Construction Methodology Statement

A160/A180 Port of Immingham Improvement

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1 Introduction - Construction Methodology Statement

1.1 Purpose and validity of this report

1.1.1 This report sets out the Highways Agency’s draft proposals for the construction phase of the A160/A180 Port of Immingham Improvement Project (the Project). It identifies key aspects of the construction phase and describes how proposals are being developed to minimise impacts, in so far as reasonably practicable, to local communities. It further describes the anticipated programme and key activities that will be undertaken on site in relation to the Project.

1.1.2 As the Project progresses through the Development Consent Order (DCO) process the detailed design, construction proposals, programme and Project costs will be further developed. However, the parameters and information in this report will inform any methodology undertaken.

1.1.3 This report has been prepared by Costain, the Highways Agency’s contractor for the Project, in conjunction with the Highways Agency.

1.2 Requirements and other commitments

1.2.1 This report together with the Requirements set out in the DCO, commitments made in the Environmental Statement, Statements of Common Ground and Side Agreements with other stakeholders will determine the final proposals for construction.

1.2.2 This report, together with the documents listed in 1.2.1, makes reference to other documents to be prepared by the contractor prior to construction. Many of these documents would require further discussion with key stakeholders prior to works commencing. This process will ensure that the contractor’s project management processes include for all commitments made.

1.3 Structure of this report

1.3.1 Sections 2 to 6 outline the proposed works, project management, supervision and audit, together with overarching topics.

1.3.2 Sections 7 to 13 provide further detail on construction disciplines. For each of these a brief description is given followed by the Project team’s proposed strategic aims for that construction discipline. Further detail is then given on how these strategic aims would be achieved.
2 Outline Description of the Project

2.1 Strategic aims of the Project

2.1.1 The Project proposes to provide better access to the Port of Immingham and the surrounding area by improving the A160 between the junction with the A180 at Brocklesby interchange and the Port. Improvements to this 5km strategic link road will help to stimulate growth and unlock economic benefits in the area.

2.1.2 The objectives of the Project are to reduce traffic congestion, improve journey time reliability and improve safety for road users and the local community. It also seeks to meet the needs of future traffic growth resulting from existing and future developments.

2.2 Key features

2.2.1 The Project consists of the following key features:

- upgrade of the Brocklesby Interchange to an oval two bridge roundabout layout, including a dedicated left turn lane for vehicles travelling from the eastbound A180 onto the A160;
- upgrade of the existing single carriageway section of the A160 between Brocklesby Interchange and Habrough Road Roundabout to dual carriageway standard;
- relocate the Habrough Road Roundabout with new link roads provided from the A160 to Ulceby Road, Top Road and Habrough Road;
- provision of a new road bridge over the A160 at Town Street to provide vehicular and pedestrian access between the two sides of South Killingholme following the central reserve closure;
- closure of the central reserve gap of the A160 at the junction with Town Street and partial closure of the central reserve gap of the A160 at the entrance to the Humber oil refinery, to only allow vehicles travelling westbound to right turn across the central reserve;
- the provision of a new gyratory carriageway system between Manby Road Roundabout, Rosper Road Junction and the Port of Immingham, requiring the construction of a new link road and bridge beneath the railway (known as Immingham New Rail Bridge); and
- localised diversion of third-party gas pipelines that cross beneath the existing A160.

2.3 Main construction activities

2.3.1 Extensive utility diversions are likely to be required as part of the Project including the diversion of up to five existing major gas mains under the A160 to the west of Poplar Farm, diversion of an oxygen pipeline near Rosper Road and the re-routing of numerous electrical and communication cables and water pipelines, particularly around the existing roundabouts. Protection works may remove the need for diversions but currently diversions are anticipated. These works will be discussed further in Section 8.

2.3.2 Temporary traffic management would be required on both the trunk roads and local road network in order to safely construct the works. This will include temporary restrictions such as reduced lane widths and speed limits, along with traffic signal controls and public rights of way diversions. Further details are given in Section 9.
2.3.3 Earthworks would be required to construct the cuttings and embankments required for the designed highway alignment, as well as for drainage, structures and landscaping works. The proposal is to seek to utilise locally sourced material from ‘borrow pits’ in agricultural land adjacent to the Project where possible. This will be discussed further in Section 10.

2.3.4 Drainage systems would be constructed to accommodate both highway drainage and run off from adjacent fields. This drainage would, where practicable, be used to manage temporary flows during construction. This will be discussed further in Section 11.

2.3.5 A number of new structures would be constructed, including bridges at Brocklesby Interchange, Town Street and Immingham New Rail Bridge. In addition there would be new culverts and existing culverts to extend or demolish. These works would require a combination of local earthworks and drainage, foundation construction, including piling, and structural concrete and steelwork. This will be discussed further in Section 12.

2.3.6 As earthworks, drainage and structures elements are completed, construction of the new and improved sections of highway would be carried out. This would include the carriageway construction itself, plus the required traffic signs, road markings and street lighting. In addition facilities for ‘non-motorised users’ such as pedestrians would be constructed, including footways and road crossings. This will be discussed further in Section 13.

2.4 Programme

2.4.1 Currently, subject to funding and successful progression through the Development Consent Process, it is intended that construction for the Project would commence in spring/summer 2015. Project completion is due in autumn 2016, when the Project would be open to traffic. Further programme details are included in Section 5.
3 **Highways Agency and its Supply Chain**

3.1 **How the Project is procured and how it will be managed**

3.1.1 The Highways Agency (HA) is the client and is delivering the Project by procuring services from specialist suppliers in their supply chain.

3.1.2 The competencies of all suppliers are thoroughly assessed by the HA. Appointments are made through a tendering process that requires an assessment of both quality and financial criteria.

3.1.3 The HA employ their own specialist project managers to manage all stages of the Project. This ensures that suppliers’ performance is actively monitored and managed so that acceptable levels of performance are achieved.

3.2 **Early Contractor Involvement**

3.2.1 The HA’s procurement strategy for this Project was to appoint a contractor as supplier under the Early Contractor Involvement (ECI) process. The main benefits of this process are:

- Construction buildability issues and impacts can be addressed early in the Project lifecycle and in particular before the draft Development Consent Order is published;
- A better understanding of construction issues can be developed at an early stage;
- A better understanding of environmental impacts can be developed during the design stage to assist with mitigation during the construction stage;
- Project budgets can be more realistic; and
- Once Development Consent has been granted, earlier delivery of the Project can be achieved.

3.3 **Delivery Partners**

3.3.1 Costain Limited was appointed as the lead Delivery Partner (Contractor) for the Project in July 2013 after a tendering process. Costain will lead the detailed design and construction activities and will be the Principal Contractor for the Project.

3.3.2 Jacobs, who have been the Highways Agency’s designer for this Project since January 2012, will work with Costain to maintain their role as Project Designer.

3.4 **Supervisor**

3.4.1 The Highways Agency has appointed a consultant supplier to fulfil the role of Technical and Site Assurance Supervisor to the Project.

3.4.2 The Supervisor’s staff will support the Highways Agency’s Project Manager in ensuring that the Project is designed and constructed in accordance with the Client Scheme Requirements, design standards, third party requirements and other commitments made.
4 Project Management Proposals

4.1 Project management system

4.1.1 The construction activities would be managed using Project specific management system documents complying with regulatory, Highways Agency and Costain requirements.

4.1.2 A Contract Management Plan would be developed setting out these management systems to ensure that an integrated and co-ordinated approach to project management is achieved.

