Essex Highways

A120/A133 Link

Environmental Options Appraisal

B355363A

November 2019

RINGWAY JACOBS integrated expertise

Essex County Council

Table of Contents

Executive Summary

Jacobs has been commissioned by Ringway Jacobs on behalf of Essex Highways (EH) to undertake an Environmental Options Appraisal, assessing key environmental risks and constraints for eight route options currently being considered for the proposed A120/A133 Link Road Scheme.

For the purpose of this appraisal, it is assumed that the Tendring Colchester Border Garden Community will be built and future receptors have been considered.

It is also assumed that the Link Road will be subject to a statutory Environmental Impact Assessment (EIA), under Schedule 2, 10 (f) of the Town and Country Planning (EIA) Regulations 2017.

The findings of the Options Appraisal are presented in Section 4 of the report and demonstrate that all route options being considered have the potential to impact upon environmental receptors. Section 5 summarises the key environmental constraints for each of the options.

Key constraints that will drive the decision on route options are as follows:

- Future receptors to noise and air quality effects resulting from the Garden Community
- Likely direct impact to two Noise Important Areas
- Adverse effects on landscape
- Impact to Turnip Lodge Protected Lane
- Potential effect on the settings of listed buildings
- Impact to Strawberry Grove, priority habitat
- Potential land contamination risk from a fuelling station and waste transfer station
- Potential land contamination risk from proximity to potentially infilled land and an area of artificial ground
- Potential impact to safeguarded sand and gravel extraction allocation

1 Introduction

1.1 Background

In line with the North Essex Garden Communities long-term sustainable growth plan for north Essex, Tendring Colchester Border Garden Community (TCBGC) has an ambitious plan to build up to 9,000 new homes. For this to be realised, it is necessary to provide a link road between A120 and A133 as well as a Rapid Transit System (RTS) and Park and Choose sites for public transport. The A120/A133 Link Road would address existing issues of poor connectivity and traffic congestion within the area by redistributing through traffic to other routes and is an essential part of the TCBGC growth strategy.

Jacobs has been commissioned by Ringway Jacobs on behalf of Essex Highways (EH) to provide an Options Appraisal of all 'Options' being developed for the proposed A120/A133 Link Road Scheme (hereafter referred to as the 'proposed Scheme').

The proposed Scheme, with all nine original route Options considered, is provided in Appendix A, "All Proposed Options Plan", B355363A-LINK-GEN-LNK-DR-001A.

This report considers the A120/A133 Link Road proposal only; the RTS is considered in a separate report (document no: B355363A-RTS-EGN-SW-RP-001) and the preferred locations and arrangements for Park and Choose sites have not yet been established.

1.2 Proposed Scheme

The proposed Scheme is located east of Colchester, Essex and extends approximately 2.5km, connecting the A120 from a new junction north of the Scheme with a new junction along the A133, south of the Scheme. Land use within this area is predominantly agricultural land, dominated by arable land and small areas of pasture, residential dwellings, farms and commercial premises. The closest village is Elmstead Market, located approximately 450m to the southeast of the Scheme Options.

The proposed Scheme would require planning consent under Section 55 of the Town & Country Planning Act 1990 and a statutory Environmental Impact Assessment (EIA).

Nine route options were developed through the Stage 1 design process for the A120/A133 Link Road: Options 1A, 1B, 1C, 1D, 2A, 2B, 2C, 3 and 4, eight of which are being developed further at Stage 2.

<u>Option 1A,1B, 1C and 1D</u>

Options 1A-D tie into A133 either west or east of Blossomwood Cottages and join the A120 with four different junction arrangements, all with slip roads tying in prior to Bromley Road overbridge. Link roads to the existing Ardleigh South Services and Waste Transfer Station (WTS) would be required as part of these options and the existing merge/diverge slip roads would be closed. All variants within Option 1 are being considered in order to accommodate nearby features such as the Waste Transfer Station, Ardleigh South Services, Strawberry Grove woodland and Blossomwood Cottages.

<u>Option 2A, 2B and 2C</u>

Option 2A, 2B and 2C join the A120 furthest east, approximately 225m north of Mitchell & Sons farm, St Anne and St Lawrence's Church and Elmstead Hall. The northern end of the three proposed Option 2 routes will maintain direct access routes off the A120. Option 2A would pass between Allen's Farm and the former sand and gravel pit (now a lake). Option 2B is proposed

east of both the lake and Allen's Farm, and joins the A133 at the same location as Option 3A and 4A. Option 2C joins the A133 closest to Elmstead Market, just east of Sixpenny Brook.

Option 3

The northern junction for Option 3 joins the A120 at the Bromley Road bridge, providing a new access onto A120. The required slip roads from this junction joining the A120 will remove the access to Ardleigh South Services and WTS in the north which would need to be provided elsewhere. Access to the WTS would be solely from Bromley Road and an additional roundabout would be created to provide an offline route to Ardleigh South Services.

