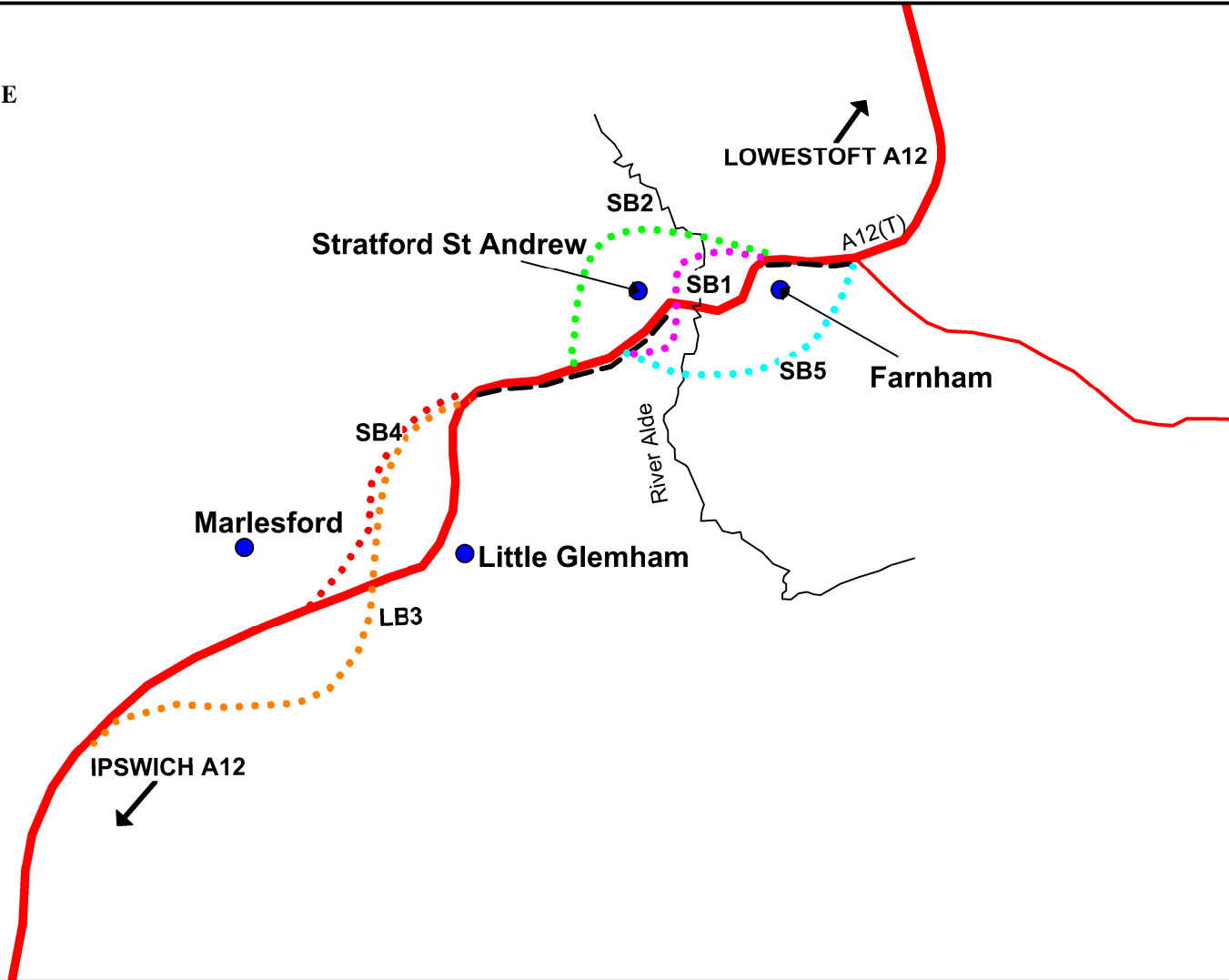


## **Appendix 1 – Bypass Option Assessment and Drawings**

## **Appendix 1.1 – Drawings**

Un-numbered SCC Drawing

60315689-SHT-00-FVSW-C-0001-A12 Four Villages Proposed Routes-Footpaths 1 of 1



**Legend**

- SB1. Pink Bypass of Farnham and Stratford St. Andrew
- SB2. Green Northern Bypass of Farnham and Stratford St. Andrew
- LB3. Orange route to the south of Marlesford and the north of Little Glemham
- SB4. Red Bypass of Little Glemham
- SB5. Blue Southern Bypass of Stratford St. Andrew and Farnham
- — A12 Improvements



**Suffolk**  
County Council

Economy, Skills and Environment,  
Endeavour House, 8 Russell Road, Ipswich, Suffolk. IP1 2BX.

Scale 1:250000

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**A12 FOUR VILLAGES  
AND SIZEWELL**

PRODUCED BY  
mitclj

CHECKED BY

DRAWING No.

DATE  
03/12/2014

## **Appendix 1.2 – Geotechnical Report**

- 1.2A Four Villages Geotechnical Report
- 1.2B Annex A - Propose Route Layout
- 1.2C Cross Sections
- 1.2D Site Visit Photographs

# Four Villages By-pass

## Preliminary Sources Study Report (PSSR)

## **Appendix 1.4 – Footpaths**

1.4A          Four Villages- Proposed Footpath Fee

**Four Villages- Proposed Footpath Fee**

Route	Footpath	Prow ID	Route Code	Option 1- Dual Carriageway	Cost	Option 2- Single Carriageway	Cost
LB3	FP1	7573	E-288/016/0	Footpath cut off between current and proposed A12		Stile positioned to connect footpaths at A12 crossing	4000
	FP2	6864	E-178/003/0	Footpath redirected under A12 overbridge and continue up to current A12	3000		3000
	FP4	8097	E-374/004/0	Footpath redirected under A12 Overbridge and continue along to current A12	3000	Stile positioned to connect footpaths at A12 crossing	4000
				Total	6000		11000
Link 1	CR1			Diverted to join with FP12 and FP11. The diversion will then continue north to Farnham where it will connect with the current A12 to rejoin at it's previous location	3000	Gates positioned to connect cycleway at A12 crossing	4000
				Total	3000		4000
SB4	FP3	8109	E-387/006/0	Footpath cut off between current and proposed A12	-	Stile positioned to connect footpaths at A12 crossing	4000
				Total	0		4000
SB1	FP7	6541	E-137/032/0	Footpath cut off between current and proposed A12	-	-	
SB2	FP7	6541	E-137/032/0	Footpath redirected under A12 Overbridge to current A12	3000	Stile positioned to connect footpaths at A12 crossing	4000
	FP6	6510	E-137/004/0	Footpath diverted along side road to Overbridge, then diverted along A12	3000	Stile positioned to connect footpaths at A12 crossing	4000
	FP5	8919	E-502/006/0	Footpath diverted along A12 to join a side road at Overbridge	3000	Stile positioned to connect footpaths at A12 crossing	4000
	CR1			Diverted to join with FP12 and FP11. The diversion will then continue north to Farnham where it will connect with the current A12 until Low Road where it will connect with FP13 to it's current route	3000	Gates positioned to connect cycleway at A12 crossing	4000
				Total	12000		16000
SB5	FP10	7204	E-243/003/0	Redirected to join the side road up to Side Road Overbridge	3000	Stile positioned to connect footpaths at A12 crossing	4000
	FP11	7202	E-243/001/0	Footpath diverted to Side Road Overbridge, then diverted along side road	3000	Stile positioned to connect footpaths at A12 crossing	4000
	FP8	6538	E-137/029/0	Footpath diverted along side road to reach A12 at proposed roundabout	3000	Stile positioned to connect footpaths at A12 crossing	4000
	FP9	7206	E-243/006/0	Footpath diverted to connect to FP10 at Side Road Underbridge	3000	Stile positioned to connect footpaths at A12 crossing	4000
				Total	12000		16000

The above table has been completed based on the following assumptions:  
 Footpath location taken from Ordnance Survey and displayed in accompanied Appendix  
 The reference 'A12' corresponds to the proposed A12 rather than the current (unless stated)

## **Appendix 2 – Environmental Assessment**



## **Appendix 2.1 – Air Quality**

2.1A A12 Four Villages Study- Air Quality Appendix

## **Appendix Air Quality**

Capabilities on project:

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## 1.1 Air Quality Objectives and Limit Values

### 1.1.1 Air Quality Objective and Limit Values

The air quality objectives and limit values currently applying to the UK can therefore be split into two groups. Each has a different legal status and is therefore handled differently within the framework of UK air quality policy. These are:

- UK air quality objectives set down in regulations for the purposes of local air quality management which are targets (Table A3.1.1); and
- EU limit values transcribed into UK legislation which are mandatory (Table A3.1.2).

**Table A3.1.1: UK air quality objectives**

Pollutant	National Air Quality Objective		Date to be Achieved by and Maintained thereafter
	Concentration	Measured as	
Benzene	16.25 µg/m <sup>3</sup>	Running Annual Mean	31.12.2003
Benzene	5.0 µg/m <sup>3</sup>	Annual Mean	31.12.2010
1,3-Butadiene	2.25 µg/m <sup>3</sup>	Running Annual Mean	31.12.2003
Carbon Monoxide	10.0 mg/m <sup>3</sup>	Maximum Daily Running 8-hour Mean	31.12.2003
Lead	0.5 µg/m <sup>3</sup>	Annual Mean	31.12.2004
	0.25 µg/m <sup>3</sup>		31.12.2008
Nitrogen Dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1 Hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual Mean	
Nitrogen Oxides (for the protection of vegetation)	30 µg/m <sup>3</sup>	Annual Mean	31.12.2000
Particles (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	24 Hour Mean	31.12.2004
	40 µg/m <sup>3</sup>	Annual Mean	31.12.2004
Particles (PM <sub>2.5</sub> ) Exposure Reduction	25 µg/m <sup>3</sup>	Annual Mean	2020
Particles (PM <sub>2.5</sub> ) Exposure Reduction UK urban areas	Target of 15% reduction in concentrations at urban background <sup>a</sup>	Annual Mean	Between 2010 and 2020

Capabilities on project:  
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Sulphur Dioxide	266 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	15 Minute Mean	31.12.2005
	350 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times a year	1 Hour Mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year	24 Hour Mean	31.12.2004
Ozone	100 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 10 times a year	8 Hour Mean	31.12.2005

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**Table A3.1.2: EU limit values**

Pollutant	EU Limit Value	Measured as	Date to be Achieved by and Maintained thereafter
Benzene	5 µg/m <sup>3</sup>	Annual Mean	1 January 2010
Carbon Monoxide	10.0 mg/m <sup>3</sup>	Maximum Daily 8-Hour Mean updated hourly	1 January 2005
Lead	0.5 µg/m <sup>3</sup>	Annual Mean	1 January 2005
Nitrogen Dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times per year	1 Hour Mean	1 January 2010
	40 µg/m <sup>3</sup>	Annual Mean	
Nitrogen Oxides (assuming as nitrogen dioxide)	30 µg/m <sup>3</sup> (for the protection of vegetation)	Annual Mean	19 July 2001
Ozone(Target)	120 µg/m <sup>3</sup> not to be exceeded more than 25 times per year	Maximum Daily Running 8-hour Mean updated hourly	1 January 2010
Particles (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> not to be exceeded more than 35 times per year.	24 Hour Mean	1 January 2005
	40 µg/m <sup>3</sup>	Annual Mean	1 January 2005
Particles (PM <sub>2.5</sub> ) Exposure Reduction UK except Scotland	Target value 25 µg/m <sup>3</sup>	Annual Mean	2010
Particles (PM <sub>2.5</sub> ) Exposure Reduction UK urban areas	Target of 20% reduction in concentrations at urban background	Annual Mean	Between 2010 and 2020
Particles (PM <sub>2.5</sub> )	25 µg/m <sup>3</sup>	Annual Mean	2015
	20 µg/m <sup>3</sup> <sup>a</sup>	Annual Mean	2020
Sulphur Dioxide	350 µg/m <sup>3</sup> not to be exceeded more than 24 times per year	1 Hour Mean	1 January 2005
	125 µg/m <sup>3</sup> not to be exceeded more than 3 times per year	24 Hour Mean	1 January 2005
	20 µg/m <sup>3</sup> (for the protection of vegetation)	Annual Mean	19 July 2001

Capabilities on project:  
 Error! Reference source not found.  
 1.1.2 Traffic Data

**Table A3.1.3: Traffic data used in the assessment of local air quality**

Link Name	2013 Base Year		Excluding Sizewell C Development				Including Sizewell C Development				Excluding Sizewell C Development				Speed (km/h)
			2024 DM		2024 DS		2024 DM		2024 DS		2035 DM		2035 DS		
	AADT	HGV (%)	AADT	HGV (%)	AADT	HGV (%)	AADT	HGV (%)	AADT	HGV (%)	AADT	HGV (%)	AADT	HGV (%)	
A12	15,505	4.6	18,376	4.3	880	0	20,171	8.7	921	0	21,709	4.0	1085	0	50-80
Bypass	0	0	0	0	17,497	4.5	0	0	19,250	9.1	0	0	20,623	4.2	96-112
Link 1 and Link 2	0	0	0	0	18,376	4.3	0	0	20,171	8.7	0	0	21,709	4.0	80-112

Capabilities on project:

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### 1.1.3 Model Verification

For any assessment it is necessary to consider and account for errors in the modelling process. Systematic errors in modelling results can arise from many factors, such as uncertainties in vehicle flows, speeds and the composition of the vehicle fleet. Such errors can be addressed and corrected for by making comparisons with monitoring data. The modelling results presented in this report were therefore verified by comparing model predictions against monitored pollutant concentrations in the study area and adjusting model predictions where necessary.

The accuracy of the future year modelling results is relative to the accuracy of the base year results, therefore greater confidence can be placed in the future year concentrations if good agreement is found for the base year.

Predicted annual average NO<sub>2</sub> concentrations were verified against monitored NO<sub>2</sub> data collected at the diffusion tube sites in the study area. The diffusion tubes located at Little Glenham 1 and Stratford St Andrew 4 were excluded from the adjustment factor calculations as these two sites had unusually low concentrations which would have lowered the adjustment factor and underpredicted concentrations at many locations. Excluding these two sites was a conservative assumption.

Initially the model was found to under-predict NO<sub>2</sub> concentrations at the diffusion tube monitoring sites. The model inputs were reviewed and with no reasonable refinements identified (such as reducing vehicle speeds or using different pollutant background concentrations, etc) two NO<sub>x</sub> adjustment factors, one for receptors located within 50 m of the A12 between Stratford Saint Andrew and Farnham and one for all other receptors were calculated to adjust modelled road NO<sub>x</sub> contributions. A higher adjustment factor was used for properties close to the A12 in Stratford St Andrew to represent the restricted dispersion due to terraced properties fronting the A12.

After the adjustment of the modelled road NO<sub>x</sub> contributions, the modelled NO<sub>2</sub> concentrations were found to be in good agreement with monitored NO<sub>2</sub> concentrations (i.e. within ±22%, excluding Little Glenham and Stratford St Andrew 4 due to their low results). A summary of the comparison between monitored NO<sub>2</sub> concentrations and modelled NO<sub>2</sub> results (adjusted and unadjusted) is shown in Appendix Air Quality, Table A3.1.4.

In the absence of local PM<sub>10</sub> monitoring data the adjustment factors determined for NO<sub>x</sub> was also applied to modelled PM<sub>10</sub> concentrations.

**Table A3.1.4: Summary of Model Verification**

Site Name	2013 Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )			
	Monitored	Modelled (Unadjusted)	Modelled (Adjusted)	Difference (Mod-Mon)
<b>Receptors located within 50 m of A12 (between Stratford Saint Andrew and Farnham)</b>				
Stratford St Andrew 1	40.0	17.0	40.0	0.0
<b>Adjustment Factor (50 m A12)</b>			<b>4.717</b>	
<b>All other receptors</b>				
Farnham 1	29.0	17.3	29.3	1
Farnham 2	31.0	17.4	29.4	-5
Stratford St Andrew 2	26.0	16.9	28.2	9
Stratford St Andrew 6	23.0	16.8	28.1	22
Stratford St Andrew 7	34.0	17.1	28.7	-15
Stratford St Andrew 4	16.0	17.3	26.4	65

Capabilities on project:  
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Little Glenham	14.0	14.6	20.7	48
<b>Adjustment Factor</b>			<b>2.753</b>	

#### 1.1.4 Significance Criteria

- Interim Advice Note 174/13

Table A3.1.5 presents the different magnitude of change criteria for any annual average NO<sub>2</sub> and PM<sub>10</sub> concentrations, which is described as a percentage of the relevant air quality threshold.

**Table A3.1.5: Magnitude of change criteria**

Magnitude of Change in Concentration	Value of Change in Annual Average NO <sub>2</sub> and PM <sub>10</sub>
Large (>4)	Greater than full Measure of Uncertainty (MoU) value of 10 % of the air quality objective (4µg/m <sup>3</sup> ).
Medium (>2 to 4)	Greater than half of the MoU (2µg/m <sup>3</sup> ), but less than the full MoU (4µg/m <sup>3</sup> ) of 10% of the air quality objective.
Small (>0.4 to 2)	More than 1% of objective (0.4µg/m <sup>3</sup> ) and less than half of the MoU i.e. 5% (2µg/m <sup>3</sup> ). The full MoU is 10% of the air quality objective (4µg/m <sup>3</sup> ).
Imperceptible (≤ 0.4)	Less than or equal to 1% of objective (0.4µg/m <sup>3</sup> ).

Only those receptors which exceed the air quality thresholds in either the without scheme scenario and/or with scheme scenario will be used to complete Table A3.1.6. Where the difference in concentrations are less than 0.4µg/m<sup>3</sup> for annual average NO<sub>2</sub> (1% of the air quality threshold) then the change at these receptors is considered to be imperceptible and they can be scoped out of the judgement on significance. Receptors are then aggregated to calculate the total number of receptors in each category in Table A3.1.6.

**Table A3.1.6: Local air quality receptors informing scheme significance**

Magnitude of Change in Annual Average NO <sub>2</sub> or PM <sub>10</sub> (µg/m <sup>3</sup> )	Total Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)		
Medium (>2 to 4)		
Small (>0.4 to 2)		

Where the outcomes of the assessment indicates that either all modelled concentrations are less than the air quality thresholds or any changes above the air quality thresholds but where the change is imperceptible, than the scheme effect is likely to be not significant for local air quality.

Changes that are greater than imperceptible should be compared to the guideline bands presented in Table A3.1.7.

**Table A3.1.7: Guideline to number of properties constituting a significant effect**



Capabilities on project:

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Magnitude of Change in Annual Average NO <sub>2</sub>	Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)	1 to 10	1 to 10
Medium (>2 to 4)	10 to 30	10 to 30
Small (>0.4 to 2)	30 to 60	30 to 60

The total number of receptors reported in Table A3.1.5 is compared with the guideline band. If the number of receptors is less than the lower guideline band in all the six magnitude categories, then a consideration of the overall direction of change should be provided. The outcome of the professional judgement of the scheme effects is likely to be not significant. This information should be used to inform overall significance.

Changes in concentrations which are greater than the upper guideline band in any of the magnitude categories are likely to be considered significant.

- Highways Agency's Guidance

**Table A3.1.8: Proposed methodology to compile the air quality indicators (sourced from the Highways Agency's Guidance to evaluating significant air quality effects)**

Box 1: Collating Information on Air Quality Indicators
<ol style="list-style-type: none"> <li>1. Collate verified Do Minimum (without scheme) and Do Something (with scheme) concentrations in the assessment year for all receptors considered.</li> <li>2. For any receptors with concentrations above the relevant air quality threshold, count the number of receptors with a large change (Do Something – Do Minimum), defined as greater than or equal to 5% of the threshold, noting those with improvements or deteriorations. Count the number of receptors (with concentrations above the threshold) with changes less than 5% of the threshold; i.e. <ol style="list-style-type: none"> <li>a. XX receptors experience a deterioration of more than 5% of the relevant threshold.</li> <li>b. YY receptors experience an improvement of more than 5% of the relevant threshold.</li> <li>c. ZZ receptors experience a change of less than 5% of the relevant threshold.</li> </ol> </li> <li>3. For receptors with concentrations over the relevant air quality threshold in either the Do Minimum or Do Something scenario, calculate frequency distribution of the change in concentration under the following ranges: <ol style="list-style-type: none"> <li>a. Improvements of more than 5% of the threshold.</li> <li>b. Improvements of between 2.5% and 5% of the threshold.</li> <li>c. Improvements of between 1% and 2.5% of the threshold.</li> <li>d. Changes (both improvements and deteriorations) of less than 1% of the threshold.</li> <li>e. Deteriorations of between 1% and 2.5% of the threshold.</li> </ol> </li> </ol>

Capabilities on project:

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- f. Deteriorations of between 2.5% and 5% of the threshold.
- g. Deteriorations of more than 5% of the threshold.
4. Based on rounding the modelled concentrations to the nearest whole number, count the number of receptors predicted to experience a deterioration, improvement or no change in air quality due to the scheme, i.e.
  - a. XX receptors above the thresholds experience a deterioration in air quality
  - b. YY receptors above the thresholds experience no change in air quality
  - c. ZZ receptors above the thresholds experience an improvement in air quality
5. Based on rounding the modelled concentrations to the nearest whole number, count the number of receptors where the scheme impact is predicted to create or remove an exceedance of the relevant air quality threshold (greater than, but not equal to) and the number of receptors where there is no change in the exceedance status, i.e. remains below / above threshold.
  - a. XX receptors experience a new exceedance of the threshold due to the scheme
  - b. YY receptors experience a removal of an exceedance of the threshold
  - c. ZZ receptors experience no change in exceedance, but were already in exceedance
6. Where 5a identifies a new exceedance of the threshold due to the scheme, comment whether these are clustered around existing exceedances (and therefore at least partially likely to be covered by existing AQAP measures) or whether they are in new areas of exceedance and new AQAP measures in pursuit of the thresholds may be required, i.e.
  - a. XX receptors experiencing a new exceedance are adjacent to existing areas of exceedance
  - b. YY receptors experiencing a new exceedance are in new areas of exceedance
7. For receptors with concentrations over the relevant air quality threshold in either the Do Minimum or Do Something scenario, calculate using current forecasting approaches, the estimated reversibility duration of the scheme's impact, and calculate frequency distribution of the reversibility durations in the following ranges
  - a. Less than 1 year
  - b. 1-3 years
  - c. 3-5 years
  - d. 5+ years

### 1.1.5 Mitigation Measures

**Table A3.1.9: Dust and emission control measures**

Activity	Control Measures for Medium Risk Site
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Capabilities on project:

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Activity	Control Measures for Medium Risk Site
Pre-site Preparation	<p>Machinery, fuel and chemical storage and dust generating activities should not be located close to boundaries and sensitive receptors if at all possible.</p> <p>Erect solid barriers to site boundary.</p>
Haul Routes	<p>Use consolidated surfaces on roads near to residential areas.</p> <p>Hard surface all major haul routes through the site (e.g. use recycled rubber blocks, concrete blocks or tarmac).</p> <p>Regularly inspect haul routes for integrity and repair if required.</p> <p>When the haul route changes, re-use surface where possible.</p>
Damping Down	<p>Use agreed wet cleaning methods or mechanical road sweepers on all roads at least once a day or consider using fixed or mobile sprinkler systems.</p> <p>Provide hardstanding areas for vehicles and regularly inspect and clean these areas.</p>
Vehicles	<p>All vehicles should switch off engines - no idling.</p> <p>Clean or wash all vehicles effectively before they leave a site if there is a risk of affecting nearby sensitive receptors.</p> <p>Wheel wash vehicles before they leave a site.</p> <p>Hard surface haul routes and clean them effectively.</p> <p>Impose an appropriate speed limit around site.</p>
Site entrances /Exits	<p>No extra control measures required if there are no nearby sensitive receptors.</p> <p>Wash or clean all vehicles effectively before leaving the site if it is close to sensitive receptors. Ideally there should be a paved area between the wheel wash and before the public road.</p> <p>Provide a control zone around the site boundary to protect sensitive receptors (this could include an area of hardstanding).</p> <p>Provide effective vehicle cleaning and specific wheel-washing facilities at all exits; with hose pipes, adequate water supply and pressure and mechanical wheel spinners or brushes.</p>
Mobile Crushing Plant	<p>This section only applies to construction sites that will operate mobile crushing plant at some point. This is an inherently dusty activity and will often be on sites normally classed as medium or high risk.</p> <p>Notify the local authority if a crusher is to be used as it has a duty to inspect the process. Mobile crushing plants are authorised as Part B processes, even if they are only temporary.</p> <p>Keep a copy of the permit on-site and adhere to the conditions therein at all times.</p> <p>Refer to Process Guidance not PG 3/16 (04) and use best available techniques (BAT) according to the guidance at all times.</p>

Capabilities on project:

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Activity	Control Measures for Medium Risk Site
Concrete Batching	<p>As for mobile crushing plants, construction sites with concrete batching plants will often be categorised as medium or high risk.</p> <p>Developers following this guidance should treat such plant as authorised Part B processes, even if temporary, and employ the same level of best practice as indicated below. The local authority should be notified if a concrete batcher is to be used on site.</p> <p>Refer to Process Guidance note PG 3/1 (04) and carry out BAT.</p> <p>Wherever possible, these processes should be totally enclosed.</p>
Excavation and Earthworks	<p>All dusty activities should be damped down, especially during dry weather.</p> <p>Temporarily cover earthworks if possible.</p> <p>Minimise drop heights to control the fall of materials.</p> <p>Re-vegetate earthworks and other exposed areas to stabilise surfaces.</p> <p>Only remove secure covers in small areas during work and not all at once.</p> <p>Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil.</p>
Stock Piles and Storage Mounds	<p>Make sure that stockpiles exist for the shortest possible time.</p> <p>Do not build steep sided stockpiles or mounds or those that have sharp changes in shape.</p> <p>Whenever possible keep stockpiles or mounds away from the site boundary, sensitive receptors, watercourses and surface drains.</p> <p>Wherever possible, enclose stockpiles or keep them securely sheeted.</p>
Cutting, Grinding and Sawing	<p>All equipment should use water suppressant or suitable local exhaust ventilation systems.</p> <p>Use dust extraction techniques where available. All other equipment should be fitted with water suppressant systems.</p> <p>Use local exhaust ventilation.</p> <p>Service all fans and filters regularly to ensure they are properly maintained.</p>
Chutes and Skips	<p>Securely cover skips.</p> <p>Minimise drop heights to control the fall of materials.</p> <p>Regularly damp down surfaces with water.</p>
Scabbling	<p>Pre-wash work surfaces, screen off work areas and vacuum up all dusty residue rather than sweeping away.</p>
Waste Disposal / Burning	<p>No burning of any material is permitted on site.</p> <p>All excess material should not be wasted, but used or safely removed from site according to appropriate legislation.</p>

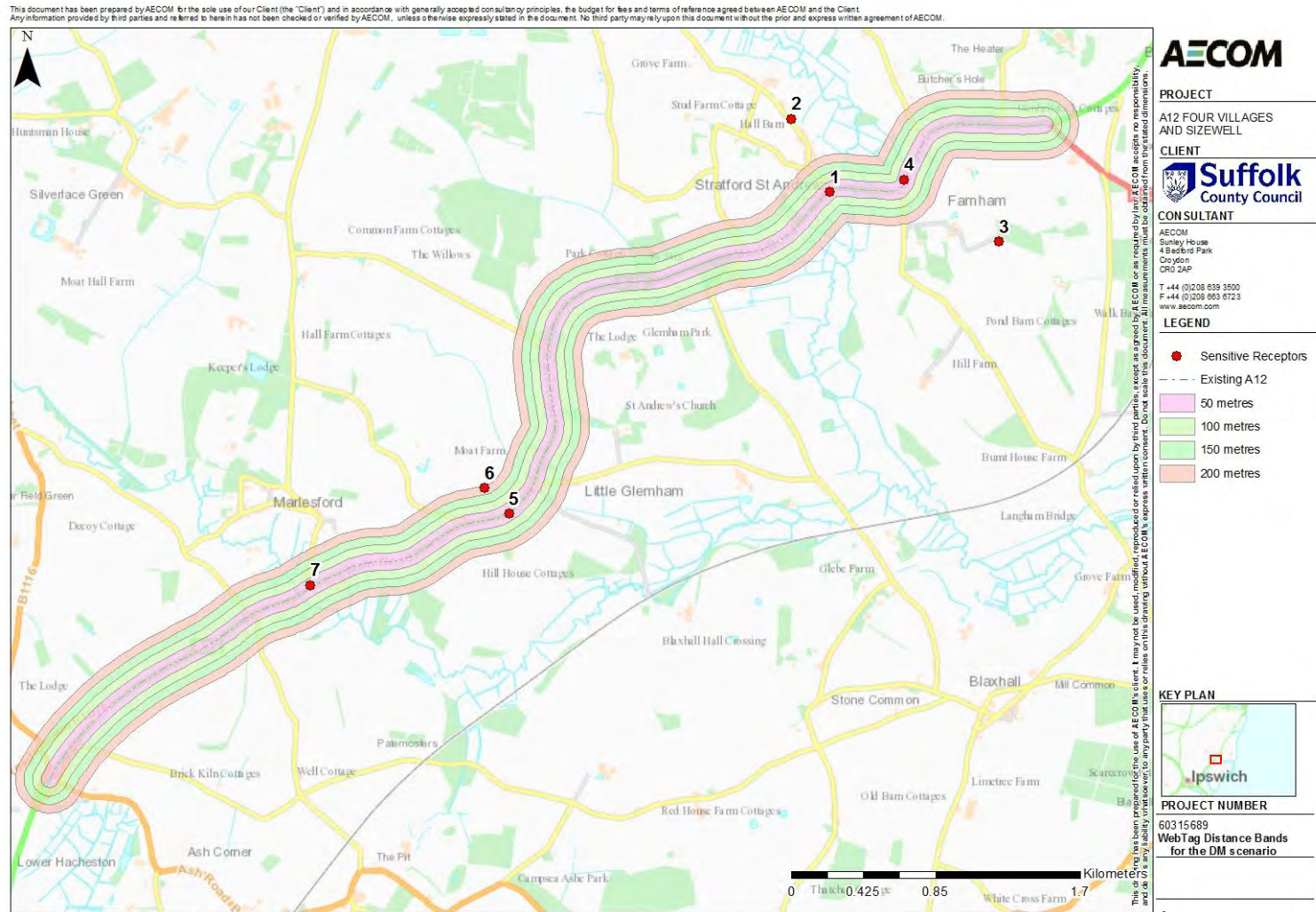
Capabilities on project:

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Activity	Control Measures for Medium Risk Site
Dealing with Spillages	<p>Use bunded areas wherever practicable.</p> <p>Regularly inspect the site area for spillages, have spillage kits readily available and clean spillages using agreed wet handling methods.</p> <p>Vacuum or sweep regularly to prevent the build up of fine waste dust material, which is spilled on the site and is designated as waste that is no longer fit for use should be dealt with in accordance with the Waste Management Licensing Regulations (WMLR), 1994.</p> <p>Inform the Environment Agency, London Fire and Emergency Planning Authority (LFEPA) or the Health Protection Agency (HPA) if harmful substances are spilled.</p>
Demolition Activities	<p>Any asbestos must be dealt with by a registered contractor at all times and removed according to appropriate regulations and approved codes of practice/HSE guidance such as HSG248 and MDHS100.</p>
Hazardous or Contaminated Materials	<p>Under the Control of Substances Hazardous to Health (COSHH) Regulations, 2002, developers must ensure that they take into account risks to the workforce from exposure to any harmful substances generated by work activities. Emphasis should be placed on preventing or reducing emissions at source and where this is not possible personal protective equipment may be appropriate.</p>
Sand, Grit and Shot Blasting	<p>Uses agreed wet processes, sheet areas to contain dust and use silica-free material.</p>
Planing and Sanding	<p>Use fans and/or filters, dust suppression techniques and water sprays.</p>
Fitting Out	<p>Fit all machinery for activities such as plastering, sanding or rendering with dust suppression/collection equipment.</p> <p>Vacuum all waste material.</p>
Welding and Soldering	<p>Follow control measures in HSE guidance notes EH54 and EH55.</p>
Tarmac Laying and Use of Bitumen	<p>Do not overheat bitumen and cover pots.</p> <p>Use great care in all processes to prevent spillages and extinguish any accidental fires immediately.</p>

Capabilities on project:  
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Figure 3.1.3: WebTag Distance Bands for DM Scenario



**Appendix 2.2C: Predicted Noise levels**



Predicted noise levels on each option with Single-carriageway – SB1

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB1 - Pink	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.5	42.9	-0.6
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.0	44.3	-0.7
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.5	43.4	-0.1
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.0	43.4	-1.6
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	48.3	2.9
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.9	49.8	2.9
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.4	48.8	3.4
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.9	48.8	1.9
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	60.0	51.2	-8.8
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	61.5	52.6	-8.9
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	60.0	51.8	-8.2
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	61.5	51.8	-9.7
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	44.5	-0.9
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.8	45.9	-0.9
	B827		DS2035 (excluding Sizewell) –	45.4	45.0	-0.4



Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.8	45.0	-1.8
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.3	47.8	-0.5
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	49.7	49.2	-0.5
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	48.3	48.3	0
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	49.7	48.3	-1.4
	B892		YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	52.9	52.9
	B892	DS2024 (including Sizewell) – DM2024 (including Sizewell)		56.3	56.3	0
	B892	DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)		52.9	53.5	0.6
	B892	DS2035 (excluding Sizewell) – DM204 (including Sizewell)		54.4	53.5	-0.9
	B952	MAIN FARM GREAT GLEMHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.0	44.5	-0.5
	B952		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.5	45.9	-0.6
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.0	45.0	0
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.5	45.0	-1.5

**Predicted noise levels on each option with Single -carriageway – SB2**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB2 - Green	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	42.6	41.2	-1.4
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.7	45.2	-1.5
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	42.6	41.7	-0.9
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	44.1	41.7	-2.4
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.6	48.3	-0.3
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	50.0	49.8	-0.2
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	47.9	48.2	0.3
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	50.0	48.8	-1.2
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	60.0	50.0	-10
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	61.5	51.4	-10.1
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	60.0	50.6	-9.4
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	61.5	50.6	-10.9
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	38.3	51.8	13.5
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	39.8	53.3	13.5
	B827		DS2035 (excluding Sizewell) –	38.3	52.4	14.1

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	39.8	52.4	12.6
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.3	48.4	0.1
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	49.7	49.9	0.2
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	48.3	48.9	0.6
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	49.7	48.9	-0.8
	B892		DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.0	48.2	0.2
	B892	YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (including Sizewell) – DM2024 (including Sizewell)	49.5	49.7	0.2
	B892		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	48.0	48.8	0.8
	B892		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	49.5	48.8	-0.7
	B952		DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.0	51.9	6.9
	B952	MAIN FARM GREAT GLEMHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.5	53.4	6.9
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.0	52.4	7.4
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.0	52.4	7.4
	B952					

**Predicted noise levels on each option with Single -carriageway – SB5**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB5 - Blue	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.7	52.5	8.8
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.2	54.0	8.8
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.7	53.0	9.3
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.2	53.0	7.8
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	49.7	4.3
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.9	51.2	4.3
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.4	50.2	4.8
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.9	50.2	3.3
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	61.6	49.4	-12.2
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	63.1	50.8	-12.3
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	61.6	50.1	-11.5
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	63.1	50.1	-13.0
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.4	42.3	-2.1
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.9	43.8	-2.1

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
	B827		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.4	42.8	-1.6
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.9	42.8	-3.1
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.2	50.0	4.8
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.6	51.4	4.8
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.2	50.5	5.3
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.6	50.5	3.9
	B892	YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.2	47.4	3.2
	B892		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.6	48.9	3.3
	B892		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.2	47.9	3.7
	B892		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.6	47.9	2.3
	B952	MAIN FARM GREAT GLEMHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	36.9	35.9	-1
	B952		DS2024 (including Sizewell) – DM2024 (including Sizewell)	38.4	37.3	-1.1
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	36.9	36.4	-0.5
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	38.4	36.4	-2.0

**Predicted noise levels on each option with Single -carriageway – SB4**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB4 - Red	B75	BRICK KILN COTTAGE, CAMPSEA ASHE, WOODBIDGE, IP13 0QL	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.4	44.5	0.1
	B75		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.9	46.0	0.1
	B75		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.4	45.0	0.6
	B75		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.9	45.0	-0.9
	B129	1 IVY HOUSE COTTAGES, MARLESFORD, WOODBRIDGE, IP13 0BZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	62.1	62.1	0
	B129		DS2024 (including Sizewell) – DM2024 (including Sizewell)	63.3	63.3	0
	B129		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	61.7	62.3	0.6
	B129		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	63.2	62.3	-0.9
	B236	PEEL HOUSE MAIN ROAD MARLESFORD, WOODBRIDGE, IP13 0AZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	49.4	41.6	-7.8
	B236		DS2024 (including Sizewell) – DM2024 (including Sizewell)	50.9	43.1	-7.8
	B236		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	49.4	42.2	-7.2
	B236		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	50.9	42.2	-8.7
	B245	ABINGER MILL LANE MARLESFORD, WOODBRIDGE, IP13 0AJ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	51.4	51.4	0
	B245		DS2024 (including Sizewell) – DM2024 (including Sizewell)	52.9	52.9	0

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
	B245		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	51.4	51.9	0.5
	B245		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	52.9	51.9	-1.0
	B524	THE MOAT FARM, LITTLE GLEMHAM, WOODBRIDGE, IP13 0BB	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	46.7	48.9	2.2
	B524		DS2024 (including Sizewell) – DM2024 (including Sizewell)	47.9	50.1	2.2
	B524		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	46.7	49.4	2.7
	B524		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	48.2	49.4	1.2
	B531	THE OLD RECTORY MAIN ROAD LITTLE GLEMHAM, WOODBRIDGE, IP13 0BS	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	51.8	50.5	-1.3
	B531		DS2024 (including Sizewell) – DM2024 (including Sizewell)	53.3	51.9	-1.4
	B531		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	51.8	51.0	-0.8
	B531		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	53.3	51.0	-2.3

Predicted noise levels on each option with Single -carriageway – LB3

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
LB3 - Orange	B75	BRICK KILN COTTAGE, CAMPSEA ASHE, WOODBIDGE, IP13 0QL	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	38.7	39.9	1.2
	B75		DS2024 (including Sizewell) – DM2024 (including Sizewell)	40.2	41.4	1.2
	B75		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	38.7	40.4	1.7
	B75		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	40.2	40.4	0.2
	B129	1 IVY HOUSE COTTAGES, MARLESFORD, WOODBRIDGE, IP13 0BZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.8	47.5	2.7
	B129		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.2	48.9	2.7
	B129		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.8	48.0	3.2
	B129		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.2	48.0	1.8
	B236	PEEL HOUSE MAIN ROAD MARLESFORD, WOODBRIDGE, IP13 0AZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	49.4	46.9	-2.5
	B236		DS2024 (including Sizewell) – DM2024 (including Sizewell)	50.9	48.4	-2.5
	B236		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	49.4	47.4	-2
	B236		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	50.9	47.4	-3.5
	B245	ABINGER MILL LANE MARLESFORD, WOODBRIDGE, IP13 0AJ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	39.2	33.8	-5.4
	B245		DS2024 (including Sizewell) – DM2024 (including Sizewell)	40.7	35.2	-5.5
	B245		DS2035 (excluding Sizewell) –	39.2	34.3	-4.9



Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B245		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	40.7	34.3	-6.4
	B524	THE MOAT FARM, LITTLE GLEMHAM, WOODBRIDGE, IP13 0BB	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.2	44.3	1.1
	B524		DS2024 (including Sizewell) – DM2024 (including Sizewell)	44.7	45.8	1.1
	B524		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.2	44.8	1.6
	B524		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	44.7	44.8	0.1
	B531	THE OLD RECTORY MAIN ROAD LITTLE GLEMHAM, WOODBRIDGE, IP13 0BS	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	51.8	51.8	0
	B531		DS2024 (including Sizewell) – DM2024 (including Sizewell)	53.3	53.2	-0.1
	B531		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	51.8	52.3	0.5
	B531		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	53.3	52.3	-1.0

Predicted noise levels on each option with Dual-carriageway – SB1

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB1 - Pink	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.5	42.9	-0.6
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.0	44.3	-0.7
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.5	43.4	-0.1
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.0	43.4	-1.6
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	48.3	2.9
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.9	49.8	2.9
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.4	48.8	3.4
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.9	48.8	1.9
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	60.0	51.2	-8.8
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	61.5	52.6	-8.9
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	60.0	51.8	-8.2
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	61.5	51.8	-9.7
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	44.5	-0.9
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.8	45.9	-0.9
	B827		DS2035 (excluding Sizewell) –	45.4	45.0	-0.4

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.8	45.0	-1.8
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.3	47.8	-0.5
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	49.7	49.2	-0.5
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	48.3	48.3	0
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	49.7	48.3	-1.4
	B892		YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	52.9	52.9
	B892	DS2024 (including Sizewell) – DM2024 (including Sizewell)		56.3	56.3	0
	B892	DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)		52.9	53.5	0.6
	B892	DS2035 (excluding Sizewell) – DM204 (including Sizewell)		54.4	53.5	-0.9
	B952	MAIN FARM GREAT GLEMHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.0	44.5	-0.5
	B952		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.5	45.9	-0.6
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.0	45.0	0
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.5	45.0	-1.5

**Predicted noise levels on each option with Dual-carriageway – SB2**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB2 - Green	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.7	43.9	0.2
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.2	45.2	0
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.7	44.4	0.7
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.2	44.4	-0.8
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	54.3	54.5	0.2
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	55.8	55.8	0
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	54.3	55.0	0.7
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	55.8	55.0	-0.8
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	60.0	51.3	-8.7
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	61.5	52.6	-8.9
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	60.0	51.9	-8.1
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	61.5	51.9	-9.6
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	38.3	54.3	16
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	39.8	55.6	15.8
	B827		DS2035 (excluding Sizewell) –	38.3	54.8	16.5

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	39.8	54.8	15.0
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	49.5	50.4	0.9
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	53.2	53.9	0.7
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	49.5	50.9	1.4
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	51.2	51.1	-0.1
	B892	YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.2	45.3	1.1
	B892		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.6	46.6	1
	B892		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.2	45.8	1.6
	B892		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.6	45.8	0.2
	B952	MAIN FARM GREAT GLEHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.0	54.3	9.3
	B952		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.5	55.6	9.1
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.0	54.8	9.8
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.0	54.8	9.8

**Predicted noise levels on each option with Dual-carriageway – SB5**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB5 - Blue	B610	57 POND BARN COTTAGES, FARNHAM, SAXMUNDHAM, IP17 1LU	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.7	55.0	11.3
	B610		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.2	56.2	11
	B610		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.7	55.5	11.8
	B610		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.2	55.5	10.3
	B630	PARK GATE FARMHOUSE MAIN ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LG	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.4	51.9	6.5
	B630		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.9	53.2	6.3
	B630		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.4	52.4	7
	B630		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.9	52.4	5.5
	B784	THE LIMES, FARNHAM, SAXMUNDHAM, IP17 1LE	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	61.6	49.6	-12
	B784		DS2024 (including Sizewell) – DM2024 (including Sizewell)	63.1	50.9	-12.2
	B784		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	61.6	50.3	-11.3
	B784		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	63.1	50.3	-12.8
	B827	MILL HOUSE, STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LH	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.8	44.0	-0.8
	B827		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.9	45.0	-0.9

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
	B827		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.8	44.5	-0.3
	B827		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.3	44.5	-1.8
	B852	MOLLETT'S FARM MAIN ROAD BENHALL, SAXMUNDHAM, IP17 1JY	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	45.2	52.4	7.2
	B852		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.6	53.6	7
	B852		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	45.2	52.9	7.7
	B852		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.6	52.9	6.3
	B892	YEW TREE COTTAGE FRIDAY STREET FARNHAM, SAXMUNDHAM, IP17 1JX	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.2	49.6	5.4
	B892		DS2024 (including Sizewell) – DM2024 (including Sizewell)	45.6	50.8	5.2
	B892		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.2	50.1	5.9
	B892		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.6	50.1	4.5
	B952	MAIN FARM GREAT GLEMHAM ROAD STRATFORD ST. ANDREW, SAXMUNDHAM, IP17 1LW	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	42.0	42.0	0
	B952		DS2024 (including Sizewell) – DM2024 (including Sizewell)	43.5	43.3	-0.2
	B952		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	42.2	42.7	0.5
	B952		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	43.7	42.7	-1.0

Predicted noise levels on each option with Dual-carriageway – SB4

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
SB4 - Red	B75	BRICK KILN COTTAGE, CAMPSEA ASHE, WOODBIDGE, IP13 0QL	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.4	44.5	0.1
	B75		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.2	46.3	0.1
	B75		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.8	45.4	0.6
	B75		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	45.9	45.2	-0.7
	B129	1 IVY HOUSE COTTAGES, MARLESFORD, WOODBRIDGE, IP13 0BZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	62.1	62.1	0
	B129		DS2024 (including Sizewell) – DM2024 (including Sizewell)	63.6	63.6	0
	B129		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	61.7	62.3	0.6
	B129		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	63.3	62.4	-0.9
	B236	PEEL HOUSE MAIN ROAD MARLESFORD, WOODBRIDGE, IP13 0AZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	0.0	0.0	0
	B236		DS2024 (including Sizewell) – DM2024 (including Sizewell)	0.0	0.0	0
	B236		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	0.0	0.0	0
	B236		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	50.9	43.3	-7.6
	B245	ABINGER MILL LANE MARLESFORD, WOODBRIDGE, IP13 0AJ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	52.0	52.0	0
	B245		DS2024 (including Sizewell) – DM2024 (including Sizewell)	53.5	53.5	0



Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
	B245		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	52.0	52.5	0.5
	B245		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.6	47.5	0.9
	B524	THE MOAT FARM, LITTLE GLEMHAM, WOODBRIDGE, IP13 0BB	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	48.6	50.8	2.2
	B524		DS2024 (including Sizewell) – DM2024 (including Sizewell)	0.0	0.0	0
	B524		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	0.0	0.0	0
	B524		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	48.2	51.7	3.5
	B531	THE OLD RECTORY MAIN ROAD LITTLE GLEMHAM, WOODBRIDGE, IP13 0BS	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	0.0	0.0	0
	B531		DS2024 (including Sizewell) – DM2024 (including Sizewell)	0.0	0.0	0
	B531		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	0.0	0.0	0
	B531		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	53.3	53.2	-0.1

**Predicted noise levels on each option with Dual-carriageway – LB3**

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
LB3 - Orange	B75	BRICK KILN COTTAGE, CAMPSEA ASHE, WOODBIDGE, IP13 0QL	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	38.7	42.3	3.6
	B75		DS2024 (including Sizewell) – DM2024 (including Sizewell)	40.2	43.6	3.4
	B75		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	38.7	42.8	4.1
	B75		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	40.2	42.8	2.6
	B129	1 IVY HOUSE COTTAGES, MARLESFORD, WOODBRIDGE, IP13 0BZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	44.8	49.9	5.1
	B129		DS2024 (including Sizewell) – DM2024 (including Sizewell)	46.2	51.2	5
	B129		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	44.8	50.4	5.6
	B129		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	46.2	50.4	4.2
	B236	PEEL HOUSE MAIN ROAD MARLESFORD, WOODBRIDGE, IP13 0AZ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	49.4	49.2	-0.2
	B236		DS2024 (including Sizewell) – DM2024 (including Sizewell)	50.9	50.5	-0.4
	B236		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	49.4	49.7	0.3
	B236		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	50.9	49.7	-1.2
	B245	ABINGER MILL LANE MARLESFORD, WOODBRIDGE, IP13 0AJ	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	39.2	35.9	-3.3
	B245		DS2024 (including Sizewell) – DM2024 (including Sizewell)	40.7	37.2	-3.5
	B245		DS2035 (excluding Sizewell) –	39.2	36.5	-2.7

Scenario	Property	Address	Assessment scenario	Predicted level, $L_{A10, 18h}$ , dB		Difference, dB
				DM	DS	
			DM204 (excluding Sizewell)			
	B245		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	40.7	36.5	-4.2
	B524	THE MOAT FARM, LITTLE GLEMHAM, WOODBRIDGE, IP13 0BB	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	43.2	46.3	3.1
	B524		DS2024 (including Sizewell) – DM2024 (including Sizewell)	44.7	47.6	2.9
	B524		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	43.2	46.9	3.7
	B524		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	44.7	46.9	2.2
	B531	THE OLD RECTORY MAIN ROAD LITTLE GLEMHAM, WOODBRIDGE, IP13 0BS	DS2024 (excluding Sizewell) – DM2024 (excluding Sizewell)	51.8	54.1	2.3
	B531		DS2024 (including Sizewell) – DM2024 (including Sizewell)	53.3	55.3	2
	B531		DS2035 (excluding Sizewell) – DM204 (excluding Sizewell)	51.8	54.6	2.8
	B531		DS2035 (excluding Sizewell) – DM204 (including Sizewell)	53.3	54.6	1.3

Appendix 2.2D – Traffic Data

Link Name	2013 Base Year		Excluding Sizewell C Development				Including Sizewell C Development				Excluding Sizewell C Development				Speed (km/h)	
			2024 DM		2024 DS		2024 DM		2024 DS		2035 DM		2035 DS		Single Carriageway	Dual Carriageway
	AAWT	HGV (%)	AAWT	HGV (%)	AAWT	HGV (%)	AAWT	HGV (%)	AAWT	HGV (%)	AAWT	HGV (%)	AAWT	HGV (%)		
A12	16,249	5	19258	5	922	5	21,140	9	965	9	21,709	4	1085	0	70	-
Bypass	0	0	0	0	18,377	5	0	0	20,174	9	0	0	20,623	4	70	95
Link 1 and Link 2	0	0	0	0	18,377	5	0	0	20,174	9	0	0	20,623	4	70	-

## **Appendix 2.3 – Biodiversity**

- 2.3A WebTAG Biodiversity Impacts Worksheet
- 2.3B Site Survey Target Notes
- 2.3C Site Designation and Protected Habitats Information
- 2.3D Planning Policy
- 2.3E Relevant Legislation and Protected Species Surveying Information
- 2.3F Mitigation Information
- 2.3G Protected and Notable Species Records

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## Appendix 2.3A – WebTAG Tables

### WebTAG Biodiversity Impacts Worksheet

**Table A1:** List of Status Abbreviations used in the WebTAG Tables Below

Abbreviation	Definition
BA	Protection of Badgers Act
Bern	The Bern Convention of Migratory Species of Wild Animals
Bonn	Bonn Convention on Conservation of Migratory Species of Wild Animals
BDir22	EC Birds Directive
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EPS	European Protected Species
HDir	EU Habitat and Species Directive
LBAP	Suffolk Biodiversity Action Plan
UKBAP	UK Biodiversity Action Plan Priority
WCA1.1	Wildlife and Countryside Act 1981 Schedule 1 Part 1
WCA5	Wildlife and Countryside Act 1981 Schedule 5
WCA9	Wildlife and Countryside Act 1981 Schedule 9
UKBAm (RSPB)	RSPB UK Amber Listed Birds (not based in IUCN Criteria)
WBAm (RSPB)	RSPB Welsh Amber Listed Birds (not based on IUCN criteria)
WBR (RSPB)	RSPB Welsh Red Listed Birds (not based on IUCN criteria)
UKBR (RSPB)	RSPB UK Red Listed Birds (not based on IUCN criteria)
S42	National Environment and Rural Communities Act 2006 Section 42
RD2	Red Data Book (not based on IUCN criteria) e.g. nationally scarce and nationally rare
LI (BIS)	Locally Important as Specified by Local Experts

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**Colour Coding**

For Clarity, the WebTAG tables below are colour coded, both by route option and assessment score of link upon receptor. Please see below for an explanation of the colour scheme.

