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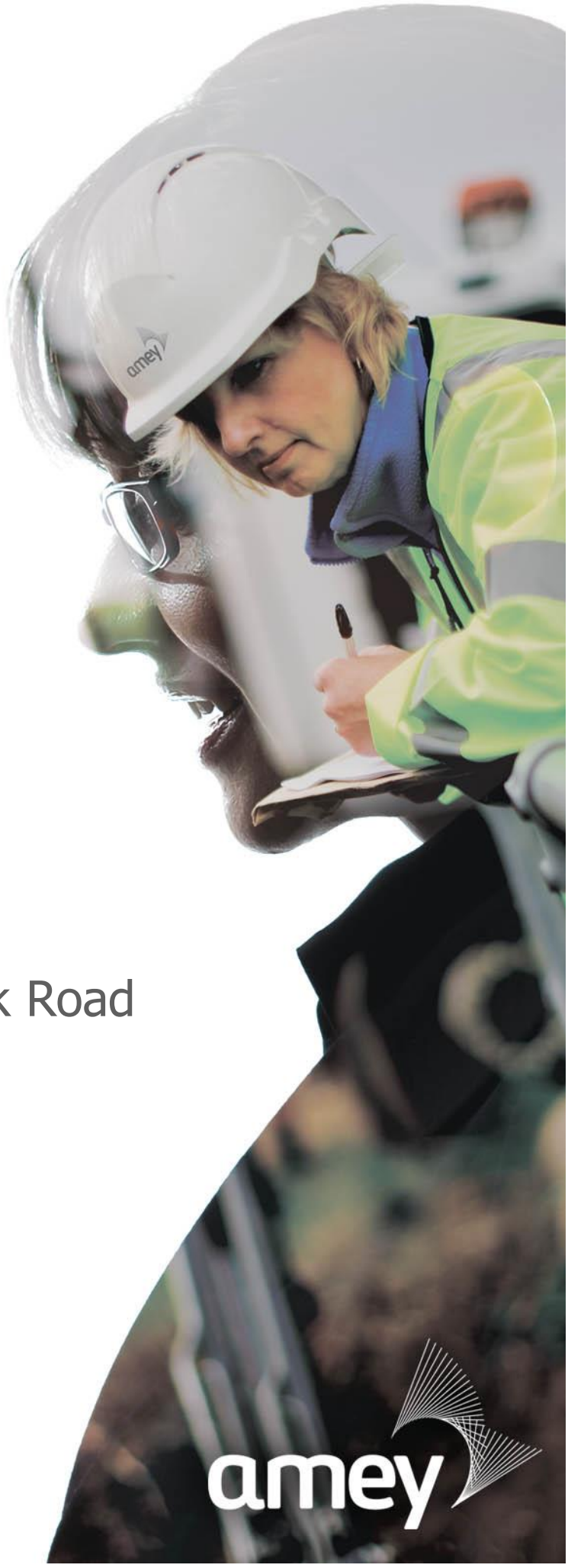
KINGSNORTH STRATEGIC LINK ROAD-FEASIBILITY STUDY

JANUARY 2016



Kingsnorth Strategic Link Road
Ashford
Feasibility Study

CO04300417/001 Revision 00

January 2016

Document Control Sheet

Project Name:	Feasibility Study
Project Number:	CO04300417
Report Title:	Kingsnorth Strategic Link Road Ashford
Report Number:	001

Issue Status/Amendment	**Prepared**	**Reviewed**	**Approved**
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Contents

1 Introduction 1
1.1 Study Area 1
1.2 Aims 2
1.3 Study Approach 2

2 Existing Conditions 4
2.1 Landform and Environment 4
2.2 Ecology 5
2.3 Geotechnical 6
2.4 Public Utilities 6

3 Description of Scheme Options 7
3.1 Description of Options 7
3.2 Cost Estimates 8

4 Engineering Assessment 10
4.1 Design Parameters & Assumptions 10
4.2 Horizontal and Vertical Alignment 11
4.3 Impact on Floodplain 12
4.4 Geotechnical 13
4.5 Public Utilities 15

5 Environmental Assessment 16
5.1 Overview 16
5.2 Archaeological Assessment 16
5.3 Ecology 18

6 Summary and Recommendation 19

Appendix A Scheme Plans
Appendix B Environment Agency Flood Risk Data
Appendix C Ecological Appraisal
Appendix D Geotechnical Desk study
Appendix E Ecological Considerations
Appendix F Ecological Mitigation Calandar

1 Introduction

The new Draft Local Plan for the borough of Ashford needs to identify new land to accommodate in the region of 4000 new dwellings. As part of this process a 'call for sites' exercise undertaken by Ashford Borough Council (Ashford BC) identified a large number of sites which are available to be developed to the south of Ashford, particularly in the Kingsnorth area. The ability of the local existing infrastructure to sustain increases in traffic resulting from the potential developments in the Kingsnorth area has led to the need to consider a possible additional highway link to the west of Kingsnorth.