Option 4

Option 4 has been scoped out at Stage 1 Initial Sifting as it is not considered to meet the scheme objectives. It has not been taken forward for the following reasons:

- Impact on a number of properties to the south of the A120 around Springvalley Lane outside TCBGC boundary;
- A further link would be required into the northeast of the site to service the employment areas and the Park and Choose site, which would not be located close to the A120. Traffic accessing the area would be directed through the residential areas;
- Potential merge/diverge conflict with either railway bridge or Bromley Road Bridge; and
- It is the longest out of the proposed route options.

Option 4 is included in all drawings for illustration purposes only however this option has not been assessed further and is not included within the remainder of this report.

1.3 Purpose of Options Appraisal Report

To inform options development of the proposed Scheme, this report presents the findings of a desk-based environmental constraints study and options appraisal of all the proposed route options being considered at Stage 2 design. No assessment on the potential magnitude or severity of environmental effect has been undertaken.

Environmental disciplines covered are explained in detail in Section 2.

2 Methodology

2.1 Sources of Information

The Constraints Study and Options Appraisal have been undertaken using desk-based information available and identifies potential environmental risks and key constraints for each of the eight A120/A133 Link Road route Options as at Design Stage 2.

Desk-based sources of information include but are not limited to the following:

- British Geological Survey, Geology of Britain Viewer (website);
- C-Maps: Colchester Borough Council Interactive Maps (website);
- Country Parks and Local Nature Reserves: Colchester Borough Council (website);
- DEFRA AQMAs Interactive Maps (website);
- Environment Agency Catchment Data Explorer (website);
- Environment Agency Flood Warning Information (website);
- Environment Agency Main River Map (website);
- Essex Asset Management Map (website);
- Essex Highways Web Map (website);
- Extrium England Noise Map Viewer (website);
- Google Maps (website);
- GOV.UK Long term flood risk information (website);
- MAGIC (website);
- Natural England East Region 1:250000 Series Agricultural Land Classification Maps 2010 (pdf);
- Old-Maps (website); and
- Sustrans (website).

2.2 Assumptions and Limitations

For the purpose of this appraisal, it is assumed that the Tendring Colchester Border Garden Community will be built and therefore the potential for future receptors has been considered.

It is assumed that the Link Road will be subject to a statutory Environmental Impact Assessment (EIA), under Schedule 2, 10 (f) of the Town and Country Planning (EIA) Regulations 2017. Consultation with statutory stakeholders and the planning authority will confirm the scope of the Environmental Impact Assessment.

Potential environmental effects, without mitigation, have been identified for some environmental aspects where relevant information is available; however, a detailed assessment on the likely significance (magnitude vs severity) has not been undertaken at this stage.

Additional topics to be investigated further within the EIA, including Transport Movement and Access, were not considered appropriate to include for the purpose of this appraisal.

2.3 Constraints Study

Environmental constraints are considered in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11 (Highways Agency, 2008) and interim advice notes (IANs) (new guidance issued by Highways England that is yet to be incorporated into the DMRB).

Both construction and operational effects are considered within the Study and potential for future receptors taken into account with regards to the Garden Community.

The following environmental topics are covered:

1. ***Air Quality*** – this section gives consideration to potential changes to air quality due to traffic flow alterations resulting from both new road construction and from changes to the existing road network. Road improvement schemes could improve the local air quality but could also change traffic patterns causing poor air quality in other areas. Particular attention is given to already sensitive areas that have been declared an Air Quality Management Area (AQMA) by the local planning authority;

2. ***Noise and Vibration*** – this section gives consideration to potential changes in traffic noise and vibration levels due to alterations in traffic flow movements and speed as a result of the proposed Options, including new road construction and changes to the existing network. Consideration is also given to the potential for increased levels of noise and vibration during construction works (e.g. due to pilling, drilling, and movement of large machinery). Particular attention is given to existing 'hot spot' areas for noise, i.e. Noise Important Areas (NIAs), which are managed by the highway authority;

3. ***Landscape, Visual and Arboriculture*** – this section gives consideration to the potential changes to landscape setting and views as a result of the proposed Options. The most likely impact would be a change in the landscape character of the area due to the introduction of a high speed road to a rural area;

4. ***Cultural Heritage*** – this section gives consideration to the potential impact on both above and below ground cultural assets. As a non-renewable resource, some elements are protected by law; if designated, archaeological remains are protected under the Ancient Monuments and Archaeological Areas Act 1979, and listed buildings and areas of the built environment are protected under the Planning (Listed Buildings and Conservation Areas) Act 1990. Unauthorised damage or alteration of nationally protected cultural heritage assets may result in fines and/or prosecution. The presence of known and unknown non-designated archaeological remains may also require mitigation, affecting project programme and budget. Archaeological deposits could lie relatively close to the surface and could be disturbed during groundworks or geotechnical investigations;

5. ***Biodiversity*** – this section gives consideration to the potential impact to habitats and species, which are protected in the UK under a variety of legislation including the Wildlife and Countryside Act 1981, Conservation of Habitats and Species Regulations 2010 (as amended) and Natural Environment and Rural Communities Act 2006. Harm or disturbance to protected habitats or species can result in fines and prosecution;