**Table A2: Route Colour Scheme**

Routing	Colour Scheme
Link 1	Grey
Link 2	Light Grey
SB1	Magenta
SB2	Green
LB3	Yellow
SB4	Red
SB5	Blue

**Table A3: Assessment of Impact of Route upon Receptor**

Impact	Colour Scheme
Neutral	White
Slight Adverse	Light Yellow
Moderate Adverse	Light Orange
Large Adverse	Light Red
Very Large Adverse	Dark Red

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**Table A4:** Option Link 1 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Alde-Ore Estuary RAMSAR SAC 4551.4m SSSI	An estuary complex of three rivers comprising various habitats including intertidal mudflats, saltmarsh, a vegetated shingle spit, saline lagoons, and semi-intensified grazing marsh. The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>1</sup>	International	International Designation (Ramsar, SAC) National Designation (SSSI) Important in the Anglian Region The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>2</sup> “The second-largest and best-preserved example of vegetated shingle in Britain. A unique feature for East Anglian beaches is the abundance on the ground of normally epiphytic lichens.” <sup>3</sup>	Some parcels favourable some unfavourable A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze. Being closely monitored though as a SSSI with appropriate management plans <sup>4</sup>	Very High	Potential indirect pollution from construction and operation	Neutral	Slight Adverse

<sup>1</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>2</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>3</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/Docs/UKBAP\\_BAPHabitats-10-CoastVegShingle.doc](http://jncc.defra.gov.uk/Docs/UKBAP_BAPHabitats-10-CoastVegShingle.doc),

[Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/coastalvegshingle.pdf>

<sup>4</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)



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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Alde-Ore & Butley Estuaries SAC 4551.4m	The SAC comprises extensive intertidal mudflats on both sides of the Alde River channel in its upper reaches and saltmarsh accreting along its fringes. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed. <sup>5</sup>	International	International Designation Supports a range of important habitats (and associated fauna). Habitats include but are not limited to : mudflats and sandflats; tidal rivers, estuaries. <sup>6</sup>	Some parcels favourable some unfavourable  A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.  Being closely monitored though as a SAC with appropriate management plan <sup>7</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight Adverse

<sup>5</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030076>

<sup>6</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC\\_tcm6-31816.pdf](http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC_tcm6-31816.pdf)

<sup>7</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Sandlings SPA 3185.3m	The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken <i>Pteridium aquilinum</i> , shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground. <sup>8</sup>	International	Nightjar <i>Caprimulgus europaeus</i> , 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)  Woodlark <i>Lullula arborea</i> , 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997) <sup>9</sup>	Declining due to bracken invasion however remedial activities/management of bracken will ensure stability <sup>10</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight Adverse

<sup>8</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>9</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>10</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
	<p>The Alde-Ore Estuary is located on the Suffolk coast in eastern England. It comprises the estuarine complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There is a variety of habitats including intertidal mud-flats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and semi-intensified grazing marsh. The Orfordness/Shingle Street land form is geomorphologically unique within the UK in combining a shingle spit with a cusped foreland. The diversity of wetland habitat types</p>		<p>High</p> <p><b>During the breeding season site supports a number of important bird species including:</b></p> <ul style="list-style-type: none"> <li>- Avocet <i>Recurvirostra avosetta</i>, 104 pairs representing at least 17.6% of the breeding population in Great Britain (5 year mean, 1990-1994)</li> <li>- Little Tern <i>Sterna albifrons</i>, 48 pairs representing at least 2.0% of the breeding population in Great Britain (5 count mean, 1993-4, 1996-8)</li> <li>- Marsh Harrier <i>Circus aeruginosus</i>, 3 pairs representing at least 1.9% of the breeding population in Great Britain (5 year mean, 1993-1997)</li> <li>- Sandwich Tern <i>Sterna sandvicensis</i>, 169 pairs representing at least 1.2% of the breeding</li> </ul>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues,</p>				

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Great Wood Ancient Woodland AND CWS 332.8m	Ancient & Semi-Natural Woodland  A very fine ancient woodland surrounded by a ditch and bank and including internal ditch and banks. The structure is one of abandoned coppice with standards. The oak and ash standards have grown very large and are shading the undergrowth; which is principally hazel and ash but with some hornbeam, maple and sallow also present. The rides too, have become overgrown, and no recent management has taken place. The ground flora is rich and a total of 87 species have been recorded. This includes early purple, twayblade and common spotted orchids, and a range of ancient woodland indicators. <sup>14</sup>	National	County Designation LBAP <sup>15</sup> National, Regional and Local value <sup>16</sup>	Stable  On a National scale ASNW declining to loss of habitat and lack of management although this woodland is stable favourable <sup>17,18</sup>	High	None Likely	None	Neutral

<sup>11</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/default.aspx?page=2010>

<sup>12</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Ore-Estuary-SPA\\_tcm6-32208.pdf](http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Ore-Estuary-SPA_tcm6-32208.pdf)

<sup>13</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>14</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>15</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/MixedDeciduousWoodland.pdf>

<sup>16</sup> [http://www.naturalareas.naturalengland.org.uk/Science/natural/NA\\_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=](http://www.naturalareas.naturalengland.org.uk/Science/natural/NA_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=)

<sup>17</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>18</sup> [Available Online, Accessed 22/04/2014] <http://www.wbrc.org.uk/atp/Ancient%20Woodland%20Threats%20-%20Woodland%20Trust.pdf>

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Pound Wood 220m	Attached to Great Wood Ancient Woodland. Pound wood is a woodland plantation located to the west of the proposed routing.	Regional	Important for its buffering capacity for Great Wood ASNW and its connectivity properties. UK and Suffolk BAP <sup>19</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>20</sup>	Medium	None Likely	None	Neutral
Stratford Plantation Broad-leaved plantation woodland 0.0m adjacent to the southern side of the road	Located immediately south of the proposed routing. Consists of Semi-mature broadleaved plantation woodland.	Local	UK and Suffolk BAP <sup>21</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>22</sup>	Low	Habitat Loss Increased Noise & disturbance & pollution (deposition & runoff) Potentially deterioration in air quality during construction and operation	Intermediate Negative	Slight adverse

<sup>19</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>20</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>21</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>22</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Fir Pits Mixed Plantation Woodland 0.0m adjacent to the northern side of the road	Semi-mature mixed plantation woodland.	Local	UK and Suffolk BAP <sup>23</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna. However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>24</sup>	Low	Habitat Loss Increased Noise & disturbance & pollution (deposition & runoff)	Intermediate Negative	Slight adverse
Roundyard Wood 480m south of the road.	Broadleaved Woodland.	Local	UK and Suffolk BAP <sup>25</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna. However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>26</sup>	Low	None	Neutral	Neutral

<sup>23</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>24</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>25</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>26</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Tinkers Brook (stream/watercourse) 0.0m adjacent to the Fir Pits Plantation	Tinkers brook feeds into River Alde (linked to SAC/SPA)	Local	Tinkers brook feeds into River Alde (which links into the SAC/SPA/RAMSAR/SSSI). Has the potential to support multiple protected species especially water voles, otters and bird species.	Unknown <sup>27</sup>	Low	Increased fragmentation from extended culvert, pollution from construction and operation indirect effect on SAC SPA?	Intermediate Negative	Slight adverse
Coastal and Floodplain Grazing Marsh 100m	Located to the east of the proposed routing, associated with the River Alde Floodplain.  Description from SOE EA Anglia 40% of coastal and floodplain grazing marsh held in Anglia	Regional	Suffolk BAP Habitat <sup>28</sup> Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation	Target 2020	Medium	Increased pollution from atmospheric deposition	Minor negative	Slight adverse
<b>Habitats General</b>								

<sup>27</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7BCD142216-9921-4A54-A34A-F67C4CA6FE48%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7BCD142216-9921-4A54-A34A-F67C4CA6FE48%7D&C=3&flipLang=&txtLogout=)

<sup>28</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Woodlands (Excluding Ancient Woodlands) (unnamed)	<p>The agricultural landscape is dotted with small pockets of mature semi-natural broadleaved and mixed woodland, copses and old plantation shelter belts – not named. These have well formed canopies including common elm and ash with occasional scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine, alexanders, false oat grass and false brome amongst others.</p> <p>Four unnamed woodlands and small woodland pockets are present within 500m of the proposed works. Two of these woodlands are to the north, and two to the south of the road. The closest of these woodland pockets appears to be an extant pocket of Stratford Woodland, immediately adjacent to the north of the road. The closest pocket of unnamed woodland to the south of the road is 350m to the south of the road.</p> <p>Multiple small copses of trees and isolated stands are also within 500m of the works.</p>	Regional	<p>UK and Suffolk BAP <sup>29</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable.</p>	Increasing <sup>30</sup>	Medium	Mostly None Potential deterioration in air quality and increase disturbance from elevated traffic	Minor negative	Slight adverse

<sup>29</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>30</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)



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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Hedgerows	<p>Hedgerows border both sides of the proposed widening section and extend for the majority of the widening section. These hedgerows are likely to be affected by the works.</p> <p>Two additional stretches of valuable hedgerow are present within 500m of the works.</p> <p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore, understory including stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs</p>	Local/Regional	<p>UK and Suffolk BAP<sup>31</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>32</sup>	Those to be directly affected – Low	Habitat loss from dualling increase deposition	Intermediate negative	Slight Adverse

<sup>31</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>32</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Small tributaries and ditches (unnamed)	<p>There are a number of small ditches and tributaries in the area these are generally low flow at the time of survey and some had dry beds. Obviously rapid flow through during heavy rain as erosion was noted. Occasional in water vegetation such as water cress was noted.</p> <p>One small tributary an approximately ten ditches are within 500m of the road. The small tributary is bisected by the existing road, and runs adjacent to Fir Pits woodland plantation. The majority of the ditches are present to the east of the works, and form a component of a ditch network adjacent to the River Alde.</p>	Local	<p>Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated).</p> <p>Can support a range of protected and valued faunal species including otters and water voles.</p>	<p>Unknown<sup>33</sup></p> <p>Likely Declining due to agricultural run off, culverting etc.</p>	Medium when considered in context of downstream importance	Indirect pollution from run off into culverts and discharges	Minor negative	Slight adverse
Ponds	<p>Sixteen unnamed ponds are present within 500m of the proposed road. Nine of these ponds are located to the west of the proposed works, in the vicinity of Great Wood, Pound Wood and Nursery Plantation. Three ponds lie to the south / south-east of the road, and four to the north. The closest pond to the works lies to the north, and is approximately 20m from the road.</p> <p>Many of these waterbodies were shaded with minimal macrophytes.</p>	Local	<p>Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections).</p> <p>Potential for replacement of this habitat feature.</p>	<p>Increasing on a regional scale<sup>34</sup></p> <p>However, likely declining nationally due to agricultural drainage succession and development</p>	Low	None as these habitat features within the area are already fragmented by an existing road.	Neutral	Slight adverse

<sup>33</sup> [Available Online, Accessed 22/04/2014]

[http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)

<sup>34</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Arable fields	The majority of the landscape within 500m of the road was arable field, mostly oil seed rape	Local	As a buffer between hedgerows, woodlands and waterbodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>35</sup> Likely declining due to development	Low	Small amounts of Habitat Loss due to dualling, increased pollution deposition and run off	Neutral	Neutral
Improved pasture	Improved pasture is present within 500m of the works area.	Local	As a buffer between hedgerows, woodlands and waterbodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including common reptiles.	Unknown <sup>36</sup> Likely declining due to development	Low	Small amounts of Habitat Loss due to dualling, increased pollution deposition and run off	Neutral	Neutral
<b>Valued Faunal Receptors</b>								

<sup>35</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

<sup>36</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Badger	The majority of woodlands and hedgerow embankments within the works area were suitable for setting and the agricultural landscape offers excellent foraging habitat. There are badger records within 500m of the route option. <sup>37</sup>	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>38</sup>	Unknown, likely increasing	Low	Small amounts of foraging habitat loss, RTAs	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids etc. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark.	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependent upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting. There are records of pipistrelle and brown long-eared bats and their roosts in the area.	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>39</sup>	Varies dependent upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse
GCN	There were sixteen waterbodies within the route corridor (need 500m buffer) and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins. There are numerous records of GCN in this area.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>40</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	Minor Negative	Slight Adverse

<sup>37</sup> Suffolk Biological Records Centre Data.

<sup>38</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>

<sup>39</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%202027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%202027_03_12.pdf)

<sup>40</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm>

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Step 2		Step 3		Step 4		Step 5		
Name / Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Common Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>41</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse
Otter	Potential presence in Tinkers Brook	Local/Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>42</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse
Water Vole	Potential presence in Tinkers Brook	Local/Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>43</sup>	Medium	Potential fragmentation of habitat and habitat loss	Minor negative	Slight Adverse
Fish & Aquatic Inverts	Potential presence in Tinkers Brook, further potential effects downstream.	Local (but un-surveyed)	Varies dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse
Terrestrial Invertebrates	The mosaic of arable, pasture, field margins, hedgerows and woodlands has the potential to support a range of invertebrates important to biodiversity	Local (but un-surveyed)	Vary dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score: SLIGHT ADVERSE**

The majority of impacts upon receptors associated with Link 1 are assessed as being neutral or slight adverse.

**Qualitative comments:**

<sup>41</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain>

<sup>42</sup> SOE State of the Environment (Anglia), Environment Agency 2010)

<sup>43</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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The illustrative alignment for Link 1 does not bisect internationally designated sites and no sites of designated for national or international importance for nature is present within 500m of the works. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore although it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Link 1 as proposed.

Great Wood Ancient Woodland, which is a CWS, is approximately 300m from the works and not anticipated to be affected by Link 1.

The illustrative alignment for Link 1 has the potential to affect a number of habitats. Dualling of this section of the road will likely cause direct habitat loss of arable fields and sections of two plantation woodlands but these are not of more than local value. There will also be an increase in habitat fragmentation due to the increased width of the road, however the landscape is already bisected by the road so the resultant increase in fragmentation effect will be minor.

With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodland plantations are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered, especially as there are records of GCN presence in the area. The works have the potential to cause a loss of GCN terrestrial habitat.

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**Table A5:** Option Link 2 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Alde-Ore Estuary RAMSAR 3716.6m SSSI	<p>Special Protection Area, SSSI. An estuary complex of three rivers comprising various habitats including intertidal mudflats, saltmarsh, a vegetated shingle spit, saline lagoons, and semi-intensified grazing marsh.</p> <p>The main habitat types of the Alde-Ore Estuary are: intertidal mudflats, saltmarsh, reedswamp, coastal freshwater, brackish lagoons, semi-improved grazing marsh, brackish ditches and vegetated shingle, the second-largest and best-preserved example in Britain.<sup>44</sup></p>	International	<p>International Designation (Ramsar, SAC) National Designation (SSSI) Important in the Anglian Region</p> <p>The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds.<sup>45</sup></p> <p>“The second-largest and best-preserved example of vegetated shingle in Britain. A unique feature for East Anglian beaches is the abundance on the ground of normally epiphytic lichens.”<sup>46</sup></p>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.</p> <p>Being closely monitored though as a SSSI with appropriate management plans<sup>47</sup></p>	Very High	Indirect pollution from construction and operation	Minor negative	Slight Adverse

<sup>44</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>45</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>46</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/Docs/UKBAP\\_BAPHabitats-10-CoastVegShingle.doc](http://jncc.defra.gov.uk/Docs/UKBAP_BAPHabitats-10-CoastVegShingle.doc),

[Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/coastalvegshingle.pdf>

<sup>47</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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<p>Alde-Ore &amp; Butley Estuaries SAC 3716.6m</p>	<p>This estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River originally entered the sea at Aldeburgh, but now turns south along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is still moving south as the Orfordness shingle spit continues to grow through longshore drift from the north. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed.<sup>48</sup></p>	<p>International</p>	<p>International Designation Supports a range of important habitats (and associated fauna). Habitats include but are not limited to: mudflats and sandflats not covered by seawater at low tide; tidal rivers, estuaries.<sup>49</sup></p>	<p>Some parcels favourable some unfavourable A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze. Being closely monitored as a SAC with appropriate management plan<sup>50</sup></p>	<p>Very High</p>	<p>Indirect pollution from construction and operation</p>	<p>Minor negative</p>	<p>Slight Adverse</p>
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<sup>48</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030076>

<sup>49</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC\\_tcm6-31816.pdf](http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC_tcm6-31816.pdf)

<sup>50</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)



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Sandlings SPA 3288.1m	<p>The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture.</p> <p>The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.<sup>51</sup></p>	International	<p>Supports breeding European nightjar and woodlark.</p> <p>Nightjar <i>Caprimulgus europaeus</i>, 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)</p> <p>Woodlark <i>Lullula arborea</i>, 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997)<sup>52</sup></p>	Declining due to bracken invasion however remedial activities/management of bracken will ensure stability. <sup>53</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight Adverse
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<sup>51</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>52</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>53</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

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<p>Alde-Ore Estuary SPA Available 3716.6m</p>	<p>The Alde-Ore Estuary is located on the Suffolk coast in eastern England. It comprises the estuarine complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There is a variety of habitats including intertidal mud-flats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and semi-intensified grazing marsh</p>	<p>International site supports</p>	<p><b>During the breeding season site supports a number of important bird species including:</b></p> <ul style="list-style-type: none"> <li>- Avocet <i>Recurvirostra avosetta</i>, 104 pairs representing at least 17.6% of the breeding population in Great Britain (5 year mean, 1990-1994)</li> <li>- Little Tern <i>Sterna albifrons</i>, 48 pairs representing at least 2.0% of the breeding population in Great Britain (5 count mean, 1993-4,1996-8)</li> <li>- Marsh Harrier <i>Circus aeruginosus</i>, 3 pairs representing at least 1.9% of the breeding population in Great Britain (5 year mean, 1993-1997)</li> <li>- Sandwich Tern <i>Sterna sandvicensis</i>, 169 pairs representing at least 1.2% of the breeding population in Great Britain (5 year mean 1991-1995)</li> </ul> <p><b>During the winter season site supports a number of important bird species including:</b></p>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.</p>	<p>Very High</p>	<p>Indirect pollution from construction and operation</p>	<p>Minor negative</p>	<p>Slight Adverse</p>
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Woodland complex including Butchers Hole and components of Benhall Lodge Park. 0.0m	A complex of small woodlands is present to the north of the proposed works. Benhall Lodge which lies immediately to the north of the road consists of a mixed woodland plantation and has the potential to be directly impacted by the works. These woodlands contain mature oak trees which may be impacted by the proposed works (description from site visit).	Regional	UK and Suffolk BAP <sup>57</sup> Provide a wide range of ecosystem services, botanically rich and may support a variety of fauna.	Increasing <sup>58</sup>	Medium	Habitat loss and damage from construction Increased Noise & disturbance & pollution (deposition & runoff) Potentially deterioration in air quality during construction and operation	Intermediate negative	Moderate Adverse
<b>Habitats General</b>								

<sup>55</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Estuary-SPA\\_tcm6-32208.pdf](http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Estuary-SPA_tcm6-32208.pdf)

<sup>56</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>57</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>58</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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Woodlands (Excluding Ancient Woodlands) (unnamed)	<p>The Suffolk agricultural landscape is dotted with small pockets of mature semi-natural broadleaved and mixed woodland, copses and old plantation shelter belts – not named. These have well formed canopies including common elm and ash with occasional Scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine, false oat grass and false brome amongst others.</p> <p>Two unnamed woodlands were present within 500m of the works, the closest of which was 260m to the west of the road. These woodlands were considered unlikely to be directly affected by the proposed routing.</p> <p>Multiple additional copses of woodland are present within 500m of the road works. Only one copse is likely to be directly impacted by the works, a small shelter bet to the east of the works area, immediately south of the road.</p>	Local	<p>UK and Suffolk BAP<sup>59</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and the soils have been under shade for hundreds of years.</p>	Increasing <sup>60</sup>	Low	Potentially deterioration in air quality	Mostly None	Slight Adverse
Hedgerows	No significant hedgerows have the potential to be directly affected by the proposed routing.	Local/Regional	<p>UK and Suffolk BAP<sup>61</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>62</sup>	Lower/Medium	No direct impacts predicted	Neutral	Neutral

<sup>59</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>60</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

<sup>61</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>62</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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Small tributaries and ditches (unnamed)	There were no small tributaries or ditches within 500m of the road routing.	Local	Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated). Can support a range of protected and valued faunal species including otters and water voles.	Unknown <sup>63</sup> Likely Declining due to agricultural run off, culverting etc	Lower	Indirect pollution from run off into culverts and discharges	Neutral	Neutral
Ponds	There were eleven unnamed ponds within 500m of the works area, five of these ponds lay to the north of the works, and six lay to the south. The closest pond lay 100m to the west of the proposed works area, and has the potential to be directly affected by the works.	Local	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections)	Increasing on a regional scale <sup>64</sup> However, likely declining nationally due to agricultural drainage succession and development	Low	None as already fragmented by existing road not connected to tributaries rely on rain water feeds	Neutral	Neutral
Arable fields	Much of the landscape surrounding the routing was under arable cultivation mostly oil seed rape. Areas immediately to the north and south of the road were utilised for arable agriculture.	Local	As a buffer between hedgerows, woodlands and water bodies this habitat provides a relatively undisturbed background to more valuable habitats.	Unknown <sup>65</sup> Likely declining due to development	Low	Small amounts of Habitat Loss due to dualling, increased pollution deposition and run off.	Neutral when considered within the wider environment .	Neutral
Non-native invasive species - Habitats	Some Rhododendron and Cherry Laurel has invaded the woodlands	Local	These species have negative effects on existing native habitats	Spreading	Negative at the Local Scale	None anticipated	Neutral	Neutral
<b>Valued Faunal Receptors</b>								

<sup>63</sup> [Available Online, Accessed 22/04/2014][http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)<sup>64</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)<sup>65</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

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Badger	The majority of woodlands and hedgerow embankments were suitable for setting the agricultural landscape offers excellent foraging habitat. There are badger records within 500m of the route option	Local (but un-surveyed)	BA Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting	Unknown, likely increasing	Low	Small amounts of foraging habitat loss, RTAs	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids etc. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark. There is a record of hen harrier the area would have suitable barn owl nesting and foraging habitat.	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution County Bird Records	Varies dependant upon species	Low although can vary dependent upon species (can be high)	Habitat loss foraging and nesting areas, disturbance and increased RTAs	Minor Negative	Slight Adverse
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting pipistrelle and brown long-eared bats are recorded within the area including their roosts in the Benhall complex.	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Suffolk BAP <sup>66</sup>	Varies dependent upon species	Low although can vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse

<sup>66</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)

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GCN	There were eleven unnamed ponds within 500m of the works area, five of these ponds lay to the north of the works, and six lay to the south. The closest pond lay 100m to the west of the proposed works area, and has the potential to be directly affected by the works. These have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins. There are numerous records of GCN in this areas	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>67</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	Minor Negative	Slight Adverse
Common Reptiles	The field margins, riparian corridors and hedgerows in the works area had the potential to support common reptiles.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>68</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score:** SLIGHT ADVERSE (1 MODERATE Benhall Plantation Complex)

All impacts upon valued receptors associated with the Link 2 proposal are assessed as being neutral or slight adverse

**Qualitative comments:**

The illustrative alignment for Link 2 does not bisect any nationally or internationally designated sites, and no sites of designated importance for nature are present within 500m of the works. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore although it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Link 2 as proposed.

The illustrative alignment for Link 2 has the potential to affect a number of valuable habitats. Direct habitat loss resultant from the routing may cause the loss of young (<20 years old) broadleaf and mixed plantation woodland. Although in itself not a hugely valuable habitat and not listed on the Suffolk BAP, this habitat has the potential to support a range of valued faunal species and groups, including badger and nesting birds. Multiple ponds are present in the vicinity of the routing and GCN are known to be in the area. Therefore, the routing has the potential to affect GCN terrestrial habitats.

<sup>67</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm>

<sup>68</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain>

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**Table A6:** Option SB1 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Alde-Ore Estuary RAMSAR 3955.2m	Special Protection Area, SSSI. An estuary complex of three rivers comprising various habitats including intertidal mudflats, saltmarsh, a vegetated shingle spit, saline lagoons, and semi-intensified grazing marsh. The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>69</sup>	International	International Designation (Ramsar, SAC) National Designation (SSSI) Important in the Anglian Region The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>70</sup> "The second-largest and best-preserved example of vegetated shingle in Britain. A unique feature for East Anglian beaches is the abundance on the ground of normally	Some parcels favourable some unfavourable A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze. Being closely monitored though as a SSSI with appropriate management plans <sup>72</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse
	<sup>69</sup> [Available Online, Accessed 22/04/2014] <a href="http://www.ramsar.org/cda/en/ramsar/documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0">http://www.ramsar.org/cda/en/ramsar/documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0</a>							
	<sup>70</sup> [Available Online, Accessed 22/04/2014] <a href="http://www.ramsar.org/cda/en/ramsar/documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0">http://www.ramsar.org/cda/en/ramsar/documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0</a>							

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Alde-Ore & Butley Estuaries SAC 4551.4m	The SAC comprises extensive intertidal mudflats on both sides of the Alde River channel in its upper reaches and saltmarsh accreting along its fringes. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed. <sup>73</sup>	International	International Designation Supports a range of important habitats (and associated fauna). Habitats include: mudflats and sandflats not covered by seawater at low tide; tidal rivers, estuaries. <sup>74</sup>	Some parcels favourable some unfavourable A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze. Being closely monitored though as a SAC with appropriate management plan <sup>75</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

<sup>71</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/Docs/UKBAP\\_BAPHabitats-10-CoastVegShingle.doc](http://jncc.defra.gov.uk/Docs/UKBAP_BAPHabitats-10-CoastVegShingle.doc),

[Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/coastalvegshingle.pdf>

<sup>72</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>73</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030076>

<sup>74</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC\\_tcm6-31816.pdf](http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC_tcm6-31816.pdf)

<sup>75</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Sandlings SPA 3288.1m	The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken <i>Pteridium aquilinum</i> , shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground. <sup>76</sup>	International	Nightjar <i>Caprimulgus europaeus</i> , 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)  Woodlark <i>Lullula arborea</i> , 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997) <sup>77</sup>	Declining due to bracken Invasion however remedial activities/management of bracken will ensure stability <sup>78</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

<sup>76</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)  
[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>77</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>78</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
			High  During the breeding season site supports a number of important bird species including:  Avocet <i>Recurvirostra avosetta</i> , 104 pairs representing at least 17.6% of the breeding population in Great Britain (5 year mean, 1990-1994)  Little Tern <i>Sterna albifrons</i> , 48 pairs representing at least 2.0% of the breeding population in Great Britain (5 count mean, 1993-4, 1996-8)  Marsh Harrier <i>Circus aeruginosus</i> , 3 pairs representing					

<sup>79</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/default.aspx?page=2010>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Coastal and Floodplain Grazing Marsh 0.0m	Routing of proposed road runs through areas of floodplain grazing marsh adjacent to the River Alde. <sup>82</sup>	Regional	Listed on Suffolk BAP <sup>83</sup> Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation. Can contain a range of habitats which support multiple valuable and protected species, including water vole and common reptiles. <sup>84</sup>	Increasing <sup>85</sup>	Medium	Direct loss of habitat type	Major negative	Moderate adverse

<sup>80</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Estuary-SPA\\_tcm6-32208.pdf](http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Estuary-SPA_tcm6-32208.pdf)

<sup>81</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>82</sup> [Available Online, Accessed 22/04/2014] Suffolk Biological Records Centre

<sup>83</sup> [Available Online, Accessed 22/04/2014] SUFFOLK PRIORITY SPECIES AND HABITATS (Suffolk Biodiversity Action Plan) January 2014

<sup>84</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/grazingmarsh.pdf>

<sup>85</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
River Alde	<p>Proposed routing bisects the river and multiple small tributaries. Direct impacts likely and any impacts may affect the SAC and SPA (River Alde - Ore Estuary) downstream.</p> <p>At proposed crossing point, river is approximately 3m wide with steep sided grassy banks. The river banks also have a belt of trees containing oak, alder and willows.</p>	National	<p>Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Alde.</p> <p>River may support both directly and indirectly a large range of valuable species, especially birds and fish.</p>	Unknown <sup>86</sup>	High	<p>Pollution both direct and indirect resulting from construction and operation.</p> <p>Direct loss of river habitat and riparian margin from construction.</p>	Intermediate Negative	Moderate Adverse

<sup>86</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Farnham Churchyard CWS 314.4m	Farnham Churchyard provides a valuable refuge for wildlife in an intensively farmed landscape. In addition to many fairly common wild flowers the site also supports a number of scarce Suffolk plants. Grass vetchling which is scattered throughout the churchyard is also uncommon in Suffolk and is mainly restricted to a few sites on the coast. <sup>87</sup>	Regional	Medium Orpine, which grows here in abundance is a declining species throughout Suffolk. <sup>88</sup>	Declining <sup>89</sup> Although parts of the churchyard are cut annually, the cuttings are left lying and a thatch has developed, smothering some of the less vigorous plants.	Medium	None	Neutral	Neutral

<sup>87</sup> Suffolk Biological Records Centre CWS Citations<sup>88</sup> Suffolk Biological Records Centre CWS Citations<sup>89</sup> Suffolk Biological Records Centre CWS Citations

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Woodland Plantation complex consisting of and Benhall Lodge Park and Butchers Hole 0.0m	Benhall Lodge Park woodland plantation lies immediately to the north of the proposed works at the far eastern end of the routing. Beyond this lay multiple woodland plantations including Butchers Hole.	Regional	UK and Suffolk BAP <sup>90</sup>  A network of connected woodland habitat Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>91</sup>	Medium	Direct damage and loss from construction. Pollution effects from operation of road.  Reduction in air quality / pollution, primarily from operation.	Intermediate Negative	Moderate Adverse

<sup>90</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>91</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Stratford Plantation 150m	Stratford Plantation woodland lies approximately 150m to the west of the routing. It is considered unlikely that the site will be directly impacted by the road under the current proposals.	Local	UK and Suffolk BAP <sup>92</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>93</sup>	Lower	Reduction in air quality / pollution, primarily from operation.	Minor negative	Slight adverse
<b>Habitats General</b>								

<sup>92</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>93</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Woodlands (Excluding Ancient Woodlands) (unnamed)	<p><b>One unnamed woodland is to be directly bisected by the proposed routing.</b></p> <p>Eight unnamed woodlands are present within 500m of the routing, the closest of this is located to the east of the route and is located north of the works. None of these woodlands are likely to be directly affected by the works. The area surrounding the routing also contains multiple woodland copse'.</p> <p>The Suffolk agricultural landscape is dotted with small pockets of mature semi-natural broadleaved and mixed woodland, copses and old plantation shelter belts – not named. These have well formed canopies including common elm and ash with occasional Scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine, false oat grass and false brome amongst others.</p>	Regional	<p>UK and Suffolk BAP<sup>94</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and the soils have been under shade for hundreds of years.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable</p>	Increasing <sup>95</sup>	Medium	<p>Direct damage and loss from construction.</p> <p>Pollution effects from operation of road.</p> <p>Reduction in air quality / pollution, primarily from operation.</p>	Minor Negative	Slight Adverse

<sup>94</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>95</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Hedgerows	<p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore, understorey including lesser stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs.</p> <p>One noted hedgerow is directly bisected by the proposed routing. Multiple additional small hedgerows are present within 500m of the routing.</p>	Local/Regional	<p>UK and Suffolk BAP<sup>96</sup>            Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.            Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>97</sup>	Low/Medium	<p>Direct damage and loss from construction.            Fragmentation effects and loss of commuting corridors for wildlife.            Pollution effects from operation of road.</p>	Minor Negative	Slight Adverse

<sup>96</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>97</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Small tributaries and ditches (unnamed)	At least eight tributaries/ditches may be bisected by the routing. Multiple small unnamed ditches and tributaries for the River Alde were present within 500m of the proposed routing.	Regional	Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated). Can support a range of protected and valued faunal species including otters and water voles.	Unknown <sup>98</sup> Likely Declining due to agricultural run off, culverting etc	Medium	Direct pollution from construction and operation. Damage / destruction to ditch through construction works. Indirect pollution from run off into culverts and discharges	Intermediate Negative	Moderate Adverse

<sup>98</sup> [Available Online, Accessed 22/04/2014]

[http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Ponds	There were seven unnamed ponds within 500m of the works area, three of these ponds lay to the north of the works, and four lay to the south. The closest pond lay 200m to the south of the proposed works area. It is considered unlikely that these ponds will be directly affected by the routing.	Local	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections). Potential for replacement of this habitat feature.	Increasing on a regional scale <sup>99</sup> However, likely declining nationally due to agricultural drainage succession and development	Low	Main potential impact is indirect, resulting from fragmentation of ponds from each other and the wider environment.	Minor Negative	Slight Adverse

<sup>99</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Arable fields	The majority of the landscape within 500m of the routing was arable field. These habitats may be directly impacted by the routing.	Local	As a buffer between hedgerows, woodlands and water bodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this land use for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>100</sup> Likely declining due to development	Low	Small amounts of habitat loss due to construction. Increased pollution deposition and run off from operation of road.	Minor Negative	Slight Adverse
<b>Valued Faunal Receptors</b>								

<sup>100</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Badger	The majority of woodlands and hedgerow embankments were suitable for setting the agricultural landscape offers excellent foraging habitat.	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>101</sup>	Increasing	Low	Small amounts of foraging habitat loss, potential loss of setts, increased risk of RTA;s post construction.	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids etc. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark.	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependent upon species	Low	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse

<sup>101</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting. Records of bats are present within 500m of the proposed routing. <sup>102</sup> Pipistrelle and brown long-eared being the most common	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>103</sup>	Varies dependent upon species	Low	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse
GCN	There were seven water bodies within the route corridor and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>104</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	Minor negative	Slight Adverse
Common Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles, multiple records of grass snake within the area.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>105</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse
Otter	There is potential for otter to be present in the River Alde, which may be affected by the routing. There are records in the area.	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>106107</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse

<sup>102</sup> Suffolk Biological Records Centre Data.<sup>103</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)<sup>104</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm><sup>105</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain><sup>106</sup> Fifth Otter Survey of England, Environment Agency, 2010<sup>107</sup> SOE State of the Environment (Anglia), Environment Agency 2010)



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Water Vole	Water vole may be present in the ditches within the River Alde floodplain and tributaries of the River Alde. There are records in the area	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>108</sup>	Medium	Potential fragmentation of habitat and habitat loss	Intermediate negative	Moderate adverse
Fish & Aquatic Invertebrates	Fish and aquatic invertebrates are likely to be supported by the River Alde and its associated habitats (tributaries and interconnected ditches)	Local (but un-surveyed)	Varies dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score:** MODERATE ADVERSE

The routing for SB1 impacts upon a range of receptors overall, most significantly is the River Alde and its associated floodplain.

**Qualitative comments:**

The illustrative alignment for SB1 does not bisect internationally designated sites. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore all though it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Routing SB1 as proposed.

The illustrative alignment for SB1 has the potential to affect a number of habitats. The moderate adverse effects come from the culverting of multiple tributaries of the River Alde which will support otter and water vole and associated habitat loss of the floodplain grazing marsh and the fragmentation of numerous ponds and water bodies that may support GCN.

Construction of this routing will likely cause direct habitat loss of arable fields and sections of a woodland. There will also be an increase in habitat fragmentation due to the creation of the road. With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodlands in the vicinity of the routing are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered.

<sup>108</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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**Table A7:** Option SB2 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Alde-Ore Estuary RAMSAR 3955.2m	<p>Special Protection Area, SSSI. An estuary complex of three rivers comprising various habitats including intertidal mudflats, saltmarsh, a vegetated shingle spit, saline lagoons, and semi-intensified grazing marsh.</p> <p>The main habitat types of the Alde-Ore Estuary are: intertidal mudflats, saltmarsh, reedswamp, coastal freshwater, brackish lagoons, semi-improved grazing marsh, brackish ditches and vegetated shingle, the second-largest and best-preserved example in Britain.<sup>109</sup></p>	International	The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>110</sup>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.</p> <p>Being closely monitored though as a SSSI with appropriate management plans<sup>111</sup></p>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

<sup>109</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>110</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>111</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Alde-Ore & Butley Estuaries SAC 3955.2m	<p>This estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River originally entered the sea at Aldeburgh, but now turns south along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is still moving south as the Orfordness shingle spit continues to grow through longshore drift from the north. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed.<sup>112</sup></p>	International	<p>High</p> <p>Supports a range of important habitats such as mudflats and sandflats not covered by seawater at low tide.<sup>113</sup></p>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.</p> <p>Being closely monitored as a SAC with appropriate management plan<sup>114</sup></p>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Sandlings SPA 3296.6m	<p>The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture.</p> <p>The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.<sup>115</sup></p>	International	High Supports breeding European nightjar and woodlark. <sup>116</sup>	Declining due to bracken invasion however remedial activities/management of bracken will ensure stability. <sup>117</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

<sup>112</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030076>

<sup>113</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC\\_tcm6-31816.pdf](http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC_tcm6-31816.pdf)

<sup>114</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>115</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>116</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>117</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Alde-Ore Estuary SPA 3955.1m	<p>The Alde-Ore Estuary is located on the Suffolk coast in eastern England. It comprises the estuarine complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There is a variety of habitats including intertidal mud-flats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and semi-intensified grazing marsh</p> <p>Over winter, the area regularly supports 24,962 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Black-tailed Godwit <i>Limosa limosa islandica</i>, Dunlin <i>Calidris alpina alpina</i>, Lapwing <i>Vanellus vanellus</i>, Shoveler <i>Anas clypeata</i>, Teal <i>Anas crecca</i>, Wigeon <i>Anas penelope</i>, Shelduck <i>Tadorna tadorna</i>, White-fronted Goose <i>Anser albifrons albifrons</i>, Redshank <i>Tringa totanus</i>, Avocet <i>Recurvirostra avosetta</i>.<sup>118</sup></p>	International	<p>High</p> <p>Supports an important population of seabirds. The diversity of wetland habitat types present is of particular significance to the birds occurring on the site as these provide a range of opportunities for feeding, roosting and nesting within the site complex. At different times of the year, the site supports notable assemblages of wetland birds including seabirds, wildfowl and waders. As well as being an important wintering area for waterbirds, the Alde-Ore Estuary provides important breeding habitat for several species of seabird, wader and raptor. During the breeding season, gulls and terns feed substantially outside the SPA.<sup>119</sup></p>	<p>Some parcels favourable some unfavourable</p> <p>A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.</p> <p>Being closely monitored though as a SAC with appropriate management plan<sup>120</sup></p>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

<sup>118</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/default.aspx?page=2010>

<sup>119</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/default.aspx?page=2010>

<sup>120</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
River Alde	<p>Proposed routing bisects the river and multiple small tributaries. Direct impacts likely and any impacts may affect the SAC and SPA (River Alde - Ore Estuary) downstream.</p> <p>At proposed crossing point, river is approximately 3m wide with steep sided grassy banks. The banks also support a belt of trees containing oak, alder and willows.</p>	National	<p>Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Alde.</p> <p>River may support both directly and indirectly a large range of valuable species, especially birds and fish.</p>	Unknown <sup>121</sup>	High	<p>Pollution both direct and indirect resulting from construction and operation.</p> <p>Direct loss of river habitat and riparian margin from construction.</p>	Intermediate Negative	Moderate Adverse
Coastal and Floodplain Grazing Marsh 0.0m	<p>Routing runs through areas of floodplain grazing marsh associated with the river Alde.</p> <p>Land within Floodplain. AP coverage shows grassland. Adjacent to land within existing CFGM habitat inventory, looks to be part of the same habitat.</p> <p>Environmentally Sensitive Areas (2008)</p>	Regional	<p>Suffolk BAP and SOE Anglian Doc</p> <p>Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation</p>	Increasing <sup>122</sup>	Medium	Direct loss of habitat type	Major negative	Moderate adverse

<sup>121</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

<sup>122</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Fir Pits 350m	Fir Pits is a semi-mature mixed plantation woodland located to the west of the route. It is not thought that this will be directly affected by the works.	Local	UK and Suffolk BAP <sup>123</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>124</sup>	Low	Potentially deterioration in air quality during construction and operation	Minor Negative	Slight adverse
Stratford Plantation 0.0m	Stratford plantation is a semi-mature broadleaved plantation woodland. This is located immediately adjacent to the south of the western end of the route. There is potential for this woodland to be directly affected by the works.	Local	UK and Suffolk BAP <sup>125</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>126</sup>	Low	Potentially deterioration in air quality during construction and operation	Minor Negative	Slight adverse

<sup>123</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>124</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>125</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>126</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Benhall Lodge Park, Butchers Hole 0.0m	A complex of small woodlands is present to the north of the proposed works at the far eastern extension of the route. Benhall Lodge which lies immediately to the north of the road consists of a young (<20 years old) deciduous and mixed woodland plantation and has the potential to be directly impacted by the works.	Regional	UK and Suffolk BAP <sup>127</sup>  Provide a wide range of ecosystem services, botanically rich and may support wildlife including Badger.	Increasing <sup>128</sup>	Medium	Direct damage and loss from construction.  Pollution effects from operation of road.  Reduction in air quality / pollution, primarily from operation.	Intermediate Negative	Moderate Adverse
<b>Habitats General</b>								
Woodlands (Excluding Ancient Woodlands) (unnamed)	These woodland features vary greatly in character but generally have well formed canopies including common elm and ash with occasional Scots pine and larch and understories of hawthorn elder and others.  Sixteen unnamed woodlands are present within 500m of the route, and multiple small woodland copses and shelter belts. There is the potential for these woodlands to be directly affected by the works. One of the unnamed woodlands lies immediately adjacent to the route, whilst another is situated 75m from the routing.	Regional	UK and Suffolk BAP <sup>129</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>130</sup>	Medium	Mostly None  Slight increase in fragmentation  Potential deterioration in air quality for those woodlands closest.	Minor Negative	Slight Adverse

<sup>127</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>128</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>129</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>130</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Hedgerows	<p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore with an understorey including stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs.</p> <p>Six noted hedgerows are directly bisected by the proposed routing. Multiple additional small hedgerows are present within 500m of the routing.</p>	Local/Regional	<p>UK and Suffolk BAP<sup>131</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>132</sup>	Lower/Medium	<p>Direct damage and loss from construction.</p> <p>Fragmentation effects and loss of commuting corridors for wildlife.</p> <p>Pollution effects from operation of road.</p>	Intermediate Negative	Moderate Adverse
Small tributaries and ditches (unnamed)	<p>Three small tributaries of the River Alde are bisected by the routing. Multiple tributaries of the Alde and other unnamed drainage ditches are present within 500m of the works and have the potential to be impacted by the works.</p>	Regional	<p>Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated).</p> <p>Can support a range of protected and valued faunal species including otters and water voles.</p>	<p>Unknown<sup>133</sup></p> <p>Likely Declining due to agricultural run off, culverting etc</p>	Medium	<p>Direct pollution from construction and operation.</p> <p>Damage / destruction to ditch through construction works.</p> <p>Indirect pollution from run off into culverts and discharges</p>	Intermediate Negative	Moderate Adverse

<sup>131</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>132</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

<sup>133</sup> [Available Online, Accessed 22/04/2014]

[http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Ponds	There were fourteen unnamed ponds within 500m of the works area, eight of these ponds lay to the north of the works, and six lay to the south. The closest pond lay 200m to the north west of the proposed routing. It is considered unlikely that these ponds will be directly affected by the works.	Local	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections)	Increasing on a regional scale <sup>134</sup> However, likely declining nationally due to agricultural drainage succession and development	Lower	Main potential impact is indirect, resulting from fragmentation of ponds from each other and the wider community	Intermediate Negative	Slight Adverse
Arable fields	Much of the landscape surrounding the routing was under arable cultivation.	Local	As a buffer between hedgerows, woodlands and waterbodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>135</sup> Likely declining due to development	Low	Habitat Loss due to road construction increased pollution deposition and run off.	Minor Negative	Neutral
<b>Valued Faunal Receptors</b>								

<sup>134</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

<sup>135</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Badger	The majority of woodlands and hedgerow embankments were suitable for setting the agricultural landscape offers excellent foraging habitat. There are badger records within 500m of the route option	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>136</sup>	Unknown, likely increasing	Low	Small amounts of foraging habitat loss, RTAs	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids etc.. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark. There is a record of Hen Harrier the area would have suitable barn owl nesting and foraging habitat.	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting Pipistrelle and brown long-eared being the most common.	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>137</sup>	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse

<sup>136</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>

<sup>137</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
GCN	There were 14 waterbodies within the route corridor and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins. There are numerous records of GCN in this area of the country.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>138</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	<b>Intermediate negative</b>	Moderate adverse
Common Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles. There are records of grass snake and slow worm in the area.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>139</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse
Otter	There is potential for otter to be present in the River Alde, which may be affected by the routing. There are records of otter in the area.	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>140141</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse
Water Vole	Water vole may be present in the ditches within the River Alde floodplain and tributaries of the River Alde. There are records of water vole in the area.	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>142</sup>	Medium	Potential fragmentation of habitat and habitat loss	<b>Intermediate negative</b>	Moderate adverse
Fish & Aquatic Invertebrates	Fish and aquatic invertebrates are likely to be supported by the River Alde and it's associated habitats (tributaries and interconnected ditches)	Local (but un-surveyed)	Varies dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score: MODERATE ADVERSE**

<sup>138</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm>

<sup>139</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain>

<sup>140</sup> Fifth Otter Survey of England, Environment Agency, 2010

<sup>141</sup> SOE State of the Environment (Anglia), Environment Agency 2010)

<sup>142</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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The routing for SB2 impacts upon a range of receptors the majority of which are associated with the River Alde and fragmentation of ponds, woodlands and hedgerows.