Accordingly, Ashford BC has requested that Amey, through the Kent County Council Technical and Environmental Services Contract, provide highway design support in respect of this new proposed link road.

This report presents the findings of a route study undertaken by Amey to examine the deliverability of options for this new link road.

1.1 Study Area

The study area is shown in figure 1 and lies to the west of Ashford Road between Pound Lane in the south and Kingsnorth Road to the north, a distance of some 0.75Km. It crosses principally agricultural and undeveloped common land extending across the broad floodplain of the East Stour River.

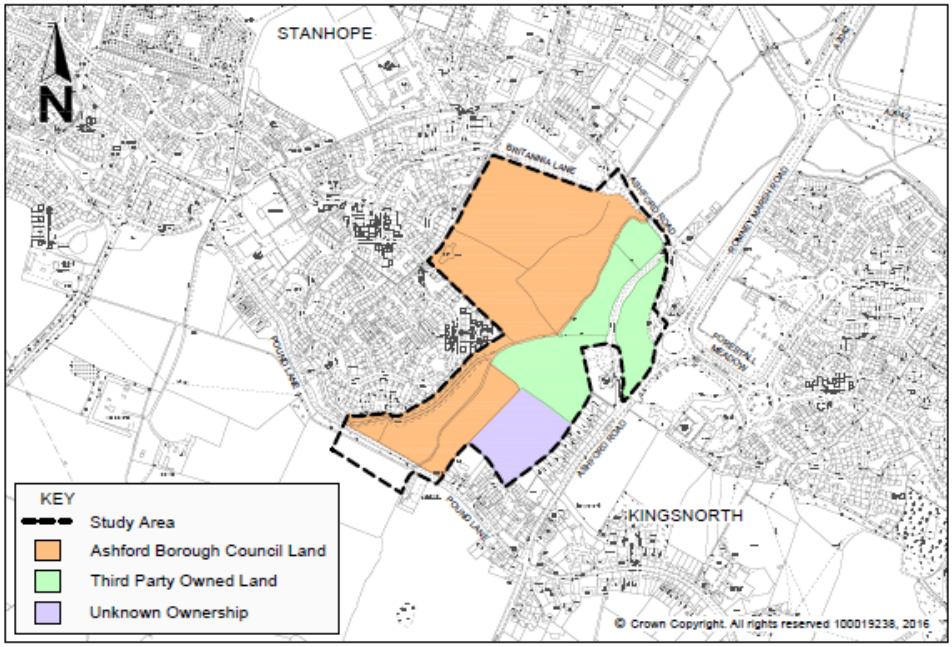

Figure 1 – Study area and land ownership

The bulk of the site is owned by Ashford BC but includes areas of third party land as indicated in figure 1. It is assumed that Ashford BC has initiated early discussions with these third parties and that any land negotiation aspects would not be prohibitive to scheme option identification. This also applies to the area of unknown title but further land enquiries would be needed to better examine the potential inclusion and/or acquisition of this land once scheme option(s) are taken forward.

1.2 Aims

The primary aims of this study are to establish the deliverability of the proposed link road and the potential costs of delivery. Two route corridors are to be explored:

i. Link delivered within land owned solely by Ashford BC

ii. Link delivered within Ashford BC land and third party land

As part of this study Amey has been requested to recommend a preferred option. The choice between options will ultimately depend on the priorities Ashford BC place on aspects such as cost, land use, environmental impact, local concerns and many other comparative factors. For the purposes of this study the aim has been to recommend a route that potentially strikes the best balance between engineering standards, costs and environmental impacts.

1.3 Study Approach

Outline design options have been developed in sufficient detail to demonstrate with confidence their engineering feasibility, likely environmental impacts and other local effects.