4.1.3 This Construction Methodology Statement document, and any successor document, will form an appendix to the Contract Management Plan to ensure that matters considered in the pre-construction, consultation and statutory processes are appropriately carried forward into the construction phase plans.

4.1.4 The management systems would co-ordinate the activities of the design team, the construction team, and the supply chain. The systems would be used to define quality management and quality assurance arrangements and the responsibilities of all team members in the planning, resourcing, verifying and certifying of the works.

4.2 Health, safety & environmental management

4.2.1 An integrated Health, Safety and Environmental Management Plan (HaSEMP) would be prepared for the Project to manage these issues during the construction of works. The HaSEMP would consist of four parts: general issues; health issues; safety issues; and environmental issues.

4.2.2 The 'environmental' part of the HaSEMP will comprise the Construction Environmental Management Plan (CEMP). The CEMP provides the management framework needed for the planning and implementation of construction activities in accordance with the environmental requirements / commitments identified within the published Environmental Statement. There is a requirement in the DCO that the CEMP has to be prepared and approved by the Secretary of State before construction can commence and the construction must be carried out in accordance with the approved CEMP.

4.2.3 Where appropriate risk assessments, method statements, work plans, permits, inspection and test plans and non-conformance reporting would be used to monitor and control the construction process. Details and an outline schedule of these documents will be set out in the HaSEMP.

4.2.4 A team of advisors would be available to manage and co-ordinate environmental and safety activities during the construction phase. An occupational health nurse to manage the health of the workforce would also be available.

4.2.5 The contractor, Costain, would also be subject to several regular audits throughout the construction phase. This would include internal and external audits, including by the Highways Agency.
5 Construction Programme

5.1 Programme overview

5.1.1 The construction programme is based on a forecast start of works in spring 2015 leading to the improved road opening in summer 2016. The construction activities and programme would be subject to modification during both the detailed design and the construction phases. The timings indicated are a best estimate based on the present situation and are a guideline. This section describes the provisional overall construction programme and the planned sequence of operations.

5.1.2 Advance works would start in early spring 2015 subject to the making and coming into force of the DCO, and after approval to start construction is given by the Highways Agency. These activities would be those required to prepare for the main works such as establishing works compounds and offices, welfare facilities, fencing, environmental mitigation and temporary works accesses. These are further described in Section 7. Some activities may be seasonally constrained, such as certain site clearance activities to avoid periods when birds may be nesting.

5.1.3 Utility works are proposed to commence on site in spring 2015. These works would focus on works to protect and, where necessary, divert up to five gas mains to the east of Poplar Farm. The works would be progressed rapidly to allow subsequent weather sensitive activities, such as earthworks and drainage, to be adequately progressed before the next winter.

5.1.4 The construction programme for the main works would have a duration of approximately 16 months, from early in 2015 to substantial completion during summer 2016. At substantial completion the majority of works would be completed sufficient that the road could be opened to traffic.

5.1.5 Some activities would extend beyond substantial completion. These would include demobilisation of works compounds and seasonally constrained activities such as landscaping.

5.1.6 Works requiring traffic management, including temporary works access / egress arrangements at the A180/A160 Brocklesby Interchange would be required for the majority of the main works period.

5.2 Works sections programme

5.2.1 The Project comprises a number of elements which have been divided into ‘Sections’ for the purposes of planning and sequencing the works as follows:

- Section 1: Brocklesby Interchange
- Section 2: A160 Dualling
- Section 3: Habrough Road Roundabout and Approaches
- Section 4: A160 Humber Road Improvements (including Town Street Bridge)
- Section 5: Rosper Road Link (including Immingham New Rail Bridge)

5.2.2 A drawing showing these Sections is provided in Appendix A.

5.2.3 The principal construction programme constraints and assumptions for each of these sections are described below.
5.2.4 The activity descriptions below necessarily include some construction terminology which may be unfamiliar to some readers. To aid understanding we have given an explanation of some key terms below.

5.2.5 ‘On-line’ and ‘off-line’ works: ‘On-line’ means works that are within areas of existing highway e.g. an existing section of road that needs to be dug out and re-modelled. ‘Off-line’ means works that are outside of the existing highway, typically in adjacent land. The distinction is important, because it has a major influence on the construction phasing. For example, traffic will normally require diverting from the existing roads – the ‘on-line’ areas – in order to carry out the works. This in turn may require the provision of an alternative route, which could be onto an area of completed ‘off-line’ work. The drawing in Appendix A shows the approximate areas of the ‘on-line’ and ‘off-line’ works.

5.2.6 ‘Bulk earthworks’: This is the excavation, movement and placement of the majority of (the ‘bulk’ of) construction ‘fill’ materials using heavy earth-moving equipment such as large tracked excavators, articulated dump trucks and dozers. Earthworks materials could be existing ‘natural’ ground, including soil and underlying layers, ‘made ground’ i.e. pre-existing man-made earthworks features such as embankments, or imported fill materials such as quarried aggregates.

5.2.7 ‘Earthworks season’: This is the period between spring and autumn that typically would be expected to be sufficiently dry, and with ground and air temperatures which are sufficiently warm to aid drying, that earthworks materials can be handled without excessive damage.

Section 1: Brocklesby Interchange

5.2.8 The initial activities in this section are the clearance of vegetation and translocation of water voles (if required), during early spring of 2015. Construction of the new A180 eastbound ‘on’ slip-road (‘on-slip’) would then follow, this being necessary to divert traffic away from the site of the northern abutment for the new bridge. Construction of the new A180 westbound ‘off’ slip-road (‘off-slip’) would be undertaken in parallel with the new eastbound on-slip. This in turn would allow traffic to be switched off the existing westbound off-slip so that the new westbound on-slip can be constructed.

5.2.9 A small number of night-time closures of the A180 local to the interchange would be needed to install the bridge deck. Traffic would be diverted ‘up and over’ the junction via the new slip roads. The traffic would be switched onto the new structure once the bridge has been completed. This would then allow the refurbishment of the existing bridge structure to be undertaken before the junction is opened as an elevated roundabout. Additionally, further lane/carriageway restrictions would be required for activities such as traffic management installation and works to the existing structure.

Section 2: A160 Dualling

5.2.10 The works to create a dual carriageway between the A180 and Humber Road are closely linked to the Brocklesby Interchange and new Habrough Road Roundabout works. Again the initial activities in this section are the clearance of vegetation and translocation of water voles (if required) during early spring of 2015. Work to the off-line southern part of this section would then be progressed in parallel with the new slip road construction at Brocklesby Interchange.

5.2.11 The northern end of the off-line section is constrained by works to protect or divert various gas mains and other services crossing the Project. These works have seasonal constraints and are currently programmed to be undertaken in the
spring/summer of 2015. The main earthworks at the northern end of the works would not start until the protection/diversions have been completed.

5.2.12 The main work sequence starts with the construction of the off-line sections of the A160 dualling starting at the southern end, away from the service diversions noted above. Once this has been completed the traffic would be switched onto the new southbound carriageway, but running in both directions temporarily, and the re-construction of the currently on-line section of the northbound carriageway would commence.

5.2.13 When this has been completed northbound traffic would be diverted onto the new carriageway and the finishing works to the central reserve of the dual carriageway section would be carried out.

5.2.14 The construction programme for both Brocklesby Interchange and the A160 dualling is based on completing the majority of bulk earthworks in the 2015 earthworks season.

