The Norfolk County Council (Norwich Northern Distributor Road (A1067 to A47(T))) Order

6.2 Environmental Statement: Volume II: Chapter 19. Construction Environment Management Plan (CEMP)

Planning Act 2008

Infrastructure Planning

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

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This document is submitted in relation to the application for a proposed development by Norfolk County Council to the Planning Inspectorate, under the Planning Act 2008.

The application is for the Norfolk County Council (Norwich Northern Distributor Road (A1067 to A47(T))) Order, to grant development consent for the construction of a new highway running west-east between the A1067 Fakenham Road and the A47 Trunk Road at Postwick, including improvements to the existing highway network to the north and north east of Norwich.

This document comprises part of the application documents and relates to Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

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A. Draft Construction Environment Management Plan (CEMP)

A.1 Introduction

Background to the Project

 A.1.1 Norfolk County Council (NNC) has made an application for a Development Consent Order (DCO) in accordance with the Planning Act 2008 as amended. This is for "The Scheme"; the Norwich Northern Distributor Road, (NDR) which is a dual carriageway all-purpose strategic distributor road. It will link the A1067 Fakenham Road, near Attlebridge to the A47 Trunk Road (T) at Postwick and will measure approximately 20.4km in length.

Purpose of the Construction Environmental Management Plan

- A.1.2 This CEMP translates the requirements of the Environmental Statement for the construction works of the NDR into specific guidance and measures to be followed by the Contractors. The Environmental Statement was prepared by Mott MacDonald on behalf of Norfolk County Council (NCC) to support the DCO for the NDR Development.
- A.1.3 Accordingly, the CEMP sets out the measures that will be put in place to control the potential environmental impacts and effects of construction and provides the basis for the works contractors to develop appropriate detailed construction methods and associated method statements. The CEMP will necessarily be kept under review and revised as the project progresses.
- A.1.4 The CEMP will be applied to all construction works, including those relating to the temporary construction areas such as the contractors compounds.
- A.1.5 NCC will take steps to ensure that all parties involved in the construction work, including contractors, subcontractors and their suppliers observe the relevant provisions of the CEMP.
- A.1.6 The CEMP sets out the following information:
- The main parties to be involved in the construction process and their principal responsibilities (Chapter 2);
- the monitoring, reporting and review procedures that will be adhered to during the construction process (Chapter 3);

- the existing environmental permits and consents held by NCC and the additional permits that will be required for the project (Chapter 4);
- environmental requirements that will be adhered to during the construction process to limit the environmental impacts (Chapters 5-18); and
- the Site Waste Management Plan
- A.1.7 The requirements of this CEMP shall be translated into individual CEMPs to be prepared by all contractors. Contractors are required to prepare a CEMP and accompanying method statements to cover their activities consistent with the requirement of this overarching project CEMP.
- A.1.8 NCC and its contractor/s are also required to obtain all necessary licences and/or consents.

Legislation

- A.1.9 In preparing the CEMP, reference has been made to relevant UK legislative requirements, British Standards, UK Environment Agency Guidance, and UK Health and Safety Guidance (Appendix B) to ensure best practice.
- A.1.10 These standards apply to all the contractors' works and shall be enforced throughout their contract periods.

Schedule of Works

A.1.11 The schedule of construction works for the NDR Project is set out in Appendix C.

A.2 Management Structure, Roles and Responsibilities

Management Structure

- A.2.1 This CEMP is primarily concerned with the construction of the NDR.
- A.2.2 NCC will appoint an overall Project Manager for the NDR construction phase of the Project. An Environment Manger will also be appointed by NCC to coordinate and manage the environmental aspects of this stage of the project. NCC may also appoint environmental consultants to support the Environment Manager in their duties.

- A.2.3 It is likely that several contractors will carry out works at various stages of the project and this document will provide consistency with the environmental requirements laid out within the environmental statement.
- A.2.4 A rigorous tender selection process by NCC is currently taking place with the highest priority being given to contractors' previous experience of successfully delivering a similar project to the highest quality. So far Birse has been appointed as the Principal Contractor.
- A.2.5 Each contractor will be required to designate a Site Manager and to assign responsibilities for environmental matters to a senior member of their staff (Environmental Coordinator).
- A.2.6 The management arrangement for the implementation of the CEMP is set out in Figure 2.1 below.



Figure 2.1: Management arrangement of the CEMP

Roles and Responsibilities

NCC

- A.2.7 NCC is responsible for adherence of all project activities to the relevant permits and consents obtained for the project, and the discharge of planning conditions, including the implementation of mitigation measures set out in the Environmental Statement. The main mechanism to achieve this is through the implementation, by the contractors, of the detailed measures included in the CEMP.
- A.2.8 The Project Manager for the construction of the NDR has overall responsibility for implementation of the CEMP.
- A.2.9 The NDR Environment Manager will support the scheme Project Manager and is responsible for:
- Overall implementation of the CEMP;
- Liaising with relevant regulatory authorities and stakeholders on behalf of NCC;
- Ensuring all relevant consent conditions are satisfactorily discharged;
- Coordination with the various contractors, including providing advice on their environmental responsibilities; and
- Undertaking regular environmental inspections and audits to monitor and evaluate the compliance of the contractors and any subcontractors with the provisions of the CEMP.
- A.2.10 The NCC Environment Manager will also be responsible for 'signing off' or recording actions in the individual CEMPs and the contractor's plans and reporting back to regulators bodies as appropriate.
- A.2.11 NCC may appoint Environmental Consultants to assist the Environment Manager in their duties.

Contractors

A.2.12 Each contractor shall prepare their own contractor's environmental management plan in accordance with this CEMP. The contractor's plan shall contain method statements that provide detailed measures for implementing

the requirement of this CEMP as relevant to their activities. Each contractor's environmental management plan shall be signed off by the NCC Environment Manager in advance of works commencing on site.

- A.2.13 The Contractor's Site Manager will be responsible for the overall implementation, maintenance and auditing of their contractor's environmental management plan. The Site Manager will set up appropriate communication lines with construction workers to make them aware of the overall aims and actions within the CEMP. The Site Manager will also be the key liaison point with the NCC Project Manager and the external bodies, including Natural England, and statutory authorities.
- A.2.14 The Contractor's Environmental Coordinator (CEC) will be responsible for the day to day environmental matters associated with the project including the implementation of their contractor's environmental management plan.

A.2.15 The CEC shall:

- Coordinate implementation of the contractor's environmental management plan and monitor compliance with that plan;
- Supervise and monitor on-site works in proximity to sensitive receptors;
- Carry out routine environmental monitoring, reporting and recording as specified in this CEMP and the contractor's environmental management plan;
- Maintain and audit the contractor's environmental management plan and its method statements and any other plans which underpin it;
- Provide environmental training for on-site employees relevant to implementation of the contractor's environmental management plan;
- Liaise with the Environment Manager to carry out regular checks to assess compliance with the contractor's environmental management plan, this CEMP and the Environmental Statement; and
- Assist the Contractor's Site Manager with liaison with external bodies, including its sub-contractors.
- The CEC will also be responsible for informing the sub-contractors and construction workers of the site's sensitivities and advising on required good construction practice on site.
- The CEC will be responsible for immediately informing the NCC Environment Manager of any significant environmental issues that arise during the

construction works, who will in turn inform the regulators/stakeholders, as required.

A.3 Monitoring, Reporting and Review

Introduction

- A.3.1 Monitoring is required to establish the Scheme's performance against the requirements, objectives and targets set out in this CEMP and each contractor's environmental management plan as well as the policies of NCC. Reporting on the outcomes of monitoring provides a record of compliance and facilitates the communication of findings to relevant stakeholders.
- A.3.2 Audit and review of the effectiveness of this CEMP procedures and their implementation, should lead to continual improvement and effective implementation of environmental mitigation actions. The requirements for monitoring, reporting and review are set out in the sections below.

Monitoring Requirements

- A.3.3 Monitoring of this CEMP is essential to ensure that the contractors audit and evaluate how successful the implementation of mitigation measures has been in managing environment impacts. The aims of monitoring are as follows:
- A.3.4 This CEMP will form the key mechanism for ensuring compliance with the Planning Conditions and other consenting requirements. Systematic monitoring and recording of how and when CEMP actions have been implemented will provide an essential internal check for compliance with regulatory requirements;
- A.3.5 Auditing compliance with the CEMP is an important mechanism to ensure contractual obligations are met by the various contractors. It will also ensure the delivery of NCC's environmental policies; and
- A.3.6 Monitoring may form part of post-project appraisal processes to consider the effectiveness of the CEMP and its implementation to improve processes in future.
- A.3.7 Each contractor shall prepare an appropriate monitoring schedule to be included in their contractor's environmental management plan. The

monitoring schedule shall include the monitoring requirements set out in Section 4 of this CEMP.

Non-Compliance

- A.3.8 If mitigation requirements set out in the Environment Statement or this CEMP are not fulfilled and appropriate action is not taken, a non-conformance should be raised by the Environment Manager. Examples of circumstances where this may arise include:
- Receipt of a complaint regarding pollution or other environmental impacts caused by project activities;
- Departure from approved or agreed environmental procedures; and/or
- Non-conformance with the CEMP identified as a consequence of any selfassessment, formal audit, or any other environmental survey or inspection.
- A.3.9 The contractors shall adopt a system for classifying CEMP non-compliance situations based on the framework shown in Figure 3.1 below.



- A.3.10 This non-compliance system will provide for early identification of noncompliance situations and allow for appropriate action to be taken.
- A.3.11 All non-conformances will be reviewed by the Environment Manager and the CEC and shall be included as an item in all regular meeting agendas. Corrective action reports shall be issued to contractors by NCC. The contractor should immediately initiate corrective actions and, once completed, provide details of the actions undertaken on the non-conformance/corrective action report and return it signed to the Environment Manager within an agreed timeframe. If the non-conformance is considered to breach legislative requirements, the breach should be reported to the appropriate public authority.

Environmental Inspections and Audit

- A.3.12 In addition to the regular monitoring detailed in Section 4, a schedule of regular audits shall be undertaken by each of the Contractor's CEC. These audits should consist of formal inspections and predetermined reporting procedures to provide a record of site conditions and activities and a mechanism by which the effectiveness of the contractor's environmental management plan can be established.
- A.3.13 The inspection checklists and reports shall be kept at each site office and shall be updated and used to identify where improvements are required in the day to day operation of the site.

Daily Inspections

A.3.14 The CEC shall carry out daily inspections of the work site to check compliance with the contractor's environmental management plan. The checklist for daily observations is included in Appendix F.

Weekly Audits

A.3.15 The CEC shall carry out weekly audits of the procedures in the contractor's environmental management plan. Note that more frequent monitoring may be required by individual method statements/ records of observations.

Reporting

Amendments to the CEMP

- A.3.16 Minor amendments to this CEMP shall be made to a Controlled Copy held on site by the Environment Manager by hand in red ink and dated. Details of minor amendments shall be summarised in weekly audit reports to the Project Manager. The CEMP will be updated and re-issued to the NCC Project Manager at least every three months.
- A.3.17 Each contractor shall establish a procedure to update and control copies of their contractor's environmental management plan.

Weekly Environmental Report

A.3.18 The CEC shall prepare a weekly environmental report summarising the findings of the weekly audits, other regular monitoring and inspections, and detailing the actions taken to rectify any breaches of the contractor's environmental management plan and action taken in response to incidents or complaints. The report shall be submitted by the CEC to the NCC Environment Manager.

Complaints Procedure

A.3.19 Complaints received from third parties shall be recorded by the CEC. The overall complaints procedures for the NCC shall apply to all environmental related complaints.

Incident reporting

A.3.20 The CEC shall submit a report to the NCC Project Manager within 24 hours of any serious environmental incident such as a breach of, or serious risk of breach of, lease, licenses, consents, agreements, regulations, bylaws or DCO conditions. At the same time, the relevant department at Broadland District Council, Norwich City Council or statutory authority shall also be informed.

CEMP Review

A.3.21 The Environment Manager shall review the CEMP every six months and shall include a review of the following:

- Results of the internal monitoring/ environmental audits;
- Non-conformance audits;
- Achievements of environmental objectives and targets;
- Records of complaints and concerns of relevant external agencies and parties; and
- Means for improving performance.
- A.3.22 The conclusions and recommendations from the management review will be communicated to the Environment Manager and shall identify areas that require corrective action and improvements to the CEMP. Any changes/revisions to the CEMP that impact on contractors shall be communicated immediately to the Site Manager and CEC. The CEC shall make amendments to their contractors environmental management plan as appropriate.

Communications

- A.3.23 During the construction process, the contractors should maintain a notice board at the site entrance, indicating the name, telephone number and email address of the CEC, together with other mandatory information.
- A.3.24 External communications with statutory consultees shall be coordinated with the Environment Manager and may include, but not limited to:
- Broadland District Council
- Norwich City Council
- Natural England
- Environment Agency
- English Heritage
- Landowners and their agents

• The general public.

Environmental Incident Response

- A.3.25 An environmental incident is any undesired, unplanned, abnormal and sudden event which in addition to disruption of work, causes damage to the environment, property, plant or equipment, or loss of productivity (e.g. unplanned shutdown), without involving persons in terms of injury, ill health or death.
- A.3.26 Incident response plans shall be developed for all phases of the Scheme. The following response plans shall be developed by NCC at an early stage:
- Project wide Emergency Response Plans; and
- Detailed work/site specific Incident Response Plans to be developed by the relevant contractors.
- A.3.27 The main purpose of the Incident Response Plans is to establish and prescribe procedures to respond to environmental incidents and emergencies during the various construction phases of the Scheme. The incident response plans should include, but are not limited to:
- List of key external and internal contacts: the contractor shall provide clear contact details for their work sites. The contractor should develop a list of contact information for all internal and external resources and personnel. The list should include the name, description, location, and contact details (telephone, email) for each of the resources/personnel, and be maintained bimonthly;
- Reporting procedures: The contractor should develop appropriate reporting procedures (Section 3.20) and documentation within the frameworks of their respective contractor's CEMP;
- Site plan including drainage and location of storage/refuelling areas;
- List of stored materials;
- Details of local environmental sensitivities;
- Location of spill equipment; and
- Procedures for spill containment and remediation.

A.4 Permits and Consents

General Requirements

A.4.1 In addition to the DCO, various other permits, licences and consents are required to undertake the construction works at the NDR Site.

Specific Permits and Consents

A.4.2 A list of the existing permits and consents held by NCC are detailed in Appendix D. The permits and consents required for the construction phases of the NDR Project are listed in Table 4.1 below. This list shall be kept under review by the Environment Manager and updated as required.

Table 19.1: Summary of permits and consents required for the construction phases			
Activity Licence Issuing Authority Response			

Activity	Licence	Issuing Authority	Responsibility
Works close to an SAC	Approval	Natural England	Environment Manager
Works close to EPS	Approval	Natural England	Environment Manager
Diversions of PROW	Temporary diversion of PROW	Norfolk County Council	Environment Manager Early works CEC EPC CECs
Mobile Plant Manager	Temporary permits for use of specialist remediation mobile plan	Environment Agency	Environment Manager Remediation CEC
Permits for abnormal load vehicles	Temporary permits for movement of abnormal load vehicles	Broadland District Council & Norwich City Council	Environment Manager All CECs

Permits and Consents Programme

A.4.3 The permit and consents identified in Table 4.1 are required at different times in the construction phase. A programme of permits and consent requirements relative to construction activities is included in Appendix F.

A.5 Construction Traffic

Purpose

- A.5.1 This Construction Traffic Management Plan ("the Plan") outlines the proposals which will be implemented to control the flow of vehicles required for construction at the site and to manage pedestrian movements during that period. The Plan presents a forecast of the traffic that will be generated by the construction works and an outline of the steps that must be implemented by NCC and the various contractors to reduce the impact of these movements on the local highway network.
- A.5.2 During construction, vehicles will access the Site to deliver plant and materials, remove waste and carry workers. The number of vehicle movements required and their routes will be established at Reserved Matters stage. However, the overall amount of traffic generated by the Proposed Development during its construction will not exceed that generated during its operation.

Environmental Statement

"It is anticipated that defined construction haul routes and time restriction for vehicle movements would be set out in a Construction Environmental Management Plan (CEMP) that would be secured under a planning condition at Reserved Matters stage. It is predicted at that stage that all traffic impacts arising during the construction phase could be mitigated through the application of the CEMP".

Requirements

A.5.3 Figure XX shows the preferred route to the site via the A47, and A1067. This route forms part of the Norfolk County Council recommended HGV route to the NDR Site. This route has no restrictions on the vehicle types that may use it. All of the HGV's travelling to and from the site shall do so via the designated routes (as illustrated in Drawing No, XXX Appendix A).

- A.5.4 All construction traffic (with the exception of the Park and Ride buses) will avoid XXX
- A.5.5 Any abnormal loads associated with the construction phase must:
- Use the designated haul routes;
- Obtain licences as required;
- Schedule movements to minimise impacts on the surrounding road networks; and
- Avoid movements at peak hours and key school drop off and pick up times of between 0830 and 0900, and 1500 and 1530 (during school terms only).

A.5.6 Any deliveries (excludes vehicles less than 3.5 tonnes) to the site must be:

- Made via the XXX.
- Enter the site via a new temporary tarmac road and new gates to the entrance, as shown in Drawing No XXX (Appendix A); and
- Avoid movements at peak hours and key school drop off and pick up times of between 0830 and 0900, and 1500 and 1530.

Staff and Visitor Access

A.5.7 Norwich Park and Ride sites, their location and capacity are detailed in table 19.2:

Table 19.2: Norwich Park and Ride Sites

Park & Ride Site name	Location	Parking spaces available
Airport	Buck Courtney Crescent	620
Sprowston	Wroxham Road	792
Postwick	Yarmouth Road	552

- A.5.8 At the peak of construction it is anticipated that there will be a maximum of XX workers per day that will need to use the Park and Ride facilities.
- A.5.9 Local labour will be used wherever possible and any site personnel sourced from outside the immediate locality, who will temporarily reside in Norwich, must use the provided bus service or public transport.
- A.5.10 Staff residing in the local area will use the park and ride service and associated bus services.
- A.5.11 Workers employed by contractors must use the Park and Ride facilities.

A.5.12 The arrangements will be as follows:

- The Park and Ride facilities will be permanently operational unless stated otherwise;
- A direct bus from the Park and Ride site will run, in advance of the morning shift;
- A further bus or mini bus will provide further runs as required, a minimum of two at each end of the day;
- There will be an additional run at lunchtime;
- Buses will stop at intermediate locations to pick up individuals using accommodation between the Park and Ride sites and NDR Site;
- These arrangements will be reversed for the return trips at the end of the shift; and
- Pick up/drop off areas for the Park and Ride services will be located inside the contractor's compound and accessed via the internal access road.

Traffic Management

- A.5.13 The construction compound will be secured within a continuous high security chain link fence, with separate vehicle and pedestrian gates and emergency exits installed around the perimeter. All deliveries, operatives and visitors to the site will be required to:
- Report to a new security office at the new Gate adjacent to Gate X as shown in Drawing No XXX(Appendix A);

- All contractors will be informed of procedures in advance of work commencing at the site;
- All staff, operatives and visitors must be informed of emergency procedures, assembly points, First Aid, site rules, and the location of welfare facilities upon arrival at the security office;
- All personnel will be required to sign in and out at the security office each day;
- Personal Protective Equipment (PPE) appropriate to the tasks being undertaken will be checked prior to signing in;
- Identification will be checked upon signing in;
- Pedestrians will use the new security office adjacent to Gate X, as shown in Drawing No XXX (Appendix A); and
- A new tarmac road will connect the new access road to Gate X with the new Gate and security office located to the south west of Gate X, as shown in Drawing No XXX (Appendix A). Parking will be provided at this location for temporary visitors and to provide car parking for the induction centre.

Delivery Vehicle Controls

- A.5.14 Deliveries will be scheduled to arrive as and when the materials are required, in line with the construction programme. The following requirements will apply:
- Vehicles shall only be on the site for the time that is required to load/unload;
- No night time deliveries will be permitted without prior notification and approval from the relevant authorities;
- Delivery vehicles (greater than 3.5 tonnes) must avoid the key school drop off and pick up times of between 0830 and 0900, and 1500 and 1530;
- All contractors will conform to noise control measures detailed in chapter 8.
- Contractors must ensure that any detritus is cleared from vehicles prior to departure from the site;
- Contractors must undertake highway cleaning operations as required;

- Contractors must provide a wheel wash facility adjacent to the site access; and
- Vehicles must not lay-up in surrounding roads.