The steps involved have been to:

- Obtain high resolution level data (5m grid levels @ 600mm accuracy) to supplement the Ordnance Survey mapping
- Undertake a detailed topographical survey in the narrow section of Ashford BC land located mid-way within the study area to provide the necessary terrain accuracy at this location
- Obtain detailed flood risk data from the Environmental Agency including model output data

- Carry out an Environmental Scoping Assessment including an ecology walkover survey and appraisal
- Undertake a preliminary geotechnical desk study
- Obtain records from major utility providers (New Roads and Street Works Act C2 enquiries)
- Develop outline designs in accordance with the Highways England (formally Highways Agency) Design Manual for Roads and Bridges and the KCC Design Guide as appropriate
- Prepare outline engineering drawings at 1:2500 scale and detailed engineering drawings (plan & profile) at 1:500 scale
- Prepare scheme cost estimates
- Identify and compare key engineering and environmental impacts/constraints for each option

2 Existing Conditions

Key environmental and engineering constraints found within the study area are shown on plan 4300417/000/014 in Appendix A and as briefly described below.

2.1 Landform and Environment

Landform

Generally, the route corridors occupy the broad floodplain of the East Stour River which flows from the Greensand Ridge northeast towards Ashford. The whole area is fairly flat, around 37mAOD near the river, and rising gently away from the floodplain by two to three metres. The topographical survey carried out at the narrow section of Ashford BC land showed the river was well contained within its banks with the river water level around 35.3mAOD at that time, which is assumed to be normal for the time of year.

Flood Levels

Product 4 flood level data obtained from the Environment Agency (EA) indicates that the majority of land that the route corridors occupy is categorised as flood zone 3. This categorisation states that the area will probably be flooded with a frequency of at least 1 in 100 years. The EA will therefore need to be consulted (National Planning Policy Framework 2012) and the 'exception test' will need to be passed[1]. Historical flood events have occurred in this area – September 1973, March 1974, November 2000 and February 2001.

The site does however benefit from flood defences currently in place in the form of upstream reservoirs on the Great Stour (Hothfield flood storage reservoir) and East Stour (Aldington flood storage reservoir). These reservoirs store water upstream of the town during times of high flows and then release it downstream at a controlled rate.

EA modelled flood levels indicate a 1 in 100 (1%) year flooding event (including for climate change) would reach peak levels of around 37.5mAOD in the area, resulting with a flood depth generally of 0.5m across the site. This however excludes the benefit of flood defences that would see flood levels reduced to around 37mAOD (i.e. the general ground level). Full details of the flood risk data received from the EA can be found in Appendix B.

[1] Details available on-line at http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/the-exception-test/

Environmental designations/conditions

An Environmental Scoping Assessment has highlighted the following baseline conditions:

- There is one Scheduled Monument (Roman Settlement) within the study area (See plan 4300417/000/014). Further records show that within 300m of the site there are many archeologically significant roman finds
- The site does not lie within an Air Quality Management Area (AQMA)
- Within a 300m radius, the relevant receptors for the scheme in terms of air and noise effects currently includes approximately 360 houses, 4 schools and 2 churches. There are no hospitals with this search radius
- There are no World Heritage Sites, registered Parks and Gardens, Conservation areas, historical landscapes within a 300m search radius or RAMSAR sites and SSSIs within a 2km search radius.
- There are 18 listed buildings within a 1km search radius the nearest being 340m
- The site does not lie within an Area of Outstanding Natural Beauty or within a National Park
- The site is located in Landscape Character Area 121 Low Weald. A landscape of low clay vales with pastoral agriculture dominated by large areas of ancient woodland. Part of the green belt suffering from a decline in traditional farming
- It is unknown if there are any Tree Preservation Orders in close proximity to the site

2.2 Ecology

A preliminary Ecological Appraisal has been undertaken including a Phase 1 Habitat Survey (ecology scoping walkover). Full details of the appraisal are contained in Appendix C.

Of particular note is the potential for some habitats to support protected species such as water voles, great crested newts and roosting bats. These habitats are highlighted on plan 4300417/000/14.

Additional surveys will be required to ascertain the presence of such species and to inform a detailed mitigation strategy once a firm scheme choice has been made.

2.3 Geotechnical

A preliminary Geotechnical Desk study has been undertaken full details of which can be found in Appendix D.

The ground conditions are expected to comprise predominantly alluvium over Weald Clay.

The principle geotechnical risks are a high water table and flooding, excessive settlement of new embankments and structures, and poor and unexpected ground conditions at the site of structures.

Contamination aspects are not addressed in this report. However, the risks are expected to be low as the existing land use is mainly agricultural.

Piled foundation solutions at structures would be preferred given the soil conditions and high water table.

No previous ground investigation information was available for this area and as such an intrusive ground investigation will be required to assess and manage the geotechnical risks highlighted by the study.

2.4 Public Utilities

Enquiries made to all main Statutory Undertakers have revealed the presence of some significant utility plant in the area that may require diversionary or protection measures.

