

Bexhill to Hastings Link Road

Chapter 3B: Construction Strategy

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No appendices are required for this chapter

Volume 3

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3B Construction Strategy

3B.1 Introduction

3B.1.1 The following sections provide a description of the construction activities for the Scheme assumed for the purposes of the Environmental Impact Assessment. In drawing up this strategy, environmental protection measures that have already emerged from the environmental input to the design process have been included. In common with the description of the existing conditions, the description of the site and infrastructure is from west to east. The main items of construction works are shown on Figure 3B.1.

3B.1.2 The assessment of construction activities assumes a Public Inquiry in 2007 with a decision and construction to commence in 2008. An indicative outline programme, providing a summary of the main construction activities, is presented as Figure 3B.2. It is anticipated that some site works would take place before main construction commenced. These would include site clearance, habitat translocation and archaeological investigations at specified archaeological sites.

3B.1.3 Construction of the Scheme would continue through to 2010. The Contractor would undertake maintenance of the completed Scheme and associated landscaping, for a period of seven years after the final completion of works.

3B.1.4 The Construction Strategy describes the main construction activities associated with the development of the Scheme. These are:

- Site Clearance;
- Utilities works;
- The Earthworks Strategy, including the movement of spoil;
- The Roadworks Strategy;
- The Structures Strategy;
- Traffic Management;
- Site Traffic;
- The Temporary Construction Site Compounds;
- Construction Environmental Management Plan; and,
- Commitment to Construction Best Practice.

3B.1.5 The activities listed above have been assessed to develop the best practicable overall Construction Strategy and programme of works to ensure that the Scheme is built in accordance with East Sussex County Council (ESCC) programme and to ensure that minimum disruption occurs to the local environment during the construction process. Wherever practicable, the sustainability processes described in the Government's Waste and Resources Action Programme guidance will be followed.

3B.1.6 It should be emphasised that the construction strategy set out in this document represents a way in which the Scheme can be built, not necessarily the way in which it will be built. That will develop as the detailed design for the Scheme progresses through the planning stage of the process. However, in developing the construction strategy the NEWT principle will be applied such that the eventual strategy that emerges will 'not be environmentally worse than' that set out in this document and reported as part of the Environmental Statement (ES).

3B.2 Site Description

3B.2.1 The layout of the Scheme, the haul route and the temporary works areas required for its construction are shown in Figure 3B.3.

3B.2.2 Within the Scheme, there are major items of construction works and these, along with their chainage references, are as shown in Table 3B.1.

Table 3B.1 Chainage References

Location	Approx. Chainage	Description
Belle Hill Junction	Ch 0	Connection of Scheme to A259. Demolition of several buildings. Construction of underground storage tanks for carriageway drainage. Likely location for site compound.
Chapel Path	Ch 150	Underpass.
Woodsgate Park Road	Ch 500	Replacement of existing masonry railway overbridge.
Ninfield Road	Ch 1150	As above. Road carries A269 over Scheme.
Retaining walls North of Ninfield Road overbridge	Ch 1150 - 1300	Bored piled walls with masonry facing and RC capping beam.
Belle Hill to Glovers Farm	Ch 0 - 1600	Construction of new route along line of disused railway mainly in cutting.
Glovers Farm	Ch 1600	Replacement of existing masonry railway overbridge to Glovers Farm.

Location	Approx. Chainage	Description
Glovers Farm to Combe Haven	Ch 1600 – 2300	<p>New cut and fill section through farmland. New open structure crossing at Combe Haven Stream. Landscape areas on both sides.</p> <p>A borrowpit would be dug to the east and west of the Scheme to provide suitable material for use in the noise bunds. The pits would be reinstated with material excavated from the lagoon excavated in Powdermill Valley which is likely to be unsuitable for use in the road construction.</p>
Actons Farm	Ch 2500	New accommodation works overbridge.
Combe Haven to Watermill Stream	Ch 2300 - 3100	New cut and fill section over farmland. New open structure crossing at Watermill Stream. Landscape areas on both sides.
Hillcroft Farm	Ch 3500	New accommodation works overbridge.
Watermill Stream to Powdermill Valley Stream	Ch 3100 – 3850	New mainly fill section over farmland and floodplain. New open structure crossing at Powdermill Valley Stream. Landscape areas mainly to the north include re-routing the Stream. A borrow pit would be dug just to the north of the Scheme between Powdermill Valley Stream and Powdermill Stream. This would then provide additional flood alleviation capacity.
Adams Farm	Ch 4200	New accommodation works overbridge.
Powdermill Valley Stream to Decoy Pond Stream	Ch 3850 – 4600	New mainly fill section over farmland and floodplain. New open structure crossing at Powdermill Stream and Decoy Pond Stream. Landscape areas mainly to north.

Location	Approx. Chainage	Description
Decoy Pond Stream to Crowhurst Road	Ch 4600 – 5200	New mainly cut section rising up from floodplain to Crowhurst Road. Potential area of slope slippage to be managed.
Crowhurst Road	Ch 5200	New underbridge and realignment of Crowhurst Road. Main access for construction vehicles/materials into the site.
Railway Bridge	Ch 5300	Route crosses railway. Fill required on both sides.
Crowhurst Road to Queensway	Ch 5200 – 5340	Cut and fill. Likely location for main site compound.
Queensway Junction	Ch 5340	Tie-in with Queensway.
Green Way	Ch 1600 - 5200	Localised regrading with several watercourse crossings. Route will be mainly split to separate equestrian from other leisure users (cyclists and pedestrians)

3B.3 Activities and Programme

3B.3.1 Summary descriptions of the main activities listed above and the works to be undertaken at these locations are provided in the following paragraphs. The descriptions include approximate time scales for the commencement and completion of the various activities.

3B.3.2 The works areas are also categorized into one or more of the 'Earthworks', 'Roadworks' or 'Structures' categories. These form the basis for the generation of the overall Construction Strategies described later in this Chapter.

3B.3.3 It should be noted that the construction activities and programme as summarized in Figure 3B.2 could be subject to change during both the detailed design and construction phases. The timings indicated are a best estimate, based on the present programme and are a realistic guideline for the purpose of the ES.

3B.4 Site Clearance

3B.4.1 The first activity on site would be surveying to set out the limits of the works, followed by wildlife pre-contract works to enable site clearance to commence. The site clearance would be carried out in accordance with a site clearance plan produced by an Ecologist and subject to their certification prior to carrying out the works and on satisfactory completion prior to earthmoving.

Mature trees noted for retention within the Scheme would be physically protected by rigid fencing to avoid damage during the currency of the works. Where it is likely that protected species or their habitats would be affected, approval or a

license would be obtained from the appropriate regulatory body. Materials arising from the site clearance would be disposed of in line with sustainability best practices and in agreement with the local authorities. This would include the use of an on-site crushing facility, which would recycle inert material from the demolition works for use as granular fill within the works. Estimated quantities of suitable inert material available from the demolition works are given in Table 3B.2.

Table 3B.2 Demolition Materials Suitable for Recycling as Granular Fill

Structure/Location	Recoverable material	Quantity (m³)
Belle Hill buildings	Brick, block, concrete, tiles.	500
Woodsgate Park Bridge	Brick, concrete, rubble fill	680
Ninfield Road Bridge	Brick, rubble fill	800
Glovers Farm Bridge	Brick, rubble fill	700

3B.4.2 Site clearance would result in the removal of all existing structures within the area of the Scheme unless otherwise specified. The use of a mobile crusher requires a licence for operation of a Type B Process (discharge to air). All felled timber, tree stumps and roots would be chipped on site for use as mulch within the landscape scheme.

