18.3.1 Table 18-3 This section sets out all the additional mitigation measures that have been assumed in the assessment of residual effects. Design mitigation is set out in Table 4-1 in Chapter 4 and sets out how all the mitigation will be secured. Additional construction mitigation is set out in Table 18-3 and will all be secured through the Strategic CEMP and the Outline SWMP. Additional operation mitigation is set out in Table 18-3 and will be secured by means of planning conditions and S106 contributions.

Table 18-3 Summary of Additional Mitigation Measures: Construction

	Mitigation Measures
Chapter 5 Agriculture and Soils	 Best practice soil handling. Notice period to allow agricultural enterprise to adapt business to loss of land.
Chapter 6 Air Quality	 Site Management (logging of incidents/complaints) Monitoring (site inspections, soiling checks, compliance with Dust Management plan, etc) Preparing and maintaining the Application Site (locate dust causing activities away from receptors, barriers, cleaning, enclosed specific operations with high potential for dust production, cover stockpiles, etc) Operating vehicle/machinery and sustainable travel (comply with NRMM standards, no idling, use mains electricity, travel plan etc) Operations (employ dust suppression, use enclosed chutes, minimise drop heights, etc) Earthworks measures (revegetate promptly, use hessian mulches and cover with topsoil, etc) Construction measures (avoid scabbling, keep aggregates damp, ensure fine powder materials are delivered enclosed and stored in silos, ensure bags are sealed after use) Trackout measures (wash access and local roads, avid dry sweeping of large areas, ensure vehicle-borne materials are covered, install hard surface haul routes, wheel washing, etc)
Chapter 7 Biodiversity	 Appropriate measures are put in place to protect water quality in aquatic features across the Application Site. This would also protect downstream habitats. Appropriate measures are put in place to control dust and other emissions that could affect air quality. Site compounds, storage facilities and staff facilities are suitably located in places that would not have an adverse effect on the environment. In advance of site clearance, protective fencing is installed to protect retained and/or ecologically sensitive habitats (the ditches, retained pond, mature trees and hedgerows) and their associated buffer zones to ensure that they are not subject to accidental damage (to be determined on a phase by phase basis). Haul routes, storage compounds and staff facilities would be located away from retained habitats where possible to minimise disturbance to the species they support. Pre-construction surveys are carried out by an ecologist to confirm the nature and extent of any ecological constraints in advance of site clearance, to ensure that appropriate mitigation measures including

licences are in place in advance of site clearance, and to confirm that no new constraints have arisen since the publication of the Environmental Statement.

- A qualified ecologist to advise on site clearance, in particular any works
 that have the potential to disturb notable ecological features. They would
 also ensure that the mitigation measures proposed adhere to best practice
 guidelines and take account of any changes in legislation that may have
 occurred.
- To avoid impacts on breeding birds, works close to retained habitats would commence outside of the bird breeding season where possible (i.e. they would commence in the period between the months of September and February, inclusive). Where this is not possible advice will be sought from a qualified ecologist to confirm the absence of nesting birds prior to vegetation removal and ensure the protection of any confirmed nesting sites. Should the presence of nesting birds be established, buffer zones would be fenced to ensure the birds are not disturbed and works would cease in the locality until the young birds have fledged.
- In advance of construction, bird nesting boxes would be installed in the hedgerows and on retained trees, in suitable locations away from the construction. This would ensure alternative nesting opportunities are provided to mitigate for any disturbance effects.
- Prior to any removal of hedgerows, pre-construction checks for any species
 of conservation concern, such as reptiles and hedgehogs, would be
 undertaken. Any features of value to hibernating reptiles would not be
 disturbed during the reptile hibernation period (October through to March).
 Should hedgehog(s) be found at this time, they would be moved to a safe
 location
- Care would be taken with the design of site drainage to prevent unbalance of and untreated silt laden surface water runoff from entering retained habitats.
- If night-time construction lighting is required during the period April to November (i,e, late afternoon), it would be directed away from the watercourses, woodlands and hedgerows when bats are active.
- The Strategic CEMP will minimise the chances of Schedule 9 plants to enter or spread within or outside of the proposed Development.
- Regular monitoring of the ecological protection measures outlined in the CEMP would be undertaken by a qualified ecologist to ensure that the protection measures remain in place for the time that they are required.
- Any remedial actions required will be undertake in a timely manner and monitored by a qualified ecologist.
- Installation of protective fencing around tree buffer zones
- Further surveys to update / inform decisions will be required. Additional habitat surveys are required to inform the details of mitigation secured by conditions
- Obtain protected species licenses where required (see Table 7-20 in Chapter 7 Biodiversity for more detail).
- Translocation of protected species where necessary