These are shown on plan 4300417/000/14 and include:

- One 18inch High Pressure Gas main crossing the site in a southwest to northeasterly direction
- A foul rising main skirting the boundary of the housing site to the east before crossing the flood plain in an easterly direction to the Romney Marsh/Ashford Road roundabout
- A 400mm diameter water main crossing the site in the northern verge of Pound Lane continuing off-line crossing the site in a north easterly direction

Other utility plant typically found within existing highway verges/footways are also present (i.e. UKPN, BT & cable companies).

3 Description of Scheme Options

3.1 Description of Options

Three scheme options have been identified that are considered most likely to meet the aims of the study and are shown on plan 4300417/000/02 @ 1:2500 scale and in more detail on plans 4300417/000/03 to 13 @ 1:500 scale (plan & profile).

Each scheme option has been sufficiently developed to indicate the approximate dimensions of the embankments and the locations of principle structures.

Option 1

Option 1 fulfils the aim to deliver a scheme within land owned solely by Ashford BC.

The alignment follows a fairly direct route crossing Pound Lane in the south to head in a north easterly direction to connect to the existing Ashford Road/Britannia Lane roundabout in the north.

The road is generally elevated on 1 to 1.5m embankment rising locally to 2m at bridge crossings of the river (2 No.). At the narrow section of land mid-way along the route where the available width is restricted, sections of embankment are supported by short lengths of retaining walls in order to retain and prevent realignment of the main river. The road crosses a tributary of the main river at this point, maintaining its link to the main river through use of a proposed box culvert.

Pound Lane is shown to be stopped up on the eastern side, converting to a footpath for a short distance. This follows concerns over the safety of the junction at the crossroads of Pound Lane with the Ashford Road in Kingsnorth. Stopping up Pound Lane will limit traffic at this junction to local use only as well as encourage use of the new road by through traffic. On the west side Pound Lane is linked into the new road with a major/minor ghost island junction arrangement.

Enlargement of the Ashford Road/Britannia Lane roundabout is proposed in order to accommodate the new link road connection at its northern end.

Option 2

Option 2 serves to provide a route to the north of Pound Lane that links direct to the Romney Marsh/Ashford Road roundabout thereby affording good access to the A2040.

The alignment crosses third party land but this is kept to a minimum by following a route to the north of the main river for as long as possible.

Similar to Option 1, embankment heights lie between 1 to 1.5m rising to 2m at bridge crossings of the river (3 No.)

To the south, the route and its features are as described for Option 1. Immediately north of the narrow section of Ashford BC land the road deviates from Option 1 and curves sharply eastwards crossing the main river and entering into third party land before connecting direct to the Romney Marsh/Ashford Road roundabout.

A new side road link is proposed that replaces the existing section of the Ashford Road between the Britannia Road/Ashford Road and Romney Marsh/Ashford Road roundabouts. This new link closely follows an existing redundant section of road before crossing the river on a new structure and tie-in to the existing Britannia Lane/Ashford Road roundabout. The replaced section of the Ashford road is then stopped up at its southern end, reverting to an access road to access local premises.

Option 3

Option 3 is similar in principle to Option 2 but follows a less sinuous alignment and has one less river crossing. Additional third party land is however required.

3.2 Cost Estimates

Preliminary construction cost estimates are given in Table 1 for the various options.

The basis of the estimates is:

- Rates and prices used are based on construction projects of a similar size and nature and are at current day prices – (January 2016/Q4 2016)
- No allowance for inflation has been included
- An allowance of 25% has been added for Principal Contractors Preliminaries (based on previous experience)
- A contingency and risk allowance of 10% has been added for design refinements
- VAT is excluded
- An assumed construction period of 12 months
- No allowance has been included for land purchase and acquisition costs including charges relating to Land Compensation Act

- Cost allowances associated with the following main Statutory Undertakers affected have been included (Foul rising main & UKPN works). Works to the high pressure gas main (option 2 & 3) and the 400mm water main (all options) are NOT included

It should be noted that no allowance has been made for planning matters, design, site supervision and other associated fees including site investigations, environmental & ecological mitigation measures & other site investigations.