3B.5 Utilities

3B.5.1 There would be several utility works required to facilitate the construction of the Scheme. These include utility works for the temporary construction phase and for the permanent Scheme. Utility works include the statutory providers (water, foul sewers, electricity, gas and telephone lines) and non-statutory service providers (cable television, other communications systems etc).

3B.5.2 For the Scheme, utility works fall into three categories:

- Existing utilities within structures due to be replaced as part of the Scheme and which require temporary diversion;
- Temporary supplies, to support construction activities; and,
- Permanent supplies, required for the operation of the new road.

3B.5.3 Insertion, diversion and removal of both temporary and permanent services may impact upon areas of ground and to depths that may have been previously undisturbed.

Existing Utility Diversions

3B.5.4 Diversions of existing utility works would be required at the following areas:

- Belle Hill Junction (electricity, BT, gas, water, foul sewers);
- Woodsgate Park Road Bridge (electricity, BT, fibre optics);
- Ninfield Road Bridge (electricity, BT, gas, water, foul sewers);
- Glovers Farm Bridge (electricity, BT);
- Actons Farm Bridge (BT); and,
- Crowhurst Road Bridge (BT).

3B.5.5 Discussions have been held with the utility providers and where diversions would be required; these have been agreed in principle. Utility diversions would generally be routed along existing service corridors, roads and footpath networks. Where this would prove not possible, routes for services would be identified following lines where there is low ecological potential or where there would be low impact on traffic flows and residents.

Temporary Services

3B.5.6 To enable construction of the Scheme, services are required to the main and satellite offices and site compounds. Services required at all satellite compound areas would include electricity, telephone and water supplies. Foul sewage and drainage from these areas would be managed either by removal from site by road tanker, or for the larger offices and stores a suitable effluent treatment unit would be provided, the specification of which would be agreed in consultation with the Environment Agency. There would be no discharge of untreated sewage or compound drainage from construction sites. A summary of the requirements for utilities is presented in Table 3B.3.

Table 3B.3 Utilities Requirements

Location	Utilities Requirements
Belle Hill Junction Site Compound	Electricity, telephone, water, sewage to be removed from site by tanker.
Topsoil storage areas	None required.
Woodsgate Park Road Bridge	None required.
Ninfield Road Bridge	Electricity, telephone, water, sewage to be removed from site by tanker.
All other structure compounds	None required.
Queensway Site Compound	Electricity, telephone, water, sewage to be removed from site by tanker.

3B.5.7 Temporary supplies would be provided from spurs off existing supply routes. Telephone communication would be provided through cables strung on poles from existing BT apparatus. Services would be provided to the compounds during the establishment of the compound areas.

3B.5.8 Other site works areas, particularly those at the structures, would be provided with mobile self contained welfare facilities. These would be subject to regular inspection and maintenance in accordance with the Health and Safety at Work Regulations.

New Permanent Supplies

3B.5.9 New electrical power supplies are required for road signage, footbridge lighting and street lighting. These would be installed along the new road verge in ducts from existing supplies. A new supply is also required for the drainage pumps in the water storage tanks.

3B.6 Earthworks Strategy

3B.6.1 The most significant operation in the construction of the Scheme is the earthworks operation. A strategy has been developed to minimise, insofar as is practicable, the environmental impacts caused by the earthworks operations and also any vehicle movements associated with earthworks activities on the local road network. This would be achieved by programming the works such that the haul road built within the site boundary is used for earthmoving operations.

3B.6.2 All suitable material excavated would be re-used in the construction of the Scheme, further reducing the requirement to import materials for construction and eliminating the need to remove surplus material from site.

3B.6.3 Borrow pits would be dug in the Powdermill Valley and at Combe Haven, just to the north of and with direct access onto the Scheme, from which suitable fill materials for permanent works will be sourced. This material would serve to balance the general cut and fill requirements of the Scheme and eliminate the requirement for importing the same materials on the local road network.

3B.6.4 A mobile crushing plant would be used to recycle the demolition material from the buildings and masonry structures, which would otherwise go to tip elsewhere, for use within the works.

3B.6.5 The excavation of cuttings and at grade earthworks would result in the removal of all topsoils and subsoils overlying natural strata. The natural strata would then be excavated to a pre-determined depth. This applies to all earthwork operations including the proposed route, the Greenway, the bunding and/or hard landscaping and the construction of new ponds or watercourses. Enabling works (such as the construction of the haul route, temporary crossings of watercourses, access points to existing roads and

construction compounds) would result in local or specific areas of disturbance to depths previously undisturbed.

3B.6.6 The haul route required through the Scheme for the construction works would follow the route of the permanent work corridor. The only deviations from this would be at the watercourses where the temporary crossings would be sited as close to the permanent works alignment as possible. Where spurs are required off the main route to areas such as the Greenway, borrow pit and new ponds, the spurs would be as short as possible and lie within areas of proposed landscape mitigation.

3B.6.7 Several watercourses would need to be bridged to enable the haul route to be completed between Combe Haven and Crowhurst Road. These would be required due to the absence of alternative vehicle access in this section of the Scheme. The larger watercourses would be temporarily bridged using Bailey type structures.

3B.6.8 Where the route corridor may be too narrow for a temporary crossing to be directly alongside the permanent crossing, for example at Decoy Pond Stream, the haul route may utilise the route of the Greenway until the permanent crossing is in use. These crossing points are listed in Table 3B.4.

Table 3B.4 Temporary Watercourse Crossings

Location	Approx Span (m)	Type of crossing
Ch. 2300 Combe Haven	8	Bailey type bridge
Ch. 2900	1	Oversize pipe/culvert
Ch. 3100 Watermill Stream	8	Bailey type bridge
Ch. 3675	1	Oversize pipe/culvert
Ch. 3850 Powdermill Valley Stream	8	Bailey type bridge
Ch. 4000 Powdermill Stream	8	Bailey type bridge
Ch. 4420	1	Oversize pipe/culvert
Ch. 4600 Decoy Pond Stream	8	Bailey type bridge

3B.6.9 Following site clearance works and the removal of debris, topsoil would be stripped and stockpiled. Topsoil would generally be removed from areas of cut only. Areas of fill and areas to be used in a temporary capacity, such as for haul routes and compounds, would not be stripped beyond vegetation clearance. This would leave the root mat intact. Temporary areas would be protected with suitable geotextile matting.

3B.6.10 A ground investigation survey has been undertaken and this identifies the nature and extent of the soil types present. Soils would be stripped using a combination of excavators and dump trucks and motor graders would be transported to temporary topsoil stockpile locations. These are indicated on Figure 3B.3.

3B.6.11 None of these temporary stockpile areas are within the designated flood plain area. Topsoil stockpiles would not exceed 4m in height and would lie at least 10m away from any fence or hedge line. Stockpiled topsoils would be used to soil completed earthworks areas and would be placed by dump track and tracked in by bulldozer. Sensitive soils would be loose-tipped and bladed out using excavator buckets. This method would also be used on steeply sloping areas.

3B.6.12 Pre-earthworks drainage ditches would be installed along the periphery of excavation slopes and at the crests of newly formed batters. These would 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 where it could be allowed to discharge to the adjacent local environment.

3B.6.13 All discharges would be subject to consent from the Environment Agency and may be required to be treated and controlled to minimise suspended solids entering watercourses. Measures would include holding lagoons and for smaller discharges, such as from a structures excavation, mobile sedimentation weir tanks.

3B.6.14 No road crossing points would be needed for the Scheme. However crossing points would need to be built to allow site vehicles to cross existing public rights of way and farm access tracks. These would be signed and fenced appropriately and would give priority to works traffic along the route of the Scheme.