**Qualitative comments:**

The illustrative alignment for SB2 does not bisect internationally designated sites. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore all though it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Routing SB2 as proposed. There is some potential for downstream impacts, discussed below.

The illustrative alignment for SB2 has the potential to affect a number of habitats. The key impacts will be upon habitats associated with the River Alde, namely the floodplain grazing marsh (a Suffolk BAP habitat) and a number of tributaries associated with the river. These habitats and features are inherently valuable, but may also support a number of protected and valuable floral and faunal species, including water voles, otters birds and reptiles. There is also the potential for there to be impacts downstream upon the Alde and Ore Estuaries designated sites (i.e. from pollution effects). A significant number of ponds, woodlands and hedgerows would also be fragmented.

Construction of this routing will likely cause direct habitat loss of arable fields and sections of a woodland. There will also be an increase in habitat fragmentation due to the creation of the road.

With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodlands in the vicinity of the routing are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered and any pond fragmentation effects addressed. Water vole may also be moderately adversely affected due to the multiple tributaries crossed.

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**Table A8:** Option LB3 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Sandlings SPA 3296.6m	The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken <i>Pteridium aquilinum</i> , shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground. <sup>143</sup>	International	<p>Nightjar <i>Caprimulgus europaeus</i>, 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)</p> <p>Woodlark <i>Lullula arborea</i>, 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997)<sup>144</sup></p>	Declining due to bracken Invasion however remedial activities/management of bracken will ensure stability <sup>145</sup>	Very High	Indirect pollution from construction and operation	Minor Negative	Slight Adverse

<sup>143</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)  
 [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

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Great Wood AWI CWS 241.7m	<p>Ancient &amp; Semi-Natural Woodland</p> <p>A very fine ancient woodland surrounded by a ditch and bank and including internal ditch and banks. The structure is one of abandoned coppice with standards. The oak and ash standards have grown very large and are shading the undergrowth; which is principally hazel and ash but with some hornbeam, maple and sallow also present. The rides too, have become overgrown, and no recent management has taken place. The ground flora is rich and a total of 87 species have been recorded. This includes early purple, twayblade and common spotted orchids, and a range of ancient woodland indicators.<sup>146</sup></p>	National	<p>County Designation LBAP<sup>147</sup></p> <p>National, Regional and Local value<sup>148</sup></p>	<p>Stable</p> <p>On a National scale ASNW declining to loss of habitat and lack of management although this woodland is stable favourable<sup>149,150</sup></p>	High	<p>Disturbance from noise and lighting during construction and operation.</p> <p>Increased pollution (deposition) during construction and operation.</p> <p>Fragmentation effects from bisecting of Pound Wood to the south.</p>	Minor Negative	Slight Adverse
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<sup>144</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>145</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>146</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>147</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/MixedDeciduousWoodland.pdf>

<sup>148</sup> [Available Online, Accessed 22/04/2014]

[http://www.naturalareas.naturalengland.org.uk/Science/natural/NA\\_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=](http://www.naturalareas.naturalengland.org.uk/Science/natural/NA_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=)

<sup>149</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>150</sup> [Available Online, Accessed 22/04/2014] <http://www.wbrc.org.uk/atp/Ancient%20Woodland%20Threats%20-%20Woodland%20Trust.pdf>

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Lower Hacheston Meadow CWS 488.5m	One of the improved pastures which is situated adjacent to the Campsey Ash/Wickham Market road contains a remnant, species diverse wetland habitat which has not been affected by agricultural chemicals. This corner of the meadow, which is only 0.1 hectare in area, supports a good population of plants which are becoming increasingly rare in Suffolk for example ragged robin, marsh marigold and square-stalked St John's-wort. <sup>151</sup>	Regional	Regionally important due to presence of increasingly rare plant species <sup>152</sup>	Unknown	Medium	Disturbance from noise and lighting during construction and operation. Increased pollution (deposition/runoff) during construction and operation.	Neutral	Neutral
Coastal and Floodplain Grazing Marsh 0.0m	Routing runs through areas of floodplain grazing marsh associated with the river Ore. <sup>153</sup>	Regional	Listed on Suffolk BAP <sup>154</sup> Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation. Can contain a range of habitats which support multiple valuable and protected species, including water vole and common reptiles. <sup>155</sup>	Increasing <sup>156</sup>	Medium	Direct loss of habitat type	Major negative	Moderate adverse

<sup>151</sup> Suffolk Biological Records Centre, CWS Citations.<sup>152</sup> Suffolk Biological Records Centre, CWS Citations.<sup>153</sup> Suffolk Biological Records Centre Data<sup>154</sup> SUFFOLK PRIORITY SPECIES AND HABITATS (Suffolk Biodiversity Action Plan) January 2014<sup>155</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/grazingmarsh.pdf><sup>156</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=)



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River Ore 0m	The road crosses the River Ore to the south of the A12, west of John's Broom and Ash Covert.	Regional	Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Ore. River may support both directly and indirectly a large range of valuable species, especially birds and fish.	Unknown <sup>157</sup>	Medium	Potential habitat loss in works area along riverside during construction. Increased pollution (deposition/runoff and silting) during construction and operation Disturbance from noise and lighting during construction and operation.	Intermediate Negative	Moderate adverse
River Deben 500m from the road	Unlikely to be directly affected by the proposed works.	Regional	Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Ore crossing location. River may support both directly and indirectly a large range of valuable species, especially birds and fish.	Unknown <sup>158</sup>	Medium	Pollution effects from operation of road. Reduction in air quality / pollution, primarily from operation.	Neutral	Neutral
Fir Pits Mixed Plantation Woodland 385m east of the road	Fir Pits is a semi-mature mixed plantation woodland located to the west of the route. It is not thought that this will be directly affected by the works.	Local	Important feature for wildlife – may support a range of protected species.	Increasing <sup>159</sup>	Low	Pollution effects from operation of road. Reduction in air quality / pollution, primarily from operation.	Minor Negative	Slight adverse

<sup>157</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

<sup>158</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

<sup>159</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Pound Wood 0m east and west of the road	Strip of woodland linking Great Wood and Nursery plantation. The route bisects this woodland to the north of Button's Road.	Regional	Important for its buffering capacity for Great Wood ASNW and it's connectivity properties. UK and Suffolk BAP <sup>160</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>161</sup>	Medium	Direct habitat loss during construction and operation where the route bisects the woodland. Direct fragmentation/severance of between Great Wood/Pound Wood and Nursery Plantation. Disturbance from noise and lighting during construction and operation.	Major Negative	Moderate Adverse
Nursery Plantation 0m to the east, adjacent to the road immediately to the south of Button's Road	The route passes immediately adjacent to the western corner of this plantation woodland.	Local	UK and Suffolk BAP <sup>162</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>163</sup>	Low	Direct habitat loss during construction where the route runs adjacent to the corner of the woodland. Disturbance from noise and lighting during construction and operation.	Intermediate negative	Slight Adverse

<sup>160</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>161</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>162</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>163</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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John's Broom 30m north of the road	An area of mixed woodland plantation. The route passes between John's Broom and Ash Covert (see below).	Local	UK and Suffolk BAP <sup>164</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>165</sup>	Low	Indirect fragmentation from habitats to the south and east of the road. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation.	Minor Negative	Slight adverse
Ash Covert 110m east of the road	An area of mixed woodland plantation. The route passes between John's Broom and Ash Covert.	Local	UK and Suffolk BAP <sup>166</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>167</sup>	Low	Indirect fragmentation from habitats to the north and west of the road. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation.	Minor Negative	Slight adverse

<sup>164</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>165</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>166</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>167</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Alder Carr 90m north of the road	Deciduous woodland (wet woodland)	Regional	UK and Suffolk BAP <sup>168</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Fluctuating, probably declining <sup>169</sup>	Medium	Indirect fragmentation from habitats to the south and east of the road. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation.	Minor Negative	Slight adverse
Hoo Plantation 415m	Broadleaved Plantation Present to the east of the road.	Local	UK and Suffolk BAP <sup>170</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>171</sup>	Low	Indirect fragmentation from habitats to the south and west of the road. Potential disturbance from noise during construction. Increased pollution (deposition) during construction.	Minor Negative	Slight adverse
<b>Habitats General</b>								

<sup>168</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Wetwoodlands.pdf>

<sup>169</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BD9CF9C18D-2519-4E78-96E2-1C533FAFB6B4%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BD9CF9C18D-2519-4E78-96E2-1C533FAFB6B4%7D&C=3&txtLogout=&flipLang=)

<sup>170</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>171</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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<p>Woodlands (unnamed)                  Within 500m of proposed works</p>	<p>The agricultural landscape is dotted with small pockets of mature semi-natural broadleaved and mixed woodland, copses and old plantation shelter belts – not named. These have well formed canopies including common elm and ash with occasional scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine, alexanders, false oat grass and false brome amongst others.</p> <p>Ten unnamed woodlands and small woodland pockets are present within 500m of the proposed works.</p> <p>Five unnamed small woodland pockets may be impacted by the works.</p> <p>One is located 20m to the west of the road at Hill House, one lies immediately east of the road south of the existing A12, and one comprises small pockets isolated by existing road junctions at Lower Hatcheston where the proposed route will join the A12. The proposed route crosses the corner of a small woodland area at the end of a dismantled railway and adjacent to a water body. A shelter belt to the south of the A12 will be bisected by the proposed road route.</p> <p>One area of unnamed woodland lies 120m to the east of the road, on the eastern side of the A12 at the junction with</p>	<p>Regional</p>	<p>UK and Suffolk BAP <sup>172</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable.</p>	<p>Increasing<sup>173</sup></p>	<p>Medium</p>	<p>Direct impacts:                  Direct habitat loss and direct fragmentation of habitat.</p> <p>Increased pollution (deposition/runoff) during construction and operation.</p> <p>Disturbance from noise and lighting during construction and operation.</p>	<p>Intermediate negative</p>	<p>Moderate Adverse</p>
<p><sup>172</sup> [Available Online, Accessed 22/04/2014]</p> <p><sup>173</sup> [Available Online, Accessed 22/04/2014]</p>	<p>Bullin Road</p> <p>to be affected by the proposed works.</p>	<p><a href="http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx">http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx</a></p>	<p><a href="http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B04E%7D&amp;flipLang=">http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B04E%7D&amp;flipLang=</a></p>					

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<p>Hedgerows</p>	<p>One hedgerow has the potential to be directly affected by the proposed works. This is located to the south of the existing A12, alongside a lane running north-south, joining the A12 to the east of the junction with Marlesford Road.</p> <p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore, understory including stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs.</p>	<p>Local/Regional</p>	<p>UK and Suffolk BAP<sup>174</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	<p>Fluctuating - probably increasing / improving<sup>175</sup></p>	<p>Medium</p>	<p>Direct damage and loss from construction.</p> <p>Fragmentation effects and loss of commuting corridors for wildlife.</p> <p>Pollution effects from operation of road.</p>	<p>Minor Negative</p>	<p>Slight Adverse</p>
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<sup>174</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>175</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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<p>Small tributaries and ditches (unnamed) Within 500m of proposed works</p>	<p>There were multiple small tributaries or ditches within 500m of the road. The majority of these form part of a network of ditches associated with the River Ore, located to the north and south of the point where the road will cross the river. These may be affected by the proposed works, particularly those lying downstream of the works area, beyond which lie multiple sensitive habitats associated with the river. There is also a network of ditches associated with the River Deben within 500m of the road, to the south of the proposed works where the road joins the A12 at Lower Hacheston. These may be affected by the proposed works but the route does not directly cross them.</p> <p>One ditch, associated with field boundaries to the north and south of the road, will be directly affected by the proposed works where the route crosses it. One ditch lies 100m to the east of the proposed route, adjacent to the existing A12 where the proposed route passes through Pound Wood, and is unlikely to be directly affected by the proposed works.</p>	<p>Regional</p>	<p>Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated).</p> <p>Can support a range of protected and valued faunal species including otters and water voles.</p>	<p>Unknown<sup>176</sup> Likely Declining due to agricultural run off, culverting etc</p>	<p>Medium</p>	<p>Direct pollution from construction and operation. Damage / destruction to ditch through construction works. Indirect pollution from run off into culverts and discharges</p>	<p>Intermediate Negative</p>	<p>Moderate Adverse</p>
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<sup>176</sup> [Available Online, Accessed 22/04/2014]

[http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)

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Ponds Within 500m of proposed works	<p>There were twenty six unnamed ponds within 500m of the route. Of these, five are adjacent or very close to the proposed route and are likely to be directly affected by the proposed works.</p> <p>One larger unnamed water body, which has the potential to be directly affected by the works at the proposed route runs adjacent to its north-western margin.</p> <p>One larger water body associated with the River Deben is located 440m to the west of the proposed route where it joins the A12 at Lower Hatcheston. This is unlikely to be affected by the proposed works.</p> <p>The remaining ponds are unlikely to be directly affected by the proposed works.</p>	Regional	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections)	Increasing on a regional scale <sup>177</sup> However, likely declining nationally due to agricultural drainage succession and development	Medium	<p>Directly affected ponds: Direct loss of habitat. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation.</p> <p>Indirect effects: Indirect fragmentation between ponds either side of the new road.</p>	Intermediate Negative	Moderate Adverse
Arable fields	Much of the landscape was under arable cultivation, mostly oil seed rape. Areas immediately to the north and south of the road were utilised for arable agriculture. This habitat is likely to be directly affected by the proposed works.	Local	As a buffer between hedgerows, woodlands and water bodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>178</sup> Likely declining due to development	Low	Habitat Loss due to road construction increased pollution deposition and run off.	Minor Negative	Neutral
Valued Faunal Receptors								

<sup>177</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

<sup>178</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)



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Badger	The majority of woodlands and hedgerow embankments were suitable for setting and the agricultural landscape offers excellent foraging habitat. There are badger records within 500m of the route option.	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>179</sup>	Unknown, likely increasing	Low	Small amounts of foraging habitat loss, RTAs	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids and other woodland species. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark. There is a record of Hen Harrier within 500m of the proposed works, and the area would have suitable barn owl nesting and foraging habitat. Look at Sams protected species tables	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting. Maybe get some general info re bats in the area Look at Sams protected species tables	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>180</sup>	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse

<sup>179</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>

<sup>180</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)

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GCN	There were 26 waterbodies within the route corridor and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins. There are numerous records of GCN in this area.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>181</sup>	Medium	Fragmentation of 5 ponds and terrestrial habitat. Loss of terrestrial habitat	Intermediate Negative	Moderate Adverse
Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles. There are records of common reptiles in the wider area and it is likely that these species would be found in suitable habitat within 500m of the proposed works.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>182</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse
Otter	The River Ore and River Deben, their networks of tributaries and riparian habitat corridors have the potential to support otters, with suitable habitat for otter holts, couches and foraging. There are records of otter within 500m of the proposed works along the River Ore.	Local/Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>183184</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse
Water Vole	The networks of ditches and river tributaries associated with the Rivers Ore and Deben and around field margins have the potential to support water voles. There are records of water vole within 500m of the proposed works area.	Local to Regional (but un-surveyed)	HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>185</sup>	Medium	Potential fragmentation of habitat and habitat loss	Intermediate negative	Moderate adverse

**Summary assessment score: SLIGHT TO MODERATE ADVERSE**<sup>181</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm><sup>182</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain><sup>183</sup> Fifth Otter Survey of England, Environment Agency, 2010<sup>184</sup> SOE State of the Environment (Anglia), Environment Agency 2010)<sup>185</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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Overall, the majority of notable impacts to receptors are slight to moderate adverse.

**Qualitative comments:**

The illustrative alignment for LB3 does not bisect internationally designated sites. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore all though it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Routing SB3 as proposed.

Great Wood CWS which is woodland (within which there is an area of Ancient Woodland) is attached to Pound Wood which is bisected by the route to the north of the existing A12, although from the works do not directly affect the Ancient woodland compartment. The likely impact upon this site may result from direct loss and damage of this habitat, pollution effects from the creation of the road and its operation, fragmentation increased RTA;'s and disturbance to and wildlife associated with the woodland during the construction of the road and its subsequent operation.

The illustrative alignment for LB3 has the potential to affect a number of valued habitat receptors. Construction of this section of the road will likely cause direct habitat loss of hedgerows, multiple woodlands in addition to any effects upon Great Wood CWS. The impacts to these woodlands will vary greatly, however the majority of impacts are assessed as being moderate adverse.

A notable section of hedgerow is be bisected by the LB3 routing, causing fragmentation and damage to this important habitat and reducing its value as a movement corridor for wildlife. There will also be an increase in habitat fragmentation due to the road. This may affect multiple species and groups, but is likely to predominately affect bat commuting routes and increase isolation between ponds (an issue with regards to GCN habitats, if this species is present).

With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodland plantations are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered, especially as there are records of GCN presence in the area. The works have the potential to cause a loss of GCN terrestrial habitat and fragmentation of populations.

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**Table A9:** Option SB4 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score

Capabilities on project:  
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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Sandlings SPA 3711.5m	<p>The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken <i>Pteridium aquilinum</i>, shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.<sup>186</sup></p>	International	<p>Nightjar <i>Caprimulgus europaeus</i>, 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)</p> <p>Woodlark <i>Lullula arborea</i>, 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997)<sup>187</sup></p>	Declining due to bracken invasion however remedial activities/management of bracken will ensure stability <sup>188</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight adverse

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
<b>Great Wood AWI CWS 241.7m</b>	<p>Ancient &amp; Semi-Natural Woodland</p> <p>A very fine ancient woodland surrounded by a ditch and bank and including internal ditch and banks. The structure is one of abandoned coppice with standards. The oak and ash standards have grown very large and are shading the undergrowth; which is principally hazel and ash but with some hornbeam, maple and sallow also present. The rides too, have become overgrown, and no recent management has taken place. The ground flora is rich and a total of 87 species have been recorded. This includes early purple, twayblade and common spotted orchids, and a range of ancient woodland indicators.<sup>189</sup></p>	National	<p>County Designation LBAP<sup>190</sup></p> <p>National, Regional and Local value<sup>191</sup></p>	<p>Stable</p> <p>On a National scale ASNW declining to loss of habitat and lack of management although this woodland is stable favourable<sup>192,193</sup></p>	High	<p>Disturbance from noise and lighting during construction and operation.</p> <p>Increased pollution (deposition) during construction and operation.</p> <p>Fragmentation effects from bisecting of Pound Wood to the south.</p>	Minor Negative	Slight Adverse

<sup>186</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

[Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>187</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>188</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>189</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>190</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/MixedDeciduousWoodland.pdf>

<sup>191</sup> [Available Online, Accessed 22/04/2014]

[http://www.naturalareas.naturalengland.org.uk/Science/natural/NA\\_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=](http://www.naturalareas.naturalengland.org.uk/Science/natural/NA_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Marlesford RNR 0.0m	Roadside nature reserve	Regional	Supports rare fungus Sandy Stiltball ( <i>Battarrea phalloides</i> ) within this site. This species is a legally protected SSP – protected under schedule 8 of WCA (1981, as amended). Protected against intentional picking, uprooting or destruction etc.	Declining – management required <sup>194</sup>	Medium	Direct habitat loss	Major Negative	Moderate Adverse
River Ore 0m	The River Ore lies approximately 220m to the west of the routing.	National	Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Ore crossing location. River may support both directly and indirectly a large range of valuable species, especially birds and fish.	Unknown <sup>195</sup>	High	Potential habitat loss in works area along riverside during construction. Increased pollution (deposition/runoff and silting) during construction and operation Disturbance from noise and lighting during construction and operation.	Minor Negative	Slight Adverse

<sup>192</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>193</sup> [Available Online, Accessed 22/04/2014] <http://www.wbrc.org.uk/atp/Ancient%20Woodland%20Threats%20-%20Woodland%20Trust.pdf>

<sup>194</sup> [Available Online, Accessed 22/04/2014]

<https://www.whatdotheyknow.com/request/8034/response/19402/attach/3/RNR%20Spreadsheet%20PUBLIC%20VERSION%20mar%2009.pdf>

<sup>195</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Coastal and Floodplain Grazing Marsh 141.0m	Located to the west of the proposed routing, associated with the Rive Ore Floodplain.	Regional	Suffolk BAP Habitat <sup>196</sup> Description from SOE EA Anglia 40% of coastal and floodplain grazing marsh held in Anglia <sup>197</sup> Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation	Target 2020	Medium	Increased pollution (deposition/runoff) during construction and operation. Increased, disturbance, noise and lighting during construction and operation.	Minor Negative	Slight Adverse
Fir Pits Mixed Plantation Woodland 385m	Semi-mature mixed plantation woodland lies to the east of the road.	Regional	UK and Suffolk BAP <sup>198</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna. However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>199</sup>	Lower	Disturbance from noise during construction, Increased pollution (deposition) during construction	Neutral	Neutral

<sup>196</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>197</sup> State of the Environment, Environment Agency.

<sup>198</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>199</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Pound Wood 0m east and west of the road	Strip of woodland linking Great Wood and Nursery plantation. The route bisects this woodland to the north of Button's Road.	Regional	UK and Suffolk BAP <sup>200</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna. However, unlike the Ancient Woodland elsewhere in the CWS, this habitat is replaceable.	Increasing <sup>201</sup>	Medium	Direct habitat loss during construction and operation where the route bisects the woodland. Direct fragmentation/severance of between Great Wood/Pound Wood and Nursery Plantation. Disturbance from noise and lighting during construction and operation.	Intermediate negative	Moderate Adverse
Nursery Plantation 0m to the east, adjacent to the road immediately to the south of Button's Road	The route passes adjacent to the western corner of the plantation woodland.	Local	UK and Suffolk BAP <sup>202</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna. However, unlike the Ancient Woodland elsewhere in the CWS, this habitat is replaceable.	Increasing <sup>203</sup>	Low	Direct habitat loss during construction where the route runs adjacent to the corner of the woodland. Disturbance from noise and lighting during construction and operation.	Intermediate negative	Slight Adverse

<sup>200</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>201</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>202</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>203</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
John's Broom 250m south of the road	An area of mixed woodland plantation. The route passes between John's Broom and Ash Covert (see below).	Local	UK and Suffolk BAP <sup>204</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>205</sup>	Low	Disturbance from noise during construction, Increased pollution (deposition) during construction	Neutral	Neutral
Alder Carr 200m south of the road	Deciduous woodland (wet woodland)	Regional	UK and Suffolk BAP <sup>206</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Fluctuating, probably declining <sup>207</sup>	Medium	Indirect fragmentation from habitats to the south and east of the road. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation.	Minor negative	Slight Adverse
Derek's Wood 360m south of the road	Mixed Woodland Copse	Regional	UK and Suffolk BAP <sup>208</sup> Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.	Increasing <sup>209</sup>	Medium	Disturbance from noise during construction, Increased pollution (deposition) during construction	Neutral	Neutral

<sup>204</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>205</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>206</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Wetwoodlands.pdf>

<sup>207</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BDC9C18D-2519-4E78-96E2-1C533FAFB6B4%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BDC9C18D-2519-4E78-96E2-1C533FAFB6B4%7D&C=3&txtLogout=&flipLang=)

<sup>208</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>209</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Habitats General								

Capabilities on project:  
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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Woodlands (unnamed) Within 500m of proposed works	<p>Seven unnamed woodlands and small woodland pockets are present within 500m of the proposed works.</p> <p>Two small woodland pockets are likely to be directly impacted by the works. Of these, one is located 25m to the east of the road at Hill House, and one lies 25m to the west of the road, adjacent to a hedgerow which is bisected by the road.</p> <p>One area of unnamed woodland lies 120m to the east of the road, on the eastern side of the A12 at the junction with Button's Road. This woodland may be affected by the proposed works (??) but the route does not pass through the woodland itself.</p> <p>The agricultural landscape is dotted with small pockets of mature semi-natural broadleaved and mixed woodland, copses and old plantation shelter belts – not named. These have well formed canopies including common elm and ash with occasional scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine,</p>	Regional	<p>UK and Suffolk BAP <sup>210</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable.</p>	Increasing <sup>211</sup>	Medium	<p>Direct impacts:</p> <p>Direct habitat loss and direct fragmentation of habitat.</p> <p>Increased pollution (deposition/runoff) during construction and operation.</p> <p>Disturbance from noise and lighting during construction and operation.</p>	Intermediate Negative	Moderate Adverse
	<p><sup>210</sup> [Available Online, Accessed 22/04/2014] <a href="http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx">http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx</a></p> <p><sup>211</sup> [Available Online, Accessed 22/04/2014] <a href="http://ukpars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&amp;C=3&amp;txtLogout=&amp;filLang=">http://ukpars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&amp;C=3&amp;txtLogout=&amp;filLang=</a></p>							

Capabilities on project:

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Hedgerows	<p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore, understorey including stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs.</p> <p>Two hedgerows are likely to be directly affected by the works, both being bisected by the proposed route. These hedgerows lie to the north of the existing A12, one running either side of Keeper's lane, and the other forming a field boundary to the north of Shop Lane.</p>	Local/Regional	<p>UK and Suffolk BAP<sup>212</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>213</sup>	Low/Medium	<p>Direct habitat loss and direct fragmentation of habitat.</p> <p>Increased pollution (deposition/runoff) during construction and operation.</p> <p>Disturbance from noise and lighting during construction and operation.</p>	Minor Negative	Slight Adverse

<sup>212</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>213</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Small tributaries and ditches (unnamed) Within 500m of proposed works	<p>There were multiple small tributaries or ditches within 500m of the road. The majority of these form part of a network of ditches associated with the River Ore, located to the north and south of the point where the road will join the A12. The closest of these ditches is located 25m to the south of the road.</p> <p>One ditch, associated with field boundaries to the north and south of the road, will be directly affected by the proposed works where the route crosses it. One ditch lies 100m to the east of the proposed route, adjacent to the existing A12 where the proposed route passes through Pound Wood, and is unlikely to be directly affected by the proposed works.</p> <p>There are a number of small ditches and tributaries in the area these are generally low flow at the time of survey and some had dry beds. Obviously rapid flow through during heavy rain as erosion was noted. Occasional in water vegetation such as water cress was noted.</p>	Regional	<p>Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated). Can support a range of protected and valued faunal species including otters and water voles.</p>	<p>Unknown<sup>214</sup>          Likely Declining due to agricultural run off, culverting etc.</p>	Medium when considered in context of downstream importance	<p>SB4 crosses few tributaries than other routes.          Indirect pollution from run off into culverts and discharges</p>	Minor Negative	Slight Adverse

<sup>214</sup> [Available Online, Accessed 22/04/2014]

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Ponds Within 500m of proposed works	There were 21 unnamed ponds within 500m of the works. Of these, five are adjacent or very close to the proposed route and are likely to be directly affected by the proposed works.	Regional	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections). Potential for replacement of this habitat feature.	Increasing on a regional scale <sup>215</sup> However, likely declining nationally due to agricultural drainage succession and development	Medium	Directly affected ponds: Direct loss of habitat. Increased pollution (deposition/runoff) during construction and operation. Disturbance from noise and lighting during construction and operation. Indirect effects: Indirect fragmentation between ponds either side of the new road.	Intermediate Negative	Moderate Adverse
Arable fields	Much of the landscape was under arable cultivation, mostly oil seed rape. Areas immediately to the north and south of the road were utilised for arable agriculture. This habitat is likely to be directly affected by the proposed works.	Local	As a buffer between hedgerows, woodlands and waterbodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>216</sup> Likely declining due to development	Low	Habitat fragmentation Disturbance from noise and lighting during construction and operation. Increased pollution (deposition/runoff) during construction and operation.	Minor Negative	Slight Adverse
<b>Valued Faunal Receptors</b>								

<sup>215</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

<sup>216</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

Capabilities on project:  
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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Badger	The majority of woodlands and hedgerow embankments were suitable for setting and the agricultural landscape offers excellent foraging habitat. There are badger records within the wider area and it is likely that badgers may be found in suitable habitat within 500m of the proposed works.	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>217</sup>	Unknown, likely increasing	Low	Small amounts of foraging habitat loss, RTAs, potential sett loss.	Minor Negative	Slight Adverse
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids and other woodland species. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark. There is a record of Hen Harrier within 500m of the proposed works, and the area would have suitable barn owl nesting and foraging habitat	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse

<sup>217</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>



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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting bats. The farmland buildings and mature trees are likely to be suitable for roosting. There are multiple records of bats in the area.	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>218</sup>	Varies dependant upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse
GCN	There were 21 waterbodies within the route corridor and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins. There are numerous records of GCN in this area.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>219</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	Intermediate negative	Moderate adverse
Common Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles. There are records of common reptiles in the wider area and it is likely that these species would be found in suitable habitat within 500m of the proposed works.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>220</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse

<sup>218</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)

<sup>219</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm>

<sup>220</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of Impact	Magnitude of impact	Assessment score
Otter	The River Ore, its network of tributaries and riparian habitat corridor have the potential to support otters, with suitable habitat for otter holts, couches and foraging. There are records of otter within 500m of the proposed works along the River Ore.	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>221222</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse
Water Vole	The networks of ditches and river tributaries associated with the River Ore and around field margins have the potential to support water voles. There are records of water vole within 500m of the proposed works area.	Local to Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>223</sup>	Medium	Potential fragmentation of habitat and habitat loss	Minor negative	Slight Adverse
Fish & Aquatic Inverts	Freshwater habitats including rivers, ponds, ditches, streams and large open water bodies have the potential to support a wide range of aquatic invertebrates important to biodiversity.	Local (but un-surveyed)	Varies dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score: SLIGHT ADVERSE**

Overall, the majority of notable impacts to receptors are slight adverse.

**Qualitative comments:**

<sup>221</sup> Fifth Otter Survey of England, Environment Agency, 2010

<sup>222</sup> SOE State of the Environment (Anglia), Environment Agency 2010)

<sup>223</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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The illustrative alignment for SB4 does not bisect internationally designated sites. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore all though it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Routing SB4 as proposed.

Great Wood CWS which is woodland (on the Ancient Woodland Inventory) that is attached to Pound Wood which is bisected by the works, although from the works do not directly affect the Ancient woodland compartment. The likely impact upon this site may result from direct loss and damage of this habitat, pollution effects from the creation of the road and its operation, increased RTA;'s and disturbance to and wildlife associated with the woodland during the construction of the road and its subsequent operation.

The illustrative alignment for SB4 has the potential to affect a number of valued habitat receptors. There will be fragmentation of some woodlands and numerous ponds. A notable section of hedgerow is be bisected by the SB4 routing, causing fragmentation and damage to this important habitat and reducing its value as a movement corridor for wildlife. Habitat fragmentation may affect multiple species and groups, but is likely to predominately affect bat commuting routes and increase isolation between ponds (an issue with regards to GCN habitats, if this species is present).

With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodland plantations are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered, especially as there are records of GCN presence in the area. The works have the potential to cause a loss of GCN terrestrial habitat.

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Table A10: Option SB5 WebTAG Table

Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Foxburrow Wood Ancient Woodland 11.4m	<p>Ancient &amp; Semi-Natural Woodland Species present included Bluebells, muscatel, beech, ash, elm, hazel, field maple, elder, dog's mercury, foxglove, lords-and-ladies, silver birch, larch, Scots pine, cherry laurel.</p> <p>Log piles present, dead wood present, dry ditch around the woodland (findings from site visit).</p>	National	<p>County Designation LBAP<sup>224</sup> National, Regional and Local value<sup>225</sup></p>	<p>Stable On a National scale ASNW declining to loss of habitat and lack of management although this woodland is stable favourable <sup>226,227</sup></p>	High	<p>Direct loss of habitat type Intermediate Negative Potential direct damage and loss from construction due to close proximity. Pollution effects from operation of road. Reduction in air quality / pollution, primarily from operation.</p>	Intermediate negative	Large Adverse

<sup>224</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/MixedDeciduousWoodland.pdf>

<sup>225</sup> [Available Online, Accessed 22/04/2014]

[http://www.naturalareas.naturalengland.org.uk/Science/natural/NA\\_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=](http://www.naturalareas.naturalengland.org.uk/Science/natural/NA_HabMap.asp?Name=East+Anglian+Plain&N=50&H=9&HName=Lowland+mixed+deciduous+woodland&S=&R=)

<sup>226</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>227</sup> [Available Online, Accessed 22/04/2014] <http://www.wbrc.org.uk/atp/Ancient%20Woodland%20Threats%20-%20Woodland%20Trust.pdf>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Alde-Ore Estuary RAMSAR 3460.2m	An estuary complex of three rivers comprising various habitats including intertidal mudflats, saltmarsh, a vegetated shingle spit, saline lagoons, and semi-intensified grazing marsh. The site supports nationally scarce plants and invertebrates and notable assemblages of breeding and wintering wetland birds. <sup>228</sup>	International	International Designation (Ramsar, SAC) National Designation (SSSI) Important in the Anglian Region  "The second-largest and best-preserved example of vegetated shingle in Britain. A unique feature for East Anglian beaches is the abundance on the ground of normally epiphytic lichens." <sup>229</sup>	Some parcels favourable some unfavourable  A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze.  Being closely monitored though as a SSSI with appropriate management plans <sup>230</sup>	Very High	Indirect impacts from pollution and reduction in air quality both whilst constructing the route and during operation.	Minor negative	Slight Adverse

<sup>228</sup> [Available Online, Accessed 22/04/2014] [http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-documents-list-anno-uk/main/ramsar/1-31-218%5E15868_4000_0__)

<sup>229</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/Docs/UKBAP\\_BAPHabitats-10-CoastVegShingle.doc](http://jncc.defra.gov.uk/Docs/UKBAP_BAPHabitats-10-CoastVegShingle.doc),

[Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/coastalvegshingle.pdf>

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<sup>230</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Alde-Ore & Butley Estuaries SAC 3460.2m	The SAC comprises extensive intertidal mudflats on both sides of the Alde River channel in its upper reaches and saltmarsh accreting along its fringes. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed. <sup>231</sup>	International	International Designation Supports a range of important habitats (and associated fauna). Habitats include but are not limited to : mudflats and sandflats not covered by seawater at low tide; tidal rivers, estuaries. <sup>232</sup>	Some parcels favourable some unfavourable A mixture of issues, disturbance, poor pest control, grazing (poaching), agriculture and vehicle damage, dredging, engineering works, pollution or bait digging, coastal squeeze. Being closely monitored though as a SAC with appropriate management plan <sup>233</sup>	Very High	Indirect impacts from pollution and reduction in air quality both whilst constructing the route and during operation.	Minor negative	Slight Adverse

<sup>231</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030076>

<sup>232</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC\\_tcm6-31816.pdf](http://www.naturalengland.org.uk/Images/UK0030076-Alde-Ore-and-Butley-Estuaries-SAC_tcm6-31816.pdf)

<sup>233</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Sandlings SPA 2489.4m	The Sandlings SPA lies near the Suffolk coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken <i>Pteridium aquilinum</i> , shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark <i>Lullula arborea</i> and Nightjar <i>Caprimulgus europaeus</i> have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground. <sup>234</sup>	International	Nightjar <i>Caprimulgus europaeus</i> , 109 pairs representing at least 3.2% of the breeding population in Great Britain (Count as at 1992)  Woodlark <i>Lullula arborea</i> , 154 pairs representing at least 10.3% of the breeding population in Great Britain (Count as at 1997) <sup>235</sup>	Declining due to bracken Invasion however remedial activities/ management of bracken will ensure stability <sup>236</sup>	Very High	Indirect pollution from construction and operation	Minor negative	Slight Adverse

<sup>234</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)  
 [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>

<sup>235</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA\\_tcm6-32228.pdf](http://www.naturalengland.org.uk/Images/UK9020286-Sandlings-SPA_tcm6-32228.pdf)

<sup>236</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/page-2084-theme=default>



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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
	The Alde-Ore Estuary is located on the Suffolk coast in eastern England. It comprises the estuarine complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There is a variety of habitats including intertidal mud-flats, saltmarsh, vegetated shingle		High  During the breeding season site supports a number of important bird species including:  - Avocet <i>Recurvirostra avosetta</i> , 104 pairs representing at least 17.6% of the breeding population in Great Britain (5 year mean, 1990-1994)  - Little Tern <i>Sterna albifrons</i> , 48 pairs representing at least 2.0% of the breeding population in Great Britain (5 count mean, 1993-4, 1996-8)  - Marsh Harrier <i>Circus aeruginosus</i> , 3 pairs representing at least 1.9% of the breeding population in Great Britain (5 year mean, 1993-4, 1996-8)	Some parcels favourable some unfavourable				

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Foxburrow Wood CWS 10m	This is an ancient wood on sandy soils with a variety of tree species including oak, ash and beech (some of which are very mature) in the canopy and also hazel, field maple, hawthorn and hornbeam coppice. In the shrub layer, elder and holly are also present. The perimeter of the wood is marked by a ditch and bank boundary with one very old oak pollard on the northern edge. The ground flora includes ferns and carpets of bluebell, with dog's-mercury dominant in parts.	National	Important Irreplaceable Ancient Woodland on Sandy Soil	Stable On a National scale ASNW declining to loss of habitat and lack of management although this woodland is stable favourable 240,241	High	Direct fragmentation and loss of connectivity to wider Environment (Pond wood) Deposition of air pollution.	Intermediate negative	Large adverse

<sup>237</sup> [Available Online, Accessed 22/04/2014] <http://jncc.defra.gov.uk/default.aspx?page=2010>

<sup>238</sup> [Available Online, Accessed 22/04/2014] [http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Ore-Estuary-SPA\\_tcm6-32208.pdf](http://www.naturalengland.org.uk/Images/UK9009112-Alde%E2%80%93Ore-Estuary-SPA_tcm6-32208.pdf)

<sup>239</sup> [Available Online, Accessed 22/04/2014] [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1003208%20](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208%20)

<sup>240</sup> Suffolk Biological Records Centre, CWS Citations.