Section 3: New Habrough Road Roundabout and Approaches

5.2.15 The work sequence for this section begins with the site preparation and bulk earthworks for the new off-line roundabout and approaches. This would be followed by forming the lower layers of new road construction through the section and installation of the new drainage network.

5.2.16 The work then requires the diversion of utility apparatus in and around Habrough Road and the existing roundabout before construction of the new off-line elements of carriageway, along with any necessary temporary links.

5.2.17 Phasing of the works will be carefully considered to maintain access to properties.

5.2.18 The traffic would then be diverted around the new roundabout and onto the existing eastbound carriageway while the new westbound carriageway is constructed. The construction of the new eastbound carriageway would follow after traffic is switched again. Finally the finishing works to the central reserve of the extended dual carriageway section would be carried out.

Section 4: A160 Humber Road Improvements

5.2.19 The initial activities in this section are completing any necessary service diversion works during the spring and early summer of 2015, with vegetation clearance being undertaken after the end of the bird nesting season in August 2015.

5.2.20 The abutments for the new Town Street Bridge would be constructed in advance of the main embankments. This would allow the bridge deck to be constructed independently. A small number of night-time closures of the A160 would be required to construct the bridge deck, with diversion routes put in place.

5.2.21 In order to minimise the import of earthworks fill material we would aim to sequence the construction of the bridge approach embankments to coincide with when material becomes available from excavation of the existing A160 embankment in late 2015/early 2016.

Section 5: Rosper Road Link

5.2.22 A key driver to the construction of the new rail bridge at Rosper Road is the diversion of an oxygen pipeline running alongside the rail embankment on the north side of the railway. It would not be possible to commence any significant works here until this pipeline has been diverted, so we would aim to progress this work as soon as possible after starting construction in spring 2015.
5.2.23 Works on the south side of the railway would be undertaken as soon as the diversion of some local services and demolition of an existing building has been completed.

5.2.24 The Immingham New Rail Bridge would be constructed largely off-line, adjacent to its final location within the railway embankment, between spring and December of 2015. This would then aim to be installed during a single closure of the railway line over the Christmas 2015 period using a large scale bridge slide method.

5.2.25 The construction sequence then passes through the completion of the bridge structure and construction of the final portion of the Rosper Road link which passes underneath the new bridge.

5.2.26 The intention is that the remainder of the link road and high load route would be constructed in parallel with other works in the Section, with the final activities being the finishing works at the Rosper Road / Humber Road junction.

5.3 Environmental Constraints to the Project

5.3.1 The constraints described below are examples which have a significant influence on the Project programme. For further detail of all the environmental constraints identified relating to the Project, refer to the Environmental Statement.

Ecological constraints

5.3.2 Any active badger sett identified within the footprint of the Project would require exclusion and subsequent destruction prior to any significant works being commenced in their immediate vicinity. This would require a licence to be obtained from Natural England. Proposals would be developed to ensure that until the sett was closed, works do not interfere with badgers or their setts.

5.3.3 Vegetation clearance would, where possible, be undertaken prior to March, or after August to avoid the bird nesting season. Where this cannot be achieved, vegetation clearance would be supervised by an ecologist with checks for birds’ nests no more than 24 hours prior to clearance. Where nests are identified the works will be reprogrammed to avoid these.

5.3.4 Water vole have been found to be widely distributed within the Project area; in particular the ditches around Rosper Road and Brocklesby Interchange. Two ditches have been identified where the Project proposals will potentially impact directly on the water voles. It is anticipated that water voles will be displaced from these ditches through a process of habitat manipulation involving the staged removal of vegetation/bankside habitat via hand strimming under the supervision of a suitably qualified ecologist. If displacement is not a viable option (dependent on preconstruction surveys scheduled for 2014) then translocation and advanced habitat creation would be used. Approximately 0.35ha of land adjacent to Rosper Road Pools has been identified in the DCO application as a habitat creation area for water vole. This area would be developed in advance of the main scheme construction by agreement with the relevant landowner in order to allow time for the habitat to mature to be suitable for water vole habitation. A method statement detailing the sensitive management of highways ditches for water vole would be prepared in advance of the Project becoming operational.

Archaeological constraints

5.3.5 Prior to commencing works that will remove topsoil from an area a programme of archaeological investigation will be carried out. No works will commence in an area requiring archaeological investigations until a written scheme for investigation has been prepared in consultation with the Relevant Planning Authority and approved by the Secretary of State.
6 Disruption Due to Construction

6.1 Construction working hours

6.1.1 The majority of construction works will normally take place between 07:30 - 18:00 Monday to Friday and 08:00 to 13:00 on Saturday. There may be exceptions to these hours for oversize deliveries and junction tie-ins etc. or for traffic management reasons. Also there are likely to be extended working hours in the summer months for the earthworks to take advantage of the weather / daylight.

6.1.2 Due to traffic management restrictions, safety and operational constraints, some operations would need to be carried out at night. The relevant Local Authorities would be liaised with where notable operations are to be carried out at night, such as erecting bridge beams. Liaison would also be carried out with the local community, businesses and other key stakeholders.

6.1.3 Where construction works could have a significant impact on neighbouring properties, businesses and residents, the affected parties would be advised of these works prior to their occurrence. Environmental Health Officers (EHOs) from the Local Authorities would be consulted with regard the nature and extent of any such works. In addition, Project Team would liaise closely with members of the public, businesses and EHO to minimise the disruption and impacts resulting from the construction works.

6.2 Project design work to date to reduce construction disruption

6.2.1 The design for the Project has, to date, been developed in order to minimise disruption where reasonably practicable. Measures proposed so far in the design include:

- avoidance of driven concrete piles to reduce noise and vibration nuisance;
- design of vertical alignment to optimise the quantity of earthworks materials;
- proposed bulk earthworks using locally 'borrowed' material for embankment construction to minimise road vehicle movements;
- prefabricated elements for structures over the A160 and A180 to reduce carriageway restrictions; and
- off-line roundabout design of Habrough Road Roundabout.

6.3 Construction strategy to minimise disruption

6.3.1 Construction of the Project would cause a degree of disruption to the local environment, local people and to users of the local highway network. Such disruption is unavoidable, although measures would be implemented to minimise the adverse effects. The most significant effects are likely to be temporary land take, visual intrusion, increased noise and vibration and reduced air quality associated with the works on site. In addition, there would be disruption to road users and disruption to footways where there may be a need for restrictions.

6.3.2 The strategic aim is to eliminate the sources of disruption and implement measures to minimise any unavoidable disruption where reasonably practicable. Prior to construction the detail of these measures would be further developed, and where appropriate would be location specific. As the detailed design, construction programme and philosophy are developed so too would be the measures to minimise disruption.

6.3.3 Mitigation measures would be recorded in the Site Environmental Control Plans that form part of the CEMP. Task specific mitigation measures would also be included in
Risk Assessments and Method Statements (RAMS) to be developed before related works commence.

6.3.4 Construction managers and supervisors would brief operatives on each RAMS prior to related works commencing. This, together with appropriate general and specific training, would ensure agreed measures are implemented.

6.3.5 Further constraints could be imposed on construction activities where disruption may cause particular local nuisance.

6.3.6 Proposals to mitigate disruption due to construction related to particular construction activities are outlined in Sections 7 to 13.

6.4 Public liaison

Communication planning

6.4.1 The Project Team will identify key stakeholders and develop the most appropriate methods of engaging with them throughout the Project lifecycle.

6.4.2 These methods would be updated at key stages of the Project, incorporating insights gained at each stage, for example the results of feedback from the DCO process.