Measures to minimise GHG emissions during construction would include:

- Implementation of materials and logistics saving measures as set out in Chapter 15: Transport and the Strategic CEMP and to be agreed as part of the detailed design and reserved matters.
- Minimising energy requirements and emissions from equipment and plant (including minimising the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment; powering down of equipment / plant during periods of non-utilisation; optimising vehicle utilisation; use of energy efficient lighting) as set out in the Strategic CEMP.

Measures to minimise GHG emissions associated with the production of waste are set out in Chapter 16: Waste and Resources and include:

- reuse and recovery of materials where possible
- endeavouring to achieve a cut and fill balance to avoid excavation waste
- implementation of a Site Waste Management Plan to record the movements of waste, control its management and to encourage better waste management practices
- employ modern methods of construction such as prefabrication of units and products off-site
- appropriate phasing of construction to allow the opportunity for the construction wastes to be reused or recycled on-site in subsequent stages of the development

Measures to minimise GHG emissions associated with materials will be agreed at detailed design and reserved matters stage.

The Strategic CEMP will be used as the basis for the Phase-specific CEMPs, which will be prepared by the Principal Contractor ahead of construction commencing. The following measures would be in place during construction:

- The Principal Contractor would register the proposed Development with the EA Flood Warning Service. This service provides alerts to warn of the risk of an impending flood event. In the case of a warning or severe warning alert, plans would be put into action to ensure that construction worksites and access routes are made safe and are evacuated of construction personnel.
- A high-level risk assessment of severe weather impacts on the construction process would be produced by the Principal Contractor to inform mitigation measures. Any receptors and/or construction-related operations and activities potentially sensitive to severe weather events should be considered in the assessment.
- During the construction phase, extended dry spells may cause increased dust production. This consequence would be minimised as far as reasonably practicable, through the measures incorporated into the Strategic CEMP (e.g. reduce dust emissions through the effective transportation and storage of materials), including the proposed monitoring regime.

Chapter 9 Cultural Heritage

 Use of appropriate controls already integrated into the construction programme and outlined in the Strategic CEMP to mitigate adverse effects (dust, noise and lighting) on the setting of designated and non-designated assets.

Chapter 8 Climate Change

	Mitigation Measures
	 Excavation of archaeological features associated with the Roman settlement with Saxon continuation, Striplands Farm, Longstanton through a full phased programme of archaeological investigation. Preservation through archaeological record. The scope and extent of this recording would be determined through consultation with heritage officer at SCDC and agreed through implementation of an archaeological mitigation strategy and Written Scheme of Investigation (WSI).
	 Preservation of Fishpond Cottages, Longstanton in situ within existing woodland area.
	 Use of appropriate PPE and site hygiene on site. Determine areas of any contaminated soils prior to earthworks detailed within the Strategic CEMP.
	 Use of best practice on site to avoid creation of dust. Determine areas of any contaminated soils prior to earthworks detailed within the Strategic CEMP
Chapter 10 Ground	 Best practice e.g. implementation of pollution prevention measures. Repeat survey at end of construction and removal of any contamination created.
Conditions	 Use of pollution prevention measures on site. Removal of any contaminated materials to reduce mobilisation as detailed within the Strategic CEMP. Appropriate construction techniques (e.g. piling) to reduce risk of creating pathways.
	 Use of pollution prevention measures on site. Removal of any contaminated materials as detailed within the Strategic CEMP. Best practice in stockpiling of materials away from water courses
	Assessment of ground conditions around existing features.
	 Strategic CEMP to address issues including residential amenity (working hours, construction traffic routes, communication with residents).
	 Encourage apprenticeships / training in construction trades through contract procurement process.
Chapter 11 Health	 Mitigation relating to air quality, landscape and visual amenity, noise and transport is described in Chapters 6, 12, 13 and 15 respectively as well as the Framework Travel Plan, Low Emissions Strategy and Landscape Strategy.
	 Mitigation measures relating to minimising the use of resources are set out in Chapter 16 (Waste and Resource Management).
	 Mitigation measures associated with the effects on climate from GHG emissions are set out in Chapter 8 (Climate Change).
Chapter 12 Landscape and Visual	The following measures set out in the Strategic CEMP will be implemented, where possible, but not limited to:
	Site management
	 Good housekeeping measures will minimise unsightly waste and secure storage will be provided for materials at risk from displacement by wind.
	 Temporary stockpiles will be located in defined storage areas, away from sensitive visual receptors.
	 Construction plant, machinery and vehicle parking areas will be located as far as practicable from sensitive receptors.