6. ***Geology and Soils*** – this section gives consideration to the potential impact on soils and geology, including the potential to encounter potentially contaminated materials underground. The geology is described in terms of superficial deposits and bedrock designations; superficial deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present. They rest on older deposits or rocks, referred to as bedrock. Geological designations identify the potential of the geological strata to provide water that can be abstracted. Land contamination can cause potential harm to the environment, to construction workers involved in the scheme's development, and to members of the public in nearby areas during the construction and operation phases. Earth moving and excavation

also has the potential to adversely impact soil structure affecting land value and agricultural viability;

7. ***Road Drainage and Water Environment*** – this section gives consideration to flood risk (surface, groundwater and fluvial), hydromorphology (including the Water Framework Directive (WFD)), and surface and groundwater quality and quantity. National Planning Policy requires new developments to demonstrate that flood risk would not increase as a result of the development. If there is an increase to flood risk (as determined by undertaking flood risk assessment), then appropriate mitigation would be required. The WFD requires no deterioration in the overall status of WFD water bodies, including changes to hydromorphological, physico-chemical and biological quality elements. The Environment Agency is the statutory authority in relation to the WFD, groundwater, pollution and flood risk in connection to main rivers. The lead local flood/planning authority is responsible for flood risk from surface water and ordinary watercourses; and

8. ***Population and Human Health*** – this section gives consideration to the potential impacts of the proposed Options to 'All travellers', including non-motorised users such as pedestrians, cyclists, and horse-riders. Consideration should also be given to the Equality Act 2010 to ensure changes allow access for all. Changes to access and land use may have an effect on land value and viability.

2.4 Options Appraisal

In order to provide a comparable basis for each of the Options to be considered, in Section 4 of the report, the environmental constraints have been categorised using a Rank based approach. The Rank value indicates a comparative level of project risk identified at this early stage from known environmental constraints. A Rank value has been assigned for each discipline according to the Options being appraised.

Please note that the options appraisal is not a detailed assessment and the Rank value should not be misinterpreted as the magnitude of impacts on environmental receptors.

Rank values assigned are subject to change as the proposed Scheme is developed and further details of how the Options might interact with environmental receptors identified are understood. Rank values are categorised as follows:

Rank 1 – least potential risk to project from environmental constraints identified

Rank 2 – environmental constraints greater than 1 but less than 3

Rank 3 – greatest potential risk to project from environmental constraints identified

3 Key Environmental Characteristics and Constraints

Please refer to Environmental Constraints Plan drawing no: B355363A-LNK-EGN-LNK-DR-001 in Appendix B.

3.1 Air Quality

There are no Air Quality Management Areas (AQMAs) within 1km of all proposed Scheme Options.

The proposed Scheme is located within a predominantly rural area east of Colchester, dominated by arable fields where a few existing receptors are scattered throughout the study area and include residential properties, a small number of businesses, hedgerows, trees and pockets of woodland within 300m of each of the Scheme Options.

In addition to existing receptors, for Options 1A-D and 3, the proposed Garden Community will, in the future, have sensitive receptors that include residential dwellings, schools and care homes. Option 2A, 2B and 2C are likely to have the least adverse impact on future receptors from the proposed Garden Community as these routes are positioned further east.

Potential impacts are likely for all proposed Options both during the construction period due to emissions and dust from the use of construction machinery on existing receptors, and during the operational period from the introduction of traffic to the area.

A detailed air quality assessment including modelling and baseline monitoring would be needed to determine the impacts of the Scheme on local air quality once the preferred option has been identified and further transport modelling has been completed.

3.2 Noise and Vibration

This Scheme has the potential to increase noise and vibration both through both temporary construction works (particularly piling, drilling and movement of large machinery) and in the operational phase, introducing traffic into the area and through changes to traffic flow movements on the existing road network.

The existing noise environment is likely to be dominated by road traffic noise from the A120 and A133.

Sensitive receptors to noise effects include dwellings, hospitals, schools, community facilities, designated areas and public rights of way located within 600m.

Elmstead Market village is within 600m south east of Options 2B and 2C and includes residential properties and Elmstead Primary School.

In addition, and relevant to all other Options, existing sensitive receptors which have the potential to be affected by noise generated from the Scheme are limited to a small number of residential properties and businesses predominantly in the north of the Scheme close to the existing A120 and those dispersed throughout the rest of the study area; Properties are located along Bromley Road, Slough Lane, Jubilee Lane, Wivenhoe Road, Green Lane, Chapel Lane, Tye Road, Church Road, Turnip Lodge Lane, A133 Clacton Road.

There are four Noise Important Areas (NIAs) in close proximity to the proposed Scheme Options. NIA ID 4781, 4782 and 4766 are located along the A120 between Harwich Road and Bromley Road and NIA ID 4769 is located along the A133 north of University of Essex Colchester Campus. These NIAs may be impacted by changes in noise levels because of potential changes to traffic flow along the A120 and A133 which could result from the proposed

Scheme. Option 3 would directly impact upon NIA IDs 4781 and 4782 where the northern junction joins the A120. NIA ID 4781 is within the area of proposed works for the overbridge replacement and proposed slip roads while NIA ID 4782 would be directly impacted by the northern slip roads.