3B.6.15 The majority of construction traffic would be directed to enter the site from the Queensway/Crowhurst Road end of the Scheme. The remainder of construction traffic would enter via the Belle Hill junction. The split would be in the region of 80/20. Construction traffic travelling from the west of the Scheme but entering at Queensway, would be directed along the coast road (the A259) before turning north onto the B2092.

3B.6.16 Material (structural fill) for the construction of the road on embankment would be obtained from areas of excavation where the road is to be constructed in cut and from a borrow pit in the Powdermill Valley. Material for the landscape mounds would be obtained from a borrow pit at Combe Haven.

3B.6.17 Generally the material from the borrow pit would be used in landscape mitigation areas, but would also be used, where the soil characteristics allow, in the main road embankments. Excavation of the borrow pit would start as early as possible within the programme to provide flood alleviation capacity. Excavation would be by 360 degree excavator loading directly into off-road articulated dump trucks. These would take the

material directly to its point of use on the Scheme. No access onto the local road network would be required.

3B.6.18 Backfill to structures (granular fill) would be imported to site as no material meeting the required specification is expected to be won from within the site. On completion of the areas for embankment construction and backfilling, the balance of the excavated material would be used to form the landscape fill areas to the designed profile. These areas would then be top soiled. Any surplus topsoil would be used as landscape fill.

3B.6.19 A summary of the earthwork quantities is shown Table 3B.5.

Table 3B.5 Estimation of Major Earthworks Quantities

Location	Excavation (m³)	Fill (m³)	Topsoil Excavation (m³)
Main Carriageway	486,000	208,000	33,000
Mitigation Earthworks	313,000	591,000	181,000
Combe Haven Borrow Pit	265,000	265,000	-
Total	1,064,000	1,064,000	214,000
Capping Layer	-	16,000	-
Type 1 sub-base	-	25,000	-
Granular Fill	2,680	15,000	-
Starter Layer	-	12,000	-

3B.6.20 To obtain sufficient acceptable material for the structural earthworks and the mitigation bunding it is necessary to gain approximately 265,000m³ from a borrow pit within the Combe Haven Valley. The borrow pit will be replenished by material generated by the creation of the pond/lagoon within Powdermill Valley since it is envisaged that this material will not be suitable for structural earthworks.

3B.6.21 A summary of the estimated earthworks movements is given in the Table 3B.6.

Table 3B.6 Summary of Earthworks Movements Cut to Fill (Approximate)

Source	Quantity (m³)	Deposition (First Priority)
Belle Hill to Glovers Lane cut	15,000	Combe Haven
Glovers Lane to Combe Haven cut	20,000	Combe Haven
Actons Farm cut	104,000	Watermill Stream
Hilcroft Farm cut	51,000	Watermill Stream and Powdermill Valley
Mitigation Areas	118,000	Landscape mitigation areas and Combe Haven Borrow Pit
Powdermill Valley pond/lagoon	195,000	Combe Haven Borrow Pit
Combe Haven Borrow Pit	265,000	Landscape mitigation areas
Adams Farm	175,000	Powdermill Stream to Powdermill Valley
Chapel Wood cut	78,000	Decoy Pond Stream and east of Crowhurst Road to rail bridge
Queensway cut	43,000	Queensway
Total	1,064,000	

3B.6.22 Fill from the excavated cut areas would be removed by articulated dump truck and placed using conventional earthworks plant, comprising bulldozers, compaction plant (compactors and vibrating and smooth rollers) which would place the material in layers in accordance with the appropriate specification for the type of material.

3B.6.23 Material produced from the cut operations would be placed in the permanent works, weather permitting, or otherwise stockpiled for later use. The earthworks 'season' is taken to be throughout the summer months (April to October) as earthmoving during periods of wet weather is impractical due to the increased moisture content in the ground. Where necessary, treatment of material with lime would be necessary to reduce the moisture content during the summer months, prior to utilisation into the works. The earthmoving operations on the Scheme would operate through part of the 2008 season

(Autumn) and a full season in 2009. Only minor finishing works and works to the landscape areas are envisaged during the 2010 (Spring) period.

3B.6.24 The temporary stockpiling of fill materials prior to incorporation in the permanent works would be avoided wherever possible so that double handling of stockpiled material is minimised. The Soil Handling and Management Strategy would be devised to protect soils during stripping, storage and re-spreading and to prevent the intermingling of different soil types where necessary for the successful implementation of the Environmental Design. No topsoil stockpile would exceed 4 metres in height. No temporary stockpile areas would be required outside the site boundaries.

3B.6.25 The first major earthworks operation following site clearance and establishment of the haul route, would be the importation and placing of the embankment starter layer in areas of the route where settlement of underlying strata is predicted. This would be followed by the installation of band drains through the starter layer. Band drains would be installed in a triangular grid pattern at approximately 1000mm centres.

3B.6.26 All material for the starter layer would be imported to the site and would enter the site from the Queensway/Crowhurst Road end. This short duration operation would commence and finish in Autumn 2008. Once this layer is in place, partial bulk excavation of the cutting between Decoy Pond Stream and Crowhurst Road would start. Excavation would be by means of 360 degree mechanical excavators, loading material into articulated dump trucks and would be used to construct the embankments between Watermill Stream and Decoy Pond Stream.

3B.6.27 The embankments between Watermill Stream and Decoy Pond Stream lie within the flood plain and require to be substantially built within the first muck shift season in order to allow for settlement of the underlying strata to be completed in time for topping up and pavement construction from Autumn 2009.

3B.6.28 Ground Investigation has shown that the slope above Decoy Pond Stream is subject to instability and measures would need to be taken to minimise the possibility of this slope slipping during excavation. These measures may include slope drainage, temporary benching and re-profiling. This would result in slower excavation rates.

3B.6.29 The major earthmoving operations would be carried out during the 2009 season (April to October). Fill operations would continue to utilize cut materials from elsewhere on the route, minimising haulage distances and eliminating the use of stockpiles and consequent double handling. The methodology for placing of the landscape fill material would use the same mechanical plant used for the main route.

3B.6.30 Underbridge abutments at Decoy Pond Stream, Powdermill Stream, Powdermill Valley Stream, Watermill Stream and Combe Haven would be completed during the Winter/Spring of 2009 prior to completion of associated fill operations adjacent to them in the Summer of 2009.

3B.6.31 The works would be completed from both Belle Hill and Queensway ends of the Scheme.

3B.7 Roadworks Strategy

3B.7.1 The roadworks strategy for the Scheme has two aims; to meet the programme for the construction of the permanent works whilst causing the minimum disruption to the local road network and to ensure that the surfacing of the Scheme is carried out in the most efficient manner.

3B.7.2 The outline design for the Scheme pavement would comprise three layers. The lowermost layer, the sub-base, would be either laid onto the prepared ground surface where the road is in embankment or would be the existing surface where the road is in cut. The depth of this layer would vary depending on the condition of the ground in the immediate area.

3B.7.3 No suitable materials are available from the excavated material on site and consequently the sub-base would be brought to the site by road. An alternative solution to importing sub-base and capping material would be to stabilize as-dug material using a mechanical rotovator which mixes lime or cement into the upper layer of fill material. This is then rolled and compacted. The viability of this solution would depend on material characteristics and moisture content, but could reduce the requirement for imported material by up to 40,000m³.

3B.7.4 The use of lime and cement in stabilization proposals would need to be undertaken in accordance with method statements as part of the Construction Environmental Management Plan (CEMP) in order to avoid adverse environmental impacts.