<sup>241</sup> [Available Online, Accessed 22/04/2014] <http://www.wbrc.org.uk/atp/Ancient%20Woodland%20Threats%20-%20Woodland%20Trust.pdf>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Farnham Churchyard CWS 404.7m	In addition to many fairly common wild flowers the site also supports a number of scarce Suffolk plants. Orpine, which grows here in abundance is a declining species throughout Suffolk. Grass vetchling which is scattered throughout the churchyard is also uncommon in Suffolk and is mainly restricted to a few sites on the coast. <sup>242</sup>	Regional	Supports scarce Suffolk plants. Farnham Churchyard provides a valuable refuge for wildlife in an intensively farmed landscape. <sup>243</sup>	Declining Although parts of the churchyard are cut annually, the cuttings are left lying and a thatch has developed, smothering some of the less vigorous plants. <sup>244</sup>	Medium	Indirect impacts from pollution and reduction in air quality both whilst constructing the route and during operation.	Minor negative	Slight adverse
Coastal and Floodplain Grazing Marsh 0.0m	Routing of proposed road runs through areas of floodplain grazing marsh adjacent to the River Alde. <sup>245</sup>	Regional	Listed on Suffolk BAP <sup>246</sup> Provides a variety of ecosystem services including biodiversity, grazing, flood attenuation. Can contain a range of habitats which support multiple valuable and protected species, including water vole and common reptiles. <sup>247</sup>	Increasing <sup>248</sup>	Medium	Direct loss of habitat type	Major negative	Moderate adverse

<sup>242</sup> Suffolk Biological Records Centre CWS Citations<sup>243</sup> Suffolk Biological Records Centre CWS Citations<sup>244</sup> Suffolk Biological Records Centre CWS Citations<sup>245</sup> Suffolk Biological Records Centre<sup>246</sup> SUFFOLK PRIORITY SPECIES AND HABITATS (Suffolk Biodiversity Action Plan) January 2014<sup>247</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/grazingmarsh.pdf>

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
River Alde	<p>Proposed routing bisects the river and multiple small tributaries. Direct impacts likely and any impacts may affect the SAC and SPA (River Alde - Ore Estuary) downstream.</p> <p>At proposed crossing point, river is approximately 3m wide with steep sided grassy banks. The river banks also have a belt of trees containing oak, alder and willows.</p>	National	<p>Provides a variety of ecosystem services including biodiversity, flood attenuation. Important Natura 2000 designated sites are directly downstream of the Alde.</p> <p>River may support both directly and indirectly a large range of valuable species, especially birds and fish.</p>	Unknown <sup>249</sup>	High	<p>Pollution both direct and indirect resulting from construction and operation.</p> <p>Direct loss of river habitat and riparian margin from construction.</p>	Intermediate Negative	Moderate Adverse
Roundyard Wood 450m	Deciduous plantation located to the south-west of the routing.	Local	<p>UK and Suffolk BAP<sup>250</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable.</p>	Increasing <sup>251</sup>	Lower	Reduction in air quality / pollution, primarily from operation.	Minor negative	Slight adverse

<sup>248</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7BE7D29822-8D7F-4798-9731-8262D355DB51%7D&C=3&txtLogout=&flipLang=)

<sup>249</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B5D01FE34-992A-400C-9B95-6DB23C3012B5%7D&C=3&txtLogout=&flipLang=)

<sup>250</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>251</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Stratford Plantation 150m	Stratford Plantation woodland lies approximately 150m to the west of the routing. It is considered unlikely that the site will be directly impacted by the road under the current proposals.	Local	UK and Suffolk BAP <sup>252</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>253</sup>	Lower	Reduction in air quality / pollution, primarily from operation.	Minor negative	Slight adverse
Pond Wood 0.0m	Pond wood would be bisected by the proposed routing. This wood is a broad-leaved semi natural woodland.	Regional	UK and Suffolk BAP <sup>254</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>255</sup>	Medium	Direct damage and loss from construction.  Pollution effects from operation of road.  Reduction in air quality / pollution, primarily from operation.  Noise and Disturbance also  Fragmentation from Nuttery Belt	Intermediate Negative	Moderate Adverse

<sup>252</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>253</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>254</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>255</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Benhall Lodge Park, Butchers Hole 250m	A complex of small woodlands is present to the north of the proposed works at the far eastern extension of the route. Benhall Lodge which lies immediately to the north of the road consists of a mixed woodland plantation and has the potential to be directly impacted by the works.	Regional	UK and Suffolk BAP <sup>256</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>257</sup>	Medium	None	Neutral	Neutral
Nuttery Belt 0.0m	Broad-leaved semi-natural woodland, with open hawthorn understory.	Regional	UK and Suffolk BAP <sup>258</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>259</sup>	Medium	Direct damage and loss from construction. Pollution effects from operation of road. Reduction in air quality / pollution, primarily from operation. Noise and Disturbance also Fragmentation from Pond Wood	Intermediate Negative	Moderate Adverse

<sup>256</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>257</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>258</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>259</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Whin Covert 200m	Broadleaved plantation	Local	UK and Suffolk BAP <sup>260</sup>  Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.  However, unlike Ancient Woodland, this habitat is replaceable.	Increasing <sup>261</sup>	Lower	Reduction in air quality / pollution, primarily from operation.  Increased noise and disturbance	Minor negative	Slight adverse
<b>Habitats General</b>								

<sup>260</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>261</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Woodlands (unnamed)	<p>One small unnamed woodland is bisected by the proposed routing, a direct effect of the works. A further ten unnamed woodlands are present within 500m of the routing, and multiple small unnamed woodland copses and shelter belts. There is potential for these to be directly affected by the works.</p> <p>These woodland features vary greatly in character but generally have well formed canopies including common elm and ash with occasional scots pine and larch and understories of hawthorn and elder with ground layers of violet, primrose, nettle, lords and ladies, lesser celandine, alexanders, false oat grass and false brome amongst others</p>	Regional	<p>UK and Suffolk BAP<sup>262</sup></p> <p>Provide a wide range of ecosystem services, botanically rich and may support a range of wildlife, including Badger and other valued / protected flora and fauna.</p> <p>However, unlike Ancient Woodland, this habitat is replaceable.</p>	Increasing <sup>263</sup>	Medium	<p>Direct damage and loss from construction.</p> <p>Fragmentation</p> <p>Pollution effects from operation of road.</p> <p>Reduction in air quality / pollution, primarily from operation.</p> <p>Increased noise and disturbance</p>	Intermediate Negative	Moderate Adverse
Hedgerows	<p>Two noted hedgerows are directly bisected by the proposed routing of SB5. Multiple additional hedgerows are present within 500m of the routing and may be affected by the works.</p> <p>The hedgerows are species rich with a mixture of blackthorn, hawthorn, elder, common elm, hornbeam, dog rose, ash, field maple, sycamore, understorey including lesser stitchwort, lords and ladies, primrose, lesser celandine and other shade tolerant herbs (information from site visit).</p>	Local/Regional	<p>UK and Suffolk BAP<sup>264</sup></p> <p>Provide a wide range of ecosystem services; including connectivity, are botanically rich and the soils have been under shade for hundreds of years.</p> <p>Especially important as corridors for commuting species including bats.</p>	Fluctuating - probably increasing / improving <sup>265</sup>	Low/Medium	<p>Direct damage and loss from construction.</p> <p>Fragmentation effects and loss of commuting corridors for wildlife.</p> <p>Pollution effects from operation of road.</p>	Minor Negative	Slight Adverse

<sup>262</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>263</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B847A5BC7-42E4-4B19-8DA5-00A6E025B5D2%7D&C=3&txtLogout=&flipLang=)

<sup>264</sup> [Available Online, Accessed 22/04/2014] <http://www.suffolkbiodiversity.org/biodiversity-action-plans.aspx>

<sup>265</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/status/species\\_habitat\\_nat\\_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=](http://ukbars.defra.gov.uk/archive/status/species_habitat_nat_trends.asp?X=%7B39331CD6-CDC5-43FD-BC15-3DA13567940D%7D&C=3&txtLogout=&flipLang=)



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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Small tributaries and ditches (unnamed)	Three small tributaries of the River Alde are bisected by the routing. Multiple tributaries of the Alde and other unnamed drainage ditches are present within 500m of the works and have the potential to be impacted by the works.	Local	Provide important local flood attenuation. Impacts upon these features can have downstream impact upon rivers and estuaries (i.e. the Alde Ore Estuary which is internationally designated). Can support a range of protected and valued faunal species including otters and water voles.	Unknown <sup>266</sup> Likely Declining due to agricultural run off, culverting etc	Medium	Direct pollution from construction and operation. Damage / destruction to ditch through construction works. Indirect pollution from run off into culverts and discharges	Intermediate Negative	Moderate Adverse
Ponds	Seventeen ponds are present within 500m of the proposed routing. Ten of the ponds are to the north of the routing, seven are to the south. The closest pond is located 80m to the north of the routing within Pond Wood.	Local	Add heterogeneity to the landscape and provide habitat for aquatic macro fauna (other biodiversity benefits will be discussed within the faunal sections). Potential for replacement of this habitat feature.	Increasing on a regional scale <sup>267</sup> However, likely declining nationally due to agricultural drainage succession and development	Medium	Main potential impact is indirect, resulting from fragmentation of ponds from each other and the wider environment.	Intermediate Negative	Moderate Adverse

<sup>266</sup> [Available Online, Accessed 22/04/2014]

[http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?C=3&X=%7BA840CF0D%2DBD81%2D4D44%2D87AB%2D594DBAD57F55%7D)

<sup>267</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2008.asp?X=%7B137E07AE-58A8-4256-9B10-9F5B7A390015%7D&C=3&flipLang=&txtLogout=)

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Arable fields	The majority of the landscape within 500m of the routing was arable field. These habitats may be directly impacted by the routing.	Local	As a buffer between hedgerows, woodlands and waterbodies this habitat provides a relatively undisturbed background to more valuable habitats. Probably under this landuse for hundreds of years. Can support valuable fauna and flora including bird species.	Unknown <sup>268</sup> Likely declining due to development	Low	Small amounts of habitat loss due to construction. Increased pollution deposition and run off from operation of road.	Minor Negative	Slight Adverse
<b>Valued Faunal Receptors</b>								
Badger	The majority of woodlands and hedgerow embankments were suitable for setting the agricultural landscape offers excellent foraging habitat.	Local (but un-surveyed)	Badgers will use the wooded areas and drainage ditches for setting and the agricultural landscape for foraging and commuting. This species is legally protected by the Protection of badgers Act 1992 <sup>269</sup>	Increasing	Low	Small amounts of foraging habitat loss, potential loss of setts, increased risk of RTA;s post construction.	Minor Negative	Slight Adverse

<sup>268</sup> [Available Online, Accessed 22/04/2014] [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals\\_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals_2005.asp?X=%7B5364AEF4-6D6B-4DBE-B308-41E002E6F87C%7D&C=3&flipLang=&txtLogout=)

<sup>269</sup> [Available Online, Accessed 22/04/2014] <http://www.legislation.gov.uk/ukpga/1992/51/contents>

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Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Nesting birds	The majority of woodlands and hedgerow embankments were suitable for nesting birds such as blue tit, tree sparrow, blackbird, corvids etc.. The improved and semi-improved grasslands were suitable for ground nesting birds such as sky lark.	Local (but un-surveyed)	WCA, WCA1 and BOCC Many still common species are under decline throughout the country due to habitat loss and noise pollution.	Varies dependent upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of foraging and nesting areas	Minor Negative	Slight Adverse
Bats	The majority of woodlands and hedgerow embankments were suitable for foraging and commuting by bats. The farmland buildings and mature trees are likely to be suitable for roosting. Records of bats are present within 500m of the proposed routing. <sup>270</sup>	Local (but un-surveyed)	EPS, HDir, WCA5, S42, Bonn, Bern, LBAP Many still common but declining due to habitat loss, common pipistrelle recovering UKBAP Suffolk BAP <sup>271</sup>	Varies dependent upon species	Vary dependent upon species (can be high)	Disturbance and increased RTAs, loss of commuting route and foraging areas.	Minor Negative	Slight Adverse
GCN	There were seventeen water bodies within the route corridor and these have potential to support breeding habitat for GCN. There is suitable connecting terrestrial habitat in the form of hedgerows and narrow field margins.	Local/Regional depending on pond numbers	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>272</sup>	Medium	Fragmentation of habitat. Loss of terrestrial habitat	<b>Intermediate negative</b>	Moderate adverse
Common Reptiles	The field margins, riparian corridors and hedgerows have the potential to support common reptiles.	Local (but un-surveyed)	WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>273</sup>	Low	Loss of habitat, disturbance	Minor Negative	Slight Adverse

<sup>270</sup> Suffolk Biological Records Centre Data.<sup>271</sup> [Available Online, Accessed 22/04/2014] [http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027\\_03\\_12.pdf](http://www.suffolkbiodiversity.org/content/suffolkbiodiversity.org/PDFs/action-plans/Suffolk%20Grouped%20Bat%20Action%20Plan%20final%20%2027_03_12.pdf)<sup>272</sup> [Available Online, Accessed 22/04/2014] <http://www.wildlifetrust.org.uk/urban/ecorecord/bap/html/gcnewt.htm><sup>273</sup> [Available Online, Accessed 22/04/2014] <http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-reptiles-amphibians/status-britain>

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Step 2		Step 3		Step 4		Step 5		
Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Type of impact	Magnitude of impact	Assessment score
Otter	There is potential for otter to be present in the River Alde, which may be affected by the routing.	Local/Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, CITES, Suffolk BAP	Increasing <sup>274</sup>	Medium	Disturbance, effects from pollution and habitat loss.	Minor Negative	Slight Adverse
Water Vole	Water vole may be present in the ditches within the River Alde floodplain and tributaries of the River Alde.	Local/Regional (but un-surveyed)	EPS, HDir, WCA5, S42, UKBAP, Bern, LBAP	Declining <sup>276</sup>	Medium	Potential fragmentation of habitat and habitat loss	Intermediate negative	Moderate adverse
Fish & Aquatic Invertebrates	Fish and aquatic invertebrates are likely to be supported by the River Alde and it's associated habitats (tributaries and interconnected ditches)	Local (but un-surveyed)	Varies dependent upon species	Vary dependent upon species	Vary dependent upon species	Disturbance and habitat damage from construction, pollution effects from operation	Minor negative	Slight Adverse

**Reference Source(s):** WebTAG unit A3 environmental impact appraisal, Department for Transport, October 2013

**Summary assessment score:** MODERATE to LARGE ADVERSE

The routing for SB5 impacts upon a range of receptors. Overall, the largest impact, is on Foxburrow wood which would not be easily mitigated, multiple fragmentation of woodlands, ponds and watercourses is a significant issue.

**Qualitative comments:**

The illustrative alignment for SB5 does not bisect internationally designated sites. Internationally designated sites are present within 5km of the routing, although the closest of these is over 3km from the proposed works they are hydrologically linked to the drainage systems in the areas therefore all though it is considered unlikely there is a small chance that these designated sites would be adversely impacted by Routing SB5 as proposed. Foxburrow Wood Ancient Woodland, which is designated as both an Ancient Woodland and a CWS, is approximately 10m from the works and the working corridor would likely cause direct adverse effects. The likely impact upon this woodland may result from direct loss and damage of this habitat, pollution effects from the creation of the road and its operation, increased RTA's and disturbance to and wildlife associated with the woodland during the construction of the road and its subsequent operation.

The illustrative alignment for SB5 has the potential to affect a number of habitats. Construction of this section of the road will likely cause direct habitat loss of arable fields and sections of three woodlands in addition to any effects upon Foxburrow Wood Ancient Woodland. Two notable sections of hedgerow are to be bisected by the SB5 routing, causing fragmentation and damage to this important habitat and reducing its value as a movement corridor for wildlife. There will also be an increase in habitat fragmentation due to the road. This may affect multiple species and groups, but is likely to predominately affect bat commuting routes and increase isolation between ponds (an issue with regards to GCN habitats, if this species is present).

<sup>274</sup> Fifth Otter Survey of England, Environment Agency, 2010

<sup>275</sup> SOE State of the Environment (Anglia), Environment Agency 2010)

<sup>276</sup> [Available Online, Accessed 22/04/2014] [http://jncc.defra.gov.uk/\\_speciespages/115.pdf](http://jncc.defra.gov.uk/_speciespages/115.pdf)

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With regards to valued fauna, the routing is likely to affect a number of species and groups. The woodland plantations are likely to support badgers and nesting birds, and common reptiles are likely to be present within any field or woodland edge habitats. A number of ponds are present in the vicinity of the routing, therefore the potential presence of GCN must be considered, especially as there are records of GCN presence in the area. The works have the potential to cause a loss of GCN terrestrial habitat. Water vole may also be moderately adversely affected due to the multiple tributaries crossed.

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## Appendix 2.3B – Site Survey Target Notes

**Table A11: A12 Four Villages**

Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
TN1	TM 32560 57325	Road passes through rough shelter belt  Mixed SN through “existing” gaps in hedge to right of broad-leaved semi-natural woodland. Although probably planted originally	Setting badger and foraging bats	Orange LB3
TN2	River Ore TM 32280 58022	Coastal and floodplain grazing marsh will be severed south of the existing road.  Species: Red dead nettle, false oatgrass, soft rush, creeping buttercup, lesser celandine, dock, nettle, comfrey, Yorkshire fog, dandelion  River — 3m wide, low flow, clear pebbly bottom, 40cm deep, with steep banks lined with mature alder and willow.  Other species on the banks of the river include: hogweed, dock, cow parsley, nettle, ramsons, red dead nettle, reed sweet grass and leads to floodplain grazing marsh soft rush, creeping bent, Yorkshire fog grass and common comfrey.	Potential for otter and water vole, foraging, commuting and roosting bats and potentially ground nesting birds.	Orange LB3
TN13	TM 36853 60571	Crosses one water course; increasing fragmentation of plantation woodland.  Mix – north deciduous young soil, then deciduous south semi	Low potential for badger setting.  Potential for reptiles and nesting birds.  Terrestrial habitat for GCN	Link1

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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
		<p>mature</p> <p>Young ~ 20 years plantation woodland, deciduous one side of road, mixed on the other as shown on OS map.</p> <p>Species: Sycamore, maple, elder, sweet chestnut, oak, gorse.</p>		
TN3	TM 33547 58214	<p>Punching through two hedgerows, both flailed with standard trees.</p> <p>Species; oak, ash, elm, field maple, elder, hawthorn, blackthorn, dog rose, honeysuckle, lords and ladies, lesser celandine, hogweed, primrose, dogwood, cleavers, creeping bent, devil's bit scabious scabious, flase oatgrass, cow parsley, nettle,</p> <p>Road track with ditches and hedges both sides. Some old oaks with bat potential. Reptiles – sub-optimal habitat except where margins wider and set-aside.</p> <p>Southern hedge with ditch: Field maple, ash, hawthorn, dogwood.</p> <p>Moves through an improved pasture landscape with large mature hedgerows here SB4 going through a large hedge dominated by blackthorn, with mature trees etc.</p>	<p>Mature oak trees with potential for roosting bats.</p> <p>Low-medium potential for reptiles.</p>	Red SB4

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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
TN4	TM 33919 58414	Point where routes LB3 and SB4 intersect arable fields and hedgerows.	Reptiles, nesting birds commuting and foraging bats and badger	LB3 SB4
TN5	TM 33919 58414	Pound Woodland connected to Great Wood CWS. Species: ash, oak, elm, with elder and hawthorn understorey. Ground flora typical of that in the area with nettles, lesser celandine and dog's mercury. Also some introduced shrub which may be snowberry.  Mature hedgerows either side of road access with large mature oak trees either side.	Suitable for setting badger, nesting birds and foraging commuting and roosting bat	Red SB4
TN6		Hedgerow hawthorn mainly, to south of track. Pasture contains 4 oak trees, 1 dead, very good bat potential. No field boundary hedge between pasture and rapt field. Wood to north west is Great Wood.	Potential for roosting bats in oak trees.	Where red and orange routes meet A12. SB4, LB3
TN7	TM 35322 59824	Bank surrounding an arable field (oil seed rape) to north of existing track with abundant alexanders. Hedge only present for half the bank.	Nesting birds and low potential for reptiles	Green SB2
TN8	TM 35524 60364	At this point there are numerous hedges where the road would pass through then some gaps in the existing hedgerow one can see floodplain/grazing marsh to the north of this point ungrazed currently	Reptiles and ground nesting birds	Green SB2



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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
		with a sward height of around 60cm..		
TN9	TM 35589 60575	Potential for a roundabout at this point. The road would pass through grazing pasture (for horses) with more floodplain grazing marsh to the north and scattered trees. Would pass through hedgerow on the north side of the existing track		Green SB2
TM10	River Alde TM 35936 60327	<p>Bridge over river at this point. Mature tree lined banks surrounded with semi-improved grassland. Alder, oak and willow trees alongside bank.</p> <p>River Alde, 3m wide and of unknown depth (due to turbidity), with cloudy water carrying suspended solids. Grassy, steep-sided bank with cattle poaching, lined with mature alder, oak and willow.</p> <p>Riparian species include: white dead nettle, ramsons, cow parsley, dogs mercury, garlic mustard, nettle and lesser celandine</p> <p>Species: Hawthorn, garlic mustard, lesser celandine on bank. Orange tip butterfly.</p> <p>River Alde tributary, 1.5m wide and 50-60cm depth, with still water and grassy sloping banks.</p>	<p>Potential for otter including holts and couches and water vole. And roosting and foraging/commuting bats.</p> <p>Badger foraging habitat</p> <p>High potential for great crested newts, and potential for water vole in the tributaries.</p>	Pink SB1

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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
		Riparian species: Nettles, lords and ladies, red dead nettle, elder.		
TN12	TM 36300 60637	Gappy defunct hedges on either side of track the green route to the east of this location wood skirt a small woodland area belonging to the house.  Bisects gappy hedge with mature trees e.g. Lombardy poplar, and grassy banks.  Species: Yorkshire fog, lords and ladies, mouse ear, white dead nettle, teasel.		Green SB2
TN 13	TM 36853 60571 WP 25	Young plantation woodland, on both sides of the road with semi-improved grassland in between. Plantation tree species include field maple, cherry, sweet chest nut trees mainly, and oak. Elder understorey and, sycamore regeneration.		Link1
TN16 (Foxburrow Wood)	TM 36733 59805	This area has a track with overgrown hedge dominated by hawthorn, and blackthorn with arable either side. Very old oak tree suitable for roosting bats,  Foxburrow Wood – Ancient woodland.  This is undisturbed mature ancient woodland with a canopy layer dominated by oak with beech, ash,	Potential for roosting bats in oak tree.  High value biodiversity overall.	Blue SB5

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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
		<p>elm, hazel, field maple, elder and silver birch, larch, Scots pine, one area of cherry laurel.</p> <p>Species: The ground flora is dominated by native bluebells, lesser celandine, moschatel, , ramsons, dog's mercury, foxglove, wood avens, lords-and-ladies.</p> <p>There is evidence of coppice management. Numerous log piles are present, dead wood present, dry ditch around woodland.</p>		
<p>TN14 TN 15</p>	<p>TM 36281 59477 TM 36508 59485</p>	<p>Arable field (oilseed rape) either side of the existing track. Hedge then footpath located to NW of Nuttery Wood.</p> <p>The route would pass through between Ponds wood broad-leaved semi-natural woodland to the north and Nuttery Belt to the south: typical oak ash canopy with hawthorn and common elm and ivy understorey, ivy. Typical ground cover – dog's mercury, bluebell, primrose, cleavers, lesser celandine, early wood violet. Dead wood</p> <p>Walking west up the track towards the floodplain of the River Ore.</p> <p>Species in the floodplain grazing marsh include reed sweet grass soft</p>	<p>Potential for roosting bats.</p> <p>Potential for setting badger.</p> <p>River Ore – potential for otter and water vole and commuting, foraging nad roosting bats.</p>	<p>Blue SB5</p>

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Target Note No.	Location/Grid Ref	Habitat Description	Suitability	Route Corridor
		<p>rush, field dock, nettle, alder, willow, flag iris, lesser celandine, false oatgrass, Yorkshire fog, creeping buttercup, common comfrey.</p> <p>River Ore has mature alder and willow lining its banks with bat roosting potential, slow-flowing, ~4m wide, meandering at this point.</p>		

## Appendix 2.3C – Site Designations and Protected Habitats Information

### Designated Sites and Protected Habitats

A variety of sites are designated in the UK, under various Conventions, Directives and Regulations, for their nature conservation importance and interest. The general aim of these designations is to conserve and protect ecological resources in addition to raising awareness and understanding. The table below outlines the statutory designations and legally protected habitats relevant to this site.

**Table A12: Relevant Site Designations**

Designation	Brief Description
Special Area of Conservation (SAC)	Special Areas of Conservation are sites designated by Member States under the EC Habitats Directive. The aim is to establish a European network of important high quality conservation sites that will make a significant contribution to conserving habitats and species considered to be most in need of conservation at a European level.
Special Protection Area (SPA)	Special Protection Areas are designated under the EC Birds Directive, to conserve the habitat of certain rare or vulnerable birds and regularly occurring migratory birds. Any significant pollution or disturbance to or deterioration of these sites has to be avoided.
Sites of Special Scientific Interest (SSSIs)	SSSIs are the country's very best wildlife and geological sites. There are over 4,100 SSSIs in England, covering around 8% of the country's land area. More than 70% of these sites (by area) are internationally important for their wildlife and designated as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites.  Many SSSIs are also National Nature Reserves (NNRs) or Local Nature Reserves (LNRs).  Natural England now has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended).
National Nature Reserve (NNR)	National Nature Reserves are statutory reserves established for the nation under the Wildlife and Countryside Act, 1981. NNRs may be owned by relevant national body (e.g. Natural England in England) or established by agreement; a few are owned and managed by non-statutory bodies. NNRs cover a selection of the most important sites for nature conservation in the UK
Local and County Wildlife Sites (LWS and CWS)	Local and County Wildlife Sites are non-statutory sites designated at a county level as being of conservation importance and often recognised in Local authority development plans. The aim of this identification is to protect such sites from land management changes, which may lessen their nature conservation interest, and to encourage sensitive management to maintain and enhance their importance. Although WS have no statutory protection they need to be considered in the planning process through Planning Policy Guidance like PPG9 which refers to the Town & Country Planning Act 1990 Section 30. This states that nature conservation issues should be included in the surveys of local authority areas to ensure that the plans are based on fully adequate information about local species, habitats, geology and landform. Plans should be concerned not only with designated areas but also with other land of conservation value and the possible provision of new habitats.
Ancient woodland Ancient Semi-natural Woodland (ASNW) Plantation on Ancient Woodland Site (PAWS)	Ancient Woodland is land that has had a continuous woodland cover since at least 1600 AD and has only been cleared for underwood or timber production. It can be placed in two categories:  Ancient Semi-natural Woodland (ASNW) – woodland that retains a native tree and shrub cover that has not been planted, although it may have been managed by coppicing or felling and allowed to regenerate naturally. This covers all stands of ancient woodland which do not obviously originate from planting.

Designation	Brief Description
	Ancient replanted Woodland (AWS - ancient woodland site or– woodland where the original tree cover has been felled and replaced by planting, often with conifers and usually this century.

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## Appendix 2.3D – Planning Policy

**Table A13: Relevant Planning Policy**

Designation	Brief Description
National Planning Policy Framework (NPPF) (2012)	<p>Section 11 is concerned with conserving and enhancing the natural environment and states that the planning system should achieve this by <i>“minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity”</i>. When determining planning applications, it states that local planning authorities should aim to conserve and enhance biodiversity and to refuse planning permission <i>“if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for”</i> with regard to any protection afforded to sites, habitats and species.</p> <p>Section 118, states that <i>“planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.”</i></p> <p>Planning and mitigation should recognise the wider benefits of ecosystem services and establishment of ecological networks to build in an element of resilience for our native species and habitats. Opportunities to enhance biodiversity are also encouraged.</p> <p>Section 119, states that <i>“the presumption in favour of sustainable development (paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.”</i></p>
Suffolk Core Strategy (2013)	<p>The Core Strategy and Development Management Policies document was formally adopted by the Council on 5 July 2013 and re-titled the <i>Suffolk Coastal District Local Plan - Core Strategy and Development Management Policies</i>. The most relevant policy is:</p> <p><b>Strategic Policy SP14 – Biodiversity and Geodiversity</b></p> <p>Biodiversity and geodiversity will be protected and enhanced using a framework based on a network of:</p> <ul style="list-style-type: none"> <li>• Designated sites;</li> <li>• Wildlife corridors and links;</li> <li>• The rivers, estuaries and coast;</li> <li>• Identified habitats and geodiversity features;</li> <li>• Landscape character areas; and</li> <li>• Protected species.</li> </ul> <p>Sites of European importance, which include Special Areas of Conservation and Special Protection Areas are statutorily protected under the Conservation of Habitats and Species Regulations 2012 (based on EU directives), and wetlands of global importance (Ramsar sites) are protected by Government policy to apply the same level of protection as to European sites.</p> <p>More generally, the policy approach to development on sites designated for their biodiversity or geodiversity interest is set out in Policy DM27.</p> <p>The Suffolk Biodiversity Action Plan and Suffolk Local Geodiversity Action Plan will be implemented.</p>

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Designation	Brief Description
	<p>The Strategy will also be to contribute to county targets through the restoration, creation and on-going management of new priority habitats as identified in those documents.</p>
<p>The UK Biodiversity Action Plan</p>	<p>Biodiversity encompasses the whole variety of life on earth. It includes the whole of the natural world from the commonplace to the critically endangered. However, the world is losing biodiversity at an ever-increasing rate as a result of human activity. In 1992, the global community responded to biodiversity loss by publishing the Convention on Biological Diversity. <b>Error! Reference source not found.</b> below summarises the legislative background to the UK BAP, which is the UK's framework to meet its responsibilities under the Convention on Biological Diversity.</p> <p>The UK's responsibilities in relation to the <b>Convention on Biological Diversity</b> are given a framework in the form of the UK BAP.</p> <p>The <b>NERC Act</b> increases the legislative impetus behind BAPs by requiring the relevant authorities to '<i>have regard</i>' to the species and habitats listed.</p> <p>Section 40(1) of the NERC Act states every public body, including local planning authorities, must '<i>have regard</i>' for conserving biodiversity.</p> <p>Under Section 41, the Secretary of State must compile and publish a list of species and habitats that are '<i>are of principal importance for the purpose of conserving biodiversity</i>'.</p> <p>In 2008, the <b>S41 List</b> was published to fulfil the Secretary of State's duty under Section 41 of the NERC Act. The S41 List is the same as the current UK BAP List.</p>
<p>Suffolk Biodiversity Action Plan</p>	<p>The Suffolk BAP contains a long list of priority habitats and species. The ones most relevant to the Study Area are listed below:</p> <ul style="list-style-type: none"> <li>• <i>Bufo bufo</i> Common toad</li> <li>• <i>Triturus cristatus</i> Great Crested newt</li> <li>• <i>Zootoca vivipara</i> Common lizard</li> <li>• <i>Natrix natrix</i> Grass snake</li> <li>• <i>Anguis fragilis</i> Slow-worm</li> <li>• <i>Tyto alba</i>* Barn owl*</li> <li>• <i>Pyrrhula pyrrhula</i> Bullfinch</li> <li>• <i>Prunella modularis</i> Hedge accentor (Dunnock)</li> <li>• <i>Sturnus vulgaris</i> Common starling</li> <li>• <i>Passer domesticus</i> House sparrow</li> <li>• <i>Turdus philomelos</i> Song thrush</li> <li>• <i>Muscicapa striata</i> Spotted flycatcher</li> <li>• <i>Limosa limosa</i> Black-tailed godwit</li> <li>• <i>Dendrocopos minor</i> Lesser spotted woodpecker</li> </ul>



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Designation	Brief Description
	<ul style="list-style-type: none"> <li>• Passer montanus Eurasian tree sparrow</li> <li>• Perdix perdix Grey partridge</li> <li>• Motacilla flava Yellow wagtail</li> <li>• Vanellus vanellus Northern Lapwing</li> <li>• Streptopelia turtur Turtle dove</li> <li>• Carduelis cannabina Linnet</li> <li>• Alauda arvensis Skylark</li> <li>• Emeriza citronella Yellowhammer</li> <li>• Lepus europaeus Brown hare</li> <li>• Lutra lutra European otter</li> <li>• Micromys minutus Harvest mouse</li> <li>• Arvicola terrestris Water vole</li> <li>• Neomys fodiens* Water shrew*</li> <li>• Erinaceus europaeus West European hedgehog</li> <li>• Anguilla anguilla European eel</li> <li>• Lampetra fluviatilis River lamprey</li> <li>• Plecotus auritus Brown long-eared bat</li> <li>• Nyctalus noctula Noctule bat</li> <li>• Pipistrellus pygmaeus Soprano pipistrelle bat</li> <li>• Arable field margins</li> <li>• Coastal and floodplain grazing marsh (inc. dykes)</li> <li>• Lowland mixed deciduous woodland</li> <li>• Ponds</li> <li>• Rivers</li> </ul>

## Appendix 2.3E – Relevant Legislation

Multiple legislative policies apply to the proposed schemes. The tables below list relevant nature conservation legislation. Please refer to the actual legislation for the precise wording the tables below provide a summary only. Please refer to the actual legislation for the precise wording, the tables below provide a summary only.

To ensure offences are not triggered under these legislative policies, species specific surveys may be required. The timings of these surveys can be seen in Table A16.

**Table A14:** Key Protection Afforded to Species and Habitats

Legislation	Brief Description
<b>EU / Worldwide</b>	
The Birds Directive (79/409/EEC)	This Directive aims to maintain the favourable conservation status of all wild bird species (Article 2). It establishes a general scheme for the protection of all wild birds (Article 5). The Directive also requires the identification and classification of <b>Special Protection Areas (SPAs)</b> for rare or vulnerable species listed in Annex I of the Directive and regularly occurring migratory species.
The Habitats Directive (92/43/EEC)	Annex II of this Directive lists the European protected species that are afforded special protection under this Directive. Refer to The Conservation of Habitats and Species Regulations 2010, as amended section below for the implications of this Directive in the UK context. The directive requires member states to contribute to a coherent European ecological network of protected sites by designating <b>Special Areas of Conservation (SACs)</b> for habitats listed on Annex I and for species listed on Annex II.
Convention on Biological Diversity	Conservation of biodiversity (the variety of life on earth) is an essential element of sustainable development. The UK Biodiversity Action Plan (BAP) provides the framework for fulfilling the UK's responsibilities towards the Convention on Biological Diversity via the Natural Environment and Rural Communities Act 2006 (NERC Act). See <b>Error! Reference source not found.</b> for more information on the UK BAP list.
<b>UK</b>	
Wildlife and Countryside Act, 1981 (as amended) (WCA)	<p>The WCA sets out the protection offered to various species of plants, birds and animals in England and Wales. Bird species listed in Schedule 1, animal species listed in Schedule 5 and plant species listed in Schedule 8 of the WCA are protected.</p> <p>Under section 14(2) of the WCA it is an offence to "<i>plant or otherwise cause to grow in the wild</i>" any plant listed in Schedule 9, Part II of the Act. Japanese knotweed (<i>Fallopia japonica</i>) is a Schedule 9, Part III species.</p> <p>The WCA has since been strengthened and updated by the Countryside and Rights of Way Act 2000 (CRoW Act) (see below).</p>
Protection of Badgers Act 1992	Offences under this Act include: (1) taking, injuring or killing badgers; (2) cruelty to badgers; (3) interference with badger setts; (4) selling and possession of live badgers and (5) marking and ringing. Exceptions and licences can apply.

Legislation	Brief Description
<p>The Conservation of Habitats and Species Regulations 2010 as amended (known as the Habitats Regulations)</p>	<p>The Habitats Regulations update and consolidate the Conservation (Natural Habitats &amp;c.) Regulations 1994 (as amended) and are the transposition of the Habitats Directive into English Law.</p> <p>The key relevant schedules are as follows:</p> <ul style="list-style-type: none"> <li>▪ Schedule 2 lists the European protected species of animals; and</li> <li>▪ Schedule 5 lists European protected species of plants.</li> </ul> <p>Under the Habitat Regulations, it is illegal to deliberately capture, injure, kill, disturb, take or destroy the eggs, or damage or destroy the breeding site or resting place of a European protected species (listed in Schedule 2).</p> <p>It is also illegal to deliberately pick, collect, cut, uproot or destroy the European protected species of plants listed in Schedule 5.</p> <p>For all species listed on Schedule 2 and Schedule 5, it is illegal to possess, control, transport, offer for sale or exchange, or sell or exchange any live or dead individual, or anything derived from or any part of such as species.</p> <p>Licences can only be granted for certain purposes but only if a set of conditions have been met.</p>
<p>Countryside and Rights of Way Act 2000 (CRoW Act)</p>	<p>The CRoW Act strengthens the legal protection offered to species listed on Schedule 1 and Schedule 5 of the WCA by introducing a new offence of '<i>reckless disturbance</i>'.</p> <p>Section 74 of the CRoW Act, which provided a statutory basis for biodiversity conservation to be undertaken as a matter of policy, has now been replaced by sections 40, 41 and 42 of the Natural Environment and Rural Communities Act 2006 (NERC Act).</p>
<p>Natural Environment and Rural Communities Act 2006 (NERC Act)</p>	<p>The NERC Act created a new integrated agency 'Natural England' to act as a champion for the natural environment and officially established a Commission for Rural Communities.</p> <p>This Act makes provision in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species. It alters enforcement powers in connection with wildlife protection, and extends time limits for prosecuting certain wildlife offences. It addresses a small number of gaps and uncertainties which have been identified in relation to the law on <b>Sites of Special Scientific Interest (SSSIs)</b>. It also amends the functions and constitution of National Park authorities, the functions of the Broads Authority and the law on rights of way.</p> <p>Section 40 to 42 of the NERC Act replace and extend the requirements of Section 74 of the CRoW Act. Section 40(1) of the NERC Act states every public body, including local planning authorities, must '<i>have regard</i>' for conserving biodiversity.</p>

Legislation	Brief Description
Water Environment (Water Framework Directive) (England and Wales) Regulations 2003	This is the implementation of the Water Framework Directive, which was transposed into UK national legislation in 2003, whereby River Basin Management Plans and associated works and monitoring are the key means of achieving these targets.

*N.B. Proposed developments must be able to show that all reasonable measures have been taken to ensure that protected species are not disturbed. The habitats of all Habitat Regulations Schedule 2 species, WCA Schedule 1 and some WCA Schedule 5 species are also protected from disturbance and destruction. Again, all reasonable precautions should be taken to ensure that this does not happen.*

### Non-Native Plant Species

Section 14 of the Wildlife and Countryside Act 1981 (as amended) makes the introduction of certain non-native invasive species into the wild an offence. It is an offence to plant or otherwise cause to grow in the wild any plant which is included in Part II of Schedule 9 of the Act.

### Legally Protected Species

In addition to habitats, a number of species have now become so rare that they are also afforded protection through international/European and national law. Other species are considered to contribute to our 'quality of life'. The specific protection afforded to species relevant to this site is detailed in table A15 below.

**Table A15:** Relevant Species Specific Legislation

Species	Brief Description
Bats Otters Great Crested Newts	<p>These species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended).</p> <p>These species are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are subject to the provisions of Section 9 of the Act, which make it an offence to:</p> <ul style="list-style-type: none"> <li>- intentionally or recklessly disturb a wild animal listed on Schedule 5 whilst it is occupying a structure or place which it uses for shelter or protection;</li> <li>- intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a wild animal listed on Schedule 5;</li> <li>- sell, offer or expose for sale, or to possess or transport for sale a live or dead wild animal listed on Schedule 5 or any part of or anything derived from a wild animal listed on Schedule 5.</li> </ul> <p>These species are also listed on Schedule 2 (European protected species of animals) of the Conservation of Habitats and Species Regulations 2010 (as amended) and are subject to the provisions of Regulation 41 which makes it an offence to:</p> <ul style="list-style-type: none"> <li>- deliberately capture, injure or kill any wild animal of a European protected species;</li> <li>- deliberately disturb wild animals of any such species (where disturbance is likely to impair their ability to survive, breed or reproduce, rear or nurture their young; or to hibernate or migrate; or to</li> </ul>

Species	Brief Description
	<p>affect significantly the local distribution or abundance of the species);</p> <ul style="list-style-type: none"> <li>- damage or destroy a breeding site or resting place of such an animal; or</li> <li>- be in possession of, control, transport, sell or exchange, or offer for sale or exchange any live or dead animal of such a species or any part of a wild animal or anything derived from an animal or any part of an animal of such a species.</li> </ul>
Water Voles	<p>Water voles are protected under the Wildlife and Countryside Act 1981 (as amended). Water voles are listed on Schedule 5 of the Act and are subject to all of the provisions of Section 9 of the Act, which make it an offence to:</p> <ul style="list-style-type: none"> <li>- intentionally kill, injure or take a water vole;</li> <li>- possess or control any live or dead specimen or anything derived from a water vole;</li> <li>- intentionally or recklessly damage or destroy any structure or place used for shelter or protection by a water vole;</li> <li>- intentionally or recklessly disturb a water vole whilst it is occupying a structure or place which it uses for shelter or protection;</li> <li>- intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a water vole;</li> <li>- sell, offer or expose for sale, or to possess or transport for sale a live or dead water vole or any part of or anything derived from a water vole.</li> </ul>
Badgers	<p>Badgers are protected under the Protection of Badgers Act 1992. The Act makes it an offence to:</p> <ul style="list-style-type: none"> <li>- wilfully kill, injure or take, or attempt to kill, injure or take, a badger;</li> <li>- possess or control a dead badger or any part of, or anything derived from, a dead badger;</li> <li>- cruelly ill-treat a badger;</li> <li>- intentionally or recklessly interfere with a badger sett by doing any of the following things: <ul style="list-style-type: none"> <li>- damaging a badger sett or any part of it;</li> <li>- destroying a badger sett;</li> <li>- obstructing access to, or any entrance of, a badger sett; or</li> <li>- disturbing a badger when it is occupying a badger sett.</li> </ul> </li> </ul>
Birds	<p>All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). Section 1 of the Act makes it an offence to:</p> <ul style="list-style-type: none"> <li>- intentionally kill, injure or take any wild bird;</li> <li>- intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; or</li> <li>- intentionally take or destroy an egg of any wild bird.</li> </ul> <p>It is also an offence to:</p> <ul style="list-style-type: none"> <li>- intentionally disturb any wild bird included in Schedule 1 of the Act while it is building a nest or is in, on or near a nest containing eggs or young; or</li> <li>- disturb dependent young of such a bird.</li> </ul> <p>Species listed on Schedule 1 include the barn owl (<i>Tyto alba</i>), Cetti's warbler (<i>Cettia cetti</i>) and kingfisher (<i>Alcedo atthis</i>)</p>
Reptiles	<p>All native British reptile species are protected under the Wildlife and Countryside Act 1981 (as amended). Reptiles are listed under Schedule 5 of the Act. The four more widespread species</p>

Species	Brief Description
	<p>including common lizard, slow worm, adder and grass snake are subject to some of the provisions of Section 9 of the Act, which make it an offence to:</p> <ul style="list-style-type: none"> <li>- intentionally kill or injure a reptile; or</li> <li>- sell, offer or expose for sale, or to possess or transport for sale a live or dead reptile or any part of, or anything derived from, a reptile.</li> </ul>
Hedgerows	<p>The Hedgerow Regulations 1997 provide statutory protection for hedgerows. Hedges that are deemed to be important under the regulations are protected and must not be removed without consulting the local planning authority.</p> <p>Important hedgerows are those which are:</p> <ul style="list-style-type: none"> <li>a) Greater than 30 years old; and</li> <li>b) meet a number of criteria based on number of species and/or features present</li> </ul>

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**Table A16:** Habitat/Species Specific Survey Timings

HABITAT/SPECIES TYPE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Phase 1 Survey	Sub optimal			Optimal						Sub optimal			
National Vegetation Classification	Survey inappropriate		Habitat dependent								Sub optimal		
Hedgerows	Survey inappropriate			Sub optimal		Optimal		Sub optimal			Survey inappropriate		
River Habitat Survey	Sub optimal				Optimal		Sub optimal						
River Corridor Survey	Survey inappropriate			Sub optimal		Optimal			Sub optimal	Survey inappropriate			
Breeding Birds	Survey inappropriate		Sub optimal	Optimal				Sub optimal	Survey inappropriate				
Wintering Birds	Optimal		Sub optimal	Survey inappropriate						Sub optimal	Optimal		
Migrating/Passage Birds	Survey inappropriate		Optimal		Survey inappropriate				Optimal		Survey inappropriate		
Badgers	Sub optimal	Optimal			Sub optimal				Optimal			Sub optimal	
Bat Hibernation	Optimal		Sub optimal	Survey inappropriate							Optimal		
Bat Activity	Survey inappropriate			Sub optimal	Optimal					Sub optimal	Survey inappropriate		
Water Voles	Survey inappropriate	Sub optimal		Optimal						Sub optimal	Survey inappropriate		
Otters	Spring and neap tides dependent												
Red Squirrels	Sub optimal		Optimal						Sub optimal				
Dormice Nest Search	Optimal		Sub optimal							Optimal			
Dormice Boxes	Survey inappropriate		Optimal								Survey inappropriate		
Great Crested Newts	Survey inappropriate		Optimal				Survey inappropriate						
Reptiles	Survey inappropriate		Sub optimal	Seasonally dependent				Optimal	Sub optimal	Survey inappropriate			
Fish	Species dependent												
White-Clawed Crayfish	Survey inappropriate			Sub optimal			Optimal				Survey inappropriate		Sub optimal
Fresh Water Invertebrates	Survey inappropriate		Optimal		Seasonally dependent				Optimal		Survey inappropriate		Sub optimal
Terrestrial Invertebrates	Survey inappropriate		Sub optimal		Species dependent				Sub optimal			Survey inappropriate	

**Key**

- Optimal/recommended period for survey
- Sub optimal period for survey
- Survey inappropriate

Licensed surveyors required for certain species and types of survey

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## Appendix 2.3F – Mitigation Information

Table A17 Below outlines generic mitigation requirements and recommendations likely to be applicable to the A12 and Four villages scheme.

**Table A17: Mitigation**

Receptor	Mitigation
Habitats General Construction	<ul style="list-style-type: none"> <li>- All Site staff will receive a tool box talk on the various ecological sensitivities of the Proposed Development as part of their site induction. Sensitive receptors, their characteristics and mitigation requirements will be outlined.</li> <li>- CEMP to be drawn up with input from an Ecologist and implemented and monitored by an Environmental Manager, who will be responsible for the safe retention of the sensitive ecological areas. The success of protective measures will be reviewed every two months to ensure that all areas are adequately protected.</li> <li>- An Ecological CoW will be present throughout the construction phases where works have the potential to impact upon sensitive receptors as outlined in the Webtag report and the CEMP.</li> <li>- Working corridors will be demarcated to prevent damage to habitats of value such as semi-improved neutral grassland.</li> <li>- Where biodiverse habitat is to be lost, the soil will be stored separating top soil and subsoil for use in later habitat creation and for the creation of the bunds it is important that the soil is removed by excavator and then transferred via loose tipping to ensure that the soil structure is not damaged. The works will be undertaken to the Construction Code of Practice for the Sustainable Use of Soils (2009).</li> <li>- Excavated topsoil will be stored and replaced to conserve soil biodiversity.</li> <li>- Soil storage mounds will be securely covered to prevent run-off into the watercourses or the spread of airborne particulates.</li> <li>- The bunds will be no more than 1m high (to prevent compaction and loss of structure within the soil and with breaks every 10m to allow for water to run off the Site).</li> <li>- The replaced topsoil will be grassed over</li> <li>- Ensure that work compounds and access tracks, etc. are not located in, or adjacent to, areas that maintain habitat value</li> <li>- Establish site fencing to prevent access to areas outside of construction working areas, particularly in areas adjacent to features of interest/value</li> <li>- Cover Site safety issues, including storage of potentially dangerous materials</li> </ul>
Habitats General Operation	<ul style="list-style-type: none"> <li>- Habitats will be replaced with native species of local provenance designed by an ecologist in conjunction with a landscape designer. The habitat will be designed to be multifunctional providing mitigation for a number of species.</li> </ul>
Trees and hedgerows Construction	<ul style="list-style-type: none"> <li>- All works in the vicinity of trees or hedgerows to be retained will be undertaken to BS5837:2012 guidelines, including the erection of robust protective fencing encompassing root protection areas of all trees and hedgerows not to be impacted and to incorporate the necessary Root Protection Areas (RPAs)</li> <li>- An AIA will be undertaken to ensure that trees and hedgerows will be retained where possible</li> </ul>

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Receptor	Mitigation
	-
Trees and hedgerows Operation	<ul style="list-style-type: none"> <li>- Replacement habitat will be provided following construction of the scheme either on or off site</li> <li>- This habitat will be native and of local provenance and designed by an ecologist in conjunction with a landscape designer</li> <li>- These habitat creations will be multifunctional and provide mitigation for a number of species (see faunal sections)</li> </ul>
Watercourses Construction	<ul style="list-style-type: none"> <li>- The duration and spatial extent of works in the vicinity of watercourses will be minimised</li> <li>- The EcOW will inspect the maintenance of all erosion controls weekly and after heavy rainfall events</li> <li>- Any abstractions from watercourses will be identified and quantified. Formal consent from the EA will be sought for any abstractions from watercourses</li> <li>- Site compounds will be located away from watercourses and floodplains;</li> <li>- The storage of any materials on the floodplain or near tributaries to reduce risk of pollutants/fine sediment entering watercourses will be regulated</li> <li>- Under the Water Resources Act 1991, the prior written consent of the Environment Agency is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of a main river or floodbank. Under the Land Drainage byelaws 1981, consent is also required for any works that affect the flow in watercourses which are not a main river. Additionally, the Environment Agency's 'Pollution Prevention Guidelines: Works and Maintenance in or Near Water', should be referred to<sup>1</sup>.</li> <li>- Excavation and enabling works will follow best practice and will adhere to the Environment Agency's Pollution Prevention Guidance Notes (PPGs) will be adhered to throughout the construction process. In particular: <ul style="list-style-type: none"> <li>o PPG 1 General Guide to the Prevention of Water Pollution;</li> <li>o PPG 5 Works In, Near or Liable to Affect Watercourses;</li> <li>o PPG 6 Working at Construction and Demolition Sites;</li> <li>o PPG 8 Safe Storage and Disposal of Used Oils; and</li> <li>o PPG 20 Dewatering Underground Ducts and Chambers.</li> </ul> </li> <li>- No in-channel works should be conducted on watercourses likely to support migratory fish between October 14<sup>th</sup> and May 31<sup>st</sup> in this case sea trout.</li> <li>- All landscaping and drainage engineering works taking place within close proximity to the waterways will require an activity-specific method statement, which will describe the specific control measures that will be applied to the activity to ensure water quality impacts will be avoided. These method statements will be agreed with the Environment Agency prior to the start of the works. In some instances it may be necessary for contractors to alter their proposed works (extent/duration/timing) in order to ensure significant impacts to the River and</li> </ul>

<sup>1</sup> The Environment Agency's (2007) Pollution Prevention Guidelines: Works and Maintenance in or Near Water: PPG5. – please note, this document has officially expired, but still contains much relevant information.