6.4.3 The Project Team will ultimately develop a construction phase Communication Plan, through which Costain will manage liaison with stakeholders during the site works. Costain would appoint a Public Liaison Officer (PLO) based on site to coordinate engagement activities.

Communication of diversion routes to the public

6.4.4 Once any temporary closures of the trunk or side roads have been agreed with the Local Authorities and the police, a number of methods would be utilised to ensure that the public were kept informed of the closures. These may include the distribution of leaflets, notices placed in service stations, bulletins on local radio, notices placed in local newspapers, web based information, advanced warning messages on trunk road gantries, and portable variable message signs informing the travelling public of the closures well in advance.

Liaison with schools and local communities

6.4.5 The Public Liaison Officer (PLO) would actively engage with the local schools to explain about the works that are going on and the dangers of construction sites. They would also maintain close contact with local community groups and parish councils. The PLO would ensure that local residents directly affected by the Project would have 24 hour access to the contractor via a Helpline, with a target that all issues are responded to within 24 hours and addressed within 7 days.

6.5 Emergency services

6.5.1 Liaison with the emergency services would be of paramount importance throughout the whole construction period, to keep the Police, Fire & Rescue Service and Ambulance Service informed of our activities and local road restrictions or closures. Regular liaison meetings would be held, organised by the Project Team, and with all key parties invited.

6.6 Considerate Constructors Scheme

6.6.1 The Contractor would register for the Considerate Constructors Scheme on this Project. Once registered, the contractor would follow the Site Code of Considerate Practice.
6.7 **Temporary land take**

6.7.1 In order to carry out the construction works, it is essential that temporary land is acquired for the duration of the works for site compounds (including offices, stores, accommodation areas and car parking), construction working areas (including for temporary works and haul routes), earthworks ‘borrow pits’, topsoil and other construction storage areas and utility diversion working areas.

### Site compounds

6.7.2 The main construction compound for the Project is proposed to be located in farmland to the southwest of the proposed new Habrough Road Roundabout. This is close to the largest proportion of the Project works, but away from the main residential areas. Areas for smaller satellite compounds are proposed to service the discrete work areas at Town Street Bridge and the Rosper Road Link.

6.7.3 The compounds would be mobilised ahead of main works commencing.

6.7.4 Temporary services would be required at the proposed compounds. These would include electricity, communications, water supply and sewerage. Where mains sewers are not available, suitable effluent treatment units would either be installed within the compounds or effluent transported to alternative facilities.

6.7.5 Car parking facilities would be provided at the compounds to reduce vehicle movements in and around the local road network and urban areas. Inter-site transport would be provided (e.g. minibuses) to minimise vehicle movements and facilitate safe transport of the workforce around the site.

### Construction working areas and haul routes

6.7.6 Where there is sufficient working space within the permanent land take for the Project, then construction can be carried out without additional temporary land. However, in some locations because of constraints on permanent land take or due to the method of construction required, additional areas of land are needed temporarily to allow construction. This can be space for:

- plant operation and/or access e.g. haul routes for earthworks;
- temporary works installations e.g. pumps / ponds for temporary drainage;
- on-site assembly e.g. steel reinforcement cages or structural steelwork; and
- working space for statutory undertakers’ utility diversions.

6.7.7 Each work location is assessed on its own merits, and where temporary land is thought necessary the size is calculated sufficient for the work to be carried out. For example, haul routes for earthworks would be assessed at a suitable width for safe passage of earthworks plant, with adequate provision for temporary fencing and drainage, and passing and turning points as required.

6.7.8 Earthworks haul routes would be needed from the proposed ‘borrow pits’ around Brocklesby Interchange around the junction and along both sides of the A160. These would permit safe access and egress to all areas for heavy earthmoving plant, minimising the need for vehicle movements on the existing roads.

6.7.9 Where feasible the footprint of the permanent works would also be used for plant and vehicle access e.g. along the new line of the A160. If required sacrificial materials would be used to provide a temporary surface for vehicles to run on.
Earthworks ‘borrow pits’

6.7.10 Land is proposed to be temporarily acquired adjacent to Brocklesby Interchange to be used as a source of material to form the embankments for the raised sections of the new road construction. These sources of material are known as ‘borrow pits’. Details of the reasons for this approach and the proposals for the borrow pit locations are given in Section 10.

Topsoil and construction materials storage

6.7.11 Temporary storage areas would be required for topsoil and subsoil stripped from the site, including borrow pit areas, for later use in reinstatement and landscaping.

6.7.12 The proposed locations and shapes of soil storage areas have been identified using, but not limited to, the following criteria:

- proximity to the works areas where the soil would be stripped from, in order to minimise haul distances and thereby achieve the most efficient use of plant. This also applies to general construction storage; and
- minimising the number of different land owner plots for ease of management e.g. dealing with fewer landowners and minimising disruption to land boundaries and ongoing use of adjacent land.

6.7.13 Bulk materials, such as earthworks fill and road construction materials, are proposed to be delivered on an ‘as required’ basis directly to the work sites. It would, however, be necessary to store some construction materials and equipment prior to use. This would include drainage components, specialist aggregates, fencing, kerbing, brickwork and blockwork, lighting equipment, steel for reinforced concrete and structural steelwork and temporary works materials.

6.7.14 In addition, some excavated materials may be stored prior to processing and recycling, and other waste materials may be stored for a time prior to disposal.

Utility diversion areas

6.7.15 There are a number of existing utilities which are likely to require diverting or protection works as a result of the Project. Temporary land has been identified for the major services which are likely to require work outside the permanent land take of the Project. The major services identified are:

- five gas mains which pass under the existing A160 approximately halfway between the junction with Ulceby Road and the existing Habrough Road roundabout;
- three water pipelines which pass under the existing A160 in the vicinity of the junction with Ulceby Road;
- an oxygen pipeline which runs to the northeast of and parallel to the railway embankment at the Rosper Road end of the Project; and,
- overhead electricity cables above the A160 to the north of Brocklesby Interchange.

6.7.16 Contact has been established with all relevant third parties and where appropriate feasibility studies and/or conceptual designs are being undertaken to confirm the works required.

6.7.17 The sizes and locations of the temporary land required is a function of the service type and location, and the likely diversion routes or protection requirements. For the major diversions noted above this means allowing sufficient land for:
• working space either side of the permanent works highway corridor for access to the likely start and end points of any diversion or protection works;
• working space either side of the service for access to the existing asset, including for temporary works e.g. to excavate and connect to and/or remove existing pipelines;
• room for any physical diversion works e.g. a lateral move from the current position; and
• temporary site compounds and storage areas for the Statutory Undertakers / service owners and their supply chain carrying out the works.

6.8 Waste minimisation and management

6.8.1 The CEMP would outline the way in which waste would be minimised and managed throughout the construction of the works. This would include waste generated through works activities and also waste generated by the associated office and welfare facilities.

6.8.2 A Site Waste Management Plan (SWMP) forms part of the CEMP and would be developed for the Project to ensure that all waste is handled efficiently and managed appropriately. The plan would ensure waste is disposed of legally, that suitable materials are recovered and recycled or reused where appropriate. Waste streams from both office facilities and construction activities would be identified with options to minimise the quantity of waste produced. If waste cannot be designed out other waste management options would be considered. These would include on site reuse and recycling, off site reuse and recycling, disposal to a waste transfer station or waste exempt site and as a last resort, disposal to a landfill site. Regular reviews of waste management would be undertaken to monitor predicted waste quantities in the SWMP.