In addition, there are a large number of future receptors within the proposed Garden Community which would be adversely affected by noise effects from the proposed new route.

Baseline surveys and noise modelling would be needed to determine the impacts of the Scheme on the noise environment, including ground borne noise and vibration once the preferred option has been identified and further transport modelling has been completed.

3.3 Landscape, Visual and Arboriculture

Landscape and visual effects are focussed on a study area of up to approximately 2km from the proposed Options. Beyond this distance, effects are not likely to be significant due to the distance and assumed scale of the Scheme.

The Options cross mainly irregularly shaped arable fields of varying sizes, divided by hedgerows with many mature hedgerow trees. Generally small woodlands and occasional remnants of orchards are interspersed between the arable fields. Small watercourses linking with Sixpenny Brook to the south of the A133, contribute to the irregular field pattern north and east of Blossomwood Farm. To the southeast of Allen's Farm, a gravel pit lake contrasts with the agricultural landscape. The landscape is relatively flat and open.

The landscape is sparsely settled with small farmsteads. Crockleford Heath village and Elmstead Market village are the closest settlements, respectively located to the east and west of the route options. This landscape is likely to change significantly, due to the proposed Garden Community development.

Whilst the landscape context is a relatively flat and open plateau interspersed by occasional river valleys, woodlands and trees in hedgerows contain the extent of views. The existing A120 and A133 corridors are reasonably well screened by vegetation belts.

Potential visual receptors would include residents, users of the Public Rights of Ways, users of open spaces users of the cycle networks, visitors, users of the University of Essex and users of the road.

Dedham Vale Area of Outstanding Natural Beauty

Dedham Vale Area of Outstanding Natural Beauty (AONB) is located more than 4km north of the route options and therefore beyond the extent of the study area and is not considered likely for its setting to be significantly affected by the proposals due to the relatively flat landscape limiting views out of the AONB, regardless of which option is selected as the preferred route.

Turnip Lodge Lane Protected Lane

Protected Lanes as designated by Essex County Council are afforded policy for their traditional character, historic value and landscape. Part of Turnip Lodge Lane is locally designated as a Protected Lane under policy EN1 – Landscape Character in the adopted Tendring District Local Plan 2007 (Tendering District Council, December 2007).

The Plan explains that:

"The ditches, hedges or banks that form the road boundaries [of the protected lanes] may reflect long vanished field systems or be the result of repeated ploughing, and the verges are often of botanical interest. The lanes also have an amenity value based on the variety of verge widths, lynchets, banks, ditches and other features…"

This Council will not permit development that would have an adverse effect upon the traditional landscape and nature conservation character of roads designated as protected lanes, including their associated verges, banks and ditches. In addition, proposals that would adversely affect

the physical appearance of protected lanes or give rise to a material increase in the amount of traffic using them will also not be permitted." (Paragraphs 6.56 and 6.56a)

In addition, national policies within the National Planning Policy Framework contains specific guidance on these assets (Paragraphs 193, 194 and 195).

Options 1A, 1B, 1C, 1D and 3 would directly affect the designated part of the Turnip Lodge Lane. In addition, Options 2B and 2C could indirectly affect the 'traditional character' of the Protected Lane. There may be scope to retain or integrate as much of the protected lane into the development as possible, through green infrastructure and green corridors etc.

Ancient Woodlands

There are five Ancient Woodlands within 1km of the options. None of the route options being considered would directly encroach upon designated Ancient Woodlands however further assessment of habitats may result in the categorisation of additional areas of Ancient Woodland, of note is Strawberry Grove. In addition, Walls Wood Ancient and Semi Natural Woodland is located approximately 150m west of Option 3 impacting connecting habitats and potentially introducing indirect impacts via the A120.

Tree Preservation Orders

Tree Preservation Order data is limited to digital data available at the time of writing this report and would need to be updated in detail during the design process. There are a large number of Tree Preservation Orders (TPOs) known to be present within the wider area, typically located close to urban areas such as Elmstead Market, Bromley Cross and associated to designated sites such as Wivenhoe Park Registered Park and Gardens and Churn Wood Ancient Woodland. These designations are unlikely to be directly impacted as a result of any Options being considered. There are however three TPO trees in Crockleford Heath, along Bromley Road that would be at risk of impact from the junction access for route Option 3.

Open Access Land and Registered Common Land

There is no Open Access Land, as defined within the Countryside and Rights of Way Act 2000, or Registered Common Land, within the study area.