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Receptor	Mitigation
	<p>potentially to breeding birds can be avoided. Such methods statements are expected to include a description of the extent, duration and timing of works and the machinery to be used, followed by details of avoidance measures that will be taken. General principles that will be adopted include (but are not limited to) the following;</p> <ul style="list-style-type: none"> <li>○ Regular damping down to minimise dust impacts on the adjacent vegetation and waterways.</li> <li>○ Phased or stepped approach to contain impacts to discrete working areas at any one time.</li> <li>○ Where appropriate the installation of temporary treatment ponds to ensure minimum water quality standards throughout construction.</li> <li>○ Timing of works to avoid sensitive periods</li> </ul> <p>- An appropriate temporary drainage system will be required as part of the CEMP in order to minimise the potential risk of increased sedimentation reaching nearby controlled waters. The temporary drainage system will include settlement ponds of appropriate capacity to allow sediment to settle out before discharge. Temporary run-off settlement ponds are particularly beneficial in that they allow for isolation and on-site treatment of sediment laden surface run-off before release to the natural aquatic environment. Discharge of surface water should be into the ground water rather than into the River (following appropriate SUDs treatment). Alternatively, water from settlement ponds can be removed by tanker for treatment off-site.</p>
<p>Watercourses Operation</p>	<ul style="list-style-type: none"> <li>- Permanent SUDs and settlement ponds will prevent operational pollution from entering the watercourses via surface water runoff.</li> <li>- Bridges and culverts must be used where the operational scheme crosses any watercourse, no matter how small. These culverts will be designed for passage for multiple species (see faunal sections)</li> <li>- The creation and maintenance of a complex riparian zone can reduce the disturbance impact of the proposed scheme and is also aimed at offsetting impacts of habitat loss and fragmentation, particularly associated with culverting. Riparian complexity provides cover for otters and bats, shade and bankside complexity for migratory fish and important allochthonous input for macroinvertebrate shredders. This habitat will be designed by an ecologist in conjunction with a landscape designer.</li> </ul>
<p>Protected Species General Construction</p>	<ul style="list-style-type: none"> <li>- Preconstruction surveys will be updated to inform the required protected species mitigation (within 1 year prior to construction) at appropriate seasonal timings, the required licences will be obtained for exclusion and/or translocation and all wildlife legislation will be adhered to.</li> <li>- On site best practice mitigation such as the covering of pits or provision of mammal ramps in all excavations over 0.5m will prevent direct badger and otter mortality on site.</li> <li>- There will be no night time working unless agreed with the local planning authority in advance</li> <li>- Where lighting is required for health and safety reasons it will be directional and low level.</li> </ul>
<p>Protected Species General Operation</p>	<ul style="list-style-type: none"> <li>- A range of habitat creation will be required to mitigate for habitat loss, direct mortality due to RTAs, noise and fragmentation. This will be designed to be multifunctional mitigating for fauna, flora and ecosystem services. This habitat will be designed by an ecologist in conjunction with</li> </ul>

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Receptor	Mitigation
	a landscape designer.
Breeding Birds Construction	<ul style="list-style-type: none"> <li>- Should the clearance of vegetation within or adjacent to the development plots be required this will take place outside the bird breeding season (typically March to August inclusive). In the event of clearance being necessary during the bird breeding season, a suitably qualified ecologist will examine the area immediately prior to starting works to confirm likely absence of breeding birds. If nesting birds are found within the affected area, works must be postponed until the juveniles have fledged. This will prevent direct mortality.</li> <li>- A pre-construction survey of all suitable watercourses should be undertaken at least one breeding season in advance of construction following methods outlined by Gilbert et al. (1998) to confirm the potential presence of kingfisher.</li> <li>- Should the presence of kingfisher be confirmed, any river or stream bank that is likely to be directly impacted by the proposed scheme that exhibits potential nesting habitat for kingfisher must be destroyed (only if strictly necessary and under supervision of the ecological clerk of works) or securely covered (which ever is applicable) outside the main breeding season (March – October) at least one year in advance of construction in order to prevent access by potentially breeding kingfishers. Once construction of the proposed scheme is completed all protective covering must be removed.</li> <li>- Any river or stream bank that is not directly impacted (but is likely to be disturbed) by construction of the proposed scheme that exhibits potential nesting habitat for kingfisher should be securely covered under the supervision of the ecological clerk of works out with the main breeding season (March – October) at least one season in advance of construction in order to prevent access by potentially breeding kingfishers. Once construction of the proposed scheme is completed all protective covering must be removed.</li> <li>- It should be noted that the above mitigation measure cannot be undertaken without taking into consideration indirect impacts (disturbance and pollution) to other ecology, for example, protected mammal species such as otter and freshwater ecology, for example, fish.</li> <li>- Landscape planting (including berry / fruit bearing trees and shrubs) at all junctions (regardless of size), embankments or any point of the proposed scheme that is below vehicle height will be not be planted within 5m of the carriageway to ensure that potential RTAs are minimised as far as practical.</li> <li>-</li> </ul>
Breeding Birds Operation	<ul style="list-style-type: none"> <li>- Planting of dense native tree and scrub species (&gt;25m from the carriageway) to screen noise and vibration disturbance associated with operation of the proposed scheme from birds located within adjacent habitats (the screening must ensure that noise levels are maintained less than 40 dBA on the side opposite to the carriageway).</li> <li>- Additional planting within and adjacent to existing areas of woodland/scrub using native scrub and tree species thereby creating additional breeding and foraging bird habitat and compensating for habitat clearance, fragmentation and isolation and disturbance impacts.</li> <li>- Habitat creation should include areas of core woodland (&gt; 30m from woodland edge) and areas located at least 50m from route alignment.</li> <li>- Bird boxes (suitable for a range of species) should be considered (at a density of 20 boxes for every 0.5ha of woodland lost) in severed areas of woodland in order to compensate for the</li> </ul>

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Receptor	Mitigation
	loss of suitable breeding habitat.
Otter Construction	<ul style="list-style-type: none"> <li>- Any works in the vicinity of the waterways (i.e. within 10m) will be preceded by monitoring surveys in respect of otter.</li> <li>- Should any otter lying-up sites be found, then mitigation would have to be adjusted as necessary. The discovery of any holts or couches that are being used for breeding will necessitate the suspension of all works in that area until the cubs have left the holt/couch.</li> <li>- During construction of the road scheme, site compounds and storage or waste dumping facilities must be located at least 30 metres away from any holt/couch or watercourse.</li> <li>- Furthermore, any works within 30m of otter holts will be preceded by monitoring surveys in respect of otter. Works likely to disturb holts with signs of occupation would likely require licensing by Natural England.</li> <li>- The loss of otter holts and couches is difficult to mitigate for and therefore every effort must be made to avoid the destruction of these. Should works be required within 30ms of a holt/couch a licence to carry out the works will have to be obtained prior to development from Natural England.</li> </ul>
Otter Operation	<ul style="list-style-type: none"> <li>- Where the road crosses wide rivers and burns (&gt;3m) bridges must be constructed. Bridge design must allow space between the abutments of the bridge and the riverbank to enable otter to pass safely during high water levels.</li> <li>- On all flowing watercourses, culverts designed to a 1:200 flood return period must be used as opposed to cylindrical culverts which fill rapidly so reducing the air space available and making swimming more difficult. Culverts must be as wide as possible and be large enough to allow the incorporation of a dry ledge that is accessible during high water levels. Mammal ledges can be made of solid concrete integral with the culvert or steel that is bolted onto the culvert using metal brackets. Ledges must be at least 500mm wide and be accessible both from the bank and the water by the provision of ramps or groups of large boulders. Ledges must be sited at least 150mm above the appropriate high flood level, allowing 600mm headroom.</li> <li>- Otter must be guided to the crossing by planting dense scrub on the opposite bank to the ledge.</li> </ul>
Water vole Construction	<ul style="list-style-type: none"> <li>- Any works in the vicinity of the waterways (i.e. within 10m) will be preceded by monitoring surveys in respect of water vole.</li> <li>- Should water vole burrows or feeding stations be found destruction of water vole habitat will be required, should this be over a small area habitat manipulation may be used. A conservation licence from Natural England would be required in order to carry out habitat destruction.</li> </ul>
Water vole Operation	<ul style="list-style-type: none"> <li>- Operational mitigation for otter will largely mitigate for water vole. Any sheltering habitat lost will be rep</li> </ul>
GCN Construction	<ul style="list-style-type: none"> <li>- Any works in the vicinity of suitable terrestrial GCN habitat or ponds will be preceded by monitoring surveys in respect of GCN.</li> <li>- If any breeding habitat or a large amount of terrestrial habitat is to be affected a Natural England exclusion licence and translocation programme with associated habitat creation would be required</li> </ul>

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Receptor	Mitigation
	<ul style="list-style-type: none"> <li>- If only small amounts of terrestrial habitat are to be removed operations may be undertaken under Reasonable Avoidance Methods (RAMs)</li> <li>- Destructive searching and two step removal of terrestrial habitat will be undertaken prior to site clearance.</li> <li>- This requires vegetation being strimmed and removed under the supervision of an ecological clerk of works. Removal of vegetation should be undertaken during spring (March-October) when reptiles will be least affected. <ul style="list-style-type: none"> <li>o Prior to strimming any natural/artificial GCN refugia must be removed if possible to an area outside the proposed route.</li> <li>o The first cut must reduce vegetation to a minimum height of 150mm. The strimmed areas should then be left for at least 24 hours so that any GCN present can safely move out of the area.</li> </ul> </li> </ul>
GCN Operation	<ul style="list-style-type: none"> <li>- Using Sustainable Urban Drainage Schemes (SUDS) that retain runoff at source will not be detrimental to amphibians rather it will be beneficial as the features used in this scheme can create amphibian habitats and will be designed as such by an ecologist in conjunction with a landscape designer</li> <li>- Underpasses may be required to maintain connectivity</li> <li>- Offset mitigation may also be required</li> </ul>
Reptiles Construction	<ul style="list-style-type: none"> <li>- Above-ground vegetation clearance works and/or ground disturbance works within/near areas of suitable reptile habitat (rough grassland, scrub, woodland edge, rubble piles) pose a risk to legally protected reptile species.</li> <li>- Where the risk to reptiles is assessed by the ecologist as 'high' – on the basis of existing knowledge of reptile populations and/or the quality/extent of reptile habitats within the target site – a full reptile survey and mitigation program may be required/advisable. Such a program would typically involve: <ul style="list-style-type: none"> <li>o a thorough reptile survey (normally undertaken April-September);</li> <li>o identification and/or creation/enhancement of a reptile receptor site;</li> <li>o use of reptile exclusion fencing and the implementation of a capture and translocation program in advance of any site clearance;</li> <li>o final destructive search of site to remove any reptiles persisting following the main capture/translocation program</li> </ul> </li> <li>- However it is likely that only small areas of habitat that have been identified as being suitable to reptiles that are to be lost or bisected by the road. Where the risk to any reptiles potentially present is assessed by the ecologist as 'low/negligible', precautionary measures may be more appropriate than a full reptile survey/mitigation program. Precautionary measures, which should be undertaken in accordance with a strict ecological method statement, include (but are not limited to): <ul style="list-style-type: none"> <li>o demarcation/fencing of area and strict exclusion of all heavy machinery (including tracked plant) until site declared free of reptiles by site ecologist;</li> </ul> </li> </ul>

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Receptor	Mitigation
	<ul style="list-style-type: none"> <li>○ timing of above-ground vegetation works during hot weather to allow reptiles to escape easily;</li> <li>○ timing of ground disturbance (including dismantling of spoil/rubble piles) works outside of winter hibernation season (typically October to February inclusive);</li> <li>○ pre-works hand search by ecologist and/or ecological watching brief during works;</li> <li>○ dismantling of key hibernation/shelter features, such as rubble piles, tree/hedge root zones, by hand and under watching brief</li> <li>○ gradual reduction in height of vegetation using handheld tools (strimmers, chainsaws) or tractor mounted flail to 30cm, then 10cm;</li> <li>○ brash/arising being removed immediately (to avoid creation of temporary habitats) and disposed of or used in habitat creation elsewhere;</li> <li>○ capture and translocation of reptiles (by experienced ecologist) to suitable habitat</li> </ul> <p>- Mitigation proposals prescribed to offset for impacts on other ecological receptors is likely to mitigate for habitat loss on reptiles.</p>
Reptiles Operation	<ul style="list-style-type: none"> <li>- Replacement terrestrial habitat may be required this will include a range of basking areas and shelter habitat to be designed by an ecologist in conjunction with a landscape designer</li> <li>- Underpasses may be required to maintain connectivity</li> </ul>
Bats Construction	<ul style="list-style-type: none"> <li>- Direct mortality to be prevented by detailed surveys by bat workers to locate roosts in trees prior to construction. Felling and demolition must take into account findings of examination. If bats are likely to be disturbed, works must cease and advice must be sought from NE including an application for an exclusion licence.</li> <li>- Works compounds, storage sites and access roads must be located at least 30m from roosts and avoid areas of woodland, wetland and scrub to prevent degradation of valuable bat habitat.</li> <li>- No night time working will be undertaken, thereby preventing disturbance, due to lighting and noise, for foraging and commuting bats. Should lighting be required during the winter time in the early morning and late afternoon, lighting would be directional and away from the riparian zone.</li> </ul>
Bats Operation	<ul style="list-style-type: none"> <li>- Road traffic casualties must be avoided by the provision of safe crossing points for bats. Where the road severs flight lines, and in particular where the road is on an embankment, planting will reduce the risk of collision with oncoming vehicles by forcing bats to fly over the top.</li> <li>- Culverts must be at least 1.5 m x 1.5 m in cross section (Brinkmann <i>et al.</i>, 2003) and preferably allow water to flow through and include lead-in structures or planting in order to increase chances of being used by bats.</li> <li>- Where alternative crossing points are provided, tree planting must be positioned to guide bats toward the crossing point. In locations not identified as crossing points, roadside planting must use trees which do not produce nectar or attract insect prey and must be at least 10 m from the road to ensure bats do not try to cross (Lemaire and Arthur, 1999).</li> </ul>



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Receptor	Mitigation
	<ul style="list-style-type: none"> <li>- Where older trees and those with suitable crevices are to be lost (due to construction and operation phases) they will be replaced.</li> <li>- Until these tree mature bat boxes will be erected to provide alternative roost sites and offset those to be lost until replacement trees have matured. Bat boxes have been shown to be readily used by the types of species recorded along the survey corridor e.g. Daubenton's bat and pipistrelle species (DMRB 2001). Many more replacement roosts will be needed than the number of trees and buildings to be lost in order to increase the likelihood of being discovered and used by bats and to replace roosts which may be abandoned due to proximity to the road. It is recommended that boxes be installed at a ratio of 4 boxes per tree with roost potential to be replaced.</li> <li>- Bat boxes must be located according to the following criteria in order to increase the likelihood of bats using them:</li> <li>- Boxes must be sited at least 30m away from the proposed scheme to prevent attracting bats to the road.</li> <li>- A mixture of box types must be used to cater for seasonal and species requirements (Mitchell-Jones, 2004). Durable woodcrete (Schwegler) boxes require less maintenance, are longer lived than wooden boxes and offer greater protection against adverse weather conditions (Cowan., 2003). Further surveys to determine species and location may be required to enable species specific bat box mitigation.</li> <li>- Boxes must be sheltered from extreme weather conditions and positioned in a range of different aspects to ensure a range of temperature conditions.</li> <li>- Boxes should be sited in areas where bats feed frequently and should be planned to maximise the chances of bats finding them, for example near existing flight lines.</li> <li>- Obstructions including overhanging vegetation should not restrict access to the roost. There should be at least a 3m clear drop under the box and 1m space in front, above and to the sides.</li> <li>- Boxes must be placed 4-5m above the ground to avoid disturbance including vandalism and taking into account that boxes will need to be monitored.</li> <li>- Provision of nursery roosts and hibernacula is particularly important as they are harder to find.</li> <li>- Habitat fragmentation will be offset by the provision of vegetation along verges and embankments to establish connectivity of landscape features for bats. Habitat creation must aim to fill in existing gaps in linear vegetation features and new areas of woodland must adjoin existing blocks or act as stepping stones between neighbouring woods or connecting tree lines (Entwistle et al., 2001)</li> <li>- The level of and provision of lighting including roadside and works must be kept to a minimum according to BS 5489 and the ILE Guidance for the Reduction of Obtrusive Light (The Institution of Lighting Engineers, 2011). Low pressure sodium lamps must be used in preference to high pressure sodium or mercury lamps and the brightness must be kept as low as possible by directing the beam downwards using hoods and limiting the height of lighting columns</li> </ul>
Badger	<ul style="list-style-type: none"> <li>- No night-time working or traffic movements (other than light vehicles) will be allowed on the</li> </ul>



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Receptor	Mitigation
Construction	<p>site at night where badger setts are located within 100m of the works area or where badgers could be injured or killed by heavy plant or other machinery.</p> <ul style="list-style-type: none"> <li>- No steep-sided, deep and/or water-filled excavations into which badgers could fall and become trapped will be left uncovered overnight. Any major excavations that need to be left uncovered overnight will have their slopes battered to a slope no steeper than 50°.</li> <li>- If it is necessary to leave small deep, steep-sided or water-filled excavations open overnight they will be fenced with suitable badger-proof fencing.</li> <li>- Any badger setts within 50m of any works area will be made known confidentially to contractors in order to ensure that they are not accidentally disturbed or destroyed during construction. Undisturbed access to these areas will also be provided throughout construction.</li> <li>- Contractors will be alerted to the importance of maintaining confidentiality with regards to locations of badger setts.</li> <li>- Supervision and guidance on working near badger setts will be provided by the ECoW.</li> <li>- Where the location of an active badger sett conflicts with the siting of construction works, the badger sett will be avoided. Where this is not possible, a sett exclusion and closure procedure will be carried out. Sett exclusions will take place between 1 July to 1 December inclusive to avoid times of year when badger cubs may be dependant and underground. Exclusions will take place using prescribed methods, in consultation and under licence from Natural England.</li> </ul>
Badger Operation	<ul style="list-style-type: none"> <li>- Badger underpasses will be installed, if necessary, at strategically important locations along the scheme (i.e. where existing badger pathways have been identified) in order to allow badgers to safely cross under the new road and continue to use their current territories. As a general rule, it is recommended that at least two underpasses are provided per social group (Highways Agency, 2001). Underpasses will comply with current DMRB standards comprising concrete pipes (minimum 900mm diameter if the underpass is less than 50m in length, and a minimum of 1050mm diameter if the underpass is greater than 50m in length) sited to be easily found by badgers and designed so that they will not become water logged. Where it is necessary to site underpasses away from an existing badger path, every effort will be made to minimise the length of detour required, preferably to no more than 250m (Highways Agency, 2001). It can be difficult to persuade badgers to use underpasses even where they are sited on existing pathways. However, scent trails of bedding and dung from the social group in question as well as syrup and peanuts can be used to encourage badgers through tunnels, (Harris et al., 1994). The length of underpasses will be kept to a minimum, in order to facilitate their use by badgers.</li> </ul>

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## Appendix 2.3G – Protected and Notable Species Records

Tables A18 to A24 below outline the records of protected and notable species recorded in the vicinity of the proposed routings.

**Table A18: Route Option Link 1 Protected species records**

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
124	Small Heath	<i>Coenonympha pamphilus</i>	Rendlesham	TM345594	RLGB.Lr(NT), Sect.41, Sect.42, UKBAP		2012
369	Eurasian Badger	<i>Meles meles</i>	Little Glemham	TM34805995	Bern3, PBA, ScotBL		2006
385	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3427959079	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
425	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3429359037	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
425	Common Toad	<i>Bufo bufo</i>	Little Glemham	TM3429359037	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.5a, WCA5/9.5b		2008
466	Common Toad	<i>Bufo bufo</i>	Little Glemham Park	TM348591	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.5a, WCA5/9.5b	Several juveniles counted	1999
478	Grass Snake	<i>Natrix natrix</i>	Stratford St Andrew	TM352602	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a, WCA5/9.5b		2002

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Table A19: Route Option Link 2 Protected species records

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
157	Little Owl	<i>Athene noctua</i>	Saxmundham	TM373605	Bern2, CITESA		1996
283	Eurasian Water Shrew	<i>Neomys fodiens</i>	Farnham	TM365604	Bern3		2003
304	Long-eared Bat species	<i>Plecotus</i>	Benhall	TM368602	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2010
335	West European Hedgehog	<i>Erinaceus europaeus</i>	Farnham	TM374603	Bern3, Sect.41, Sect.42, UKBAP		2009
377	Smallest Pottia	<i>Microbryum davallianum</i>	Farnham	TM364604	NS, ScotBL		1998
401	Green Woodpecker	<i>Picus viridis</i>	Benhall	TM375607	BAmb, Bern2		1994
474	Common Kestrel	<i>Falco tinnunculus</i>	Benhall	TM363604	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1997

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Table A20: Route Option SB1 Protected species records

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
1	European Otter	<i>Lutra lutra</i>	Farnham	TM359601	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
70	European Otter	<i>Lutra lutra</i>	Farnham	TM36026013	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2004
93	Green Woodpecker	<i>Picus viridis</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010
93	Song Thrush	<i>Turdus philomelos</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, UKBAP		2010
93	Common Starling	<i>Sturnus vulgaris</i>	Stratford St Andrew	TM358601	BD2.2, BRed, UKBAP		2010
93	European Robin	<i>Erithacus rubecula</i>	Stratford St Andrew	TM358601	Bern2, ScotBL		2010
93	Hedge Accentor	<i>Prunella modularis</i>	Stratford St Andrew	TM358601	BAmb, Bern2, UKBAP		2010
93	House Sparrow	<i>Passer domesticus</i>	Stratford St Andrew	TM358601	BRed, Sect.41, Sect.42, UKBAP		2010
93	Great Tit	<i>Parus major</i>	Stratford St Andrew	TM358601	Bern2		2010
93	Blue Tit	<i>Cyanistes caeruleus</i>	Stratford St Andrew	TM358601	Bern2		2010
93	Barn Swallow	<i>Hirundo rustica</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010
93	European Greenfinch	<i>Carduelis chloris</i>	Stratford St Andrew	TM358601	Bern2		2010

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93	European Goldfinch	<i>Carduelis carduelis</i>	Stratford St Andrew	TM358601	Bern2		2010
93	Common Linnet	<i>Carduelis cannabina</i>	Stratford St Andrew	TM358601	Bern2, BRed, ScotBL, UKBAP		2010
93	Sky Lark	<i>Alauda arvensis</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, Sect.41, UKBAP		2010
102	Common Kestrel	<i>Falco tinnunculus</i>	Benhall	TM363604	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1997
114	Brown Long-eared Bat	<i>Plecotus auritus</i>	Stratford St Andrew Churchyard	TM358602	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2002
116	Eurasian Water Shrew	<i>Neomys fodiens</i>	Farnham	TM365604	Bern3		2003
117	Smallest Pottia	<i>Microbryum davallianum</i>	Farnham	TM364604	NS, ScotBL		1998
309	Long-eared Bat species	<i>Plecotus</i>	Benhall	TM368602	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2010
310	Brown Long-eared Bat	<i>Plecotus auritus</i>	Benhall	TM362608	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	Roost	2010
310	Eurasian Badger	<i>Meles meles</i>	Farnham	TM36336019	Bern3, PBA, ScotBL		2011
313	Eurasian Badger	<i>Meles meles</i>	Benhall	TM36386083	Bern3, PBA, ScotBL		2007
313	Pipistrelle	<i>Pipistrellus pipistrellus</i>	Farnham	TM362599	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.42, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1997

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313	Smallest Pottia	<i>Microbryum davallianum</i>	Farnham Churchyard	TM362599	NS, ScotBL		1998
350	West European Hedgehog	<i>Erinaceus europaeus</i>	Farnham	TM363601	Bern3, Sect.41, Sect.42, UKBAP		1993
368	Grass Snake	<i>Natrix natrix</i>	Farnham	TM363600	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a, WCA5/9.5b		2008

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Table A21: Route Option SB2 Protected species records

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
137	Serotine	<i>Eptesicus serotinus</i>	Stratford St Andrew	TM354604	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1993
147	Brown Long-eared Bat	<i>Plecotus auritus</i>	Benhall	TM362608	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	Roost	2010
147	Eurasian Water Shrew	<i>Neomys fodiens</i>	Farnham	TM365604	Bern3		2003
177	Smallest Pottia	<i>Microbryum davallianum</i>	Farnham	TM364604	NS, ScotBL		1998
211	Common Kestrel	<i>Falco tinnunculus</i>	Benhall	TM363604	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1997
220	Eurasian Badger	<i>Meles meles</i>	Benhall	TM36386083	Bern3, PBA, ScotBL		2007
269	Grass Snake	<i>Natrix natrix</i>	Stratford St Andrew	TM352602	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a, WCA5/9.5b		2002
308	Brown Long-eared Bat	<i>Plecotus auritus</i>	Stratford St Andrew Churchyard	TM358602	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2002
309	Long-eared Bat species	<i>Plecotus</i>	Benhall	TM368602	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2010
338	Green Woodpecker	<i>Picus viridis</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010

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338	Song Thrush	<i>Turdus philomelos</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, UKBAP		2010
338	Common Starling	<i>Sturnus vulgaris</i>	Stratford St Andrew	TM358601	BD2.2, BRed, UKBAP		2010
338	European Robin	<i>Erithacus rubecula</i>	Stratford St Andrew	TM358601	Bern2, ScotBL		2010
338	Hedge Accentor	<i>Prunella modularis</i>	Stratford St Andrew	TM358601	BAmb, Bern2, UKBAP		2010
338	House Sparrow	<i>Passer domesticus</i>	Stratford St Andrew	TM358601	BRed, Sect.41, Sect.42, UKBAP		2010
338	Great Tit	<i>Parus major</i>	Stratford St Andrew	TM358601	Bern2		2010
338	Blue Tit	<i>Cyanistes caeruleus</i>	Stratford St Andrew	TM358601	Bern2		2010
338	Barn Swallow	<i>Hirundo rustica</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010
338	European Greenfinch	<i>Carduelis chloris</i>	Stratford St Andrew	TM358601	Bern2		2010
338	European Goldfinch	<i>Carduelis carduelis</i>	Stratford St Andrew	TM358601	Bern2		2010
338	Common Linnet	<i>Carduelis cannabina</i>	Stratford St Andrew	TM358601	Bern2, BRed, ScotBL, UKBAP		2010
338	Sky Lark	<i>Alauda arvensis</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, Sect.41, UKBAP		2010
345	Brown Long-eared Bat	<i>Plecotus auritus</i>	Benhall	TM360610	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	Roost	2009
345	Pipistrelle Bat species	<i>Pipistrellus</i>	Benhall	TM360610	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	Roost	2009
398	Eurasian Badger	<i>Meles meles</i>	Farnham	TM36336019	Bern3, PBA, ScotBL		2011



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434	European Otter	<i>Lutra lutra</i>	Farnham	TM359601	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	2008
458	Eurasian Badger	<i>Meles meles</i>	Little Glemham	TM34805995	Bern3, PBA, ScotBL	2006
493	West European Hedgehog	<i>Erinaceus europaeus</i>	Farnham	TM363601	Bern3, Sect.41, Sect.42, UKBAP	1993

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**Table A22: Route Option LB3 Protected species records**

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
129	Bacidia caligans	<i>Bacidia caligans</i>	Hacheston	TM312568	NS		2000
129	Cyrtidula hippocastani	<i>Cyrtidula hippocastani</i>	Hacheston	TM312568	NS		2000
129	Common Kestrel	<i>Falco tinnunculus</i>	Hacheston	TM312568	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1993
179	European Otter	<i>Lutra lutra</i>	Blaxhall	TM3380857302	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2007
181	Small Heath	<i>Coenonympha pamphilus</i>	Rendlesham	TM345594	RLGB.Lr(NT), Sect.41, Sect.42, UKBAP		2012
184	Little Owl	<i>Athene noctua</i>	Little Glemham	TM337584	Bern2, CITESA		1994
184	Brambling	<i>Fringilla montifringilla</i>	Little Glemham	TM337584	ScotBL, WCA1i		1994
190	Little Owl	<i>Athene noctua</i>	Little Glemham	TM337585	Bern2, CITESA		1995
224	Xanthoria ucrainica	<i>Xanthoria ucrainica</i>	Hacheston	TM311564	NS		2004
248	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3427959079	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
255	Bacidia neosquamulosa	<i>Bacidia neosquamulosa</i>	Marlesford	TM324575	NR(vp)		2002
255	Lecanora stenotropa	<i>Lecanora stenotropa</i>	Marlesford	TM324575	NS		2002

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281	Hen Harrier	<i>Circus cyaneus</i>	Little Glemham	TM336583	BD1, BRed, CITESA, CMS_A2, ScotBL, Sect.41, Sect.42, WCA1i	1994
281	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3429359037	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	2008
281	Common Toad	<i>Bufo bufo</i>	Little Glemham	TM3429359037	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.5a, WCA5/9.5b	2008
398	Common Kestrel	<i>Falco tinnunculus</i>	Hacheston	TM315574	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42	1995
408	European Otter	<i>Lutra lutra</i>	Marlesford	TM327577	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	2008
408	Sandy Stiltball	<i>Battarrea phalloides</i>	Marlesford	TM327577	Sect.41, UKBAP, WCA8	2006
415	Tawny Owl	<i>Strix aluco</i>	Little Glemham	TM343584	Bern2, CITESA	1996
415	Little Owl	<i>Athene noctua</i>	Little Glemham	TM343584	Bern2, CITESA	1996
423	European Water Vole	<i>Arvicola amphibius</i>	Wickham Market	TM308566	ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.1t, WCA5/9.2, WCA5/9.4a, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b	2000
423	West European Hedgehog	<i>Erinaceus europaeus</i>	Wickham Market	TM308566	Bern3, Sect.41, Sect.42, UKBAP	1996

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437	European Otter	<i>Lutra lutra</i>	Marlesford	TM32715773	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2004
473	Eurasian Badger	<i>Meles meles</i>	Campsey Ash	TM33855698	Bern3, PBA, ScotBL		2002
482	Eurasian Badger	<i>Meles meles</i>	Blaxhall	TM34255736	Bern3, PBA, ScotBL		2006
485	Eurasian Badger	<i>Meles meles</i>	Campsey Ash	TM3385056967	Bern3, PBA, ScotBL		2013
489	Common Kestrel	<i>Falco tinnunculus</i>	Little Glemham	TM334585	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1995
496	European Water Vole	<i>Arvicola amphibius</i>	Marlesford	TM328578	ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.1t, WCA5/9.2, WCA5/9.4a, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1996

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**Table A23: Route Option SB4 Protected species records**

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
0	Little Owl	<i>Athene noctua</i>	Little Glemham	TM337584	Bern2, CITESA		1994
0	Brambling	<i>Fringilla montifringilla</i>	Little Glemham	TM337584	ScotBL, WCA1i		1994
12	Hen Harrier	<i>Circus cyaneus</i>	Little Glemham	TM336583	BD1, BRed, CITESA, CMS_A2, ScotBL, Sect.41, Sect.42, WCA1i		1994
28	Sandy Stiltball	<i>Battarrea phalloides</i>	Marlesford	TM331579	Sect.41, UKBAP, WCA8		2012
58	Little Owl	<i>Athene noctua</i>	Little Glemham	TM337585	Bern2, CITESA		1995
120	European Water Vole	<i>Arvicola amphibius</i>	Marlesford	TM328578	ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.1t, WCA5/9.2, WCA5/9.4a, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1996
181	Small Heath	<i>Coenonympha pamphilus</i>	Rendlesham	TM345594	RLGB.Lr(NT), Sect.41, Sect.42, UKBAP		2012
232	European Otter	<i>Lutra lutra</i>	Marlesford	TM32715773	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2004
248	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3427959079	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008

Capabilities on project:

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256	European Otter	<i>Lutra lutra</i>	Marlesford	TM327577	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
256	Sandy Stiltball	<i>Battarrea phalloides</i>	Marlesford	TM327577	Sect.41, UKBAP, WCA8		2006
281	Great Crested Newt	<i>Triturus cristatus</i>	Little Glemham	TM3429359037	Bern2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008
281	Common Toad	<i>Bufo bufo</i>	Little Glemham	TM3429359037	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.5a, WCA5/9.5b		2008
295	Common Kestrel	<i>Falco tinnunculus</i>	Little Glemham	TM334585	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1995
419	Blue Pimpernel	<i>Anagallis arvensis subsp. foemina</i>	Marlesford	TM329583	NS, ScotBL		1997
436	Lesser Spotted Woodpecker	<i>Dendrocopos minor</i>	Little Glemham	TM333586	Bern2, BRed, UKBAP		1994
436	Grey Partridge	<i>Perdix perdix</i>	Little Glemham		BD2.1, BRed, ScotBL, Sect.41, Sect.42, UKBAP	5 adults counted	

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**Table A24: Route Option SB5 Protected species records**

Proximity to Route (m)	Species	Scientific Name	Location	Grid reference	Legal and BAP Status*	Comments	Date
104	Tawny Owl	<i>Strix aluco</i>	Farnham	TM363594	Bern2, CITESA		1996
123	Little Owl	<i>Athene noctua</i>	Saxmundham	TM373605	Bern2, CITESA		1996
129	Long-eared Bat species	<i>Plecotus</i>	Benhall	TM368602	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2010
180	Pipistrelle	<i>Pipistrellus pipistrellus</i>	Farnham	TM366599	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.42, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1993
209	Common Kestrel	<i>Falco tinnunculus</i>	Farnham	TM362593	BAmb, Bern2, CITESA, CMS_A2, ScotBL, Sect.42		1996
225	Great Spotted Woodpecker	<i>Dendrocopos major</i>	Foxburrow Wood (Farnham)	TM370598	Bern2		1995
302	West European Hedgehog	<i>Erinaceus europaeus</i>	Farnham	TM374603	Bern3, Sect.41, Sect.42, UKBAP		2009
317	Grayling	<i>Hipparchia semele</i>	Farnham	TM371598	RLGB.VU, Sect.41, Sect.42, UKBAP		2007
361	Eurasian Badger	<i>Meles meles</i>	Farnham	TM36505917	Bern3, PBA, ScotBL		2006
378	Green Woodpecker	<i>Picus viridis</i>	Benhall	TM375607	BAmb, Bern2		1994
386	Pipistrelle	<i>Pipistrellus pipistrellus</i>	Farnham	TM362599	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.42, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		1997
386	Smallest Pottia	<i>Microbryum davallianum</i>	Farnham Churchyard	TM362599	NS, ScotBL		1998
457	Hen Harrier	<i>Circus cyaneus</i>	Farnham	TM366591	BD1, BRed, CITESA, CMS_A2, ScotBL, Sect.41, Sect.42, WCA1i		1994

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460	Green Woodpecker	<i>Picus viridis</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010
460	Song Thrush	<i>Turdus philomelos</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, UKBAP		2010
460	Common Starling	<i>Sturnus vulgaris</i>	Stratford St Andrew	TM358601	BD2.2, BRed, UKBAP		2010
460	European Robin	<i>Erithacus rubecula</i>	Stratford St Andrew	TM358601	Bern2, ScotBL		2010
460	Hedge Accentor	<i>Prunella modularis</i>	Stratford St Andrew	TM358601	BAmb, Bern2, UKBAP		2010
460	House Sparrow	<i>Passer domesticus</i>	Stratford St Andrew	TM358601	BRed, Sect.41, Sect.42, UKBAP		2010
460	Great Tit	<i>Parus major</i>	Stratford St Andrew	TM358601	Bern2		2010
460	Blue Tit	<i>Cyanistes caeruleus</i>	Stratford St Andrew	TM358601	Bern2		2010
460	Barn Swallow	<i>Hirundo rustica</i>	Stratford St Andrew	TM358601	BAmb, Bern2		2010
460	European Greenfinch	<i>Carduelis chloris</i>	Stratford St Andrew	TM358601	Bern2		2010
460	European Goldfinch	<i>Carduelis carduelis</i>	Stratford St Andrew	TM358601	Bern2		2010
460	Common Linnet	<i>Carduelis cannabina</i>	Stratford St Andrew	TM358601	Bern2, BRed, ScotBL, UKBAP		2010
460	Sky Lark	<i>Alauda arvensis</i>	Stratford St Andrew	TM358601	BD2.2, BRed, ScotBL, Sect.41, UKBAP		2010
489	Eurasian Water Shrew	<i>Neomys fodiens</i>	Farnham	TM365604	Bern3		2003
490	Grass Snake	<i>Natrix natrix</i>	Farnham	TM363600	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a, WCA5/9.5b		2008
498	European Otter	<i>Lutra lutra</i>	Farnham	TM359601	Bern2, CITESA, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, WCA5/9.5b		2008



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## **Appendix 2.4 – Landscape**

- 2.4A Option SB1 Landscape Worksheet
- 2.4B Option SB2 Landscape Worksheet
- 2.4C Option SB4 Landscape Worksheet
- 2.4D Option SB5 Landscape Worksheet
- 2.4E Option LB3 Landscape Worksheet
- 2.4F Four Villages Landscape Character Areas
- 2.4G Four Villages Landscape Designations

ENVIRONMENT: LANDSCAPE Option-SB1							
FEATURES	DESCRIPTION	SCALE IT MATTERS	RARITY	IMPORTANCE	SUBSTITUTABILITY	IMPACT	ADDITIONAL MITIGATION
<b>PATTERN</b>	<p>A mix of flat landscape and gently rolling river terraces and coastal slopes, predominantly open, rural valley floor landscape. The valley slopes from west to east towards the river then up eastwards from the river bottom. The landform is gently sloping, and natural in appearance. The rectilinear fields are used for both arable and grazing agriculture. The pattern is of large scale although a relatively complex mosaic field boundaries that create a more intricate and smaller scale to the overall pattern of the landscape.</p> <p>There is a focus of settlement with more scattered cottages and farmsteads on the outskirts of the main settlement for Farnham and Stratford St Andrew. The River Alde is a well vegetated linear feature whilst the A12 corridor and associated traffic is a prominent and detracting feature.</p>	Local	Common	High at a local level	Irreplaceable although boundaries and hedgerow could be replanted	The SB1 route would result in the disruption to the complex pattern of the rolling river terraces and relatively flat landscape. Two over bridge crossings of a watercourse and a local road would be required resulting in a loss of vegetation. Vegetation loss includes field boundaries with the associated loss of mature trees, hedges and pockets of carr woodland. The potential for embankments would further disrupt this arable landscape and its gently rolling topography with route sb1 at variance with the landscape. The potential impact of this route option on the pattern of the landscape is considered to be <b>Large Adverse</b> . This is unlikely to be reduced with mitigation due to complexity of the landscape along the proposed route corridor.	None
<b>TRANQUILLITY</b>	<p>Although there are long and extensive rural views across this very gently rolling landscape there is only a limited sense of tranquillity within the valley floor due to the with the presence of settlements, road, rail and electricity transmission infrastructure (pylons and overhead line). The prominence of traffic along the A12 in particular contributes to an increased lack of tranquillity.</p>	Local	Common	Low at a local level	None	Where localised areas of relative rural tranquillity exist, these will be further eroded by the introduction of the SB1 route corridor. Whilst there is generally a limited sense of tranquillity due to the presence of the A12 road corridor, railway line and settlements the additional road corridor would further erode tranquillity and would result in <b>Moderate Adverse</b> effect on tranquillity. This is highly unlikely to be reduced with mitigation planting due to the proximity and presence of the road corridor to the existing A12 and associated traffic.	None
<b>CULTURAL</b>	<p>There are some local features of cultural importance within the study area of this route option. Local features of some importance include:</p> <ul style="list-style-type: none"> <li>- The settlement patterns defined by liner groups of private dwellings in addition to scattered farmsteads and estate cottages most of which are located along the main road and a mix of local roads.</li> <li>- The dominant architectural style is of 19<sup>th</sup> century red brick buildings with tiled or slate roofs, with the material coming from a number of small local brickworks</li> <li>- The extensive nature late enclosures with a pattern of tree belts are typical of this landscape and contribute to its cultural value.</li> <li>- Glemham Hall Registered Park and Garden and in addition to non-registered parks and gardens; Benhall Lodge Park.</li> </ul>	Glemham Hall Registered Park and Garden at a National scale	Glemham Hall Park Registered park and Garden is rare, other cultural features are important at a local level	High at a national Level	The conservation of the conservation area is irreplaceable as are the Registered and Non-Registered Parks and Gardens.	The SB1 route corridor has the potential to result in indirect effects on the setting of Glemham Hall Park Registered park and Garden. It is likely that this route option also has the potential to result in indirect effects on the setting of the Non-Registered Park and Garden, Benhall Lodge Park as the route adjoins the A12 in relatively close proximity southern boundary of the park. Whilst the A12 already affords screening in this area, further development in this corridor would result in <b>Moderate Adverse</b> effect with the potential for this to reduce to <b>Slight Adverse</b> with re-placement boundary planting and structure planting in addition to sensitive assimilation of the proposed corridor into the landscape.	None
<b>LANDCOVER</b>	<p>Landcover to the north A12 and this proposed route is dominated by cattle grazed fields and converted arable agriculture to the north both with hedgerow field boundaries that enclose local routes and scattered mature trees. The route leads north into low density settlement with some vegetation consisting of domestic gardens, mixed hedges and a scattered mix of semi-mature trees.</p> <p>The north of the settlements there are more parklands and clusters of ancient semi-natural woodland.</p> <p>Where the A12 bridge crossing of the River Alde there is small semi-mature woodlands are under a TPO.</p> <p>To the north-east of the study area landcover consists of woodland belts and plantations and comes within close proximity to the River Alde with ribbons of wet woodland.</p>	Local	Un-common - common	Vegetative features of high importance to local character including designations (TPOs)	Some, semi-mature woodland and hedges are replaceable over time. Mature trees and ancient woodland are irreplaceable.	The SB1 route would result in the loss of arable land with smaller pockets of grazed land and carr woodland. Vegetation loss would be associated primarily with boundary planting including hedges, trees and riparian vegetation and pockets of mature woodland. Without sensitive routing potentially adverse effects are likely on a pocket of TPO trees where the proposed roundabout with the A12 crosses the River Alde This route has the potential to result in <b>Large Adverse</b> effects on the landcover with the potential to reduce to <b>Moderate Adverse</b> effects at year 15 once substantial mitigation planting has been established.	Offsite tree and hedge planting could be undertaken to screen specific views from properties which would also increase vegetation cover in specific areas.
<b>SUMMARY OF CHARACTER</b>	<p>The character of the landscape is predominantly rural containing a small number of cultural features two adjoining settlements of focus; Farnham and Stratford St Andrew. The combination of pattern and landcover gives rise to an attractive mosaic of predominantly arable land interspersed by historic parkland landscapes and well vegetated boundaries, creating an attractive scenic quality.</p> <p>The associated landscape is of a managed, open, estate feel being replaced by a pattern of small streams and smaller fields. The views are open and can be long. However, the comprehensive network of winding lanes and tall hedges means that other areas can be more intimate.</p>	Local	Common apart from Glemham Hall Park Registered Park and Garden	High at a national and local level due cultural features and landcover.	None	The SB1 route would result in <b>Large Adverse</b> effects in year1 due to the fragmentation of the landscape and the direct loss of important boundary vegetation, mature woodland and riparian vegetation. Following the establishment if replacement planting and additional planted mitigation measures the potential effect is unlikely to be reduced.	As Above

**Reference Source(s):** Suffolk County Council Landscape Character Assessment (2011); Ariel Photography; Ordnance Survey and Google Street View; Suffolk Coastal District Local Plan-Core Strategies and Development Management Policies (adopted 2013)

**Summary assessment score:** **Large adverse effect** on landscape character at scheme opening. This is unlikely to be reduced with mitigation due to complexity of the landscape along the proposed route corridor.

**Qualitative comments:** Landscape character types include: ancient estate claylands, Rolling estate claylands, Rolling estate sandlands and Valley meadowlands. There is potential for localised adverse effects on the Upper Deben Valley SLA, however, the overall integrity of the SLA is unlikely to be substantially affected by the introduction of this route option.

ENVIRONMENT: LANDSCAPE Option SB2							
FEATURES	DESCRIPTION	SCALE IT MATTERS	RARITY	IMPORTANCE	SUBSTITUTABILITY	IMPACT	ADDITIONAL MITIGATION
<b>PATTERN</b>	<p>A mix of flat landscape and gently rolling river terraces and coastal slopes, predominantly open, rural valley floor landscape. The valley slopes from west to east towards the river then up eastwards from the river bottom. The landform is gently sloping, and natural in appearance. The rectilinear fields are used for both arable and grazing agriculture. The pattern is of large scale although a relatively complex mosaic field boundaries that create a more intricate and smaller scale to the overall pattern of the landscape.</p> <p>There is a focus of settlement with more scattered cottages and farmsteads on the outskirts of the main settlement for Farnham and Stratford St Andrew. The River Alde is a well vegetated linear feature whilst the A12 corridor and associated traffic is a prominent and detracting feature.</p>	Local	Common	Medium at a local level	Irreplaceable although boundaries and hedgerows could be replanted	The Sb2 route would result in the disruption to the relatively complex pattern of the gently rolling river terraced landscape. An over bridge and a river bridge crossing of a water course and local road network would result in the loss of vegetation. Field boundaries would be broken with the associated loss of hedgerow and tree planting as well as pockets of parkland, structure planting and woodland. The potential for cuttings or embankments would further disrupt this arable landscape with route SB2 at variance with the local pattern of the landscape. The potential impact of this route option on the pattern of the landscape is considered to be <b>Large Adverse</b> with the potential for this to reduce at year 15 to <b>Moderate Adverse</b> with re-placement boundary planting and structure planting around the crossings and along embankments. Careful siting of the retention ponds and softening of the earthwork profiles would further integrate the structures into the pattern of the landscape.	None
<b>TRANQUILLITY</b>	Although there are long and extensive rural views across this very gently rolling landscape there is only a limited sense of tranquillity within the valley floor due to the with the presence of settlements, road, rail and electricity transmission infrastructure (pylons and overhead line). The prominence of traffic along the A12 in particular contributes to an increased lack of tranquillity.	Local	Common	Low at a local level	None	The SB2 route would result in further erosion of the already limited sense of tranquillity that is confined to intimately enclosed areas. The presence of a further road corridor in addition to the A12, railway line and settlements would result in a <b>Moderate Adverse</b> effect on tranquillity. This unlikely to be reduced with mitigation measures due to the proximity of the proposed route to large pylons, existing routes and settlements and additional associated traffic.	None
<b>CULTURAL</b>	<p>There are some local features of cultural importance within the study area of this route option. Local features of some importance include:</p> <ul style="list-style-type: none"> <li>- The settlement patterns defined by liner groups of private dwellings in addition to scattered farmsteads and estate cottages most of which are located along the main road and a mix of local roads.</li> <li>- The dominant architectural style is of 19<sup>th</sup> century red brick buildings with tiled or slate roofs, with the material coming from a number of small local brickworks</li> <li>- The extensive nature late enclosures with a pattern of tree belts are typical of this landscape and contribute to its cultural value.</li> <li>- Glemham Hall Registered Park and Garden and in addition to non-registered parks and gardens; Benhall Lodge Park.</li> </ul>	Glemham Hall at a National scale	Glemham Hall is rare, other cultural features are important at a local level	High at a National level	None	The SB2 route corridor has the potential to result in indirect effects on the setting of Glemham Hall Park Registered park and Garden. Northern sections of the proposed route have the potential to result in direct effects on the parkland setting of Non-Registered Park and Garden, Benhall Lodge Park as the proposed over bridge may become a detracting feature of prominence. Whilst the A12 already affords screening in this area, further development in this corridor would result in <b>Large Adverse</b> effect with the potential for this to reduce to <b>Moderate Adverse</b> with re-placement boundary planting and structure planting in addition to sensitive assimilation of the proposed corridor into the landscape.	None
<b>LANDCOVER</b>	<p>Landcover to the north A12 and this proposed route is dominated by cattle grazed fields and converted arable agriculture to the north both with hedgerow field boundaries that enclose local routes and scattered mature trees. The route leads north into low density settlement with some vegetation consisting of domestic gardens, mixed hedges and a scattered mix of semi-mature trees.</p> <p>The north of the settlements there are more parklands and clusters of ancient semi-natural woodland. To the north-east of the study area landcover consists of woodland belts and plantations and comes within close proximity to the River Alde with ribbons of wet woodland.</p>	Local	Common	Medium-high importance at a local level	Some, semi-mature woodland and hedges are replaceable over time. Mature trees and ancient woodland are irreplaceable.	The SB2 route would result in the loss of arable land and notable pockets of carr woodland vegetation loss would be associated with mature trees, boundary hedge planting and potentially a large swathe of riparian vegetation. This route has the potential to result in <b>Large Adverse</b> effects on the landcover with the potential to reduce to <b>Moderate Adverse</b> effects at year 15 once the mitigation planting has established. This would include replacement boundary planting and assimilation of structures into the landscape with structure planting.	Offsite tree and hedge planting could be undertaken to screen specific views from properties which would also increase vegetation cover in specific areas.
<b>SUMMARY OF CHARACTER</b>	<p>The character of the landscape is predominantly rural containing a small number of cultural features two adjoining settlements of focus; Farnham and Stratford St Andrew. The combination of pattern and landcover gives rise to an attractive mosaic of predominantly arable land interspersed by historic parkland landscapes and well vegetated boundaries, creating an attractive scenic quality.</p> <p>The associated landscape is of a managed, open, estate feel being replaced by a pattern of small streams and smaller fields. The views are open and can be long. However, the comprehensive network of winding lanes and tall hedges means that other areas can be more intimate.</p>	Local	Common	High at a national level as a result of cultural features	None	The SB2 route would result in <b>Large Adverse</b> effects in year 1 due to the fragmentation of the landscape and the direct loss of important features including historic parkland landscape, boundary vegetation, and mature woodland and riparian vegetation. Following the establishment of replacement planting and additional planted mitigation measures the effect has the potential to reduce to <b>Moderate Adverse</b> after 15 years.	As above

**Reference Source(s):** County Council Landscape Character Assessment (2011); Ariel Photography; Ordnance Survey and Google Street View; Suffolk Coastal District Local Plan-Core Strategies and Development Management Policies (adopted 2013)

**Summary assessment score:** **Large Adverse** effect on landscape character at Scheme Opening reducing to **Moderate Adverse** after 15 years and the establishment of mitigation planting.