Hoarding and Fencing

- Use of well-maintained fencing and hoardings to prevent unwanted access to the construction site, to provide noise attenuation, screening, and site security where required.
- Use of different types of fencing and hoarding to minimise visual intrusion.
- Retaining existing walls, fences, hedges and earth banks for the purpose of screening as far as reasonably practicable.

Lighting

- Lighting will be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings or habitats such as trees and so as to prevent unnecessary interference with local residents, passing motorists, the navigation lights for air traffic and wildlife breeding seasons.
- At night and during periods of darkness, directional security lighting will be used.
- Any temporary fencing will be removed as soon as reasonably practicable after completion of the works.
- Adherence to the Institution of Lighting Professionals (ILP) Guidance Notes
 for the Reduction of Obtrusive Light, with regards to light spill, glare and
 sky glow. All lighting related to the works will be designed and fitted to
 minimise light intrusion onto any sensitive habitat such as hedgerows,
 mature trees and woodland.

Existing Trees

- Maximising the retention and protection of existing tree and vegetation where possible and in accordance with the parameter plans;
- Aftercare and establishment works are to be carried out by an approved landscape sub-contractor in accordance with good horticultural practice.

Planting

 Advance Planting to be implemented in the first available season after commencement of works, to provide early establishment of vegetation to control views between the proposed Development and receptors.

The following mitigation measures are included within the Strategic CEMP to reduce the impact of noise and vibration within construction works:

- Best Practicable Measures (BPM) (as outlined in Section 72 of COPA will be employed in order to minimise noise and vibration levels throughout the period of the works;
- Recommendations and good practice as shown in BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1, Noise and Part 2 Vibration' would be adopted; and

Chapter 13 Noise and Vibration

The measures set out in BS 5228 will include the following as appropriate:

- Construction working hours will be agreed with SCDC;
- Construction tasks anticipated to have the potential to cause greater adverse effects caused by noise and vibration will be identified at the earliest opportunity, such as any piling works, to enable careful planning of methodology, programming of the works at less sensitive times, and the selection of plant;

- Careful selection of plant, construction methods and programming. Only
 plant conforming with relevant national or international standards,
 directives and recommendations on noise and vibration emissions will be
 used;
- Construction plant will be located, as far as is reasonably practicable, away
 from adjacent occupied buildings or as close as possible to noise barriers
 or site hoardings where these are located between the plant and the
 buildings;
- Careful attention will be paid to the selection and location of generators so as to minimise adverse effects on the local community;
- Static and semi-static plant/equipment will be fitted with suitable enclosures where practicable;
- Personnel will be instructed on BPM to reduce noise and vibration as part of their induction training and as required prior to specific work activities;
- When plant is not being used, it will be shut down and not left to idle;
- Vehicles will not wait with engines running;
- Where practicable, all audible warning systems and alarms will be designed to minimise noise. Broadband reverse alarms will be fitted to all vehicles;
- Local residents will be notified in advance of the works commencing; and
- Localised mobile screening will be used where reasonably practicable to reduce the noise levels from handheld tools such as concrete saws.

Appropriate construction traffic routing be implemented to minimise noise effects on sensitive receptors. Details of the routing of construction vehicles and visitors to the Application Site will be agreed with Cambridgeshire County Council (CCC)/SCDC. All construction traffic entering and leaving the Application Site will be closely controlled.

