route is divided into sections as described below.

Table 2.1: CSET scheme sections

Section.	Length	Description
Phase J: FCA to Bridge Structure 1	680m	Starts at the bus guided junction exit with Francis Crick Avenue, runs along the avenue down to the roundabout at the junction of Addenbrooke's Road and Dame Mary Archer Way. It then leaves the existing road network on a segregated route towards the existing railway line before heading south.
Phase I: Bridge Structure 1 to Granham's Road	1.8kms	The segregated public transport route runs west of Nine Wells Nature Reserve, adjacent to and parallel with the mainline railway before curving along the eastern hedge line running down to Granham's Road. This section of the route crosses the Hobson's Conduit (a watercourse with historic significance) but is otherwise in arable fields. There are hedge lines that provide breeding and winter shelter habitats for ground nesting and other bird species in this area
Phase H: Granhams road to Hinton way	0.88km	The route crosses Granham's Road through a signalised crossing and continues in a south easterly alignment through two fields before crossing Hinton Way. The route would be close to the easternmost residential properties in Great Shelford where it crosses Hinton Way. There would be a stop at the Hinton Way crossing (the Great Shelford Stop) for residents to access the CSET Scheme with cycle stands, disabled parking and a pick and drop off point for other passengers. There would be shelters for waiting passengers with real time message boards and lighting provided appropriate to the setting.

Phase G: Hinton way to Haverhill road	1km	From Hinton Way the route runs for a short distance across arable fields to the crossing with Haverhill Road. On the southern side of the Haverhill Road signalised crossing there would be another stop – the Stapleford Stop. This would have the same facilities as described for the Great Shelford Stop.
Phases E&F: Haverhill to Sawston Road	3km	This section of the route crosses a bridleway, the River Granta flood plain and river channel (a County Wildlife Site) and a PRoW. The river crossing in this section is called the River Granta (Stapleford) crossing to differentiate it from a second crossing of the river further south along the route. The land use for most of the route is arable fields with some pasture and scrub and tree belts between the River Granta crossing and Sawston Road. The route also passes within a residential property at North Farm where the route is parallel to a disused railway alignment. The route is close to the boundary of the South Cambridge Business Park in Sawston. Between the business park and Sawston Road the field is designated for new housing which has commenced construction. At the Sawston Road crossing there will be another stop, called the Sawston Stop, with similar facilities to those described for the Great Shelford Stop
Phase D: Sawston Road to High street.	1km	From Sawston Road the route continues in a south easterly direction to where it crosses the High Street that runs into Babraham. In this area, there are currently still two route options under consideration. The land use in the area is arable fields and there is one public footpath (PRoW) crossed in this stretch.

Phases B&C: High street to A11 Travel Hub	1.08km	From the High Street crossing the route curves around in a north easterly direction to into the Travel Hub site, crossing the river at the River Granta (Babraham) crossing. The Travel Hub is located adjacent to the A11, southwest of the separated grade junction between the A1307 and A11. General traffic would access the Travel Hub off the A1307 via a new roundabout junction. The Travel Hub will cover an area of approximately 15.5ha. There is a high-pressure gas main running south-south-west to north-north-east on the western boundary of the Travel Hub. This fixes the potential Travel Hub layout to a 200m wide strip of arable field between the gas main and the A11. The CSET Scheme would cross the mains near the departure/entrance of the HQPT route to the Travel Hub. There is a public footpath (PRoW) which traverses the Travel Hub site and crosses the A11 across an existing footbridge. Improving the access for cyclists and pedestrians to the footbridge on either side of the A11 would form part of the CSET Scheme. Equestrian access to cross the A11 is being considered via a new path alongside the A11 down to the River Granta passing under the A11 and then back alongside the A11 to the footbridge. Pedestrian and cycling access to the Babraham Research Park and Granta Park from the Travel Hub is likely to form part of the CSET Scheme. The southern part of the Travel Hub site is in Flood Zones 2 and 3 of the River Granta, in this area the site drainage will be completed along with

suitable habitat creation but there would be no car parking or other infrastructure in this area.

The parking areas, access roads and user facilities would be lit with LED lighting columns.

2.1.9 GCP is currently investigating two operating systems options for the CSET scheme, the kerb guidance and optical guidance systems. However, regardless of which system is finally employed, the CSET scheme will maintain the following core facilities:

- A suitable segregated carriageway for the HQPT vehicles.
- Four number stops at CBC, Hinton Way (Great Shelford), Haverhill Road (Stapleford) and Sawston Road (Sawston).
- Travel Hub with capacity for 1250 car parking spaces *including 62 Blue-Badge spaces and 62 electric vehicle charging bays, alongside a public transport interchange* and 188cycle racks at the A11 Travel Hub site to the east of the A11, with 25 HQPT pick up/drop off points, ten coach parking spaces, waiting room and welfare facilities, solar panel power installation over car parking area on the north side, connections to shared use paths, secure cycle parking, recharging points for electric powered vehicles.
- Signalised junctions with priority for the HQPT vehicles where the route crosses existing roads.
- Non-motorised user path for the full length of the CSET Scheme within the route corridor.
- Appropriate environmental mitigation and landscaping to deliver Biodiversity Net Gain (BNG) along the route.

3 Project Programme and Working Hours

3.1 Proposed works programme

3.1.1 The proposed works will comprise:

- Site clearance
- Fencing & Road Restraint Systems
- Drainage and service ducts
- Earthworks (excavation and fill)
- Highway construction
- Structures construction
- Pavements
- Kerbs, footways, and paved areas
- Traffic signs & road markings
- Street Lighting
- Landscaping works

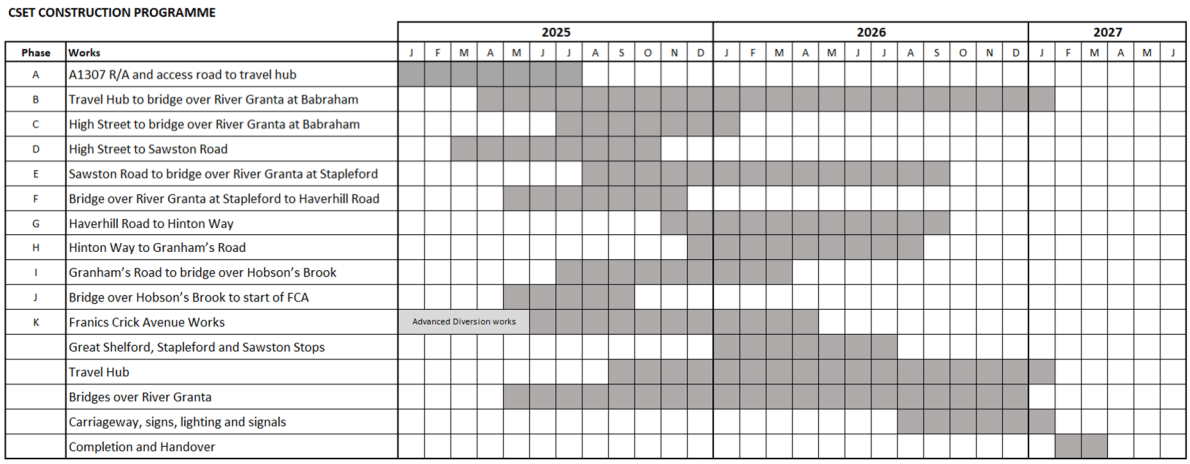
3.1.2 A detailed construction programme shall be developed during detailed design by the Principal Contractor. This shall take into account any conditions on programme set by the TWAO and deemed planning approval.

3.1.3 The detailed programme will be available for review in the site office, notice board or from the Project Manager. The indicative programme is included below.

• Project start	Jan 2025
• Site mobilisation (set up compounds)	Jan 2025 – July 2025
• Vegetation clearance according to work area	Jan 2025 – Dec 2026
• Main works by work area	Jan 2025 – Dec 2027
• Structures over rivers/brook	May 2025 – Dec 2026
• Travel Hub	Sep 2025 – Jan 2027
• Stops along route (excl Francis Crick Avenue)	July 2026 – Nov 2026
• Site wide works	Aug 2026 – Jan 2027
• Decommissioning site compounds	Jan 2027
• Project completion (excluding maintenance period)	Jan 2027

3.1.4 The figure below illustrates the programme against specific areas of work.

Figure2: Proposed Construction Programme



3.2 Site working hours.

3.2.1 The table below details the standard project working hours.

Table1: Proposed Site Working Hours

Day	Times	Comments
Monday – Friday Day Working	08:00 – 18:00	Route wide works
Saturday Working	08:00 – 16:00	Route wide works
Monday – Sunday Night Works	20:00 – 06:00	Restricted to works that cannot be completed within standard traffic management, such as carriageway surfacing which will be completed under full road closures. Requires prior approval from GCP and relevant statutory bodies.
Public Holidays	Any time	No works are anticipated during public holidays, any exceptional works will be restricted to works that are required for safety reasons only and with prior approval from GCP and relevant statutory bodies.

3.2.2 These work hours are subject to the agreement of Highways England and CCC Streetworks team depending on the section of road being worked upon.

4 Training and Awareness

4.1 Introduction

4.1.1 All personnel on site will be made aware of the Project Environmental Policy, the environmental Aspects and Impacts Register and relevant environment control plans in the CEMP.

4.1.2 Specific training needs will be identified and provided for all personnel involved in project activities that could adversely impact the environment. Trainings will refer to the importance of adhering to the contents of the CEMP and the potential consequences of departing from specified methods of work.

4.2 In-house training

4.2.1 Site teams will receive awareness training (not limited) on topics such as environmental risks and assessments, ecological aspects, and relevant legislation to the scheme. It will be the responsibility of the project Environmental lead to develop and ensure delivery of the relevant training.

4.3 Toolbox talks

4.3.1 Toolbox talks will be undertaken on site and the evidence will be maintained on record as part of the management system. Each sub-contractor will establish a regime of toolbox talks such that every employee receives a health, safety & environmental briefing. There will be minimum target of one toolbox talk on an environmental topic per month. Supervisors for sub-contractors will be responsible for conducting these briefings and their implementation will be monitored by the Site manager and Environmental Lead/Advisor. New or task specific toolbox talks can be requested from the scheme Environment Lead. Below is an indicative but not limited list of some of the appropriate toolbox talks that will be provided.

- Spill control
- Nesting birds and protected species
- Segregation and storage of waste
- Bio security/ Japanese knotweed and giant hogweed
- Plant and machinery wash down
- Water discharge and Silt management
- Dust and air quality
- Fire safety
- Noise and vibration

4.4 Site Inductions

4.4.1 Prior to commencing work on site, all personnel will undergo a site induction, where environmental objectives, requirements, responsibilities, and site rules will be communicated to the workforce. Site Inductions will sufficiently cover areas relating to environmental site rules, energy management, biodiversity protection and enhancement, emergency spill procedures and spill kit use/locations.

5 Roles and Responsibilities.

5.1 Introduction

5.1.1 The final CEMP will include an organogram with named individuals and contact details for delivering the CEMP under the CoCP.

5.1.2 Proposed roles and responsibilities are described below but the final organisation may vary depending on the client and contractor final project organisation set up.

5.2 Contracts Manager

5.2.1 Overseeing the implementation of the whole CSET Scheme and the individuals undertaking specific roles and duties.

5.3 Project manager

- Responsible for management of the construction phase of the project.
- Liaison with relevant consultees/stakeholders.
- Providing adequate resources to implement the CSET scheme Environmental Management System (EMS) effectively.
- Ensuring that the CEMP is developed and held on site and is implemented throughout all phases of the project.
- Ensuring the CEMP is updated when relevant information is provided by the stakeholders, e.g. issues that may require further consent conditions or pre-construction surveys.
- Ensuring that environmental issues identified in the Pre-Construction Information and site surveys are addressed.
- Communicating the CEMP and other related document to employees, contractors, and client representatives.
- Ensuring compliance with the principles of ISO 14001 are implemented across the scheme.

5.4 Site Manager/Supervisor

- Ensuring that areas of works are managed in accordance with the principles of good environmental practice.
- Managing sub-contractor and supply chain environmental performance.
- Ensure Client operational safety rules are observed by all on site.
- Ensuring all tasks have specific risk assessments and method statements (RAMS) before commencing and the task is carried out in accordance with RAMS.
- Conducting site inductions, toolbox talks and briefings on environmental issues relevant to the scheme.
- Ensuring that operatives understand and obey site rules
- Ensuring that construction workers use best practicable means to reduce the noise effect on the local community.
- Apply for licences or legal consents and ensure that the conditions of such consents are adhered to.

- Ensure the site has appropriately trained First Aiders and first aid facilities, spill kits are readily available for use on site.
- Arranging for controlled site access to avoid hazards and that egress routes in case of emergencies or incidents are clearly identified and safe.
- Ensuring that all material, fuel, and chemicals stored on site are in a safe and secured location.
- Making sure contractors have the right permits or certifications for the activities they meant to undertake.
- Reporting performance for Environmental KPI's monthly.
- Obtaining and recording Duty of Care information

5.5 Environmental Advisor

5.5.1 The Environmental advisor will ensure work on site is carried out:

- In accordance with legislation & consents, objectives, targets, and the Construction Environmental Management Plan.
- Ensure site staff operate in accordance and adhere to agreed Risk Assessments and Method Statement (RAMS).

5.5.2 The Environmental advisor will be responsible for preparing the Environmental Aspects and Impacts Register in accordance with the requirements of the CoCP and the Principal Contractor's environmental management system. This will take into account the mitigation works included in the design to ensure the mitigation works are delivered in accordance with the Environmental Statement or any requirements arising from the TWAO and associated planning conditions.

5.5.3 The Environmental Advisor will be responsible for developing and delivering relevant environment and sustainability training to all project staff

5.5.4 The Environmental Advisor will be responsible for obtaining all environmental consents, permits and exemptions for operational activities

5.5.5 The Environmental Advisor will be responsible for Monitoring and Reporting on the implementation of all relevant environmental management plans by:

- Ensuring compliance with Environmental legislation & consents, objectives, targets, and the Construction Environmental Management Plan.
- Carrying out Inspections, Audits, and investigations.
- Planning and delivery of environmental training and awareness raising.
- Liaising with the Site Manager to complete the site waste management plan and ensure it is followed.
- Reporting environmental performance data.
- Follow up and report on any environmental incidents logged on site.
- Produce lessons learned from any environmental incidents and feed these back to staff working on site.
- Ensuring work is carried out in considerations of provisions in the Environmental Statement.
- Managing of noise monitoring as required, reporting the results to the site team, Environmental Health Officer (EHO) and Project Senior Management team.