**Qualitative comments:** Landscape character types include: ancient estate claylands, Rolling estate claylands, Rolling estate sandlands and Valley meadowlands. There is potential for localised adverse effects on the Upper Deben Valley SLA, however, the overall integrity of the SLA is unlikely to be substantially affected by the introduction of this route option.

ENVIRONMENT: LANDSCAPE Option SB4							
FEATURES	DESCRIPTION	SCALE IT MATTERS	RARITY	IMPORTANCE	SUBSTITUTABILITY	IMPACT	ADDITIONAL MITIGATION
<b>PATTERN</b>	<p>Gently rolling valley into flat landscape with a mix of some organic pattern of field enclosures and private estates characterised by straight boundaries. Rectilinear field patterns are large scale although a relatively complex mosaic of field boundaries exist which create a more intricate and smaller scale to the overall pattern of the landscape.</p> <p>Roads are largely enclosed by mixed hedges and hedgerows with hedgerow trees and field boundaries are mixed with broken hedgerows apparent as well as post and wire/wood fence lines. Occasionally sunken lanes.</p> <p>There are large areas of enclosed former heathland.</p> <p>To the south of the study area the River Ore and the railway line are well vegetated linear features. The A12 corridor and associated traffic, is a prominent and detracting feature.</p>	Local	Common	High at a local level	Irreplaceable although boundaries and hedgerow could be replanted.	The SB4 route would result in the disruption to the relatively complex pattern of the gently rolling landscape. There is one crossing of a culvert and intersection of a local would be required resulting in the loss of some vegetation. A small number of field boundaries would be broken with the associated loss of hedgerow and tree planting. The potential for cuttings or embankments would further disrupt this arable landscape and rolling topography. Route SB4 is at slight variance with the local pattern of the landscape. The potential impact of the landscape would be considered as <b>Moderate Adverse</b> with the potential for this to reduce at year 15 to <b>Slight Adverse</b> with replacement boundary planting and structure planting around the crossing and the stopping up of the local road. Careful siting and softening of earthwork profiles would further integrate the structures into the pattern of the landscape.	None
<b>TRANQUILLITY</b>	Where gaps and height of hedges and hedgerows allow, there are extensive rural views. However there is limited sense of tranquillity within this routes study area with the presence of settlements, road rail and pylons and over head lines. The prominence of traffic along the A12 and the railway line particularly contribute to an increased lack of tranquillity.	local	Common	Low at a local level	None	The SB4 route corridor will further erode the relatively limited sense of tranquillity. Whilst the sense of tranquillity is limited due to the presence of the A12 road corridor, settlements, railway line and local roads the additional road corridor would further erode tranquillity and would result in a <b>Slight Adverse</b> effect on tranquillity. This unlikely to be reduced with mitigation planting due to the presence of the road corridor and associated introduction of traffic.	None
<b>CULTURAL</b>	<p>The most prominent cultural feature within the study area of this route is the Marlesford conservation area with vernacular architecture, often 19<sup>th</sup> century estate type of brick.</p> <p>Settlement pattern is broadly defined by a few settlements of focus with scattered farmstead and small hamlets. Many of which are in the Marlesford conservation area.</p> <p>A number of historic parks and gardens Campsey Ashe Park Registered Park and Garden and Glemham Hall Park Registered Park and Garden</p> <p>The relatively flat landscape had been used for WWII airfields in the past</p>	Campsey Ashe Park and Glemham Hall Park at a national scale	Un-common in this area a number of designations and cultural features	High at a national and level.	None. The character of the conservation area is irreplaceable, as are the Registered and Non-Registered Parks and Gardens.	The introduction of this route corridor has the potential to result in indirect effects on the setting of Campsey Ashe Park Registered Park and Garden and the Non-Registered Parks and Gardens of Marlesford Hall and Benhall Lodge. The route will directly affect Glemham Hall Park Registered Park and Garden crossing through the north west section of the estate landscape. Whilst, the A12 already divides the registered Park and Garden in two with structure planting screening much of the A12 road corridor from Glemham Hall. The further separation and incursion into the historic parkland landscape would result in a <b>Moderate Adverse</b> effect which is unlikely to be reduced by mitigation planting.	None
<b>LANDCOVER</b>	<p>Land cover is dominated by arable farmland interspersed by smaller pockets of grazed land and marshland. Mature parkland is also apparent and typical of this landscape. Settlements are located along the a12 and include Marlesford and Little Glemham as well as a number of scattered properties and farmsteads.</p> <p>Vegetation cover includes fragmented woodland, occasional carr woodland mixed hedges and mature trees which often line the road corridors and field boundaries. Woodland pockets are evident along with parkland specimen trees associated with the historic parkland landscapes. Vegetation is particularly associated the wooded river corridors with a network of tree belts and coverts associated with localised water courses.</p>	Local	Common	Vegetative features are of medium importance at a local level	Trees, woodland and hedges are easily replaced. Mature trees would not be substitutable for some time.	The SB4 route would result in the loss of arable land with smaller pockets of parkland landscape. Vegetation loss would be mainly associated with boundary planting including some field hedgerows and trees as well as fragmented pockets of woodland. The route has the potential to result in <b>Moderate Adverse</b> effects on the landcover the potential to reduce to <b>Slight Adverse</b> effects at year 15 once the mitigation planting has established. This would include replacement boundary planting and assimilation of structures into the landscape with structure planting.	Offsite tree and hedge planting could be undertaken to screen specific views from properties which would also increase vegetation cover in specific areas.
<b>SUMMARY OF CHARACTER</b>	<p>The character of the landscape is predominantly rural with a small number of settlements with some degree of cultural importance. The combination of pattern and landcover give rise to an attractive mosaic of predominantly arable land intersperse by historic parkland landscapes and well vegetated boundaries creating an attractive scenic quality.</p> <p>The landscape is often open and even where coverts and hedges are present; the regular arrangement of these features can often enhance the feeling of distance rather than reduce it. There are some areas within the study area where picturesque meadows are evident providing relative tranquillity set within a wider arable landscape and if accessible provide an oasis of enclosure with confined views. A number of Public Rights of Way also intersect the study area. The intricate characteristics of the landscape form part of the wider Upper Deben Valley SLA.</p>	Local	Common apart from the historic parkland landscapes (Campsey Ashe Park and Glemham Hall Park)	The features have importance both at a national and local level. The registered parks and gardens are important at a national level.	Some components of the landscape are replaceable such as the hedgerow and younger tree planting whereas others are not such as the parkland landscapes	The LB3 route would result in <b>Moderate Adverse</b> effects in year 1 due to the fragmentation of the landscape and the direct loss of important features including historic parkland landscape, boundary vegetation, mature woodland and riparian vegetation. Following the establishment of replacement planting and additional planted mitigation measures the effect has the potential to reduce to <b>Slight Adverse</b> after 15 years.	As above

**Reference Source(s):** Suffolk County Council Landscape Character Assessment (2011); Ariel Photography; Ordnance Survey and Google Street View; Suffolk Coastal District Local Plan-Core Strategies and Development Management Policies (adopted 2013)

**Summary assessment score:** **Moderate Adverse effect** on landscape character at Scheme Opening reducing to **Slight Adverse** after 15 years and the establishment of mitigation planting.

**Qualitative comments:** Landscape Typology includes: Ancient estate claylands, Rolling estate claylands, Plateau estate farmlands, Valley meadowlands and Rolling estate sandlands. There is potential for localised adverse affects on the Upper Deben Valley SLA however the overall integrity of this SLA is unlikely to be affected by the introduction of this route option.

ENVIRONMENT: LANDSCAPE Option - SB5							
FEATURES	DESCRIPTION	SCALE IT MATTERS	RARITY	IMPORTANCE	SUBSTITUTABILITY	IMPACT	ADDITIONAL MITIGATION
<b>PATTERN</b>	<p>A mix of flat landscape and rolling river terraces and coastal slopes, predominantly open, rural valley floor landscape. Variable patterns of fields including geometric units and more sinuous shapes. In most places the estate character of the settlement and enclosure is not particularly marked.</p> <p>There is a focus of settlement with more scattered cottages and farmsteads on the outskirts of the main settlement. The River Alde is a well vegetated linear feature whilst the A12 corridor and associated traffic is a prominent and detracting feature.</p>	Local	Common	Medium at a local level	None	The SB5 route would result in the disruption to the river terraces and rolling landscape. Bridges including a river bridge, over bridge and an under bridge crossings would result in a considerable loss of vegetation. Field boundaries, pockets of woodland, mature trees and riparian vegetation. Arable and grazed fields would further disrupt the landscape and gently rolling topography. The potential impact of this route option on the pattern of the landscape is considered to be <b>Moderate Adverse</b> which is unlikely to be reduced by mitigation planting.	None
<b>TRANQUILLITY</b>	Where gaps and height of boundary planting of hedges and hedgerows allow there are open views of the rural landscape. However there is only a limited sense of tranquillity within the valley floor due to the adverse effects and prominence of the traffic on the A12; dispersed buildings leading to the recognised settlement; the proposed roundabout and the potential for associated lighting columns and traffic.	Local	Common	Low at a local level	None	Where numerous localised areas of relative rural tranquillity exist, these will be further eroded by the introduction of the SB5 route corridor. Whilst there is generally a limited sense of tranquillity due to the presence of the A12 road corridor, railway line and settlements the additional road corridor would further erode tranquillity and would result in a <b>Moderate Adverse</b> effect on tranquillity. This is unlikely to be reduced with mitigation planting due to the presence of the road corridor and associated introduction of traffic.	None
<b>CULTURAL</b>	<p>There are some local features of cultural importance within the study area of this route option. Local features of some importance include:</p> <ul style="list-style-type: none"> <li>- The settlement patterns defined by liner groups of private dwellings in addition to scattered farmsteads and estate cottages most of which are located along the main road and a mix of local roads.</li> <li>- The dominant architectural style is of 19<sup>th</sup> century red brick buildings with tiled or slate roofs, with the material coming from a number of small local brickworks.</li> <li>- The extensive nature late enclosures with a pattern of tree belts are typical of this landscape and contribute to its cultural value.</li> <li>- Glenham Hall Registered Park and Garden and in addition to non-registered parks and gardens; Benhall Lodge Park.</li> </ul>	Glenham Hall at a National scale	Glenham Hall is rare, other cultural features are important at a local level	High at a national Level	None	The SB5 route corridor has the potential to result in indirect effects on the setting of Glenham Hall Park Registered park and Garden. It is likely that this route option also has the potential to result in direct effects on the setting of the Non-Registered Park and Garden, Benhall Lodge Park as the route adjoins the A12 at the southern boundary of the park. Whilst the A12 already affords screening in this area, further development in this corridor would result in <b>Moderate Adverse</b> effect which is unlikely to be reduced by mitigation measures.	None
<b>LANDCOVER</b>	<p>Landcover to the north A12 and this proposed route is dominated by cattle grazed fields and converted arable agriculture to the north both with hedgerow field boundaries that enclose local routes and scattered mature trees. The route leads north into low density settlement with some vegetation consisting of domestic gardens, mixed hedges and a scattered mix of semi-mature trees.</p> <p>To the north of the settlements there are more parklands and clusters of ancient semi-natural woodland. Continuing the route north-east landcover consists of woodland belts and plantations with occasional carr woodland.</p>	Local	Un-common - common	Vegetative features of high importance to local character including designations (TPOs)	Some, semi-mature woodland and hedges are replaceable over time. Mature trees would take considerably longer to replace.	The SB5 route would primarily result in the loss of arable, grazed land and parkland landscape. Vegetation loss would be mainly associated with boundary planting including roadside hedgerow vegetation, field hedgerows and trees as well as riparian vegetation and pockets of woodland planting in particular Pond Wood which will be both lost and fragmented. This route has the potential to result in <b>Large Adverse</b> effects on the landcover with the potential to reduce to <b>Moderate Adverse</b> effects at year 15 once the mitigation planting has established. This would include replacement boundary planting and assimilation of structures into the landscape with structure planting.	Offsite hedge and tree planting could be undertaken to screen views from properties towards elevated bridge structures.
<b>SUMMARY OF CHARACTER</b>	<p>The character of the valley is predominantly rural containing a small number of cultural features two adjoining settlements of focus; Farnham and Stratford St Andrew. The land in close proximity to the A12 and the proposed route corridor is pressured by concentration of development and changes in land use and detract from some of the natural features of the river valley floor.</p> <p>Landscape character types include: ancient estate claylands, Rolling estate claylands, Rolling estate sandlands and Valley meadowlands.</p> <p>The associated landscape is of a managed, open, estate feel being replaced by a pattern of small streams and smaller fields. The views are open and can be long. However, the comprehensive network of winding lanes and tall hedges means that other areas can be much more intimate.</p>	Local	Common	High at a national and local level due cultural features	None	The SB5 route would result in <b>Moderate Adverse</b> effects in year 1 due to the fragmentation of the landscape and the direct loss of important features including historic parkland landscape, boundary vegetation, mature woodland and riparian vegetation. However this is reliant upon sensitive routing to avoid large swathes of Pond Wood, located to the east of the proposed under bridge. It should also be noted that a great proportion of this route option falls outside the Upper Deben Valley SLA boundary. However it is unlikely the degree of effect would be reduced through mitigation planting.	As above

**Reference Source(s):** Suffolk County Council Landscape Character Assessment (2011); Ariel Photography; Ordnance Survey and Google Street View; Suffolk Coastal District Local Plan-Core Strategies and Development Management Policies (adopted 2013)

**Summary assessment score:** **Moderate Adverse** effect on landscape character provided sensitive routing is applied in the vicinity of Pond wood. The effect is unlikely to be reduced due to the proximity to cultural features and disruption to landcover and pattern.

**Qualitative comments:** Landscape character types include: ancient estate claylands, Rolling estate claylands, Rolling estate sandlands and Valley meadowlands. The potential for localised effects upon the Upper Deben Valley are slight and the overall integrity of the SLA is very unlikely to be substantially affected by the introduction of this route option.

ENVIRONMENT: LANDSCAPE Option LB3							
FEATURES	DESCRIPTION	SCALE IT MATTERS	RARITY	IMPORTANCE	SUBSTITUTABILITY	IMPACT	ADDITIONAL MITIGATION
<b>PATTERN</b>	<p>Gently rolling valley into flat landscape with a mix of some organic pattern of field enclosures and private estates characterised by straight boundaries. Rectilinear field patterns are large scale although a relatively complex mosaic of field boundaries exist which creates a more intricate and smaller scale to the overall pattern of the landscape.</p> <p>Roads are largely enclosed by mixed hedges and hedgerows with hedgerow trees and field boundaries are mixed, with broken hedgerows apparent as well as post and wire/wood fence lines.</p> <p>Large areas of enclosed former heathland.</p> <p>Occasionally sunken lanes.</p> <p>To the south of the study area the River Ore and the railway line are well vegetated linear features. The A12 corridor and associated traffic, is a prominent and detracting feature.</p>	Local	Common	High at local level	Irreplaceable although boundaries and hedgerow could be replanted	The LB3 route would result in the disruption to the relatively complex pattern of the gently rolling landscape. Four separate crossings of water courses and the local road network would be required resulting in the loss of vegetation. Field boundaries would be broken with the associated loss of hedgerow and tree planting as well as pockets of structure planting and woodland. The potential for cuttings or embankments would further disrupt this arable landscape and rolling topography with route LB3 at variance with the local pattern of the landscape. The potential impact of this route option on the pattern of the landscape is considered to be <b>Large Adverse</b> with the potential for this to reduce at year 15 to <b>Moderate Adverse</b> with re-placement boundary planting and structure planting around the crossings and along embankments. Careful siting of the retention ponds and softening of the earthwork profiles would further integrate the structures into the pattern of the landscape.	None
<b>TRANQUILLITY</b>	<p>Where gaps and height of hedges and hedgerows allow, there are extensive rural views. However there is limited sense of tranquillity within this routes study area with the presence of settlements, road, rail and electricity transmission infrastructure (pylons and overhead line). The prominence of traffic along the A12 and the railway line particularly contribute to an increased lack of tranquillity.</p>	Local	Common	Low at local level	None	Where localised areas of relative rural tranquillity exist, these will be further eroded by the introduction of the LB3 route corridor. Whilst there is generally a limited sense of tranquillity due to the presence of the A12 road corridor, railway line and settlements the additional road corridor would further erode tranquillity and would result in a <b>Moderate Adverse</b> effect on tranquillity. This is unlikely to be reduced with mitigation planting due to the presence of the road corridor and associated introduction of traffic.	None
<b>CULTURAL</b>	<p>The most prominent cultural feature within the study area of this route is the Marlesford conservation area with vernacular architecture, often 19<sup>th</sup> century estate type of brick.</p> <p>Settlement pattern is broadly defined by a few small settlements of focus with scattered farmstead and small hamlets set within the rural landscape. Many of which are in the Marlesford conservation area.</p> <p>A number of historic parkland landscapes exist including Campsey Ashe Park and Glemham Hall Park Registered Parks and Gardens as well as Marlesford Hall and Benhall Lodge Non-Registered Park and Garden.</p> <p>The relatively flat landscape had been used for WWII airfields in the past</p>	Campsey Ashe Park and Glemham Hall Park at a national scale	Un-common in this area a number of designations and cultural features	Close to conservation area  Deben Valley Special landscape Area	The character of the conservation area is irreplaceable, as are the Registered and Non-Registered Parks and Gardens	The introduction of this route corridor has the potential to result in indirect effects on the setting of Campsey Ashe Park Registered Park and Garden and the Non-Registered Parks and Gardens of Marlesford Hall and Benhall Lodge. The route will directly affect Glemham Hall Park Registered Park and Garden crossing through the north west section of the estate landscape. Whilst, the A12 already divides the registered Park and Garden in two with structure planting screening much of the A12 road corridor from Glemham Hall. The further separation and incursion into the historic parkland landscape would result in a <b>Moderate Adverse</b> effect which is unlikely to be reduced by mitigation planting	None
<b>LANDCOVER</b>	<p>Land cover is dominated by arable farmland interspersed by smaller pockets of grazed land and marshland. Mature parkland is also apparent and typical of this landscape. Settlements are located along the A12 and include Marlesfordr and Little Glemham as well as a number of scattered properties and farmsteads.</p> <p>Vegetation cover includes fragmented woodland, occasional carr woodland, mixed hedges and mature trees which often line the road corridors and field boundaries. Woodland pockets are evident along with parkland specimen trees associated with the historic parkland landscapes. Vegetation is particularly associated with the wooded river corridors with a network of tree belts and coverts often associated localised water cocurses</p>	Local	Common	Vegetative features are of medium importance at a local level	Trees, woodland and hedges are replaceable. Mature trees would take considerably longer to replace.	The LB3 route would primarily result in the loss of arable land with smaller pockets of grazed land and parkland landscape. Vegetation loss would be mainly associated with boundary planting including roadside hedgerow vegetation, field hedgerows and trees as well as riparian vegetation and pockets of woodland planting which will be both lost and fragmented. This route has the potential to result in <b>Large Adverse</b> effects on the landcover with the potential to reduce to <b>Moderate Adverse</b> effects at year 15 once the mitigation planting has established. This would include replacement boundary planting and assimilation of structures into the landscape with structure planting.	Offsite tree and hedge planting could be undertaken to screen specific views from properties which would also increase vegetation cover in specific areas.
<b>SUMMARY OF CHARACTER</b>	<p>The character of the landscape is predominantly rural with a small number of settlements with some degree of cultural importance. The combination of pattern and landcover gives rise to an attractive mosaic of predominantly arable land interspersed by historic parkland landscapes and well vegetated boundaries, creating an attractive scenic quality..</p> <p>The landscape is often open and even where coverts and hedges are present; the regular arrangement of these features can often enhance the feeling of distance rather than reduce it. There are some areas within the study area where picturesque meadows are evident providing relative tranquillity set within a wider arable landscape and if accessible provide an oasis of enclosure with confined views. A number of Public Rights of Way also intersect the study area.</p> <p>The intricate characteristics of the landscape form part of the wider Upper Deben Valley SLA</p>	Local	Common apart from the historic parkland landscapes (Campsey Ashe Park and Glemham Hall Park)	The features have importance both at a national and local level. The registered parks and gardens are important at a national level.	Some components of the landscape are replaceable such as the hedgerow and younger tree planting whereas others are not, such as the parkland landscapes	The LB3 route would result in <b>Large Adverse</b> effects in year 1 due to the fragmentation of the landscape and the direct loss of important features including historic parkland landscape, boundary vegetation, mature woodland and riparian vegetation. Following the establishment of replacement planting and additional planted mitigation measures the effect has the potential to reduce to <b>Moderate Adverse</b> after 15 years.	As above

- **Reference Source(s):** Suffolk County Council Landscape Character Assessment (2011); Ariel Photography; Ordnance Survey and Google Street View; Suffolk Coastal District Local Plan-Core Strategies and Development Management Policies (adopted 2013)

**Summary assessment score:** **Large Adverse effect** on landscape character at Scheme Opening reducing to **Moderate Adverse** after 15 years and the establishment of mitigation planting.

**Qualitative comments:** Landscape Typology includes: Ancient estate claylands, Rolling estate claylands, Plateau estate farmlands, Valley meadowlands and Rolling estate sandlands... There is the potential for localised adverse effects on the Upper Deben Valley SLA, however, the overall integrity of the SLA is unlikely to be substantially affected by the introduction of this route option.

## **Appendix 2.5 – Heritage**

2.5A A12 Known Heritage Assets sheet 1 of 2

2.5B A12 Known Heritage Assets sheet 2 of 2



## **Appendix 3 – Cost Breakdown**

## Appendix 3.1 – Cost Breakdown

3.1A	Cost breakdown - SB1 Pink
3.1B	Cost breakdown - SB2 Blue (Single)
3.1C	Cost breakdown - SB2 Blue (Dual)
3.1D	Cost breakdown - SB4 Red (Single)
3.1E	Cost breakdown - SB4 Red (Dual)
3.1F	Cost breakdown - SB5 Green (Single)
3.1G	Cost breakdown - SB5 Green (Dual)
3.1H	Cost breakdown - LB3 Orange(Single)
3.1I	Cost breakdown - LB3 Orange(Dual)
3.1 J	Cost breakdown- SB1 Pink North
3.1 K	Cost breakdown- SB1 Pink South

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		21,262	£ 234.76	£ 4,991,532.90
<b>2 Structures</b>				£ 1,369,500.00
<b>3 Signals</b>				£ 45,120.00
<b>4 Noise Barriers</b>				£ 183,300.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		21,262	£ 309.92	£ 6,589,452.90
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 1,976,835.87
<b>8 Works Total</b>		21,262	£ 402.89	£ 8,566,288.77
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 657,000.00
<b>11 Construction Total</b>				£ 9,223,288.77
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 1,106,794.65
Supervision	5%			£ 461,164.44
Design	4.5%			£ 415,047.99
<b>13 Sub-Total</b>				£ 11,206,295.85
<b>14 Compulsory Purchase of Land</b>		61,410 m2	£ 5.00	£ 307,050.00
<b>15 Total</b>				£ 11,513,345.85
<b>16</b>				
Contingency/ Risk	10%			£ 1,151,334.59
Inflation	20%			£ 2,302,669.17
Optimism Bias	32%			£ 3,684,270.67
<b>17 Grand Total</b>		21,262	£ 877.23	£ 18,651,620.28

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 1,976,835.87	
	Series 200: Site Clearance				£ 26,653.51	
	Series 300: Fencing				£ 234,229.20	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 225,420.50	
	Series 500: Drainage and Service Ducts				£ 704,180.60	
	Series 600: Earthworks				£ 2,621,627.91	
	Series 700: Pavements				£ 2,491,203.04	
	Series 1100: Kerbs, Footways and Paved Areas				£ 33,963.61	
	Series 1200: Traffic Signs and Road Markings				£ 44,418.82	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 45,120.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 27,288.10	
	Series 3000: Landscape and Ecology				£ 135,347.61	
	<b>Total Measured Works</b>				£ 8,566,288.77	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 657,000.00	
	<b>Construction Total</b>				£ 9,223,288.77	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 1,106,794.65	
	Supervision	5%			£ 461,164.44	
	Design	5%			£ 415,047.99	
	<b>Compulsory Purchase of Land</b>	61,410	m2	£ 5.00	£ 307,050.00	
	<b>Total</b>				£ 11,513,345.85	
	Contingency/ Risk	10%			£ 1,151,334.59	
	Inflation	20%			£ 2,302,669.17	
	Optimism Bias	32%			£ 3,684,270.67	
	<b>Grand Total</b>				£ 18,651,620.28	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	1,976,835.87	
					<b>£ 1,976,835.87</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	7 ha	£	3,000.00	£ 21,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	599 m	£	3.00	£ 1,798.16	
2.03	Take up road studs	30 nr	£	3.50	£ 105.00	
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	1,000 m	£	2.50	£ 2,500.35	
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	1,250.00	£ 1,250.00	
					<b>£ 26,653.51</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	255 m2	£	200.00	£ 50,929.20	
3.02	Allowance for noise barriers; 1 x 400m	1,200 m2	£	152.75	£ 183,300.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 234,229.20</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required to single carriageway roads
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	122	m	£ 250.00	£ 30,445.50	Assume required at new side road overbridge
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	886	m	£ 220.00	£ 194,975.00	Scope unknown; assume needed around roundabout area, 1000mm wide; includes allowance for islands at roundabout; include allowance for gaps in bars for pedestrian walkways of 17m
					<b>£ 225,420.50</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 27.16m, Int Diameter 1.5m	27	m	£ 560.00	£ 15,120.00	Culvert crossings
5.02	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.82m, Int Diameter 1.5m	25	m	£ 560.00	£ 14,000.00	Culvert crossings
5.03	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 21.93m, Int Diameter 1.5m	22	m	£ 560.00	£ 12,320.00	Culvert crossings
5.04	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 19.85m, Int Diameter 1.5m	20	m	£ 560.00	£ 11,200.00	Culvert crossings

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.05	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 18.32m, Int Diameter 1.5m	19 m	£	560.00	£ 10,640.00	Culvert crossings
5.06	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.79m, Int Diameter 1.5m	25 m	£	560.00	£ 14,000.00	Culvert crossings
5.07	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 40.44m, Int Diameter 1.5m	40 m	£	560.00	£ 22,400.00	Culvert crossings
5.08	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 44.51m, Int Diameter 1.5m	45 m	£	560.00	£ 25,200.00	Culvert crossings
5.09	Extra over cost for installation of culvert's over watercourse	8 nr	£	24,500.00	£ 196,000.00	Culvert crossings
<b>Filter Drains</b>						
5.10	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	3,833 m	£	100.00	£ 383,300.60	Scope allowed for drainage both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 704,180.60</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	3,192 m3	£	5.50	£ 17,554.63	85% of material acceptable class 5A; field area; AECOM cut & fill measure
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	563 m3	£	6.00	£ 3,379.50	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	233 m3	£	5.50	£ 1,279.39	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	2,869 m3	£	6.00	£ 17,213.58	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	479	m3	£ 6.00	£ 2,872.58	
6.06	Allowance for excavation of turning areas; assume 500mm deep	260	m3	£ 15.00	£ 3,904.84	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	563	m3	£ 10.50	£ 5,914.13	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	3,424	m3	£ 10.00	£ 34,243.66	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	84,808	m3	£ 28.00	£ 2,374,626.75	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	88,232	m3	£ 1.00	£ 88,232.46	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	445	m2	£ 8.00	£ 3,561.92	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	10,591	m2	£ 6.50	£ 68,844.49	Assumed 1000 wide
					<b>£ 2,621,627.91</b>	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	3,189	m3	£ 33.40	£ 106,523.15	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	78	m3	£ 33.40	£ 2,608.43	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	21,262	m2	£ 23.60	£ 501,785.68	
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	21,262	m2	£ 12.80	£ 272,154.94	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	21,262	m2	£ 9.40	£ 199,863.79	
7.06	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	521	m2	£ 45.00	£ 23,429.03	
<b>Jointing Between New and Existing Carriageway</b>						
7.07	Allow for feathered layers of surface and binder courses to suit	614	m	£ 25.00	£ 15,338.03	
<b>Structures</b>						
7.08	Allowance for new roundabout; 32m diameter	1	item	£ 320,000.00	£ 320,000.00	
7.09	New single carriageway structure over existing River Alde, single span steel composite deck with full height abutments and piled foundations	30	m	£ 20,850.00	£ 625,500.00	
7.10	Extra over cost for installation of River Bridge	1	item	£ 76,000.00	£ 76,000.00	
7.11	New single carriageway structure over existing track, single span steel composite deck	17	m	£ 16,000.00	£ 272,000.00	
7.12	Extra over cost for installation of Overbridge	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 2,491,203.04</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	760 m	£	15.00 £	11,402.46	Scope unknown; assumed kerbs needed around roundabout area
11.02	Allowance for bullnosed edging to turning circles	150 m	£	15.00 £	2,243.03	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	903 m2	£	2.50 £	2,258.13	Scope unknown; assume needed at roundabout area, 1000mm wide; includes allowance for islands at roundabout
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	903 m2	£	20.00 £	18,060.00	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	- £	-	
				<b>£</b>	<b>33,963.61</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1 item	£	15,000.00 £	15,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	3,822 m	£	1.50 £	5,733.17	Scope allowed for line down outside lane of both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	1,911.06 m	£	1.00 £	1,911.06	Allowance for line down the centre of new carriageway
12.04	Allowance for various road markings such as arrows or triangles at junctions	1 item	£	1,250.00 £	1,250.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	2 nr	£	70.00 £	140.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Series 1200: Traffic Signs and Road Markings**

**Reflecting Road Studs**

12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	1,274	nr	£ 16.00	£ 20,384.60	Allowance for one catseye per 4.5m of white line to new carriageway
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**£ 44,418.82**

**Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts**

**Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts**

13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	32	nr	£ 680.00	£ 21,760.00	Scope allowed for 32 at roundabout area
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13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	32	nr	£ 400.00	£ 12,800.00	
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13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	32	nr	£ 330.00	£ 10,560.00	
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**£ 45,120.00**

**Series 1400: Electrical Work for Road lighting and traffic Signs**

**Trench for Cable or Duct**

14.01	300 to 450 mm wide; depth not exceeding 1.5 m	742	m	£ 16.00	£ 11,868.10	
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14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£ 5,000.00	£ 5,000.00	
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**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	742	m	£ 10.00	£ 7,420.00	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1	item	£ 3,000.00	£ 3,000.00	
					<b>£ 27,288.10</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	45,116	m2	£ 2.00	£ 90,231.61	
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	45,116	m2	£ 1.00	£ 45,116.00	
					<b>£ 135,347.61</b>	
					<b>£ 8,566,288.77</b>	

## A12 Four Villages and Sizewell Four Villages Bypass

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
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### Assumptions

#### 0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0012
- 0.02 All measurements are based on AECOM drawing nr 60315689-SKE-00-FVSW-C-0012
- 0.03 The carriageway has been assumed to be a single carriageway
- 0.04 All costs are exclusive of VAT

#### 1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

#### 2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road studs and thermoplastic lines to existing carriageway

#### 3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

#### 4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge
- 4.02 Allowance for pedestrian road restraint around new roundabout area due to the existence of two villages, either side of the roundabout

#### 5.00 Series 500: Drainage and Service Ducts

#### 6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

#### 7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

#### 11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**

SB1 - Pink Route



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts around the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Single Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		31,900	£ 199.38	£ 6,360,222.50
<b>2 Structures</b>				£ 1,677,250.00
<b>3 Signals</b>				£ 132,540.00
<b>4 Sundries</b>				
<b>5 Sub-Total (1-4)</b>		31,900	£ 256.11	£ 8,170,012.50
<b>6 Preliminaries &amp; Traffic Management</b>	30%			£ 2,451,003.75
<b>7 Works Total</b>		31,900	£ 332.95	£ 10,621,016.25
<b>8 Ancillaries and Major Items</b>				
<b>9 Statutory Undertakers</b>				£ 2,472,000.00
<b>10 Construction Total</b>				£ 13,093,016.25
<b>11 Preparation and Supervision</b>				
Preparation	12%			£ 1,571,161.95
Supervision	5%			£ 654,650.81
Design	4.5%			£ 589,185.73
<b>12 Sub-Total</b>				£ 15,908,014.74
<b>13 Compulsory Purchase of Land</b>		92,148 m2	£ 5.00	£ 460,740.00
<b>14 Total</b>				£ 16,368,754.74
<b>15</b>				
Contingency/ Risk	10%			£ 1,636,875.47
Inflation	20%			£ 3,273,750.95
Optimism Bias	32%			£ 5,238,001.52
<b>16 Grand Total (exc VAT)</b>		31,900	£ 831.27	£ 26,517,382.68

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 2,451,003.75	
	Series 200: Site Clearance				£ 59,950.50	
	Series 300: Fencing				£ 733,200.00	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 72,875.00	
	Series 500: Drainage and Service Ducts				£ 662,200.00	
	Series 600: Earthworks				£ 2,552,380.00	
	Series 700: Pavements				£ 3,558,621.00	
	Series 1100: Kerbs, Footways and Paved Areas				£ 45,350.00	
	Series 1200: Traffic Signs and Road Markings				£ 44,996.00	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 132,540.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 34,000.00	
	Series 3000: Landscape and Ecology				£ 273,900.00	
	<b>Total Measured Works</b>				<b>£ 10,621,016.25</b>	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 2,472,000.00	
	<b>Construction Total</b>				<b>£ 13,093,016.25</b>	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 1,571,161.95	
	Supervision	5%			£ 654,650.81	
	Design	4.5%			£ 589,185.73	
	<b>Compulsory Purchase of Land</b>	92,148 m2	£	5.00	£ 460,740.00	
	<b>Total</b>				<b>£ 16,368,754.74</b>	
	Contingency/ Risk	10%			£ 1,636,875.47	
	Inflation	20%			£ 3,273,750.95	
	Optimism Bias	32%			£ 5,238,001.52	
	<b>Grand Total</b>				<b>£ 26,517,382.68</b>	



**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	2,451,003.75	
					<b>£ 2,451,003.75</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	12.4 ha	£	3,000.00	£ 37,200.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	2,200 m	£	3.00	£ 6,600.00	
2.03	Take up road studs	43 nr	£	3.50	£ 150.50	Assume 1Nr road stud every 9m of 390m of existing road
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	3,250 m	£	2.50	£ 8,125.00	Assumed 1 line both sides of road on existing road within site area and one line down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	1,000.00	£ 1,000.00	For various markings at junctions and the like
2.06	Allowance for the removal of safety barrier	275 m	£	25.00	£ 6,875.00	
					<b>£ 59,950.50</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
3.02	Allowance for noise barriers; 4 x 400m at 3m high	4,800 m2	£	152.75	£ 733,200.00	As per e-mail from Stephanie Munn; 11 / 12 June 2014
					<b>£ 733,200.00</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Vehicle Parapets</b>						
4.01	Metal parapet Group P2 (113KPH); 1.0m high, comprising steel yielding posts and steel horizontal rails	275	m	£ 265.00	£ 72,875.00	Allowance for parapets to new overbridges
<b>Pedestrian Guard Rails and Handrails</b>						
4.02	Allowance for tubular galvanized mild steel pedestrian guard rails		m	£ 220.00	£ -	Assume not required; no pedestrian areas
					<b>£ 72,875.00</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway	55	m	£ 560.00	£ 30,800.00	
5.02	Extra over cost for installation of culvert's over watercourse	1	nr	£ 24,500.00	£ 24,500.00	
5.03	Allowance for ditch diversions	240	m	£ 60.00	£ 14,400.00	
<b>Filter Drains</b>						
5.06	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area; 2.0m deep	3,950	m	£ 150.00	£ 592,500.00	Scope allowed for drainage to both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 662,200.00</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of areas of 'greenland'; such as existing fields and the like; assume 500 deep	45,700	m3	£ 7.00	£ 319,900.00	Assume acceptable material
6.02	Excavation of existing farmers track; assume 500 deep	90	m3	£ 8.50	£ 765.00	Assume unacceptable material
6.03	General excavation of area around existing drains	115	m3	£ 10.00	£ 1,150.00	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Series 600: Earthworks (Cont'd)</b>						
<b>Excavation (Cont'd)</b>						
6.04	General excavation of drainage retention areas; assumed acceptable material; 500 deep	3,300	m3	£ 7.00	£ 23,100.00	
6.05	General excavation of drainage retention areas; assumed unacceptable material; 1500 deep	9,900	m3	£ 8.50	£ 84,150.00	
6.06	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	990	m3	£ 2.50	£ 2,475.00	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way; assume existing carriageway 500 deep	8,290	m3	£ 10.50	£ 87,045.00	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	36,750	m3	£ 10.00	£ 367,500.00	Assume 75% of excavated acceptable material can be used for deposition
<b>Disposal of Material</b>						
6.09	Disposal of remaining acceptable material	12,250	m3	£ 10.00	£ 122,500.00	
6.10	Disposal of unacceptable material	19,385	m3	£ 15.00	£ 290,775.00	
<b>Imported Fill</b>						
6.11	Imported selected well graded granular fill	40,300	m3	£ 28.00	£ 1,128,400.00	Based on AECOM area of fill
<b>Compaction of Fill</b>						
6.12	Compaction of granular fill material	77,050	m3	£ 1.00	£ 77,050.00	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.13	Timber closeboarded supports left in excavation; for drainage retention areas	665	m2	£ 8.00	£ 5,320.00	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks (Cont'd)</u></b>						
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.14	Using backacters and breakers; not exceeding 100mm deep	6,500	m2	£ 6.50	£ 42,250.00	Existing road area
					<b>£ 2,552,380.00</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	4,785	m3	£ 33.40	£ 159,819.00	
7.02	Allowance for creation of Agricultural underpass; assume 150mm thick	480	m3	£ 33.40	£ 16,032.00	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	31,900	m2	£ 23.60	£ 752,840.00	Including road for new bridge over dual carriageway
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	31,900	m2	£ 12.80	£ 408,320.00	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	31,900	m2	£ 9.40	£ 299,860.00	
7.06	Allowance for creation of agricultural underpasses; dense bitumen macadam; base, binder and surface course; 500 mm deep	3,200	m2	£ 45.00	£ 144,000.00	
<b>Jointing Between New and Existing Carriageway</b>						
7.07	Allow for feathered layers of surface and binder courses to suit	260	m	£ 25.00	£ 6,500.00	
<b>Structures</b>						
7.08	Allowance for new roundabout; 42m diameter	1	nr	£ 42,000.00	£ 42,000.00	
7.09	Allowance for new roundabout; 52m diameter	1	nr	£ 52,000.00	£ 52,000.00	
7.09	SB5 River Bridge; new single carriageway structure over existing River Alde; single span steel composite deck with full height abutments and	15	m	£ 20,850.00	£ 312,750.00	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement (Cont'd)</u></b>						
<b>Structures (Cont'd)</b>						
7.10	SB5 Overbridge; new structure for existing track over new single carriageway; two span steel composite deck; full height abutments and piled foundations	405	m2	£ 1,700.00	£ 688,500.00	
7.11	SB5 Agricultural underpass; new single carriageway structure over new agricultural underpass	16,000	m	£ 28.00	£ 448,000.00	
7.12	Extra over cost for installation of spanning structures	3	nr	£ 76,000.00	£ 228,000.00	
					<b>£ 3,558,621.00</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	490	m	£ 15.00	£ 7,350.00	Scope unknown; assumed kerbs needed around roundabout area and at roundabout islands
<b>Footways and Paved Areas</b>						
11.02	Sub-bases to paved areas; 100mm thick hardcore	1,200	m2	£ 2.50	£ 3,000.00	Allowance for islands at roundabout area
11.03	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	1,200	m2	£ 20.00	£ 24,000.00	Scope unknown; as above
11..04	Allowance for footpaths	1	item	£ 11,000.00	£ 11,000.00	Data from AECOM Chelmsford; email from Lydia Hunt 25 April 2014
					<b>£ 45,350.00</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 10,000.00	£ 10,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	7,700	m	£ 1.50	£ 11,550.00	Scope allowed for line down both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	3,150	m	£ 1.00	£ 3,150.00	Scope allowed for central line to carriageway
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 1,000.00	£ 1,000.00	Hatching and other various markings that may be required
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	1,206	nr	£ 16.00	£ 19,296.00	Allowance for one catseye per 9 m of white line on new road
					<b>£ 44,996.00</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	94	nr	£ 680.00	£ 63,920.00	Scope allowed for 94 at roundabouts; 42 Nr at A12 West; 52 Nr at A12 East
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	94	nr	£ 400.00	£ 37,600.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	94	nr	£ 330.00	£ 31,020.00	
					<b>£ 132,540.00</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	1,000	m	£ 16.00	£ 16,000.00	Scope unknown, assumed electricity at 500m away; for 2 nr roundabouts
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£ 5,000.00	£ 5,000.00	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	1,000	m	£ 10.00	£ 10,000.00	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1	item	£ 3,000.00	£ 3,000.00	
					<b>£ 34,000.00</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	91,300	m2	£ 2.00	£ 182,600.00	
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	91,300	m2	£ 1.00	£ 91,300.00	
					<b>£ 273,900.00</b>	
					<b>£ 10,621,016.25</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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Assumptions

0.00 Generally

- 0.01 The site area has been assumed as the orange dotted line, along with the areas where any works are due to take place outside of this
- 0.02 All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0035
- 0.03 The carriageway has been assumed to be a single carriageway road
- 0.04 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.05 Compulsory purchase of land area taken from AECOM Chelmsford drawing "Blue Route - SB5 Single - Land Outside Highway Boundary
- 0.05 All costs are exclusive of VAT

1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for the removal of kerbs at junctions on existing roads and along the stretch of existing road, to one side, near the existing Tinker Brook road intersection
- 2.03 Allowance for the removal of cats eyes at 9m intervals along existing stretch of road near Tinker Brook road intersection
- 2.04 Allowance for the removal of pavements to one side of existing road, at stretch of road near Tinker Brook intersection and at the intersection between the A12 and A1094
- 2.05 Allowance for the removal of reflectorized thermoplastic road markings to both sides of existing road and down the middle

3.00 Series 300: Fencing

- 3.01 Noise barrier information based on email from Stephanie Munn on 11 and 12 June 2014; 3m x 400m noise barriers required at 4 Nr.