	Option 1	**Option 2**	**Option 3**
Description	Amount	Amount	Amount
Preliminaries	£ 589,858.28	£ 734,706.97	£ 705,919.58
Site Clearance	£ 8,247.40	£ 8,407.40	£ 8,407.40
Fencing	£ 50,000.00	£ 58,000.00	£ 58,000.00
Safety Fencing	£ -	£ -	£ -
Drainage	£ 142,160.00	£ 138,160.00	£ 138,160.00
Earthworks - General	£ 450,962.16	£ 630,503.28	£ 630,353.71
Pavements	£ 684,456.75	£ 705,442.75	£ 705,442.75
Kerbs Footways & Paved Areas	£ 176,699.36	£ 181,581.25	£ 181,581.25
Traffic signs	£ 21,550.00	£ 21,550.00	£ 21,550.00
Road Markings	£ 4,000.00	£ 4,000.00	£ 4,000.00
Lighting	£ 45,000.00	£ 58,500.00	£ 58,500.00
Electrical Work	£ 48,560.00	£ 78,740.00	£ 78,740.00
Landscaping & Ecology	£ 152,797.44	£ 203,943.19	£ 203,943.19
Structures	£ 575,000.00	£ 850,000.00	£ 735,000.00
Accommodation Works	£ -	£ -	£ -
Statutory Undertakers - Diversions	£ 24,000.00	£ 24,000.00	£ 24,000.00
Contingencies	£ 299,729.14	£ 372,153.48	£ 357,759.79
TOTAL	**£ 3,273,020.52**	**£ 4,069,688.33**	**£ 3,911,357.67**

Table 1 – Cost Estimates

4 Engineering Assessment

4.1 Design Parameters & Assumptions

The design parameters that have been used to inform the designs are given in Table 8 below.

Parameter	Value/Description	Comments
Design Standards	DMRB & Kent Design Guide as appropriate	Used to set minimum geometric parameters, including design relaxations as appropriate
Road Type	Urban all-Purpose (UAP2) road	Good standard single carriageway with frequent side road connections. Road capacity – 1470 vph one-way hourly flow
Target Design Speed	70kph (40mph)	40mph speed limit assumed.
Junction Types	At-grade	Combination of major/minor ghost island junctions or roundabouts
Road x-section (Typical)	7.3m wide carriageway, 2m soft verges with 2m footway on one side	Overall width, excluding batter slopes, 14.3m May vary depending on visibility requirements and physical constraints
Pedestrian Provision	Single 2m footway with at-grade crossings	Formal uncontrolled crossings assumed
Minimum Road levels	1:100 year flood + Climate Change + 300mm freeboard (current modelled flows) - Undefended	Data related to East Stour River. Modelled flows obtained from EA.
Bridge clearance over river(s)	1:100 year flood + Climate Change + 600mm freeboard	Additional freeboard to allow for debris clearance at structures
Embankment side slopes	1v:2h (26 degrees)	Formed using granular imported material with a free-draining starter layer (drainage blanket)
Surface water drainage	Positive system out falling locally into East Stour river at several locations	Relatively flat gradients and frequent low points prevent use of possible flood attenuation measures at other adjacent sites (i.e. south of Pound Lane). Localised Attenuation measures prior to outfalls into the river will therefore be necessary

Table 2 - Design Parameters

It is understood that the section of new road being considered for this study forms part of a larger link road to connect various development sites including the Chilmington Green development site to the west of the study area. As such it will not be constructed in isolation and its implementation will be subject to the timescales associated with the various development sites to the west.

4.2 Horizontal and Vertical Alignment

All options conform to the geometric requirements set out in TD 9/93[2] of the Design Manual for Road Bridges (DMRB) for a design speed of 70Akph (40mph). This excludes the side road link associated with option 2 & 3 which uses a design speed of 60Bkph (30mph).

At least desirable minimum standards have been met in terms of horizontal, vertical and visibility requirements with the exception of that part of the alignment that passes through the narrow section of Ashford BC land for Option 1 & Option 2. Here, a relaxation in horizontal alignment (Radius 127m – 2step relaxation) and forward visibility (marginally less than 120m for Option 2 – 1 step relaxation) has been considered and introduced in the design to allow the road to be constructed solely within the Ashford BC land.

It is envisaged that for Option 2 the combination of relaxations in horizontal and forward visibility would need to be treated as a Departure from standard (TD9/93[2], para 1.24). The implication is in effect a momentary reduction in forward visibility for drivers heading southbound. This has been considered acceptable on the basis that the location is fairly isolated from junctions on a road with no frontage access. Drivers will therefore have limited distractions. To mitigate, addition warning signs and/or enhanced road markings could be introduced to better alert drivers of the layout ahead.

The highway alignments proposed have been set above the flood plain to ensure the road does not incur flooding (1 in 100 year event). Standards of vertical alignment for all options are essentially similar achieving at least Desirable Minimum crest/sag curvature values for the selected design speed. The emphasis has been to minimise embankment heights whilst satisfying the minimum flood level requirements.