Responsibilities

- A.5.15 This Construction Traffic Management Plan describes the anticipated construction traffic volumes that will be generated as well as the vehicle movements associated with construction works at the NDR development site.
- A.5.16 The Plan shall be provided to all contractors by the NCC Project Manager in advance of working on site. Each contractor shall prepare a specific traffic management plan consistent with the requirements set out above to cover their own activities during the construction phase. The plan shall be provided to the NCC Project Manager for approval and include provisions for the monitoring the implementation of all its measures.
- A.5.17 The Environment Manager shall regularly audit the implementation of the contractor's plan to confirm minimal disruption to the highway network and to verify that vehicle operators are complying with site regulations.

A.6 Air Quality

Purpose

- A.6.1 The Environmental Statement includes mitigation measures related to air quality management. The requirements set out in this section aim to ensure that air quality is not adversely affected during the construction of the Scheme.
- A.6.2 The Air Quality Action Plan, Air Quality Standards Regulations 2007 (HMSO, 2007) attaches particular emphasis to reducing the emissions of fine particles into the atmosphere. Local emission sources from construction works have been targeted for priority action. Emissions reduction, and subsequent reduction in air quality impacts, will be achieved by using a range of best practice measures.

Requirements

- A.6.3 A key effect during construction phase is associated with dust raising activities associated with earthworks, construction and track-out. This includes the handling of spoil, loading of trucks and the movement of the trucks around the construction sites and onto the local road network.
- A.6.4 The proposed Scheme has a number of incorporated mitigations for the construction phase which are principally aimed at reducing dust effects from the construction activities. The mitigation measures provided below are required for the duration of the construction works to reduce level to low risk:

Site Planning

- A.6.5 Plan the site layout; locating machinery and dust causing activities away from sensitive receptors where possible
- A.6.6 All site personnel are to be fully trained
- A.6.7 A trained and responsible manager should be on site during working times to maintain and carry out site inspections

Construction Traffic

- A.6.8 Residual effects during the construction phase will occur for a limited period of time but these will not pose a significant risk. They should be controlled through best practice mitigation measures throughout the construction period:
- All loads carrying potentially air-borne material entering and leaving site are to be covered
- All stationery vehicles are to have their engines switched off they should not be permitted to idle;
- Effective vehicle cleaning and specific wheel-washing on leaving site should occur;
- Dampen down haul routes
- Avoid site runoff of water or mud
- On-road vehicles should comply to set emission standards

- All non-road mobile machinery (NRMM) to use ultra-low sulphur tax-exempt diesel (ULSD) where available and be fitted with appropriate exhaust after-treatment from the approved list.
- Minimise movement of construction traffic around site
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site.

Site Activities

- Minimise dust generating activities
- Use water as dust suppressant where applicable
- Cover, seed or fence stockpiles to prevent wind whipping
- Re-vegetate earthworks and exposed areas
- Ensure concrete crusher or concrete batcher has permit to operate

Post Construction

A.6.9 During the post construction phase of the site residual effects are not expected to occur therefore no specific mitigation measures are included.

Responsibilities

A.6.10 All contractors are responsible for ensuring the air quality management plan is adhered to. The CEC will monitor the air quality measures put in place and implement actions where improvement is required.

A.7 Carbon & Energy

Purpose

 A.7.1 The Carbon and Energy management chapter outlines a system and procedures to establish and maintain controls over carbon and energy issues. This is in accordance with current regulatory and legislative requirements. The Scheme has been designed to minimise impacts where possible. A.7.2 The Scheme will not be lit (except at Postwick) which means that potential carbon emissions associated with energy use from lighting during the operation of the roads is minimised.

Requirements

- A.7.3 To minimise impact during the construction phase, the following should be applied:
- A neutral cut and fill balance should be sought to remove the need to transport bulk fill materials from or to site. All excavated materials should be utilised within the site.
- After ascertaining the known volume of contaminated materials there should follow remediation and burial under landscape areas;
- Cement stabilised granular material will be used to reduce the import of quarried materials; and
- Recycled crushed glass filler material should be used as an alternative to sand.
- A.7.4 Measures to reduce the impact of the construction works i.e. plant and traffic will also be implemented and should consist of the following:
- Ensure that the engines of all vehicles and plant on site are not left running unnecessarily:
- Construction plant and vehicles should be well maintained and routinely serviced in accordance with the manufacturer's recommendations. Records of this are to be maintained on site;
- Avoid where possible the use of diesel or petrol powered generators and use mains electricity or battery powered equipment
- Maximise energy efficiency where possible at all times e.g. ensuring full loading and efficient routing of vehicles;
- Instruct drivers, while stationery on public highways, where possible to switch off their vehicle's engines to prevent exhaust emissions;
- Develop a Site Waste Management Plan, which will identify materials that can be reused and recycled; and

Responsibilities

A.7.5 All contractors and their workers are responsible for ensuring the carbon and energy management plan is adhered to. The CEC will monitor the carbon and energy measures put in place and implement actions where improvement is required.

A.8 Cultural Heritage

Purpose

A.8.1 Several archaeological investigations (desk based and field work) have been conducted within and around the site as part of the Broadland Gate Environmental Statement (Mott MacDonald 2011) and the Northern Distributor Road Route Environmental Impact Assessment (NAU 2008). The evaluations revealed sites in close vicinity to the Proposed Development that will require further archaeological mitigation work; these are listed in table 8.1.

NHER/Site	Archaeological Resource
30315	Possible Iron Age Ditch and bank-on line of parish boundary
30315	Field systems of possible IA date evaluated by trial trenches and further associated features seen in 2012 geophysics to the west.
124468	Prehistoric discrete features
49748	Ditch or pit with early Neolithic pottery (NPS 2012)
49758 (T1 & T3)	Rectilinear enclosure and possible ring ditches
123955	Large prehistoric enclosure and crop marks (NPS 2012)
124298	Early Saxon pits and ditch (NPS 2012)
51049	Deserted medieval village (edge of) – Rackheath (NPS 2012)
50501	Deserted medieval village – Rackheath (NPS 2012)

Table 8.1: Archaeologica	l sites requiring	further mitigation	measures
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Document F	Reference:	6.2
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18131	Large rectilinear enclosure. Probably dates from the Bronze
	Age (NPS 2012) Also prehistoric pits and burnt mound
	recorded in the trenches.

- A.8.2 The construction sites and surrounding areas therefore have the potential for previously unrecorded remains to be uncovered during construction works.
- A.8.3 The Scheme has been designed to mitigate its potential impact on the settings of heritage assets. The new road will be integrated into its surroundings by utilising mature landscape planting. The landscape mitigation proposed for the Scheme includes planting native hedgerow and trees along the new road, earth bunds and in woodlands to screen views.
- A.8.4 There should be no direct physical impacts on any listed buildings identified within the study area, but mitigation measures may impact on archaeological remains.

Requirements

Archaeological Heritage

- A.8.5 Due to the general nature of the construction, archaeological preservation in situ will be difficult to achieve but there may be opportunities to locate landscape bunds or construction compounds over identified sites, where construction activities can be controlled to prevent damage.
- A.8.6 Not all areas of the NDR route have been archaeologically surveyed and therefore, an additional programme of survey will be required to finalise the mitigation strategy, this will include:
- Field walking and Geophysical Survey
- Targeted Trail Trenching
- Preservation by Record
- A.8.7 Once the surveys have been carried and if areas of archaeological importance are identified a mitigation strategy will be produced, and agreed with Norfolk Landscape Archaeology. This will be factored into the Scheme's construction programme.

A.8.8 The requirements for archaeological mitigation will be set out in an overarching archaeological Written Scheme of Investigation, and will be incorporated into this CEMP.

Historic Buildings Mitigation

- A.8.9 Construction of the road will result in the loss of some unlisted historic farm buildings and WWII buildings within Rackheath Park. These will be recorded to supplement the existing report on the farmhouse (NHER 42007) and all historic fabric recovered from the site by re-use.
- A.8.10 In the case of WWII buildings in the vicinity of Gazebo Farm, these will be investigated and recorded as part of a wider investigation into the WWII buildings and occupation of the Parkland.

Historic Landscape Mitigation

A.8.11 Proposals to mitigate the visual impacts of road building on the historic landscape are also dealt with in Chapter 9: Landscape and Visual.

A.8.12 General historic landscape mitigation will be carried out as follows:

- Relict field corners that are created through road construction will be subject to planting schemes. This will fossilise the lines of the former field boundaries.
- New planting and a combination of mounding and planting tied into the existing parkland will blend the new road into the landscape at:

Beeston Park – This will occur where the route crosses the former parkland to the north of Beeston Hall; so that the road will not appear intrusive within this sensitive landscape. Planting will be restricted to clumps of specimen trees to reinforce the parkland feel. Further east towards Beeston Lane, however, a combination of mounding and dense planting will be provided to screen the route from the estate cottages and the church. It is also proposed to update the NCC/UEA survey of 1989-91 to include all changes since this report was produced and to produce a comprehensive photographic record.

Rackheath Park – Extensive mitigation planting and screen mounding is proposed along the route which would help to blend the new road into the landscape and screen it from affected properties.

• At Horsham St Faith Airfield; a record of any WWII remains will be made ahead of any site works. It is proposed to relocate the museum to a nearby site of similar size.

Responsibilities

- A.8.13 The archaeological mitigation will be monitored by the Norfolk Historic Environment Service Officer (NHESO).
- A.8.14 An Archaeological Manager and/or Archaeological Clerk of Works will be appointed by the Project Manager to monitor archaeological remains to ensure continuity throughout construction.
- A.8.15 The Archaeological Manager and/or Archaeological Clerk of Works will adhere to the contents of the WSI as part of their contractual appointment.
- A.8.16 The WSI and details of the archaeological contractor will be issued to the construction contractors prior to development commencing. The contractor shall inform the archaeological Manager and/or Clerk of Works when works in the designated areas are taking place and build flexibility into their programme to allow time for archaeological excavation and recording, should it be necessary.

A.9 Landscape & Visual

Purpose

- A.9.1 This chapter describes the proposed planting scheme and the aims of the landscape management during the first year after planting and in future years. An extensive landscaping scheme has been designed which is shown in drawings:
- MMD-233906-DT-0866 to MMD-233906-DT-0878 and
- MMD-233906-DT-0941 (DCO Document 2.8 Detailed Landscape Planting Proposals)
- A.9.2 These have been prepared in order to integrate the road into the surrounding landscape as far as possible. It will also reduce its visual impact adjacent to housing. This will involve extensive mounding and grading of side slopes to blend the road, where possible, into the surrounding topography. It will also link the road planting with adjoining existing vegetation.

Requirements

- A.9.3 New planting will be provided in excess of the 6 to 1 replacement ratio recommended by the Forestry Commission. The species chosen will be mostly native and deciduous to reflect those found in the immediate locality.
- A.9.4 In the vicinity of the airport (approximately 2 km either side of Horsham St Faith) the planting mixes will be adjusted to reduce the risk of bird strike hazards to aircraft; shrub planting will be kept to a minimum to 2 m in height and the percentage of large trees reduced. In addition, the proportion of berry producing shrubs will also be reduced to avoid attracting large flocks of birds which may prove hazardous to aircraft.
- A.9.5 Good and effective site management will ensure that waste materials and debris are controlled to avoid items from blowing off site.
- A.9.6 Careful planning and management of the construction process will minimise the loss of existing trees and shrubs.
- A.9.7 The construction sequence should be optimised to avoid double handling of material and excessive vehicle movements.

Responsibilities

- A.9.8 NCC shall appoint a suitably qualified contractor to implement the tree protection measures. These protection measures must be in place prior to construction and conform to BS 5837.
- A.9.9 Each contractor's environmental management plan shall include a method statement that identifies requirements specific to their activities. The method statement shall include the weekly monitoring of tree protection measures to ensure no trees are subject to damage.

A.9.10 NCC will be responsible via a qualified contractor for:

- the management and maintenance of the planting regime; and
- ensuring replacement planting is undertaken in accordance with the landscape management plan

A.10 Nature Conservation

Purpose

A.10.1 The following section describes the general, overarching processes, features and parameters of nature conservation that will be provided as an inherent part of the construction of the Scheme.

Requirements

- A.10.2 Measures will centre on good construction practice to ensure that disturbance in all its forms is minimised. Effective well thought out measures to eliminate potential pollution events will be installed. Refuelling of vehicles and plant will be allowed only in specific areas away from separate locations, over bunded trays. Fuel will be stored in double-bunded bowsers and tanks. Spill kits will be readily available at these locations.
- A.10.3 Dust suppression measures will be put into place and construction phase drainage will be carefully addressed to eliminate the potential for pollution of the rivers, other watercourses and groundwater. Timing of works will be carefully considered, so that disturbance at sensitive times will be avoided as far as possible.
- A.10.4 Lighting will be directional, with hoods fitted wherever possible, to reduce light spill.

Statutory designated Sites

- A.10.5 Construction phased mitigation will be in accordance with those measures already described and will be employed throughout the construction phase across the whole site.
- A.10.6 The proposed SuDS drainage system (inputting storm water to groundwater) will ensure that potential pollutants and contaminants i.e. hydrocarbons, heavy metals, de-icing salt will not enter the River Yare via surface water overland flow.
- A.10.7 Specific monitoring is not proposed for Statutory Designated Sites.

Non-Statutory Designated Sites

- A.10.8 During construction, adherence to this document will ensure that the disturbance to these sites will be minimised.
- A.10.9 A length of Marriotts Way CWS will be lost to the proposed Scheme. The length directly affected has been minimised as far as possible. For example, the approach ramps to the over-bridge will be as steep as design parameters allow. The proposed earth banks, either side of the approach ramps, will be planted with those species currently growing in this location. This will replicate the habitats that will be unavoidably lost because of the Scheme. Nevertheless, this together with the proposed landscaping scheme will provide connectivity between Marriotts Way and other areas of semi-natural habitat, where currently little exists.
- A.10.10 Fakenham Road RNR, which is within the footprint of the proposed Scheme, will be subject to a seed harvesting process at the appropriate time of year. This will ensure that seeds of valuable species can be stored during construction. The verge topsoil will be carefully stripped and carefully stored apart from other areas of stored topsoil. On completion of construction in this location, it will be returned to site and used to re-build the verge. The harvested seeds will then be planted, which will allow the seed bank, within the soil, to remain roughly in the same location. These processes will maximise the chances of valuable flora to re-establish.
- A.10.11 The removal of lengths of important hedgerows has been minimised as far as possible and those that are will be replaced as part of the proposed landscape management scheme.
- A.10.12 During the operational phase of the Scheme landscaping and earth bunding will screen the CWSs from the impact of the Scheme at these locations. The landscape management plan will ensure that new planting will mingle with the existing to enhance the surroundings.
- A.10.13 It will be necessary to monitor newly created habitats over a two to three year maintenance period. The health of the newly planted trees and shrubs will be monitored with the aim of replacing any that die during this period. Particular attention will be paid to the trees on Marriott's Way and Middle Road Green Bridges, where the soil depth and general conditions will make for challenging growing conditions.

Bats

- A.10.14 During the Construction phase, the bat mitigation guidelines set out in DMRB Volume 10, Section 1; Part 8 (HA 80/99 Nature Conservation Advice in Relation to Bats) will be strictly adhered to. Any lighting along the route and within site compounds will be bat friendly. The lighting should, wherever possible, be low level and directional so as to orientate its spill away from areas used by bats. This is especially important near roost areas or important flight routes. The potential use of hoods or cowls will further improve this.
- A.10.15 The mitigation measures proposed relate to the maintenance of landscape permeability and functionality for bats. key to this is the combination of wire bat gantries, modified accommodation bridges and green bridges which will be provided. These will promote the continued use of known major flight routes that would otherwise be severed by the proposed Scheme.
- A.10.16 The wire bat gantries will be installed at the following locations:
- Deighton Hills (shooting school) access track;
- Tree line south of Horsford;
- Quaker Lane;
- Beeston Estate 1 Tree line/woodland north east of the Hall buildings;
- Beeston Estate 2 Farm track off Beeston lane, west of The Springs;
- Double tree line off Toad Lane; and
- Smee Lane
- A.10.17 Two green bridges (land bridges) will be included as part of the proposed Scheme. The first will be at Marriott's Way; this is because of its importance as a commuting route for local bat populations, which include the barbastelles. The second green bridge will be constructed at Middle Lane.
- A.10.18 Two proposed highway bridges will provide additional structures for use by bats. These are to be located at Buxton and Newman Roads they are designed with solid parapets to reduce light intrusion from vehicle headlights using the NDR. The effect of both will be to create dark passages for bats to encourage them to remain in the area and facilitate their movement across the Scheme.
- A.10.19 A bat underpass is also proposed under the crossing point into Rackheath Estate. This is a drainage culvert for the Scheme and allows

surface water to run along the existing drainage ditch network unimpeded. This underpass will be 2 m in width and 2 m in height and will cater in particular for low-flying bat species identified using this route.

A.10.20 A long term monitoring programme, scheduled to occur during and after construction, is proposed to ensure that the mitigation measures, put in place for the Scheme, are functioning effectively. This will allow decisions to be made quickly to correct any problems identified. The monitoring programme is shown in Table 10.2 below.

Activity	Monitoring Period	Months of Checks
Unmanned static monitoring	12 locations, as during 2013 survey season	15 years (years 1, 2, 3, 5, 10 and 15). Late April, June and September each year
Manned static monitoring of bat bridge and bat tunnel locations	three visits per season	15 years (years 1, 2, 3, 5, 10 and 15). Late April, June and September each year
Survey for dead bats at 10 selected monitoring locations	Early morning twice each year.	15 years (years 1, 3, 5, 10 and 15). Late April and September each year.
Counts of known roosts within 50 m of the works area	Two dusk surveys per roost.	15 years (years 1, 3, 5, 10 and 15). May- August inclusive each year (repeat at same time each monitoring visit for each roost)
Monitoring counts of each bat house.	Two dusk surveys.	15 years (years 1, 2, 3, 5, 10 and 15). May- August inclusive each year (repeat at same time each monitoring visit for each roost)

Table 10.2 Bat Monitoring during and after Scheme construction

Document Reference: 6.2

Bat box checks.	Twice a year.	15 years (years 1, 3, 5, 10 and 15). May/June and August/September.
Hibernation surveys of known roosts within 2 km.	15 years (years 1, 3, 5, 10 and 15).	Jan to March.
Radio-tracking (barbastelles).	7 years (years 1 and 7).	May/June or Aug each year, focussing on same areas identified as important through baseline surveys.

Badgers

- A.10.21 Badger setts currently exist within the footprint of the Scheme and setts
 3, 4, 6 and 7 will be closed. The remainder will be unaffected. Mitigation measures, during construction, therefore will be limited to ensuring, as far as possible, the safety of any badgers which may stray into the works areas. In most cases it should be possible to install permanent badger fencing alongside the Scheme boundary during the early stages of construction. Once in place it should not need to be moved or altered, so it should be possible to retain it in place throughout Scheme operation as well as.
- A.10.22 Permanent badger fencing will be particularly beneficial at the "Green Bridge" at Marriott's Way. This will guide badgers away from the NDR carriageway at this point, and encourage them to use the "Green Bridge", to facilitate the continuance of their existing home range.
- A.10.23 During the operational phase of the Scheme, monitoring will also take place for, at least, five years to assess the effectiveness and durability of the proposed badger fencing to prevent badgers being killed and injured by vehicles on the NDR.
- A.10.24 In addition to the above, the following mitigation measures should also be implemented on site during construction:
- Ensure chemicals are safely stored;

- Open trenches should be covered, where possible, at the end of each working day, or a means of escape provided for any animal that falls in. This could be a 450 deg, ramp located every 20m along the trench which is dug into the edge or laid as a plank, to provide a ramp; and
- Any temporarily exposed open pipe system should be capped to prevent badgers gaining access into it.

Great Crested Newts

- A.10.25 The ponds at Dog Lane, Horsford are used by the meta-population; these are approximately 100 metres north of the proposed Scheme. The available terrestrial habitat, between these ponds and the proposed Scheme, is limited to a small number of arable field margins. There are no ponds suitable for newts south of the proposed Scheme. Therefore it is not necessary to provide access for them to their habitats in this location.
- A.10.26 A precautionary approach is to be employed to exclude newts from the Scheme footprint and install temporary newt proof fencing during construction. This should be installed, coincident, with the northern fence-line which demarcates the Scheme extents at this location. The newt proof fencing should be of sufficient length to prevent newts using the ponds on Dog Lane and thus exclude them from the site.
- A.10.27 The newt proof fencing should be erected pre-construction and programmed to avoid adverse impacts on the newts. The fencing should remain in place for the duration of the construction phase.
- A.10.28 The meta-population, at Quaker Lane, Spixworth, which uses pond 16, is located approximately 100 metres from the proposed Scheme. Similarly to the Dog Lane, Horsford, newt meta-population, they will be excluded from the construction site by the installation of temporary newt proof fencing. This will also be installed coincidently with the erection of the northern fence-line. This will exclude them from all construction areas and new drainage lagoons, to be built, in this area. It should again be of sufficient length to exclude newts from using the pond on Quaker Lane. This also should be installed at preconstruction stage.
- A.10.29 The meta-population of newts at Newman Road, Rackheath, will suffer the loss of one breeding pond. This is in addition to their terrestrial habitats which are also suitable for great crested newts.