4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge's; assume

5.00 Series 500: Drainage and Service Ducts

- 5.01 Culvert costs based on AECOM culvert crossing costings for SB1
- 5.02 Filter drains allowed to both sides of carriageway for drainage, along with connection to new drainage retention areas
- 5.03 225mm pipes allowed for, with Type A bed and Type B fill; at 2.0m deep

6.00 Series 600: Earthworks

- 6.01 Earthworks areas based on AECOM cut and fill measure
- 6.02 Area of existing 'greenland' excavation assumed acceptable material
- 6.03 Area of existing farmers' tracks excavation assumed unacceptable material
- 6.04 Excavation of areas at existing drainage / ditch areas assumed require additional excavation works
- 6.05 Assumed 25% or excavated material from drainage retention areas acceptable; 75% unacceptable
- 6.06 Allowance for cutting through existing road; assume existing carriageway 500 deep
- 6.07 Assume 75% of excavated acceptable material can be used for other areas of fill across the site
- 6.08 Fill based on AECOM cut & fill measure
- 6.09 Area of pavement at intersection near Tinker Brook junction and intersection with A12 and A1094



## A12 Four Villages and Sizewell Four Villages Bypass

SB5 - Blue Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
7.00	<u>Series 700: Pavements</u>					
7.01	Build up to new road as follows					
	Sub-base course of granular material DfT Type; 150mm thick					
	Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep					
	Binder course of dense bitumen macadam to DfT clause 904; 100mm deep					
	Surface course of dense bitumen macadam to DfT clause 909; 50mm deep					
7.03	Roundabout assumed to be 32m in diameter for single carriageway road, rather than 48m diameter as for dual carriageway					
7.04	Costs of roundabout based on Cost Model "Infrastructure" by Neal Kalita of Davis Langdon					
7.05	Costs for SB5 River Bridge and SB5 Over Bridge based on AECOM structures estimates					
7.06	Costs for SB5 Agricultural underpass based on costs for other routes adjusted to suit the situation for SB5					
11.00	<u>Series 1100: Kerbs, Footways and Paved Areas</u>					
11.01	Assumed kerbs required at junctions, at the roundabout and the roundabout islands					
11.02	Allowance for paved areas at A12 West Roundabout					
11.03	Roundabout islands included in pavement quantity					
11.04	Footpaths costs based on email from Lydia hunt; 24 April 2014					
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 1 Nr lamppost per m diameter of roundabout					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
14.02	Assume connection for electricity at 500m distance from each					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		68,463	£ 174.77	£ 11,965,334.37
<b>2 Structures</b>				£ 2,475,100.00
<b>3 Signals</b>				£ 67,680.00
<b>4 Noise Barriers</b>				£ 733,200.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		68,463	£ 222.62	£ 15,241,314.37
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 4,572,394.31
<b>8 Works Total</b>		68,463	£ 289.41	£ 19,813,708.68
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 2,472,000.00
<b>11 Construction Total</b>				£ 22,285,708.68
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 2,674,285.04
Supervision	5%			£ 1,114,285.43
Design	4.5%			£ 1,002,856.89
<b>13 Sub-Total</b>				£ 27,077,136.05
<b>14 Compulsory Purchase of Land</b>		302,960 m2	£ 5.00	£ 1,514,800.00
<b>15 Total</b>				£ 28,591,936.05
<b>16</b>				
Contingency/ Risk	10%			£ 2,859,193.61
Inflation	20%			£ 5,718,387.21
Optimism Bias	32%			£ 9,149,419.54
<b>17 Grand Total (exc VAT)</b>		68,463	£ 676.56	£ 46,318,936.40

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 4,572,394.31	
	Series 200: Site Clearance				£ 89,554.45	
	Series 300: Fencing				£ 733,200.00	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 712,776.63	
	Series 500: Drainage and Service Ducts				£ 1,716,107.14	
	Series 600: Earthworks				£ 3,838,107.72	
	Series 700: Pavements				£ 7,452,153.32	
	Series 1100: Kerbs, Footways and Paved Areas				£ 32,001.24	
	Series 1200: Traffic Signs and Road Markings				£ 151,484.23	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 67,680.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 21,000.00	
	Series 3000: Landscape and Ecology				£ 427,249.65	
	<b>Total Measured Works</b>				£ 19,813,708.68	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 2,472,000.00	
	<b>Construction Total</b>				£ 22,285,708.68	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 2,674,285.04	
	Supervision	5%			£ 1,114,285.43	
	Design	5%			£ 1,002,856.89	
	<b>Compulsory Purchase of Land</b>	302,960	m2	£ 5.00	£ 1,514,800.00	
	<b>Total</b>				£ 28,591,936.05	
	Contingency/ Risk	10%			£ 2,859,193.61	
	Inflation	20%			£ 5,718,387.21	
	Optimism Bias	32%			£ 9,149,419.54	
	<b>Grand Total</b>				£ 46,318,936.40	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	4,572,394.31	
					<b>£ 4,572,394.31</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	21 ha	£	3,000.00	£ 63,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	1,796 m	£	3.00	£ 5,389.35	Assume kerbs on all of existing road
2.03	Take up road studs	1,198 nr	£	3.50	£ 4,191.72	Assume 1Nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	5,389 m	£	2.50	£ 13,473.38	Assumed 1 line both sides of road on existing road within site area and one line down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	3,500.00	£ 3,500.00	
					<b>£ 89,554.45</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
3.02	Allowance for noise barriers; 4 x 400m	4,800 m2	£	152.75	£ 733,200.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 733,200.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	3,469	m	£ 175.00	£ 607,154.63	
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	2	nr	£ 2,500.00	£ 5,000.00	
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	402	m	£ 250.00	£ 100,622.00	Allowance for parapets to two overbridges
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	-	m	£ 220.00	£ -	Assume not required; no pedestrian areas
					<b>£ 712,776.63</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway	53	m	£ 560.00	£ 29,680.00	Culvert crossings
5.02	New Culvert to carry watercourse below carriageway	58	m	£ 560.00	£ 32,480.00	Culvert crossings
5.03	New Culvert to carry watercourse below carriageway	45	m	£ 560.00	£ 25,200.00	Culvert crossings
5.04	Extra over cost for installation of culvert's over watercourse	3	nr	£ 24,500.00	£ 73,500.00	
5.05	Allowance for ditch diversions	306	m	£ 60.00	£ 18,371.34	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Filter Drains</b>						
5.06	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	15,369 m	£	100.00	£ 1,536,875.80	Scope allowed for drainage to inside and outside lanes on both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 1,716,107.14</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	184,258 m3	£	5.50	£ 1,013,418.16	85% of material acceptable class 5A; field area; AECOM cut & fill measure
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	32,516 m3	£	6.00	£ 195,096.54	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	232 m3	£	5.50	£ 1,277.36	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	2,864 m3	£	6.00	£ 17,186.36	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	27,639 m3	£	4.00	£ 110,554.71	
6.06	Allowance for excavation of turning areas; assume 500mm deep	288 m3	£	15.00	£ 4,324.67	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	32,516 m3	£	10.50	£ 341,418.95	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	141,840 m3	£	10.00	£ 1,418,401.77	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	42,650 m3	£	10.00	£ 426,499.18	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	-	m3	£ 28.00	£ -	Assume none needed; all used from fill supplied from excavated materials
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	141,840	m3	£ 1.00	£ 141,840.18	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	444	m2	£ 8.00	£ 3,555.68	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	25,313	m2	£ 6.50	£ 164,534.16	Assumed 1000 wide
				<b>£</b>	<b>3,838,107.72</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	10,269	m3	£ 33.40	£ 342,999.11	
7.02	Allowance for granular sub-base to central reservation, assumed 75mm thick	2,930	m3	£ 33.40	£ 97,850.02	
7.03	Allowance for creation of turning circles at road closures; assume 150mm thick	86	m3	£ 33.40	£ 2,888.88	
<b>Pavement</b>						
7.04	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	68,463	m2	£ 23.60	£ 1,615,724.35	Including road for new bridge over dual carriageway
7.05	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	68,463	m2	£ 12.80	£ 876,325.07	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Pavement</b>						
7.06	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	68,463	m2	£ 9.40	£ 643,551.22	
7.07	Allowance for central reservation, consisting of; base course of dense bitumen macadam, 100 deep; binder course 50 deep; surface course 50 deep	39,062	m2	£ 35.00	£ 1,367,165.94	
7.08	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	577	m2	£ 45.00	£ 25,948.04	
<b>Jointing Between New and Existing Carriageway</b>						
7.09	Allow for feathered layers of surface and binder courses to suit	184	m	£ 25.00	£ 4,600.70	
<b>Structures</b>						
7.10	Allowance for new roundabout; 48m diameter	1	item	£ 480,000.00	£ 480,000.00	
7.11	New dual carriageway structure over existing River Alde; single span steel composite deck with full height abutments and piled foundations	26	m2	£ 20,850.00	£ 542,100.00	
7.12	Extra over cost for installation of River Ale riverbridge	1	item	£ 76,000.00	£ 76,000.00	
7.13	composite deck; full height abutments and piled foundations	810	m2	£ 1,700.00	£ 1,377,000.00	
					<b>£ 7,452,153.32</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	835	m	£ 15.00	£ 12,529.47	Scope unknown; assumed kerbs needed around roundabout area, roundabout islands and junctions/ slip roads
11.02	Allowance for bullnosed edging to turning circles and access road	211	m	£ 15.00	£ 3,164.66	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	58 m2	£	2.50 £	145.24	Allowance for islands at roundabout area; assumed 1m wide
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	58 m2	£	20.00 £	1,161.88	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	15,000.00 £	15,000.00	Data from AECOM Chelmsford
				<b>£</b>	<b>32,001.24</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1 item	£	35,000.00 £	35,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	15,369 m	£	1.50 £	23,053.14	Scope allowed for line down both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	7,684 m	£	1.00 £	7,684.38	Scope allowed for central line to carriageway
12.04	Allowance for various road markings such as arrows or triangles at junctions	1 item	£	3,500.00 £	3,500.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	4 nr	£	70.00 £	280.00	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	5,123 nr	£	16.00 £	81,966.71	Allowance for one catseye per 4.5 m of white line on new road
				<b>£</b>	<b>151,484.23</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	48	nr	£ 680.00	£ 32,640.00	Scope allowed for 50 at roundabout
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	48	nr	£ 400.00	£ 19,200.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	48	nr	£ 330.00	£ 15,840.00	
				<b>£</b>	<b>67,680.00</b>	
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	500	m	£ 16.00	£ 8,000.00	Scope unknown, assumed electricity at 500m away
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£ 5,000.00	£ 5,000.00	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	500	m	£ 10.00	£ 5,000.00	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1	item	£ 3,000.00	£ 3,000.00	
				<b>£</b>	<b>21,000.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	142,417	m2	£ 2.00	£ 284,833.10	
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	142,417	m2	£ 1.00	£ 142,416.55	
					<b>£ 427,249.65</b>	
					<b>£ 19,813,708.68</b>	

## A12 Four Villages and Sizewell Four Villages Bypass

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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### Assumptions

#### 0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0027
- 0.02 All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0027
- 0.03 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.04 All costs are exclusive of VAT

#### 1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

#### 2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road suds and thermoplastic lines to existing carriageway

#### 3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

#### 4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge

#### 5.00 Series 500: Drainage and Service Ducts

#### 6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

#### 7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

#### 11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB5 - Blue Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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12.00 Series 1200: Traffic Signs and Road markings

12.01 General allowance for traffic signs; no detail

12.02 Allowance for thermoplastic lines to carriageways

12.03 Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways

13.00 Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts

13.01 Allowance for 48 lampposts at the roundabout area

14.00 Series 1400: Electrical Work for Road Lighting and Traffic Signs

14.01 General allowance for trench and cable to make connection; no scope

30.00 Series 3000: Landscape and Ecology

30.01 Assumed grass only to verges and other soft landscaping areas

30.02 No trees included

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		28,040	£ 152.19	£ 4,267,347.06
<b>2 Structures</b>				£ 748,000.00
<b>3 Signals</b>				£ 45,120.00
<b>4 Sundries</b>				
<b>5 Sub-Total (1-4)</b>		28,040	£ 180.48	£ 5,060,467.06
<b>6 Preliminaries &amp; Traffic Management</b>	30%			£ 1,518,140.12
<b>7 Works Total</b>		28,040	£ 234.62	£ 6,578,607.18
<b>8 Ancillaries and Major Items</b>				
<b>9 Statutory Undertakers</b>				£ 1,317,000.00
<b>10 Construction Total</b>				£ 7,895,607.18
<b>11 Preparation and Supervision</b>				
Preparation	12%			£ 947,472.86
Supervision	5%			£ 394,780.36
Design	4.5%			£ 355,302.32
<b>12 Sub-Total</b>				£ 9,593,162.72
<b>13 Compulsory Purchase of Land</b>		87,036 m2	£ 5.00	£ 435,178.57
<b>14 Total</b>				£ 10,028,341.30
<b>15</b>				
Contingency/ Risk	10%			£ 1,002,834.13
Inflation	20%			£ 2,005,668.26
Optimism Bias	32%			£ 3,209,069.21
<b>16 Grand Total (exc VAT)</b>		28,040	£ 579.39	£ 16,245,912.90

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 1,518,140.12	
	Series 200: Site Clearance				£ 53,564.79	
	Series 300: Fencing				£ -	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 9,847.25	
	Series 500: Drainage and Service Ducts				£ 653,820.00	
	Series 600: Earthworks				£ 1,083,530.61	
	Series 700: Pavements				£ 2,921,615.40	
	Series 1100: Kerbs, Footways and Paved Areas				£ 16,458.94	
	Series 1200: Traffic Signs and Road Markings				£ 66,070.00	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 45,120.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 25,296.16	
	Series 3000: Landscape and Ecology				£ 185,143.90	
	<b>Total Measured Works</b>				£ 6,578,607.18	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 1,317,000.00	
	<b>Construction Total</b>				£ 7,895,607.18	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 947,472.86	
	Supervision	5%			£ 394,780.36	
	Design	4.5%			£ 355,302.32	
	<b>Compulsory Purchase of Land</b>	87,036 m2	£	5.00	£ 435,178.57	Pro rata from site area of 16ha for dual carriageway option to 10ha for single
	<b>Total</b>				£ 10,028,341.30	
	Contingency/ Risk	10%			£ 1,002,834.13	
	Inflation	20%			£ 2,005,668.26	
	Optimism Bias	32%			£ 3,209,069.21	
	<b>Grand Total</b>				£ 16,245,912.90	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	1,518,140.12	
					<b>£ 1,518,140.12</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	10 ha	£	3,000.00	£ 30,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	2,630 m	£	3.00	£ 7,890.72	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	292 nr	£	3.50	£ 1,022.87	Assume 1Nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	5,260 m	£	2.50	£ 13,151.20	Assume 1 line on outside lanes and one line down the middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	1,500.00	£ 1,500.00	
					<b>£ 53,564.79</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
					<b>£ -</b>	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required on single carriageway roads
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	39	m	£ 250.00	£ 9,847.25	Assume required where agricultural underpass is being formed
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	-	m	£ 220.00	£ -	Scope unknown; assume not required
					<b>£ 9,847.25</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	47	m	£ 560.00	£ 26,320.00	Culvert crossings
5.02	Extra over cost for installation of culvert's over watercourse	1	nr	£ 24,500.00	£ 24,500.00	Culvert crossings
<b>Filter Drains</b>						
5.03	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	6,030	m	£ 100.00	£ 603,000.00	Scope allowed for drainage both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 653,820.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	47,228	m3	£ 5.50	£ 259,751.77	85% of material acceptable class 5A; field area; AECOM cut & fill measure; pro rata rate to 10 ha site from 14 ha site
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	8,334	m3	£ 6.00	£ 50,005.69	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure; pro rata rate to 10 ha site from 14 ha site
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	234	m3	£ 5.50	£ 1,285.80	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,325	m3	£ 6.00	£ 7,948.59	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	7,084	m3	£ 4.00	£ 28,336.56	
6.06	Allowance for excavation of turning areas; assume 500mm deep	331	m3	£ 15.00	£ 4,960.46	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	8,334	m3	£ 10.50	£ 87,509.96	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	47,461	m3	£ 10.00	£ 474,613.77	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material excluding Class 5A	9,659	m3	£ 10.00	£ 96,590.47	
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	741	m3	£ 28.00	£ 20,757.08	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	48,203	m3	£ 1.00	£ 48,202.70	AECOM cut & fill measure

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	446	m2	£ 8.00	£ 3,567.76	
					<b>£ 1,083,530.61</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	4,206	m3	£ 33.40	£ 140,477.90	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	99	m3	£ 33.40	£ 3,313.58	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	28,040	m2	£ 23.60	£ 661,732.20	
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	28,040	m2	£ 12.80	£ 358,905.60	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	28,040	m2	£ 9.40	£ 263,571.30	
7.06	Allowance for central reservation, consisting of; base course of dense bitumen macadam, 100 deep; binder course 50 deep; surface course 50 deep	20,438	m2	£ 35.00	£ 715,332.91	
7.07	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	661	m2	£ 45.00	£ 29,762.73	
<b>Jointing Between New and Existing Carriageway</b>						
7.08	Allow for feathered layers of surface and binder courses to suit	21	m	£ 25.00	£ 519.19	Pro rata from dual to single carriageway

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Structures</b>						
7.09	Allowance for new roundabout; 32m diameter	1	item	£ 320,000.00	£ 320,000.00	
7.10	New single carriageway structure over existing watercourse; single span steel composite deck with full height abutments and piled foundations	22	m	£ 16,000.00	£ 352,000.00	
7.11	Extra over cost for installation of SB4 underpass	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 2,921,615.40</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	437	m	£ 15.00	£ 6,562.16	Scope unknown; assumed kerbs needed around roundabout area; pro rata from 40m diameter to 32m diameter roundabout
11.02	Allowance for bullnosed edging to turning circles	259	m	£ 15.00	£ 3,881.84	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	90	m2	£ 2.50	£ 223.88	Allowance for islands at roundabout area
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	90	m2	£ 20.00	£ 1,791.06	Scope unknown; as above
11.05	Allowance for footpaths	1	item	£ 4,000.00	£ 4,000.00	Data from AECOM Chelmsford
					<b>£ 16,458.94</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 20,000.00	£ 20,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	6,030	m	£ 1.50	£ 9,045.00	Scope allowed for line down both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	3,015	m	£ 1.00	£ 3,015.00	Scope allowed for line down centre of road
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 1,500.00	£ 1,500.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	5	nr	£ 70.00	£ 350.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	2,010	nr	£ 16.00	£ 32,160.00	Allowance for one catseye per 4.5m of white line on new road
				<b>£</b>	<b>66,070.00</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	32	nr	£ 680.00	£ 21,760.00	Scope allowed for 32 at roundabout
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	32	nr	£ 400.00	£ 12,800.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	32	nr	£ 330.00	£ 10,560.00	
				<b>£</b>	<b>45,120.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments	
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>							
<b>Trench for Cable or Duct</b>							
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	665 m	£	16.00	£	10,643.79	
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£	5,000.00	£	5,000.00
<b>Cable and Duct</b>							
14.03	Cable in trench; not exceeding 1.5m deep	665 m	£	10.00	£	6,652.37	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1	item	£	3,000.00	£	3,000.00
					<b>£</b>	<b>25,296.16</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>							
<b>Ground Preparation and Cultivation</b>							
30.01	Supply and apply granular cultivation treatments	61,715 m2	£	2.00	£	123,429.27 Pro rata rate from site area of 14ha to 10ha	
<b>Seeding and Turfing</b>							
30.02	Selected grass seed; by conventional sowing	61,715 m2	£	1.00	£	61,714.63 Pro rata rate from site area of 14ha to 10ha	
					<b>£</b>	<b>185,143.90</b>	
					<b>£</b>	<b>6,578,607.18</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Assumptions**

0.00 Generally

- 0.01 The site has been assumed to consist of 9.3m wide road, with 12m of land either side of each carriageway, totaling a 33.3m wide site, with length 3,015m
- 0.02 All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0019
- 0.03 The carriageway has been assumed to be a single carriageway
- 0.04 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.05 All costs are exclusive of VAT

1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road suds and thermoplastic lines to existing carriageway

3.00 Series 300: Fencing

4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge

5.00 Series 500: Drainage and Service Ducts

- 5.01 Assumed culvert crossings are the same for dual and single carriageway options; based on AECOM culvert crossing costings for SB1

6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road
- 6.04 Excavation work pro rated from dual carriageway option with site size 14ha to single carriageway option site size 10ha

7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep
- 7.02 Single carriageway road area consists of an assumed constant width of 9.3m with length equal to the dual carriageway option
- 7.03 Roundabout assumed to be 32m in diameter for single carriageway road, rather than 40m diameter as for dual carriageway

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route



Item	Description	Quantity	Unit	Rate	Total	Comments
11.00	<u>Series 1100: Kerbs, Footways and Paved Areas</u>					
11.01	Assumed kerbs required at junctions					
11.02	Allowance for paved areas with kerbs at the new roundabout area					
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts at the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					
30.03	Landscaping work pro rated from dual carriageway option with site size 14ha to single carriageway option site size 10ha					



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		52,706	£ 141.11	£ 7,437,107.61
<b>2 Structures</b>				£ 1,132,000.00
<b>3 Signals</b>				£ 56,400.00
<b>4 Sundries</b>				
<b>5 Sub-Total (1-4)</b>		52,706	£ 163.65	£ 8,625,507.61
<b>6 Preliminaries &amp; Traffic Management</b>	30%			£ 2,587,652.28
<b>7 Works Total</b>		52,706	£ 212.75	£ 11,213,159.89
<b>8 Ancillaries and Major Items</b>				
<b>9 Statutory Undertakers</b>				£ 1,317,000.00
<b>10 Construction Total</b>				£ 12,530,159.89
<b>11 Preparation and Supervision</b>				
Preparation	12%			£ 1,503,619.19
Supervision	5%			£ 626,507.99
Design	4.5%			£ 563,857.20
<b>12 Sub-Total</b>				£ 15,224,144.27
<b>13 Compulsory Purchase of Land</b>		121,850 m2	£ 5.00	£ 609,250.00
<b>14 Total</b>				£ 15,833,394.27
<b>15</b>				
Contingency/ Risk	10%			£ 1,583,339.43
Inflation	20%			£ 3,166,678.85
Optimism Bias	32%			£ 5,066,686.17
<b>16 Grand Total (exc VAT)</b>		52,706	£ 486.67	£ 25,650,098.71

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 2,587,652.28	
	Series 200: Site Clearance				£ 66,564.79	
	Series 300: Fencing				£ -	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 868,347.73	
	Series 500: Drainage and Service Ducts				£ 1,109,257.60	
	Series 600: Earthworks				£ 1,506,221.98	
	Series 700: Pavements				£ 4,610,815.18	
	Series 1100: Kerbs, Footways and Paved Areas				£ 14,099.48	
	Series 1200: Traffic Signs and Road Markings				£ 109,303.23	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 56,400.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 25,296.16	
	Series 3000: Landscape and Ecology				£ 259,201.46	
	<b>Total Measured Works</b>				£ 11,213,159.89	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 1,317,000.00	
	<b>Construction Total</b>				£ 12,530,159.89	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 1,503,619.19	
	Supervision	5%			£ 626,507.99	
	Design	4.5%			£ 563,857.20	
	<b>Compulsory Purchase of Land</b>	121,850	m2	£ 5.00	£ 609,250.00	
	<b>Total</b>				£ 15,833,394.27	
	Contingency/ Risk	10%			£ 1,583,339.43	
	Inflation	20%			£ 3,166,678.85	
	Optimism Bias	32%			£ 5,066,686.17	
	<b>Grand Total</b>				£ 25,650,098.71	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	2,587,652.28	
					<b>£ 2,587,652.28</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	14 ha	£	3,000.00	£ 42,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	2,630 m	£	3.00	£ 7,890.72	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	292 nr	£	3.50	£ 1,022.87	Assume 1 nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	5,260 m	£	2.50	£ 13,151.20	Assumed 1 line both sides of road on existing road within site area and two lines down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	2,500.00	£ 2,500.00	
					<b>£ 66,564.79</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
					<b>£ -</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	4,906 m	£	175.00 £	858,500.48	Allowance for two barriers, one on each side of inside lane of carriageways, along central reservation
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	- nr	£	2,500.00 £	-	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	39 m	£	250.00 £	9,847.25	Assume required where agricultural underpass is being formed
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	m	£	220.00 £	-	Scope unknown; assume not required
					<b>£ 868,347.73</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	47 m	£	560.00 £	26,320.00	Culvert crossings
5.02	Extra over cost for installation of culvert's over watercourse	1 nr	£	24,500.00 £	24,500.00	Culvert crossings
<b>Filter Drains</b>						
5.03	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	10,584 m	£	100.00 £	1,058,437.60	Scope allowed for drainage both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 1,109,257.60</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	66,119	m3	£ 5.50	£ 363,652.48	85% of material acceptable class 5A; field area; AECOM cut & fill measure
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	11,668	m3	£ 6.00	£ 70,007.96	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	234	m3	£ 5.50	£ 1,285.80	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,325	m3	£ 6.00	£ 7,948.59	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	9,918	m3	£ 4.00	£ 39,671.18	
6.06	Allowance for excavation of turning areas; assume 500mm deep	331	m3	£ 15.00	£ 4,960.46	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	11,668	m3	£ 10.50	£ 122,513.94	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	66,352	m3	£ 10.00	£ 663,524.15	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material excluding Class 5A	12,993	m3	£ 10.00	£ 129,927.60	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	1,131	m3	£ 28.00	£ 31,678.27	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	67,484	m3	£ 1.00	£ 67,483.78	AECOM cut & fill measure

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	446	m2	£ 8.00	£ 3,567.76	
					<b>£ 1,506,221.98</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	7,906	m3	£ 33.40	£ 264,055.38	
7.02	Allowance for granular sub-base to central reservation, assumed 75mm thick	1,533	m3	£ 33.40	£ 51,197.40	
7.03	Allowance for creation of turning circles at road closures; assume 150mm thick	99	m3	£ 33.40	£ 3,313.58	
<b>Pavement</b>						
7.04	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	52,706	m2	£ 23.60	£ 1,243,853.67	
7.05	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	52,706	m2	£ 12.80	£ 674,632.50	
7.06	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	52,706	m2	£ 9.40	£ 495,433.24	
7.07	Allowance for central reservation, consisting of; base course of dense bitumen macadam, 100 deep; binder course 50 deep; surface course 50 deep	20,438	m2	£ 35.00	£ 715,332.91	
7.08	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	661	m2	£ 45.00	£ 29,762.73	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Jointing Between New and Existing Carriageway</b>						
7.09	Allow for feathered layers of surface and binder courses to suit	49 m	£	25.00	£ 1,233.78	
<b>Structures</b>						
7.10	Allowance for new roundabout; 40m diameter	1 item	£	400,000.00	£ 400,000.00	
7.11	New dual carriageway structure over existing water course and agricultural track	41 m	£	16,000.00	£ 656,000.00	
7.12	Extra over cost for installation of SB4 underpass	1 item	£	76,000.00	£ 76,000.00	
					<b>£ 4,610,815.18</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	547 m	£	15.00	£ 8,202.71	Scope unknown; assumed kerbs needed around roundabout area
11.02	Allowance for bullnosed edging to turning circles	259 m	£	15.00	£ 3,881.84	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	90 m2	£	2.50	£ 223.88	Allowance for islands at roundabout area
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	90 m2	£	20.00	£ 1,791.06	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	-	£ -	Data from AECOM Chelmsford
					<b>£ 14,099.48</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 25,000.00	£ 25,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	11,107	m	£ 1.50	£ 16,660.89	Scope allowed for line down inside and outside lane of both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	5,554	m	£ 1.00	£ 5,553.63	
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 2,500.00	£ 2,500.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	5	nr	£ 70.00	£ 350.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	3,702	nr	£ 16.00	£ 59,238.71	Allowance for one catseye per 4.5 m of white line on new road
					<b>£ 109,303.23</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	40	nr	£ 680.00	£ 27,200.00	Scope allowed for 40 at roundabout
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	40	nr	£ 400.00	£ 16,000.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	40	nr	£ 330.00	£ 13,200.00	
					<b>£ 56,400.00</b>	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB4 - Red Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Series 1400: Electrical Work for Road lighting and traffic Signs**

**Trench for Cable or Duct**

14.01	300 to 450 mm wide; depth not exceeding 1.5 m	665 m	£	16.00	£	10,643.79
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1 item	£	5,000.00	£	5,000.00

**Cable and Duct**

14.03	Cable in trench; not exceeding 1.5m deep	665 m	£	10.00	£	6,652.37
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1 item	£	3,000.00	£	3,000.00

**£ 25,296.16**

**Series 3000: Landscape and Ecology**

**Ground Preparation and Cultivation**

30.01	Supply and apply granular cultivation treatments	86,400 m2	£	2.00	£	172,800.98
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**Seeding and Turfing**

30.02	Selected grass seed; by conventional sowing	86,400 m2	£	1.00	£	86,400.49
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**£ 259,201.46**

**£ 11,213,159.89**

# A12 Four Villages and Sizewell Four Villages Bypass

SB4 - Red Route



Item	Description	Quantity	Unit	Rate	Total	Comments
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## Assumptions

### 0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0019
- 0.02 All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0019
- 0.03 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.04 All costs are exclusive of VAT

### 1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

### 2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road suds and thermoplastic lines to existing carriageway

### 3.00 Series 300: Fencing

### 4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge

### 5.00 Series 500: Drainage and Service Ducts

### 6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

### 7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

### 11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area; roundabout islands

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**

SB4 - Red Route



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 40 lampposts around the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		27,156	£ 217.48	£ 5,905,866.23
<b>2 Structures</b>				£ 1,127,000.00
<b>3 Signals</b>				£ 45,120.00
<b>4 Noise Barriers</b>				£ 366,600.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		27,156	£ 274.14	£ 7,444,586.23
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 2,233,375.87
<b>8 Works Total</b>		27,156	£ 356.38	£ 9,677,962.10
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 3,075,000.00
<b>11 Construction Total</b>				£ 12,752,962.10
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 1,530,355.45
Supervision	5%			£ 637,648.11
Design	4.5%			£ 573,883.29
<b>13 Sub-Total</b>				£ 15,494,848.96
<b>14 Compulsory Purchase of Land</b>		100,415 m2	£ 5.00	£ 502,075.23
<b>15 Total</b>				£ 15,996,924.18
<b>16</b>				
Contingency/ Risk	10%			£ 1,599,692.42
Inflation	20%			£ 3,199,384.84
Optimism Bias	32%			£ 5,119,015.74
<b>17 Grand Total (exc VAT)</b>		27,156	£ 954.30	£ 25,915,017.17

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 2,233,375.87	
	Series 200: Site Clearance				£ 49,550.36	
	Series 300: Fencing				£ 448,789.60	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 157,571.68	
	Series 500: Drainage and Service Ducts				£ 694,020.00	
	Series 600: Earthworks				£ 2,937,343.10	
	Series 700: Pavements				£ 2,774,565.89	
	Series 1100: Kerbs, Footways and Paved Areas				£ 43,996.63	
	Series 1200: Traffic Signs and Road Markings				£ 64,746.71	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 45,120.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 20,253.49	
	Series 3000: Landscape and Ecology				£ 208,628.77	
	<b>Total Measured Works</b>				£ 9,677,962.10	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 3,075,000.00	
	<b>Construction Total</b>				£ 12,752,962.10	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 1,530,355.45	
	Supervision	5%			£ 637,648.11	
	Design	5%			£ 573,883.29	
	<b>Compulsory Purchase of Land</b>	100,415 m2	£	5.00	£ 502,075.23	Pro rata from site area of 16ha for dual carriageway option to 10ha for single
	<b>Total</b>				£ 15,996,924.18	
	Contingency/ Risk	10%			£ 1,599,692.42	
	Inflation	20%			£ 3,199,384.84	
	Optimism Bias	32%			£ 5,119,015.74	
	<b>Grand Total</b>				<b>£ 25,915,017.17</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	2,233,375.87	
					<b>£ 2,233,375.87</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	10 ha	£	3,000.00	£ 30,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	2,875 m	£	3.00	£ 8,625.83	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	639 nr	£	3.50	£ 2,236.33	Assume 1Nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	2,875 m	£	2.50	£ 7,188.20	Assume 1 line on outside of lanes and one line down the middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	1,500.00	£ 1,500.00	
					<b>£ 49,550.36</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	411 m2	£	200.00	£ 82,189.60	
3.02	Allowance for noise barriers; 2 x 400m	2,400 m2	£	152.75	£ 366,600.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 448,789.60</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required on single carriageway road
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	222	m	£ 250.00	£ 55,537.00	Allowance for parapets to two overbridges
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	464	m	£ 220.00	£ 102,034.68	Scope unknown; assume needed around roundabout area, 1000mm wide; includes allowance for islands at roundabout; include allowance for 5Nr gaps in bars for pedestrian walkways of 1.5m
					<b>£ 157,571.68</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	55	m	£ 560.00	£ 30,800.00	Culvert crossings
5.02	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	50	m	£ 560.00	£ 28,000.00	
5.03	Extra over cost for installation of culvert's over watercourse	2	nr	£ 24,500.00	£ 49,000.00	Culvert crossings
5.04	Allowance for drain diversion	37	m	£ 60.00	£ 2,220.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Filter Drains</b>						
5.05	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	5,840 m	£	100.00	£ 584,000.00	Scope allowed for drainage to both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 694,020.00</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	64,112 m3	£	5.50	£ 352,616.39	85% of material acceptable class 5A; field area; AECOM cut & fill measure; pro rata rate from 16ha site to 10 ha site
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	11,314 m3	£	6.00	£ 67,883.37	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure; pro rata rate from 16ha site to 10ha site
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	233 m3	£	5.50	£ 1,281.72	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,321 m3	£	6.00	£ 7,923.34	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	9,617 m3	£	4.00	£ 38,467.24	
6.06	Allowance for excavation of turning areas; assume 500mm deep	503 m3	£	15.00	£ 7,540.40	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	11,314 m3	£	10.50	£ 118,795.90	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	64,345 m3	£	10.00	£ 643,451.10	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	55,936	m3	£ 28.00	£ 1,566,194.73	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	120,281	m3	£ 1.00	£ 120,280.64	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	445	m2	£ 8.00	£ 3,563.63	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	1,438	m2	£ 6.50	£ 9,344.65	Assumed 1000 wide
					<b>£ 2,937,343.10</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	4,073	m3	£ 33.40	£ 136,051.70	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	127	m3	£ 33.40	£ 4,225.13	
7.03	Allowance for creating access to properties at Benhall Stock Cottages; assume 150m thick	204	m3	£ 33.40	£ 6,817.92	
<b>Pavement</b>						
7.04	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	27,156	m2	£ 23.60	£ 640,882.26	
7.05	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	27,156	m2	£ 12.80	£ 347,597.16	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Pavement</b>						
7.06	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	27,156	m2	£ 9.40	£ 255,266.66	
7.07	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	843	m2	£ 45.00	£ 37,954.35	
7.08	Allowance for creating access to properties at Benhall Stock Cottages; dense bitumen macadam, 100 deep; binder course 100 deep; surface course 50 deep	1,361	m2	£ 45.00	£ 61,238.84	
<b>Jointing Between New and Existing Carriageway</b>						
7.09	Allow for feathered layers of surface and binder courses to suit	101	m	£ 25.00	£ 2,531.87	Pro rata from dual to single carriageway
<b>Structures</b>						
7.10	Allowance for new roundabout; 32m diameter	1	item	£ 320,000.00	£ 320,000.00	
7.11	New single carriageway structure over existing River Alde; single span steel composite deck with full height abutments and piled foundations	20	m	£ 19,600.00	£ 392,000.00	
7.12	Extra over cost for installation of SB2 River Bridge	1	item	£ 76,000.00	£ 76,000.00	
7.13	Allowance for river diversion	50	m	£ 60.00	£ 3,000.00	
7.14	New single carriageway structure over existing track; single span steel composite deck with full height abutments and piled foundations	25	m	£ 16,600.00	£ 415,000.00	
7.15	Extra over cost for installation of SB2 Overbridge	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 2,774,565.89</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	473 m	£	15.00 £	7,099.09	Scope unknown; assumed kerbs needed around roundabout area; pro rata from 50m diameter to 32m diameter roundabout
11.02	Allowance for bullnosed edging to turning circles and access road	953 m	£	15.00 £	14,293.43	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	471 m2	£	2.50 £	1,178.24	Allowance for islands and pedestrian areas at roundabout area; assumed 1m wide
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	471 m2	£	20.00 £	9,425.88	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	12,000.00 £	12,000.00	
				<b>£</b>	<b>43,996.63</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1 item	£	20,000.00 £	20,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	5,840 m	£	1.50 £	8,760.01	Scope allowed for line down both sides of carriageway and additional line on new single carriageway roads from roundabout
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	2,920 m	£	1.00 £	2,920.00	Scope allowed for line down centre of road
12.04	Allowance for various road markings such as arrows or triangles at junctions	1 item	£	1,500.00 £	1,500.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	6 nr	£	70.00 £	420.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Series 1200: Traffic Signs and Road Markings**

**Reflecting Road Studs**

12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	1,947	nr	£ 16.00	£ 31,146.70	Allowance for one catseye per 4.5 m of white line on new road
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**£ 64,746.71**

**Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts**

**Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts**

13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	32	nr	£ 680.00	£ 21,760.00	Scope allowed for 32 at roundabout
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	32	nr	£ 400.00	£ 12,800.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	32	nr	£ 330.00	£ 10,560.00	

**£ 45,120.00**

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	471 m	£	16.00	£ 7,540.61	
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1 item	£	5,000.00	£ 5,000.00	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	471 m	£	10.00	£ 4,712.88	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1 item	£	3,000.00	£ 3,000.00	
					<b>£ 20,253.49</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	69,543 m2	£	2.00	£ 139,085.85	Pro rata rate from site area of 16ha to 10ha
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	69,543 m2	£	1.00	£ 69,542.92	Pro rata rate from site area of 16ha to 10ha
					<b>£ 208,628.77</b>	
					<b>£ 9,677,962.10</b>	

## A12 Four Villages and Sizewell Four Villages Bypass

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
	<b><u>Assumptions</u></b>					
0.00	<u>Generally</u>					
0.01	The site has been assumed to consist of a 9.3m wide road, with 12m of land either side of each carriageway, totaling a 33.3m wide site, with length 2,920m					
0.02	All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0021					
0.03	The carriageway has been assumed to be a single carriageway					
0.04	We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines					
0.05	All costs are exclusive of VAT					
1.00	<u>Series 100: Preliminaries</u>					
1.01	Preliminaries and traffic management allowance at 30% of construction cost					
2.00	<u>Series 200: Site Clearance</u>					
2.01	Assumed green site; medium density woodland					
2.02	Allowance for removal of kerbs, road suds and thermoplastic lines to existing carriageway					
3.00	<u>Series 300: Fencing</u>					
3.01	Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works					
4.00	<u>Series 400: Road restraint Systems (Vehicle and Pedestrian)</u>					
4.01	Allowance for vehicular road restraint at new overbridge					
4.02	Allowance for pedestrian road restraint around new roundabout area due to the existence of two villages, either side of the roundabout					
5.00	<u>Series 500: Drainage and Service Ducts</u>					
5.01	Assumed culvert crossings are the same for dual and single carriageway options; based on AECOM culvert crossing costings for SB1					
6.00	<u>Series 600: Earthworks</u>					
6.01	Earthworks costings based on AECOM cut and fill measure					
6.02	Percentage of acceptable class 5A material based on areas of field					
6.03	Percentage of acceptable material excluding class 5A material based on area of existing road					
6.04	Excavation work pro rated from dual carriageway option with site size 16ha to single carriageway option site size 10ha					
7.00	<u>Series 700: Pavements</u>					
7.01	Build up to new road as follows					
	Sub-base course of granular material DfT Type; 150mm thick					
	Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep					
	Binder course of dense bitumen macadam to DfT clause 904; 100mm deep					
	Surface course of dense bitumen macadam to DfT clause 909; 50mm deep					
7.02	Single carriageway road area consists of an assumed constant width of 9.3m with length equal to the dual carriageway option					
7.03	Roundabout assumed to be 32m in diameter for single carriageway road, rather than 50m diameter as for dual carriageway					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
11.00	<u>Series 1100: Kerbs, Footways and Paved Areas</u>					
11.01	Assumed kerbs required at junctions					
11.02	Allowance for paved areas with kerbs at the new roundabout area					
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts at the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					
30.03	Landscaping work pro rated from dual carriageway option with site size 16ha to single carriageway option site size 10ha					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		50,833	£ 230.69	£ 11,726,617.00
<b>2 Structures</b>				£ 2,236,200.00
<b>3 Signals</b>				£ 70,500.00
<b>4 Noise Barriers</b>				£ 366,600.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		50,833	£ 283.28	£ 14,399,917.00
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 4,319,975.10
<b>8 Works Total</b>		50,833	£ 368.26	£ 18,719,892.11
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 3,075,000.00
<b>11 Construction Total</b>				£ 21,794,892.11
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 2,615,387.05
Supervision	5%			£ 1,089,744.61
Design	4.5%			£ 980,770.14
<b>13 Sub-Total</b>				£ 26,480,793.91
<b>14 Compulsory Purchase of Land</b>		143,057 m2	£ 5.00	£ 715,285.00
<b>15 Total</b>				£ 27,196,078.91
<b>16</b>				
Contingency/ Risk	10%			£ 2,719,607.89
Inflation	20%			£ 5,439,215.78
Optimism Bias	32%			£ 8,702,745.25
<b>17 Grand Total (exc VAT)</b>		50,833	£ 866.71	£ 44,057,647.83



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 4,319,975.10	
	Series 200: Site Clearance				£ 68,550.36	
	Series 300: Fencing				£ 448,789.60	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 1,028,206.31	
	Series 500: Drainage and Service Ducts				£ 1,280,785.40	
	Series 600: Earthworks				£ 4,684,473.55	
	Series 700: Pavements				£ 6,300,265.92	
	Series 1100: Kerbs, Footways and Paved Areas				£ 51,989.88	
	Series 1200: Traffic Signs and Road Markings				£ 112,296.48	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 70,500.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 20,253.49	
	Series 3000: Landscape and Ecology				£ 333,806.03	
	<b>Total Measured Works</b>				£ 18,719,892.11	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 3,075,000.00	
	<b>Construction Total</b>				£ 21,794,892.11	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 2,615,387.05	
	Supervision	5%			£ 1,089,744.61	
	Design	5%			£ 980,770.14	
	<b>Compulsory Purchase of Land</b>	143,057	m2	£ 5.00	£ 715,285.00	
	<b>Total</b>				£ 27,196,078.91	
	Contingency/ Risk	10%			£ 2,719,607.89	
	Inflation	20%			£ 5,439,215.78	
	Optimism Bias	32%			£ 8,702,745.25	
	<b>Grand Total</b>				£ 44,057,647.83	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	4,319,975.10	
					<b>£ 4,319,975.10</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	16 ha	£	3,000.00	£ 48,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	2,875 m	£	3.00	£ 8,625.83	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	639 nr	£	3.50	£ 2,236.33	Assume 1Nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	2,875 m	£	2.50	£ 7,188.20	Assumed 1 line both sides of road on existing road within site area and two lines down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	2,500.00	£ 2,500.00	
					<b>£ 68,550.36</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	411 m2	£	200.00	£ 82,189.60	Assume not required
3.02	Allowance for noise barriers; 2 x 400m	2,400 m2	£	152.75	£ 366,600.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 448,789.60</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	4,975 m	£	175.00	£ 870,634.63	
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	- nr	£	2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	222 m	£	250.00	£ 55,537.00	Allowance for parapets to two overbridges
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	464 m	£	220.00	£ 102,034.68	Scope unknown; assume needed around roundabout area, 1000mm wide; includes allowance for islands at roundabout; include allowance for 5Nr gaps in bars for pedestrian walkways of 1.5m
					<b>£ 1,028,206.31</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	55 m	£	560.00	£ 30,800.00	Culvert crossings
5.02	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	50 m	£	560.00	£ 28,000.00	
5.03	Extra over cost for installation of culvert's over watercourse	2 nr	£	24,500.00	£ 49,000.00	Culvert crossings
5.04	Allowance for drain diversion	37 m	£	60.00	£ 2,220.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Filter Drains</b>						
5.05	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	11,708 m	£	100.00	£ 1,170,765.40	Scope allowed for drainage inside and outside lanes of both sides of dual carriageway; price includes trenching and fill with Type A material
					<b>£ 1,280,785.40</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	102,579 m3	£	5.50	£ 564,186.22	85% of material acceptable class 5A; field area; AECOM cut & fill measure
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	18,102 m3	£	6.00	£ 108,613.39	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	233 m3	£	5.50	£ 1,281.72	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,321 m3	£	6.00	£ 7,923.34	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	15,387 m3	£	4.00	£ 61,547.59	
6.06	Allowance for excavation of turning areas; assume 500mm deep	503 m3	£	15.00	£ 7,540.40	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	18,102 m3	£	10.50	£ 190,073.43	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	102,812 m3	£	10.00	£ 1,028,123.53	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	89,637	m3	£ 28.00	£ 2,509,826.63	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	192,449	m3	£ 1.00	£ 192,449.02	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	445	m2	£ 8.00	£ 3,563.63	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	1,438	m2	£ 6.50	£ 9,344.65	Existing road area
					<b>£ 4,684,473.55</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	7,682	m3	£ 33.40	£ 256,562.28	
7.02	Allowance for granular sub-base to central reservation, assumed 75mm thick	2,378	m3	£ 33.40	£ 79,420.70	
7.03	Allowance for creation of turning circles at road closures; assume 150mm thick	127	m3	£ 33.40	£ 4,225.13	
7.04	Allowance for creating access to properties at Benhall Stock Cottages; assume 150m thick	204	m3	£ 33.40	£ 6,817.92	
<b>Pavement</b>						
7.05	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	51,210	m2	£ 23.60	£ 1,208,556.85	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Pavement</b>						
7.06	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	51,210	m2	£ 12.80	£ 655,488.46	
7.07	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	51,210	m2	£ 9.40	£ 481,374.34	
7.08	Allowance for central reservation, consisting of; base course of dense bitumen macadam, 100 deep; binder course 50 deep; surface course 50 deep	31,705	m2	£ 35.00	£ 1,109,670.45	
7.09	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	843	m2	£ 45.00	£ 37,954.35	
7.10	Allowance for creating access to properties at Benhall Stock Cottages; dense bitumen macadam, 100 deep; binder course 100 deep; surface course 50 deep	1,361	m2	£ 45.00	£ 61,238.84	
<b>Jointing Between New and Existing Carriageway</b>						
7.11	Allow for feathered layers of surface and binder courses to suit	241	m	£ 25.00	£ 6,016.60	
<b>Structures</b>						
7.12	Allowance for new roundabout; 50m diameter	1	item	£ 500,000.00	£ 500,000.00	
7.13	New dual carriageway structure over existing River Alde; single span steel composite deck with full height abutments and piled foundations	42	m	£ 19,600.00	£ 823,200.00	
7.14	Extra over cost for installation of SB2 River Bridge	1	item	£ 76,000.00	£ 76,000.00	
7.15	Allowance for river diversion	79	m	£ 60.00	£ 4,740.00	
7.16	New dual carriageway structure over existing track; single span steel composite deck with full height abutments and piled foundations	55	m	£ 16,600.00	£ 913,000.00	
7.17	Extra over cost for installation of SB2 Overbridge	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 6,300,265.92</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	739 m	£	15.00 £	11,092.34	Scope unknown; assumed kerbs needed around roundabout area
11.02	Allowance for bullnosed edging to turning circles and access road	953 m	£	15.00 £	14,293.43	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	471 m2	£	2.50 £	1,178.24	Allowance for islands and pedestrian areas at roundabout area; assumed 1m wide
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	471 m2	£	20.00 £	9,425.88	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	16,000.00 £	16,000.00	Data from AECOM Chelmsford
				<b>£</b>	<b>51,989.88</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1 item	£	25,000.00 £	25,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	11,506 m	£	1.50 £	17,258.83	Scope allowed for line down inside and outside lane of both sides of carriageway and additional line on new single carriageway roads from roundabout
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	5,753 m	£	1.00 £	5,752.94	Scope allowed for central line to both sides of carriageway
12.04	Allowance for various road markings such as arrows or triangles at junctions	1 item	£	2,500.00 £	2,500.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Road Markings</b>						
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	6	nr	£ 70.00	£ 420.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	3,835	nr	£ 16.00	£ 61,364.71	Allowance for one catseye per 4.5 m of white line on new road
					<b>£ 112,296.48</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	50	nr	£ 680.00	£ 34,000.00	Scope allowed for 50 at roundabout
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	50	nr	£ 400.00	£ 20,000.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	50	nr	£ 330.00	£ 16,500.00	
					<b>£ 70,500.00</b>	
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	471	m	£ 16.00	£ 7,540.61	
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£ 5,000.00	£ 5,000.00	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	471 m	£	10.00	£ 4,712.88	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1 item	£	3,000.00	£ 3,000.00	
					<b>£ 20,253.49</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	111,269 m2	£	2.00	£ 222,537.35	
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	111,269 m2	£	1.00	£ 111,268.68	
					<b>£ 333,806.03</b>	
					<b>£ 18,719,892.11</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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Assumptions

0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0021
- 0.02 All measurements are based upon AECOM drawing nr 60315689-SKE-00-FVSW-C-0021
- 0.03 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.04 All costs are exclusive of VAT

1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road suds and thermoplastic lines to existing carriageway

3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge
- 4.02 Allowance for pedestrian road restraint around new roundabout area due to the existence of two villages, either side of the roundabout

5.00 Series 500: Drainage and Service Ducts

6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB2 - Green Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts at the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		69,006	£ 258.58	£ 17,843,257.91
<b>2 Structures</b>				£ 2,008,550.00
<b>3 Signals</b>				£ -
<b>4 Noise Barriers</b>				£ 549,900.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		69,006	£ 295.65	£ 20,401,707.91
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 6,120,512.37
<b>8 Works Total</b>		69,006	£ 384.35	£ 26,522,220.29
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 876,000.00
<b>11 Construction Total</b>				£ 27,398,220.29
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 3,287,786.43
Supervision	5%			£ 1,369,911.01
Design	4.5%			£ 1,232,919.91
<b>13 Sub-Total</b>				£ 33,288,837.65
<b>14 Compulsory Purchase of Land</b>		216,741 m2	£ 5.00	£ 1,083,704.86
<b>15 Total</b>				£ 34,372,542.51
<b>16</b>				
Contingency/ Risk	10%			£ 3,437,254.25
Inflation	20%			£ 6,874,508.50
Optimism Bias	32%			£ 10,999,213.60
<b>17 Grand Total (exc VAT)</b>		69,006	£ 806.94	£ 55,683,518.86