6 Internal and External communications

6.1 Introduction

6.1.1 All engagement with stakeholders shall be conducted in accordance with the requirements of the CoCP. This sets out the requirements for the following:

- Pre-Start Project Consultation
- Identifying a Customer Liaison Officer
- Requirements before works commence
- Dealing with complaints
- Setting up bi-weekly stakeholder meetings

6.1.2 Stakeholder engagement will be carried out through established links between GCP and local communities. Some of the established forums may change but at present these include:

- Local liaison forum for parish and district council members
- Parish councils
- Residents representative groups
- Working groups engaging with Active Travel stakeholders and Landscape, Heritage and Ecological interested parties
- Key stakeholders including:
  - Hobson's Conduit Trust
  - Cambridge Past, Present and Future
  - Magog Trust
  - Landowners and leaseholders

6.2 Internal communication

6.2.1 To ensure environmental requirements are communicated effectively, the CEMP will be distributed, and sensitive operations briefed to the different Project teams and subcontractors. Both the Clients and CSET scheme environmental policies will also be displayed on site notice boards.

6.2.2 Meetings which enable project managers and teams to exchange information and receive immediate feedback will be scheduled on a weekly basis. These will cover health, safety and environmental issues or incidents that might require control, remediation, or attention of the client.

6.2.3 During the construction phase reporting will be provided on Inspections, audits and non-conformance, Environmental performance data (including incidents, near misses) and progress on reaching targets. The project management team will be informed of any visits by regulatory bodies and what outcome or feedback is received from such visits.

6.3 External Communications

6.3.1 Liaison with the occupiers of neighbouring properties must take place before work gets underway and good communication must continue throughout the works. At the start of the scheme there shall be a public consultation meeting, hosted locally to the project in a venue accessible to the community, enabling local stakeholders, residents, farmers etc. to see the plans and talk to the

contractor(s) that are delivering the scheme. This provides a platform to ask questions and raise any concerns.

6.3.2 The project manager will document and respond to any relevant communications from externally interested parties. External communications may include but will not necessarily be limited to: Dealing with complaints from members of the public or dealing with the media and information requests.

6.3.3 All complaints received will be investigated and a response given to the complainant as soon as reasonably practicable. The Principal contractor, after liaison with the Local Authority EHO, will submit section 61 applications for planned noisy works or out of hours activities, in accordance with provisions set out in section 60 (1) of The Control of Pollution Act 1974. The Local Authority EHO may also be a first point of contact for residents affected by noise or dust. Therefore, EHO will need to be kept updated of progress, programme and upcoming phases of works that may give raise to disturbance, so that they can respond to public complainants.

6.3.4 The delivery of the construction works on Francis Crick Avenue will be phased to reduce the impact and disruption caused by the works. Where construction works affect third party stakeholders there will be engagement carried out to coordinate the works to ensure that stakeholder disruption is minimised. This will include coordination of access & deliveries. Francis Crick Avenue provides one of the key strategic routes regularly used for ambulances for 'blue light' access, as such it will be maintained for the majority of the programme, however when works are carried out that may restrict or compromise access then alternative access will be fully coordinated and agreed with CBC and emergency services prior to any works being carried out

6.4 Information for Visitors and Contractors

6.4.1 Relevant site layout plans detailing the locations offices, tool stores, waste skips, materials and topsoil storage areas, construction site compounds and car parking areas will be displayed on an information board at the site entrance.

6.4.2 All contractors and visitors to the site will be made aware of the controls applicable to their presence and activities on site. These shall not be limited to including site inductions, environmental briefings, toolbox talks but will also include Method Statements and Risk Assessments.

7 Security and Housekeeping

7.1 General security on site

7.1.1 Manned barriers shall be in operation during site hours at the entrance to haul roads and construction compounds. Measures to ensure the safety of the public during construction by limiting access to the construction areas will be developed by the Principal Contractor.

7.1.2 Individual work areas monitored by CCTV cameras 24 hours per day shall be installed in compound and storage areas to protect the site against theft and vandalism. A digital signing in and out process shall be installed to track incoming and outgoing workforce and visitors. The process will ensure site security and assist with roll calls during emergency situations.

7.1.3 Works to live carriageways to be protected with Chapter 8 compliant signs and guards, including traffic cones and pedestrian barriers. Where appropriate remote monitored CCTV camera towers to be installed to protect compound and storage areas.

7.1.4 Francis Crick Avenue has been identified as a highly sensitive site due to proximity to the Addenbrookes Hospital and supporting businesses. Additionally, the Cambridge South Station compound, operated by Network Rail, which will be adjacent to CSET compound 7 will require further security measures to manage and control access to the CSET and CSS sites.

7.1.5 Increased security shall be enforced. This shall include:

- Criminal record and background checks of all staff
- Increased CCTV
- Digital Sign in/out system
- Site security barriers in operation.

7.1.6 Defra and the Environment Agency provide 'Guidance for Pollution Prevention'[1] that will be followed by the Site Managers during the set-up and operation of all compounds and storage areas.

7.1.7 Security fencing will be erected around construction site compounds and along parts of the project route to prevent pedestrians or animals encountering plant machinery, trucks, and equipment.

7.2 Safety around Public Rights of Way (PRoW)

7.2.1 Construction activity associated with building the proposed A11 Travel Hub and the associated HQPTR between the CBC and the A11 is likely to increase traffic flows during construction on the local highway network as indicated in Chapter 17, table 17.14 and 17.11 of the ES. (extracts are shown below).

Total (two-way) Vehicle Flow during construction (AM peak)

Road name	Total (two-way) traffic flow AM peak	CSET Scheme construction traffic flow	Percentage increase	Magnitude of impact
Hinton Way	560	38	6.9%	Negligible

[1] Pollution prevention for businesses - GOV.UK (www.gov.uk)

Road name	Total (two-way) traffic flow AM peak	CSET Scheme construction traffic flow	Percentage increase	Magnitude of impact
Haverhill Road	454	34	7.4%	Negligible
Sawston Road	488	38	7.9%	Negligible
A1301	1025	58	5.6%	Negligible

CSET Construction Vehicle Impact

Highway Link (two-way)	2024 DM AADT HGV flow	Committed Development AADT HGV flow	CSET construction flow	Total	Percentage increase (%)
Addenbrooke's Road	130	224	88	442	25%
Granham's Road	109	0	32	141	29%
Hinton Way	139	0	64	203	46%
Haverhill Road	54	0	56	110	104%
Sawston Road	101	70	64	235	37%
A1307	862	140	264	1266	26%
A1301	239	70	96	405	31%

Source: Mott MacDonald Ltd (2021) and Skanska (2021)

7.2.2 The highway link most affected during construction of the CSET Scheme will be Haverhill Road with an increase in two-way HGV movements during Q4 of 2023 as a result of setting up construction Compound 4 and commencing construction Phase F. This increase in HGV flow is expected to produce a Moderate magnitude of impact upon severance

7.2.3 There are not anticipated to be any major diversion routes as a result of CSET Scheme construction because the majority of works can be conducted offline

7.2.4 For any online construction works, such as those required for each of the HQPT priority signal crossings, construction shall be limited to night-time, where possible

7.2.5 Driver Delay is only likely to be experienced as a result of increased total flow on the network; increased construction HGV movements will be spread throughout the day, minimising the effect on the local road network

7.2.6 Public Transport User Delay is only likely to be experienced as a result of increased total flow on the network. However, as increased construction HGV movements will be spread throughout the day, minimising the effect on the local road network, it is not anticipated that this increase will materially impact upon public transport user delay. Therefore, the magnitude of impact upon public transport users during construction is considered to be negligible

7.2.7 Special care will be required around the PRoW crossings. Temporary diversions will be in place and will need to be policed during working hours where construction traffic and members of the public may have to use the same areas. The following PRoW will need special measures in place during construction.

Table 2: PRoWs Permanently affected during Scheme Construction.

PRoW Ref	Type	Sensitivity
39/47	Foot paths	Medium – This footpath is on Francis Crick Avenue and is used by many walkers and cyclists travelling to and from Cambridge. However, alternative routes are also available.
212/2	Bridleway	Medium – This bridleway connects Ash Grove and numerous other PRoWs to the Stapleford community and is primarily used for recreational purposes. However, alternative routes are also available.
12/10	Restricted Byway	Medium – This byway connects the community in Sawston to a network of PRoW in the east which are located to the north of Babraham
196/12 179/1 12/9 12/8	Footpath	Medium – these footpaths provide a connection from Sawston to the eastern edge of Babraham and the network of PRoW to the north of Babraham. It is primarily used for recreational purposes and alternative routes are available.
12/4 4/3	Footpath	High – these two footpaths provide a connection between High Street in Babraham and the Abington Community and is the only WCH route across the A11. The footpath also provides a direct connection from Babraham to Cambridge International School

7.2.8 The HQPTR has been designed as a segregated route whereby any increases in HQPT vehicle flows do not have a material impact upon flows elsewhere within the wider CSET Scheme corridor. The HQPTR remains segregated from existing traffic for the entirety of its length, even whilst travelling along Francis Crick Avenue, and joins the existing guided busway, a dedicated public transport route.

7.2.9 The DNA Cycle Path and its ATP realignment have been carefully designed to avoid any significant increase to journey length during operation. During construction, the realigned path is proposed to be built offline, so that users of the existing path can continue to use the DNA Cycle Path until the realigned route is fully operational

7.2.10 There are minor permanent realignments to all PRoW crossed by the CSET Scheme to enable continued use of these routes by Walkers, Cyclists and Horses. Where temporary diversions to PRoW and other designated WCH routes such as the DNA Path, are required as a result of construction activity, these will be detailed in the final CEMP. This would require:

- Consultation about any temporary diversionary routes to be undertaken with affected individuals, groups and Cambridge County Council.
- The public would be informed of the nature, timing and duration of particular activities during the construction stage and the duration of any works by newsletter, and other forms of appropriate communication, locally and regionally (where applicable).

- If alternative points of access are required, directions would be clearly communicated in appropriate locations.

7.2.5. The appointed contractor will appoint a nominated Community Liaison Officer (CLO) who will be responsible for engaging with local communities and providing regular updates on the construction programme. The CLO will develop a community liaison plan to be agreed with the Applicant prior to any construction works commencing.

7.3 COSHH, Waste, Materials and Fuel Storage

7.3.1 Designated storage areas will be allocated to each sub-contractor, and it will be the responsibility of each sub-contractor to ensure these areas are maintained without risk to health, safety or environment, i.e. stacking of materials, chemicals etc. Storage areas will be located within the site compounds.

7.3.2 Any contaminated materials found during construction must be stockpiled at least 10m away from watercourses on impermeable surfaces within bunded areas and clearly marked as potentially contaminated. Disposal of the materials will be in accordance with the relevant regulatory controls on contaminated material disposal which will include the requirement for testing of the materials prior to disposal.

7.3.3 Topsoil will be stockpiled on level ground and away from water courses to prevent any runoff from entering water courses in particular the Hobsons Brook/Conduit, ditches, and drains. Additionally, topsoil stockpiled on exposed ground must be prevented from generating dust or water runoff.

7.3.4 The CSET Spoils Management Strategy sets out the requirements for managing all spoil and topsoil during construction. A more detailed Materials Management Plan (MMP) will have to be developed by the Principal Contractor to ensure safe use, storage and recycle, reuse or disposal of the spoil material generated by the project.

7.3.5 Hazardous waste arising from the works could include oil/fuel contaminated materials and empty aerosols. All hazardous waste will be dealt with in accordance with the relevant regulations including the Hazardous Waste (England and Wales) Regulations 2005. They will be identified prior to removal from site.

7.3.6 Storage of hazardous liquids (including fuel stores) will be within bunded areas to 110% of the total capacity of the storage containers, in accordance with the Oil Storage Regulations and EA Guidance (PPG2 and 26).

7.3.7 There will be no mixing/blending of hazardous and non-hazardous or inert materials.

7.3.8 Fuel contaminated soils due to spillages or accident should be considered as hazardous until proven otherwise after testing.

7.3.9 Chemicals that DO NOT float on water should NOT be stored in an ‘interceptor’ drip tray.

7.3.10 There will be no unauthorised keeping, treating, deposit or disposal of waste materials on site, audits of waste contractors will also be carried out by the Environment Advisor to ensure that this does not occur offsite

7.3.11 All COSHH, Materials and Waste should be segregated by type while stored on site prior to use or disposal. The range of waste material segregation will be determined in conjunction with the waste management supply chain.

7.3.12 Contractors are to ensure all plant and equipment arriving on site is compliant with legal requirements, i.e. test certificates, inspections etc. and must be checked before being used on site. The Principal Contractor will conduct random audits on equipment being delivered and equipment found non-compliant will not be permitted onto site.

7.3.13 Maintenance of plant, vehicles and equipment will be carried out at the site compounds and least 50m from any watercourse and 10m away from any drain. Spill kits will be available during all plant maintenance operations and a drip tray will be used to contain any leakage of oil. Where emergency repair is necessary within 10m of a drain, a drain seal will be used to ensure that no contamination enters the drainage system

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

7.3.15 Fuel and / or oil storage tanks will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 and will be locked when not in use i.e. outside working hours. Storage areas will not be located within 10m of site drainage. No refuelling will be permitted within 50m of a watercourse or within 10m of a highway drainage gully.

7.3.16 Mobile bowsers will be bunded or double skinned to 110% their capacity and will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 and will be locked when not in use i.e. outside working hours. Trained operatives will carry out refuelling of plant and equipment.

7.3.17 Drums will be stored in bunded areas with a minimum capacity of 25% of the total volume contained within the bund, or 110% of the largest container, whichever is the greater. Where possible these bunds will be fitted with roofs to prevent the collection of rainwater. Individual drums in use will be stored on a drip tray sufficient to contain 25% of the full capacity of the drum. Drums will be maintained in a good condition, fitted with lids and labelled to indicate the contents

7.3.18 The delivery of fuels etc. shall be attended and always supervised

7.3.19 Environmentally considerate lubricants, such as synthetic non-toxic biodegradable hydraulic fluids, will be used on site. Plant systems will be checked daily, as per the PUWER inspection regime, and the hydraulic system checked for leakages, ingress of dust, dirt and water.

7.3.20 Biodegradable oils will be stored, handled and disposed of using the same procedures and facilities as standard oils and fuels.

7.3.21 All Chemicals and hazardous substances must be stored away from drains and water courses. They must be stored on impermeable surfaces in bunded areas. The chosen area of storage must also avoid the risk of accidental damage from impact or collision with site traffic.

7.3.22 All chemical and hazardous substance containers must be labelled, sealed, and locked away when not being used. Inspections should be carried out regularly to ensure they are fit for purpose and duty of care must be exercised when disposing off the damaged or old containers.

7.3.23 All site staff will be trained on how to respond in case of emergencies and how to use spill kits to contain spillages. There should always also be a designated responsible person on site.

7.3.24 The Principal Contractor shall ensure that materials and work equipment being delivered to site will be pre-arranged with the project management team at pre-arranged times and entered onto the delivery schedule. Deliveries that have not been pre-arranged may not be permitted to enter the

site. Contractors are to ensure that suitably inducted personnel are made available to escort the delivery onto site.