- A.10.30 New receptor ponds will have to be constructed outside the boundaries of the construction site for all the newts that are to suffer exclusion from their current ponds and habitats. They will have to be trapped and relocated; and all this must occur during the pre-construction phase of the scheme.
- A.10.31 At Scheme completion, the temporary newt fencing will be removed. This will allow them access to the new landscaped areas. The adherence to the principle of tying in new landscaped areas with the existing field boundaries will offer newts an opportunity to roam to areas where currently they cannot. Habitat connectivity will be increased to encompass improved woodland, scrub and grassland.
- A.10.32 Permanent newt proof fencing will not be required for the post construction period. Recent research has demonstrated that a road that carries more than 20 vehicles per hour provides a deterrent to newts (as well as other amphibian and reptilian species). It is likely that the NDR will carry a traffic volume of traffic that will exceed this by a significant margin; therefore the risk of injury/mortality to newts is likely to be low which will render the provision of newt fencing ineligible.
- A.10.33 The terrestrial habitat created by the landscape management plan for the Scheme will encourage the meta–populations to take advantage of newly created artificial refugia and hibernacula. These will provide shelter during the summer season and their hibernation period. They may also be used by other amphibians and reptiles.
- A.10.34 Monitoring will be required for the great crested newt meta-populations at Quaker Lane, Spixworth and Newman Road, Rackheath during both construction and post-construction phases to ascertain the effectiveness of the proposed mitigation and enhancement measures.
- A.10.35 A thorough population survey of identified existing breeding ponds and the four new ponds will be carried out. These surveys will require six visits to each pond on suitable nights (i.e. when the overnight temperature is 5°C or greater and when it is not raining heavily) between mid-February and mid-June. The visits should not be on consecutive nights; but at least half of them must be carried out in the peak period between mid-April and mid-May. These surveys will need to be repeated each year following the opening of the NDR for six years. At their completion a report will be prepared for Natural England as part of the mitigation for the return of their licence.
Breeding Birds

- A.10.36 The main mitigation measure for reducing impact on breeding birds is to carry out habitat clearance during the winter months when breeding activity is at an end. This has already been factored into the construction programme for the Scheme.
- A.10.37 All temporary construction areas should have access tracks, lay down areas and compounds, suitably sited to minimise their impact on breeding birds. Public Amenity areas, heavily grazed grassland or arable land has been selected for these temporary areas as far as possible. These will be reinstated following Scheme completion. Where this is not possible alternative areas will be provided, as part of the Scheme, to compensate for their loss.
- A.10.38 During construction; industry best practice guidelines that relate to potential disturbance will be followed:
- These will ensure that construction predominantly occurs in daylight hours to minimise light emissions. Where lighting is provided, the lamps will be directed away from sensitive areas;
- Any chemical spills will be cleared up quickly and effectively to prevent accidental poisoning of birds and other wildlife;
- Any dangerous or sharp equipment should be stored away safely when not in use;
- Construction procedures will be subject to national limits on noise and pollution emissions. This will serve to reduce the effects on wildlife locally.
- A.10.39 A key feature of this mitigation package will be to monitor its success post construction. This monitoring will seek to measure any change in species composition, species number and the number of individuals using the habitats alongside the new road. It will also test in particular those habitat areas that have been newly created, within the Scheme, for wildlife.
- A.10.40 The monitoring programme will involve establishing baseline for the year prior to construction by surveying the route three times between March and June. It will then be repeated each year until five years have elapsed post construction.

Barn Owls

- A.10.41 One identified Barn Owl nesting site will be directly affected by the Scheme and will be removed, by a licensed and experienced ecologist. This will occur outside the nesting season. As previously described, habitat clearance will take place outside of the nesting season, in order that no nesting or breeding birds will be affected.
- A.10.42 Where nest, roosting and rest sites occur within 150m of construction activities appropriate screening with fine mesh will be installed under the supervision of a suitably qualified ecologist.
- A.10.43 Where nesting, roosting and resting sites are to be removed because of construction impacts; these will be capped or blocked up under the supervision of a suitably qualified ecologist.
- A.10.44 If there is any indication that barn owls are nesting within 150m of the construction site activity at any time, work must stop within that area until the matter can be fully investigated and appropriate mitigation measures implemented.
- A.10.45 Site compounds will be managed to ensure that potential impacts on barn owls are eliminated or reduced. Measures will be taken to ensure that there is no risk of barn owls drowning in open containers of liquid.
- A.10.46 It will be necessary to monitor the success of the provision of ten barn owl boxes. This will be carried out by a suitably qualified ecologist holding a valid Natural England or British Trust for Ornithology licence.

Aquatic Invertebrates

- A.10.47 The Scheme will not have any direct impacts on aquatic invertebrates at "The Springs". However, it will be necessary to mitigate for potential indirect impacts such as pollutants and silt entering surface and groundwater here. Particular attention should also be given to monitoring alterations to the groundwater hydrological regime that may affect aquatic and semi-aquatic vegetation on which the Desmoulin's whorl snail lives.
- A.10.48 To minimise the Scheme's impact the following general mitigation measures will be put in place:
- Measures to prevent silt run-off from site operations (such as construction of temporary settlement lagoons) should be constructed as early as possible in the works programme;

- Spillages of liquid to ground during construction should be mitigated by implementation of an environmental management plan with appropriate refuelling procedures, including an effective spill containment plan, to ensure that it does not enter either the surface or groundwater; and
- Groundwater and water table monitoring will take place to ensure that no changes to groundwater levels occur.
- A.10.49 Monitoring of the macro-invertebrate communities should be carried out during and following construction at all sites to establish whether there has been any change from the established baseline. This should be carried out at the same time of year as the baseline data survey (autumn and spring). Monitoring should be carried out during construction and in years 1, 3 and 5 following Scheme construction to assess any operational impacts.
- A.10.50 Monitoring of the Desmoulin's whorl snail population should also be undertaken during construction and in years 1, 3 and 5 following Scheme construction at the appropriate time of year (mid to late summer).

Terrestrial Invertebrates

A.10.51 There are no specific mitigation measures proposed for the existing above average habitats of invertebrates in the immature plantation woodland at "The Springs". Nevertheless, benefit will be obtained for this area from the proposed mitigation measures outlined in the landscape management plan.

Habitats

- A.10.52 The permanent loss of areas of valuable habitat to the Scheme will be mitigated by the proposed landscaping management plan, which will ensure that similar habitat is provided. The temporary loss of habitats, where site compounds, materials storage, batching plants, topsoil storage etc will be located will be minimised by careful design. Wherever possible these are to be positioned on arable land, thus avoiding valuable habitats.
- A.10.53 Identified existing trees and woodland will be protected during construction by fencing, to eliminate impacts to root protection areas, as required by British Standard 5837:2012 Trees in Relationship to Design, Demolition and Construction.
- A.10.54 No further mitigation measures are proposed.

Reptiles

- A.10.55 Reptile populations within the Zone of Influence (ZoI) are sufficiently low to allow individual reptiles to be effectively carefully evicted from the areas where they are recorded.
- A.10.56 Phased vegetation removal, (i.e. vegetation is first strimmed to a height of 150mm, and then on subsequent days strimmed to ground level) will displace reptiles to other suitable areas.
- A.10.57 No mitigation measures are therefore proposed.

Deer

- A.10.58 The potential risk of deer collisions with vehicles on the NDR has been addressed by the following measures:
- Scheme design includes wide verges and swales along the majority of the proposed route;
- Landscaping management plan has ensured that there will be little or no woodland or scrub vegetation adjacent to the road where deer are known to cross.
- A.10.59 No mitigation measures are therefore proposed.

Responsibilities

- A.10.60 The CECs shall ensure that all workers understand the environmental issues regarding protected species, especially bats, badgers and birds. The CECs shall monitor on a daily basis the ecological management of the site with reference to the requirements set out in this Chapter.
- A.10.61 The contractors will apply to the Project Manager who will in turn apply for any protected species permits from Natural England that may be required.

A.11 Geology & Soils

Purpose

- A.11.1 The construction phase of the NDR has the potential to result in both the loss and degradation of the soils in the scheme area from activities such as heavy machinery movements, excavation and re-profiling the landscape.
- A.11.2 Construction may also disturb contaminated land especially during the ground works phase.
- A.11.3 During construction a range of hazardous substances may be used, such as oils and fuels; and accidental spillage or leakage of these hazardous substances may result in local contamination of soils, with potential implications for groundwater.
- A.11.4 Post construction; the new highway will have no effect on geology and soils except in he event of an accident of emergency.

Requirements

- A.11.5 Soils should be stripped, handled, stored and reinstated using best practice procedures, in accordance with appropriate guidelines, such as DEFRA's 2009 'Code of Practice for the Sustainable Use of Soils on Construction Sites'.
- A.11.6 Best practice procedures should include soil stripping, stockpiling and placing in the driest possible conditions. Soil stockpiles should be clearly identified and stored for as short period as possible.
- A.11.7 Tracked equipment should be used where possible, and traffic should be confined to designated routes to minimise ground compaction.
- A.11.8 Should contaminated soil be encountered a Remediation Strategy will be invoked, which includes contact details for the relevant consultees and regulators. Investigation and risk assessment will then be undertaken by a suitable Remediation Contractor appointed by NCC and the existing remediation strategy will be updated to include details of how the unsuspected contamination will be managed. This document will require approval by the Local Planning Authority prior to recommencing with the development works.
- A.11.9 Hazardous substances, including contaminated land, fuels, chemicals, waste and construction material, will be stored, handled, transported and disposed of, according to relevant legislation and best practice guidance to mitigate spillages and leaks.

- A.11.10 Contamination issues relating to surface water runoff from roads is addressed in the Water Resources and Land Drainage Chapter 16.
- A.11.11 Appropriate Personal Protective Equipment will be issued to construction workers and toolbox talks will be set up for them. Good site hygiene procedures will also be put in place.
- A.11.12 Dust suppression, using best practice methods, should prevent spread of potentially contaminated wind blown material. The Construction Environmental Management Plan will cover the issue of dust.
- The Materials chapter 12 of this CEMP discusses mitigation measures to protect materials in the area of the Scheme. A cut and fill balance has been developed to ensure all excavated materials will be utilised within the site.
- The Nature Conservation chapter 10 of this CEMP describes the re-use of excavated soil to create earth banks to mitigate the likely disturbance experienced by wildlife.

Responsibilities

A.11.13 In the event of the discovery of unsuspected contamination the CEC will inform the Environment Manager who will immediately order a cessation of construction activities in that location. The Environment Manager, will liaise with the Environment Agency and Local Authority.

A.12 Materials

Purpose

- A.12.1 This chapter examines limiting the potential impacts of constructing the Scheme on the regions resources. It also considers increasing the Schemes resource efficiency with regards to materials and waste.
- A.12.2 A preliminary Site Waste Management Plan (SWMP) has been prepared for the Scheme and is included in appendix H.
- A.12.3 The agreement of, and compliance with the SWMP will be secured by requirements in the Development Consent Order (DCO). The SWMP aims to ensure that the waste produced in the construction phase, and other phases of the project is dealt with in accordance with the Duty of Care Provisions under the EPA and the duty of care provisions, the Waste Strategy (2007) and principles outlined within the Waste Hierarchy.

A.12.4 The Scheme requires limited maintenance, which would generally be in accordance with Norfolk County Council's maintenance plans for roads.

Requirements

A.12.5 Approaches to mitigation are recommended for the Scheme below:

- Quarry materials are only to be used as a back-up if site won materials are not adequate. Therefore effective use of excavated site materials is essential
- Avoid damage of materials when decommissioning and transporting to the scheme, will maximise their usability. Use recycled materials instead of new materials
- The recycled content in the new material should be maximised. Materials should be ordered for when they are required; this will reduce stockpiling and reduce excess materials that will increase wastage. Where possible materials should be sourced as locally as possible to reduce the transport distance.
- Segregation of waste materials and correct storage to avoid damage.
- Segregation of waste materials in the storage sites to maximise the opportunities for recycling any waste material. This can be helped by storing materials with best practise to avoid damage.
- Waste to landfill should be minimised through waste management (described above). When required the landfills chosen should be in close proximity to the scheme to reduce the transport distance of waste.
- Maintenance activities will produce waste, for example grass cutting. The waste anticipated from these activities can either be recycled or disposed of in green waste landfills.

Responsibilities

A.12.6 The SWMP will be updated by the CECs, as necessary, during the various phases of the Scheme. The Plan will be circulated by the CEC to the Construction Design and Management (CDM) Coordinator, Project Manager, and the Contractor Site Manager every time the plan is updated.

A.13 Noise

Purpose

- A.13.1 Noise will be generated during construction of the scheme and will affect homes, businesses and fauna in the surrounding area. It is possible that this may be experienced simultaneously, sporadically or episodically on separate occasions.
- A.13.2 Adherence to the CEMP should ensure that impacts on noise during the construction phase are reduced as far as reasonably practicable. However, this has the potential to cause annoyance and it is assessed that the effect would have an adverse effect on residents and businesses.
- A.13.3 This chapter identifies a series of measures to reduce the environmental effects during the construction period and covers environmental and safety aspects affecting the interests of residents, businesses, all road users and the general public in the vicinity of the works.

Requirements

Traffic noise

Primary measures: Reduction at source:

A.13.4A thin surface course (TSC) should be applied to the new carriageways along the length of the NDR highway within the Scheme. This material reduces the generation of tyre noise relative to that of hot-rolled asphalt (HRA). The beneficial effect from TSC increases with traffic speed, but reduces with time and wear.

Secondary measures: barriers and bunds

A.13.5 A number of bunds, false cuttings and barriers should be included in the Scheme design to reduce noise impacts and which are summarised below:

	Chainage (approx)	Length (approx)
South (city) side	m	m

Application for Development Consent Order

Document Reference: 6.2

Bund	1250-2200	950	
Bund	2500-2900	400	
Bund	3000-3250	250	
2m barrier fence	3250-3450	200	
Bund	3450-4100	650	
Bund	5400-6500	1100	
Bund	8450-8900	450	
Bund	10400-10900	500	
Bund	12350-13700	1350	
Bund	17250-17500	250	
Bund	17700-19000	1300	
North side			
Bund	1000-1150	150	
Bund	1350-1700	350	
Bund	4000-6500	2500	
Bund	7900-12100	4200	
Bund	13850-14150	300	
Bund	14850-15100	250	
Bund	15750-16100	350	
Bund	16250-16900	650	
Bund	17000-17150	150	
Bund	17700-19000	1300	
Total		17600	

Construction Noise

- A.13.6 Limits for normal working hours and levels of noise at nearby properties will be agreed in advance with the Local Authority and incorporated into the contract specification for the Scheme. The contract will also include a clause requiring that the best practicable means for noise control (BPM) be applied at all times. These should include the selection of the most appropriate method and plant for the job, adequate maintenance of plant, optimum siting of stationary plant, local screening and the education of the workforce.
- A.13.7 Restrictions will be placed on the off-site haul routes and early/late delivery times.
- A.13.8 Potentially affected residents should be kept informed in advance of the works and a telephone complaint hotline will be provided.
- A.13.9 In the matter of managing community relations contractors must establish local liaison groups, information and complaints hotline, information centre and website, weekly newsletter.
- A.13.10 Specific provisions for the notification of affected residents ahead of noisy works and arrangements for the investigation and remediation of noise issues that may arise during construction are also required.
- A.13.11 Where potentially significant construction noise and vibration effects are predicted, recommendations to minimise the impacts to levels lower than those classed as significant impacts are required. This may include, amongst others, the erection of temporary noise barriers around working areas or alternative methods of working.
- A.13.12 The contractor will additionally be required to seek prior consent under Section 61 of the Control of Pollution Act 1974 for its works in advance of commencing works, which will require 'best practicable means' to be adopted at all times.
- A.13.13 Any dwellings at which the predicted traffic noise is found to satisfy the criteria for sound insulation measures in accordance with the Noise Insulation Regulations 1975 (i.e. a design year level > 68 dB and an increase of at least 1 dB etc.) should be offered either sound insulation measures or a grant instead.
- A.13.14 Eligible dwellings are required to be shown on a map, or list produced by the highway authority, and made available for public inspection no later than six months after the opening of the NDR.

Responsibilities

- A.13.15 The contractors shall be responsible for routine monitoring of noise from their activities in accordance with their agreed noise method statements. The CEC is responsible for ensuring that noise reduction measures are implemented. The CEC will implement noise mitigation measures in accordance with BS 5228.
- A.13.16 The CEC shall monitor adherence to noise control targets using suitably trained personnel and equipment, and shall inform the NDR Environment Manager of performance against these targets.

A.14 Effects on all Travellers

Purpose

- A.14.1 Seven public access routes (i.e. Public Rights of Way and permissive paths) will be affected by the construction of the NDR. One of these is the regionally important Marriotts Way, which is part of the Norfolk Trails network, which offers walking and cycling facilities. During construction, all diversion routes for PRoW and road closures will be signposted clearly, with the intention of minimising delays and frustration.
- A.14.2 Since the road will be a new road passing across a predominantly agricultural landscape, the majority of the route will be built 'off-line' with little interference to existing roads, reducing the disruption and consequent driver stress caused during construction. In addition, the construction programme will be developed to ensure that disruption to motorised and non-motorised users is minimised wherever possible. The following roads are crossed by the NDR and a new roundabout is proposed to be constructed. In all cases they will be constructed in phases using traffic signals to control traffic:
- Breck Farm Way will remain open until the new Marriotts Way structure is completed.
- Reepham Road.
- Drayton Lane.
- Holt Road. This will be constructed before the permanent diversion of Drayton Lane is undertaken.

- Reepham Road
- Drayton Lane
- Wroxham Road
- Salhouse Road
- North Walsham Road

Requirements

- A new interchange will be created where the NDR crosses Cromer Road. This will be constructed in multiple phases using traffic signals to control the traffic. While these works are progressed Holt Road, Hall Lane (Holly Lane) and New Home Lane will all be stopped up at the interchange.
- The emergency access to the airport from Old Norwich Road will be closed. Alternative emergency access through the site compound will be discussed with Norwich International Airport.
- The construction of the tie-ins at Buxton Road will be undertaken in phases using traffic signals to control the traffic.
- At Newman Road access to the park will be maintained at all times necessitating the use of traffic signals to construct the tie-ins.
- Plumstead Road will only be closed at off peak times to facilitate the delivery and placing of the bridge beams. At other times traffic will be controlled with signals to allow the abutments to be constructed.
- A.14.3 Impacts for motorised and non-motorised users of the existing network have been taken into account with regards to severance and changes to journey length and amenity in developing the Scheme design. As a result, the Scheme incorporates several roundabout junctions along the route to give direct access to various radial routes and the communities they link with. Where individual or joint access to properties will be severed by the proposed NDR, arrangements will be made to provide new access points to existing roads.
- A.14.4 Visibility standards for the proposed NDR will be in accordance with DMRB Volume 6, thus providing good sight distances to junctions, across verges, and around obstacles such as safety barriers.

- A.14.5 Approximately 25km of new links suitable for use by NMUs would be provided along the route, together with improved surfacing on some existing rights of way. The new routes will link to existing facilities, and where possible will be screened from the road by a combination of low mounds and/or hedge and tree planting. They include the following (approximate lengths):
- Bridleways = 11487m;
- Cycle Track = 2140m;
- Cycle Track (with right of way on foot) = 288m;
- Shared Use Footway Cycleway = 7039m;
- Private Means of Access (PMA) = 5848m;
- PMA combined with Cycle Track (with right of way on foot) = 425m;
- PMA combined with diverted Restricted Byways = 966m (RB6 93m + RB5 646m + RB3 227m);
- PMA combined with Bridleway = 2497m;
- PMA combined with Cycle Track = 1140m; and,
- Restricted Byway (RB7) = 73m.

Responsibilities

A.14.6 Contractors must apply to the Project Manager who will apply to Norfolk County Council for a Temporary Traffic Order prior to closing or diverting any public highway or PROW and must incorporate these diversions into their Traffic Management Plan.