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 6,120,512.37	
	Series 200: Site Clearance				£ 112,689.48	
	Series 300: Fencing				£ 549,900.00	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 66,564.00	
	Series 500: Drainage and Service Ducts				£ 1,534,715.40	
	Series 600: Earthworks				£ 11,935,119.12	
	Series 700: Pavements				£ 5,532,443.14	
	Series 1100: Kerbs, Footways and Paved Areas				£ 16,188.71	
	Series 1200: Traffic Signs and Road Markings				£ 150,209.00	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ -	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ -	
	Series 3000: Landscape and Ecology				£ 503,879.07	
	<b>Total Measured Works</b>				£ 26,522,220.29	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 876,000.00	
	<b>Construction Total</b>				£ 27,398,220.29	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 3,287,786.43	
	Supervision	5%			£ 1,369,911.01	
	Design	5%			£ 1,232,919.91	
	<b>Compulsory Purchase of Land</b>	216,741	m2	£ 5.00	£ 1,083,704.86	Pro rata from site area of 36ha for dual carriageway option to 25ha for single
	<b>Total</b>				£ 34,372,542.51	
	Contingency/ Risk	10%			£ 3,437,254.25	
	Inflation	20%			£ 6,874,508.50	
	Optimism Bias	32%			£ 10,999,213.60	
	<b>Grand Total</b>				£ 55,683,518.86	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30%	£ 6,120,512.37	
					<b>£ 6,120,512.37</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	25 ha	£	3,000.00	£ 75,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	4,754 m	£	3.00	£ 14,262.50	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	528 nr	£	3.50	£ 1,848.84	Assume 1 nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	7,131 m	£	2.50	£ 17,828.13	Assumed 1 line both sides of road on existing road within site area and two lines down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	3,750.00	£ 3,750.00	
					<b>£ 112,689.48</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
3.02	Allowance for noise barriers; 3 x 400m	3,600 m2	£	152.75	£ 549,900.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 549,900.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required on single carriageway road
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	266	m	£ 250.00	£ 66,564.00	Assume required where new overbridges and agricultural underpass is being formed
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails		m	£ 220.00	£ -	Scope unknown; assume not required
					<b>£ 66,564.00</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	47	m	£ 560.00	£ 26,320.00	Culvert crossings
5.02	Extra over cost for installation of culvert's over watercourse	1	nr	£ 24,500.00	£ 24,500.00	Culvert crossings
<b>Filter Drains</b>						
5.03	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	14,839	m	£ 100.00	£ 1,483,895.40	Scope allowed for drainage to both sides of carriageway; price includes trenching and fill with Type A material
					<b>£ 1,534,715.40</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	154,840	m3	£ 5.50	£ 851,622.60	85% of material acceptable class 5A; field area; AECOM cut & fill measure; pro rata rate from 36ha site to 25ha site
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	27,325	m3	£ 6.00	£ 163,948.74	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure; pro rata rate from 36ha site to 25ha site
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	233	m3	£ 5.50	£ 1,283.43	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	2,878	m3	£ 6.00	£ 17,267.91	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	23,226	m3	£ 4.00	£ 92,904.28	
6.06	Allowance for excavation of turning areas; assume 500mm deep	137	m3	£ 15.00	£ 2,061.11	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	27,325	m3	£ 10.50	£ 286,910.29	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	155,074	m3	£ 10.00	£ 1,550,738.23	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	303,784	m3	£ 28.00	£ 8,505,959.63	AECOM cut & fill measure



**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	458,858	m3	£ 1.00	£ 458,858.10	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	446	m2	£ 8.00	£ 3,564.82	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep		m2	£ 6.50	£ -	
					<b>£ 11,935,119.12</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	10,351	m3	£ 33.40	£ 345,720.06	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	41	m3	£ 33.40	£ 1,376.82	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	69,006	m2	£ 23.60	£ 1,628,541.60	
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	69,006	m2	£ 12.80	£ 883,276.80	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	69,006	m2	£ 9.40	£ 648,656.40	
7.06	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	275	m2	£ 45.00	£ 12,366.63	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Jointing Between New and Existing Carriageway</b>						
7.07	Allow for feathered layers of surface and binder courses to suit	158 m	£	25.00 £	3,954.84	Pro rata from dual to single carriageway
<b>Structures</b>						
7.08	Reinforced concrete wall in front of existing abutments	11 m	£	12,750.00 £	140,250.00	
7.09	New dual carriageway structure over existing track; single span composite deck with full height abutments and piled foundations	15 m	£	16,600.00 £	249,000.00	
7.10	Extra over cost for installation of LB3 overbridge	1 item	£	76,000.00 £	76,000.00	
7.11	New dual carriageway structure over River Ore; single span steel composite deck with full height abutments and piled foundations	29 m	£	19,000.00 £	551,000.00	
7.12	Extra over cost for installation of LB3 River Bridge	1 item	£	76,000.00 £	76,000.00	
7.13	New dual carriageway structure over existing A12; single span steel composite deck with full height abutments and piled foundations	14 m	£	21,450.00 £	300,300.00	
7.14	Extra over cost for installation of LB3 A12 Overbridge	1 item	£	76,000.00 £	76,000.00	
7.15	New dual carriageway structure over existing watercourse and track; single span steel composite deck with full height abutments and piled foundations	29 m	£	16,000.00 £	464,000.00	
7.16	Extra over cost for installation of LB3 Underpass	1 item	£	76,000.00 £	76,000.00	
					<b>£ 5,532,443.14</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	242 m	£	15.00 £	3,628.41	Scope unknown; assumed kerbs required at junctions at slip roads and side roads to new dual carriageway

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.02	Allowance for bullnosed edging to turning circles	104 m	£	15.00 £	1,560.30	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	- m2	£	2.50 £	-	Assume no pavements required
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	- m2	£	20.00 £	-	Scope unknown; as above
11.05	Allowance for footpaths	1 item	£	11,000.00 £	11,000.00	
				<b>£</b>	<b>16,188.71</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1 item	£	37,500.00 £	37,500.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	14,839 m	£	1.50 £	22,258.43	Scope allowed for line down both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	7,419 m	£	1.00 £	7,419.48	Scope allowed for line down centre of carriageway
12.04	Allowance for various road markings such as arrows or triangles at junctions	1 item	£	3,750.00 £	3,750.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	2 nr	£	70.00 £	140.00	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Series 1200: Traffic Signs and Road Markings**

**Reflecting Road Studs**

12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	4,946	nr	£ 16.00	£ 79,141.09	Allowance for one catseye per 4.5 m of white line on new road
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**£ 150,209.00**

**Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts**

**Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts**

13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	-	nr	£ 680.00	£ -	Assume not required
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	-	nr	£ 400.00	£ -	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	-	nr	£ 330.00	£ -	

**£ -**

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	-	m	£ 16.00	£ -	Assume not required
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	-	item	£ 5,000.00	£ -	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	-	m	£ 10.00	£ -	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	-	item	£ 3,000.00	£ -	
					<u>£ -</u>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	167,960	m2	£ 2.00	£ 335,919.38	Area of greenery comes from site area minus road area; rate pro rated from dual (36ha) to single (25ha) site area's
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	167,960	m2	£ 1.00	£ 167,959.69	Area of greenery comes from site area minus road area; rate pro rated from dual (36ha) to single (25ha) site area's
					<u>£ 503,879.07</u>	
					<u>£ 26,522,220.29</u>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Assumptions**

0.00 Generally

- 0.01 The site has been assumed to consist of a 9.3m wide road, with 12m of land either side of each carriageway, totaling a 33.3m wide site, with length 7420 m
- 0.02 All measurements are based upon AECOM drawing nr's 60315689-SKE-00-FVSW-C-0023 & 60315689-SKE-00-FVSW-C0024
- 0.03 The carriageway has been assumed to be a single carriageway
- 0.04 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty which is stipulated by the DfT guidelines
- 0.05 All costs are exclusive of VAT

1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road studs and thermoplastic lines to existing carriageway

3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge's

5.00 Series 500: Drainage and Service Ducts

- 5.01 Assumed culvert crossings are the same for dual and single carriageway options; based on AECOM culvert crossing costings for SB1

6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road
- 6.04 Excavation work pro rated from dual carriageway option with site size 36ha to single carriageway option site size 25ha

7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep
- 7.02 Single carriageway road area consists of an assumed constant width of 9.3m with length equal to the dual carriageway option

11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Single Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					
30.03	Landscaping work pro rated from dual carriageway option with site size 36ha to single carriageway option site size 25ha					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		116,538	£ 261.72	£ 30,500,225.07
<b>2 Structures</b>				£ 3,400,750.00
<b>3 Signals</b>				£ -
<b>4 Noise Barriers</b>				£ 549,900.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		116,538	£ 295.62	£ 34,450,875.07
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 10,335,262.52
<b>8 Works Total</b>		116,538	£ 384.31	£ 44,786,137.59
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 876,000.00
<b>11 Construction Total</b>				£ 45,662,137.59
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 5,479,456.51
Supervision	5%			£ 2,283,106.88
Design	4.5%			£ 2,054,796.19
<b>13 Sub-Total</b>				£ 55,479,497.17
<b>14 Compulsory Purchase of Land</b>		312,107 m2	£ 5.00	£ 1,560,535.00
<b>15 Total</b>				£ 57,040,032.17
<b>16</b>				
Contingency/ Risk	10%			£ 5,704,003.22
Inflation	20%			£ 11,408,006.43
Optimism Bias	32%			£ 18,252,810.30
<b>17 Grand Total (exc VAT)</b>		116,538	£ 792.92	£ 92,404,852.12



**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 10,335,262.52	
	Series 200: Site Clearance				£ 146,939.48	
	Series 300: Fencing				£ 549,900.00	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 1,975,257.75	
	Series 500: Drainage and Service Ducts				£ 2,672,445.80	
	Series 600: Earthworks				£ 17,177,781.67	
	Series 700: Pavements				£ 10,944,383.25	
	Series 1100: Kerbs, Footways and Paved Areas				£ 11,188.71	
	Series 1200: Traffic Signs and Road Markings				£ 247,392.56	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ -	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ -	
	Series 3000: Landscape and Ecology				£ 725,585.86	
	<b>Total Measured Works</b>				£ 44,786,137.59	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 876,000.00	
	<b>Construction Total</b>				£ 45,662,137.59	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 5,479,456.51	
	Supervision	5%			£ 2,283,106.88	
	Design	5%			£ 2,054,796.19	
	<b>Compulsory Purchase of Land</b>	312,107	m2	£ 5.00	£ 1,560,535.00	
	<b>Total</b>				£ 57,040,032.17	
	Contingency/ Risk	10%			£ 5,704,003.22	
	Inflation	20%			£ 11,408,006.43	
	Optimism Bias	32%			£ 18,252,810.30	
	<b>Grand Total</b>				£ 92,404,852.12	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30%	£ 10,335,262.52	
					<b>£ 10,335,262.52</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	36 ha	£	3,000.00	£ 108,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	4,754 m	£	3.00	£ 14,262.50	Assumed kerbs on both sides of road on existing road within site area
2.03	Take up road studs	528 nr	£	3.50	£ 1,848.84	Assume 1 nr road stud every 4.5m of existing road within site area
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	7,131 m	£	2.50	£ 17,828.13	Assumed 1 line both sides of road on existing road within site area and two lines down middle of existing carriageway
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	5,000.00	£ 5,000.00	
					<b>£ 146,939.48</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	m2	£	200.00	£ -	Assume not required
3.02	Allowance for noise barriers; 3 x 400m	3,600 m2	£	152.75	£ 549,900.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 549,900.00</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	10,878 m	£	175.00 £	1,903,693.75	Allowance for two barriers, one on each side of inside lane of carriageways, along central reservation
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	2 nr	£	2,500.00 £	5,000.00	Assume connection from existing dual carriageway at beginning of LB3
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	266 m	£	250.00 £	66,564.00	Assume required where new overbridges and agricultural underpass is being formed
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	m	£	220.00 £	-	Scope unknown; assume not required
				<b>£</b>	<b>1,975,257.75</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below carriageway; RC pipe and RC headwalls	47 m	£	560.00 £	26,320.00	Culvert crossings
5.09	Extra over cost for installation of culvert's over watercourse	1 nr	£	24,500.00 £	24,500.00	Culvert crossings
<b>Filter Drains</b>						
5.10	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	26,216 m	£	100.00 £	2,621,625.80	Scope allowed for drainage inside and outside lanes of both sides of dual carriageway; price includes trenching and fill with Type A material
				<b>£</b>	<b>2,672,445.80</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	222,970	m3	£ 5.50	£ 1,226,336.54	85% of material acceptable class 5A; field area; AECOM cut & fill measure
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	39,348	m3	£ 6.00	£ 236,086.18	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	233	m3	£ 5.50	£ 1,283.43	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	2,878	m3	£ 6.00	£ 17,267.91	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	33,446	m3	£ 4.00	£ 133,782.17	
6.06	Allowance for excavation of turning areas; assume 500mm deep	137	m3	£ 15.00	£ 2,061.11	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	39,348	m3	£ 10.50	£ 413,150.81	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	223,204	m3	£ 10.00	£ 2,232,036.31	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	437,552	m3	£ 28.00	£ 12,251,456.74	AECOM cut & fill measure
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	660,756	m3	£ 1.00	£ 660,755.66	AECOM cut & fill measure

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	446	m2	£ 8.00	£ 3,564.82	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep		m2	£ 6.50	£ -	
					<b>£ 17,177,781.67</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	17,481	m3	£ 33.40	£ 583,856.77	
7.02	Allowance for granular sub-base to central reservation, assumed 75mm thick	3,198	m3	£ 33.40	£ 106,811.11	
7.03	Allowance for creation of turning circles at road closures; assume 150mm thick	41	m3	£ 33.40	£ 1,376.82	
<b>Pavement</b>						
7.04	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	116,538	m2	£ 23.60	£ 2,750,303.36	
7.05	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	116,538	m2	£ 12.80	£ 1,491,689.96	
7.06	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	116,538	m2	£ 9.40	£ 1,095,459.81	
7.07	Allowance for central reservation, consisting of; base course of dense bitumen macadam, 100 deep; binder course 50 deep; surface course 50 deep	42,639	m2	£ 35.00	£ 1,492,370.74	
7.08	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	275	m2	£ 45.00	£ 12,366.63	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Jointing Between New and Existing Carriageway</b>						
7.09	Allow for feathered layers of surface and binder courses to suit	376	m	£ 25.00	£ 9,398.05	
<b>Structures</b>						
7.10	Reinforced concrete wall in front of existing abutments	11	m	£ 12,750.00	£ 140,250.00	
7.11	New dual carriageway structure over existing track; single span composite deck with full height abutments and piled foundations	28	m	£ 16,600.00	£ 464,800.00	
7.11	Extra over cost for installation of LB3 overbridge	1	item	£ 76,000.00	£ 76,000.00	
7.12	New dual carriageway structure over River Ore; single span steel composite deck with full height abutments and piled foundations	58	m	£ 19,000.00	£ 1,102,000.00	
7.13	Extra over cost for installation of LB3 River Bridge	1	item	£ 76,000.00	£ 76,000.00	
7.14	New dual carriageway structure over existing A12; single span steel composite deck with full height abutments and piled foundations	26	m	£ 21,450.00	£ 557,700.00	
7.15	Extra over cost for installation of LB3 A12 Overbridge	1	item	£ 76,000.00	£ 76,000.00	
7.16	span steel composite deck with full height abutments and piled	52	m	£ 16,000.00	£ 832,000.00	
7.17	Extra over cost for installation of LB3 Underpass	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 10,944,383.25</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	242	m	£ 15.00	£ 3,628.41	Scope unknown; assumed kerbs required at junctions at slip roads and side roads to new dual carriageway
11.02	Allowance for bullnosed edging to turning circles	104	m	£ 15.00	£ 1,560.30	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	-	m2	£ 2.50	£ -	Assume no pavements required
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	-	m2	£ 20.00	£ -	Scope unknown; as above
11.05	Allowance for footpaths	1	item	£ 6,000.00	£ 6,000.00	Data from AECOM Chelmsford
					<b>£ 11,188.71</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 50,000.00	£ 50,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	26,216	m	£ 1.50	£ 39,324.39	Scope allowed for line down inside and outside lane of both sides of carriageway
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	13,108	m	£ 1.00	£ 13,108.13	
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 5,000.00	£ 5,000.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	2	nr	£ 70.00	£ 140.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	8,739	nr	£ 16.00	£ 139,820.04	Allowance for one catseye per 4.5 m of white line on new road
					<b>£ 247,392.56</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	-	nr	£ 680.00	£ -	Assume not required
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	-	nr	£ 400.00	£ -	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	-	nr	£ 330.00	£ -	
				<b>£</b>	<b>-</b>	
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	-	m	£ 16.00	£ -	Assume not required
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	-	item	£ 5,000.00	£ -	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	-	m	£ 10.00	£ -	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	-	item	£ 3,000.00	£ -	
				<b>£</b>	<b>-</b>	



**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	241,862	m2	£ 2.00	£ 483,723.91	Area of greenery comes from site area minus road area
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	241,862	m2	£ 1.00	£ 241,861.95	
					<b>£ 725,585.86</b>	
					<b>£ 44,786,137.59</b>	

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
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**Assumptions**

0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr's 60315689-SKE-00-FVSW-C-0023 & 60315689-SKE-00-FVSW-C0024
- 0.02 All measurements are based upon AECOM drawing nr's 60315689-SKE-00-FVSW-C-0023 & 60315689-SKE-00-FVSW-C0024
- 0.03 We have included for a 32% Optimism Bias; this percentage is based on an 80% design certainty, which is stipulated by the DfT guidelines
- 0.04 All costs are exclusive of VAT

1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road studs and thermoplastic lines to existing carriageway

3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge's

5.00 Series 500: Drainage and Service Ducts

6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions to new road

**A12 Four Villages and Sizewell  
Four Villages Bypass**

LB3 - Orange Route - Dual Carriageway



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route (North)



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		12,387	£ 243.91	£ 3,021,264.21
<b>2 Structures</b>				£ 1,369,500.00
<b>3 Signals</b>				£ 45,120.00
<b>4 Sundries</b>				
<b>5 Sub-Total (1-4)</b>		12,387	£ 358.11	£ 4,435,884.21
<b>6 Preliminaries &amp; Traffic Management</b>	30%			£ 1,330,765.26
<b>7 Works Total</b>		12,387	£ 465.54	£ 5,766,649.48
<b>8 Ancillaries and Major Items</b>				
<b>9 Statutory Undertakers</b>				£ 281,571.43
<b>10 Construction Total</b>				£ 6,048,220.91
<b>11 Preparation and Supervision</b>				
Preparation	12%			£ 725,786.51
Supervision	5%			£ 302,411.05
Design	4.5%			£ 272,169.94
<b>12 Sub-Total</b>				£ 7,348,588.40
<b>13 Compulsory Purchase of Land</b>		61,410 m2	£ 5.00	£ 307,050.00
<b>14 Total</b>				£ 7,655,638.40
<b>15</b>				
Contingency/ Risk	10%			£ 765,563.84
Inflation	20%			£ 1,531,127.68
Optimism Bias	32%			£ 2,449,804.29
<b>16 Grand Total</b>		12,387	£ 1,001.22	£ 12,402,134.21

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries				£ 1,330,765.26	
	Series 200: Site Clearance				£ 15,516.29	
	Series 300: Fencing				£ -	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)				£ 225,420.50	
	Series 500: Drainage and Service Ducts				£ 428,888.91	
	Series 600: Earthworks				£ 1,526,884.07	
	Series 700: Pavements				£ 2,028,609.63	
	Series 1100: Kerbs, Footways and Paved Areas				£ 33,667.93	
	Series 1200: Traffic Signs and Road Markings				£ 27,147.40	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts				£ 45,120.00	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs				£ 27,288.10	
	Series 3000: Landscape and Ecology				£ 77,341.38	
	<b>Total Measured Works</b>				<b>£ 5,766,649.48</b>	
	Ancillaries and Major Items					
	Statutory Undertakers				£ 657,000.00	
	<b>Construction Total</b>				<b>£ 6,423,649.48</b>	
	<b>Preparation and Supervision</b>					
	Preparation	12%			£ 770,837.94	
	Supervision	5%			£ 321,182.47	
	Design	5%			£ 289,064.23	
	<b>Compulsory Purchase of Land</b>	61,410	m2	£ 5.00	£ 307,050.00	
	<b>Total</b>				<b>£ 8,111,784.12</b>	
	Contingency/ Risk	10%			£ 811,178.41	
	Inflation	20%			£ 1,622,356.82	
	Optimism Bias	32%			£ 2,595,770.92	
	<b>Grand Total</b>				<b>£ 13,141,090.27</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	1,330,765.26	
					<b>£ 1,330,765.26</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	4 ha	£	3,000.00	£ 12,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	343 m	£	3.00	£ 1,027.52	Pro Rata from 7 ha to 4 ha to allow for North side of route only
2.03	Take up road studs	17 nr	£	3.50	£ 60.00	Pro Rata from 7 ha to 4 ha to allow for North side of route only
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	572 m	£	2.50	£ 1,428.77	Pro Rata from 7 ha to 4 ha to allow for North side of route only
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	1,000.00	£ 1,000.00	
					<b>£ 15,516.29</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	- m2	£	200.00	£ -	Not required to the North side
					<b>£ -</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required to single carriageway roads
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	122	m	£ 250.00	£ 30,445.50	Assume required at new side road overbridge
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	886	m	£ 220.00	£ 194,975.00	Scope unknown; assume needed around roundabout area, 1000mm wide; includes allowance for islands at roundabout; include allowance for gaps in bars for pedestrian walkways of 17m
					<b>£ 225,420.50</b>	

**Series 500: Drainage and Service Ducts**

**Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)**

5.01	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 27.16m, Int Diameter 1.5m	27	m	£ 560.00	£ 15,120.00	Culvert crossing- North
5.02	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.82m, Int Diameter 1.5m	25	m	£ 560.00	£ 14,000.00	Culvert crossing- North
5.03	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 21.93m, Int Diameter 1.5m	0	m	£ 560.00	£ -	Culvert crossing- South
5.04	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 19.85m, Int Diameter 1.5m	0	m	£ 560.00	£ -	Culvert crossing- South

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.05	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 18.32m, Int Diameter 1.5m	19 m	£	560.00 £	10,640.00	Culvert crossing- North
5.06	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.79m, Int Diameter 1.5m	0 m	£	560.00 £	-	Culvert crossing- South
5.07	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 40.44m, Int Diameter 1.5m	40 m	£	560.00 £	22,400.00	Culvert crossing- North
5.08	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 44.51m, Int Diameter 1.5m	45 m	£	560.00 £	25,200.00	Culvert crossing- North
5.09	Extra over cost for installation of culvert's over watercourse	5 nr	£	24,500.00 £	122,500.00	Culvert crossings
<b>Filter Drains</b>						
5.10	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	2,190 m	£	100.00 £	219,028.91	Scope allowed for drainage both sides of carriageway; price includes trenching and fill with Type A material. Pro Rata from 7 ha to 4 ha to allow for North side of route only
					<b>£ 428,888.91</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	1,824 m3	£	5.50 £	10,031.21	85% of material acceptable class 5A; field area; AECOM cut & fill measure. Pro Rata from 7 ha to 4 ha to allow for North side of route only
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	322 m3	£	6.00 £	1,931.14	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure. Pro Rata from 7 ha to 4 ha to allow for North side of route only
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	117 m3	£	5.50 £	643.39	



**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Series 600: Earthworks</b>						
<b>Excavation</b>						
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,443	m3	£ 6.00	£ 8,656.55	
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	274	m3	£ 6.00	£ 1,641.47	
6.06	Allowance for excavation of turning areas; assume 500mm deep	184	m3	£ 15.00	£ 2,760.97	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	322	m3	£ 10.50	£ 3,379.50	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	1,941	m3	£ 10.00	£ 19,408.37	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	48,478	m3	£ 28.00	£ 1,357,375.97	AECOM cut & fill measure. Pro Rata from 7 ha to 4 ha to allow for North side of route only
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	50,419	m3	£ 1.00	£ 50,418.55	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	224	m2	£ 8.00	£ 1,792.45	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 600: Earthworks</u></b>						
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	10,591	m2	£ 6.50	£ 68,844.49	Assumed 1000 wide; pavements at roundabout.
					<b>£ 1,526,884.07</b>	
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	1,891	m3	£ 33.40	£ 63,170.97	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	55	m3	£ 33.40	£ 1,844.33	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	12,387	m2	£ 23.60	£ 292,333.20	
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	12,387	m2	£ 12.80	£ 158,553.60	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	12,387	m2	£ 9.40	£ 116,437.80	
7.06	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	368	m2	£ 45.00	£ 16,565.81	
<b>Jointing Between New and Existing Carriageway</b>						
7.07	Allow for feathered layers of surface and binder courses to suit	408	m	£ 25.00	£ 10,203.93	
<b>Structures</b>						
7.08	Allowance for new roundabout; 32m diameter	1	item	£ 320,000.00	£ 320,000.00	
7.09	New single carriageway structure over existing River Alde, single span steel composite deck with full height abutments and piled foundations	30	m	£ 20,850.00	£ 625,500.00	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Structures</b>						
7.10	Extra over cost for installation of River Bridge	1	item	£ 76,000.00	£ 76,000.00	
7.11	New single carriageway structure over existing track, single span steel composite deck	17	m	£ 16,000.00	£ 272,000.00	
7.12	Extra over cost for installation of Overbridge	1	item	£ 76,000.00	£ 76,000.00	
					<b>£ 2,028,609.63</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	760	m	£ 15.00	£ 11,402.46	Scope unknown; assumed kerbs needed around roundabout area
11.02	Allowance for bullnosed edging to turning circles	130	m	£ 15.00	£ 1,947.35	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	903	m2	£ 2.50	£ 2,258.13	Scope unknown; assume needed at roundabout area, 1000mm wide; includes allowance for islands at roundabout
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	903	m2	£ 20.00	£ 18,060.00	Scope unknown; as above
11.05	Allowance for footpaths	1	item	£ -	£ -	
					<b>£ 33,667.93</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 12,500.00	£ 12,500.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	2,184	m	£ 1.50	£ 3,276.10	Scope allowed for line down outside lane of both sides of carriageway. Pro Rata from 7 ha to 4 ha to allow for North side of route only
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	1,911.06	m	£ 1.00	£ 1,911.06	Allowance for line down the centre of new carriageway. Pro Rata from 7 ha to 4 ha to allow for North side of route only
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 1,000.00	£ 1,000.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	2	nr	£ 70.00	£ 140.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	520	nr	£ 16.00	£ 8,320.24	Allowance for one catseye per 4.5m of white line to new carriageway. Pro Rata from 7 ha to 4 ha to allow for North side of route only
					<b>£ 27,147.40</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	32	nr	£ 680.00	£ 21,760.00	Scope allowed for 32 at roundabout area. All allowed for in North Area.
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	32	nr	£ 400.00	£ 12,800.00	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	32	nr	£ 330.00	£ 10,560.00	
					<b>£ 45,120.00</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	742 m	£	16.00	£ 11,868.10	
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	1	item	£ 5,000.00	£ 5,000.00	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	742 m	£	10.00	£ 7,420.00	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	1	item	£ 3,000.00	£ 3,000.00	
					<b>£ 27,288.10</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	25,780 m2	£	2.00	£ 51,560.92	Pro Rata from 7 ha to 4 ha to allow for North side of route only
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	25,780 m2	£	1.00	£ 25,780.46	Pro Rata from 7 ha to 4 ha to allow for North side of route only
					<b>£ 77,341.38</b>	
					<b>£ 5,766,649.48</b>	

## A12 Four Villages and Sizewell

### Four Villages Bypass

SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
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#### Assumptions

##### 0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0012
- 0.02 All measurements are based on AECOM drawing nr 60315689-SKE-00-FVSW-C-0012
- 0.03 The 'North Area' of this route has been determined by marked up drawing nr 60315689-SKE-00-FVSW-C-0011, sent by Kathryn Carman - 03.06.2014
- 0.03 The carriageway has been assumed to be a single carriageway
- 0.04 All costs are exclusive of VAT

##### 1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

##### 2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road studs and thermoplastic lines to existing carriageway

##### 3.00 Series 300: Fencing

##### 4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge
- 4.02 Allowance for pedestrian road restraint around new roundabout area due to the existence of two villages, either side of the roundabout

##### 5.00 Series 500: Drainage and Service Ducts

##### 6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

##### 7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

##### 11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area

## A12 Four Villages and Sizewell

### Four Villages Bypass

SB1 - Pink Route (North)



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts around the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					

**A12 Four Villages and Sizewell  
Four Villages Bypass**

SB1 - Pink Route (South)



Elements	%	Area (m2)	Rate	Estimated Civils Cost
<b>1 Highway Construction</b>		8,875	£ 224.37	£ 1,991,194.57
<b>2 Structures</b>				£ -
<b>3 Signals</b>				£ -
<b>4 Noise Barriers</b>				£ 183,300.00
<b>5 Sundries</b>				
<b>6 Sub-Total (1-4)</b>		8,875	£ 245.02	£ 2,174,494.57
<b>7 Preliminaries &amp; Traffic Management</b>	30%			£ 652,348.37
<b>8 Works Total</b>		8,875	£ 318.53	£ 2,826,842.95
<b>9 Ancillaries and Major Items</b>				
<b>10 Statutory Undertakers</b>				£ 375,428.57
<b>11 Construction Total</b>				£ 3,202,271.52
<b>12 Preparation and Supervision</b>				
Preparation	12%			£ 384,272.58
Supervision	5%			£ 160,113.58
Design	4.5%			£ 144,102.22
<b>13 Sub-Total</b>				£ 3,890,759.89
<b>14 Compulsory Purchase of Land</b>		61,410 m2	£ 5.00	£ 307,050.00
<b>15 Total</b>				£ 4,197,809.89
<b>16</b>				
Contingency/ Risk	10%			£ 419,780.99
Inflation	20%			£ 839,561.98
Optimism Bias	32%			£ 1,343,299.17
<b>17 Grand Total</b>		8,875	£ 766.28	£ 6,800,452.03



**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Summary</b>						
	Series 100: Preliminaries			£	652,348.37	
	Series 200: Site Clearance			£	11,637.22	
	Series 300: Fencing			£	208,764.60	
	Series 400: Road Restraint Systems (Vehicle and Pedestrian)			£	-	
	Series 500: Drainage and Service Ducts			£	275,291.69	
	Series 600: Earthworks			£	1,099,948.30	
	Series 700: Pavements			£	497,771.07	
	Series 1100: Kerbs, Footways and Paved Areas			£	5,235.45	
	Series 1200: Traffic Signs and Road Markings			£	17,840.21	
	Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts			£	-	
	Series 1400: Electrical Work for Road Lighting and Traffic Signs			£	-	
	Series 3000: Landscape and Ecology			£	58,006.04	
	<b>Total Measured Works</b>			£	<b>2,826,842.95</b>	
	Ancillaries and Major Items					
	Statutory Undertakers			£	657,000.00	
	<b>Construction Total</b>			£	<b>3,483,842.95</b>	
	<b>Preparation and Supervision</b>					
	Preparation	12%		£	418,061.15	
	Supervision	5%		£	174,192.15	
	Design	5%		£	156,772.93	
	<b>Compulsory Purchase of Land</b>	61,410 m2	£	5.00	£ 307,050.00	
	<b>Total</b>			£	<b>4,539,919.18</b>	
	Contingency/ Risk	10%		£	453,991.92	
	Inflation	20%		£	907,983.84	
	Optimism Bias	32%		£	1,452,774.14	
	<b>Grand Total</b>			£	<b>7,354,669.07</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 100: Preliminaries</u></b>						
1.01	Preliminaries and traffic management			30% £	652,348.37	
					<b>£ 652,348.37</b>	
<b><u>Series 200: Site Clearance</u></b>						
<b>Site Clearance</b>						
2.01	Allowance for general clearance; including tree removal; medium density wooded	3 ha	£	3,000.00	£ 9,000.00	Whole site measure
<b>Take Up and Remove Off Site</b>						
2.02	Take up precast concrete kerbs	257 m	£	3.00	£ 770.64	Pro Rata from 7 ha to 3 ha to allow for South side of route only
2.03	Take up road studs	13 nr	£	3.50	£ 45.00	Pro Rata from 7 ha to 3 ha to allow for South side of route only
<b>Take Up and Remove Off Site</b>						
2.04	Removal of existing reflectorized thermoplastic road markings; 200mm wide	429 m	£	2.50	£ 1,071.58	Pro Rata from 7 ha to 3 ha to allow for South side of route only
2.05	Allowance for removal of miscellaneous reflectorized thermoplastic road markings	1 item	£	750.00	£ 750.00	
					<b>£ 11,637.22</b>	
<b><u>Series 300: Fencing</u></b>						
<b>Light Reflective Barriers</b>						
3.01	Allowance for headlight screening; assumed 2m high	127 m2	£	200.00	£ 25,464.60	Not required to the North side
3.02	Allowance for noise barriers; 1 x 400m	1,200 m2	£	152.75	£ 183,300.00	Costs as per e-mail from Stephanie Munn; 12 June 2014
					<b>£ 208,764.60</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 400: Road Restraint Systems (Vehicle and Pedestrian)</u></b>						
<b>Safety Barriers</b>						
4.01	Safety barrier, VRS (N2 W2), designed to impact on one side only, straight or curved exceeding 120 metres radius including terminations and the like	-	m	£ 175.00	£ -	Assume not required to single carriageway roads
<b>Safety Barriers</b>						
4.02	Connection to existing system, containment performance class unknown, design to impact on one side only	-	nr	£ 2,500.00	£ -	Assume no connection needed; no existing barriers
<b>Vehicle Parapets</b>						
4.03	Steel parapets; Group P2 (113KPH); 1.0m high; including steel posts and horizontal rails; straight or curved exceeding 50m radius	-	m	£ 250.00	£ -	Assume not required
<b>Pedestrian Guard Rails and Handrails</b>						
4.04	Allowance for tubular galvanized mild steel pedestrian guard rails	-	m	£ 220.00	£ -	Assume not required
				<b>£</b>	<b>-</b>	
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.01	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 27.16m, Int Diameter 1.5m	0	m	£ 560.00	£ -	Culvert crossing- North
5.02	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.82m, Int Diameter 1.5m	0	m	£ 560.00	£ -	Culvert crossing- North
5.03	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 21.93m, Int Diameter 1.5m	22	m	£ 560.00	£ 12,320.00	Culvert crossing- South
5.04	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 19.85m, Int Diameter 1.5m	20	m	£ 560.00	£ 11,200.00	Culvert crossing- South

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 500: Drainage and Service Ducts</u></b>						
<b>Drains and Service Ducts (Excluding Filter, Narrow Filter Drains and Fin Drains)</b>						
5.05	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 18.32m, Int Diameter 1.5m	0 m	£	560.00	£ -	Culvert crossing- North
5.06	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 24.79m, Int Diameter 1.5m	25 m	£	560.00	£ 14,000.00	Culvert crossing- South
5.07	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 40.44m, Int Diameter 1.5m	0 m	£	560.00	£ -	Culvert crossing- North
5.08	New Culvert to carry watercourse below single carriageway; RC pipe and RC headwalls; Length 44.51m, Int Diameter 1.5m	0 m	£	560.00	£ -	Culvert crossing- North
5.09	Extra over cost for installation of culvert's over watercourse	3 nr	£	24,500.00	£ 73,500.00	Culvert crossings
<b>Filter Drains</b>						
5.10	Allowance; surface water drain to length of new road, including making connection with existing drainage retention area	1,643 m	£	100.00	£ 164,271.69	Scope allowed for drainage both sides of carriageway; price includes trenching and fill with Type A material. Pro Rata from 7 ha to 3 ha to allow for South side of route only
				<b>£</b>	<b>275,291.69</b>	
<b><u>Series 600: Earthworks</u></b>						
<b>Excavation</b>						
6.01	General excavation of acceptable material Class 5A (assumed 500mm deep)	1,368 m3	£	5.50	£ 7,523.41	85% of material acceptable class 5A; field area; AECOM cut & fill measure. Pro Rata from 7 ha to 3 ha to allow for South side of route only
6.02	Excavation of acceptable material excluding Class 5A in cutting and other excavation (assumed 500mm deep)	241 m3	£	6.00	£ 1,448.36	15% of material acceptable, excluding 5A; existing road area; AECOM cut & fill measure. Pro Rata from 7 ha to 3 ha to allow for South side of route only
6.03	General excavation of acceptable material Class 5A; assume 150mm deep; to new drainage retention areas	117 m3	£	5.50	£ 643.01	
6.04	Excavation of acceptable material excluding Class 5A in cutting and other excavation; assume 1,850mm deep; to new drainage retention areas	1,442 m3	£	6.00	£ 8,651.40	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b>Series 600: Earthworks</b>						
<b>Excavation</b>						
6.05	Extra over allowance to excavate unacceptable material Class U1/U2 in cutting and other excavation; say 15% acceptable material Class 5A	205	m3	£ 6.00	£ 1,231.10	
6.06	Allowance for excavation of turning areas; assume 500mm deep	417	m3	£ 15.00	£ 6,256.51	
<b>Excavation in Hard Material</b>						
6.07	Typical motorway cutting generally using motorized scrapers and / or dozers; average haul 2000m one way	241	m3	£ 10.50	£ 2,534.63	
<b>Deposition of Fill</b>						
6.08	Deposition of acceptable material in embankments and other areas of fill	1,485	m3	£ 10.00	£ 14,848.04	
<b>Disposal of Material</b>						
6.09	Disposal of acceptable material	-	m3	£ 10.00	£ -	Assume all used for areas of fill
<b>Imported Fill</b>						
6.10	Imported selected well graded granular fill	36,329	m3	£ 28.00	£ 1,017,215.07	AECOM cut & fill measure. Pro Rata from 7 ha to 3 ha to allow for South side of route only
<b>Compaction of Fill</b>						
6.11	Compaction of granular fill material	37,814	m3	£ 1.00	£ 37,813.91	AECOM cut & fill measure
<b>Supports Left in Excavation</b>						
6.12	Timber closeboarded supports left in excavation; for drainage retention areas	223	m2	£ 8.00	£ 1,782.88	
<b>Breaking Up and Perforation of Redundant Pavements and Roads</b>						
6.13	Using backacters and breakers; not exceeding 100mm deep	-	m2	£ 6.50	£ -	Assume not required for South section
					<b>£ 1,099,948.30</b>	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Sub-Base</b>						
7.01	Granular material DfT Type 1; Sub-base in carriageway and hardstrip, assumed 150mm thick	1,331	m3	£ 33.40	£ 44,461.76	
7.02	Allowance for creation of turning circles at road closures; assume 150mm thick	125	m3	£ 33.40	£ 4,179.35	
<b>Pavement</b>						
7.03	Dense bitumen macadam; base to DfT Clause 903; 200mm deep	8,875	m2	£ 23.60	£ 209,440.63	
7.04	Dense bitumen macadam; binder course to DfT Clause 904; 100mm deep	8,875	m2	£ 12.80	£ 113,594.92	
7.05	Dense bitumen macadam; surface course to DfT Clause 909; 50mm deep	8,875	m2	£ 9.40	£ 83,421.27	
7.06	Allowance for creation of turning circles at road closures; dense bitumen macadam; base, binder and surface course; 500 mm deep	834	m2	£ 45.00	£ 37,539.05	
<b>Jointing Between New and Existing Carriageway</b>						
7.07	Allow for feathered layers of surface and binder courses to suit	205	m	£ 25.00	£ 5,134.10	
<b>Structures</b>						
7.08	Allowance for new roundabout; 32m diameter	-	item	£ 320,000.00	£ -	
7.09	New single carriageway structure over existing River Alde, single span steel composite deck with full height abutments and piled foundations	-	m	£ 20,850.00	£ -	
<b><u>Series 700: Pavement</u></b>						
<b>Structures</b>						
7.10	Extra over cost for installation of River Bridge	-	item	£ 76,000.00	£ -	
7.11	New single carriageway structure over existing track, single span steel composite deck	-	m	£ 16,000.00	£ -	

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 700: Pavement</u></b>						
<b>Structures</b>						
7.12	Extra over cost for installation of Overbridge	-	item	£ 76,000.00	£ -	
					<b>£ 497,771.07</b>	
<b><u>Series 1100: Kerbs, Footways and Paved Areas</u></b>						
<b>Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage</b>						
11.01	Precast concrete kerbs; bedded jointed and pointed in cement mortar; bullnosed, splayed or half battered; laid straight or curved exceeding 12m; 125 x 150 mm	-	m	£ 15.00	£ -	Assume not required for South section
11.02	Allowance for bullnosed edging to turning circles	349	m	£ 15.00	£ 5,235.45	
<b>Footways and Paved Areas</b>						
11.03	Sub-bases to paved areas; 100mm thick hardcore	-	m2	£ 2.50	£ -	Assume not required for South section
11.04	Bitumen macadam surfacing; binder course of 20mm open graded aggregate; surface course of 6mm medium graded aggregate	-	m2	£ 20.00	£ -	Scope unknown; as above
11.05	Allowance for footpaths	1	item	£ -	£ -	
					<b>£ 5,235.45</b>	
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.01	Allowance for new signage as needed	1	item	£ 10,000.00	£ 10,000.00	Scope unknown
<b>Road Markings</b>						
12.02	Thermoplastic spray; continuous line in reflectorized white; 200mm wide	1,638	m	£ 1.50	£ 2,457.07	Scope allowed for line down outside lane of both sides of carriageway. Pro Rata from 7 ha to 3 ha to allow for South side of route only

**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1200: Traffic Signs and Road Markings</u></b>						
<b>Traffic Signs</b>						
12.03	Thermoplastic spray; intermittent line in reflectorized white; 100mm wide with gap	819	m	£ 1.00	£ 819.02	Allowance for line down the centre of new carriageway. Pro Rata from 7 ha to 3 ha to allow for South side of route only
12.04	Allowance for various road markings such as arrows or triangles at junctions	1	item	£ 750.00	£ 750.00	
12.05	Thermoplastic screed or spray; circles with arrows to create turning circle at road closures; 1.6m diam	1	nr	£ 70.00	£ 70.00	
<b>Reflecting Road Studs</b>						
12.06	140 x 254 mm rectangular one way reflecting road studs with catseye reflectors	234	nr	£ 16.00	£ 3,744.11	Allowance for one catseye per 4.5m of white line to new carriageway. Pro Rata from 7 ha to 3 ha to allow for South side of route only
					<b>£ 17,840.21</b>	
<b><u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u></b>						
<b>Road Lighting Columns, Brackets, Wall Mountings, CCTV Masts and Cantilever Masts</b>						
13.01	Galvanized steel road lighting columns to BS EN 40 with flange base plate: 10m nominal height	-	nr	£ 680.00	£ -	Not required to South section
13.02	Galvanized steel bracket arm with 5 degree uplift; 1m projection single arm	-	nr	£ 400.00	£ -	
13.03	Lantern unit with photoelectric control set to switch on at 100 lux; lamos 250W SON	-	nr	£ 330.00	£ -	
					<b>£ -</b>	



**A12 Four Villages and Sizewell**  
**Four Villages Bypass**  
 SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
<b><u>Series 1400: Electrical Work for Road lighting and traffic Signs</u></b>						
<b>Trench for Cable or Duct</b>						
14.01	300 to 450 mm wide; depth not exceeding 1.5 m	-	m	£ 16.00	£ -	
14.02	Allowance for trench to make connection; 300 to 450 mm wide; depth not exceeding 1.5 m;	-	item	£ 5,000.00	£ -	
<b>Cable and Duct</b>						
14.03	Cable in trench; not exceeding 1.5m deep	-	m	£ 10.00	£ -	
14.04	Allowance for cable to make connection; cable in trench; not exceeding 1.5m deep	-	item	£ 3,000.00	£ -	
					<b>£ -</b>	
<b><u>Series 3000: Landscape and Ecology</u></b>						
<b>Ground Preparation and Cultivation</b>						
30.01	Supply and apply granular cultivation treatments	19,335	m2	£ 2.00	£ 38,670.69	Pro Rata from 7 ha to 3 ha to allow for South side of route only
<b>Seeding and Turfing</b>						
30.02	Selected grass seed; by conventional sowing	19,335	m2	£ 1.00	£ 19,335.35	Pro Rata from 7 ha to 3 ha to allow for South side of route only
					<b>£ 58,006.04</b>	
					<b>£ 2,826,842.95</b>	

## A12 Four Villages and Sizewell

### Four Villages Bypass

SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
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#### Assumptions

##### 0.00 Generally

- 0.01 The site boundary has been taken as the orange dotted line shown on AECOM sheet nr 60315689-SKE-00-FVSW-C-0012
- 0.02 All measurements are based on AECOM drawing nr 60315689-SKE-00-FVSW-C-0012
- 0.03 The 'South Area' of this route has been determined by marked up drawing nr 60315689-SKE-00-FVSW-C-0011, sent by Kathryn Carman - 03.06.2014
- 0.03 The carriageway has been assumed to be a single carriageway
- 0.04 All costs are exclusive of VAT

##### 1.00 Series 100: Preliminaries

- 1.01 Preliminaries and traffic management allowance at 30% of construction cost

##### 2.00 Series 200: Site Clearance

- 2.01 Assumed green site; medium density woodland
- 2.02 Allowance for removal of kerbs, road studs and thermoplastic lines to existing carriageway

##### 3.00 Series 300: Fencing

- 3.01 Costs of noise barriers as per email from Stephanie Munn of 12 June 2014, based on costs of £152.75 per m2, as per Spons Civil Engineering and Highways Works

##### 4.00 Series 400: Road restraint Systems (Vehicle and Pedestrian)

- 4.01 Allowance for vehicular road restraint at new overbridge
- 4.02 Allowance for pedestrian road restraint around new roundabout area due to the existence of two villages, either side of the roundabout

##### 5.00 Series 500: Drainage and Service Ducts

##### 6.00 Series 600: Earthworks

- 6.01 Earthworks costings based on AECOM cut and fill measure
- 6.02 Percentage of acceptable class 5A material based on areas of field
- 6.03 Percentage of acceptable material excluding class 5A material based on area of existing road

##### 7.00 Series 700: Pavements

- 7.01 Build up to new road as follows
  - Sub-base course of granular material DfT Type; 150mm thick
  - Base course of dense bitumen macadam to DfT clause 903 ; 200mm deep
  - Binder course of dense bitumen macadam to DfT clause 904; 100mm deep
  - Surface course of dense bitumen macadam to DfT clause 909; 50mm deep

##### 11.00 Series 1100: Kerbs, Footways and Paved Areas

- 11.01 Assumed kerbs required at junctions
- 11.02 Allowance for paved areas with kerbs at the new roundabout area

## A12 Four Villages and Sizewell

### Four Villages Bypass

SB1 - Pink Route (South)



Item	Description	Quantity	Unit	Rate	Total	Comments
12.00	<u>Series 1200: Traffic Signs and Road markings</u>					
12.01	General allowance for traffic signs; no detail					
12.02	Allowance for thermoplastic lines to carriageways					
12.03	Allowance for thermoplastic road markings (arrows and the like) to junctions and carriageways					
13.00	<u>Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts</u>					
13.01	Allowance for 32 lampposts around the roundabout area					
14.00	<u>Series 1400: Electrical Work for Road Lighting and Traffic Signs</u>					
14.01	General allowance for trench and cable to make connection; no scope					
30.00	<u>Series 3000: Landscape and Ecology</u>					
30.01	Assumed grass only to verges and other soft landscaping areas					
30.02	No trees included					