6.8.3 Checks would be carried out on documentation and facilities prior to the transporting of waste from site to any disposal / exempt site and before importing any recycled / recovered material onto site. Waste Management Licences and environmental permits / exemptions would be obtained together with the Waste Carrier Licences of those transporting the waste. Should recycled material be required as part of any construction works, then assurances and documentation would be obtained that the material being imported is a product and not a waste, and that it complies with the relevant protocols.

6.9 Noise and vibration from construction activities

6.9.1 Where appropriate and practical, noise and vibration from construction activities has been assessed in the Environmental Statement.

6.9.2 The Environmental Heath Officers (EHOs) of North Lincolnshire Council and North East Lincolnshire Councils would be consulted on the noise and vibration limits to be included within the CEMP. It is anticipated that a scheme of noise and vibration monitoring at key receptors would be agreed with the EHOs to ensure compliance with the limits set. Neighbours to the works would be engaged through the public liaison principals described in Section 6.4.

6.9.3 Where activities are anticipated that may generate a significant impact, such as bridge construction at Town Street, construction methodologies will be developed to minimise this nuisance. Where specific activities remain where there are no reasonable alternatives methods, detailed proposals would be discussed with the relevant EHO and public liaison would be carried out.
6.9.4 BS 5228 (part 1 and 2) provides guidance on best practice to minimise noise and vibration impacts during construction. It also advises on proactive measures that can be taken in terms of liaising with residents. The following mitigation measures could be employed on site to ensure that noise and vibration levels are attenuated as far as possible and will be considered in preparing the CEMP:

- the use of ‘best practicable means’ during all construction activities, as contained in BS 5228;
- switching off plant and equipment when it is not in use for longer periods of time;
- establish agreement with the local authority on appropriate controls for undertaking significantly noisy works or vibration-causing operations close to receptors;
- programming works so that the requirement for working outside normal working hours is minimised;
- use of low noise emission plant where possible;
- where feasible piling would be bored to protect sensitive sites;
- the use of temporary noise screens around particularly noisy activities; and
- regular plant maintenance.
7 Pre-Construction and Mobilisation

7.1 Brief description of the works

7.1.1 Pre-construction and mobilisation activities will be required to support the construction workforce, provide storage for materials and allow the works to be constructed in a safe and efficient manner, with reference to the local environments.

7.1.2 The pre-construction and mobilisation activities will likely include:

- mobilisation of compounds, offices and welfare facilities;
- provision of works accesses and delineation of the site boundaries;
- works to identify, delineate and protect statutory utility apparatus, other hazards and environmental constraints; and
- environmental site clearance.

7.2 Strategic aims for pre-construction and mobilisation activities

7.2.1 To engage effectively with local communities and directly affected landowners to explain the planned works.

7.2.2 To mobilise the site efficiently, and provide where practical early mitigation measures.

7.2.3 To mobilise the site so that disruption is minimised, safe access is provided, and adequate security provided to keep the public safe.

7.2.4 To complete as much site clearance as is possible outside of restrictive seasonal windows.

7.3 How the works will be managed to deliver the aims

Pre-construction exhibitions and ongoing communication

7.3.1 Pre-Construction exhibitions would be held to explain the detailed proposals to the local community, and to explain what mitigation measures are proposed to minimise disruption due to construction.

7.3.2 For those stakeholders most directly affected, the consultation that has already commenced would continue.

The Pre-construction and Mobilisation works

7.3.3 These activities would commence with the setting out of the limits of the works, followed by fencing and site clearance.

7.3.4 Fencing would separate the public areas and farming operations from the works sites. The permanent fencing would be erected wherever practicable. Where this is not possible, suitable temporary fencing would be installed.

7.3.5 Site clearance would take into account seasonal environmental constraints. For example, as much clearance of trees, shrubs and hedgerows would be undertaken outside the bird nesting season (typically March to August). Where protected species or their habitats would likely be affected, the works would be carried out in accordance with the methods laid out in the CEMP and agreed with an ecologist. All necessary approvals or licences would be obtained from the appropriate regulatory body for the planned works.

7.3.6 Subject to the DCO being approved, early entry may be negotiated with landowners to facilitate early site clearance.
7.3.7 The extent of the site clearance would be kept to the minimum required for the works.

7.3.8 Areas that have been identified in the archaeological surveys as having potential for archaeological interest would be monitored as the site clearance is progressing. This would be done in advance of the main earthworks activities in any area.

7.3.9 One residential property in South Killingholme and a building near to Manby Road roundabout would require demolition. The demolition of these properties would be carried out early in the construction programme.
8 Diversion of Statutory Undertakers (SU) and Other Apparatus

8.1 Brief description of the SU works

8.1.1 There would be extensive diversions of, or protection works for, utility apparatus required to allow the Project to be constructed. These works are anticipated to be undertaken directly by the utility companies and include gas mains, water mains, electricity cables and communications cables. The Highways Agency and its contractor may carry out additional protection works and other civil engineering works to assist the utility companies.

Summary of key diversions

8.1.2 The major services which are likely to require work (protection or diversion) as a result of the Project are:

- five gas mains, including four high pressure, which pass under the existing A160 approximately halfway between the junction with Ulceby Road and the existing Habrough Road roundabout;
- two large water mains which pass under the existing A160 in the vicinity of the junction with Ulceby Road;
- an oxygen pipeline which runs to the northeast of and parallel to the railway embankment at the Rosper Road end of the Project; and
- overhead electricity cables above the A160 to the south of the Ulceby Road Truck Stop.

8.1.3 In addition there are a number of smaller services, such as local electricity supplies and telecommunications cables which are likely to need to be re-routed, for example around the existing Habrough Road and Manby Road Roundabouts.

8.1.4 A 400kV overhead power line on pylons crosses the site in the vicinity of Brocklesby Interchange. No works are required to this line except to provide protection measures during the works.

8.2 Strategic Aims for diversion of statutory undertaker’s apparatus

8.2.1 To avoid where possible the need to divert apparatus and use protection measures instead.

8.2.2 To minimise the impacts of any outages on local residents and businesses.

8.3 How the works will be managed to deliver the aims

8.3.1 The project team are in discussions with the various Statutory Undertakers and service owners to determine the diversion or protection works that may be needed.

8.3.2 Costain would coordinate these works and the utility companies would be expected to comply with the requirements of the Contract Management Plan and the Health, Safety & Environmental Management Plan including the CEMP.

8.3.3 Safe methods of work would be developed to ensure that safe practices are adopted around the existing and diverted utilities. Any effect upon the utilities could be both dangerous to the workforce and to third parties as well as highly disruptive to local communities.
9 Traffic Management

9.1 Brief description of the works

9.1.1 Temporary traffic management and restrictions would be needed to provide safe access and working areas for the construction workforce and their vehicles, plant and equipment, and to permit safe passage of vehicles and non-motorised users, such as pedestrians and cyclists, through and adjacent to the works.

9.1.2 These traffic restrictions must be carefully planned and managed and would include a variety of measures, from separating works areas from public access areas to full closures of certain roads for short durations, speed restrictions and temporary traffic signals.

9.2 Strategic aims for traffic management

9.2.1 To minimise disruption to road users during the works.

9.2.2 To minimise disruption to local communities and businesses and emergency services during the works, providing access throughout.