3B.7.5 The middle layer (the lower road base) would be 150mm to 200mm thick. This material would be brought in by road and along the haul route to the point of laying where it would be mechanically placed by paver and compacted in layers using vibrating and smooth drum rollers to achieve the required specification.

3B.7.6 The uppermost layer, which would form the road surface, would be a bituminous road pavement layer approx 100mm thick. The final layer of the pavement would be a proprietary thin wearing course with low noise characteristics.

3B.7.7 Roadwork activities would be undertaken using conventional dump trucks, bulldozers and compactors. Materials for the highway construction would be delivered to site via road wagon where they would be tipped as close to their permanent position as is practicable. Road pavement construction would be by means of conventional road paving equipment and vibrating and smooth drum rollers, serviced by ancillary plant including excavators and dump truck. Deliveries of pavement material would be by road wagon. Finally, white lining of the finished road would be undertaken.

3B.7.8 The installation of new highway drainage would take place prior to the construction of new road surfacing. The design would be based on the drainage network areas shown in Figure 3B 4, each of which channels water into infiltration or balancing ponds after the appropriate treatment.

3B.7.9 Runoff from the carriageway alongside the Egerton Stream would be held in underground holding tanks constructed north of Belle Hill Junction. The construction of these tanks would follow site clearance and would involve significant temporary works to support the deep excavation.

3B.7.10 A sheet piled or contiguous piled (rotary bored) retaining wall would be constructed around the perimeter of the site before it is excavated. The excavation would then follow and would use 360 degree excavators loading articulated dump trucks. Enough fill material would be stockpiled adjacent to the excavation for use as backfill.

3B.7.11 The surplus spoil would be transported through the worksite for use as fill elsewhere on the Scheme. When completed and operational, water from these tanks would be released at times when the Egerton Stream was running below capacity.

3B.7.12 Drainage pipelines incorporating kerbs and gullies would be installed by mechanical excavator and dump trucks and would generally be provided in the western Bexhill Connection section and at the Queensway junction. Grass and concrete channels would be constructed in the more rural central section together with carrier drains. The concrete channel would be installed by slip forming the concrete through a mechanical paver fitted with a channel mould.

3B.7.13 The concrete for this operation would be delivered to the paver using ready mix concrete trucks. Where existing roads are being modified, the drainage in these roads would be replaced and upgraded where necessary in accordance with the drainage designed for the Scheme. Drainage systems would be connected to discharge points via pollution control devices. Material required for the construction of drainage systems would be delivered to site by road wagon.

The Greenway

3B.7.14 The Greenway would be constructed separately from the main carriageway and would involve separate resources. Construction of the Greenway would use essentially the same methodology as the larger earthwork operations i.e. at grade or cutting/embankments where necessary, stripped of top and subsoils to a predetermined depth. The pavement would be laid using a small paver where practicable and hand laid elsewhere. Haul route connections between the Greenway routes and the main carriageway would be restricted and demarcated in order to minimise disruption to these strips of habitat.

The Existing Road Network

3B.7.15 Programming of roadworks would aim to maintain traffic flow throughout the construction phase. The construction of the works has been assessed and the key areas of potential impact are at Belle Hill junction, Crowhurst Road and Queensway junction. The replacement of existing road bridges over the Scheme at Woodsgate Park Road and particularly Ninfield Road would also impact on the road network.

3B.7.16 Management of the construction works associated with these areas would be designed to minimise the impact on the local road system. This would be achieved by the use of road closures at Crowhurst Road and Woodsgate Park Road, temporary traffic lights at Ninfield Road and Queensway and lane restrictions at Belle Hill. Advance notice and temporary signage would indicate the nature and duration of any restrictions.

3B.7.17 Where existing road surfaces need to be removed, these would be planed out using road planers loading into road wagons. Planed out materials would be re-used in the permanent works for either the construction of the Greenway, verges or landscape fill, subject to appropriate testing for contaminants. Tie-in works to Belle Hill, Queensway and Crowhurst Road would be generally undertaken over short periods and during night time partial temporary closures. Any contaminated material encountered during removal of the existing road surfaces would be removed from site and taken to a licensed waste disposal facility.

Surfacing of the Scheme

3B.7.18 The proposed strategy for the surfacing of the Scheme is broadly as follows in Table 3B.7

Table 3B.7 Proposed Strategy for the Surfacing of the Scheme

Location/Activity	Indicative Construction Date(s)
Belle Hill Junction	Winter 2009
Belle Hill to Glovers Farm	Autumn 2009
Glovers Farm to Decoy Pond Stream	Spring 2010
Decoy Pond Stream to Queensway	Spring 2010
Queensway Junction	Spring 2009
Crowhurst Road	Autumn 2009
Woodsgate Park Road	Spring 2009
Ninfield Road	Winter 2009
Greenway	Spring 2010

3B.7.19 The strategy allows a continuous phased construction of new road surfacing by roadworks plant, with additional visits for one off sections such as for Woodsgate Park Road and Ninfield Road.

3B.8 Structures Strategy

3B.8.1 Unlike the earthworks and roadworks activities, which by their nature would progress throughout the construction site, the structures construction activities would be fixed at specific locations. Programming of these activities and development of a strategy to meet the work programme is therefore more straightforward. The new structures to be built as part of the Scheme (from west to east) are listed in Table 3B.8.

Table 3B.8 - Provisional Structures Programme

Location/Activity	Structure	Provisional Construction Date(s)
Chapel Path Underpass	Insitu Concrete structure	Summer 2009
Underground Storage Tank near London Road Junction	Insitu Concrete structure	Winter 2008
Woodsgate Park Road Overbridge	Pad foundations, RC abutments. Steel beams, concrete deck.	Autumn 2008 / Spring 2009
Ninfield Road Overbridge	Pad foundations, RC abutments. Steel beams, concrete deck.	Spring 2009 / Spring 2010
Retaining wall(s)	Bored piled, masonry faced. RC capping beam.	Summer 2009
Glovers Farm Overbridge	Pad foundations, RC abutments. Steel beams, concrete deck.	Spring / Summer 2009
Combe Haven Underbridge	Pad foundations, RC abutments. Precast concrete beams. Sheet piled cut off walls.	Winter 2008 / Spring 2009
Actons Farm Overbridge	Steel sprung arch, RC pad foundations. Steel ladder beam deck.	Spring / Autumn 2009
Watermill Stream Underbridge	Piled foundations, RC abutments, Precast concrete beams.	Winter 2009
Hilcroft Farm Overbridge	3 span. Steel ladder beam deck. RC pad foundations.	Autumn / Winter 2009
Powdermill Valley Stream Underbridge	Piled foundations, RC abutments, Precast concrete beams.	Winter 2008 / Spring 2009

Location/Activity	Structure	Provisional Construction Date(s)
Powdermill Stream Underbridge	Piled foundations, RC abutments, Precast concrete beams.	Winter 2008 / Spring 2009
Adams Farm Overbridge	3 span. Steel ladder beam deck. RC pad foundations.	Summer / Autumn 2009
Decoy Pond Underbridge	Piled foundations, RC abutments, Precast concrete beams.	Winter 2008 / Spring 2009
Gas Valve Retaining Wall	Crib wall or RC.	Summer 2009
Crowhurst Road Underbridge	Pad foundations, RC abutments. Precast concrete beams.	Winter 2008 / Spring 2009
Railway Underbridge	Pad foundations, RC abutments. Precast concrete beams.	Winter 2008 - Summer 2009
Greenway Underbridges	Wood / steel on pad footings.	Winter 2009 / Summer 2010
Combe Haven Valley – water control structures	Sheet piled temporary cofferdams for concrete structures and wooden stoplogs.	Spring 2009 / Winter 2009

3B.8.2 Construction of new structures may result in local or specific areas of disturbance to depths potentially previously undisturbed.