Chapter 14 Socio economics

- Construction areas would be cordoned off to prevent public access and a range of health safety protection measures as outlined in the Strategic CEMP will mitigate the risk.
- A range of mitigation measures are proposed and are outlined in the Strategic CEMP. This includes screening, controlling working hours and street lighting for landscape and visual amenity and construction traffic management plans, parking controls and designated vehicle routes for transport.
- Mitigation measures relating to air quality, landscape, noise and transport (which may impact upon residential amenity) are described in more detail in Chapters 6, 12, 13 and 15 respectively as well as the Framework Travel Plan, Low Emissions Strategy and Landscape Strategy.

A Construction Traffic Management Plan (CTMP) would be implemented to minimise the effects of road traffic during the construction phase and would be anticipated to incorporate:

Chapter 15 Transport

- Identification of appropriate safe routes for the proposed Development traffic to and from the site (which will be via the A14 Huntingdon Road and the B1050):
- Where possible the development would utilise raw materials from local sources to reduce the vehicular traffic impact;

- Staff travelling to work would be encouraged to car-share, walk, cycle and travel via public transport and appropriate vehicle constraint targets will be set out within the CTMP;
- Full staff welfare facilities would be provided as part of the compound construction to reduce the requirement to travel off-site on lunch breaks and encourage sustainable travel;
- Frequent inspections and monitoring to confirm the required measures would be implemented;
- There would be designated and adequate onsite parking facilities for site workers who travel by car, or other vehicles, to ensure that vehicles are not parked on the highway;
- The contractor would implement cleaning measures, such as wheel washing or wash-down facilities, which would serve to minimise the spread of dust, mud and other materials on to the roads;
- Regular sweeping of roads would be undertaken, both on and off the site to reduce the spread of mud; and
- Additional measures in relation to construction vehicles have been suggested within Chapter 6 Air Quality and Chapter 13 Noise and Vibration.

The Strategic CEMP will also set out how the applicant, developers and contractors will manage, and where practical minimise, the impact of the proposed Development's construction upon surrounding environmental receptors.

The construction mitigation relevant to transport is provided in Chapter 4: Access Arrangements of the Strategic CEMP, which includes details on haulage routes, deliveries and on public access.

Chapter 16 Waste

- Employ best practice methods of construction as set out in the Strategic CEMP.
- Waste sent to landfill minimised.
- Endeavour to achieve a cut and fill balance to minimise excavation waste.
- Excavation materials to be reused onsite where possible as new landscape features.
- Any waste produced to be managed and recycling and reuse opportunities maximised throughout the proposed Development through the implementation of the Outline SWMP.

Table 18-4 Summary of operation additional mitigation measures

	Mitigation Measures
Chapter 5 Agriculture and Soils	No additional mitigation measures required.
Chapter 6 Air Quality	No additional mitigation measures required.
Chapter 7 Biodiversity	Preparation of an Ecological Management and Monitoring Plan (EMMP) to guide the approach to habitats and species as each parcel of the proposed Development is built out.
	A number of approaches would be employed to limit impacts to badger populations.

- Ensuring that key corridors remain unlit.
- Maintenance of mitigation features created, including setts (if applicable).
- Monitoring of any impacted setts, particularly using remote camera and badger bait marking techniques.

In order to minimise the potential for operational impacts to the bat populations within the Application Site the following measures would be implemented:

- Implementation of a suitable lighting strategy, ensuring commuting routes and areas important for foraging bats are kept dark.
- Features being installed to limit access by humans in areas where disturbance may adversely impact bats. This could include planting strategies, fences or carefully deployed SuDS features, if required.
- Maintenance and monitoring will be required of any retained or created habitats, including roosts.

In order to minimise operational impacts to retained and enhanced GCN populations, likely to be predominantly through human disturbance and impacts from domestic animals, the following approaches would be implemented:

- GI would be designed to limit human accessibility to the most sensitive areas.
- Buffers would be created and maintained around retained and created GCN areas to limit impacts from humans and domestic animals.
- Maintenance and monitoring would be required of any retained or created habitats. The targets for these habitats would be defined in the relevant licensing documents.