9.2.3 To provide a safe working area for the construction workforce.

9.2.4 To provide safe and clearly signed traffic routes through the works.

9.2.5 To ensure non-motorised users are provided with suitable facilities.

9.3 How the works will be managed to deliver the aims

9.3.1 Traffic management would comply with the requirements of Chapter 8 of the Traffic Signs Manual with Project specific additions and relaxations as agreed with the Highways Agency and other relevant Highway Authorities.

9.3.2 The traffic management strategy will be set out in the Traffic Management Plan (TMP), which will be produced in consultation with the appropriate Highway Authorities and key stakeholders. The TMP will include details and plans that will outline measures such as:

- the minimum number of lanes that will be in operation during the works;
- maximum temporary speed limits to be applied;
- details of any carriageway closures and restrictions;
- details of any slip road closures;
- times of day that any restrictions would be in place;
- the schedule for removing roadworks during bank holidays or provide the rationale for not doing so;
- details of other identified traffic management schemes in the vicinity of the project;
- any significant events planned during construction works and measures that can be put in place to mitigate impacts on travel due to the roadworks;
- details of breakdown and recovery arrangements during the works; and
- details on any measures to be put in place for driver compliance and enforcement of speed limits.

9.3.3 Wherever reasonably practicable the following principles would be adopted in traffic management detailed design, installation and programming:
Construction Methodology Statement

- Construction methodology to minimise the need for total closures of trunk roads and/or carriageway closures;
- Principle works access / egress to be via the A180, A160 and Rosper Road to minimise the need for works traffic on local roads; and
- Avoiding the use of local roads such as Top Road, Habrough Road and Town Street for works vehicles.

**Construction traffic**

9.3.4 Restrictions on the movement of construction traffic on the local road network would be agreed with the local Highway Authorities prior to commencing works. Costain would ensure that these restrictions would be issued to all suppliers, subcontractors and to the directly employed workforce. Disciplinary action would be taken if these restrictions were not adhered to.

**Trunk road traffic management**

9.3.5 Minimising disruption to traffic on the trunk roads (A180 and A160) would also reduce disruption on local roads as traffic is less likely to select alternative routes. Temporary traffic management measures would therefore be designed to keep trunk road traffic moving efficiently, for example by:

- Maintaining the existing number of operational lanes as far as is practicable;
- Providing clear and consistent temporary signing and road markings;
- Enforcing reduced speed limits where appropriate to reduce the risk of incidents (as well as for the safety of the workforce); and,
- Providing traffic monitoring and free breakdown recovery where appropriate.

9.3.6 Further measures are proposed to reduce disruption to local roads whilst constructing the Project including:

- Deliveries of materials to either be to the appropriate satellite compound or storage area or directly to the point of use;
- Delivery vehicles would be restricted to certain routes avoiding local communities as noted in 9.3.4; and
- Using locally ‘borrowed’ fill material for embankment construction. The fill material would primarily be transported on purpose built haul roads, thus minimising road vehicle movements.

9.3.7 Key to reducing the nuisance caused by the remaining disruption would be effective communication with affected stakeholders.

9.3.8 Measures would be provided to reduce any mud carried onto the trunk and local roads. Facilities would be available to ensure that, should mud be carried onto a road such that it may cause a hazard or nuisance, it can promptly be removed.

9.3.9 Full carriageway closures would be required for bridge deck installation over the A180 at Brocklesby Interchange and for the new Town Street Bridge over the A160 Humber Road. Suitable temporary diversion routes would be agreed with local Highway Authorities and other stakeholders including consideration of HGV movements. Full closures would only be implemented during off-peak times (i.e. at nights and weekends), unless otherwise agreed.

9.3.10 Slip road closures at Brocklesby Interchange are likely to be required for traffic management installation on the A180 and would be considered for certain elements of work. Diversion routes would be established.
Local road traffic management

9.3.11 The Project has been designed to limit disruption on the local side roads with the majority of the works constructed off line.

9.3.12 Temporary traffic signals would be required to enable the works to be completed. The local Highway Authority and Police would be consulted prior to implementing any restrictions.

9.3.13 No restrictions to private accesses to residential properties are expected. However should any short term restrictions be required these would be discussed with any affected party. Any works that affect field accesses would be discussed in detail with the individual parties affected to agree methods of working and programming prior to commencement of the particular section of work.

Bank holidays

9.3.14 Ideally the construction programme would be developed, wherever practicable, to avoid the need to have temporary traffic management in place over bank holiday periods. However, major elements of traffic management, such as narrow lanes and significant lengths of solid barrier or cones, would need to remain in place to maintain the safety of the travelling public. In addition, removal and reinstatement would result in inefficient completion of works, additional surfacing and lining works and confusion for the road user.

9.3.15 Where acceptable from a safety perspective, and where it is not cost or time prohibitive (e.g. for ‘local’ traffic management on side roads), traffic management would be removed from the network during bank holiday periods in accordance and the relevant Highway Authorities consulted.

Adjacent / nearby roadworks and traffic management

9.3.16 The contractor will liaise with the relevant Highway Authorities to ensure they are aware of the Project’s timescales and extents so as to manage potential conflicts with other road works that may be due to be carried out in the vicinity of the Project at the same time.

Significant events including ‘shut downs’

9.3.17 There may be major maintenance ‘shut downs’ at local petrochemical plants and movements of abnormal loads to and from the ports and local plants. In addition there may be busier than average periods at the Port of Immingham and varying shift patterns at local employers which could affect peak traffic flows. Where practicable, traffic management would be co-ordinated with local stakeholders to minimise the impact on these events.
10 Earthworks

10.1 Brief description of the works
10.1.1 The Project would require new embankments to be built and cuttings to be excavated to achieve the required road alignment, with the largest quantities being for Brocklesby Interchange and for the A160 dualling works.

10.1.2 Other movements of natural earth and made ground would be needed to construct the new drainage system, including ditches and attenuation ponds, and for the construction of new structures, such as Town Street Bridge and Immingham New Rail Bridge.

10.1.3 There would also be a significant requirement for earth movement for initial site clearance e.g. stripping and storing topsoil and for final landscaping throughout the works area.

10.2 Strategic aims for earthworks
10.2.1 To optimise the earthworks balance subject to engineering and other constraints.

10.2.2 To minimise imported materials from off site and reduce vehicle movements on the road network.

10.2.3 To minimise environmental impacts and nuisance to the local community.

10.3 How the works will be managed to deliver the aims

Earthworks balance
10.3.1 A key aim of the earthworks philosophy has been to optimise the earthworks balance subject to engineering and other constraints. Where appropriate, material would be processed to maximise the quantity of materials reused in the completed Project. A total balance would be achieved, when the volume of excavated material equals the volume of fill material required for both embankment construction and landscape ground shaping. This would maximise the reuse of materials available from within the site, minimise the import of materials from outside the site and minimise the need for inert material disposal.

10.3.2 A balance has been sought within the various sections of work thereby reducing haulage lengths, plant movements and bulk haulage and also enabling material to be moved predominantly by dump trucks within the site boundaries. The programme also aims to minimise any double-handling of material and therefore reduce unnecessary plant movements.

Minimising imported materials
10.3.3 The Project requires approximately 300,000m$^3$ of fill material to construct the new embankments for raised sections of the road and for landscaping works. A similar volume of existing material would be excavated, thus achieving an approximate earthworks balance. However, the construction sequencing means that much of the removed material would not be available until later in the programme. A source of material is therefore required from the start of the works. There are two main options for sourcing of this material:

- ‘borrowing’ material by excavating from a suitable, nearby area of land; and
- ‘importing’ primary aggregates (e.g. quarried, crushed rock) or secondary materials (e.g. pulverised fuel ash from power stations).
10.3.4 An assessment of these two options has been carried out and it has been determined that the ‘borrow’ option is the best overall solution for the Project. It provides a good engineering solution, as it uses similar materials as those used to construct the existing embankments. In addition it is more cost effective, efficient to construct and environmentally sustainable compared to the alternative.