Local Open Spaces

The Proposals Map Inset 12 of the adopted Tendring District Local Plan 2007 (Tendering District Council, December 2007) identifies a number of open spaces (under policy COM7 - Protection of Existing Recreational Open Space Including Children's Play Areas and Pitch and Non-Pitch Sports Facilities and policy COM7a - Protection of Existing Playing Fields, Including School Playing Fields) and a proposed open space associated with Elmstead Market (under policy COM8a - Proposed New Recreational Open Space) , including three spaces on the northern fringe of the town, approximately 1km or more from route Option 2C. These include the playing fields for Elmstead Primary School, Elmstead Grasshoppers Cricket Club and an adjacent open space at the rear of Holly Way. Should Options 2A, 2B or 2C be taken forward, fieldwork should be undertaken to determine the potential for significant visual effects from these open spaces.

Wivenhoe Park Registered Park and Garden

The Grade II listed Wivenhoe Park Registered Park and Garden is located south of the A133, approximately 1km west of the closest part of options. There are a number of trees within the park, including trees with TPOs, which, together with a woodland adjacent to the B1028 and tree belts associated with the A133, would limit intervisibilty between the park and the route options. As such it is considered unlikely that any of the route options would lead to significant landscape or visual effects on the park or its visitors.

A Landscape and Visual Assessment is recommended and impacts of the schemes will need to be assessed in detail on a national, regional and local scale.

3.4 Cultural Heritage

Archaeological Remains:

The presence of known non-designated archaeological remains has been identified within the footprint of all eight Scheme Options. As the Scheme is positioned predominantly over unmade ground, there is likely to be a high potential for further unknown archaeological remains to be present.

Heritage Sites:

Historic buildings (comprising 1 grade I, 2 grade II* and 16 grade II listed buildings) are illustrated within the Environmental Constraints Plan. While no listed buildings are situated within the footprint of the Options themselves, Allen's Farm is located within 200m of Options 1B, 1C and 2A and three additional listed buildings are located East of the study area, within 250m of Options 2A-C. The potential impact to the setting of all heritage assets will need to be considered when developing the design and mitigation.

There are nine Scheduled Monuments within 5km of the route options, located in Colchester. The nearest of which is the crop mark site south of Ardleigh, located approximately 1.5km north of the A120.

The closest Conservation Areas to the proposed Scheme are within Colchester itself. Colchester is over 3km from the Options and of sufficient distance to be unlikely affected by the route options. Colchester overall has a high density of Scheduled Monuments, Conservation Areas and listed buildings, all of which however are considered sufficient distance so as not to be directly impacted by the works.

The non-designated historic landscape character of the area is likely to comprise a mix of rural types such as pre-18th century enclosure, 18th -19th century enclosure, 20th century agriculture, and woodland. In relation to the pre-enclosure landscape types, there may be Important Hedgerows to consider under the Hedgerow Regulations 1997.

The nearest Registered Parks and Gardens is the Grade II Registered Wivenhoe Park, which forms the setting of the Grade II* Wivenhoe House. Wivenhoe park is bounded along its northern edge by Elmstead Road, which is heavily bordered by trees. The park is situated approximately 1km west of the nearest proposed roundabout junction on the A133 which is associated with Options 1A, 2B, and 3. At this distance and with the adequate shielding it is unlikely to be significantly affected by the proposed options. No other registered parks and gardens would be affected by the proposed options.

3.5 Biodiversity

Habitats and species in the UK are protected under a variety of legislation including the Wildlife and Countryside Act 1981, The Conservation of Habitats and Species Regulations 2017 and the Natural Environment and Rural Communities Act 2006. Harm or disturbance to protected habitats or species can result in fines and prosecution.

Designated Areas:

There are no sites designated for nature conservation within the footprint of the Scheme Options however multiple sites of nature conservation interest are present within the wider study area and the potential indirect impacts upon these will need to be considered.

Dedham Vale, an Area of Outstanding Natural Beauty designated in recognition of is national importance, is located approximately 4.5km north of the proposed Scheme in Manningtree.

All Scheme Options are located within the Impact Risk Zone for three Sites of Special Scientific Interest (SSSIs); Wivenhoe Gravel Pit SSSI, designated for geologically important interglacial

sediment deposits, is located within 1km of all route options. Ardleigh Gravel Pit SSSI, designated for geologically important interglacial sediment deposits, is located approximately 1km north of Option 3. Upper Colne Marshes SSSI, designated for ecologically important unique plant assemblages, terrestrial and aquatic invertebrates and breeding and wintering birds, is located approximately 2.2km south of Options 2B and 3. Colne Estuary Ramsar site and Special Protection Area is located within 5km of the route options, approximately 3.5km south of Option 2C.

Essex Estuaries Special Area of Conservation is located within 5km of the route options, approximately 3.4km south of the A133.

There are no National Nature Reserves (NNR) within 5km of the route options.

There are five areas of Ancient Woodland within 1km of the proposed route options. Ancient woodlands are sites of high nature conservation value and are considered an irreplaceable habitat. Of these, Walls Wood Ancient and Semi-Natural Woodland (ASNW), located 160m west of route Option 3 is the only one potentially at risk of impact by Option 3 from the proposed northern junction and slip roads along the A120.