A.15 Community & Private Assets

Purpose

- A.15.1 This chapter deals with measures that remove, reduce or manage the socioeconomic effects of the construction activities. Key measures have already been outlined in this CEMP such as:
- Air Quality
- Noise

- Nature Conservation
- Effects on all travellers

Requirements

A.15.2 No operational phase mitigation measures have been identified for socioeconomics, as predicted operational effects for this topic are considered to be positive.

Responsibilities

- A.15.3 Contractors shall establish a code of conduct for workers which will include a commitment related to:
- Respect for the local community and its cultural norms in which labourers are working; and
- Presentation of professional behaviour and integrity when dealing with the public at all times

A.16 Road Drainage & Water Environment

Purpose

- A.16.1 This chapter sets out the overall Surface Water Management Plan for the project and associated responsibilities for its implementation.
- A.16.2A number of conditions concerned with surface water drainage and flood risk apply to the NDR project. A Flood Risk Assessment (FRA) is submitted under separate cover but is summarised in this chapter

Requirements

Surface Water

- A road drainage network and infiltration ponds will be installed at an early stage. No direct discharges will be allowed into ditches or watercourses feeding the Wensum.
- No direct discharge to be permitted in and around 'The Springs'.

- All runoff in these areas will be controlled and contained in ponds prior to discharge to enable settlement.
- Method statements are to be developed by contractors based on appropriate Environment Agency Pollution Prevention Guidelines (PPG).
- No direct discharge to be permitted. Only discharge via temporary storage and silt trap systems.
- All construction compounds to have properly bunded and contained storage facilities for hazardous soluble substances.
- All batching plant areas (e.g. concrete or bitumen) are to be mounted on concrete pads with properly constructed drainage to contain spillages.
- No direct discharges into ditches or watercourses feeding the Wensum. Discharge to ground in this area.
- Discharge is via settlement ponds, vegetated treatment ponds and then into natural boggy area before discharge into streams and lake. Pollution controls installed to contain spillages and isolate discharge points.
- Existing discharge from A1151 will be routed through new treatment before discharge into Dobbs Beck.
- Discharge via treatment system. Discharge located to enter Dobbs Beck through lagoons 17 and 18, via vegetated wetland. Very high contamination removal potential even after treatment system due to wetland and reed beds in the area
- No additional measures to those already in place for the A47 drainage are required based on HAWRAT assessment results ('passed').
- Discharge of road drainage is to ground. Alignment of road avoids affecting ponds directly.

Groundwater

- Environment Agency PPG will be complied with
- Following pollution prevention measures required in SPZ1 within GP3.
- No abstraction/dewatering permitted within 50m radius (nominal SPZ1).

- No routine discharges will be permitted to ground of any contaminated water.
- Infiltration lagoons within SPZ1 are preceded by passive treatment systems (swales and/or silt traps) and containment systems to prevent spillages entering infiltration pond areas. Significant unsaturated zone provides additional protection and opportunity for removal of contaminants infiltrating into the Chalk.
- No discharge from road runoff occurs within 50 m of any private source. Discharge to ground only where maximum groundwater levels (as monitored) at least 1.2 m below base of infiltration ponds. All infiltration ponds are preceded by passive treatment (swales and silt traps) and containment systems to prevent spillages entering infiltration ponds.
- The impermeable road surface and drainage network provides equivalent or greater protection in cuttings than the lost unsaturated zone.
- Drainage for the Scheme is designed taking into account spillage risks. Risk assessment shows that no sections of the Scheme have significant risks from accidents.
- Drainage networks and treatment designed to intercept and remove significant contaminants loading in the runoff prior to discharge to infiltration ponds.
- No infiltration pond is located where highest measured main water table, as monitored, is less than 1.2 m below base of infiltration pond except Lagoons 4 and 9.

Flood Risk

- Consent required from Environment Agency/IDB for any temporary dewatering during earthworks and road construction.
- Discharge from Lagoon 18 at or near the green-field runoff rate.
- The overland flow through the new culvert and ditch under track that leads to AWS pumping station will be improved for water conveyance; a larger culvert installed under Wroxham Road and 2500mm culvert at chainage 14750.
- All runoff is discharged at green-field runoff rates from the lined Lagoons 17 and 18 at 'The Springs' to the receiving watercourse.

- Spreader ditches, large box culvert (2500mm) and new ditch providing flow path to Dobbs Beck, to maintain runoff from associated overland flow catchment.
- Permanent drainage installed as soon as practical.
- Regular maintenance will prevent blockages.
- Flood bank to protect the bridleway proposed at chainage 1000. Permanent changes will be made to overland flow-path.
- Spreader ditches and/or culverts to maintain runoff from overland flow catchments downstream of the road crossing.

Responsibilities

- A.16.3 The contractor will be responsible for the design of the Road Drainage and Water Management Scheme; and must sure that all the above requirements are taken into consideration in the detailed design of the Scheme.
- A.16.4 During construction, each contractor must ensure that temporary drainage systems comply with the above requirements. Monitoring of drainage systems during construction will be undertaken by the CEC

A.17 Construction Compound Layout and Reinstatement

Purpose

A.17.1 The aim of this chapter is to preserve the visual amenities of the area during the construction period.

Requirements

Construction Compound Layout

- A.17.2 The contractor's storage and welfare facilities shall be established by the Early Works Contractor (see Location Plan Drawing No (Appendix A)).
- A.17.3 These areas must be contained within an earth top spoil bund and a security fence. This temporary security fence shall be erected around the contractor's compounds. A security gate shall be installed at the entrance to the temporary

construction facilities as a general site control. This gate will be in addition to the individual contractor's security at their part of the compound.

A.17.4 The following facilities shall be provided:

- Offices
- Changing rooms
- Showers
- Mess facilities
- A.17.5 These facilities shall be in the form of either one or two storey "porta-cabins" and painted a colour to minimise any visual intrusion in the area, this external colour finish must be submitted to and approved by the Local Authority in writing prior to construction/installation.

A.17.6 The main facilities and operations in the compounds will include the following:

- Power provided either by a connection to the National Grid or operated by diesel powered generators;
- Foul sewage through provision and servicing of appropriate facilities with the sewage removed off site for disposal at a licensed site;
- Drainage controlled, all storage areas containing hazardous substances must be bunded and appropriately drained for collection of spillages for disposal to appropriate offsite facilities;
- Normal runoff from other hard surfaces will be managed through standard structures to ensure no additional flood risk is created for neighbouring land;
- Lighting installed around the contractors' facilities, designed to be directional low level lighting wherever possible (also see the External Lighting Plan, Chapter 12). The implementation of this type of lighting will minimise any impacts on bats, other nocturnal species using the area and neighbouring properties;
- An entrance to the compound via a single track road;
- Separate security arrangements by contractors if individual contractors create their own compounds within the greater compound area.

Soil Management

A.17.7 (This is also referred to in Chapter 11 Geology & Soils)

A.17.8 Contractors shall:

- Prepare a Soil Strategy and Soil Resource Plan detailing the areas, type and volume of topsoil and subsoil to be stripped, haul routes, the methods to be used, and the location, type and management of each soil stockpile;
- Appoint a member of staff responsible for supervising soil management procedures;
- Strip, handle, store and reinstate soils using best practice procedures, in accordance with DEFRA's 2009 Code of practice for the sustainable use of soils on construction sites;
- Undertake stripping, stockpiling or placing soil in the driest conditions available.
- Use tracked equipment where possible to reduce compaction;
- Confine traffic movements to designated routes;
- Keep soil storage periods as short as possible; and
- Clearly define and separately store different soil materials.
- A.17.9 A Site Waste Management Plan will be developed and implemented by each contractor as appropriate during construction. The SWMP will outline the procedures for storage and disposal of waste, including hazardous and potentially contaminated soils.

Reinstatement of Soils

- A.17.10 Reinstatement of soils shall follow DEFRA's 2009 Code of practice for the sustainable use of soils on construction sites.
- A.17.11 Contractors shall implement the following measures during reinstatement of soils:
- Prevent mixing between topsoil and subsoil;
- Reinstate soils during appropriate weather conditions;

- Aim for structured, un-compacted and well aerated profile;
- Handle soils only when dry or slightly moist, and keep to a minimum;
- Prior to spreading of soil, un-compact the underlying substrate by ploughing, or a similar method, to reduce runoff and encourage deep root growth;
- Move and spread topsoil by the 'loose tipping' method (using dump trucks and hydraulic excavators);
- Suspend any soil handling operations in sustained heavy rainfall (for example over 10mm in 24 hours); and
- Not restart works until the soil has had a full dry day or has reached moisture criteria defined in the DEFRA guidance.

Responsibilities

- A.17.12 NCC will submit the site compound layout plan to the Broadland DC and Norwich City Council in coordination with the appropriate contractors.
- A.17.13 The reinstatement contractor will develop the Soil Reinstatement Plan.
- A.17.14 The reinstatement contractor will store and reinstate soils. The CEC will monitor implementation of the Soil Strategy and Reinstatement Plan.

A.18 Construction Waste Management

Background

A.18.1 A Site Waste Management Plan (SWMP) is submitted in support of the NDR Project DSO (see Appendix I). The SWMP aims to ensure that all construction waste is managed stored and disposed of in an appropriate manner by appropriate contractors in accordance with all relevant legislation. Measures have been included on the Plan for minimisation, re-use and recycling of construction and demolition of waste and also to facilitate resource efficiency.

Requirements

A.18.2 The SWMP will be finalised in consultation with the NDR Project Manager and each of the contractors depending on the works are to be carried out.

Responsibilities

A.18.3 The SWMP will be updated by the CECs, as necessary, during the various phases of the NDR Project. The Plan will be circulated by the CEC to the Construction Design and Management (CDM) Coordinator, NDR Project Manager, and the Contractor Site Manager every time the plan is updated.

A.19 References

- A.19.1 AT Coombes Associates (2010) NDR Project, Arboricultural Implications Assessment, dated XXXXX
- A.19.2 British Standards Institution BS 5228 Noise and Vibration Control on Construction and Open Sites. 1997.
- A.19.3 British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites Part 1: Noise. 2009.
- A.19.4 British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites Part 2: Vibration. 2009.
- A.19.5 Department for Environment Food and Rural Affairs (March 1997). The United Kingdom National Air Quality Strategy, Cm 3587, Department for Environment Food and Rural Affairs.
- A.19.6 Mott MacDonald (XXXX) NDR Project, Environmental Statement Volume 1 and 2, Report Ref XXXXXX, dated XXXXXX
- A.19.7 Mott MacDonald (XXXX) NDR Project, Habitat Regulation assessment (Information to Inform the Appropriate Assessment) Report Ref XXXXX, dated XXXXX
- A.19.8 Mott MacDonald (XXXX) NDR Project, Site Waste Management Plan. Report Ref XXXXXX, dated XXXXX
- A.19.9Mott MacDonald (XXXX) NDR Project, Site Waste Management Plan. Report Ref XXXXX, dated XXXX
- A.19.10 Office of the Deputy Prime Minister (2004). Planning Policy Statement 23: Planning and Pollution Control.

A.19.11 Planning Policy Guidance PPG24: Planning and Noise. Department of the Environment, Transport and the Regions. 1994.

B. Appendix A. Drawings

C. Appendix B. Relevant Legislation, British Standards and Guidelines

- C.1.1 The Contractors are required to comply with all relevant current environmental legislation and good practice throughout the duration of the works.
- C.1.2 Relevant UK Legislation and Policy to be complied with include:
- Environmental Protection Act 1990
- The Water Resources Act 1991
- The Noise Act 1996
- The UK National Air Quality Strategy, 2007
- Waste Management Licensing Regulations 1994
- The Controlled Waste (Amendment) Regulations 1993
- Environmental Protection Act 1990, Waste Management,: The Duty Of Care, A Code Of Practice, Department of the Environment
- Management of Health and Safety at Work regulations 2003 & 2006
- Other Relevant Environmental good practice Guidance that should be followed as far as reasonably Practicable.
- Ciria C532: Control of water pollution from construction sites
- Ciria C650: Environmental good practice site guide
- BS6031:1981 Code of Practice for Earth works
- PPG 1: Prevention of pollution
- PPG 2: Above ground oil storage tanks
- PPG 3: Use and design of oil separators in surface water drainage systems
- PPG 5: Works and maintenance in or near water
- PPG 6 Pollution prevention guidance for working at construction and demolition sites
- PPG 7: Refuelling Facilities

- PPG 8: Safe storage and disposal of used oils
- PPG 13: Vehicle washing and cleaning
- PPG 18: Managing fire, water and major spillages
- PPG21: Pollution Incidence response plan
- PPG 26: Storage and handling of drums and intermediate bulk containers

D. Appendix C. Schedule of Works

D.1.1 NCC to provide

E. Appendix D. Permits and Consents Register

Table D.1: Existing Environmental Permits and Consents held By NCC for the NDR project

Permit/Consents	Issuing authority
License for abstraction of groundwater for industrial and commercial use	Environment Agency
Environment Permit	Environment Agency
Hazardous Substances Consent	Broadland DC & Norwich City Council

F. Appendix E. Inspections Checklist

Date

Completed by

Weather Conditions (Including Wind Speed, Direction and Ground Conditions)

lssue	Achieved			Comments/Actions
	Yes	No	Part	
Have any visible dust incidents been noted?				
Are site accesses/egresses free from mud and debris?				
Are wheel wash facilities functional and in use?				
Are dry/friable materials all adequately stored (in a container, sheeted or damped down)?				
Is there any evidence of spillage or leakage from fuel stores/bowsers?				
Are bowsers/fuel stores adequately locked?				

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Are appropriate and agreed noise reduction measures in place?		
Do all stationary plant have drip trays?		
Have all deliveries been appropriately logged?		
Have bunds been inspected and emptied of excessive water?		
Have all soil stripping/storage activities been undertaken?		
Are vehicles being appropriately sheeted as they leave the site?		
Are segregated waste facilities available, in use and in good condition?		
Are skips covered (where appropriate)?		
Are hazardous waste stores being		



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used and in good condition?		
Have all waste consignment notes been completed for the day?		
Are relevant drains sealed?		
Have visual inspections been undertaken for ecological pollution?		

G. Appendix F. Permits and Consents Programme

H. Appendix G. Arboricultural Implications Assessment

I. Appendix H. Site Waste Management Plan



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Northern Distributor Road

Outline Site Waste Management Plan

November 2013

Norfolk County Council


Northern Distributor Road

Outline Site Waste Management Plan

November 2013

Norfolk County Council

County Hall, Martineau Lane, Norwich, Norfolk, NR1 2DH



Issue and revision record

Revision	Date	Originator	Checker	Approver	Description	Standard
0	30/09/2013	N. Agbasiere/	A. Manns	D. Dray	Outline	

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1 Administration and planning

1.1 Introduction

1

This Site Waste Management Plan (SWMP) has been developed for the NDR Development in accordance with the Site Waste Management Plans (SWMP) Regulations 2008 and the "Non-statutory guidance for site waste management plans", April 2008, DEFRA, to ensure that all construction waste is managed, stored and disposed of in an appropriate manner by appropriate contractors in accordance with all relevant legislation. The SWMP has been produced using the information currently available at the time of issue.

This document is a live document and requires updating regularly as the project progresses.

The project scope is subject to change and the SWMP will be updated to reflect any changes as necessary.

The purpose of this SWMP is to enable the issue of waste production to be dealt with in a structured and auditable manner from the commencement of the project through to construction and post construction.

Waste minimisation should be emphasised from the outset, during all design phases, commencing at outline design, through to construction. This is to ensure that the waste produced during the construction phase is dealt with in accordance with the relevant Duty of Care legislation and principles outlined within the Waste Hierarchy (reduction, reuse, recovery and recycling).

Best practice suggests that the SWMP approach should be applied from the very early design stages through the concept of Designing out Waste and carried forward and revised throughout the project delivery process. This ensures cost savings are maximised by considering waste minimisation initiatives and identifying opportunities to reduce, reuse or recycle waste materials in the scheme and improve resource efficiency during the design stage on into construction.

There are a number of works associated with the construction Northern Distributor Road (NDR) that are a direct consequence of the project. These encompass works to the existing roads, footpaths, cycleways, bridleways and private access tracks that are crossed by the NDR, including alterations to these as well as the provision of new facilities to link with the existing access network. The NDR will also necessitate the diversion of a number of existing private access tracks, in addition to the provision of new tracks in some locations along its route. These 'associated works' are described within this report.

The NDR will require modifications to some local utilities and services where these cross the footprint of the development. Discussions are underway with the relevant service/utility providers in accordance with the New Roads and Streetworks Act 1991 (NRSWA). The final design of these diversion works has yet to be finalised and agreement also needs to be reached with each provider as to who will be responsible for carrying out the works. This report therefore describes typical construction methods for the utility works and these have been assessed in the Environmental Statement (ES) supporting the planning application.



1.2 Site location

The Scheme (the Norwich Northern Distributor Road, known as the NDR) is a dual carriageway allpurpose strategic distributor road, which would link the A1067 Fakenham Road, near Attlebridge to the A47 Trunk Road (T) at Postwick. This will be over a length of approximately 20.4km. See General Arrangement Plans included in Chapter 2 of The Scheme Description, which also provides a full description of the NDR.

The NDR consists of a dual two-lane carriageway with intermediate junctions connecting it to existing radial roads, running east to west across principally open agricultural land to the north of Norwich, from the Broadland Gate roundabout at Postwick, where it connects with the A47, to the A1067 Fakenham Road..

The alignment includes 8 at-grade roundabout junctions, 2 grade-separated junctions and 7 bridge crossings.

1.3 Surrounding area

2

The geology along the NDR proposed route has been determined through a comprehensive site investigation which was undertaken by May Gurney between August 2006 and June 2008. The works comprise an analysis of the information identified through borehole and machine excavated trial pits. Soils samples were collected and tested for contamination.

Across the NDR route, the ground stratigraphy consists of alluvium, brickearth, glacial sands/gravel, crag and upper chalk. The main composition of the brickearth is fine grained sand, with subordinate gravel, with a sandy clay or till at the bottom.

The current use of land along the proposed NDR route is predominantly agricultural. A Phase 1 investigation on A47 Longwater Junction, New Costessey was completed by Mott MacDonald in June 2008 which showed that there are no apparent historical sources of contamination within the site boundary. However, contamination has been associated with the movement of vehicles along the A47. Contaminants present on-site include oils, hydrocarbons and heavy metals from fuel spillages. These may have run-off during wet periods and also may have been dispersed through the highway drainage system.

Potentially contaminated land along the route includes a former airline crash, of which the extent and nature of contamination is unknown. Norwich airport is designated as a potentially polluted area and the route crosses the disused runways and passes around the northern boundaries of the airport. There is an active and an inactive railway, which will be crossed by the route. These are both potentially contaminated. An inactive waste site, which received up to 75,000 tonnes per annum of inert waste between 1980-1985, is adjacent to the route and hence is a potential source of contamination.



1.4 Development description

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The Scheme (the Norwich Northern Distributor Road, known as the NDR) is a dual carriageway allpurpose strategic distributor road, to be classified as the A1270 Principal Road, which would link the A1067 Fakenham Road, near Attlebridge to the A47 Trunk Road (T) at Postwick,. This will be over a length of approximately 20.4km. Refer to the General Arrangement Plans in document number 2.6.

General Description: Scheme Route (This may be subject to minor revisions)

From west to east, the NDR is proposes to start at a new at-grade roundabout junction on the A1067 Fakenham Road, located to the west of Taverham. It would then continue eastwards as a dual carriageway to its new at-grade roundabout junction with the C262 Fir Covert Road. From this roundabout, the NDR would then cross the Marriott's Way (a permissive path providing a pedestrian, cycling and horse riding facility along the route of a disused railway) which will be taken across the NDR via a new bridge), to a new at-grade roundabout junction with the C261 Reepham Road. The NDR would then continue southeastwards, crossing Bell Farm Track/Horsford Restricted Byway No. 5 (which will be taken up over the NDR via a new Restricted Byway and private access accommodation bridge) before connecting with a new at-grade roundabout junction, just west of the existing C282 Drayton Lane, and which new roundabout will have two new link road connections, one with the C261 Reepham Road and one with the B1149 Holt Road, to replace the existing Drayton Lane.