10.3.5 Areas of agricultural land proposed to be used temporarily as sources of borrow material ('borrow pits') are included within the DCO application.

10.3.6 The borrow pits would be re-filled on completion of the works to a similar level using sources of backfill material gained from the works and reinstated to a quality appropriate to allow them to be returned to their previous agricultural use. This would involve the production of a Soil Resource Plan, showing the areas and type of topsoil and subsoil to be stripped, the proposed haul routes, the methods to be used, and the location, type and management of each soil stockpile, and a Restoration Plan for the borrow areas, developed with an agricultural specialist for agreement with the landowners and their agents.

10.3.7 The size of the borrow areas have been calculated from the total volume of fill material required to meet programme requirements (currently estimated at 170,000m³) and the following assumptions:

- the top 1m of material from the borrow pits, comprising topsoil and subsoil, is not used for construction, but is excavated and stored for reinstatement in line with DEFRA guidelines;
- typically only material from between 1m and 3m below existing ground level is extracted for use. This is to avoid excavation within the water table which is generally below 3m; and
- 80% of the material extracted is suitable for use. Material that is unsuitable for construction would be stored and replaced in the borrow pits on reinstatement.

10.3.8 Some additional land is needed around the borrow areas to accommodate safe side slopes into the pits, drying out areas for excavated material, plant and vehicle access and temporary fencing. Further areas of adjacent land would be used for storage of the topsoil and subsoil as noted in Section 6.7.

10.3.9 The locations of the proposed borrow pits have been selected by considering:

- proximity to the works areas where the fill material would be used in order to minimise haul distances and thereby achieve the most efficient use of plant;
- the likelihood of suitable material being available within the selected areas, based on geotechnical information;
- minimising the number of different land plots to reduce the number of affected parties and minimise disruption to land boundaries and the ongoing use of adjacent land; and
- proximity to residential areas to minimise nuisance from noise and dust during the excavation, hauling and backfilling operations.

10.3.10 The result of this is that the proposed borrow pits are located immediately adjacent to Brocklesby Interchange, to the northeast and south of the junction.

10.3.11 A summary of the estimated earthworks quantities is given in Table 10.1.
Table 10.1: Summary of Earthworks Quantities

<table>
<thead>
<tr>
<th>Element</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Earthworks Cut/Fill</td>
<td></td>
</tr>
<tr>
<td>Bulk earthworks cut required</td>
<td>160,000 m³</td>
</tr>
<tr>
<td>Bulk earthworks fill required</td>
<td>300,000 m³</td>
</tr>
<tr>
<td>Proposed 'Borrowed' fill to meet programme requirements</td>
<td>170,000 m³</td>
</tr>
<tr>
<td>Remaining bulk fill (obtained from cut)</td>
<td>130,000 m³</td>
</tr>
<tr>
<td>Backfill to Borrow Pits</td>
<td></td>
</tr>
<tr>
<td>Surplus bulk earthworks cut material</td>
<td>30,000 m³</td>
</tr>
<tr>
<td>Surplus topsoil</td>
<td>25,000 m³</td>
</tr>
<tr>
<td>‘U1’ unacceptable material excavation</td>
<td>15,000 m³</td>
</tr>
<tr>
<td>Other excavation</td>
<td>10,000 m³</td>
</tr>
<tr>
<td>Other arisings from drainage, structures, temporary works etc.</td>
<td>60,000 m³</td>
</tr>
<tr>
<td>Material available to backfill borrow pits</td>
<td>140,000 m³</td>
</tr>
<tr>
<td>Current estimated shortfall of borrow backfill material</td>
<td>30,000 m³</td>
</tr>
<tr>
<td>Borrow land area</td>
<td>110,000 m²</td>
</tr>
<tr>
<td>Depth of shortfall over borrow area*</td>
<td>0.27 m</td>
</tr>
</tbody>
</table>

*To be addressed by profiling/regrading to achieve a suitable topography for return to agriculture.

Minimising environmental impacts and nuisance

10.3.12 Earthworks activities are generally susceptible to weather, particularly wet weather. In addition to safety and soil/engineering quality problems associated with carrying out earthworks operations in wet weather, there are a number of environmental implications including the increased risk of silt entering watercourses (siltation), and mud spreading onto the local road network.

10.3.13 Dry weather conditions may lead to airborne dust arising from earthworks operations. Dust suppression such as through the use of water bowsers would be deployed to dampen haul routes, access tracks and temporary stockpiles to minimise dust nuisance.

10.3.14 Following site clearance and fencing works, topsoil would be stripped and stockpiled. The topsoil stripping operation would be subject to archaeological restrictions and requirements for monitoring as determined by the approved written scheme for the investigation of areas of archaeological interest. Topsoil would likely be stripped using dozers and tracked excavators. It is anticipated that dump trucks would transport material to temporary topsoil stockpile locations where it would be stored no greater than 2m high.

10.3.15 Topsoil storage areas have already been identified as described in Section 6.7.

10.3.16 Pre-earthworks drainage ditches are proposed to be installed where needed along the periphery of excavation slopes and at the crests of newly formed batters. These ensure that any surface run-off entering the site and any land drainage that is encountered is directed away from the construction operations to suitable discharge points.

10.3.17 Where required, balancing ponds would be at least partially excavated as part of the pre-earthworks operations in order to serve as temporary settlement lagoons thereby...
preventing suspended solids created by the earthworks operations from entering watercourses. These lagoons would also provide a source of water for spraying to suppress dust during dry conditions.

10.3.18 Bulk earthmoving operations would typically be carried out using large excavators, articulated dump trucks, dozers and heavy compaction plant.

10.3.19 On completion of the earthworks and landscape fill areas, topsoil would be placed and planting carried out in accordance with the specified landscape design.
11 Drainage

11.1 Brief description of the works

11.1.1 Where necessary an extensive network of drainage pipes, culverts and ditches would be constructed to collect the run off from the paved highway, embankment slopes, adjacent fields where they slope towards the Project and to drain the lower layers of the road construction.

11.1.2 These are proposed to be connected to a series of attenuation ponds, where facilities will exist to control potential pollution incidents, allow solids to settle out and collect oils.

11.2 Strategic aims for drainage

11.2.1 To ensure there are no pollution incidents as a result of the works.

11.2.2 To maintain satisfactory operation of the existing drainage systems during the works.

11.2.3 To safely construct the works in an efficient manner.

11.3 How the works will be managed to deliver the aims

11.3.1 New drainage and modification of existing drainage systems would be carried out in accordance with the water pollution controls outlined in the CEMP.

11.3.2 Measures would be taken to ensure that site run-off is not allowed to contaminate existing watercourses. Such measures could include temporary ponds, filtration systems and pollution prevention equipment. Where appropriate such measures would be consulted upon with the Environment Agency (EA) and Internal Drainage Board (IDB) as appropriate.

11.3.3 Attenuation ponds are required to control run off from the hardened surfaces of the Project into local watercourses. These ponds would be excavated to provide a storage facility for water discharged from drainage systems and to allow settlement of silts and controlled discharge to watercourses.