3B.8.3 Structures activities are undertaken all-year round, as they are not adversely affected by wet winter weather. However a prolonged period of freezing weather would disrupt the programme as this would hamper the placing of concrete. Concrete would be sourced from local existing concrete batching plants and delivered to site by ready mix concrete trucks.

Structures Treatment

3B.8.4 Three of the structures would replace existing masonry bridges built originally for the Crowhurst, Sidley and Bexhill Railway circa 1900. The treatment of each of these structures is described in Table 3B.9.

Table 3B.9 Existing Structures Treatment

Location	Current situation	Treatment
<p>Woodsgate Park Overbridge.</p> <p>Ref: 9404, Woodsgate Park Railway, U 6745, OS 7395 0850</p> <p>Assessed capacity 40 Te HA and 80 Te ESCC abnormal load vehicle with substandard parapets</p>	<p>Much modified masonry arch bridge, due to previous strengthening works. This carries a residential road over the Scheme.</p>	<p>Close and divert traffic for works duration. Divert services and demolish. Build new structure in same location.</p>
<p>Ninfield Road Overbridge</p> <p>Ref: 9102, Sidley Railway, A269, OS 7429 0900.</p> <p>Assessed capacity 40 Te HA and 45 units of HB</p>	<p>Masonry arch bridge which carries A269 Ninfield Road over the Scheme.</p>	<p>Restrict traffic to single way working. Temporary diversion of services. Probable use of temporary Bailey type bridges (one for services, one for traffic). Demolish piecemeal and construct new structure in same location. Re-divert services.</p>
<p>Glovers Farm Overbridge</p> <p>Ref: 4415, Glovers Farm Access, OS 7455 0927</p>	<p>3 span masonry arch bridge. This carries the access track to Glover's Farm over the Scheme.</p>	<p>Build new structure approx 150m east of existing. Once complete demolish existing.</p>

Piled Foundations

3B.8.5 The structures where piling would be required are the retaining walls east of Ninfield Road (in cutting), and the bridges at Watermill Stream, Powdermill Valley Stream, Powdermill Stream and Decoy Pond Stream.

3B.8.6 Where piled foundations are required, these would be constructed using a rotary bored piling rig which is a large diameter drilling rig used to excavate 'columns' below ground level. The piling works would commence with the installation of a temporary steel casing that would be 'spun' into the ground in advance of the rotary auger to prevent the ground from collapsing into the bored hole. This would generally be installed to about 2m below existing ground or to a suitable depth depending on the ground condition.

Beyond this depth the boring would be continued without a casing. On completion of the boring, a prefabricated reinforcement cage would be lowered into the bore and the bore concreted. Where the hole is cased, the casing would be gradually removed as the concrete backfilling progresses. The concrete would be placed using a concrete pump fed from a concrete ready mix delivery truck. Other ancillary equipment includes an air compressor and concrete vibrators.

3B.8.7 For the retaining walls, the piles would be constructed sequentially (contiguously) and in a line, to form the load-bearing section of a retaining wall. A reinforced concrete capping beam would then be constructed on top of the piles. Where piles are exposed, these would be faced with brick or block to give an appearance suitable for the location.

Concrete Foundations

3B.8.8 The structures supported on concrete foundations are Woodsgate Park Road, Ninfield Road, Glovers Farm, Combe Haven, Actons Farm, Hillcroft Farm, Adams Farm, Crowhurst Road and the Railway Bridge. The Greenway bridges would also have concrete footings. The method of construction of the foundations would be as follows:

3B.8.9 A 360 degree excavator would excavate the foundations for the bridge bases, placing the material into dump trucks for removal to fill areas within the Scheme boundary. Dewatering and temporary shoring support would be used if required. All dewatering would be via a settlement tank before discharge to local watercourse.

3B.8.10 After blinding concrete being placed at formation level, formwork and reinforcement would be installed in place. The concrete foundations would be cast in situ. The concrete would be delivered by ready mix truck and compacted using vibrating pokers.

3B.8.11 More detailed descriptions of the construction process for each of these structures are as follows.

Overbridge Construction (General)

3B.8.12 On completion of the foundation works the sub-structure and super-structure works would proceed as follows:

- The bridge abutments would be cast insitu using ready mix concrete and placed using a concrete pump;
- Steel girders or precast concrete beams that span the abutments would be delivered by low loader and lifted into position by a large mobile crane;
- The deck would be cast insitu using a concrete pump fed by ready mix concrete trucks in either a continuous operation or a sequence of concrete pours;
- The parapet beams would either be cast insitu or precast offsite;

- Once all concreting works are complete, the deck would be waterproofed and the bituminous road surfacing laid; and,
- Fixing of permanent handrails, deck joints, ducting, painting and finishing works would complete the bridge structures.

Underbridge construction (General)

3B.8.13 Underbridges that cross watercourses and have concrete pad foundations rather than bored pile foundations would require the following additional work prior to foundation works. The integrity of the watercourse would be secured by driving a sheet piled cut-off wall approximately 1m back from each side of the watercourse and parallel to it. The sheet steel piles would be installed using a percussion piling rig. Each sheet would be driven into the ground in turn interlocking with the previous sheet to form a continuous wall. The wall on completion would be capped off with a concrete capping beam.

3B.8.14 On completion of the foundation works the sub-structure and super-structure works would proceed as follows:

- The bridge abutments would be cast insitu using ready mix concrete and placed using a concrete pump;
- Precast concrete beams that span the abutments would be delivered by low loader, and lifted into position by a large mobile crane;
- The deck would be cast insitu using a concrete pump fed by ready mix concrete trucks in either a continuous operation or a sequence of concrete pours. No supporting falsework beneath the deck and above the watercourse would be required and all gaps would be sealed to prevent cement grout contaminating the watercourse below;
- The parapet beams would either be cast insitu or precast offsite;
- Once all concreting works are complete, the deck would be waterproofed and the bituminous road surfacing laid; and,
- Fixing of permanent handrails, deck joints, ducting, painting and finishing works would complete the bridge structures

Ninfield Road Bridge

3B.8.15 The following suggested sequence of works allows the bridge to be rebuilt whilst maintaining a single line of traffic. This would either be traffic light controlled or worked as a one-way system utilizing Woodsgate Park Road Bridge. A weight load of 7.5 tonne would be enforced and any HGVs rerouted. Full closures would be needed to cater for major traffic management switches and the installation and removal of the Bailey bridges. These off-peak closures would be carried out during weekend closures from Friday evenings through to Monday mornings:

- The two footways across the bridge would be closed and pedestrians diverted either via Woodsgate Park Road Bridge or via a temporary pedestrian footbridge. A weekend closure would be required for installation of a temporary bridge;

- Single line working would be installed on the Bexhill side of bridge. This would be programmed to commence after completion of the replacement of Woodsgate Park Road Bridge to minimise disruption. A weekend closure would be required;
- All existing services would be diverted to the Hastings side of bridge deck;
- A Bailey bridge would be installed to allow demolition of the bridge on the Bexhill side.
- The new bridge abutments and partial wing walls would be constructed;
- The precast concrete bridge beams to the west side of new bridge would be installed and would include the ducts/pipes for services;
- Services would be re-diverted into the new deck;
- Surfacing/finishings on available side of the bridge would be completed;
- The temporary Bailey bridge would be removed and traffic diverted onto the new section of bridge deck. Traffic would remain in single way working. A weekend closure would be required;
- The remaining sections of the old bridge would be demolished and works on the Hastings side of bridge and wing walls would be completed;
- Traffic would be realigned to allow construction of the footways. A weekend closure would be needed for surfacing tie-ins; and,
- The completed bridge would open to unrestricted traffic.