7.3.25 Materials will generally be delivered to site on a 'just in time' basis to avoid the requirement for space for lengthy storage on site.

7.3.26 Materials usually sourced through builders merchants will be safely stored in compounds or in secured areas on site.

8 Environmental Register

8.1 Environmental Permits and Licence Register

8.1.1 The final CEMP will include a detailed register of all the permits and licences that will be required as set out in the CoCP. This register will be maintained by the Environmental Advisor (or equivalent) and will be regularly reviewed and updated at least every month.

8.1.2 The register will document:

- Permit/licence name
- Activities covered by the permit including locations on site
- Date applied for
- Conditions attached to the permit
- Expiry date
- Renewal dates (as appropriate)

8.2 Environment Aspects and Impacts Register

8.2.1 Wherever possible, adverse environmental impacts of the scheme have been minimised through scheme design elements. Activities to minimise impacts will continue during the detailed design process, construction, operation, and maintenance phases.

8.2.2 To ensure appropriate measures are implemented with best effect an Environmental Aspects and Impacts register will be completed at the start of the project and reviewed regularly. The Environmental Advisor is responsible for its completion and review.

8.2.3 The register will include a map showing all key sensitivities along the Scheme that are linked to the aspect and impact register.

8.2.4 It will be availed to all sub-contractors to assist them with the production of Risk Assessment and Method Statements (RAMS) for specific work activities. Sub-contractors will manage all risks associated with their work activities/ packages in accordance with the CEMP.

9 Monitoring and Evaluation

9.1 Inspections

9.1.1 Environmental inspections will be carried out by competent persons at frequencies determined by the Project Inspection Schedule. The Inspections shall detail realistic timescales for actions, and these will be monitored by the scheme Environmental Lead and Site Managers. The data obtained from inspections will be used for trend analysis, with the purposes of identifying and preventing recurring issues.

9.2 Monitoring

9.2.1 The Project Manager will ensure that supervisors monitor all safety, health, and Environmental performances routinely by:

- Carrying out spot checks of sub-contractors to verify compliance by either inspecting documents or registers.
- Reviewing risk assessments and method statements at specified intervals in Project Inspection Schedule
- Using stop shift audits to conduct sample checks on method statement briefings by of sub-contractors to their teams, this will be coupled with permit to work compliance checks.
- Checking sub-contractors staff training records.

9.2.2 It will be the responsibility of Sub contractor managers, Environmental Advisors, and supervisors to ensure that they monitor their own staff's activities in relation to Environmental standards.

9.2.3 Each contractor will ensure that Inspection records include confirmation that previous remedial actions have been carried out. These reports will need to be reviewed at specified project environment and safety meetings.

9.3 Internal Audits

9.3.1 The scheme Environmental lead/manager will conduct audits to examine environmental systems and performance standards at the earliest opportunity. The first audits should typically be carried out about 4-6 weeks after works have commenced on site. Environmental audits to ensure compliance with the scheme Environmental Management System (EMS) will be scheduled and undertaken in accordance with the CSET scheme audit schedule.

9.3.2 In situations where local processes or documents are being used, they will be assessed for suitability to determine whether they meet the requirements set in the CEMP.

9.3.3 Compliance with the conditions of Environmental Authorisations, Permits and Consents will be assessed during site inspections and audits.

9.4 Client Internal Inspection programmes

9.4.1 The CSET Scheme Environmental lead will complete joint inspections with the client where requested.

9.5 Non-conformity and corrective actions

9.5.1 Any non-conformances or corrective actions shall be identified through near miss environmental reporting, environmental incident reporting, environmental inspections, and audits.

9.5.2 All non-conformances and corrective actions will be recorded. Any required actions shall be appropriate to the scale of the anticipated or actual environmental impact. It will be the responsibility of the Environmental lead to ensure that the required corrective actions are implemented.

9.5.3 As a minimum the non-conformity reporting approach should be able to identify the root cause of the issue, identify appropriate mitigating actions/ procedures, Identify preventative actions against any recurrences, Assign responsibility for implementing the corrective action and time frame in which it should be done.

9.5.4 The Project manager will reserve the right to remove from site immediately any person whose acts or omissions in his opinion constitutes danger to people, environment, or property. Any persons who disregard environmental rules and arrangements detailed in this plan will in the first instance receive a written warning from the nominated person and any subsequent misdemeanours will provoke the removal of the person from site.

9.6 Close out reports

9.6.1 Any corrective actions recorded must be closed out within the given timeframe. Those items not closed out completely shall be carried forward to the next inspection until they are closed out. If the deficiency persists or is a serious breach, then the project management team will be informed to act.

10 Protecting Air Quality and Managing Noise

10.1 Introduction

10.1.1 It is anticipated the works has potential to create dust, however measures shall be implemented to minimise dust at source including careful management of materials deliveries and any stockpiles, dust suppression for haul roads and tools and appropriate site monitoring. This monitoring would include checking weather forecasts for continued dry spells and daily site audits (housekeeping checks) undertaken by the works foreman. During the completion of earthworks on the main site, methods to wet the material shall be in use to prevent dust creation. Site Speed Limit of 10mph also in place and wheel washes shall be located at each satellite compound. Where possible, haul roads will be constructed using bound material and swept regularly to mitigate dust.

10.1.2 Noise and vibration statutory nuisances are controlled under the Environmental Protection Act 1990. The Control of Pollution Act 1974 offers protection to nearby receptors. Under section 60 of the Act a local authority can serve a notice specifying noise control requirements covering plant or machinery (which is or is not being used), working hours, and levels of noise that can be emitted.

10.1.3 The Principal Contractor (PC) will liaise with the local Environmental Health Officer (EHO) to gain consent for potentially disruptive works regarding statutory nuisance. Best Practical Means (BPM) shall always be implemented during the construction period to minimise the impact of noise to local sensitive receptors and the community kept informed of any particularly noisy activities. Principally, any plant used on site shall be selected to be Super Silent models to eliminate or reduce noise pollution, be appropriately maintained and any static plant sited away from receptors or within acoustic enclosures. Where feasible battery-operated plant and equipment shall also be used and/ or solar panels for generating and storing electricity.

10.1.4 The type of construction activities that will be carried out on site can create significant noise levels that are over the 80-decibel limit. Therefore, ear defenders for all operatives and staff will be required between 80 and 85 decibels and mandatory on activities over 85 decibels. The PC will regularly monitor the noise levels to ensure contractors are complying with their duties.

10.1.5 Prior to commencing works, all contractors will avail their method statements for inspections in accordance with principle described in BS 5228: 2009: Part 2: Code of practice for noise and vibration control on construction and open site. Stating precisely the type of plant to be used, the proposed noise control methods and the frequency and type of testing to be undertaken.

10.1.6 All tools and equipment must be suitably selected, maintained and inspected to reduce noise and vibration so far as reasonably practicable. As a minimum, operatives should know their exposure limits for the equipment they are using and the steps necessary to reduce the risk. PPE must afford the appropriate level of protection as indicated by the risk assessment and manufacturers guidance. Health surveillance for all operatives must be undertaken if there is a residual risk from noise and or vibration.

10.1.7 Temporary acoustic fencing or solid site hoarding should be provided around Compound 4, Compound 5, Sawston Road Stop, Haverhill Road Stop and Hinton Road Stop at minimum, to reduce potentially significant adverse noise effects.

10.1.8 Additional mitigation measures, including monitoring of works, will be included as necessary for CBC receptors which have the potential to be subject to significant adverse noise and vibration effects.

10.1.9 Where practicable the control measures set out in BS 5228:2009+A1:2014 Part 1 and 2, Sections 8 will be implemented. A combination of generic and site-specific noise and vibration measures to be used will include:

- Hiring equipment from reputable companies, thereby employing only modern, quiet and well-maintained equipment; any plant, equipment, or items fitted with noise control equipment found to be defective will not be operated until repaired.
- Locating noise and vibration generating fixed plant as far away from sensitive premises as possible.
- Careful planning of the sequence of work in order to minimise the transfer of noise / vibration to nearby receptors.
- Arranging for materials, such as flagstones and steelwork, to be cut off-site where practicable.
- Ensuring all materials cut on site are done so in a sound reducing cutting booth
- Ensuring that an appropriate electricity supply exists before any work involving demolition or excavation starts, so that generators are not necessary.
- Where reasonably practicable, fixed items of construction plant and lighting towers will be electrically powered from the mains supply in preference to being diesel or petrol driven. Ensuring silent generators or battery generators are used where mains electricity is not available.
- Construction plant utilising innovative or renewable energy sources shall be considered wherever possible, as to reduce the demand on diesel/petrol use.
- Avoiding the unnecessary revving of engines, motor-driven tools and equipment.
- Avoiding the unnecessary reversing of vehicles and providing wherever possible one-way routes. Alarms should be set to the minimum output noise level required for safety compliance.
- Ensuring site vehicles (and suppliers vehicle fleets) are fitted with broadband white noise reversing alarms.
- Switching off plant, vehicles and equipment when they are not in use.
- Effective use of temporary noise screens and barriers.
- Staff and management utilising “quiet practices” training. Site induction and toolbox talks for all staff on the nuisance effects of noise and vibration and ways to minimise noise and vibration at the source. Raising awareness among sub-contractors and suppliers of the environmental constraints of the site and of the obligation to follow the necessary procedures to minimise noise and vibration levels.
- Supervision of staff to prevent any unnecessary noise such as shouting or banging at all times.
- Displaying of signs within the site to raise awareness and to stress the importance of noise and vibration control to prevent impacts on the local residents.
- Ensuring the movement of plant and vehicles onto and around a site, and the delivery or collection of any materials, are within the permitted working hours of the site.
- Use of screws and drills rather than nails for fixing hoardings, etc.
- Careful handling of materials and waste such as lowering rather than dropping items.
- Loading / unloading material into vehicles within designated areas only.
- Taking care when erecting or striking scaffolds to avoid impact noise from banging steel.
- Avoidance of unnecessary noise (such as engines idling between operations, shouting, loud radios or excessive revving of engines) by effective site management.

- Potential fitting of exhaust silencers to vehicles and mechanical plant utilised for any activity associated with the construction works. Any silencers or noise control measures shall be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable.
- Provision of appropriate ingress and egress points for all construction compounds.
- Review and update of BPM throughout the works in response to the results of regular monitoring of works and any complaints received.

10.2 Piling

10.2.1 During construction of the bridge structures, it is assumed that some piling operations will take place. At this stage it is assumed piling would employ a Continuous Flight Auger (CFA) piling method.

10.2.2 CFA piles offer an economic, quick, low noise and vibration solution to constructing retaining walls or bearing piles for medium to highly loaded structures. The system eliminates the need to use support fluid or casings in cohesive soils, non-cohesive or water bearing soils. The process can be used for environmentally sensitive sites and/or working near existing structures.

10.2.3 The use of newer, regularly serviced plant shall be utilised to further attempt to reduce noise and vibration levels.

10.3 Excavation/spoil removal

10.3.1 All plant utilised in the excavation, removal, and deposition of spoil on site must be switched off when not in use and must be subject to regular maintenance checks and servicing.

10.4 Concrete pours

10.4.1 The size and scale of concrete pours is dictated to a large extent by the design of the Continuously Reinforced Concrete Pavement (CRCP) and structures. The method of pouring concrete to the CRCP and Structures will be similar as this will be a manual operation with concrete pump and vibratory small plant.

10.4.2 Care must be taken at an early stage to ensure that the structural design, and resulting construction/daywork joints, are such that the required concrete pours are of a volume that can be completed within permitted hours. A contingency period must also be factored in for events such as concrete pump failures, batching plant delays and traffic congestion affecting deliveries.

10.4.3 In order for concrete deliveries and concrete pours to be completed within the permitted hours contractors must have in place a protocol with the concrete supplier and/or concreting subcontractor to ensure that sufficient contingency is allowed, to consider pour size, delivery times and concrete placement, and mix workability so that works do not overrun the permitted hours.

10.4.4 The PC will liaise with the Local Authority EHO to keep them updated of progress, programme and upcoming phases of works that may give raise to disturbance, such as works that are planned outside of normal working hours for larger more complex pours.

10.5 Steelwork and reinforcing bars

10.5.1 All fabrication and cutting of steelwork shall take place off-site. Where this is not practicable, contractors shall carry out any cutting within a mobile acoustic enclosure – such details must be agreed in advance and be included in the Site Construction Management Plan. Reinforcing bars must normally be cut to the required lengths and shapes prior to site delivery to minimise any

necessary site trimming. Should site cropping of rebar be necessary then electrohydraulic cutters shall be used in preference to angle grinders.

10.6 Electrical generators and air compressors

10.6.1 The use of electrical generators and air compressors at construction sites often cause noise complaints, which is often due to very intrusive low frequency components of the sound that they emit. The low frequency sound that is produced is difficult to control and reduce and can travel considerable distances and penetrate neighbouring buildings without reducing significantly in level. It can cause severe disruption in nearby buildings which is exacerbated by the long periods that the equipment may be in use; it is sometimes also associated with a disturbing ground borne noise and vibration.

10.6.2 For these reasons, such equipment is not judged to meet BPM unless it can be demonstrated that its use is unavoidable. The intention to supply temporary electrical supplies to all satellite compounds will negate the need to utilise generators of any kind near to neighbouring properties and greatly reduce any excess noise. Generators and other motorised small plant shall still be used in isolation away from the compounds, but noise shall be managed accordingly in line with current regulations.

10.7 Dust Control

10.7.1 Dust could become an issue during the project. The main operations of the project for the most part shall not create excess dust. Dust shall mainly be produced during the running of vehicles along the haul roads between compounds.

10.7.2 As a minimum, the following measures and practices must be implemented:

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked.
- Record and respond to all dust and air quality pollutant emission incidents and complaints. Records must be made available to the local authority when requested.
- Record any exceptional incidents that cause dust and / or air emissions, either on- or off-site and the action taken to resolve the situation in the logbook.

10.8 Preparing and Maintaining the Site

- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel or petrol power generators and use main electricity or battery powered equipment where practicable or HVO fuel. Plant powered by renewable energy shall be considered too.
- Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas.
- Produce a construction logistics plan to manage the sustainable delivery of goods and materials.
- Implement a travel plan that supports and encourages sustainable travel.

- identifying onsite drainage channels and keeping them free of blockages to allow controlled flow of run off.
- Minimising the time between vegetation clearance and establishment of cover. Delay clearing and topsoil strip of each phase of works until shortly before construction begins rather than stripping the whole site.
- Closing and stabilising open trenches as soon as possible.
- Leaving existing vegetation along the perimeter of the site, haul roads and stockpiles to provide buffer against sediments
- Site entrances should extend 15m from paved road and consist of minimum 150mm of gravel laid on geotextile fabric where there is soft ground.