Strawberry Grove woodland, priority habitat, sits immediately south of the A120 and is identified as a key constraint to the Options in regards to the potential ecological value at risk of impact. Strawberry Grove would be almost entirely eradicated under Option 1A northern junction tying into the A120. Whilst having less direct impact on the receptor, Options 1B and 1C would isolate the habitat having similarly devastating impacts on the integrity of the site. Option 1D also impacts the north western corner of the woodland. The significance of these impacts will be greater understood following a more comprehensive understanding of the habitat and the magnitude of the impacts of these Options.

There are no Special Area of Conservations (SACs) within or within 5km of the study area.

Salary Brook Local Nature Reserve (LNR) is located approximately 1.3km west of the proposed Scheme Options, on the eastern outskirts of Colchester. Within the LNR are conservation grassland meadows, three fishing ponds and areas of wetland which have a known population of water voles.

Species and Habitats:

There is potential for legally protected and notable species to be active within, or in close proximity to, the proposed working area. The study area is largely within arable land with four small areas of woodland priority habitat. Habitat features including broadleaved woodland, conifer woodland, grassland, hedgerows and scattered trees, are all present within the Scheme footprint, as well as ponds and lakes. These habitats hold potential for the presence of numerous protected species including great crested newts (GCN), bats, dormouse, badgers, water vole and reptiles. In addition, a former sand and gravel extraction pit within the study area may have potential for notable species.

The landscape is largely undeveloped and is well connected via linear habitat features such as hedgerows and field boundaries, meaning that development would result in the potential fragmentation of certain habitats. This would negatively impact species which use these features and result in impacts arising from both the construction and operation of the Scheme.

An extended Phase 1 habitat survey by qualified ecologists and a suite of species and habitat specific surveys would be required to further determine the extent of ecological constraints present on site and the likely potential impacts on their presence and activity.

3.6 Geology and Soils

Land contamination can cause potential harm to receptors, including human health (construction workers and members of the public in nearby areas), controlled waters (groundwater and surface water) and the environment (flora and fauna and geo-conservation) during the Scheme's construction and operational phases. Earthworks also have the potential to adversely impact soil structure thereby affecting land value and viable agricultural land.

The study area for geology and soils is considered to include potential historical land use up to 1km from the proposed Scheme Options which may have an impact upon the scheme (e.g. ground gas, migration of contaminated groundwater).

Land impacted by Options 2A, 2B and 2C has been identified as emerging safeguarded sand and gravel extraction allocation within the Minerals and Waste Planning Authority, ECC, Local Plan. The implications of these Options on this allocation needs further investigation.

The overall potential risk from contaminated soils/water associated with current/historical potential sources of contamination is low where the Scheme Options pass through largely rural/agricultural area. However, this increases to a medium risk in areas where potentially contaminative current and historical land uses exist, where the route intersects the current WTS and fuelling station for Options 1A-D and 3 and where Options 2A-C intersect areas of potentially infilled ground.

As the proposed route would result in the loss of a significant amount of agricultural land, it will require further assessment in relation to the agricultural land classification and potential loss of soils as a result of the Scheme.

3.7 Road Drainage and Water Environment

Main Rivers:

Two Environment Agency (EA) main rivers, Salary Brook and Sixpenny Brook, pass through the study area. The Salary Brook has its source to the north of the study area, south east of Langham near God's House Farm and flows south to Ardleigh Reservoir. From Ardleigh Reservoir the watercourse continues south, passing though the west of the study area, around Colchester to its confluence with the River Colne. The Salary Brook passes beneath both the A120 and the A133 west of the Scheme.

Within the upstream reaches of the Salary Brook (from its source to Ardleigh Reservoir) the watercourse is typically bordered by agricultural fields and has a narrow vegetated riparian corridor, consisting of small trees and shrubs. Downstream of Ardleigh Reservoir, the Salary Brook typically has a straight planform as it flows through a densely vegetated deciduous woodland. The trees along the bank tops are likely to offer some stability to the banks as a result of the root networks, as well as shade the channel. Downstream of Bromley Road, Salary Brook has a less complex vegetated riparian corridor, consisting of a narrow strip of semi-continuous trees and shrubs. The surrounding land use along the west bank consists of arable and pastoral agriculture, with recreational parklands, ponds and residential development on the east bank. No geomorphological features are evident from aerial imagery.

The Sixpenny Brook flows from its source, west of Elmstead Market, south until it joins Alresford Creek north of Brightlingsea. The watercourse is classified as a main river south of the point it is crossed by the A133. The watercourse typically has a straight planform, apart from the upper most reaches where it exhibits some sinuosity. The vegetated riparian corridor is largely vegetated by mature trees, although there are some lengths where there is limited tree cover and vegetation comprises mainly of grasses. The surrounding land use is extensively used for agricultural purposes, and the watercourse crosses beneath a number of roads between its source and confluence with Alresford Creek, including the A133.