Railway Bridge

3B.8.16 The Railway Bridge close to the eastern end of the Scheme would be constructed in a similar manner to that described above for overbridges. All approvals required from Network Rail and South East Gas Network would be in place prior to any works commencing on the structure. Approvals would concentrate on method of construction, particularly the plant to be used. No heavy plant would be allowed within set limits of the rail and gas lines that run beneath the structure. Craneage would be assessed as to the risk of turning over or jibbing over the railway. The programme for the bridge works would include possession periods when closure of the railway would be required for installation of the pre-stressed concrete beams. The works programme would highlight 'Green' and 'Red' zone working and the protection measures, such as fencing, that would be required to allow works to proceed alongside the live railway.

Water Control Structures

3B.8.17 The water control structures would be constructed in a similar manner to that described above for concrete foundations and summarised below. The sequence of methods of construction and any requirements for temporary diversions would be agreed in advance with the Environment Agency. No works would commence until approval has been given by the Environment Agency.

- A temporary cofferdam would be installed with pumps for dewatering. All dewatering would be via a settlement tank before discharge to local watercourse;
- A 360 degree excavator would excavate for the stop log structures, placing the material into dump trucks for removal to fill areas within the Scheme boundary;
- After blinding concrete being placed at formation level, formwork and reinforcement would be installed in place;
- The concrete foundations would be cast in situ. The concrete would be delivered by ready mix truck and compacted using vibrating pokers; and,
- The stoplogs would be installed and the temporary cofferdam removed

3B.9 Traffic Management

3B.9.1 Traffic Management would be required at the tie-ins at the west and east ends of the Scheme, Crowhurst Road and off-line at the replacement overbridges at Woodsgate Park Road and Ninfield Road. Both the Belle Hill Junction and Queensway junctions would be improved to cater for future traffic design flows. A Toucan crossing would be installed at the Queensway junction.

Belle Hill Junction

3B.9.2 A temporary access off the A269 London Road at the point that the new London Road Junction would be built, would be constructed to take works traffic into the site. The new road alignment is planned to progress in Summer/Autumn 2009. The works access off the public highway would be permanently manned for security and safety of pedestrians. The existing footways at Chapel Path and Bancroft Road would be diverted temporarily away from the site.

Queensway Junction

3B.9.3 A temporary access to the site compound would be built from the Crowhurst Road between the current junction with Queensway and where Crowhurst Road crosses the railway. Works to reconfigure the Queensway junction are planned for Summer 2009. The site access to the compound would be permanently manned. A temporary 30 mph speed limit would be proposed for Queensway during the junction modification works (Summer 2009).

Crowhurst Road

3B.9.4 Crowhurst Road would be the main access to and from the site until Autumn 2009. Due to the rural nature of this road it would be closed to all non construction traffic except for residents access, and buses between Queensway Junction and a point south of Crowhurst village. Manned security points would be established at both ends of this closure. During the closure, the realignment of Crowhurst Road under a new structure carrying the Scheme would be constructed off-line. All items of plant and material deliveries would cross the existing masonry arch bridge at Crowhurst Road to gain access to the haul route. Localised temporary widening of the road and its embankment would be required at the western end of the bridge to facilitate the swept path of articulated vehicles. No work is anticipated on the structure.

Woodsgate Park Road

3B.9.5 To enable the existing structure to be demolished and replaced, Woodsgate Park Road would be closed and a diversion route via Ninfield Road signed. The construction traffic for this bridge would be via the haul route from Belle Hill Junction wherever possible. The welfare units and office establishment would be set up within an enclosed compound on the closed section of Woodsgate Park Road. The works are planned for the period Autumn 2008 to Spring 2009.

Ninfield Road

3B.9.6 The replacement of this busy road bridge would follow the reopening of Woodsgate Park Road. Works would be over a period Spring 2009 to Spring 2010. During this time, traffic would generally be restricted to single lane running. A one-way system utilising London Road, Woodsgate Park Road and Bancroft Road is a suggested proposal to be used as an

alternative to traffic lights over Ninfield Road Bridge. Several off-peak full closures at weekends would be needed for installation and removal of temporary works and therefore a diversion route for HGVs would be implemented to keep lorries away from local routes.

3B.10 Site Compounds

3B.10.1 Temporary site compounds would be established to support the construction operations. These would generally comprise mobile portacabin office units, welfare facilities, storage areas for construction materials, maintenance areas and parking areas for the workforce. On completion of the Scheme works, these compound areas would be restored and returned to their original condition, prior to return to the landowner or incorporation into the environmental mitigation proposals.

3B.10.2 The construction compounds would be prepared by the removal of vegetation and overlaying with a suitable geotextile membrane prior to building up with a suitable thickness of temporary granular fill material and where appropriate, hardened with asphalt surfacing.

3B.10.3 There would be three main compound and temporary storage areas associated with the construction of the Scheme. Smaller compound areas would be established around the structures during the currency of that section of works. These would include a limited number of mobile cabins, welfare, material storage and temporary works areas.

Belle Hill Junction

3B.10.4 This area is currently built up and the existing buildings would be demolished as part of the works to accommodate the main temporary offices for the western section of the Scheme. The location of the compound area is shown on Figure 3B.3. The compound at this location would be established during Autumn 2008 and would remain operational 24 hours a day, 7 days a week. Access to the compound would be from the existing A269 London Road, which at this point already has an existing 30 mph limit. Additional signage would highlight the presence of a works access.

3B.10.5 In addition, this area would be required for the storage of recycled demolition material which would be mechanically crushed on site as it is produced during the initial site clearance works. This would be required to produce suitable granular fill that would meet the requirements of the Specification for Highways Works. The crusher is a mobile trailer unit that would be loaded from stockpile by a loading shovel with the resultant crushed material being transported by dump truck along the haul route to where it would be required on site as granular fill. The crushing facility is planned for operation for Autumn 2008 to Spring 2009.

3B.10.6 Service requirements for this area include telephone, electricity and water. Foul sewage would be removed from site by road tanker for disposal at a suitably licensed facility.

3B.10.7 The compound area would be reduced considerably prior to the completion of the Scheme and would be dispensed with by Spring 2010. Restoration of the compound area would comprise removal of hardstandings. All unsuitable and waste materials would be removed from the site prior to its restoration.

Queensway Junction

3B.10.8 This area is currently partly occupied by East Sussex Fire and Rescue (ESFR) who use it as a training area. This facility would be relocated if appropriate following agreement with ESFR. The remaining area is scrub and partially established vegetation planted as a landscape mitigation measure for the previous Queensway scheme. It is required for the main temporary offices for the eastern section of the Scheme and overall main office establishment. The location of the compound area is shown on Figure 3B.3. The compound at this location would be established during Autumn 2008. Access to the compound would be from the existing Crowhurst Road, which is proposed to be closed to all non essential traffic during the works.

3B.10.9 The compound would contain the main site offices, stores and workshop, a site canteen, subcontractors work areas, the main temporary storage area and traffic management compound and car parking area. The compound would be constructed during Autumn 2008 and would be the last temporary item to be removed towards the end of the construction phase. The compound would be shielded from view behind temporary earth bunds constructed from excavated material from the main works.

3B.10.10 Immediately adjacent to this compound would be a temporary lay down area for the construction of the eastern abutments of the rail bridge. Service requirements for this area would include telephone, electricity and water. Foul sewage would be removed from site by road tanker for disposal at a suitably licensed facility.