From here, the NDR would then continue south-eastwards to a new grade-separated junction (provision of a bridge over the NDR with slip roads to/from the NDR) with the A140 Cromer Road, located close to and just northwest of Norwich International Airport. The provision of this grade-separated junction will require the stopping up of lengths of the B1149 Holt Road and Holly Lane (U57142), as well as a length of the A140 Cromer Road, which will be replaced by a new highway west of its existing position, which will betaken over the NDR and provide the connection for its four connecting slip roads. East of the A140, the NDR would continue as a dual carriageway, turning north-eastwards around the northern boundary of the airport to a further new at-grade roundabout junction at the northern tip of the airport. The primary purpose of this roundabout is to allow the NDR to undertake a roughly 90 degree change of direction around the Airport site. From this roundabout, the NDR would continue south-eastwards, skirting the north east boundary of the airport, before turning eastwards and passing under a new highway, which be carried by bridge over the NDR, immediately to the east of the existing C246 Buxton Road, and which would provide the new connection for its realignment sections north and south of the NDR. The route of the dual carriageway NDR would then continue eastwards through the north of Beeston Park. It would then connect with both the B1150 North Walsham Road and the A1151 Wroxham Road via a new at-grade roundabout at each location, before turning south eastwards and entering the north eastern section of Rackheath Park approximately 250 metres from the western end of Sir Edward Stracey Road (U57538). It would then continue south eastwards, passing under a new bridleway and access bridge across the NDR, some 200 metres south west of the junction of Newman Road (U57490) with Long's Crescent (U57852).

The NDR would then connect with the C283 Salhouse Road via a new at-grade roundabout, before rising up on an embankment (maximum height approximately 8.5 metres), to cross both the Norwich to Cromer &



Sheringham rail line and the C874 Plumstead Road on individual bridges in close proximity, prior to a new at-grade roundabout on the NDR, which would connect it via a new link road to a further small at-grade roundabout on the C874 Plumstead Road.

The NDR route would then continue southwards, crossing under the C442 Middle Road (which would be raised to pass over the NDR, on its existing alignment, via a new bridge) before connecting with a new atgrade roundabout known as the Business Park Roundabout.

At this point a single carriageway link is provided westwards to the existing C829/C830 Broadland Way/C831 Peachman Way roundabout and includes an at-grade roundabout on the link road to the proposed Broadland Gate Business Park.

From the Business Park roundabout the NDR proceeds southwards as a dual carriageway to a new Postwick north east at-grade roundabout immediately north of the A47(T) Norwich Southern Bypass. This roundabout has links from a new A47(T) eastbound diverge slip road and a new A47(T) eastbound merge slip road. The NDR continues over the A47(T) as a four lane carriageway, one lane north and three south, on a new bridge and terminates at its southernmost point at a signalised junction, which replaces the existing Park and Ride roundabout with the A1042 Yarmouth Road.

This signalised junction provides further links:

- Directly to and from the park and ride site for buses;
- West to the existing Postwick North West roundabout, via the existing Postwick bridge over the A47(T);
- East to the proposed park and ride site entrance at the proposed Oak's Lane roundabout and further east to the Brundall Low Road junction with the A1042 Yarmouth Road to Postwick village; and
- West to the A47(T) via an existing westbound merge slip road.

The works at Postwick Junction, will include modifications to the existing Postwick north west roundabout (as a result of closing the existing eastbound diverge slip road) and to the existing A1042 Yarmouth Road overbridge of the A47(T), to provide revised traffic lanes and the provision of a shared use cycle/footway.

The route of the NDR that has been described above is, for the majority of its length, within Broadland District. It does, however, for a short stretch close to Norwich International Airport, fall within the administrative area of Norwich City Council. A very small part of the works at Postwick falls within the administrative area of The Broads Authority. The new road from west to east runs through the following parishes:

Attlebridge;

- Taverham;
- Drayton;
- Horsford;



- Horsham St. Faith and Newton St.Faith;
- Spixworth;
- Beeston St. Andrew;
- Sprowston;
- Rackheath;

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- Great and Little Plumstead; and
- Postwick with Witton.
- Overview of scheme features

As described above, the scheme consists of a number of different features which are detailed further below. The location of the proposed Scheme features is measured by reference to the "chainage", which is the distance from the start of the scheme, at its junction with the A1067 Fakenham Road, in metres.

There will be ten new highway structures, which consist of six overbridges and four underbridges carrying the following existing routes, or new routes as necessary, either under or over the NDR.



Overbridges:

Overbridge	Chainage
Marriott's Way – permissive path providing a pedestrian, cycling and horse riding facility along the route of disused railway	2390
Bell Farm Track – Horsford Restricted Byway No. 5 and private means of access	3980
New A140 Cromer Road	6800
New road - C246 Buxton Road replacement	10940
Private means of access and new bridleway leading from Newman Road (U57490)	15500
C442 Middle Road	18060

Underbridges:

Underbridge	Chainage
Norwich to Cromer & Sheringham railway line	16920
C874 Plumstead Road	17010
New flood culvert/bat underpass which will be located to the west of Rackheath	14810
A47 Trunk Road at Postwick	20220

Grade separated junctions:

Junction	Chainage

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A140 Cromer Road (to include eastbound and westbound merge and diverge slip roads)	6800
A47 Trunk Road at Postwick (to include new roundabout east of the existing roundabout with provision of new eastbound diverge and eastbound merge slip roads to/from the A47(T))	19450 - 20400

At-grade roundabout junctions:

Junction	Chainage
A1067 Fakenham Road	510
C262 Fir Covert Road	1750
C261 Reepham Road	2910
New Highway links just west of C282 Drayton Lane	5330
B1150 North Walsham Road	12100
A1151 Wroxham Road	14240
C283 Salhouse Road	16100
C874 Plumstead Road (South)	17300

On-line access roundabouts:

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Access roundabouts	Chainage
Northernmost point of Norwich Airport to include a new highway access to the Petans offshore training facilities and secure access to Norwich International Airport	9120
At the proposed Broadland Gate Business Park location to link theNDR to the proposed Broadland Gate Link Road	19450 – 20400

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Off-line roundabouts

Off-line roundabouts	Chainage
C282 Drayton Lane/B1149 Holt Road junction	Off-line
C874 Plumstead Road (North)	Off-line
Proposed site of the Broadland Gate Business Park, off the Broadland Gate Link Road	Off-line

Major/minor priority junction:

Junction	Chainage
C282 Drayton Lane/C621 Reepham Road	Off-line

Bat gantries:

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Bat gantry	Chainage
Along the line of Attlebridge Restricted Byway No.3	760
Along the line of track to Glebe Farm	5780
Approximately 150 metres south west of Quaker Farm	10020
Approximately 150 metres north east of North Park Cottage	12650
Along the line of track approximately 400 metres east of Park Farm	13140

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Along the line of track approximately 250 metres north west of Oak's Farm	17730
Parallel with Smee Lane (U59400)	19000

To convey natural runoff under the NDR, a number of culverts will be provided.

Road closures:

Road closures	Chainage
Breck Farm Lane (U57168) to the south of the NDR	2525
Furze Lane (U57168) to the north of the NDR	2525
C282 Drayton Lane – a 892 metres length from its junction with the C261 Reepham Road	5350
B1149 Holt Road to north of the NDR	6600
Holly Lane (U57142) to the South of the NDR	6600
C251 Bullock Hill to the North of the NDR	8900
Road closure	Chainage
Quaker Lane (U57188) to the North of the NDR	9820
C251 St Faiths Road to the South of the NDR	9990
C258 Broad Lane at its junction with C874 Plumstead Road/Norwich Road	17010
C258 Broad Lane at its junction with C874 Plumstead Road/Norwich Road Low Road (U59392) to the east and west of the NDR	17010 18380
C258 Broad Lane at its junction with C874 Plumstead Road/Norwich Road Low Road (U59392) to the east and west of the NDR Smee Lane (U59400) to the east and west of the NDR	17010 18380 19000

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A length of the existing A47(T) eastbound merge slip road, from its junction with	
Postwick North West roundabout, eastwards to the connection point with the new	19500
A47(T) eastbound merge slip road	

Public and private Rights of Way to be stopped up/diverted

Tracks and Rights of Way	Chainage
Private: Access Track running north-south between the A1067 Fakenham Road and Attlebridge Restricted Byway No.3, to the north aof the NDR)	700
Public: A 386 metre length of Attlebridge Restricted Byway No. 3, north westwards from its junction with the A1067 Fakenham Road (a diverted route from the northern side of the A1067 Fakenham Road Roundabout to be provided)	760
Private: A length of Access Track running along a co-existent route with Attlebridge Restricted Byway No.3, to the north of the NDR	760
Private: Track running from the C261 Reepham Road to Glebe Farm on B1149 Holt Road, to the north and south of the NDR	5150
Public: Horsford Restricted Byway No.7 – a 60 metre length from its junction with the C282 Drayton Lane	5300
Private: Track at the southern termination point of C250 Old Norwich Road, to Norwich International Airport Control Tower and Airport curtilage, to the north of the NDR	7900
Public: Spixworth Bridleway No.1, to the east of the NDR	9800
Public: Horsham St. Faith and the Newton St. Faith Bridleway No.6, to the west of the NDR	8900
Private: Track leading north of Red Hall Farm, Beeston Lane (U57186), to the north and south of the NDR	11730
Private: Track leading north off Beeston Lane (U57186), approximately 400 metres east of Park Farm, to the north and south of the NDR	13150



Private: Track leading south west from the C258 Green Lane West, to the pumping station , to the north and south of the NDR	14800
Private: Track leading from the existing Newman Track west of Gazebo Farm in the northerly direction for approximately 250m.	15200
Private: Track leading from the realigned Newman Track on the east of overbridge leading northwards for approximately 80m.	15500
Private: Track leading southwards from Newman Road (U57490)/Long's Crescent (U57852) junction, over its length to the circulatory track around March Farm, Park Gardens etc.	15500
Private: Track leading fromC258 Green Lane West to Hall Farm, west of the NDR	15800
Public: Great and Little Plumstead Footpath No.5, to the north and south of the NDR	18750
Public: PostwickFootpath No.2 – a 700 metre lenth from its junction with the A1042 Yarmouth Road.	19000

Private Rights of Way Closures:

Tracks and Rights of Way	Chainage
Private: Access Track leading from the C261 Reepham Road, opposite Long Dale (U51249), to Dog Lane (U57176), to the north and south of the NDR	3750

Diversions of Tracks and Rights of Way

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Track and Rights of Way diversions	Chainage

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Public: Attlebridge Restricted Byway No. 3 (to the North of the NDR) diverted alongside the NDR to join the Fakenham Road roundabout.	750
Public: Drayton Restricted Byway No. 6 diverted north of Reepham Road roundabout to join the roundabout.	3000
Public: Horsford Restricted Byway No. 5 diverted over the new Bell Farm Overbridge.	3950



New links

Approximately 25 kilometres of new links suitable for use by pedestrians, cyclists and equestrians where permitted would be provided alongside, over, and connecting with, in places, the NDR route, together with improved surfacing provided on some existing rights of way.

The new links provided for use by pedestrians, cyclists and equestrians would be provided alongside the NDR route within the landscape strip. These would link to existing facilities and be screened from the NDR carriageway by a combination of low mounds and/or hedge and tree planting.

Where individual or joint access to premises will be severed by the NDR, new accesses will be provided to link these to the NDR or to other existing roads, other than where the premises are already served by another reasonably convenient means of access

Statutory undertakers

Utility works:

Utility company	Number of diversions
EDF	22
Government pipelines	1
National Grid Gas	9
National Grid Gas (High P)	1
Utility company	Number of diversions
British Telecom	16
Anglian Water (potable)	16
Anglian Water (Sewers)	7



Biffa	1
Virgin Media	1

Complementary works

It is proposed to carry out the following off-line complimentary works:

- Relocation of the C258 Green Lane West junction with the A1151 Wroxham Road, by provision of a new highway connection from the C258 Green Lane West to the A1151 Wroxham Road, 75 metres to the south west of its existing junction, together with closure of the existing junction and turning the remaining C258 Green Lane West into a residential cul-de-sac;
- Closure of the C249 Rackheath Lane at its junction with the B1150 North Walsham Road, together with widening of the C249 Crostwick Lane arm of the junction;
- Highway improvements measures on the C874 Plumstead Road through Thorpe End; and
- The provision of a shared use footway/cycleway, within the northern highway verge of the C261 Reepham Road, between its junction with Horsford Restricted Byway No.5 and Long Dale (U51249)

Lighting

The majority of the proposed scheme will not be lit. The exception to this is the Postwick Junction area of the scheme which will provide lighting as follows:

Illumination	Chainage
From the Business Park roundabout westwards to the C829 Broadland Way/C831 Peachman Way roundabout.	19450 - 20400
From the Business Park roundabout southwards to and including the Postwick North East roundabout.	19450 - 20400
South from the Postwick North East roundabout across the new NDR overbridge of the A47(T) to the signalised junction on the A1042 Yarmouth Road.	19450 - 20400
The A1042 Yarmouth Road signalised junction.	19450 - 20400
On the existing A1042 Yarmouth Road bridge over the A47(T).	19450 - 20400

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From the existing A1042 Yarmouth Road bridge over the A47(T) to and including Postwick North West roundabout.	19450 - 20400
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Proposed Traffic Regulation Orders

In addition to the above scheme features, it is proposed that the following Permanent Traffic Regulation Orders will be brought into effect:

- Clearway for the entire length of the NDR between and including the A1067 Fakenham Road roundabout and A47(T) at Postwick and roads forming the Postwick Hub junction and Broadland Gate link;
- Amendment to speed limits on existing routes where these are bisected on the NDR;
- Extension of the existing 30 mph speed limit on C442 Middle Road westward to a point immediately
 west of the proposed bridge over the NDR, to include the built-up extents of Toad Lane closest to
 Middle Road;
- 40mph speed limit to roads forming the Postwick Junction, South of and including the proposed Broadland Gate link.Prohibition of entry on diverge Slip Roads at the A140 Cromer Road junction and Postwick North East Roundabout;
- 30 mph, 40mph and 50mph speed limits on the Drayton Lane Link Road.
- Extension of 30 mph speed limit on the B1149 Holt Road to include the new roundabout.
- Extension of 30 mph speed limit on the C283 Salhouse Road.
- Extension of 40 mph speed limit on the C874 Plumstead Road/Norwich Road.
- 40 mph speed limit on new Plumstead Road Link Road.
- Amendments to existing 7.5T weight restrictions on the U59400 Smee Lane, the U59393 Low Road, the U57188 Quaker Lane and the C251 Saint Faiths Road.
- Prohibition of Motor Vehicles on the C282 Drayton Lane at its junction with the C261 Reepham Road.
- Prohibition of Motor Vehicles on the C249 Rackheath Lane at its junction with the B1150 North Walsham Road.
- Prohibition of Motor Vehicles on the C258 Green Lane West at its junction with the A1151 Wroxham Road.
- Prohibition of Motor Vehicles on the C258 Broad Lane (north-western leg) at its junction with the C874 Norwich Road.
- Prohibition of Motor Vehicles (except for buses) at the western entrance to the Postwick Park and Ride site.

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1.4.1 Temporary Works

A site compound will be located on the Airport land north of the NDR, which will have welfare facilities and parking for staff and operatives. A plant storage and maintenance compound will also be provided at this location as well as a recycling yard for storing recycled materials. Two satellite compounds will be constructed to provide office, parking and plant storage facilities to the North West of Drayton Lane and also at Postwick which will be retained for the construction of the NDR. Smaller compounds will also be established at each of the bridge sites to provide welfare facilities, parking and material storage associated with their construction. These will be reinstated after the construction is completed.

1.5 Project information

Client	Norfolk	County C	ouncil			
Principal Contractor	Birse					
Name of person in charge of project	TBC					
Author of SWMP	Nnenna	Agbasiere	•			
Project title/ reference	Northern	Northern Distribution Road (NDR)				
Project location	The 20.4 the A47	lkm NDR I at Postwic	inks the A1067, k	Fakenham	Road at Attle	bridge to
Project cost (estimated)	TBC					
Footprint (ha)	TBC					
Start date	Day	Х	Month	Х	Year	Х
Completion date	Day	Х	Month	Х	Year	Х
Description of project scope	TBC					
Waste Management Champion	TBC					
Person responsible for SWMP	TBC					
Document Controller	TBC					
Version number and date	Version	1 – 14/11/	2013			
Location of SWMP	Site offic	e				

1.6 Responsibilities

1.6.1 Client and Principal Contractor

The Client has initiated the production of the SWMP, which has been undertaken by the project designers and consultants. This will assist in steering the direction of the SWMP and influence the waste management options to be adopted by the Principal Contractor.

As this project is at the planning stage, a Principal Contractor has not yet been appointed. Once this has occurred the Principal Contractor should take on the responsibility for adopting the SWMP and updating it as the project progresses.



1.6.2 Construction Manager

The Construction Manager is responsible for instructing workers, overseeing and documenting results of the SWMP and will monitor the effectiveness and accuracy of the documentation during the routine site visits. Copies of the plan will be distributed to the CDM coordinator, Client, Site Manager and each contractor. This will be undertaken every time the plan is updated.

1.6.3 Waste Co-ordinator and Waste Champion

Although the proposed scheme is currently at the planning stage and has not appointed a Principal Contractor, it is important that someone is assigned responsibility for waste issues at an early stage. This could be implemented in the form of a Waste Co-ordinator within the project team, in order to oversee the integration of the SWMP into other aspects of the project and to liaise with the Principal Contractor once appointed, who will then appoint a site Waste Champion.



2 Proposals for minimisation, reuse and recycling waste

2.1 General measures

The SWMP should be used to record any early decisions, design changes, construction methods or material specifications which have helped to minimise waste arisings on site in order that the Principal Contractor knows the measures taken to reach the decisions and how the project is expected to be undertaken.

Waste minimisation is at the top of the waste hierarchy and this should be considered to be a priority throughout the project.

Waste from the project will arise mainly from site clearance, excavation and any unavoidable construction waste. The proposed scheme will require specific construction materials (such as asphalt, concrete, and cabling etc.) to be imported to the site. The Bill of Quantities has been used to identify the potential types and quantities of materials produced from this project.

The person responsible for purchasing shall ensure that materials are ordered so that the timing of the delivery, the quantity delivered and the storage is not conducive to the creation of unnecessary waste.

Waste for recycling, recovery and disposal, where it cannot be reused back in the scheme should be sent to appropriately permitted facilities. A non-exhaustive list can be found in Tables 3.3 and 3.4. However, it is recommended that the sites are contacted prior to construction to ensure they are able to accept the waste types being removed.

A cut and fill balance will be achieved for the earthworks associated with the NDR. Excavated material will be used to form the structural embankments, landscape areas and bunds and granular material will be used to form the sub-base for the main carriageway where it will be stabilised with cement.

The road surfacing will be constructed with bituminous material delivered from Tarmac's coating plant in both Norfolk and Suffolk. The delivery of this material will be made by road vehicles.

Materials storage areas will be identified at the main construction compound adjacent to Norwich Airport and within the planning application site boundary adjacent to the bridge locations. Materials will be transported around the site by road vehicles.

Actions to be taken to facilitate resource efficiency throughout the project, and therefore minimise waste produced, are detailed below:

Demolition materials

Material arising from the demolition of any existing build on site shall be carefully stored in segregated piles for reuse on site, if possible. If any material deemed acceptable from the enabling works is produced e.g. good quality topsoil, this should be stored and re-laid, within the project or if this is not possible should be sent for composting or reuse elsewhere.



Excavated materials

The NDR scheme has been designed with a cut/fill balance such that all excavated materials will be transported to fills, bunds, landscape areas or for use in the manufacture of the sub base materials. Therefore it is anticipated that no excavated material will need to be disposed of offsite. Any contaminated material encountered will be reviewed as to whether it can be incorporated into the scheme.

Excavated soils and clay should be carefully stored in segregated piles on chosen areas along the NDR route for subsequent reuse along the route. The soils and clay will be reused as deposition material for infilling other areas along the route (e.g. junctions, balancing and bunding) or landscaping. In addition the soils and clay will be used to infill the excavated borrow pits that have been highlighted for use during construction. Any surplus soils and clay will be removed from site for direct beneficial use elsewhere (such as land remediation projects) or for recycling or recovery at an appropriately permitted off-site facility. If the material is contaminated then it should be kept separate from the clean material and sent for either recycling or recovery, where appropriate, or disposal at appropriately permitted facilities.

The project will examine the potential re-use and disposal options for excavated material produced as part of the scheme and in particular re-use options for glacial sand and gravel. Where re-use is not possible there will be a requirement to dispose of excavated material, by licensed carriers, to permitted landfill sites and handled in accordance with the Environmental Permitting Regulations 2010 as amended.

Unacceptable material

Other unusable Construction, Demolition and Excavation (C,D&E) waste materials will be collected in receptacles with mixed C&D waste materials, for subsequent separation and disposal at an off-site facility.

Concrete

Concrete will be taken up and should be source segregated, for recycling either as fill/capping on site and/or removed to an off-site facility. All existing concrete will be broken up and stored in the main compound prior to crushing for reuse as sub base on the side roads or roundabouts. Similarly all existing paved areas within the works will be planed out for similar reuse.