[2] DMRB 6.1.1 TD 9/93Highway Link Design

This has resulted in relatively shallow gradients throughout, typically between 0-1%, with several low points that will to a large extent dictate the location and number of outfalls required, which would need to be agreed with the EA.

4.3 Impact on Floodplain

Discussions with the Environment Agency regarding the scheme options are currently ongoing. Whilst at the time of writing, these preliminary discussions are yet to be concluded, we have summarised what could be reasonably expected to be required as the scheme develops through feasibility, outline and detailed design.

Flow balancing and Attenuation

As a result of the increase in impermeable area and restricted discharge rates, it is reasonable to expect that storm water attenuation will be required. Depending upon which route option is selected, the site impermeable area varies between 1.25ha and 1.75ha. Rainfall on this area will need to be attenuated prior to discharge into the East Stour River. With an assumed allowable discharge rate of 5l/s/hectare, the volume of storage could vary between 600m³ or 1000m³ respectively for a 1/30 event.

Compensatory Storage

The proposed route will be built upon embankment crossing an existing flood zone. As a result earthworks will occupy areas currently at risk of flooding and it is expected that the EA will require compensatory storage to be provided on a level for level basis as local to the area lost as possible. At this stage we have not identified suitable areas of compensatory storage but this would need to be factored into any land purchase requirements and hence costs.

Outfall

The location, number and discharge rate of any new outfalls will need to be agreed with the EA. Given the shallow gradients and requirement for storage, it is likely that multiple outfalls will be required to the East Stour River.

Flood Defence Consent and Modelling

Any works within 8m of the watercourse will be subject to Flood Defence Consent. Where the route options cross or result in realignment of the watercourse it is expected that the EA would wish to see verification by modelling that the proposed solution results in no more onerous flooding conditions or loss of capacity compared with the existing situation. Any watercourse realignment may be subject to Parliamentary order.

It would be expected that the scheme would be subject to a supporting Environmental Impact Assessment which would consider the water environment and be subject to a Water Framework Directive Assessment.

Environmental

The ecological study has highlighted the potential presence of water voles and great crested newts. Further investigation will be required and programmed into the project timeline.

Water Quality

In accordance with the requirements of CIRIA SuDs manual, water quality measures will need to be considered as part of any design adopting the three treatment approach.

4.4 Geotechnical

All options will encounter similar geotechnical conditions with the zone of interest largely underlain by alluvium, which overlies Weald Clay. Comparatively speaking, Options 2 & 3 are likely to encounter improved ground conditions where they tie-in with the roundabout connecting Ashford Road with Romney Marsh Road due to the outcrop of 3rd terrace river gravels comprising sands and gravels of limited depth.

Generally however, the following aspects apply to all the routes.

Earthworks

As the zone of interest is relatively flat and primarily within a floodplain, cuttings are not anticipated with any of the options. Cuttings in alluvium are not advisable in any case.

Should any low lying structures such as cattle underpasses or pedestrian underpasses be required, then these would need to be tanked or pumped, due to the high groundwater level. Balancing ponds or flood storage compensation areas on the floodplain should be designed with side slopes no steeper than 1v:2.5h (22 degrees)

Construction of the highway embankments should commence with a free-draining starter layer (drainage blanket). The low embankments will settle over the alluvium, but the magnitude and duration of settlement can only be determined following ground investigation. Given the likely depth of alluvium and the presence of free-draining gravel horizons, it is unlikely that band drains or other ground treatment will be required to accelerate the consolidation process. However a delay of a few months before construction of the road and drainage is advisable.

For preliminary design a design slope of 1v:2h (26 degrees) for embankments has been assumed on the basis that there would be a significant earthworks deficit and all material will be granular imported fill.

Site-won material is likely to be limited to Weald Clay, which would be classified as a Class 2 cohesive general fill.

Alluvium dredged from flood storage compensation areas, if required, is likely to be unacceptable as general fill, but could be used as landscape fill.

Drainage

The ground is unsuitable for infiltration basins or soakaways as all the strata present are of low impermeability and the groundwater is likely to be high.

Subgrade

As the road will be constructed on embankment, a CBR of at least 2.5% could be expected throughout the length of the scheme.

Foundation designs could therefore be expected to be in the region of either 450mm of subbase only, or 250mm of subbase and 350mm capping.

Structural Foundations

As previously mentioned, a piled foundation solution is preferred over a spread foundation for bridges crossing the East Stour (Box culverts). Whist the alluvium is possibly not that deep, the Weald Clay will be weathered and there is a high water table.