Due to the location of the water vole habitats away from the residential areas, operational impacts are likely to be minimal. However, in order to minimise impacts to water vole populations, likely to be predominantly through human disturbance and impacts from domestic animals, the following approaches would be implemented:

- GI will be designed to limit human and pet accessibility to the most sensitive areas (i.e. Ditch H).
- Buffers will be maintained around water vole areas to limit impacts from humans and pets.

Operational mitigation is proposed to safeguard and maximise the value of the development for nesting birds:

- Maintaining high species diversity within woodland areas, a mixture of scrub and trees which are well linked. This could be achieved by appropriate planting, coppicing, thinning and felling.
- Maintaining species rich grassland to provide optimal foraging habitat.
- The provision and maintenance of appropriate nest boxes. This can increase the carrying capacity of the habitat, increasing population density. Within the design, barn owl nest boxes should be erected.
- Impacts to retained and newly created habitats would be minimised through GI design, to focus recreational impacts in certain areas and to minimise impacts to other areas, utilising topography, habitat and fencing to control recreational pressures, if required.

In order to minimise operational impacts to reptile populations, likely to be predominantly through human disturbance and impacts from domestic animals, areas around retained and created reptile areas would be buffered.

	Mitigation Measures
	 Provision of an off-site area for farmland birds and brown hare to achieve biodiversity net gain targets:
	 Creation of wet meadow and neutral grassland habitats in the centre of the Application Site
	 Enhancement of the CGB mitigation area in the north of the Application Site
	 creation of the mosaic of developed and natural surfaces within the built portion of the Application Site.
	Implementation of a Non-native Invasive Species Management Plan
	Preparation of a Lighting Strategy
Chapter 8 Climate Change	No additional mitigation required.
Chapter 9 Cultural	 Community engagement involving local groups in researching and recording heritage assets. A heritage strategy for Northstowe is being produced by a Heritage Core Team established as part of implementation of the Phase 2 planning permission.
	 Involving local interest groups in deciding how assets are preserved, enhanced and interpreted, especially utilising the potential Heritage Centre in Phase 2.
Heritage	 On-site interpretation resources containing information on heritage assets (as derived from the archaeological investigations).
	Open days for the public during excavations.
	Temporary displays of artefacts found from the Application Site.
	 Dissemination of data derived on the historic environment of the Application Site to the local population, general public and academia.
Chapter 10 Ground Conditions	No additional mitigation required.
Chapter 11 Health	No additional mitigation required.
Chapter 12 Landscape and Visual	No additional mitigation required.
Chapter 13 Noise and Vibration	No additional mitigation required.
Chapter 14 Socio- economics	No additional mitigation required.
Chapter 15 Transport	 George Street Willingham: measures to improve conditions for pedestrians and cyclists will be considered alongside measures being investigated as part of Phase 2 mitigation and delivered via a S106 agreement for Phase 3B. Junction enhancements comprising the provision of a new right turning
	facility from Boxworth End to Ramper Road to be delivered through a S106 contribution for 3B (as shown in Appendix K of the Transport Assessment).

	Mitigation Measures
	 Suggested mitigation at the B1050 / Ramper Road roundabout (Junction 04) includes provision for a flare at the B1050 southern armJunction capacity improvements comprising provision of additional southbound flare length at B1050 / Crabtree Road / Stirling Road junction (Junction 30) (as shown in Appendix K of the Transport Assessment).
	 J103 A14 Bar Hill Roundabout: Widening to three lanes on the circulatory carriageway and provision of a left turn flare on the westbound off-slip.
	 J104 A14 Bar Hill Jug Handle: Altering the staging and introducing a left filter from the north.
Chapter 16 Waste and Resource Management	Meet SCDC's current average recycling rate.

18.4 Monitoring

18.4.1 The monitoring identified for the construction and operation phases of the proposed Development are set out in Tables 18-5 and 18-6.