Tarmac

Tarmac will be taken up and reused on site for either tarmac hardstanding, capping or for sub base. The provision of storage facilities at the main compound to accept road planings from other highway schemes within the County is being considered.

Metal

Where metal material items e.g. signage, supporting structures or fencing, arise they will, where considered possible, be reclaimed and utilised within the scheme. Any metal that cannot be utilised will be sent off-site for recycling at an appropriate site.



Vegetation

In order for construction to take place, areas of vegetation comprising mainly of grassland, some mature trees and hedges will require clearance. Any vegetation removed will be sent for composting. If landscaping is part of the scheme then any vegetation could be turned into mulch or compost to be reused back in the scheme.

If any material deemed acceptable from the enabling works is produced e.g. good quality topsoil, this should be stored and re-laid within the project, or if this is not possible, should be sent for composting.

Hazardous waste

Hazardous wastes including any contaminated soil materials will be identified, removed and kept separate from other C&D waste materials in order to avoid further contamination and will be disposed of in accordance with the Hazardous Waste (England and Wales) Regulations 2005.

Asbestos based materials and other contaminants are not believed to be present, however, should asbestos be suspected or encountered, it will be managed by an appropriately qualified contractor.

All asbestos will be removed off site in accordance with legislation and disposed of in an appropriately permitted site by a licensed contractor in accordance with all appropriate regulations.

Imported material

Surplus or waste materials arise from either the materials imported to site or those generated on site.

Where possible, consideration will be made for the reuse of material back into the project however the proposed scheme will require specific materials to be imported to the site.

Any waste produced through the importation of materials will be monitored and included in the SWMP under construction works. Where possible, consideration should be given to the use of recycled imported material such as concrete with a high recycled content. However, due to the integrity of the material required for the structure this may not be considered a suitable method.

Waste from imported material is likely to come from the packaging and spillages but these cannot be quantified at this stage..

Packaging

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Any packaging waste should be source segregated for recycling or returned to suppliers. If feasible the use of pre-fabricated material should be used and imported to site. In certain circumstances this will reduce the amount of packaging required. Standardisation/use of modular sizes is also recommended in order to reduce off cuts.



New build waste

Final fit out of the infrastructure should be done in conjunction with the client and not to an assumed design specification in order to reduce wastage of materials. New build waste can be defined as:

- Vegetation waste which will be shredded and mulched for reuse in the re-soiling operation;
- Concrete waste, which will be collected for crushing; and
- Timber and steel waste, which will be collected and disposed of offsite for reuse/recycling in the appropriate skips.

2.2 Materials resource efficiency

Waste Minimisation statement	The purpose of the Site Waste Management Plan is to facilitate the principles of the waste hierarchy and to minimise the production of waste from the outset of the project. Such measures are to be incorporated into the design and implemented in the construction stages of the project. This is in addition to ensuring correct waste disposal procedures in accordance with the Waste Duty of Care provisions. This will be achieved by ensuring that wherever possible existing materials excavated at the Northern distribution Road site are reused. Where waste cannot be re-used or recycled, it shall be disposed of in accordance with the Landfill Directive (1999/31/EC) and Waste Acceptance Criteria procedures.
	Acceptance official procedures.

Table 2.1 highlights the various objectives for minimising waste during the site works. It demonstrates the components and decisions involved in ensuring a reduction in the amount of waste and surplus materials being produced during any works on site. This has the effect of minimising the amount of material which would traditionally be sent to landfill and to ensure a cradle to cradle approach¹.

¹ Products and systems that eliminate the concept of waste.

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Table 2.1: General material resource efficiency measures to be considered for the proposed Northern Distributor Road development

Planning waste minimisation during construction	Waste minimisation decisions taken	Resource saving	Responsibility	Start date
Nature of project	See Waste Minimisation Statement	² See footnote	Project Manager	
Design	Enabling the purchase of materials in shape/dimension and form that minimises the creation of off-cuts/waste.	Minimal waste will be produced.	Project Manager	From the design outset
	Consideration should be given to the use of pre-fabricated units where possible.			
	Specifying materials and producing the resulting Bills of Quantities that allow wastage to be minimised.			
	Due to potential contamination, chemical testing would need to be undertaken to determine composition of the material and subsequent opportunities for re-use or remediation.			
Construction methods	The works consist of material excavation, laying of foundations and construction of a highway and associated works.	Minimal waste produced.	Project Manager/ Site Manager	During design and planning stages and implemented during the construction.
	Sequencing the works such that re-use of materials can be undertaken.			
	Consider whether previous or subsequent phases produce or require material considered not to be required for that phase that can be reused in later phases.			

² The above table demonstrates the components and decisions involved in ensuring a reduction in the amount of waste and surplus materials being produced during the works at the Northern Distributor Road site. This has the effect of minimising the amount of material which traditionally would be sent to landfill and to ensure a cradle to cradle approach.

Northern Distributor Road Site Waste Management Plan



Planning waste minimisation during construction	Waste minimisation decisions taken	Resource saving	Responsibility	Start date
Materials	Consider whether previous or subsequent phases produce or require material considered not to be required for that phase that can be reused in later phases. Ordering of material and equipment should be done in line with the Bill of Quantities. Assess the quantities of materials required on site. Just in time delivery (as needed basis) to prevent over supply Secure storage to minimise the generation of damaged materials/ theft. Keeping deliveries packaged until they are ready to be used. Inspection of deliveries on arrival Increase the use of recycled content; this could include traditional use of recovered material such as crushed concrete demolition waste and by procuring mainstream manufactured products with higher recycled content than their peers. Quick win areas of the project in which to implement this for could be concrete frames, flooring and brick/block work.	Prevents lost time in re- ordering of damaged equipment, reduces need for storage if over ordering takes place. An increase in the demand for such products would reduce the quantity of waste going to landfill. Recycled material use results in a reduction in demand for extraction of virgin materials and subsequently a reduction in the projects carbon and environmental footprint.	Project Manager/ Site Manager	During construction planning and throughout the project construction. During design and throughout the procurement/ construction stages of the project
Other	Decommissioning of any existing structures containing electrical or electronic equipment.	Reduction in waste sent to landfill as in conjunction with the Waste Electric and Electronic Equipment (WEEE) Regulations, possible financial benefits	Project Manager	



The suggested waste minimisation measures outlined above are limited to best practice with regard to material ordering and storage. Further benefits could be made through material reuse, which should be incorporated into the project design. It is anticipated that the contractor(s) (once appointed) will endeavour to reuse or recycle materials on the project where possible.

Table 2.2 shows a summary of proposed and recommended minimisation measures that can be taken to appropriately reuse or recycle waste produced on site during the excavation and construction of the development.



Table 2.2: Summary of proposed and recommended minimisation measures

Summary of proposed and recommended minimisation measures						
Use of prefabricated elements	Recommended	It is recommended that as much of the construction as possible will be carried out off site, with prefabricated				
		Some elements such as kerb stones/access ramps, and drainage pipes can be pre-fabricated offsite to minimise on-site waste arisings and associated vehicle movements.				
		These units will generate less on-site waste through off-cuts and storage damage.				
		Units should be sourced from a supplier that recycles off-cuts and materials at the pre-fabrication site, otherwise, this measure simply shifts the waste problem from one location to another.				
Excavation	Proposed	Excavation is likely to be for roads (and the laying of the porous car parking) and foundations. It is anticipated that any waste produced through the construction of the roads and foundations will be cut and fill and be reused elsewhere on site.				
		Surplus excavated materials including soils, gravels and man-made fill can potentially generate the largest quantities of all the waste streams with significant implications on disposal costs if it cannot be reused on site.				
		Where material is required to be excavated; it is proposed that this material, where appropriate, will be stored for re-use as landscaping material or infilling.				
Minimisation of vegetation clearance at the design phase	Recommended	Clearance of vegetation has the potential to be insignificant due to the nature of the area.				
		Identify, during the design phase, ways to minimise the loss of vegetation on site. Where minimisation is not possible, composting or mulching the vegetation should be considered for reuse in landscaping within the scheme.				
Minimisation of contaminated land arisings	Recommended	Where possible, contaminated land should be remediated and reused on site, or, if found to pose no risk to receptors (e.g. groundwater and human health) should be left undisturbed. The latter can minimise potential transport and disposal costs. This approach should be standard practice among designers and contractors.				
Contractor targets	Recommended	The Principal Contractor should consider setting off-cut/surplus targets for sub-contractors with a positive incentive scheme for on-site waste champions.				
		Good practice suggests that 3% wastage rate based on the total amount of construction material handled on site is achievable.				
Avoiding over-purchasing and accurate delivery times	Recommended	Over-purchasing can lead to significant wastage and should be avoided in the first place.				
		Ensuring materials are ordered for delivery shortly before they are used on the project would also avoid possible damage and therefore wastage.				
Use of take back schemes	Recommended	Some suppliers offer a take back scheme, which should be utilised where practicable, particularly for packaging and pallets.				



Summary of proposed and recommended minimisation measures						
Monitoring and review	Recommended	The Principal Contractor should use the waste data provided from the waste removed from the project and the periodic review process (required as part of the SWMP) to their advantage to assess whether the waste objectives are being met, and if not to review procedures to steer the project towards achieving them. This will require clear responsibilities to be identified, supported with authority and incentives to act on any deviations from the SWMP.				
Education and awareness	Recommended	Waste minimisation must be underpinned by education and awareness throughout all levels of the project team, from the design team to site contractors who handle the construction materials via site inductions and monthly toolbox talks which all contractors and site workers will be expected to attend.				
Consideration of End of Life materials	Recommended	Consideration should be given to what will happen to the materials specified, when they reach the end of their useful life. Where possible, elements should be designed for repair, modular repair, recycling at the end of life or safe disposal. The use of hazardous materials, in particular, should be minimised.				



2.3 Initial review of anticipated waste arisings

An initial review of the Bill of Quantities is required to identify potential and expected waste arisings required for this project. The aim of this review is to identify the waste streams anticipated to be encountered during the project, and consider the possible management options for these materials (which would include identification of suitable local waste management or disposal sites that can accept the waste).

This initial waste review considers the recycling and reuse potential of each waste stream anticipated and identifies some indicative benchmark recycling targets which could be used to steer the detailed SWMP as the project develops. It is intended that the Principal Contractor summarises the current estimates of the waste arisings and reuse or disposal quantities for these arisings in Section 5 of this SWMP.



Table 2.3: Initial review of anticipated waste arisings

Activity	Anticipated waste stream	Anticipated volume	Recovery potential	Overall priority for recovery	Indicative recovery target	Management options
Site clearance	Green waste	High	High	High	50%	Some green waste is likely to arise from the excavation and removal of the grass covering the abandoned areas. The removal of some mature trees and hedges may also be required in order to commence the construction of the development.
						Arisings removed from the scheme should be collected in skips and stockpiled on site. If it cannot be reused in the project it will need to be sent off-site for processing. A local merchant composting facility would be the most practicable treatment solution, but consideration could also be given to the use of council owned composting facilities if there is one available and it has sufficient capacity available to accept the waste.
						Timber arisings from any trees or hedges removed could be reused on site by chipping the material down for landscaping.
	Metal	Medium	Low	Low	100%	Any metal produced from site clearance including lighting columns, pedestrian barriers, piling etc, have the potential to be recycled off site. Lighting columns are to be replaced with new more efficient ones but the whole column has the potential to be sent for recycling.
Earthworks	Topsoil	High	High	High	75%	Undisturbed topsoil has excellent potential for reuse. Opportunities for reuse in landscaping should be identified
	Excavated natural ground	Medium	Medium	High	50%	Opportunities for the reuse of material as infill or as a base for any access routes should be explored. If the material is low grade subsoil there is potential to reuse this as a landscaping or infill material prior to the laying of topsoil.
	Excavated made ground	Low	Low	Low	5%	Due to the properties of made fill, opportunities to reuse the material compared to natural or topsoil are more limited. As the proposed development is on an existing site, the opportunities to recycle or reuse some of the excavated fill may be possible if permitted.
	Contaminated soil	Low	Low	Low	0%	A contaminated land site investigation will need to be carried out but it is not anticipated that any significant amounts of contamination will arise.
						Soil extracted will be subject to contamination testing (totals and leachability testing) for a suite of contaminants to assess levels of contamination present in the soil and suitability for reuse.
						Hazwaste online software can be used to determine whether the soil would be classified as hazardous, potentially hazardous and non-hazardous and further WAC testing (compliance testing) undertaken on those samples that indicate that the soils would require landfilling, to determine the appropriate landfill.
						All soil extracted (whether contaminated or not) will need to be stockpiled at the site.

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Activity	Anticipated waste stream	Anticipated volume	Recovery potential	Overall priority for recovery	Indicative recovery target	Management options
Construction General Site Waste	Concrete, bricks and mortar, slates	Low	High	High	100%	It is planned that much of the construction will be carried out off site, but there will be elements that need to be done on site such as foundations. This could potentially create waste through damage to bricks and paving slates and spillages of cement. Any arisings should be contained in an appropriate skip to be sent for off-site reprocessing.
	Bitumen road surface	Low	High	High	80%	Through careful ordering of materials it is likely that there will be very little (if any) waste generated from road surfacing activities. Any excess road-surfacing material can be reworked into a reusable form to enable use on future highway construction projects.
C c F V F V V r V V V V V V	Concrete drainage, kerbs and walls	Low	High	High	100%	Small quantities may arise, although pre-casting of the components prior to arrival on the site would reduce wastage in the first place. Any arisings should be placed in the skips and sent to a local recycling facility for crushing down and subsequent reuse on other projects.
	Hazardous waste (paints, resins etc)	Low	Medium	Medium	50%	These waste streams should be segregated from other waste streams in secure and bunded storage cupboards for subsequent identification and removal for treatment off- site at a hazardous waste facility.
	Packaging waste (plastics, wood, film, metal and cardboard	Low Low	Low	Medium	50%	This waste will predominantly consist of plastic sheeting, shrink-wrap, wooden pallets, metal strips (binding).
					Segregate each waste stream into colour-coded skips and remove off-site to an appropriate local facility for recycling.	
						Opportunities should be explored for supplier packaging take back schemes.
	Mess waste Medium (comprising of food waste but also mixed waste)	ste Medium Mediu ng of te but	Medium	um Medium	50%	Likely to comprise food waste and non-recyclable materials. Consideration should be given for providing separate bins for the collection of food waste, newspapers and non-recyclable materials.
						Food waste can be sent to an in-vessel composting facility, whilst non-recyclable (residual) waste will require landfilling. Another opportunity to be explored is to send the non-recyclable waste to an energy-from-waste facility.
-	Office waste (comprising of paper, cardboard, plastics and non-recyclable mixed waste)	Medium	Medium	Medium	50%	Likely to comprise paper, cardboard, metal cans and plastic bottles. All materials can be recycled. Offices should be equipped with bins to segregate each waste stream for collection and future recycling off-site. Consideration should be given for the use of a local material recycling facility, which would recover those waste streams for onward recycling.
	Welfare facilities waste (sewage sludge)	Medium	Low	Low	0%	Limited options to recover waste arising from on-site welfare facilities. Sewage sludge from the toilet facilities will be pumped out and sent to an appropriately licensed treatment plant. Other wastes such as paper towels, etc. are likely to require landfilling.


3 Waste management

3.1 Waste segregation

All construction related activities will be carried out closely with the waste management contractors, in order to determine the best techniques for managing waste and ensure a high level of recovery of materials for recycling.

A specific area shall be laid out and labelled to facilitate the separation of materials, where possible, for potential recycling, salvage, reuse and return.

Earthworks material (excavated soils and clay) including topsoil will be source segregated and stored to suit the method of construction. Where possible, the soils and clay will be stockpiled within the new fenced lines along the highway corridor. They may also be stored temporarily at the borrow pits, landscaping areas and balancing pond locations with the possibility of acting as temporary screening.

Recycling and waste bins are to be kept clean and clearly marked in order to avoid contamination of materials. Skips for segregation of waste identified currently are:

- Mixed inert (e.g. inert plastics, concrete and rubble);
- Green (e.g. mature trees, shrubs, grass);
- Hazardous (e.g., or heavily contaminated soils);
- Mixed non-hazardous (biodegradable waste, welfare waste, general waste);
- Metal (e.g. copper and iron);
- Wood (e.g. fencing/hoarding);
- Food (canteen waste);

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- Paper and cardboard (office waste); and
- WEEE: Waste Electronic and Electrical Equipment (e.g. cables, lighting).

Successful recycling relies upon early planning, educating teams, clear responsibility and space within a compound for segregation and storage. Shelter may be needed to prevent some materials such as cardboard and paper from deteriorating while being sorted or awaiting collection.

Discussions will be required between the Client and the Principal Contractor to identify space requirements within the compound to accommodate skips and storage of reusable materials. Details of site compound locations can be found in the section 1.4.1 - Temporary Works.

For all waste management options, consideration will need to be given for identifying whether waste exemptions or permits are required to enable the storage and treatment of waste materials.

Waste management options will be supported by the identification of appropriately permitted waste management and recycling facilities in close proximity to the site.



3.1.1 Classification of skips

Use sufficiently clear signage to ensure that construction workers are clear about where to put each type of waste. This reduces the levels of contamination in the skips and increases the likelihood that a load will not subsequently be rejected once the waste stream has been sent off-site for reprocessing. In cases where the load is rejected, the likely destination would be landfill (which would increase the costs of the project).

3.2 Contaminated land

The cost of hazardous waste treatment and disposal is significantly higher than treatment or disposal of non-hazardous or inert waste. Through identifying areas of contamination early on, the project layout and construction methods to be adopted could be amended to minimise the handling of such materials, potentially reducing the project costs. Contaminated land site investigations have been undertaken to identify any areas that could potentially comprise of contaminated soils and gravels. Details of the investigations can be found in Volume 2 Chapter 9 of the environmental statement. Any soils unsuitable for reuse and destined for landfill will be subject to a WAC (Waste Acceptance Criteria) test to determine the type of landfill.

3.3 Reuse of construction materials

Uncontaminated material will be reused, where possible, within the proposed improvement works for site levelling and fill. It is likely that there will be a requirement for importation of additional bulk fill materials for the project.

Any contaminated materials, which will not be re-used on-site, will be treated in accordance with all relevant legislation and best practice guidelines or at an alternative suitable site prior to disposal.

If applicable, surplus inert excavated materials with some engineering strength (e.g. stone, bricks, clay, rubble, rock) can be suitable for reuse in land reclamation projects, if one were proceeding at the same time as the proposed scheme. This would require compliance with the criteria and thresholds for an exemption (U1 or U11 may be applicable) or it may require a permit under the Environmental Permitting Regulations 2010 as amended. The CL:AIRE Code of Practice (CoP) may also be applicable for the reuse of this material. The material could be reused in other phases of the project or other schemes in the surrounding area, if one were proceeding at the same time, to avoid disposal at landfill and its associated impacts and costs, but would need to meet current legislative requirements.

3.4 Waste disposal characterisation

Under the Landfill (England and Wales) Regulations 2002 (as amended), waste is classified as Inert, Non-Hazardous and Hazardous. In order to determine the suitability of the landfill for the waste material being sent to it a Waste Acceptance Criteria (WAC) test will be required.



Hazardous waste cannot be re-used on site and may require additional treatment prior to disposal. There is a statutory requirement under the Landfill Directive (1999/31/EC as amended) to pre-treat any waste (including hazardous waste) prior to disposal off-site. Pre-treatment may reduce the costs of disposal by rendering the waste non-hazardous. Responsibility for the basic classification of waste rests with the Producer and Landfill Operator.

3.5 Forecasting and planning the reduction, reuse and recycling of waste

This section details expected waste arisings from the NDR.

Table 3.1 and Table 3.2 details the waste expected to arise from the enabling/demolition and construction works (respectively) and segregates the approximate amounts of waste into different waste streams. The overall aim is to prevent cross-contamination of waste types and to maximise reuse and recycling opportunities.

Material quantities are an approximate guide for efficient waste management best practice; the contractor should independently verify the quantities of waste materials likely to be produced during the works. Waste quantities specified within the SWMP are also subject to programme and design change. The current estimated wastes arising during excavation and demolition have been taken from the Bill of Quantities; a summary of which can be found in Appendix A.