A steel sheet pile solution with a concrete capping beam has been assumed in the preliminary design for any retaining walls required.

Risks

The Geotechnical Desk Study contained in Appendix D provides an initial geotechnical risk register. This includes appropriate control measures to mitigate these risks.

As previously stated, the principal geotechnical risks are a high water table and flooding, excessive settlement of new embankments and structures, and poor and unexpected ground conditions at the site of structures

4.5 Public Utilities

Options 2 & 3 are likely to have the greatest impact on utility plant as they both align across an 18inch high pressure gas main near to the tie-in at the Ashford Road/Romney Road roundabout. Whilst discussions with Southern Gas Networks (SGN) have not taken place at this stage, they are unlikely to accept a new road on embankment to cross the main without diversion/protection measures to their plant. This may incur significant costs that at this stage cannot be realistically quantified. Early consultation with SGN is therefore recommended following route choice.

Further utility impacts can be anticipated for all options including, but not limited to, diversion/protection measures to a 400mm water main located along Pound Lane, a foul rising main that crosses the floodplain and the 'standard' utility apparatus typically found in existing highway verges/footways (i.e. street lighting, BT, cable networks and others). As before, early consultation with all utilities should take place following route choice.

5 Environmental Assessment

5.1 Overview

At this stage only a broad desk-based study, including a walkover survey, has been carried out which has indicated the relevant baseline conditions and constraints for the area as described in sections 2.1 & 2.2.

Potentially there will be significant environmental impacts irrespective of which option is to be taken forward. Noise, air quality, landscape and visual impact effects will largely be similar for each option, and possibly result in adverse permanent impacts to nearby properties located to the west of the East Stour River and users of the affected land. Detailed assessments of noise, air quality and landscape aspects will, therefore, be necessary.

Cultural Heritage and ecology aspects are of particular note and are discussed in sections 5.2 & 5.3 below.

An Environmental Impact Assessment (EIA) may be required. In accordance with the requirements set out in HD 47/08[3], it is likely that the new road will be categorised as a '*relevant Annex II project*' as its overall footprint will exceed 1hectare. As such, the decision to provide an EIA will subject to a determination process in accordance with the EIA Regulations (Screening Opinion). As more information becomes available it will become clearer as to whether this scheme requires an EIA. Detailed environmental assessments (i.e. noise, air, landscape) and relevant ecology species surveys should be undertaken prior to a Screening Request being submitted.

At this stage, we believe there is a reasonable likelihood that an EIA will be required for any of the options presented in this report.

5.2 Archaeological Assessment

Option 1 would run into the northeast corner of a Scheduled Monument (TR04SW 83; 1017645; 31481) as shown in figure 2. The Monument is a 1st – 3rd century Roman settlement site identified by geophysical survey and partial excavation, including industrial areas, burials and a temple. It is located at the junction of 2 no. Roman roads (RR 130 & 131).

[3] DMRB 11.2.3 – Environmental Impact Assessment

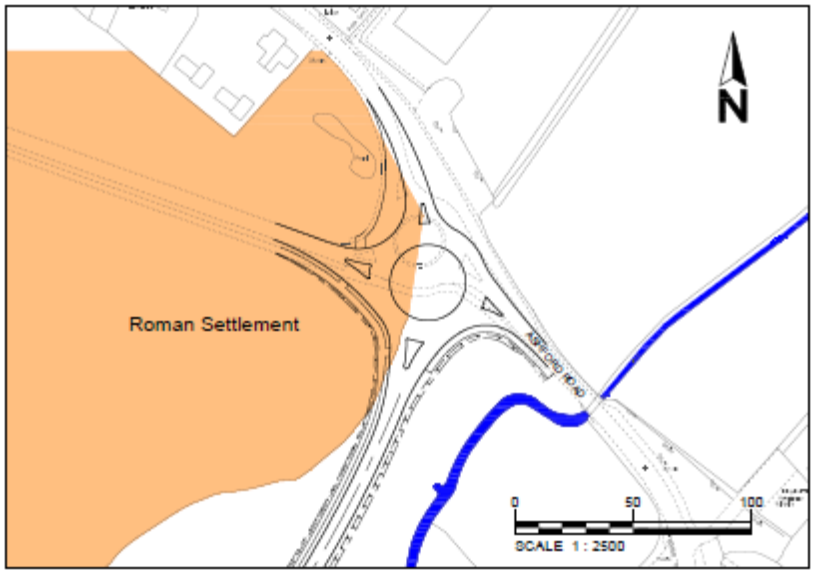

Figure 2 - Option 1 encroachment into Rome Settlement

The option would impact upon approximately 1000m^2 of the Scheduled area previously undisturbed or build on. It would, therefore, require Scheduled Monument Consent (SMC) from Historic England which must be applied for. If SMC is granted, then it is likely that a preliminary programme of archaeological investigation would be required, probably involving total area excavation. Considering the range and nature of the known and suspected remains, such an investigation would most likely be time-consuming, labour-intensive and expensive.