11.3.4 Wherever practical these attenuation ponds would be constructed early in the construction programme to assist with controlling construction run-off, and to attenuate flows from field run-off as the existing flow regime is interrupted by new cut-off ditches.

11.3.5 Where this is not practical other measures will need to be adopted to control site run-off and provide settlement facilities prior to discharge to local watercourses.

11.3.6 Due to the accelerated delivery programme, drainage works would continue through the winter. Pumping is likely to be required to keep excavations and lower highway construction layers dry. The works for the new link to Rosper Road may require significant pumping due to the relatively deep excavation and variable water table level.

11.3.7 For all work that would directly or indirectly affect the local watercourses the necessary approvals would be sought from the EA / IDB as appropriate.

11.3.8 Many of the fields that the route crosses have existing field drains. Local knowledge of these drains would be sought from land owners prior to commencing works. Wherever field drainage is encountered records would be taken. Where cut-off ditches that would run along the perimeter of the highway boundary are sufficiently deep, field drainage would be directed into the ditch. All modifications to existing land drainage systems would be consulted on with the relevant landowner.
12 Structures

12.1 Brief description of the works

12.1.1 The Project would require the construction of three new major bridge structures:
- Brocklesby Interchange new overbridge;
- Town Street Bridge; and
- Immingham New Rail Bridge

12.1.2 In addition, new culverts would be required for the drainage system.

12.1.3 An existing bridge and a number of existing culverts are likely to also require modification and/or partial demolition.

12.1.4 Other culverts and two existing buildings are also proposed to be completely demolished.

12.2 Strategic aims for structures

12.2.1 To minimise disruption to traffic and non-motorised users during Town Street and Brocklesby Interchange bridge construction.

12.2.2 To minimise disruption to railway operation during Immingham New Rail Bridge construction.

12.2.3 To ensure the safety of the workforce and minimise environmental impacts from demolition activities.

12.3 How the works will be managed to deliver the aims

Demolition of existing culverts and buildings

12.3.1 Prior to demolition, surveys would be carried out to ensure that no hazardous materials are contained within the structure of the buildings and culverts, such as asbestos.

12.3.2 Ecologists would survey the structures to ensure that no birds would be nesting, and to confirm the absence of any protected species such as bats or water vole.

12.3.3 Methods of demolition would be such that maximum practical recovery of reusable or recyclable materials would be targeted.

12.3.4 Methods of demolition would be developed with due consideration of other local residential properties, to minimise where practicable any resultant noise or dust.

Town Street Road Bridge

12.3.5 Where practicable construction methodologies and plant would be selected to minimise noise and disruption. Likely disruptive activities would include the compaction of concrete and structural backfills. Some activities would also need to be carried out at night, due to constraints on the A160, such as installing the bridge beams.

12.3.6 Driven piles would be avoided and during the detailed design further consideration will be given to the use of strengthened earthworks versus reinforced concrete construction for the bridge abutments to balance noise and vibration impacts. Dust suppression equipment would be available during dry periods.
12.3.7 Off-site construction methods would be considered, and plant and machinery kept to a minimum close to the bridge, to minimise plant movements or double handling of materials.

12.3.8 Consultation would be carried out in advance with local residents. Structural surveys would be carried out in advance subject to the agreement of the owners of local properties to provide an early warning should any damage occur and ensure that if any damage is attributable to the project this is identified.

Brocklesby Interchange Bridge

12.3.9 The new bridge at Brocklesby Interchange is remote from residential areas so issues with nuisance e.g. from noise, vibration and dust are expected to be minimal.

12.3.10 There will be some disruption to traffic from traffic restrictions and closures of the A180 needed for bridge deck installation. However, these closures would be at off-peak times only, of short duration and with diversion routes in place.

Immingham New Rail Bridge

12.3.11 The new rail bridge is remote from residential areas, so issues with nuisance e.g. from noise, vibration and dust are expected to be minimal. The exception may be the bridge installation operation, proposed to be carried out during a closure of the railway line over the Christmas 2015 period. In order to minimise rail traffic disruption, this would be a continuous operation over a proposed 61 hour period and could include some noisy works through the night. An assessment of the potential noisy operations would be carried out in advance of the works, and control measures put in place to prevent nuisance as far as practicable. Any unavoidable impacts would be discussed with the Local Authority’s Environmental Health Officer and any local residents who could be affected well in advance.

12.3.12 The rail bridge is close to businesses from which some permanent land take would be required. It is also next to the Immingham West Fire Station on Rosper Road. Close liaison with businesses that may be impacted and the fire service would be carried out and arrangements put in place to maintain their access and operational needs.

12.3.13 For the full railway closure for bridge installation, and all other works associated with the railway, detailed discussions will take place with Network Rail to ensure the works are properly planned and disruption to rail traffic is kept to a minimum.
13 **Highway Construction**

13.1 **Brief description of the works**

13.1.1 The Project would require the construction of new sections of road in order to deliver the ultimate objective of improving the highway between the A180 and the Port of Immingham.

13.1.2 All the previously described activities in terms of mobilisation, service diversion/protection, traffic management, earthworks, drainage and structures are required in order to allow the final road construction to be built.

13.1.3 This work involves:

- Installing kerbing and paved areas e.g. footways;
- Construction of the road surface (known as the 'pavement'), on top of the earthworks foundation (known as the 'formation' layer);
- Installing road restraint systems such as vehicle and pedestrian safety barriers;
- Installing road markings (e.g. white lining) and road signs; and
- Installing any required traffic signals, road lighting and other roadside technology systems.

13.2 **Strategic aims for highway construction**

13.2.1 To minimise disruption to traffic and non-motorised users. This is a particular issue at areas that interface with existing road or footway areas which are in use.

13.2.2 To ensure the safety of the workforce and minimise environmental impacts.

13.3 **How the works will be managed to deliver the aims**

**Kerbing and paved areas**

13.3.1 These works involve the use of equipment which can create noise and dust, for example for handling and cutting of concrete kerb units and paving slabs.

13.3.2 The key control measure will be to clearly and safely demarcate works areas from areas of public access. Suitable diversions for public rights of way will be put in place and fencing and screening installed to exclude members of the public and protect them from the works.

13.3.3 Wherever practicable, noisy works will be carried out during normal daytime working hours.

**Road pavement construction**

13.3.4 Road pavement construction requires large items of specialist plant, such as paving machines and heavy rollers, and the delivery to site of significant volumes of construction materials such as asphalt. In addition, it is likely that some pavement works will need to be completed at night due to traffic management requirements when tying the new road surface into existing highways.

13.3.5 The paving works will be carefully planned to avoid night-time works in close proximity to residential areas wherever practicable. The routing of delivery vehicles will be considered in the Traffic Management Plan to minimise disruption to traffic.
Other highways elements

13.3.6 The installation of road restraint systems, road signs and lighting will generally be carried during normal daytime working hours in the highway verges as some of the last activities in each Section. They are unlikely to have any significant impacts on the local environment.

13.3.7 Some traffic signals, including the proposed Toucan Crossing of the A160 near Top Road, will require works adjacent to existing public footways and near to residential areas. These works would be programmed to avoid noisy works at night-time and with appropriate public right of way diversions put in place.

13.3.8 Road marking is likely to require some night-time working to tie in to the existing road network, but this will be localised, of short duration and is unlikely to have any significant impact on the local environment.
Appendix A

Drawing B1879500/H/WD/134 Rev 0:
Proposed Works Sections for Programme & Methodology