Table 3.1: Estimated quantities of enabling/demolition waste

		Estimated Volumes	Trade Contractor	Waste Minimisation	On-site Reuse/	Off-site reuse/		
NDR Area	Material type	(m3)	Package	Opportunities	recycling	recycling	Recovery	Disposal
Fakenham – Fir Covert	Vegetation, topsoil, subsoils, sand & gravel, clay	28,579	TBC	TBC	Y	Y	TBC	TBC
Fir Cover Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	3,129	TBC	TBC	Y	Y	TBC	TBC
Fir Covert – Reepham	Vegetation, topsoil, subsoils, sand and & gravel, clay	66,553	TBC	TBC	Y	Y	TBC	TBC
Reepham Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	2,488	TBC	TBC	Y	Y	TBC	TBC
Reepham – Drayton	Vegetation, topsoil, subsoils, sand and & gravel, clay	77,461	TBC	TBC	Y	Y	TBC	TBC
Drayton Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	57,459	TBC	TBC	Y	Y	TBC	TBC
Drayton - Cromer	Vegetation, topsoil, subsoils, sand and & gravel, clay	87,791	TBC	TBC	Y	Y	TBC	TBC
Cromer Junction West	Vegetation, topsoil, subsoils, sand and & gravel, clay	30,214	TBC	TBC	Y	Y	TBC	TBC
Cromer Junction East	Vegetation, topsoil, subsoils, sand and & gravel, clay	9,077	TBC	TBC	Y	Y	TBC	TBC
Cromer – Airport	Vegetation, topsoil, subsoils, sand and & gravel, clay	140,312	TBC	TBC	Y	Y	TBC	TBC
Airport Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	9,993	TBC	TBC	Y	Y	TBC	TBC
Airport - Buxton	Vegetation, topsoil, subsoils, sand and & gravel, clay	152,931	TBC	TBC	Y	Y	TBC	TBC
Buxton Road	Vegetation, topsoil, subsoils, sand and & gravel, clay	5,466	TBC	TBC	Y	Y	TBC	TBC
Buxton – N. Walsham	Vegetation, topsoil, subsoils, sand and & gravel, clay	46,645	TBC	TBC	Y	Y	TBC	TBC
N,Walsham Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	140	TBC	TBC	Y	Y	TBC	TBC
N. Walsham – Wroxham	Vegetation, topsoil, subsoils, sand and & gravel, clay	84,363	TBC	TBC	Y	Y	TBC	TBC

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		Estimated Volumes	Trade Contractor	Waste Minimisation	On-site Reuse/	Off-site reuse/		
NDR Area	Material type	(m3)	Package	Opportunities	recycling	recycling	Recovery	Disposal
Wroxham Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	4,081	TBC	TBC	Y	Y	TBC	TBC
Wroxham – Salhouse	Vegetation, topsoil, subsoils, sand and & gravel, clay	213,908	TBC	TBC	Y	Y	TBC	TBC
Salhous Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	1,239	TBC	TBC	Y	Υ	TBC	TBC
Salhouse – Railway	Vegetation, topsoil, subsoils, sand and & gravel, clay	8,629	TBC	TBC	Y	Υ	TBC	TBC
Railway - Plumstead	Vegetation, topsoil, subsoils, sand and & gravel, clay	8,070			Y	Υ		
Plumstead Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	3,031			Y	Υ		
Plumstead - Business Park	Vegetation, topsoil, subsoils, sand and & gravel, clay	50,970			Y	Y		
Business Park Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	23,866			Y	Y		
Business Park – Postwick NE	Vegetation, topsoil, subsoils, sand and & gravel, clay	42,325			Y	Y		
Postwick NE Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	16,797			Y	Y		
Postwick NE – A47	Vegetation, topsoil, subsoils, sand and & gravel, clay	0			Y	Y		
A47 – Park & Ride	Vegetation, topsoil, subsoils, sand and & gravel, clay	0			Y	Y		
Park & Ride Junction	Vegetation, topsoil, subsoils, sand and & gravel, clay	600			Y	Y		
TOTAL Excavated Ma	terial	1,175,517						
TOTAL Reused on Sit	e	1,105,955						
TOTAL Residual Was	te	69,562						
GRAND TOTAL		118,255	(69,562 m3 x1	.7 bulking factor)				

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Table 3.2: Estimated quantities of construction works



		Forecast Estimated Quantities	Trade Contractor	Waste Minimisation	On-site Reuse/	Off-site reuse/	5	
NDR Area	Material type	(m3)	Package	Opportunities	recycling	recycling	Recovery	Disposal
Fakenham – Fir Covert	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Fir Cover Junction	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	TBC	TBC
Fir Covert – Reepham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Reepham Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Reepham – Drayton	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Drayton Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Drayton - Cromer	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	твс	TBC
Cromer Junction West	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Cromer Junction East	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Cromer – Airport	TBC [Asphalt, concrete etc]	твс	ТВС	ТВС	Y	Y	TBC	TBC
Airport Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Airport - Buxton	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Buxton Road	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Buxton – N. Walsham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
N,Walsham Junction	TBC [Asphalt, concrete etc]	TBC	ТВС	ТВС	Y	Y	TBC	TBC
N. Walsham – Wroxham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Wroxham Junction	TBC [Asphalt, concrete etc]	твс	твс	ТВС	Y	Y	TBC	TBC
Wroxham – Salhouse	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Salhouse Junction	TBC [Asphalt, concrete etc]	твс	ТВС	ТВС	Y	Y	TBC	TBC
Salhouse – Railway	TBC [Asphalt, concrete etc]	твс	ТВС	ТВС	Y	Y	TBC	TBC
Railway - Plumstead	TBC [Asphalt, concrete etc]	твс	ТВС	ТВС	Y	Y	TBC	TBC
Plumstead Junction	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	TBC	ТВС

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NDR Area	Material type	Forecast Estimated Quantities (m3)	Trade Contractor Package	Waste Minimisation Opportunities	On-site Reuse/ recycling	Off-site reuse/ recycling	Recovery	Disposal
Plumstead - Business Park	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park – Postwick NE	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE – A47	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
A47 – Park & Ride	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Park & Ride Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
TOTAL [xxxx] Material		TBC						
TOTAL [xxxx] Material		TBC						
TOTAL [xxxx] Material		TBC						

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3.6 Disposal and treatment options

Table 3.2 highlights a number of treatment and recycling facilities within a reasonable proximity of the NDR site. However, this is a guide and the appointed waste contractor for the site should contact the Environment Agency directly to determine the most appropriate waste transfer station to handle the waste material being produced. The transfer station will then send it off for final disposal at an appropriate landfill site.

As described in Section 3.4 the Landfill (England and Wales) Regulations 2002 require that disposal sites are classified into one of three categories dependent on the chemical composition of the material; these are hazardous, non-hazardous and inert. Prior to disposal, if material does not meet the hazardous landfill WAC criteria it must be treated. Further actions required within the Landfill Regulations are as follows:

- Higher engineering and operating standards to be followed.
- Hazardous liquids, flammable, corrosive, explosive, oxidising and infectious wastes have been banned from landfill since July 2002.
- Non-hazardous liquids have been banned since 2007.
- Co-disposal has been banned since 16 July 2004.
- Whole tyres were banned from 2003, and shredded tyres have been banned since 2006.
- Waste will be required to be pre-treated prior to landfilling.
- Operators must demonstrate that they and their staff are technically competent to manage the site, and have made adequate financial provision to cover the maintenance and aftercare requirements.



Table 3.3:Waste treatment sites

Site name	Site address	Material Handled		Distance from Site ³ (miles)
Hyde P L	The Old Airfield, Frans Green, East Tuddenham,	Cardboard	Wood	8
	Dereham, Norfolk, NR20 3JG	Metal	Paper	
	Tel: 01603 882100	General office paper	Mixed plastics	
		Cardboard	Textiles / clothing	
		Confidential	Green waste	
		Printers and fax cartridges	Clay	
		Cans	Hardcore	
		Fluorescent tubes	Inert waste	
		Food	Rubble	
		Furniture	Subsoil	
		Coloured / container	Topsoil	
		Plate or flat	Carpeting	
Baldwin Skip Hire Ltd	Walnut Tree Farm, Silver Street, Besthorpe, Attleborough, Norfolk, NR17 2LF Tel: 01953 453625	Cardboard	Pallets	14
		Plastic	Wood	
		Glass	Plastic film	
		Metal	Fertiliser sacks	
		General office paper	Paper	
		Cardboard	Mixed plastics	
		Confidential	Green waste	
		Cans	Clay	
		Drums / containers	Hardcore	
		Food	Inert waste	
		Furniture	Rubble	
		Gas cylinders	Subsoil	
		Ferrous	Topsoil	
		Non-ferrous		

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³ The distance has been calculated from Norwich International Airport, Amsterdam Way Norwich NR6 6JA; which is along the NDR route

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Site name	Site address	Material Handled		Distance from Site ³ (miles)
Drurys Skip Hire & Waste	Folgate Road, Lyngate Industrial Estate North Walsham,	Cardboard	Gas cylinders	12
Recycling Services	Norfolk, NR28 0AJ	Plastic	Ferrous	
	Tel: 01692 405820	Glass	Non-ferrous	
		Bale twin and netwrap	Precious	
		Cores	Pallets	
		Tree guards	Tyres	
		Other plastics	Wood	
		Metal	Plastic film	
		Lead acid	Paper	
		Dry cell	Mixed plastics	
		NiCad	Textiles / clothing	
		Alkaline	Green waste	
		Zinc chloride	Fridges	
		Button	Clay	
		General office paper	Hardcore	
		Cardboard	Inert waste	
		Printers and fax cartridges	Rubble	
		Cans	Subsoil	
		Drums / containers	Topsoil	
		Electrical & electronic equipment	Carpeting	
		Furniture		
Localfast Co Ltd	Folgate Road, Lyngate Industrial Estate North Walsham,	Metal	Clay	16
	Norfolk, NR28 0AJ	Lead acid	Hardcore	
	Tel: 01508 548543	Photographic and printing inks	Inert waste	
	Email: localfast@localfast.co.uk	Drums / containers	Rubble	
		Coloured / container	Subsoil	
		Wood	Topsoil	
		Textiles / clothing	Carpeting	
		Green waste		

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Site name	Site address	Material Handled		Distance from Site ³ (miles)
O R M North Norfolk	Shrubbs Farm, Edgefield, Norwich, Norfolk, NR24 2AT	Cardboard	Clay	14
	Tel: 01227 860901	General office paper	Hardcore	
	Email: paul@cjclee.co.uk	Cardboard	Inert waste	
		Pallets	Rubble	
		Wood	Subsoil	
		Paper	Topsoil	
		Green waste		
Raymond Mcleod (farms) Ltd	Raymond Mcleod (farms) Ltd, Longham Quarry, Reed	Clay	Rubble	18
	Lane, Bittering, Dereham, Norfolk, NR19 2RJ	Hardcore	Subsoil	
	Tel: 01362 687240	Inert waste	Topsoil	
	Email: mcleod@mcleodfarms.co.uk			
Thurtle Walter	Lindgreat Yard, Harfreys Road, Great Yarmouth, Norfolk, NR31 0LS	Cardboard	Precious	20
		Plastic	Pallets	
	Tel: 01493 668118	Glass	Wood	
	Email: <u>wtwaste@googlemail.com</u>	Bale twin and netwrap	Plastic film	
		Other plastics	Paper	
		Metal	Mixed plastics	
		General office paper	Textiles / clothing	
		Cardboard	Green waste	
		Cans	Clay	
		Drums / containers	Hardcore	
		Furniture	Inert waste	
		Coloured / container	Rubble	
		Plate or flat	Subsoil	
		Ferrous	Topsoil	
		Non-ferrous	Carpeting	

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Site name	Site address	Material Handled		Distance from Site ³ (miles)
W T Waste	Hafrey's Road, Great Yarmouth, NR31 0LS,, NR31 0LS	Cardboard	Wood	20
	Tel: 01493 668118	Plastic	Fertiliser sacks	
		Glass	Paper	
		Other plastics	Mixed plastics	
		Metal	Textiles / clothing	
		General office paper	Green waste	
		Cardboard	Clay	
		Cans	Hardcore	
		Drums / containers	Inert waste	
		Furniture	Rubble	
		Coloured / container	Subsoil	
		Ferrous	Topsoil	
		Non-ferrous	Carpeting	
		Pallets		



Site name	Site address	Material Handled		Distance from Site ³ (miles)
Docwra Mike	Land / Premises At, High Mill Link Road, Cobholm, Great Yarmouth, Norfolk, NR31 0DL Tel: 01493 658504 Email: <u>leondocwra@hotmail.co.uk</u>	Cardboard Plastic Silage films Horticultural films Bale twin and netwrap Cores Tree guards Other plastics Machinery / parts Metal Lead acid Dry cell NiCad Alkaline Zinc chloride Button General office paper Cardboard Confidential Cans Drums / containers	Electrical & electronic equipment Furniture Ferrous Non-ferrous Precious Pallets Tyres Wood Plastic film Fertiliser sacks Paper Mixed plastics Vehicles Clay Hardcore Inert waste Rubble Subsoil Topsoil	19

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Site name	Site address	Material Handled		Distance from Site ³ (miles)
East Coast Waste Ltd	East Coast, Hafreys Road, Hafreys Industrial Estate,	Cardboard	Food	20
	Great Yarmouth, Norfolk, NR31 0LS	Plastic	Furniture	
	Tel: 01493 653600	Silage films	Gas cylinders	
		Horticultural films	Ferrous	
		Bale twin and netwrap	Non-ferrous	
		Cores	Precious	
		Tree guards	Tyres	
		Other plastics	Wood	
		Machinery / parts	Plastic film	
		Metal	Fertiliser sacks	
		Dry cell	Paper	
		Alkaline	Mixed plastics	
		Button	Textiles / clothing	
		General office paper	Fridges	
		Cardboard	Clay	
		Confidential	Hardcore	
		Printers and fax cartridges	Inert waste	
		Cans	Rubble	
		Drums / containers	Subsoil	
		Electrical & electronic equipment	Topsoil	
		Fluorescent tubes	Carpeting	

Source: the Waste Directory⁴

NB. The ability for materials to be deposited at these sites will be dependent on the conditions imposed on the sites through the relevant licence/permit. This list is not exhaustive and there may be other facilities in the vicinity of the site that can be used.

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⁴ http://www.wastedirectory.org.uk/



For excavated soils, where soil testing and analysis has determined that the soil does not contain elevated concentrations of contaminants in accordance with comparison against human health screening values such as the EA Soil Guideline Values (SGVs) then there are a number of reuse and recycling opportunities. The SGVs assess the risk to human health in relation to residential (with and without home grown produce) and commercial end use. The excavated soils may then be suitable for use as infill, bunding and landscaping (as long as the soil contamination testing does not exceed the residential SGVs) on the site.

Further uses for excavated materials could be for construction or maintenance of pavements, footings for fencing, etc. Materials produced could also be used in the laying of roads around the site or stored for later use, providing there are adequate storage areas and the material is adequately managed to minimise dust and run off.

If reuse or recycling on site is not possible, Table 3.4 highlights a number of possible waste disposal
facilities within a reasonable proximity to the site and that also run a waste collection service.

Site name	Site address	Landfill class	Distance from Site ⁵ (miles)
Attlebridge Landfill Site	Reepham Road, Attlebridge, Norwich, Norfolk, NR5 5TD	Hazardous and Non-Hazardous	2.3
Costessey	Longwater Industrial Estate, Longwater Lane, Costessey, Norwich, Norfolk, NR5 0TL	Non- Hazardous	3.9
Hainford	The Poultry Farm, Spixworth Road, Hainford, Norfolk, NR10 3BX	Non- Hazardous	2.9
Rackheath	Salhouse Road, Rackheath, Norwich, Norfolk, NR13 6LA	Non- Hazardous	3.4

Table 3.4: Waste disposal sites

Source: The Environment Agency – 'What's in your backyard'⁶

NB. The ability for materials to be deposited at these sites will be dependent on the availability of void space and the conditions imposed on the sites through the relevant licence/permit. This list is not exhaustive and there may be other facilities in the vicinity of the site that can be used.

⁵ The distance has been calculated from Norwich International Airport, Amsterdam Way Norwich NR6 6JA; which is along the NDR route

⁶ http://maps.environmentagency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&to pic=waste



3.7 Waste controls and handling

3.7.1 Duty of care compliance

One aim of the SWMP is to reduce the levels of fly-tipping generated from construction projects.

One requirement is to incorporate an auditable system that identifies:

- The person responsible for removing the waste from site; and
- Keeping copies of all duty of care documentation (waste transfer notes and hazardous waste consignment notes).

All reputable waste contractors will have systems in place to ensure that all the duty of care requirements are met prior to the waste being collected.

Various information sources are available to enable the Principal Contractor to identify local waste management facilities for both recycling, recovery and disposal.

3.7.2 Declaration

The client and principal contractor will take all reasonable steps to ensure that:

all waste from the site is dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) regulations 1991 as amended; and materials will be handled efficiently and waste managed appropriately.						
Signatures	Client	Principal Contractor				
Date						

3.7.3 Responsibility for waste management

Table 3.5 identifies the primary waste streams that will arise from the activities at the site and whose responsibility it is to control and monitor the amounts of waste produced.

Tuble 0.0. Wabie management reep	onoiointy	
Site Activity/ Sub-contractor Work Package	Primary Waste Stream	Who is responsible for waste management
Excavation and site clearance	Soils, subsoils, clay	TBC
Groundworks/Foundations	ТВС	TBC
Road construction	ТВС	TBC
Landscaping	Soils	TBC
Mechanical Electrical	Cables, WEEE	TBC
Removal of Site Offices, Temporary Works & Final Clear Away	TBC	ТВС

Table 3.5: Waste management responsibility



3.7.4 Site security

Both Client and Principal Contractor will take reasonable steps to ensure site security measures are in place to prevent illegal disposal of waste at the site.



4 Implementation of the SWMP

4.1 **Register of waste carrier licences and permits**

Table 4.1 below assists with the information required to meet the duty of care requirements (see Section 3.7.1). It is intended to be used to provide and record information on the waste management contractors, their Environmental Permit details, waste carrier licenses and exemptions that have been checked and verified for use on this project.

The Landfill (England and Wales) Regulations 2002 also require that waste is described by European Waste Catalogue (EWC) codes on Transfer Notes required under the Duty of Care Regulations. The EWC categorises wastes into 20 main groups and approximately 900 codes. The EWC also identifies hazardous wastes, and these are dealt with by the Hazardous Waste Regulations.



Table 4.1: Register of waste licences and permits

			Waste carrier			Disposal site	
EWC Waste description*	EWC7	Origin	Name	Licence number	Expiry date	Name	Licence number/ exemption ref.
Soils and stones	17 05 04	Excavation /Earthworks	TBC	TBC	TBC	TBC	TBC
Soil and stones containing dangerous substances)	17 05 03	Historical contamination possibly from railway/airport based activities at the site	TBC	TBC	TBC	TBC	ТВС
Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances	17 01 06	From excavation of Made Ground and potential historical contamination	TBC	TBC	TBC	TBC	TBC
Concrete	17 01 01	From excavation of Made Ground	TBC	TBC	TBC	TBC	ТВС
Mixed construction & demolition waste	17 09 04		TBC	TBC	ТВС	TBC	ТВС
Wood	17 02 01		TBC	TBC	TBC	TBC	TBC
Other, as applicable							
Other, as applicable							
Other, as applicable							

*This is not an exhaustive list and may be required to be extended to include wastes not mentioned that are produced on site.

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⁷ EWC code categorised from the Lists of Wastes pursuant to Article 1(a) of Directive 75/442/EEC on waste and Article 1 (4) of Directive 91/689/EEC on hazardous wastes



4.2 Training and communication

The intention is to develop a culture of promoting best practice and increasing knowledge and awareness through education on waste management issues at the site and to maximise the opportunities available for the management of waste in an appropriate (and compliant) manner.

The waste management plan as well as the procedures to be followed will be given to all contractors and subcontractors at site induction and key measures reinforced through the use of "tool box" talks. "Tool box" talks will be carried out every month on waste issues and all subcontractors should be expected to attend. It is hoped that these values can be transferred from this site to the next, promoting adoption of sustainable waste management practices on a wider scale.

This decision will ultimately need to be made between discussions between the Client and Principal Contractor.

4.3 Monitoring and waste records

The Principal Contractor will receive a waste transfer note (or consignment note if the waste is hazardous) from the waste disposal company showing the exact amount of waste materials removed from site. This sheet also identifies how much material went to landfill and how much went for recycling.

Whenever waste is removed from the site, the Principal Contractor must record the actions in Table 4.2 to ensure compliance with the Duty of Care requirements, which includes documenting the name of the company removing the waste and details of the site where the waste is being transferred to for each waste type.

All skips need to be monitored to ensure that cross-contamination of segregated skips does not occur. The "tool box" talks shall focus on how the waste management system is working and identify the extra costs associated with contamination.

The Principal Contractor shall continually review the type of surplus materials being produced and change the site set up to maximise on site reuse or recycling; landfill should be the last option.

This plan should be included as an agenda item at the weekly construction meetings. In addition, the plan will be communicated to the whole team (including the client) at the monthly meetings. This shall include any updates from the last version.