10.9 Construction Operations

- Make frequent site inspections during dust generating operations and at least once daily during general works to ensure that there is no dust release caused by site operations. The frequency of any site inspections must be increased when site activities have a high potential to generate dust and during prolonged dry and windy weather.
- Avoid cutting, grinding and sawing on-site and use prefabricated material and modules where practicable.
- Fit equipment such as disc cutters, table saws, sanders, etc., with dust suppression (water spray) or a dust collection facility.
- Ensure that there is sufficient water suppression such as water sprays, and/or pressure washers during demolition work, spoil heaps, general vehicular movements on site and other activities that generate high levels of dust. There must be sufficient supply of water and where possible it should be recycled water.
- Avoid scabbing (roughening of concrete) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emissions control to prevent escape of a material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- Silty or oily water should not be used for dust suppression, it can generate polluted run-off or more dust
- Water bowser movements need to be monitored, as excessive application of water may lead to increased run off
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the Site boundary, which are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a potential for dust production and the Site is active for an extensive period.

10.10 Waste Management

- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site, if they are being re-used on-site cover as described below.
- No bonfires or burning of waste materials.
- Skips must be completely covered and, if necessary, completely enclosed to ensure that dust does not escape. Skips must be located within a site where this is possible

10.11 Mitigation specific to demolition

10.11.1 No demolition expected although the following should be implemented should demolition occur:

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems manually controlled can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, use appropriate manual or mechanical alternatives,
- Bag and remove any biological debris or damp down such material before demolition

10.12 Mitigation specific to earthwork:

- Revegetate earthworks and exposed areas / stockpiles to stabilise surfaces as soon as practicable.
- Use hessian, mulches or trackifiers where it is not possible to revegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- Cover stockpiles/arisings of sand, earth or similar dust-generating materials when not in use to prevent wind whipping.

10.13 Mitigation specific to trackout:

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit.
- Access gates to be located at least 10m from receptors where possible.

- Regularly clean hoardings, fencing, barriers and scaffolding using wet methods, where practicable, to prevent re-suspension of particulates.
- Clearly display contact details for the person responsible for the site on the site boundary so that residents and businesses are able to contact the developer and/or contractor to raise any issues that they may have and report complaints. Display the head or regional office contact information.
- Contractors must take responsibility for cleaning any dust which has contaminated common parts of a property which are otherwise occupied or not a part of the approved works. The site must ensure that equipment is readily available onsite to clean any dry spillages as soon as reasonably practicable using wet methods.
- Actively encourage site workers to travel to site using sustainable transport and public transport.
- All commercial road vehicles attending the site must meet European Emission Standards pursuant to the EC Directive 98/69/EC of Euro 4 for petrol vehicles and Euro 6 for diesel vehicles and Euro VI for all lorries and specialist heavy goods vehicles.
- All sites must make efforts to have sufficient mains electrical power to avoid the use of diesel/petrol generators.
- Combustion based equipment must, where practicable be replaced with electrical/battery/low emission technology equipment.
- Ensure that all non-road mobile machinery (NRMM), such as generators, excavators, piling machines, comply with Stage IIIB of EU Directive 97/87/EC.
- Locate NRMM, machinery, haulage routes, site entrances and any dust generating activities away from receptors, where possible, particularly schools, hospitals and homes.
- Reuse and recycle waste materials to reduce dust and pollution.
- All compounds will be fed with mains services to reduce the need to have generators running constantly.
- Lighting to compounds will be low level, 6m or less, and activated by motion sensors.

10.14 Eco-Friendly Welfare Facilities

10.14.1 Eco-Friendly welfare facilities will be used to reduce the carbon footprint of the project. Eco-Friendly welfare facilities offer the latest energy saving devices to help save money on water and energy costs. They are available in a range of sizes and to suit a variety of applications, providing high quality facilities in a comfortable, eco-friendly environment.

10.14.2 The Eco-Friendly welfare facilities have been researched and developed to help users reduce energy consumption and benefit from lower energy costs. Compared to a standard cabin Eco-Friendly ranges have large potential energy savings.

Figure3: Typical example of eco-friendly office and canteen solution

10.14.3 In general, Eco-Friendly welfare solutions include:

- Fully insulated floor, ceiling and walls
- Double glazed windows
- Lighting with PIR sensors
- Heating with PIR and timers
- An Energy Performance Rating of at least “B”
- Waterless urinal technology
- Dual flush toilets
- Hand dryers to reduce use of paper towels
- Non concussive aerated taps to minimise water usage

Figure 4: Typical washroom / toilet facilities

11 Protecting Biodiversity

11.1 Introduction

11.1.1 Both desktop and field surveys completed to date, have identified six Statutory Sites for nature conservation within 2km of the CSET Scheme. They comprise Sites of Special Scientific Interest (SSSI) (Gog Magog golf course, Sawston Hall meadows, Denford Fen) and two Local Nature Reserves (LNR), Nine Wells and Beechwoods.

11.1.2 Nine non-statutory sites for nature conservation were also identified with 2km of the CSET Scheme. River Granta County wildlife site (CWS) located directly within the scheme's footprint in two locations, and other sites (Shelford-Haverhill disused railway, Red Cross, Worts Cause Road site verge, Long Road plantation, Trumpington Road woodland and Wandlebury CWS) within a 35m to 1.8km proximity of the of the scheme's footprint.

11.1.3 The dominant habitats across the CSET Scheme are arable fields and semi-improved neutral grassland.

11.1.4 There are 34 species-rich hedges, 32 woodland blocks and notable semi- improved calcareous grassland stretching across the CSET Scheme from the CBC via Great Shelford, Stapleford and Sawston to the A11/A1307/A505.

11.1.5 The construction phase of the CSET scheme is anticipated to impact the existing biodiversity through direct change in land use, damage, disturbance of habitats and species during site clearance and topsoil excavation. The CSET environmental scoping report indicates the most likely species to be impacted will include badgers, reptiles, and nesting birds, specifically corn bunting habitats within the grass field margins.

11.1.6 Vegetation clearance during construction is not anticipated to result in a severance and fragmentation of habitat used by barbastelle bats. The species has been shown to cross major motorways with more significant gaps than will be created during the construction of the CSET Scheme and additionally key high-quality corridors will be maintained across the CSET Scheme, including the two River Granta crossings

11.1.7 There will be a pre-commencement meeting with the Cambridge City Council tree officer and the appointed tree surgeon to discuss the implementation of tree protection and arboricultural work.

11.2 Protective measures

11.2.1 Existing trees and hedgerows to be retained will be protected from damage for the duration of the works on site by the erection of protective fencing in accordance with British Standards 5837:2005.

11.2.2 If any protected species are encountered during works, the activity will be halted, and a licenced ecologist and Natural England contacted for advice.

11.2.3 In the event of any unexpected discoveries of protected or invasive species that could impact activities, works must cease, and the discovery reported to the Site Manager and Environmental Lead.

11.2.4 An ecologist shall be appointed by the Project Manager to check vegetation for invasive species or signs of breeding bird activity before clearance.

11.2.5 Compensatory landscaping and planting/ net biodiversity gain to be incorporated into the CSET scheme design.

11.2.6 Site compounds to be sized appropriately to avoid unnecessary loss of habitat.

11.2.7 Dust and Noise and Vibration mitigation measures as described in this CEMP must be implemented to minimise the impact on habitat degradation as a result of construction activities.

11.2.8 Existing trees and vegetation to be retained (including hedgerows) will be protected during the construction phase with protective fencing where necessary.

11.2.9 Vegetation clearance will be programmed to avoid the nesting bird season (March to August inclusive). Where this is not possible a breeding bird survey will be carried out by an ecologist 48 hours in advance of proposed clearance works to check for bird nesting activity. If active nests are found a buffer of vegetation shall be retained until all young have fledged and the nest is deemed inactive by an ecologist.

11.2.10 Works in the location of the two river crossings (if feasible) will be undertaken outside of the kingfisher breeding season (core season February to September). If the breeding season cannot be avoided, an ornithologist must be contacted. The ornithologist will be present during all further works to monitor sections of the river within 50m of the construction activities for possible nesting locations and observing kingfisher activity.

11.2.11 Data will be logged, and the design / timings / programming of construction activity will be shifted in a responsive manner so as to ensure minimal disturbance.

11.3 River Granta County Wildlife Site

11.3.1 The entire length of the River Granta in the project area has been designated as a County Wildlife Site. Therefore, during construction special measures will be required to ensure no impacts to the riverbed or walls of the river occur. Pollution control measures and silt control measures set out in Section 15 will be followed rigorously.

11.3.2 Any temporary bridge crossing of the river shall be in the form of an up and over structure. A culvert within the confine of the river channel itself will not be acceptable. However, a box culvert will be used where the route crosses a ditch known to be accessed by water voles. Construction of any temporary bridge shall be done with minimal harm to the banks of the river and in accordance with the Description of Works and ES Chapter 18: Water Resources and Flood Risk.

11.3.3 Vegetation clearance within 10m of the riverbanks shall be minimised to only that required for the construction of the operational scheme and the temporary bridge structures. Special attention to measures required to protect specific species including breading birds, otters, water voles, white clawed crayfish are set out in this document and will be followed at all times.

11.3.4 The river will be screened by fencing from the construction works in both locations to further minimise impacts.

11.3.5 Any proposals to deviate from the controls set out here will be agreed to by the local authority officers responsible for overseeing the County Wildlife Site.

11.4 Nine Wells Local Nature Reserve

11.4.1 Compound 7 is to be located on land to the north of the Nine Wells LNR. The Contractor will ensure that the compound set up takes into account the need to avoid disturbance to the setting of the

reserve as much as possible. This means avoiding placing noisy and intrusive activities along the boundary of the compound closest to the reserve. Security fencing will be required to ensure the compound activities are further screened from the reserve itself.

11.5 Bats

11.5.1 All bat species, their breeding sites and resting places are fully protected under the Conservation Regulations 2010 (as amended), Wildlife & Countryside Act 1981 (as amended), Natural Environment & Rural Communities Act 2006 (NERC).

11.5.2 Stage 1 bat inspection surveys undertaken in October 2019 by WYG on trees and woodland blocks within the survey area returned five trees with the potential to contain features suitable for roosting bats and 11 woodland blocks suitable for roosting bats. Further stage 2 bat activity surveys identified seven species of bats including common pipistrelle, soprano pipistrelle, noctule, brown long-eared, Myotis species, serotine and barbastelle.

11.5.3 The mature trees, hedgerows, linear tree planting, tall ruderal, waterbodies, and semi-improved grassland habitat provide good foraging opportunities for bats and the network of hedgerows and linear features provide suitable commuting routes for bats.

11.5.4 Although the Eversden and Wimpole Woods Special Area of Conservation (SAC) is located approximately 10.5km to the west of the route alignment, a Habitats Regulation Assessment (HRA) determined the CSET Scheme is not likely to have any direct adverse impacts upon the Bat species which qualify them for selection as European designated sites. However, the removal of habitats could sever commuting and foraging routes used by the bat species e.g. barbastelles. While the losses of habitat will be localised, this loss will increase the fragmentation of commuting and foraging habitats and reduce the foraging resource for bats.

11.5.5 Measures within the CoCP and CEMP will provide controls on noise and vibration which will act to limit disturbance and displacement of roosting bats.

11.5.6 All works and the design of the street lighting will be undertaken in accordance with best practice guidelines relating to bats and measures implemented to ensure light spill is minimised. It is recommended that the new temporary access and haulage roads are not lit to minimise impacts upon commuting and foraging bats.

11.5.7 The closure of the roost will require a Natural England European Protected Species (EPS) licence.

11.5.8 Ten bat boxes are to be provided to enhance the local bat population.

11.5.9 Dead hedges will be used during construction to maintain connectivity.

11.5.10 Planting incorporated into the design along the CSET Scheme to minimise the risk of mortality through traffic collisions.

11.5.11 Plant mature / taller trees at all junctions to encourage bats to fly up and over.

11.5.12 The riparian corridor will be maintained with planting either side of the bridge structures.

11.5.13 Incorporation of bat bricks within new bridge structure as a biodiversity enhancement.

11.5.14 If bats are encountered during construction, contractors will stop work immediately and an appointed ecologist contacted for advice.

11.5.15 Risk assessments & method statements (RAMS) from contractors will be scrutinised and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to.

11.6 Badgers

11.6.1 The Protection of Badgers Act (1992) protects badgers and badger setts making it an offence to intentionally kill, injure a badger, damage, destroy their setts or sett entrances.

11.6.2 Preliminary surveys undertaken in 2020 identified a number of active main, annex, subsidiary and outlier setts within 250m of the CSET scheme, in addition third party data (WYG 2020) identified one set that will be directly impacted by the scheme and another within close proximity. However, more detailed badger bait marking surveys are to be undertaken in October 2020. This will identify the territorial boundaries of badger groups affected by the scheme, search for alternative badger group setts in case one is required to be closed during construction and identify locations for artificial replacement setts.

11.6.3 If badgers are confirmed to be present within the boundaries of the CSET scheme, the project's earthwork activities are likely to lead to loss of foraging areas, loss, and damage of setts as well as disturbances from vibrations, noise and light. However, as recommended by Natural England, heavy machinery and excavation works will be kept at least 30m away from setts and sett entrances, and suitable fencing and signage erected. If a badger sett is confirmed within proximity of proposed work areas (<30m), a mitigation strategy will be devised, and a Natural England license will be obtained prior to construction.

11.6.4 If badgers are encountered during construction, contractors will stop work immediately and contact a licensed ecologist for advice. Contractors are to be prohibited from making the location of setts known to the public.

11.6.5 A License to interfere with a sett should be applied for from Natural England. This should be applied for as soon as possible as Licenses will take at least 30 days to be approved by Natural England and setts can only be closed between 1st July and 30th November to avoid the badger breeding season

11.6.6 Construction activities may result in the direct mortality or injury of badgers. To avoid this, standard working practice following Natural England Guidance, Badgers: surveys and mitigation for development projects will be adhered to, including:

a) Covering any excavations to ensure animals do not get trapped. If this is not possible, a ramp will be provided so that trapped animals can escape.

b) Where retained setts are in close proximity to the construction works, temporary fencing and signage will be used to demarcate the sett and prevent construction activities from impeding onto the setts

c) To mitigate the risk of badgers potentially moving into the works footprint, pre-construction surveys will be undertaken within 50m of the route. If any new setts are identified, these may need to be closed under a licence.

d) If a new main sett is identified, badger bait marking will be required in order to locate a suitable location for an artificial sett. The pre-construction surveys will also confirm the status of setts already identified.

e) The landscape design will include newly created areas of grassland and broadleaved woodland. Once established, this will reduce habitat loss and fragmentation and will also include enhanced green corridors for the length of the route and foraging ground

f) Ensuring construction lighting faces away from main setts and mammal runs.

g) Trees shall be felled away from active sett entrances and later cleared away from badger paths and sett entrances.

h) Through the scheme design plans and operations, badger foraging and watering areas will be maintained as well as habitat connectivity through tunnels or underpasses.

i) All licensable works/ badger sett closures will be closely overseen and directed by a suitably experienced ecologist who will ensure that damage to the sett is minimised. The ecologist will ensure that the works are carried out slowly and carefully so that badgers are not physically harmed.