3B.10.11 Restoration of the area used for the compound would consist of removal of hardstandings and replacement of topsoil, where necessary. All unsuitable and waste materials would be removed from the site prior to its restoration.

Crowhurst Road

3B.10.12 A temporary compound area would be established on the line of the Scheme to the west of Crowhurst Road. This would be used as a holding area for the earthmoving equipment. No office accommodation or services would be required at this location. The compound area would be in cutting, screening the plant from both north and south.

The Construction Work Force

3B.10.13 During the construction phase, site staff, operatives, subcontractors and visitors would attend the site on a daily basis. This would have an impact on the local road network. This section provides details of the likely numbers of persons in the area of the site during the construction phase.

3B.10.14 The estimated peak numbers of staff (except for operatives which are dealt with in a following paragraph) working on the site would be as follows:

- Queensway compound 40
- Belle Hill compound 15
- Total staff: 55

3B.10.15 The total of 55 staff would assume that all operations are carried out concurrently, which would not be the case in reality. Works would be phased over a period of nearly two years and it is only the main compound that would be staffed throughout the entire construction phase. Staff would generally commute to the area from home or other offices or would rent accommodation in the local area.

3B.10.16 In addition to the staff and work force, many subcontractors would be used throughout the project (e.g. fencing gangs, plant operators etc.). Where possible, local subcontractors would be employed. Where specialist contractors are required (e.g. piling works) their staff and work force would also find suitable accommodation in the local area.

3B.10.17 It is estimated that a maximum of 150 operatives and subcontractors would work on the site at some time during the construction phase, albeit this would not be at a continuous level.

3B.10.18 Working hours would vary slightly during the year to make best use of daylight hours. Generally, the working week would be 07:00 to 17:00 hrs Monday to Friday with Saturday mornings 07:00 – 13:00 hrs. However, works outside these periods would be required for certain key activities including works to Ninfield Road Bridge, the Railway Overbridge and junction tie in works at Belle Hill and Queensway. Particular restrictions may be required in residential areas which would be agreed in advance with the local Environmental Health Officer.

3B.11 Site Traffic

3B.11.1 This section assesses the likely numbers of vehicle movements that would occur during the construction phase. The majority of vehicle movements associated with the construction phase would take place within the boundary of the site. There would be however, vehicles travelling to and from the site carrying deliveries, site personnel and visitors.

Movements to/from the Site

3B.11.2 Deliveries to site would take place virtually daily from the onset of construction through to completion. Deliveries would include items from packages delivered by courier to aggregates and materials for construction. The bulk of materials for the Scheme would be brought in from the access off Crowhurst Road, close to where the main compound would be located. Deliveries to the western end of the Scheme would access the site at the Belle Hill/London Road compound area.

3B.11.3 Where practicable, all material deliveries would be programmed on an 'as required' basis to avoid temporary storage and double handling. They would be taken through the site on the internal haul route direct to their point of use. Deliveries to the two access points on the Scheme would be on existing 'A' roads only. There would be no construction traffic permitted through the village of Crowhurst. Numbers of deliveries to the site are estimated in Table 3B.10.

Table 3B.10 Estimated Numbers of Deliveries to Site

Material Type	Deliveries per Day	Duration (weekdays)	Number of Movements
Deliveries to main site establishment	20	440	8800
Deliveries to satellite office establishments	8	375	3000
Traffic Management	4	620	2480
Suitable structural fill for embankments, structures and road starter layer (no suitable material on site)	16	300	4800
Piling Works (excluding concrete supply)	5	100	500
Concrete (all operations)	5	440	2200
Road Construction (sub-base, bituminous pavement materials)	13	350	4500
Drainage materials (aggregates, pipework, geotextile etc)	4	200	800
Construction materials (Pre-cast/steel bridge beams, fencing, safety fencing, manholes, kerbs etc)	0.5	300	150

3B.11.4 The total number of deliveries during construction is therefore estimated at around 27,500 over the construction period, which, assuming 440 weekdays for construction, equates to approximately 62 deliveries per day. As far as is practicable, deliveries to the site would take place during normal working hours, Monday to Friday. However, some weekend working would be required to make efficient use of the programme period, particularly for works which affect road users such as structures work to Ninfield Road and the junction tie in works.

3B.11.5 Materials required for these operations include fill material, cement, sand, gravel and bituminous pavement material for road surfacing. Estimates of the main quantities of materials required for construction are given below. Sources for these materials would be identified as close to the Scheme as possible:

- Concrete 30,000 tonnes
- Sand/Aggregates 60,000 tonnes
- Sub-base 50,000 tonnes
- Bituminous pavement materials 40,000 tonnes

3B.11.6 The quantities of concrete and bituminous pavement materials are likely to be too small to justify batching on site, a process that would still require all the constituent materials to be delivered to site beforehand.

3B.11.7 Staff and operatives would be encouraged to share vehicles, which is established good practice on major construction projects. Crew buses would be used to take gangs onto the site and minimise the number of private vehicle movements. Welfare facilities and mobile site canteens would also reduce the amount of travelling through the site. Even so, based on the estimates of site staff and operatives and assuming a worst case (i.e. all staff, subcontractors and operatives driving to site separately), there would be an additional 205 vehicles arriving on site at the peak of construction.

3B.11.8 The numbers of visitors to the main site compound is not expected to exceed 5 vehicles per day.

3B.11.9 No routine night works are planned for the Scheme. The exceptions would be for rail possessions at the Rail Bridge and at Ninfield Road where weekend closures may be required for the installation of temporary works. Tie in work at Belle Hill and Queensway may also be carried out off-peak which may be at night. However traffic management crews and security would be retained to provide 24 hour, 7 day cover. This would mean a minimum of 4 personnel at Belle Hill and 6 personnel at Queensway which includes covering the manned security posts either end of Crowhurst Road.

3B.11.10 Assuming the above, this equates to approximately 267 additional vehicle movements (arriving and leaving the site) each day during the construction phase. The majority of these would be to the main site compound at Queensway. Traffic movements on the local network are shown on Figure 3B.5.

Movements within the Site

3B.11.11 Vehicle movements through the site would comprise articulated dump trucks, excavators, graders and bulldozers involved in earthworks operations and site vehicles (four-wheel drives, staff vans, delivery trucks, all terrain cranes etc).

Other Construction Works in the Area

3B.11.12 It is not expected that there would be any other major construction projects in the surrounding area during the construction phase of the Scheme. However, the Highways Agency does have Targeted Programme for Improvement (TPI) schemes on the A21 at Tonbridge and Kippings Cross programmed to start after 2008 which may affect the local resource availability for this Scheme.

3B.12 Construction Environmental Management Plan

3B.12.1 The Construction Environmental Management Plan (CEMP) would be the responsibility of the Contractor and would be prepared prior to the start of construction works on site. It would be the responsibility of ESCC as the overseeing authority to ensure that the works are being carried out in accordance with the requirements of the CEMP.

3B.12.2 The CEMP would comply with the requirements of ISO 14001 and would dictate how environmental management would be achieved during the construction phase so as to minimise the impact of all activities on the surrounding environment. The CEMP would include a means of demonstrating that the contractual requirements, the commitments made at any potential Public Inquiry and all legal requirements, standards and guidelines are met. The CEMP would also include a means of identifying non-conformance, carrying out corrective actions and therefore providing a method of demonstrating continuous improvement throughout the construction phase. The project requirement for environmental site inspections, monitoring, auditing and reporting would be clearly stated within the CEMP.