Through design refinement of the road layout, it may be possible to marginally reduce the area of impact; however impact on the site is unlikely to be avoidable if to accommodate the new road solely within Ashford BC land and retain the local road connections.

There is also the possibility that there are unknown subsurface archaeological remains along the northern part of the route, especially as there are several other prehistoric, Roman and medieval sites in the vicinity.

As such, further archaeological mitigation would be required, probably involving geophysical survey and selective trial trenching.

Options 2 & 3 involves the construction of new road across greenfield sites within an area of significant archaeological survival, especially Roman remains as it is close to the junction of 2 no. Roman roads (RR 130 & 131) and a Roman settlement; there are also several other prehistoric, Roman and medieval sites in the vicinity.

As such, archaeological mitigation would be required, probably involving geophysical survey and selective trial trenching.

5.3 Ecology

All options will potentially impact on habitat suitable to support a variety of protected species. This habitat, in the main, is centred round the East Stour River and its associated tributary offering potential for the presence of great crested newts, water voles, otters and white-clawed crayfish. In addition, the site has potential to support reptiles, badgers, nesting birds and bats. Several hedgerows are also affected by the options although it has not been possible at this stage to confirm if any of the hedgerows are classed as important hedgerows.

In order to gain an appreciation of the relative differences between the options in ecological terms, a summary of potential ecology impacts including measures needed to address them for each option is provided in Appendix E.

Overall, it is the new crossings over the rivers which are likely to have the greatest ecology impact. For that reason Option 1 is considered to have the least impact. Furthermore, Options 2 & 3 cross areas substantially 'rich' in good habitat vegetation located adjacent to the Ashford Road/Romney Marsh roundabout. Options 2 & 3 also impact on a larger area compared to Option 1.

It should be noted that mitigation measures to translocate protected species and clear habitat on the site can only happen at specific times of the year. Appendix F includes an 'Ecological Mitigation Calendar' that details of these specific times.

6 Summary and Recommendation

The primary aim of this study has been to establish the feasibility of the proposed link road and the potential costs of delivery.

Two route corridors have been explored, one within land owned solely by Ashford BC and one within Ashford BC land and third party land. As a result, three alignment options are identified, each developed in sufficient detail to demonstrate with confidence their engineering feasibility, likely environmental impacts and other local effects. These options are detailed on the plans contained in Appendix B.

Costs of delivery range from £3.27m for Option 1 (Ashford land only) to £4.07m for Option 2 and £3.91m for Option 3.

All options occupy to a large extent, the East Stour River floodplain and as a result are generally elevated on 1 to 2m high embankments. River crossings are required and the use of concrete box culverts has been assumed. Significant impacts on the floodplain in terms of displaced flood water and possibly impeded flow is likely. Detailed flood risk assessments will therefore be required to accurately establish the full impact on flood waters, the outcome of which is likely to lead to compensatory flood storage and surface water attenuation measures.

Environmentally, being a new road, significant environmental impacts can be expected and mitigation necessary, particularly for residential properties situated in the fairly new housing estate located to the west of the East River Stour. Generally, there is little to choose between the options in environmental terms however of note is the potential impact on the Scheduled Monument with Option 1, where it encroaches marginally into the monument at its northern end.

As previously mentioned, the choice between options will ultimately depend on the priorities Ashford BC place on aspects such as cost, land use, environmental impact, local concerns and many other comparative factors. Assuming that the impact on the floodplain is similar for either option and that the differences in scheme costs are tolerable, Option 3 is the preferred choice.

Option 3 is considered to offer a better standard of road alignment, provide good connectivity to the local road network (i.e. direct to the Romney Marsh/Ashford Road roundabout) and minimise environmental impact due to its lower number of river crossings and greater distance from nearby properties west of the East Stour River.

Appendix A Scheme Plans

Appendix B Environment Agency Flood Risk Data

Appendix C Ecological Appraisal

Appendix D Geotechnical Desk study

Appendix E Ecological Considerations

Appendix F Ecological Mitigation Calandar