Ordinary Watercourses:

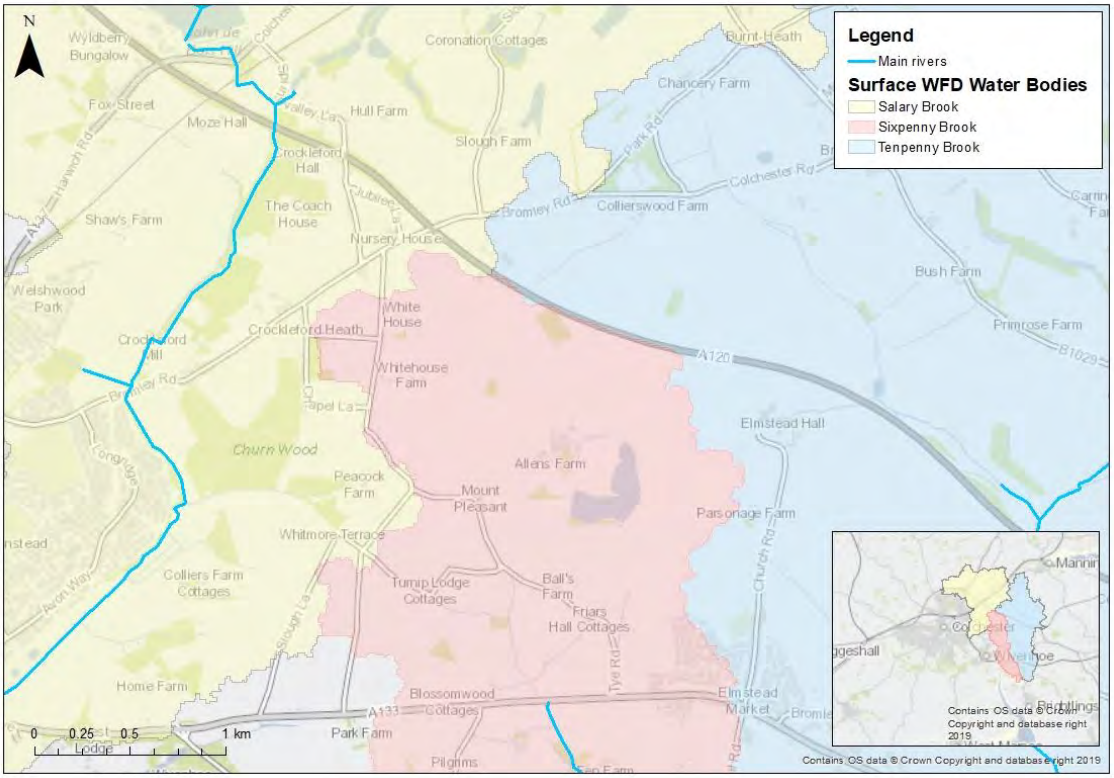
The proposed Scheme options cross a further four ordinary watercourses, including Bromley Brook. Bromley Brook has its source west of Bromley Cross and flows south east. The watercourse passes through the east of the study area, and then continues to its confluence with the Tenpenny Brook immediately north of the A120. The planform of the watercourse is typically straight, with the vegetated riparian corridor predominantly consisting of grasses and the occasional mature tree. No geomorphological features are evident from aerial imagery.

The remaining three ordinary watercourses can be characterised as field/land drains. These watercourses are likely to be man-made or have been historically extensively modified, with straight planforms and narrow uniform vegetated riparian corridors. The watercourses are likely to exhibit little geomorphological diversity.

A single large lake is present in the centre of the study area, which is a former sand and gravel extraction pit. As an artificially created water feature, it is unlikely to exhibit any significant natural geomorphological features.

Water Framework Directive:

Figure 1: Location of surface WFD water bodies and main rivers in relation to the proposed Scheme options.



The proposed Scheme lies within three surface WFD water bodies; namely the Sixpenny Brook, Tenpenny Brook and Salary Brook (Figure 1). The three surface WFD water bodies lie within the Colne Operational Catchment, which forms part of the Anglian River Basin District. All three WFD water bodies are designated as being Heavily Modified.

The proposed Scheme is underlain by a single groundwater WFD water body, the Essex Gravels which is currently achieving Poor Status.

All watercourses within the study area ultimately drain into the Colne Estuary, which is recognised as a Site of Special Scientific Interest (SSSI), a Special Protection Area (SPA), as well as a Special Area of Conservation (SAC).

No surface water nitrate vulnerable zones have been identified.

The underlying bedrock within the study area is the Thames Group, formed of clay, silt and sand. The overlying superficial geology is a combination of clay and silt alluvium, Kesgrave sand and gravel. The soils are primarily composed of slightly acid loamy and clayey soils, which often have impeded drainage due to agricultural use which makes the area vulnerable to polluted run-off entering the watercourses.

The proposed Scheme is underlain by an Unproductive Aquifer (Bedrock) and Secondary B Aquifer (Superficial). The proposed Scheme also lies within a groundwater nitrate vulnerable zone (Sandlings and Chelford, G78).

Flood Risk:

None of the proposed route Options encroach on Flood Zones 2 or 3. The fluvial flood risk is therefore considered low. Where the options cross minor watercourses that would be too small to be considered within the EA flood map, the fluvial flood risk is likely to be similar to that shown in the surface water flood risk map.