11.7 Birds

11.7.1 The Wildlife and Countryside Act (1981) protects all birds, their nests, and eggs. Making it an offence to intentionally kill, injure, disturb, or take any wild bird. This legislation and its requirements should be highlighted in staff inductions, toolbox talks and signed by all, operatives, and sub-contractors.

11.7.2 Desktop studies undertaken in May 2020 identified the presence of barn owl, a Schedule 1 species within the CSET Scheme footprint. Two potential nest sites, one active roost site and two occupied breeding sites were identified. Due to an abundance of fish and suitable perches along stretches of River Granta CWS and Hobson's Brook, it makes the area also highly likely to support kingfishers.

11.7.3 Fourteen of the bird species recorded (corn bunting, fieldfare, grey partridge, herring gull, house sparrow, linnet, mash tit, redwing, skylark, song thrush, starling, yellow hammer, mistle thrush and woodcock) within proximity of the CSET scheme are listed under Section 41 of the Natural Environment and Rural Communities Act 2006 as Species of Principle Importance (SPI) for the conservation of biodiversity in England. There are also ten Amber Listed Birds of Conservation Concern: Barnacle goose, great black headed gull, lesser black-backed gull, black headed gull, dunnock, green sandpiper, greylag goose, kestrel, mallard, and meadow pipet.

11.7.4 The undulating arable landscape with continuous areas of scrub, grassland, woodland, and hedgerows provide suitable habitats for owls, breeding, and wintering birds.

11.7.5 The arable land also provides opportunities for ground nesting birds such as skylark. The CSET scheme also presents a network of hedgerows, mosaic of fields, scrub, and grassland adjacent to River Granta, which are suitable ground for the assemblage of wintering birds.

11.7.6 Therefore, vegetation clearance of the scattered scrub should ideally take place in the months September-February, outside of the main bird breeding season.

11.7.7 Where not possible, inspection by a qualified ecologist for active nests must be made within 48 hours prior to clearance. If a nest is found, works will need to be delayed at this location until the chicks have fledged.

11.7.8 General habitat enhancement should include provision of nest boxes at suitable locations around the site / within landownership boundary.

11.7.9 If nesting birds are encountered during construction, contractors are to be advised to stop work immediately and contact an ecologist for advice. After this, method statements will be revised, and suitable changes applied.

11.7.10 Method statements and risk assessments from contractors will be scrutinised and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to by the construction team.

11.8 Great crested Newts (GCN)

11.8.1 Great Crested Newts (*Triturus cristatus*) are protected by the Conservation Regulations 2010 (as amended), Wildlife & Countryside Act 1981 (as amended) and Natural Environment & Rural Communities Act 2006.

11.8.2 There are 55 waterbodies within 500m of CSET Scheme. Of these 22 were dry, three were scoped out due to significant barriers, 18 were subjected to a Habitat Suitability Index assessment (HSI) and turned out as poor to excellent and will be subject to further eDNA surveys. HSI / eDNA surveys are yet to be undertaken for 12 ponds which previously could not be accessed.

11.8.3 If any GCN are encountered during construction, contractors are to stop work immediately and a licenced ecologist contacted for advice. Method statements will be revised to reflect the new findings and mitigation measures suggested.

11.8.4 Risk Assessments and Method Statements (RAMS) from contractors will be scrutinised by the Environmental Advisor or Appointed Ecologist and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to.

11.8.5 This CEMP will be updated by the Environmental Advisor to reflect the outcome of any outstanding surveys and will detail any licenses and/or mitigation required.

11.9 Reptiles

11.9.1 Desktop studies reported records of a single grass snake from the River Granta CWS in Babraham and a single common lizard approximately 0.5km southwest of the CSET Scheme, near Sawston in 2015.

11.9.2 However, areas of reptile habitat suitability were noted across vast sections or within proximity of the CSET scheme. These include three locations immediately south of the CBC, narrows strips of vegetation in the centre of the Scheme, west of Stapleford and an area surrounding a large lake to the south of Babraham and adjacent the A11. Further surveys will need to be undertaken to identify species present and suitable location habitats.

11.9.3 Due to the nature of project works, during clearance and construction there is a risk of injuring and / or killing reptiles when working within rough grassland, tall ruderal vegetation, and / or scattered scrub.

11.9.4 To minimise the risk of disturbing reptiles, reasonable avoidance measures under the supervision of an ecologist will be undertaken prior to construction.

11.9.5 As part of the site induction process, all staff working on site will be made aware of the potential presence of reptiles on site and their status as a UK and European Protected Species. During toolbox talks pictorial illustrations will be displayed and later pinned in the site office so that staff are aware of what these reptiles look like.

11.9.6 Vegetation clearance required to protect reptiles will be undertaken in a phased manner, under supervision of an ecologist or Ecological Clerk of Works.

11.9.7 In collaboration with the sub-contractor who will be carrying out the vegetation clearance on site, the following measures will be adopted:

a) If the rough grassland, tall ruderal vegetation, and / or scattered scrub areas are not being impacted no further survey or mitigation for reptiles are required.

b) If the habitat is to be disturbed, then a mitigation strategy will be required to minimise the risk of disturbing reptiles. Most likely this will involve strimming of the work area under ecological supervision prior to construction.

c) If a reptile is identified during any of the above operations, development may need to be suspended until a translocation site is agreed with the local authority ecologist.

d) Risk Assessments and Method Statements (RAMS) from contractors will be scrutinised and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to.

11.10 Terrestrial Invertebrates

11.10.1 Though surveys are incomplete, several small heaths butterflies (*Coenonympha pamphilus*) a species of principle importance were recorded towards the centre of the CSET Scheme, close to Stapleford during a site visit in 2019. Thus, presenting the area as a suitable habitat for invertebrate species. However, further surveys will need to be carried out on the grassland areas southeast of the Scheme, adjacent the A11 and north of the Scheme close to Great Shelford since they also present suitable habitats.

11.10.2 Advice will be sought from a qualified ecologists about potential impacts and suitable mitigation measures.

11.10.3 Invertebrates will only be translocated as a last resort; compensation measures will be used if there are still negative impacts for invertebrates.

11.11 Water voles

11.11.1 Based on data records and third-party communications with local game keepers water voles are considered to be present in the River Granta. One ditch located just to the south of the CBC was identified as having suitability to support water vole. Water voles are species of principal importance and are a conservation priority of the local BAP. A box culvert will be used where the route crosses a ditch known to be accessed by water voles.

11.11.2 To minimise noise and vibration disturbance to voles, the Continuous Flight Auger (CFA) piling method will be used for the construction of the bridges. Newer, regularly serviced plant will be utilised to further reduce noise and vibration levels.

11.11.3 A buffer of 5m will be demarcated by temporary fencing and signage to ensure construction activities are kept within the footprint. Water vole proof fencing will be set up by the Contractor to stop voles from entering into the construction footprint.

11.11.4 Construction light spill onto hedgerows and any areas of suitable water vole habitat will be minimised through the use of directional lighting, hoods and shields.

11.12 Otters

11.12.1 Surveys undertaken by WYG in 2020 identified otter evidence within the CSET Scheme boundary. One spraint and potential otter couch was identified 65m to the east of the CSET Scheme along the River Granta and one potential couch located to the east of the large lake south of Babraham and adjacent the A11. Seven otter spraints were located under the A11 bridge along the northern and southern riverbanks while another two otter spraints and slides were located on the southern bank of the River Granta under the bridge for the A11. Two potential resting places were also identified under the A11.

11.12.2 It is an offence under the Wildlife and Countryside Act 1981 (sections 9.1 and 9.4, to kill, injure or take an Otter from the wild without a licence; to damage or obstruct a Holt or disturb an Otter in its resting place.

11.12.3 Any Construction works will be undertaken in a sensitive manner to avoid or minimise the risk to otters. Therefore, prior to commencing any works on site, through inductions and toolbox talks all operatives will be informed of the presence of otters and protected species on or within proximity of the CSET scheme boundary.

11.12.4 Open excavations will be kept to a minimum across the whole site, covered overnight or fitted with a means of escape to prevent otters or other animals becoming trapped.

11.12.5 Works around otter habitats will restricted to daylight hours.

11.12.6 No works will be carried out within 30m of known otter habitats. If during works, new otters' features are identified, work shall stop, and a qualified ecologist contacted for advice. Work will only resume in this section after the otter is removed or assessment of the identified feature is carried out by the ecologist.

11.12.7 No operatives are to disturb potential otter features e.g. holts, slides, spraints until fully investigated by a qualified ecologist.

11.12.8 Fencing within vicinity of otter features will only be erected upon completion of an otter assessment by a qualified ecologist.

11.12.9 Routine assessments and checks of the river Grant and the A11 bridge riverbanks will be undertaken during the scheme construction by a qualified ecologist.

11.12.10 A log of all site checks, sightings of otters or their signs and infringements of the method statement (to include advice given and actions taken to rectify) will be kept by the CSET scheme environmental lead.

11.13 White clawed crayfish

11.13.1 Biological Records Centre documentation indicates four records of white clawed crayfish *Austropotamobius pallipes* within a stretch of the River Granta CWS close to Granta Park between 2011 and 2014. Detailed cray fish surveys are to be concluded between July- October 2020.

11.13.2 The CSET scheme works will minimise disturbances of the riverbanks, avoid siltation or release of sediment into the river.

11.13.3 All site operatives working within proximity of crayfish habitat will be briefed about the presence of white-clawed crayfish on the site and that it is illegal to move any species of crayfish to a new site without written permission from Natural England.

11.13.4 Excavation works on the riverbanks will be undertaken using hand tools where practicable. However, where this is not feasible the soil should be carefully removed a layer at a time by an experienced digger operative, allowing a licensed ecologist to regularly check the area of works for crayfish.

11.13.5 Draining areas of banks that support white-clawed crayfish refuges will encourage them to emerge. Therefore, installation of a coffer dam can be used to encourage crayfish to voluntarily exit and allow for structural works along the riverbanks.

11.13.6 Affected areas along the riverbank will be drained for a period of two hours 2-3 days prior to the works with a licensed ecologist present to collect any emerging crayfish and check any potential refuges.

11.13.7 To ensure that neither non-native crayfish nor the crayfish plague is transferred to the habitat, where practicable operatives will be discouraged from moving between sites. But if not feasible, operatives entering the riverbank work area must thoroughly clean, disinfect and where possible dry their equipment. The Environmental Advisor and Site Manager will ensure Bio security guidelines

issued by the Non-Native Species Secretariat (NNSS) are emphasised during pre-task briefings, toolbox talks and are followed by all operatives when working within the river or banks.

11.14 Trees and woodlands

11.14.1 Most of the proposed CSET scheme route is on agricultural or grass land with minimal trees directly affected by the proposed works. No tree preservation orders have been identified in the scoping report. A pre-construction walk over will be undertaken by Environmental Advisor and contracted Arborist in liaison with the Local Authority Tree Officer to assess the trees condition and identify if there have been any significant changes.

11.14.2 Where trees are to be retained, tree protection areas will be fenced using an approved fencing system. Protective fences are to comply with BS 5837:2012 – Trees in relation to design, demolition, and construction. Waterproof notices will be attached to the fencing and marked as 'Construction Exclusion Zone – No Access. No materials will be stored in this area or under tree canopies or root protection zones**.**

11.14.3 Any tree branches extending over the protective fence will be pruned by a competent arborist and if any roots over 25mm diameter are found outside the root protection zone an arboriculturist will be contacted.

11.14.4 Tree planting and replanting will be undertaken in accordance with *BS 8545:2014 'Trees: From Nursery to Independence in the Landscape – Recommendations'*. Protection will be considered for areas planned for replanting trees.

11.14.5 The fifty-one recently planted trees should be transplanted to a suitable location within their current locale to provide the best chance of surviving transplantation.

11.15 Hedgehogs.

Although no hedgehogs were identified during survey, precautionary methods of work are advised during clearance of hedgerows and scrubs. To avoid killing or injury to hedgehogs that may be present within hedgerows and other dense vegetation, suitable habitat will be hand-searched by an ecologist for hedgehogs prior to its clearance. Piles of cut vegetation such as brash piles will also be searched as they can be used as shelter by hedgehogs. Hedgehogs found will be moved to a suitable release site away from the development within scrub, hedgerow or other dense cover.

Open excavations will be covered. If this is not possible, they will be fitted with mammal ladders (planks of wood at either end) to allow animals to climb out if they fall in and prevent the trapping of hedgehogs

11.16 Harvest Mouse

To avoid killing or injury to harvest mice that may be present within long grass or arable crops, suitable habitat will be hand-searched by an ecologist for harvest mice prior to clearance. Harvest mice found will be moved to a suitable release site away from the construction footprint into suitable habitat

11.17 Polecat

Cambridgeshire and Peterborough Environmental Records Centre (CPERC) records indicate three sightings of polecats within 2.5km of the CSET Scheme. Therefore, to avoid killing or injury to polecats that may be present within hedgerows and other dense vegetation, suitable habitat will be

hand-searched by an ecologist prior to its clearance to make sure none remain within the construction footprint.

Open excavations will be covered or fitted with mammal ladders to prevent the trapping of animals.

11.18 Amphibians

Suitable habitats will be hand-searched by an ecologist for toads prior to clearance. Piles of cut vegetation such as brash piles will also be searched as they can be used as shelter by toads. The ditch WB15 will also be searched for toads, prior to its destruction. Any toads found will be moved to a suitable release site away from the development within scrub, hedgerow or other dense cover.

Open excavations will be covered, if this is not possible, they will be fitted with mammal ladders to allow animals to climb out if they fall in and prevent the trapping of toads and other amphibians.

12 Protecting the Historic Environment.

12.1.1 The Scheme traverses multiple areas of known archaeological interest, including a number of listed buildings near the route such as the grade II* listed Church of St Andrew in Stapleford, the grade II* listed Middlefield and Garden Wall, the grade II listed Nine Wells Monument, the grade II listed Church Farmhouse, and the Babraham Conservation Area.

12.1.2 The CSET route is likely to visibly truncate the inter connectivity of the historic lower chalk plains and Hobson's Conduit, a 17th century non-designated landscape feature of high historic importance that stretches northwards from Nine Wells spring into the centre of the City of Cambridge.

12.1.3 To minimise impacts or reduce significant effects on assets, mitigation measures will be incorporated into the detailed design of the CSET scheme and included in the final CEMP. The heritage mitigation strategy reported in the ES will be produced and agreed with the Cambridgeshire Historic Environment Team and included in the final CEMP. This will include a Written Scheme of Investigation to be produced in agreement with the County Archaeologist (to cover both monitoring, excavation and recording activities). The CEMP and Written Scheme of Investigation will have to be in place prior to any works on site commencing.