Table 18-5 Summary of Monitoring Requirements: Construction

	Monitoring Requirements
Chapter 5 Agriculture and Soils	None required
Chapter 6 Air Quality	None required
Chapter 7 Biodiversity	 Regular monitoring of the ecological protection measures is outlined in the Strategic CEMP and should be undertaken by a qualified ecologist, to ensure that the protection measures are effective and remain in place for the time period required.
	 Additional monitoring requirements may be identified as part of the detailed design for each parcel. This should be secured as each parcel proceeds towards construction, through liaison with an ecologist.
Chapter 8 Climate Change	None required
Chapter 9 Cultural Heritage	 Archaeological monitoring is likely to be required during construction but the nature and extent of this would be determined at detailed design stage. It is likely that, subject to design, the extent of the Roman settlement with Saxon continuation would be fully excavated prior to construction works commencing.
Chapter 10 Ground Conditions	None required
Chapter 11 Health	None required

Monitoring Requirements	
Chapter 12 Landscape and Visual	 The setting out, protection of existing landscape features, and the implementation of the proposed softworks will be regularly and professionally monitored by the relevant 'competent person'. In the event that any tree dies or is removed without the prior consent of
	SCDC, it would be replaced as soon as is reasonably practicable and, in any case, by not later than the end of the first available planting season, with trees of such size, species and in such number and positions as may be agreed with the SCDC. This would be secured by the monitoring set out in the Strategic CEMP.
Chapter 13 Noise and Vibration	 As a result of the nature of the survey supporting this application, there is a potential that monitoring may be required. Specifically, this could be required to support the consideration of key construction tasks where identified in the phase-specific CEMPs as having the potential to result in adverse effects; based upon activity and separation distances.
	 Monitoring may also be required to demonstrate compliance with any planning conditions that may form part of a planning approval in relation to the control of adverse noise and vibration effects. Such planning conditions may relate to either the construction phase or the detailed design of specific elements of the proposed Development. This could relate to construction compliance noise and vibration monitoring of activities identified in the Strategic CEMP as having the potential for greater adverse effects.
Chapter 14 Socio economics	None required
Chapter 15 Transport	None required
Chapter 16 Waste and Resources	 Principal contractor to monitor waste arisings, management and minimisation during construction through the SWMP;
	 As part of the SWMP, a monitoring report should then be generated on a bi-annual basis which would include details of the progress made in diverting waste materials from landfill, against the pre-agreed rates;
	 All waste collected from site by the employed waste carrier(s) should be recorded and monitored by the Principal Contractor using the SWMP; and
	Skips should be monitored to ensure that there is no contamination of the separate waste streams.

Table 18-6 Summary of Monitoring Requirements: Operation

	Monitoring Requirements
Chapter 5 Agriculture and Soils	None required
Chapter 6 Air Quality	None required
Chapter 7 Biodiversity	Monitoring of the bat usage of the site may need to be conducted, to inform the success of avoidance mitigation and commuting corridors. An EMP will be required to monitor the status of the following habitat and species receptors:

	Monitoring Requirements
	Habitats
	Badger setts
	Bats - retained or created habitats, including roosts
	Retained or created GCN habitats
	Monitoring of the reptile translocation areas would be required, to evaluate the success of the translocation(s). This would be required during both the construction and operation phases and should be secured as a component of each parcel proceeding through the planning process, as appropriate.
	Monitoring of off-site mitigation areas would be required throughout the operation phase to determine the success of the farmland bird mitigation. The requirements for this should be specified within a habitat creation, management and monitoring plan for the off-site mitigation areas.
Chapter 8 Climate Change	None required.
Chapter 9 Cultural Heritage	None required.
Chapter 10 Ground Conditions	None required.
Chapter 11 Health	None required.
Chapter 12 Landscape and Visual	 The habitats created would be managed via an Ecological Management Plan (EMP) to achieve the target condition. Monitoring will be required to ensure that management is effective.
Chapter 13 Noise and Vibration	 No further monitoring required, although there is potential for elements to be required following reserved matters applications.
Chapter 14 Socio economics	None required.
Chapter 15 Transport	 A traffic monitoring strategy is anticipated to be required by CCC as a planning condition. This will set out proposals for monitoring and the relationship of the monitoring programme to that proposed for Northstowe Phases 1, 2 and 3A.
Chapter 16 Waste and Resources	None required.