Table 4.2: Waste management records

Date removed	Waste type	Identity of the person removing the waste	Site the waste is being taken to and whether licensed or exempt	Waste carrier and registration number*	Confirmation of delivery*	Waste management route (reuse on/offsite, recycled on/offsite, recovery, landfill, other
TBC	TBC	TBC	ТВС	TBC	TBC	ТВС



4.4 SWMP implementation checklist

Table 4.3 is a checklist, which is to be filled out by the principal contractor to ensure the SWMP is fully implemented from the outset of the project. Further actions required to accompany the checklist should be identified in Table 4.4.

Table 4.3: SWMP checklist	
Checks (please tick) Y	Ν
Have terms and commercial rates been agreed with the waste management contractor(s)?	
Have data reporting procedures been agreed with waste management contractor(s)?	
For offsite waste management or disposal- Are all the waste destination details correct?	
Has a waste segregation/ collection area been prepared?	
Has the waste management area been adequately sign posted?	
Has the SWMP planning meeting been set?	
Has the waste management document control/ filing system been set up?	
Have all necessary staff and contractors read and signed the SWMP?	
Have all the SWMP training/ briefing requirements for staff been met?	
Have all the SWMP training/ briefing requirements for contractor(s) been met?	
Have all the waste management targets been set?	
Has the SWMP been approved by the Project Manager?	
Table 4.4: Further actions required	
Comments/ Further Actions:	
1. Excavated material to be tested for contamination prior to reuse and/or disposal	
2. Waste Contractor to be assigned	
3. Storage areas for waste to be decided upon	
4. Frequency of waste removal from the site to external storage areas or waste transfer station to be decided up	on

5. TBC

6. TBC

4.5 Updating the SWMP

The plan must be updated as often as necessary, to provide accurate information on progress, or at least every six months if there is little change during the project.

Updates to the plan will give a current picture of how work is progressing against the waste estimates contained in the plan. Therefore, for waste that is re-used or recycled on site, the SWMP should be updated to describe how much of the estimated volume or tonnage has been processed. For waste that is removed from the site the SWMP must be updated to record the identity of the person removing the waste, the type (and quantity) of waste and the site to which it has been taken.



Whenever waste is removed from the site the Principal Contractor must record the actions in Table 4.2 above. Revisions of the SWMP are recorded in Table 4.5.

Table 4.5:	SWMP revisions

Nature of revision	Date of revision	Author of revision
[waste records updated]	TBC	ТВС

The latest version of the SWMP must be kept in the site office and be available for viewing by the Environment Agency or other interested parties.



5 Review and audit of SWMP

5.1 **Post-construction review**

This section of the SWMP is a post construction review and is designed to ensure the SWMP is monitored throughout the lifetime of the project and then signed off at its closure (see Table 5.1). The aim is to:

- highlight the benefits of completing a SWMP; and
- identify the amounts of waste reduction and resource efficiency achieved.

This is achieved by adhering to the principles outlined at the beginning of the SWMP, in addition to realising the cost benefits associated with the SWMP if it has been carried out correctly.

At the end of the project, both the Client and Principal Contractor are responsible for reviewing, revising and refining the SWMP as necessary within three months of completion to identify if lessons could be learned for the next time a similar project is undertaken. This review will identify and conclude the following:

- Confirmation that the SWMP has been monitored and updated within the defined timescales;
- An explanation of any deviation from the original plan;
- A comparison of the estimated quantities of each waste type against the actual quantities generated;
- An action plan to address the lessons that have been learnt from the project that could be implemented for the next project; and
- An estimation of the cost savings (if any) that have been achieved through the measures undertaken to minimise, reuse, recycle or recover waste arisings rather than just sending it to landfill.

Table 5.1: Post construction review declaration

This plan has	s been mon	itored on a regular basis to ensure that work is progressing according to the plan and has
been update	d to record	details of the actual waste management actions and waste transfers that have taken place.
Signatures Date	Client	Principal Contractor

5.2 Estimated versus actual waste quantities

Section 5 summarises the current estimates of the waste arisings and reuse or disposal quantities for these arisings. The data is taken from the bill of quantities and where unclear, assumptions have been made as to the waste minimisation option applied.

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Table 5.2: Actual waste quantities for all excavation, deposition, filing and demolition activities on the NDR route

	Material type	Forecast Estimated Quantities	Trade Contractor	Waste Minimisation	On-site Reuse/	Off-site reuse/	Pecoverv	Disposal
Fakenham – Fir Covert	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Fir Cover Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Fir Covert – Reepham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Reepham Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Reepham – Drayton	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Drayton Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Drayton - Cromer	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Cromer Junction West	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Υ	TBC	TBC
Cromer Junction East	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Cromer – Airport	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Airport Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Airport - Buxton	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Υ	TBC	TBC
Buxton Road	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Υ	TBC	TBC
Buxton – N. Walsham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
N,Walsham Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
N. Walsham – Wroxham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Υ	TBC	TBC
Wroxham Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Wroxham – Salhouse	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Salhous Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC
Salhouse – Railway	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Railway - Plumstead	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Plumstead Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	ТВС	Y	Y	TBC	TBC

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NDR Area	Material type	Forecast Estimated Quantities (m3)	Trade Contractor Package	Waste Minimisation Opportunities	On-site Reuse/ recycling	Off-site reuse/ recycling	Recovery	Disposal
Plumstead - Business Park	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park – Postwick NE	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE – A47	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
A47 – Park & Ride	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Park & Ride Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
TOTAL [xxxx] Material		TBC						
TOTAL [xxxx] Materia	al	твс						
TOTAL [xxxx] Material		твс						



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Table 5.3: Actual waste quantities for construction works



		Forecast Estimated Quantities	Trade Contractor	Waste Minimisation	On-site Reuse/	Off-site reuse/		5
NDR Area	Material type	(m3)	Package	Opportunities	recycling	recycling	Recovery	Disposal
Fakenham – Fir Covert	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Fir Cover Junction	TBC [Asphalt, concrete etc]	ТВС	TBC	TBC	Y	Y	TBC	TBC
Fir Covert – Reepham	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Reepham Junction	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Reepham – Drayton	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Drayton Junction	TBC [Asphalt, concrete etc]	твс	ТВС	ТВС	Y	Y	TBC	TBC
Drayton - Cromer	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	TBC	TBC
Cromer Junction West	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Cromer Junction East	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Cromer – Airport	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Υ	Y	TBC	TBC
Airport Junction	TBC [Asphalt, concrete etc]	твс	TBC	TBC	Y	Y	TBC	TBC
Airport - Buxton	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Buxton Road	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Buxton – N. Walsham	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	TBC	ТВС
N,Walsham Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
N. Walsham – Wroxham	TBC [Asphalt, concrete etc]	ТВС	ТВС	ТВС	Y	Y	TBC	ТВС
Wroxham Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Υ	Y	TBC	TBC
Wroxham – Salhouse	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	ТВС
Salhous Junction	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Salhouse – Railway	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Railway - Plumstead	TBC [Asphalt, concrete etc]	твс	TBC	ТВС	Y	Y	TBC	TBC
Plumstead Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC

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NDR Area	Material type	Forecast Estimated Quantities (m3)	Trade Contractor Package	Waste Minimisation Opportunities	On-site Reuse/ recycling	Off-site reuse/ recycling	Recovery	Disposal
Plumstead - Business Park	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Business Park – Postwick NE	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE Junction	TBC [Asphalt, concrete etc]	TBC	TBC	TBC	Y	Y	TBC	TBC
Postwick NE – A47	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
A47 – Park & Ride	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
Park & Ride Junction	TBC [Asphalt, concrete etc]	TBC	TBC	ТВС	Y	Y	TBC	TBC
TOTAL [xxxx] Material		TBC						
TOTAL [xxxx] Materia	al	TBC						
TOTAL [xxxx] Material		TBC						

Mott MacDonald

Mott MacDonald



5.3 Record of deviations from SWMP

Table 5.4:Record of deviations	
Issue	Details
[waste forecasts- exceeded]	TBC reasons
[waste forecasts- not met]	TBC reasons

5.4 Estimate of cost savings

[Enter text here]

5.5 Relevant signatures

Table 5.5: Insert Table Title here

Principal Contra	ctor:	Date:
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Appendices



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Appendix A. Waste arisings from Bill of Quantities	60

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Appendix A. Waste arisings from Bill of Quantities

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Table A.1: Identified waste arisings from the BoQ

			Quantity of		On-site Reuse/		
NDR Location	Activity type	Activity description	arisings	Units	recycling 8	Disposal	Assumptions
Newman Road OverBridge	Cast-in-place Piles	Trim and prepare pile heads	36	Nr			
Rackheath Railway Bridge	Cast-in-place Piles	Trim and prepare pile heads	117	Nr			
Total Arisings Cast-	in-place Piles		153	Nr			
General	Earthworks – Excavation and disposal	Excavation and disposal of acceptable material excluding Class 5A in new watercourses	1,200	m3		1,200	
General	Earthworks – Excavation and disposal	Excavation and disposal of acceptable material excluding Class 5A in new watercourses (Ditches - Linear measurement given only)	14,501	m		14,501	may be a duplication
General	Earthworks – Excavation and disposal	Excavation and disposal of class U1B	2,000	m3		2,000	
General	Earthworks – Excavation and disposal	Excavation of unacceptable material (Japanese Knotweed)	_ 1,500 _	m3		1,500	
		Excavation of class U2					
		Disposal of unacceptable material class U2 (inc Jap Knotweed)					
Buxton Road OverBridge	Earthworks – Excavation and disposal	Excavation and on-site disposal of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support	3,468	m3	3,468		onsite disposal/ reuse
Newman Road OverBridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	3,143	m3	3,143		onsite disposal/ reuse
Middle Road OverBridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	1,779	m3	1,779		onsite disposal/ reuse
Rackheath Bat Underpass	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	643	m3	643		onsite disposal/ reuse
Marriots Way Overbridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	2,986	m3	2,986		onsite disposal/ reuse

8 Note that there was no recorded quantities of materials for off-site reuse/recycling or for recovery. Columns have been deleted

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			Quantity of		On-site Reuse/		
NDR Location	Activity type	Activity description	arisings	Units	recycling 8	Disposal	Assumptions
Cromer Road OverBridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	3,247	m3	3,247		onsite disposal/ reuse
Bell Farm Overbridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	1,581	m3	1,581		onsite disposal/ reuse
Rackheath Railway Bridge	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	860	m3	860		onsite disposal/ reuse
Rackheath Rd Bridge inc Ret Wall	Earthworks – Excavation and disposal	Excavation of acceptable material class excluding Class 5A in structural foundations 0 to 3 metres in depth intermediate support and on-site disposal	982	m3	982		onsite disposal/ reuse
Bat Gantry 1 - 54m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 2 - 69m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 3 - 120m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 4 - 64m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 5 - 64m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 6 - 65m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
Bat Gantry 7 - 72m long	Earthworks – Excavation and disposal	Excavation and disposal of acceptable materials excluding class 5A	14	m3	14		
General	Earthworks – Excavation in Hard Material	Provisional quantities for extra over any item of drainage for excavation in hard material	200	m3	200		generated and used or stock- piled onsite
Total Arisings from	Excavation and Disposal of Ea	arthworks onsite or to landfill	38,188	m3	18,987	19,201	19,201
General	Earthworks – NNDR: Excavation	EO for Excavation in hard material	3,500	m3			brought onto site
General	Earthworks – NNDR: Excavation and deposition	Excavation of acceptable material class 5A and Deposition in landscape areas and bunds	493,083	m3	164,396	328,687	the rest disposed
General	Earthworks – NNDR:	Excavation of acceptable material excluding class 5A	1,395,028	m3	1,395,027		

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NDR Location	Activity type	Activity description	Quantity of arisings	Units	On-site Reuse/ recycling 8	Disposal	Assumptions
	Excavation, deposition, disposal and filling	Deposition of acceptable material in embankments and other areas of fill					
		Deposition of acceptable material in landscape areas and bunds	-				
		Deposition of acceptable material excluding class 5A in landscape areas and bunds	_				
		Reuse of acceptable excavated material as class 6C starter layer					
General	Earthworks – NNDR: Filing	Excavation of soft spots (arisings disposed on site) and filling with site won granular material	12,500	m3	12,500		
Total Arisings from	NNDR Excavation, Deposition,	Filling and Disposal of Earthworks onsite or to landfill	1,904,111	m3	1,571,923	328,687	332,188
General	Earthworks – NNDR: Filing	Compaction of acceptable material	1,494,346	m3			brought onto site
General	Earthworks – NNDR: Filing	Soil stabilisation of existing material in situ to form capping 250mm thick	133,810	m2			brought onto site
General	Earthworks – NNDR: Filing	Geogrid Tensar 40RE or similar	130,154	m2			brought onto site
General	Earthworks – NNDR: Filing	Geotextile Terram 1000 or similar	130,154	m2			brought onto site
General	Earthworks – NNDR: Filing	Topsoiling 50mm thick horizontal and sloping	67,530	m2	64,862		
General	Earthworks – NNDR: Filing	Topsoiling 150mm thick horizontal and sloping	230,608	m2	222,165		
General	Earthworks – NNDR: Filing	Topsoiling 300mm thick horizontal and sloping	176,143	m2	176,068		
General	Earthworks – NNDR: Filing	Topsoiling 600mm thick horizontal	34,213	m2			
General	Earthworks – NNDR: Filing	Topsoiling 600mm thick	213,267	m2			
General	Earthworks – NNDR: Filing	Completion of Formation	455,731	m2		455,731	assume material disposed
Total Arisings from	NNDR Excavation, Deposition,	Filling and Disposal of Earthworks onsite or to landfill	3,065,956	m3	463,095	455,731	2,602,861
General	Earthworks – NNDR: Filing	Clearing of existing ditches	5,000	m		5,000	assume cleared and disposed

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			Quantity of		On-site Reuse/		
NDR Location	Activity type	Activity description	arisings	Units	recycling 8	Disposal	Assumptions
General	Earthworks – NNDR: Filing	Backfilling disused drains of 150mm diam with concrete	1,200	m	1,200		
General	Earthworks – NNDR: Filing	Backfilling disused gullies and chambers with concrete	70	Nr	70		
Other Arisings from	NNDR Excavation, Depositior	n, Filling and Disposal of Earthworks onsite or to landfill					
Middle Road OverBridge	Footways and Paved Areas	Footway comprising ST1 concrete infill with 20mm asphalt surface	209	m2			
Marriots Way Overbridge	Footways and Paved Areas	Footway comprising ST1 concrete infill with 20mm asphalt surface	66	m2			
Rackheath Railway Bridge	Footways and Paved Areas	Footway comprising ST1 concrete infill with 20mm asphalt surface	225	m2			
Total Arisings from in	nfill of Footways and Paved A	reas	500	m2			
Buxton Road OverBridge	Imported Fill	Imported acceptable material Class 6N granular infill around structural foundations	1,804	m3			
Buxton Road OverBridge	Imported Fill	Imported acceptable material class 6I / 6J as infill to reinforced earth embankment	3,704	m3			
Newman Road OverBridge	Imported Fill	Imported acceptable material Class 6N granular infill around structural foundations	1,269	m3			
Newman Road OverBridge	Imported Fill	Imported acceptable material class 6I / 6J as infill to reinforced earth embankment	3,153	m3			
Middle Road OverBridge	Imported Fill	Imported acceptable material Class 6N granular infill around structural foundations	2,072	m3			
Middle Road OverBridge	Imported Fill	Imported acceptable material class 6I / 6J as infill to reinforced earth embankment	3,979	m3			
Marriots Way Overbridge	Imported Fill	Imported acceptable material Class 6N granular in fill around structural foundations	1,536	m3			
Marriots Way Overbridge	Imported Fill	Imported acceptable material class 6I / 6Jas fill to reinforced earth embankment	3,428	m3			
Cromer Road OverBridge	Imported Fill	Imported acceptable material Class 6N granular in fill around structural foundations	2,875	m3			
Cromer Road OverBridge	Imported Fill	Imported acceptable material class 6I / 6Jas fill to reinforced earth embankment	4,804	m3			
Bell Farm Overbridge	Imported Fill	Imported acceptable material Class 6N granular in fill around structural foundations	1,269	m3			

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			Quantity of		On-site Reuse/		
NDR Location	Activity type	Activity description	arisings	Units	recycling 8	Disposal	Assumptions
Bell Farm Overbridge	Imported Fill	Imported acceptable material class 6I / 6Jas fill to reinforced earth embankment	3,153	m3			
Rackheath Bat Underpass	Imported Fill	Imported acceptable material sand bedding to PCC culvert units	11	m3			
Rackheath Railway Bridge	Imported Fill	Imported acceptable material Class 6N granular infill around structural foundations	3,321	m3			
Rackheath Rd Bridge inc Ret Wall	Imported Fill	Imported acceptable material Class 6N granular infill around structural foundations	1,261	m3			
Coltishall Aggregate	Imported Fill	Imported Class 6F2 Fill	440	m3	440		assume imported for use onsite
Coltishall Aggregate	Imported Fill	Imported Filter Media	23,297	m3	23,297		assume imported for use onsite
Coltishall Aggregate	Imported Fill	Imported Graded Pipe Bedding	15,969	m3	15,969		assume imported for use onsite
Coltishall Aggregate	Imported Fill	Recycled Planings	1,370	m3	1,370		assume imported for use onsite
Coltishall Aggregate	Imported Fill	Imported Type 1	28,535	m3	28,535		assume imported for use onsite
Total Arisings from	Imported material for infills		107,249	m3	69,610		37,639
Buxton Road OverBridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	510	m2			
Buxton Road OverBridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	55	m2	512		inconsistent arisings and reuse figures
Newman Road OverBridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	359	m2			
Newman Road OverBridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	300	m2	280		
Middle Road OverBridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	586	m2			
Middle Road OverBridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	656	m2	656		
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			Quantity of		On-site		
NDR Location	Activity type	Activity description	arisings	Units	recycling 8	Disposal	Assumptions
Rackheath Bat Underpass	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	205	m2			
Marriots Way Overbridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	434	m2			
Marriots Way Overbridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	402	m2	402		
Cromer Road OverBridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	814	m2			
Cromer Road OverBridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	684	m2	684		
Bell Farm Overbridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	359	m2			
Bell Farm Overbridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	214	m2	214		
Rackheath Railway Bridge	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	1,624	m2			
Rackheath Railway Bridge	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	1,395	m2	923		
Rackheath Rd Bridge inc Ret Wall	Waterproofing	Waterproofing with two coats bituminous paint more than 300mm wide	2,170	m2			
Rackheath Rd Bridge inc Ret Wall	Waterproofing	Waterproofing with proprietary waterproofing system 300mm wide or less at any inclination; using 25mm thick red tinted sand asphalt protection	858	m2	858		
Total Arisings from Waterproofing		11,625	m2	4,529	0	7,096	
General	Site Clearance	General site clearance	327	HA		327	
General	Cleaning existing drainage systems	Cleaning piped drainage system	8	Sum		8	number of systems

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NDR Location	Activity type	Activity description	Quantity of arisings	Units	On-site Reuse/ recycling 8	Disposal	Assumptions			
Type 1 Main Carriageway	Management of Established Waterbodies	Inspection of existing waterbodies and removal of debris / silt where required	1	Sum			inspection and removal done but no quantities recorded.			
Type 1 Main Carriageway	Pavements surfacing	Extra over for increased PSV to surface course (68psv) to side roads if required	1	Sum			One pavement surfaced?			
Type 1 Main Carriageway	Ground Preparation and Cultivation	Vegetation clearance, Subsoil treatment and Final preparation of soils	1,421,926	m2	1,421,926		soild treated and reused			
General	Headwalls and outfall works	Provisional quantities for excavation and filing of soft spots and other voids in bottom of trenches, chambers and gullies	400	m3	400					
Newman Road OverBridge	Surface Impregnation of Concrete	Surface impregnation to plain concrete surfaces with silane or pavix	209	m2						
OTHER SITE ACTIVITIES										



J. Appendix I. Written Scheme of Investigation

- I.1. Introduction
- I.2. Planning Context
- I.3. National Planning Context (PPS5)
- I.4. Local Planning Context
- I.5. Baseline Conditions
- I.6. Objectives and Proposals
- I.7. Detailed Methodology
- I.8. Monitoring and Programme
- I.9. Post-Excavation Requirements
- I.10. Archive
- I.11. References

K. Appendix J. Site Drainage Plan

- J.1. Current Drainage System
- J.2. Surface Water Drainage Systems Key Requirements

L. Appendix K. Environmental Noise Surveys

- K.1. Introduction
- K.2. Methodology
- K.3. Results