12.1.4 Mitigating measures will include pre-construction excavation and recording via planned strip and record activities in key areas along the route, watching briefs by qualified archaeologists, and advance planting or screening to reduce visual intrusion on the setting of nearby buildings.

12.1.5 If items or materials of archaeological nature are encountered whilst carrying out ground-breaking activities such as piling, trenching and excavations, work is to stop, and the local authority archaeologist contacted.

12.1.6 Risk Assessments and Method Statements (RAMS) from contractors will be scrutinised by the Environmental Advisor and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to.

13 Landscaping and Vegetation Clearance

13.1 Introduction

13.1.1 The works will require for existing trees and vegetation to be cleared to allow the proposed design to be installed. The works will include the provision of new planting to help mitigate the impacts of the proposed scheme upon the landscape. Vegetation clearance shall be programmed to avoid the nesting bird season (March to August inclusive). Where this is not possible, a breeding bird survey shall be carried out by an ecologist within 48 hours of proposed clearance to check for bird nesting activity. If active nests are found a buffer of vegetation shall be retained until all young have fledged and the nest deemed inactive by an ecologist.

13.1.2 Areas of retained vegetation and newly landscaped areas shall be protected and maintained for the duration of the works. Exclusion zones shall be established around existing trees and vegetation to prevent mechanical excavation within root protection zones. Where excavation is required within root protection zones, non-mechanical methods are to be used such as vacuum excavation.

13.2 Topsoil

13.2.1 It is assumed that a topsoil strip of 150mm will be undertaken. The resultant arisings are assumed to be classified as class A/B topsoil and is to be bunded and stored on site. Stored topsoil shall then be reused for landscaping purposes prior to completion of the project. Where agreed, excess topsoil shall be delivered to local farmers for recycling. The Principal Contractor shall assist all farmers accepting exported topsoil with acquiring an Upper Tier Waste Carrier License.

13.3 Class 1 Material

13.3.1 It is assumed that all “cut” material shall be classified as Class 1 material. It would be the intention to reuse any Class 1 material as “fill” for areas such as embankments and ramps to bridge structures. If the import of Class 1 material is required, only virgin material shall be permitted for “fill”.

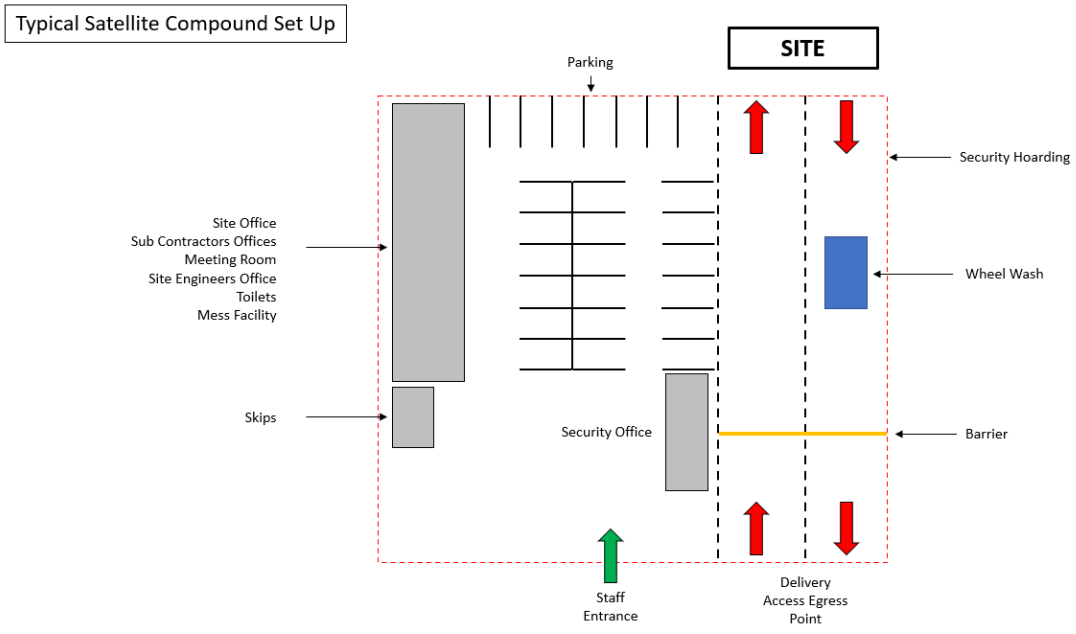
13.3.2 There is no plan to export any Class 1 material to landfill, reducing site traffic movements throughout the project duration.

13.4 Contamination of the Public Highway

13.4.1 It has been identified that mud build up on carriageways could cause a substantial hazard. Therefore, to prevent this occurrence, wheel wash systems shall be installed at all compounds that provide an interface with the public highway.

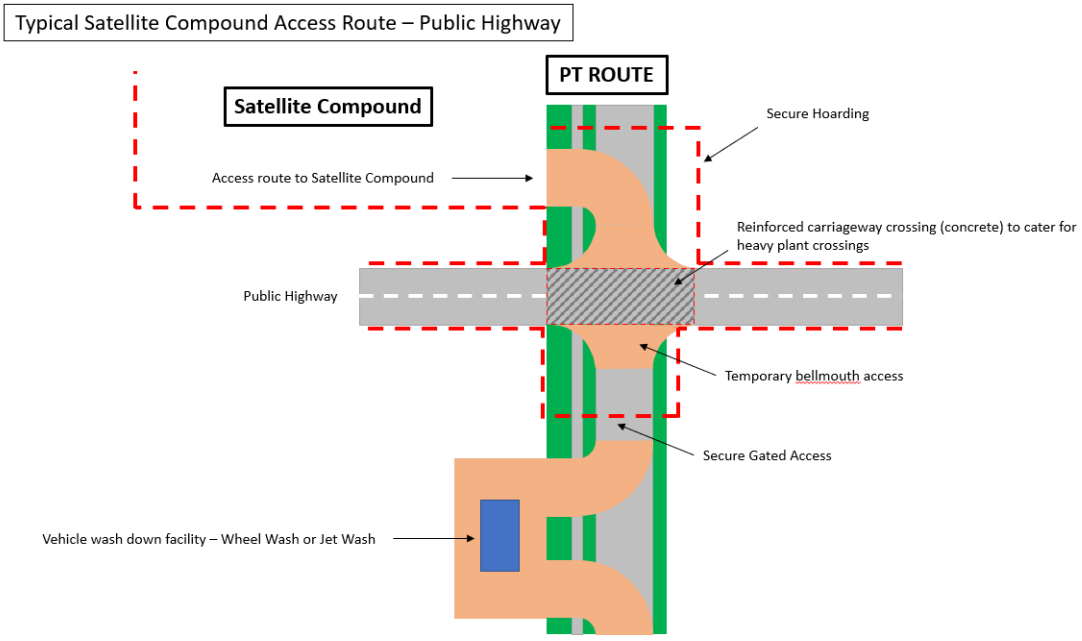
Figure 5: Typical wheel wash set up

Figure 6: Typical satellite compound set up



SKANSKA

Figure 7: Typical satellite compound access route – public highway



13.4.2 The diagrams above show the typical planned site setup arrangement showing wheel washes located before exiting onto the public highway.

13.4.3 Further consideration of wheel washes using a dry wash technique can be found in **Section 15.8**

14 Noise and Vibration

14.1.1 Noise and vibration statutory nuisances are controlled under the Environmental Protection Act 1990. The Control of Pollution Act 1974 offers protection to nearby receptors. Under section 60 of the Act a local authority can serve a notice specifying noise control requirements covering plant or machinery (which is or is not being used), working hours, and levels of noise that can be emitted.

14.1.2 Due to COVID-19 and restrictions on field work, no field studies have been carried out along the CSET scheme route. However, desktop studies using the Extrium (available online at: http://extrium.co.uk/) noise maps indicate that baseline noise levels in the immediate vicinity of the CSET Scheme area are characterised by a combination of railway and road traffic (A1307, A11, A505) noise.

14.1.3 The existing ambient noise levels at sensitive receptors from road traffic and rail noise sources during daytime periods are typically less than 55 dB LAeq,16hr. Ambient noise levels for areas close to the A11 near the Travel Hub, within Great Shelford and CBC are likely higher and typically between 55-60dB LAeq,16hr.

14.1.4 There are no noise important areas (NIA) located within 600m of the Travel Hub or CSET Scheme route.

14.1.5 The majority of noise sensitive receptors are residential properties along the scheme route in Babraham, Sawston, Stapleford, Great Shelford, Trumpington and Cambridge.

14.1.6 Non-residential receptors include Addenbrooke's Hospital, CBC facilities, Babraham Research Campus, schools, and community facilities.

14.1.7 There are receptors within the areas of Sawston, Stapleford, Great Shelford and the CBC that lie within a 300m radius of the CSET Scheme. Therefore, during construction there is a potential of the scheme increasing noise and vibration levels in these locations for a temporary period.

14.1.8 Noise from diversion routes will also have the potential to increase noise levels and impacts on receptors along those routes.

14.1.9 The CSET Scheme is not expected to result in substantial changes to traffic flows on the existing road network, however, potential impacts are anticipated to be localised to areas around the Scheme route.

14.1.10 Prior to commencing works, all contractors will avail their method statements for inspections in accordance with principle described in BS5228 Parts 1 and 2 Code of practice for noise and vibration control on construction and open site. Stating precisely the type of plant to be used and the proposed noise control methods.

14.1.11 All works will comply with provisions of the Control of Pollution Act, 1974.

14.1.12 Muffling should be in accordance with the recommendations set out in BS 5228:1997, Code of practice for noise control on construction and demolition site. Best practicable means to reduce the noise effect on the local community will be used by all contractors on site. The Site Manager is to ensure that:

- Ancillary plant such as generators, compressors, and pumps liable to create noise and/or vibration whilst in operation are reasonably located away from sensitive receptors.

- Drop height while off-loading materials from lorries or plant is kept at a minimum and materials like steel works or scaffolders are handled with care. They should be placed rather than dropped.
- As required and reasonably practical noise barriers are used to deflect or absorb noise away from sensitive receptors.
- Noise and vibrations are minimised during piling operations.
- All plant silencers and acoustic enclosures are maintained in good and efficient working order to minimise noise as far as reasonably practicable.
- Plant, equipment, or items fitted with noise control equipment found to be defective will not be operated until repaired.
- As reasonably practical vehicles and plant are fitted with effective exhaust silencers and are maintained in good working order.
- Machines in intermittent use are shut down between work and where reasonably practicable, use electrically powered equipment instead of diesel or petrol driven ones.

14.1.13 Adverse construction vibration effects are likely to occur for receptors during the closest approach to vibratory roller activities. These receptors include residential properties near Hinton Road and Haverhill Road Stops, commercial receptors south of the route near Compound 3 and receptors on Francis Crick Avenue within CBC. Therefore, the appointed contractor should consider minimising potential vibration effects during construction at these receptors by implementing guidance stated within BS 5228-2 Sections 7 and 8. ie.

14.2 Work Preparation

- The principal contractor will undertake early consultation/ seek guidance concerning recommended vibration levels for the neighbourhood surrounding a site and concerning acceptance of the proposed methods of working from the Local Authority. This should be done at the same time as approvals are being requested for the commencement of work with the with local authority.
- The Project designs should include the location of items such as haulage roads, crushing plants and compaction plant.
- Preferred routes for off-site movement of vehicles will be established with the local highway authority and the police. As far as reasonably practicable access traffic should be routed away from sensitive premises.

14.3 Execution of work

14.3.1 Where reasonably practicable, low vibration working methods will be employed. Consideration will be given to use of the most suitable plant, reasonable hours of working for operations which might give rise to perceptible vibrations.

14.3.2 Working will be planned, and account will be taken of the effects of vibration upon persons in areas surrounding site operations and upon persons working on site.

14.3.3 On-site vibration levels will be monitored regularly by a suitably qualified person appointed by the Project Manager specifically for the purpose, particularly if changes in machinery or project designs

are introduced. A vibration measurement method specified in BS 7385-1 will be agreed upon with the Local Authority prior to commencement of works.

14.3.4 Warning signs will be displayed in areas where vibration is likely to be a hazard to Operatives.

14.3.5 The local authority will be informed as soon as possible when it is unavoidable to exceed permitted vibration limits because of an emergency.

14.3.6 Where reasonably practicable, vibrating equipment will be located as far from sensitive premises as possible,

14.3.7 Use of continuous flight auger injected piles

14.3.8 Where vibration levels are predicted or likely to exceed SOAEL (PPV 1.0mm/s) the appointed contractor should seek to:

- Use alternative construction methods if practicable
- Keep affected receptors informed of the likely times and duration of works
- Monitor the vibration level at the nearest receptors (or at an equivalent offset distance) to enable the vibration level at receptors to be determined and recorded

14.3.9 Carry out a condition survey at any nearby sensitive structures to determine if works can be completed without permanent damage and ensure any current damage to buildings is accounted for ahead of time

15 Pollution prevention and Water Management

15.1 Introduction

15.1.1 Due to the sensitivity of water resources in the project area receptors that could be impacted by the CSET Scheme are: The River Granta which is considered to have a high value as it is a water body with a WFD classification and a Q95 flow between 0.001m3/s and 1m3/s. Hobson's Brook: does not have a WFD classification but it is a spring-fed watercourse considered a medium value receptor. The groundwater in the chalk aquifer is considered to have a high value as it is locally important as an aquifer (providing local drinking water supplies) and supports the ecosystem in the River Granta. Therefore, the appointed contractor shall adopt robust controls to ensure water resources are protected from physical disturbance and pollution including those set out in CIRIA's Environmental good practice on site.

15.1.2 The Contractor shall develop a Site Water Management Plan for the construction phase to provide detail on the broader protective measures set out in this document and the CoCP. The final CEMP requires the appointed Contractor to adopt best practice measures to protect the environment during construction. These documents will be finalised once approval for the Scheme is provided to take into account any specific requirements set out in the approval. The final CoCP and CEMP will require approval by the local planning authority prior to works commencing on site.

15.1.3 Prior to construction any permit or consents required for works near or over watercourses will be obtained from the Environment Agency or LLFA (as appropriate) by the Principal Contractor(s) for both temporary and permanent works. This is a legal requirement before works can commence.

15.1.4 No pollution pathways will be created between the construction area and the watercourses, as measures will be implemented to prevent surface water runoff containing suspended sediment (or hazardous substances) reaching watercourses through overland flow in rainfall events

15.1.5 The pollution control measures will be in accordance with the CIRIA C753 SuDS Manual, CIRIA C532: Control of Water Pollution from Construction Sites and Control of water pollution from linear construction projects. Technical guidance (C648).