3B.12.3 The CEMP would define the roles and responsibilities of key staff, including the Contract Manager, the Environmental Manager, the Community Relations Officer and Environmental Specialists. It will also define what will be included in the environmental section of the site induction presentation that will be given to all personnel, including visitors and delivery drivers. Environmental Specialists would be appointed prior to construction commencing to monitor and oversee specific environmental works. These specialists would include the Project Archaeologist, Ecologist and Landscape Clerk of Works.

3B.12.4 The Environmental Manager would have experience of managing construction related environmental issues on similar construction projects. The role of Environmental Manager would include:

- Preparation, issue and management of CEMP;
- Management of environmental and technical support staff;
- Identifying and managing any environmental risks;
- Providing an input to construction method statements to ensure that any environmental requirements are met;
- Programming and obtaining licences, consents etc that are required from the Regulatory Authorities (Environment Agency, Natural England and the local Environmental Health Officers);
- Monitoring site performance against the CEMP;
- Carrying out regular site inspections, checks and audits and reporting the results of these to the Contract and Client Managers; and,
- Development and preparation of training for site personnel, including site induction and specific training as required by the phasing of works on site.

3B.12.5 The CEMP would include a series of specialist control procedures that would define the scope of each procedure, key roles and responsibilities,

control procedures and any monitoring or training that would be required to ensure that staff and operatives are aware of their responsibilities. The specialist procedures would include:

- Community Relations;
- Waste Management;
- Pollution Incident Control and emergency response;
- Construction plant refuelling and maintenance;
- Surface and groundwater protection;
- Ecological works;
- Noise and vibration management;
- Dust and air quality protection;
- Landscape and agricultural works;
- Contaminated land works;
- Use of lime and/or cement for stabilization works;
- Traffic works; and,
- Archaeological works.

3B.12.6 The CEMP and specialist procedures would be subject to regular review by the Environmental Manager. These reviews would be fully documented.

3B.13 Commitment to Construction Best Practice

3B.13.1 These are additional measures to those described above. Measures would be taken during the construction phase to minimise, as far as is reasonably practicable, the impact of construction activities on the surrounding highway network, Public Rights of Way and other publicly accessible areas. The CIRIA site guide *Environmental Good Practice* Edition 2 (and subsequent revisions) would be followed in addressing the environmental issues on site.

3B.13.2 Prior to construction, the Contractor would register with the National Considerate Constructor's Scheme and establish a forum to disseminate construction information to the Statutory Authorities, advisory bodies, landowners, parish councils, local interest groups and the general public. A Community Relations Officer would be appointed who would be responsible for these specific tasks.

3B.13.3 The main principles of the National Considerate Constructor's Scheme of relevance to the minimisation of impacts upon the community as a result of the Scheme include:

- Consideration: for site neighbours and the public at large by explaining the works to be carried out, the length of time the site would operate, dealing with complaints, the use of notice-boards and signs;

- Environment: ensure works are carried out at reasonable times, protect trees and vegetation, avoid pollution and waste of material, suppress noise from plant and vehicles etc.;
- Cleanliness: ensure roads and footpaths around the site are kept clean of construction material, mud and spillages. Safety barriers, lights and warning signs maintained in a clean and safe condition. Prevent surplus materials and rubbish from accumulating. Minimising dirt and dust from the works to reduce the affect on neighbours; ;
- Good Neighbour: maintain full and regular consultation with neighbours regarding site activity, ensure lighting does not affect neighbours, keep a complaint register and minimise alarms from security systems etc.;
- Respectful: maintain respectful standards of dress and provide general public consideration in induction procedure etc. Zero tolerance in proven cases of failures in discipline;
- Safe: follow applicable Health & Safety procedures, make sites secure and position appropriate warning signs where required;
- Responsible: arrange talks at local schools to highlight dangers of construction sites, get to know the local police and neighbourhood associations and ensure adequate First Aid cover is provided throughout the site; and,
- Accountability: be available to receive and discuss complaints and queries, monitor accidents and maintain and advertise a 24 hour telephone 'hotline' number.

3B.13.4 During the construction phase all activities would be subject to a health and safety and environmental risk assessment. Where these works require consent or approval of any external body or authority, the contractor would work with them in the drafting and finalisation of the risk assessment so that consent is obtained prior to that activity commencing.

3B.13.5 All suppliers of mechanical plant would be required to provide modern and efficient equipment with full service records. Best practice would include switching off plant when not in use and shielding of generators, compressors and mechanical breakers behind noise attenuation barriers. Demolition works using shears rather than Montebert hammers would be the preferred option at Belle Hill, Woodsgate Park Road, Ninfield Road and Glovers Farm.

3B.13.6 At the start of construction, an up to date set of constraints drawings would be prepared. These would be based on the information presented in this ES and on any additional environmental surveys that are undertaken prior to the start of construction on site. The constraints drawings would provide the construction team with information on all the environmental constraints in relation to the construction of the Scheme and would include the following information:

- The site boundary;
- All areas of ecological importance/sensitivity;
- Trees and other vegetation to be retained;

- Specified cultural sites;
- Areas where specific requirements exist for topsoil and subsoil stripping;
- Identified locations of noxious plants (e.g. Japanese Knotweed, Himalayan Balsam);
- Areas of contaminated land, soil borne diseases and burial pits;
- The extent of the aquifers underlying the construction site;
- The location of sensitive water features (e.g. Combe Haven, Watermill Stream, Powdermill Stream etc);
- Permitted and prohibited access routes; and,
- Locations where neighbouring properties might be at risk of nuisance caused by the construction works.

3B.13.7 The assessment of risk for any site operation would include reference to the constraints drawings to ensure that any environmental impact is adequately assessed and addressed prior to any specific construction activity commencing. Of particular importance would be the identification and control of potential contamination pathways to sensitive receptors (e.g. watercourses), from for example, material storage areas.

3B.13.8 Site operations would be subject to regular inspection by site personnel trained in health and safety and environmental protection. Particular attention would be paid to site tidiness and litter. Inspections of work sites, compound areas and welfare facilities would be undertaken and recorded and actions required to achieve improvement would be monitored.

3B.13.9 Inspections would include all aspects of health and safety of the work force and general public. All environmental issues would be checked, but specifically waste management, material storage, protection of vegetation and ecological habitats, site access points and plant crossings, and noise and dust control would be more closely monitored. Records of all inspections would be maintained on site.

3B.13.10 Where works would have a larger impact on neighbouring properties, businesses, buildings etc, the occupants of these premises would be advised of these works prior to their occurrence. The nature and extent of any such works, which might include bored or driven piling, night time works on road tie-ins and the rail crossing, would be agreed with the appropriate Environmental Health Officer of the relevant Local Authority. In addition, all works would be undertaken following consultation with the appropriate Regulatory Authority and all construction activities would be undertaken to minimise the impact on the environment by using Best Practicable Means, as defined in Section 72 of the Control of Pollution Act (1974).

3B.13.11 Works would be undertaken in line with the Waste Management Strategy produced by ESCC. The principal aim is to reduce, reuse, recycle or recover to minimise waste. All waste material that cannot be used on site will be segregated to allow recycling. All waste material will be managed and disposed of in accordance with the latest regulations.

3B.13.12 All operations will be reviewed to ensure works are carried out in accordance with Best Practice to minimise, as far as reasonably practicable, the impact on the environment, the local inhabitants, the travelling public and provide a safe working environment. From the site inspections and audits any lessons learnt will be fed back to ensure continuous improvement throughout the project.

3B.13.13 Regular liaison meetings will be held to keep all stakeholders advised of progress and of forthcoming works to try and minimise any complaints.

3B.13.14 The aim is to work closely with all relevant statutory authorities and stakeholders to endeavour to construct the works in accordance with the regulations and minimise the impact on the environment and neighbours.