15.2 Surface Water Pollution prevention

15.2.1 Potential for impacts on surface water quality will be minimised by the following measures

- Works compounds will be located at least 20m away from any surface watercourse or drain.
- No materials will be stored or stockpiled within Flood Zones 2 or 3. The contractor will subscribe to the Environment Agency's Flood Warning Service and have an Emergency Flood Plan for the Project. The plan will detail areas that are prone to flooding and the necessary arrangements for working in a flood zone and measures to deal with a flood.
- Areas of bare soil near to water courses will be kept to a minimum to reduce silty runoff.
- Before any discharge of water is to be made during construction, adequate provisions for preventing pollution will be made, chosen where most appropriate for each specific area of the scheme. Techniques may include settlement lagoons, use of straw bales for silt trapping and use of flocculants.
- All pumped drainage from the construction works, including from areas used for temporary storage of construction materials or excavated soils, will be passed through silt settlement

treatment prior to discharge to surface watercourses or drains. The Contractor will ensure that all required permits are in place prior to commencement of such activities.

- Where appropriate, watercourses will be shielded by bunds to further prevent contamination from surface water runoff.
- The use of water sprays for reducing dust or washing construction areas will be carefully regulated to avoid washing substantial quantities of silt (etc.) into surface water drains.
- Where large quantities of gravel, mud or other such material requires clearing from existing highways, the area will be swept clean prior to any subsequent hosing down.
- The potential for impacts on the WFD status of the waterbodies will be minimised by ensuring that the temporary river crossings do not interfere with the bed or immediate banks of the rivers. Any impacts on the soils or vegetation will require reinstatement back to pre-existing conditions following construction
- Provision of dry wheel wash facilities where reasonably practicable for vehicles moving to and from the site at all entry and exit points. Wheel wash facilities will be located on the main entrance / exit points to the public highways. Where these use water to wash the wheels down the water shall be collected and treated on site to remove silt / drainage, before any discharge on site, or it will be removed from site and disposed of to a suitably licensed facility

15.3 Wet cement and Concrete management

15.3.1 The potential for impacts to occur as a result of contamination of water by wet cement or concrete will be minimised by the following measures

- Manholes and catchpits will be covered to prevent concrete / cement ingress.
- The placing of any wet concrete in or close to any watercourse will be controlled in order to minimise the risk of leakage of wet cement into the watercourse.
- All major culvert structures will be preconstructed away from the watercourse and not built in-situ. Any concreting at watercourse culvert sites will be closely supervised in order to prevent concrete contamination of the watercourses.
- The washing of any concrete mixing plant or ready-mix lorries will be carried out so as to prevent the resulting effluent from being allowed to flow into any watercourse or drain.

15.4 Contamination from Oil or COSHH liquids

15.4.1 Potential impacts as a result of contamination of water by oil or other liquids will be minimised by the following measures:

- Storage compounds for fuels, oils or other liquid chemicals will be located at least 30m away from surface water drains. They will have an impermeable base and impermeable bunds with a capacity of 110% and will not drain directly into the surface water drains.
- Small plant such as pumps will be equipped with drip trays.
- There will be no refuelling within 30m of any surface water body
- Emergency response procedures will be included in the Environmental Incident Control Plan to handle any leakages or spillages of potentially contaminating substances.
- Spill kits will be located near to watercourses and within the works compounds, and staff will be trained in their use.
- Watercourses will also be monitored visually during construction to ensure there are no oil or silt impacts.

15.4.2 The CSET Scheme crosses about 32m of Flood Zone 2 and 3 connecting CBC to Hobson's Brook flood plain.

15.4.3 Between Stapleford and Sawston the route crosses about 220m of the River Granta Flood Zone 2 and 3. The route then crosses the River Granta a second time about 500m west of the A11 (about halfway between the A11 and Babraham). At this location, the Flood Zones 2 and 3 are about 170m wide.

15.4.4 No materials will be stored or stockpiled within Flood Zones 2 or 3. The contractor will subscribe to the Environment Agency's Flood Warning Service and have an Emergency Flood Plan for the Project. The plan will detail areas that are prone to flooding and the necessary arrangements for working in a flood zone and measures to deal with a flood.

15.4.5 Works compounds will be located at least 20m away from any surface watercourse or drain and no storage or works compounds will be located within Flood Zones 2 and 3.

15.4.6 If there are works within the flood plain that potentially affect the function of the flood plain these will adhere to requirements set out in the Flood Risk Assessment and will have to be approved by the Environment Agency.

15.4.7 Any discharges to surface water from the project (eg. run off from working areas) will have to be controlled so that turbid water is not discharged into surface water courses. This will require control measures to be installed as part of the construction management of site drainage by the main contractor.

15.4.8 There is one licensed abstraction point from the Granta near Babraham which would be within the Scheme footprint although at this point the Scheme will be on a bridge over the River Granta. The abstraction (Licence No. 6/33/28/*S/0035) is a single point which abstracts from the River Granta (at NRG TL 5135 4968) and is used for agricultural spray irrigation. The abstraction licence allows for a maximum abstraction quantity of 3,600m3 per day

15.4.9 The contractor will be responsible for ensuring there is no interruption to the supply from the licensed abstraction point and will agree how this is achieved with the landowner (Cheveley Park Farms).

15.4.10 In terms of geology, a large portion of the CSET Scheme is on chalk out crops except where it crosses the River Granta. During construction there is not likely to be significant below ground works except in the vicinity of the main structural elements at the River Granta crossings where foundations will be built in the underlying chalk formation.

15.5 Ground Water pollution Prevention

15.5.1 Continuous Flight Auger (CFA) piling, and pad foundations will be required for bridges and structures on the Scheme. Piling works for the foundations are likely to create opportunities for pollutants to move more rapidly to any groundwater encountered by the piling. However, with properly controlled piling operations the movement of turbid materials will be minimised and localised. Other mitigation measures will include monitoring of injection (of concrete, cement or grout) during CFA piling to ensure no significant loss of materials. The contractor must also follow best practice and methodology to monitor and control progress during piling and monitor any turbidity effects in the adjacent surface watercourses.

15.5.2 Piling mats or platforms will be isolated from the main water management systems. Runoff from the piling mats should be directed to a stone lined sump in the area and the water should be pumped

through a settlement system (silt sock or settlement unit) prior to discharge into the any drainage system.

15.5.3 The following measures will be implemented, if required, to minimise potential impacts upon groundwater during earthworks:

- If dewatering is required, groundwater will be pumped from excavations into lagoons / settlement tanks in order to enable sediment to drop out, and if necessary, sediment removal will be aided by the addition of flocculants, subject to the agreement of the Environment Agency. After sediment removal, water will be discharged to a watercourse subject to agreement with the Environment Agency and subject to contaminant levels being below Drinking Water Standards and Environmental Quality Standards.
- Subsoil will be exposed for a minimum length of time after topsoil strip. Cut-off trenches, where necessary, will be excavated in order to prevent massive surface water runoff into watercourses. Cut-off trenches will discharge into sediment lagoons, with discharge to watercourses subject to the prior consent of the Environment Agency.
- Topsoil / vegetation along watercourses will be retained in order to aid attenuation and sediment infiltration.

15.5.4 Construction phase operations will be carried out in accordance with the Environment Agency's guidance documents: "Protect groundwater and prevent groundwater pollution and "Groundwater protection technical guidance.

15.6 Water consumption

15.6.1 Effective construction management can deliver major savings in water use and the associated costs of energy, water supply and wastewater treatment. This can be achieved without compromising the performance of the project.

15.6.2 Onsite use of water will mainly be for the following purposes:

Cleaning

- Road sweepers
- Boot wash
- Wheel washers
- High pressure washing

Dust suppression

- Topsoil Stockpiles
- Vehicular dust suppression

Construction

- Mortar mixing
- Block work

Domestic and Welfare facilities

- Toilets
- canteens

- Offices
- Drinking water

15.6.3 To enable monitoring of water use, easy to read meters will be installed in the site compounds.

15.6.4 To Minimise the risk of uncontrolled use of water, sensor actuated taps and occupancy sensors will be placed in welfare facilities on site**.** Leak detection equipment and pulsed meters for regular monitoring will be used on site. Valves and overflows will be installed in a visible place to enable early detection of water loss and access for maintenance.

15.6.5 There will be encouragement of behavioural and attitude change towards use of water on site. Actions that aim to reduce water wastage e.g. reporting/repairing leaks, turning off taps not in use, using water efficiently will be promoted. Toolbox talks will be used to disseminate information on appropriate use of fittings and appliances, costs, and environmental importance.

15.6.6 For easy quantification and monitoring of site water consumption welfare and site works water consumption will be reported separately. Site water consumption will be recorded on a regular basis for review at project progress meetings and all meter readings, submeter or standpipes will be taken regularly (weekly).

15.7 Pollution Prevention Guidelines

15.7.1 Site layout plan will show storage location of bunded fuel store and packaged chemicals and materials.

15.7.2 All contractors will need to be familiar with and apply the relevant best practice listed in the below Pollution Prevention Guidance (PPG) documents. Copies of the following will be made available in the site office:

- PPG2: Above ground oil storage tanks: Provides information about storing oil in above-ground storage tanks, for new installations and existing tanks. The guidance is for small to medium size commercial oil storage. It gives advice on choosing, installing, using, and maintaining oil tanks and how to deal with spills.
- PPG3: Use and design of oil separators in surface water drainage systems provides information about choosing and using oil interceptors to comply with environmental law and prevent pollution. It gives information about choosing, installing, and maintaining an oil separator. Oil separators can be fitted to surface water drains to protect the aquatic environment.
- PPG7: Refuelling facilities: It includes guidance on planning, designing, operating, and maintaining refuelling facilities, plus information on storing other related, non-fuel products and dealing with environmental incidents.
- PPG13: Vehicle Washing & Cleaning provides information on how to comply with the law and prevent pollution when washing and cleaning vehicles. It includes advice on dealing with effluent, waste management and storing and using chemicals.
- PPG26: Drums and intermediate bulk containers gives information to store and handle drums and intermediate bulk containers (IBCs). It provides advice on choosing drums and IBCs, designing storage areas, delivery and handling, maintenance, dealing with spills and waste management.

15.8 Wheel cleaning facilities.

15.8.1 A dry wheel wash system will be installed on an outbound lane from the site onto the haulage route/highway. All delivery vehicles will have to drive over before leaving the construction site. The dry wheel wash stations use a rack or bar system to provide efficient wheel cleaning with environmental benefits. They do not use fuel, no concrete sump installation, or vehicles idling while queuing to be washed, unlike with a jet wash.

15.8.2 The wheel wash station will be monitored by an operative to ensure that trucks and plant are suitably clean before joining the highway and other roads. If wheels are considered clean before a vehicle accesses the wash station, they can be driven past the station to avoid un-necessary cleaning and noise generation. The wheel wash system will be monitored, and the debris cleaned out with a loading shovel or bucket on a weekly or more regular basis if required.

15.8.3 Road sweepers will be kept on standby to ensure that any debris deposited on the public road network is cleared as soon as practicable. Visual checks will be conducted daily by site operatives to monitor construction mud on the public road networks and recommend whether there is need for the road sweepers to clear it up.

15.8.4 A typical dry wheel wash will measure approximately 20m in length, with two 3m on and off ramps, and two 7m centre sections. Such a station will be able to clean up to 15 vehicles/hour. The wheel wash station should be placed on a hard tarmac or aggregate surface as illustrated below.

Figure 8: Wheel Wash station

Figure 9: Dry Wheel Wash Station in use

16 Managing Construction Site Waste and Materials

16.1 Introduction

16.1.1 A Construction Site Waste Management Plan (SWMP) will be developed and maintained on site by the Project/Site Manager taking into account the comments in Section 16.4. It will be made available to all personnel on site as appropriate.

16.1.2 Where required the SWMP will be utilised alongside other industry guidance documents such as the CIRIA Waste Minimisation in Construction and the Highways England Design Manual for Roads and Bridges Volume 7 Part 2 HD35/04 '*Conservation and Use of Secondary and Recycled Materials*' which specifies where materials can be reused within a road construction project.

16.2 Construction Waste

16.2.1 The main types of material to be disposed of will be, concrete, aggregate, soil, stones, sand, woody plant material, some landfill materials (bound within soils) and vegetation.

16.2.2 In addition to the excavation material quantities, other waste types (general construction waste) will be generated during construction of the CSET scheme.

16.2.3 The quantities of general construction wastes will be made up of wood, plastic materials, packaging, metals, blocks, food/canteen waste, site clearance, hazardous waste (oils, aerosol cannisters and adhesives), and residual waste generated during the construction phase.

16.2.4 Reviewed below are the European waste catalogue codes (EWC) for the anticipated wastes that will be generated by the CSET scheme.

Table 3: EWC codes for waste anticipated to be generated by the CSET scheme

EWC code	Waste description
17 05 04	Soils and stones other than those mentioned in 17 05 03
17 01 07	Mixture of Concrete, bricks, tiles, and ceramics
17 05 03*	Soils and stones containing hazardous substances
13 07 01	Liquid Fuels
17 02 01/02/03	Wood, glass, plastic
17 03 01*/02	Bituminous mixtures, coal tar and tarred products
16 06 04/01	Batteries
17 04 07	Metal

17 05 03*/04	Soil (incl. excavated soils from contaminated sites), stones and dredging spoil
16 02 13/14	WEEE
17 09 04	Other construction and demolition waste

16.2.5 Prior to commencing construction works sampling of specific waste streams like potentially contaminated soils will be undertaken, and waste classifications assigned.

16.2.6 A Sampling Plan will be developed and implemented in line with Environment Agency guidance WM3.

16.3 Waste hierarchy.

16.3.1 On site waste hierarchy will be implemented as follows.

- Waste Prevention and Reduction
- Re-use. Products and material can be used again, for the same or a different purpose.
- Recycling and composting- Resources can often be recovered from waste.
- Energy recovery. Value can be recovered by generating energy from waste.
- Disposal- Only if none of the above options offer an appropriate solution should waste be disposed of.

16.3.2 The waste hierarchy will be implemented throughout the construction to minimise disposal and maximise reuse and recycling of waste arisings. Opportunities for re-use and recycling of waste include (but are not limited to):

- Re-using excavated soils on-site in the landscaping features of the A1307 route and the A11 Travel Hub
- Chipping green waste on-site for use in the landscaping for the CSET Scheme and composting of remaining green waste
- Recycling of inert material by crushing, blending and subsequent reuse, as an aggregate
- Re-using waste on other nearby schemes
- Re-using waste for uses with clear benefits to the environment, for example in the remodelling of agricultural land or in the restoration of nearby quarries or other excavation sites
- Facilities will be provided on-site to separate out waste to enable the recovery of material through recycling.

16.4 Site Waste Management Plan (SWMP)

16.4.1 The plan will:

- Assign responsibilities to individuals for waste management
- Ensure Contractor's staff are informed of responsibilities and commitments
- Specify types of waste and the quantities likely to be generated. Waste produced on site will be managed in accordance with the Duty of Care under the Environmental Protection Act 1990
- Adopt measures during construction to minimise waste generation

- Adopt measures to segregate and handle wastes
- Ensure that any material imported on the site is suitable for the intended use.
- Identify opportunities for recycling and/or reuse of waste
- Identify Waste Carriers together with details of their Licences
- Identify treatment and disposal sites together with details of their Environmental Permits
- Establish a method for recording Waste Transfer Notes and maintaining the Waste Log
- Identify Hazardous Waste Streams to be disposed of separately and the method for recording Hazardous Waste Consignment Notes.

16.4.2 All suppliers on the approved supplier list will undergo an initial desktop duty of care audit and will be risk rated. Risk will be determined based on spend with any one supplier, local knowledge, or expertise. Higher risk suppliers will then be subject to site audit and sample inspections.

16.5 Responsibilities

16.5.1 It will be the responsibility of the project manager, site managers/supervisor to.

- Maintain records of waste transfers for operations or sites under their control.
- Ensure Purchase Orders for waste service procurement have fully completed waste records.
- Maintain Waste Transfer Notes for non-hazardous waste for two years under environmental legislation and up to six years under commercial requirements.
- Ensure that duty of care checks have been carried out while transferring waste to companies not on the approved supplier list.
- Maintain hazardous waste consignment notes for three years.
- Ensure all waste is stored securely and maintain compliance with any waste permits or exemptions for their respective sights.
- Maintain records for Waste Stream Assessments and Environmental Plans
- Notify the project environmental lead if the sight requires hazardous waste transfer codes.

16.6 Waste segregation.

16.6.1 Different types of waste should be segregated to allow for correct disposal. To prevent pollution or cross contamination each waste type should be store separately and securely. Each waste container should be clearly marked or labelled.

16.6.2 The total quantity of liquid waste stored on site should not exceed 1000 litres at any one time. No more than 50m^3 of waste should be stored on a site at any one time.

16.6.3 The maximum time waste can be stored on site shall not exceed three months.

16.6.4 All Waste Electrical and Electronic Equipment (WEEE) and batteries should be handled and transferred as hazardous waste to be recycled by an authorised recycling centre.

16.7 Reuse

16.7.1 Non-hazardous excavation material or uncontaminated topsoil will be used as fill and for landscaping works. This will be after appropriate tests have been carried out to ensure the material is suitable for the proposed use.

16.7.2 If the excavation material is not re-used, the sub-contractor will endeavour to send it for recovery or recycling at an off-site interim storage facility with an appropriate waste licence or permit in place.

16.8 Material management

16.8.1 A draft CSET Spoils Management Strategy has been developed for the topsoil excavation works. Suitable site-won material from the scheme works will be managed in accordance with this strategy. The goal is to reuse as much topsoil as possible within the boundary of the scheme.

16.8.2 However, a Materials Management Plan (MMP) in line with the CL:AiRE Code of Practice will need to be produced by the Principal Contractor for material imported for use on site as indicated in the CSET Spoils Management Strategy.

16.8.3 The amount of waste material on site will be reduced as far as reasonably practicable, through waste-minimisation, re-use, and recycling. This shall be achieved by implementing the following strategy:

- Materials will be delivered on an 'as required' basis to avoid damage or contamination and therefore limit the likelihood of waste.
- Where site-won material is not available or suitable for reuse, secondary or recycled materials will be procured where available and practicable.
- All suitable excavated material will be reused in the construction of the CSET Scheme and in landscaping features along the A1307 route and the A11 Travel Hub to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site.
- Road planings will be incorporated into new pavements on- or off-site.
- Temporary stockpiling of fill materials prior to incorporation into the CSET Scheme will be avoided where possible, to ensure double handling and damage are minimised, therefore avoiding waste. However, where required, materials will be stockpiled in accordance with best practice and managed appropriately to limit the likelihood of damage or contamination.
- Locally sourced materials and suppliers will be identified and used where practicable.
- Pre-cast elements will be used where practicable to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.
- Where waste must be taken to a recycling or disposal site, the appointed contractor will ensure that the sites have the appropriate permits. In addition, the suitable facility will be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The appointed contractor will identify the closest and relevant treatment and disposal sites.
- A list of waste infrastructure sites and sites that will receive inert waste for restorative purposes within a 10km radius of the CSET Scheme is to be displayed on site and used for waste deposits subject to conditions imposed on the sites by the relevant licence or permit.
- Proper and secure storage should ensure material shelf life is not exceeded, damage and contamination are prevented including loss, theft, and vandalism.
- Minimising damage during offloading of deliveries making sure deliveries are to the correct location on site, acceptance of materials and components only in accordance with the order.
- Handling materials and components using the correct methods.
- Providing temporary protection where applicable to minimise damage.

16.9 Waste auditing

16.9.1 The contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase. The name, address and authorisation details of all facilities and locations to which materials from the construction phase are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered or disposed of.

16.10 Waste types

Excavated clay, soil, and stones

16.10.1 Excavated materials will be loaded directly to vehicles for re-use on the scheme as appropriate. Where short term temporary storage is unavoidable, topsoil will be stored separately from other soil types and where possible topsoil stockpiles will not be more than two metres in height as it may damage the soil structure and limit its future use. Details on how to handle, use, re-use, store and dispose topsoil can be found in the CSET schemes Spoils management strategy.

16.10.2 The Spoil Management Strategy (SMS) should be followed, which sets out how soils are to be managed in accordance with Defra's Code of Practice (CoP).

Metals

16.10.3 One of the primary sources of metal waste will be rebar for structural constructions. This will be reduced by ordering made to measure rebar from the manufacturer and detailed scheduling of all Reinforced Concrete (RC) structural elements. Skips will be provided and when full should be sent to a metals recycling facility

Timber

16.10.4 This will be stored separately as it is readily contaminated by other wastes so any pallets will be returned to the supplier for re-use. Off cuts and trimmings will be used in formwork where at all possible. A container for waste wood will be managed by a waste carrier who will forward it to a wood recycling facility for chipping.

16.10.5 Treatment of timber with chemicals and the overuse of nails will be minimised and avoided as this will make it difficult to reuse/recycle the timber afterwards. The utilisation of reclaimed timber products will also be investigated.

Concrete

16.10.6 Waste is to be sent back to the supplier for re-use. It is anticipated that approximately 1911m^3 of recycled Type 1 will be used throughout the entire scheme.

Packaging and Plastic

16.10.7 Double handling will be avoided by segregating packaging wastes immediately after unwrapping. Waste packaging will be segregated and stored in separate containers, preferably covered for collection, or returned to the supplier.

Blocks, Bricks, kerbs

16.10.8 The most likely wastes produced will be off-cuts, trimmings and waste arising from breakages. Every effort will be made to use broken kerb pieces, bricks, blocks, and off cuts.

Hazardous Wastes

16.10.9 Hazardous wastes will be identified, removed, and kept separate from other construction waste materials to avoid cross contamination. Specific method statements detailing the necessary mitigation measures required during excavation, handling, transportation, and disposal of hazardous wastes encountered on site will be prepared as required. The likely disposal/treatment options for any hazardous wastes will depend on the nature of the material and the concentration of parameters of concern.

Hazardous Liquids

16.10.10 Oils, Aerosol cannisters, bitumen, adhesives and chemicals will be kept in a separate contained storage area which will be locked when not in use. Lids will be kept on containers to avoid spillage or waste by evaporation. These will be stored in a containment tray with a capacity to contain 110% of the volume of the largest container.

16.10.11 Fuels and chemicals will be stored in double skinned containers or within a bund i.e. an impervious structure with the capacity to contain 110% of the volume of the largest tank stored within it. All containers will be carefully labelled.

Canteen Wastes

16.10.12 Designated receptacles will be provided at the canteen to allow for the segregation and storage of individual waste streams. These will include receptacles for food waste (e.g. brown bin for waste foods, peelings etc), dry recyclables (e.g. green bin for packaging, plastics, metals, wood, paper, cardboard, tetra pack, etc) and residual bin (e.g. black bin for mixed food and packaging waste). Separate receptacles for the recyclable fractions such as plastics, metals, glass may also be provided.

Residual Wastes

16.10.13 This is normally made up of non-recyclable waste such as soiled paper, cloth, cardboard, general waste found on the sites including plastic bottles, bags, cans etc. Given the heterogeneous nature of this material it is most important that residual waste is kept separate from the other waste streams to avoid contamination. This material will be stored in a dedicated container in the Waste segregation area.

16.10.14 Container size and collection frequency will be assessed with waste management contractors as works proceed. All residual wastes will be dispatched to a suitably licensed facility for disposal.

16.10.15 Other construction and demolition waste material will be collected in receptacles with mixed construction and demolition waste materials for subsequent separation and disposal at a segregation facility.

17 Protecting Soil and Managing Contaminated Land Risks

17.1.1 The land use along the CSET scheme is predominantly agricultural and there are no known brownfield sites on the route. The route is largely on outcropping chalk bedrock except where it crosses the River Granta valley, there are superficial river terrace gravels and Alluvium associated with the River Granta valley.

17.1.2 The Scheme is underlain by Grade 2 and Grade 3 agricultural soils and an agricultural soil survey has been carried out during the EIA which provides more detailed information on the soil characteristics along the route.

17.1.3 During construction about 150mm of this topsoil will be stripped away in about 16m width over 8.5km of the scheme's length.

17.1.4 Handling and management of topsoil will be set out in both the CSET scheme Spoils management strategy and CSET scheme CoCP in accordance with:

- DEFRAs Code of Practice on the sustainable use of soils, 'Code of practice for the sustainable use of soils on construction sites'.
- CL:AiRE ISBN 978-1-905046-23-2, 'Definition of Waste Code of Practice.

17.1.5 Since there are no active waste management or land fill sites within the immediate surroundings of the scheme, topsoil not able to be used on the Scheme it is intended that soil will be spread on surrounding fields with local landowners' approval.

17.1.6 Contractors will be advised that whilst carrying out ground-breaking activities such as piling, trenching etc., if items or materials are encountered not in keeping with the expected nature of the site soils and geology, work is to be stopped. The area will be isolated to prevent any further disturbance or escape of the contaminated material. A specialist will be contacted to identify, remove, pick sample for testing or dispose the material or substance. An instruction to dispose of the hazardous material will be issued and appropriate duty of care will be taken to dispose it of at a licensed facility.

17.1.7 Although it is unlikely there will be need for importation of topsoil to the scheme, any imported soil materials used for landscaping or ground stabilisation will be certified to BS3882:2007.

17.1.8 For material certified under BS3882:2007 – a copy of the analysis certificate should be submitted to the Local Authority for approval before the material is imported.

18 Construction Lighting

18.1.1 It is anticipated that no construction works will be carried out after 1800hrs. The presumption will be to shut down traffic management (traffic lights) where the works cross public highways unless it is not safe to do this.

18.1.2 As far as practicable construction work will be scheduled for daylight times. However, during winter when daylight availability is shorter, work may be required to be carried out in the dark, thus requiring lighting as well as for security purposes on site.

18.1.3 In determining the lighting arrangement on the site compounds and scheme route, consideration will be given to residents and other sensitive receptors that may experience a nuisance. Where artificial lighting is used during construction, light spill onto hedgerows and any areas of suitable badger, otter, barn owl and vole foraging habitat and bat corridors etc, will be minimised through the use of directional lighting, hoods and shields. Where appropriate, measures will be implemented to reduce obtrusive light. e.g. dimming or switching off lights where it is safe to do so, using specifically designed equipment and positioning lights sensibly.

18.1.4 Along the scheme route linear scrub, trees and hedgerows do provide suitable habitats for commuting and foraging bats. Therefore, Bats and lighting in the UK, Bats and the built environment series guidance will be observed in these locations.

18.1.5 Where artificial lighting is used during construction, light spill onto hedgerows and any areas of suitable badger habitat will be minimised through the use of directional lighting, hoods and shields

18.1.6 Note: Please also review the CSET Scheme Lighting plan in conjunction with this document

19 Invasive or injurious plants

19.1.1 Section 14(2) of the Wildlife and Countryside Act 1981 makes it an offence to plant or cause to grow in the wild any plant which is included in Part II of Schedule 9. Site surveys have not indicated any injurious or invasive species along the scheme route, but should they be encountered during construction, work will stop, and the environmental lead informed immediately.

19.1.2 The risks posed by both injurious and invasive species will be highlighted during inductions and toolbox talks.

19.1.3 Risk Assessments and Method Statements (RAMS) from contractors will be scrutinised and authorised before work commences to ensure the requirements above are understood, factored into working methods, and adhered to.

20 Emergency Plans

20.1.1 All incidents will be managed in accordance with the requirements of the draft CoCP requirements on emergency plans and incident control.

20.1.2 An environmental incident could be a fuel or chemical spillage onto ground, into drains or a watercourse, damage to habitats of protected species or nesting birds, damage to protected species, either plants or animals and Incidents involving waste, such as fly-tipping or the illegal transfer of waste. Therefore, all environmental incidents should be reported directly to CSET scheme project manager and Environmental lead.

20.1.3 An Environment Incident Control Plan (EICP) detailing information on all stores, bulk storage vessels, drums or containers intended for storing oils, chemicals or other potentially polluting materials will need to be produced Principal Contractor for the CSET scheme and The Project Manager with the assistance of the Environmental Advisor will ensure it is made available to all sub-contractors and operatives on site.

20.1.4 The project or Site Manager will maintain a record of the equipment and materials on site to deal with pollution incidents e.g. absorbent materials, drain mats or covers, pipe blockers, boom pumps, over drums. All equipment should be clearly labelled, readily available in the area it is likely to be required – the locations and how the equipment is to be used should be detailed in environmental Toolbox Talks to all contractors.

20.1.5 An incident reporting system/protocol will be established for the scheme. All environmental incidents, hazards and near misses will be logged on the system and notifications sent out for corrective action or control measures to be put place. The system should also have provision or procedures for reporting significant Incidents likely to give rise to public concern and adverse media attention.

20.1.6 Callout personnel for 24-hour coverage shall be arranged by the Project manager to take control of and investigate out of hour's incidents. The names and contact numbers of these personnel will be displayed on site and relayed to site personnel during the induction process and will be detailed in the Environment incident response plan.

20.1.7 In the event of substances entering a drain or watercourse, soaking into the ground, getting released into the atmosphere, ground or water in breach of permit conditions, unexpected discovery of protected species, habitats, or items of archaeological importance, the relevant regulatory bodies or stakeholders will be consulted on the appropriate course of action.

20.1.8 An Emergency Flood Plan (EFP) shall be produced by the PC for this Project. The plan details areas of the site that are prone to flooding and the necessary arrangements for working in a flood zone and measures to deal with a flood. Site staff involved with emergency response will be familiar with and have access to the site plan and training in incident response procedures.