The River Colne has tidal reaches extending from the town of Colchester, flowing south-east, within approximately 4,700m at its closest point from the proposed Scheme. The Colne tidal Barrier is approximately 3,300m from the proposed Scheme. However, none of the eight route options encroach on Flood Zones 2 or 3. Therefore, the tidal flood risk is considered low.

The Ardleigh Reservoir is approximately 1.5km from the nearest route option (option 3). However, none of the proposed Scheme route options are within an area susceptible to reservoir flooding according to the EA's Risk of Flooding from Reservoir Mapping (Environment Agency, 2018b). Therefore, the risk of reservoir flooding is considered low.

The baseline risk of groundwater flooding for the proposed Scheme options was identified from the Areas Susceptible to Groundwater Flooding map within the Addendum to the Tendring District Council's Strategic Flood Risk Assessment (SFRA) by Essex County Council Flood Services, (Essex County Council, 2017). Section 4: Options Assessment for Each Route gives the risk to groundwater flooding for each of the route options for the proposed Scheme. It should be noted the SFRA (JBA Consulting, 2009) reports that there have been very few reported incidents of groundwater flooding across the district, with no specific locations or events detailed.

Anglian Water provided records of sewer flooding through their DG5 register, this is shown in Map 10 of the SFRA (JBA Consulting, 2009). The map indicates that the entire proposed Scheme area is within an area given to historically have had 5 properties flooded as a result of incidents of sewer flooding. As the proposed Scheme is predominantly within greenfield site with the exception of the small and isolated Allen's Farm (adjacent to option 2A) and Elmstead Hall (adjacent to options 2A, 2B and 2C), the risk of sewer flooding is considered to be low.

As the proposed Scheme route options are not within an area designated as benefitting from flood defences and there has been no historical incidences of flooding due to failure of flood defences in the proposed Scheme area, the risk is considered low.

No major constraints to any of the options have been identified due to the water environment at this stage.

3.8 Population and Human Health

At this stage, as the alignment of the route Options are high level and conceptual, a detailed assessment of specific properties and businesses that may potentially be affected by the Scheme has not been conducted at this stage. Community and private assets of note within the study area include Allen's Farm, Elmstead Hall, Elmstead Parish Church, Ardleigh South Services, VisionTech Automotive, Vinyl Hunter Essex, Pheasant Suites B&B, and various businesses along Bromley Road. Hythe train station and a few schools are located within 2km of the Scheme Options and University of Essex within 1km of the Options routes being assessed.

There is a 700m stretch of Essex Cycle Network route that runs adjacent to the length of A133 between Brick and Tile Cottages and Elmstead Road. This section of the cycle route would be directly impacted by route Options 1A, 1B, 1C, 1D, 2A, 2B and 3. The cycle route would need to be diverted or incorporated into the proposed road design. In addition, there are bus services along the A133 connecting Elmstead Market to Colchester in the west.

There is a network of Public Rights of Way (PRoWs) that run west/east across the entire site. All options would result in some severance of PRoWs which would have an adverse effect on walkers, cycles and horse-riders through increase in journey times. Options 1A,1B, 1C and 1D intersect PRoW 162_21. Options 2A, 2B and 2C intersects PRoW 162_1, 162_2 and 162_3. Option 3 intersects PRoW 158_47. In addition, PRoW 162_3 would be substantially impacted by the proposed junction and slip roads of Options 2A, 2B and 2C that tie into the A120.

The diversion of PRoWs would require a formal application to divert the footpath and early engagement with the Ramblers Association in particular would be essential.

The proposed options are unlikely to result in community severance; the separation of residents from facilities and services within their community caused by new or improved roads or by changes in traffic flows. Currently, pedestrian accessibility and connectivity within this area is limited. There would be potential for provision of improved pedestrian, cyclist and public transport access in the development of the Scheme.

The land take for all Options is agricultural land. Further assessment would be required in relation to the use of the agricultural land. This would consider the extent of the loss of land, the severance of the land on either side of a relief road and farm viability.

3.9 Planning

Planning Application:

Consent for the construction of the new road is required as works would constitute ‘development’ under Section 55 of the Town and Country Planning Act 1990. The consenting route that is most appropriate to the A133-A120 Link Road is the Town and Country Planning Act 1990 with an application for planning permission being submitted to Essex County Council for determination.

The Town and Country Planning Act 1990 legislation provides the principal consenting route for development in England, most commonly used by local highways authorities to consent highways schemes on the local highway network. Applications are considered by the local planning authority, which in this instance would be Essex County Council (under Regulation 3 of Town and Country Planning Regulations 1992).

A Planning Application for the Scheme would need to include sufficient information for the detailed design to be assessed, though it is possible to apply for consent with certain matters reserved for future consent where the detailed design is not available at time of submission.

Under the Town and Country Planning Act 1990 the determination period for any planning application would be 16 weeks (based on the assumption that an Environmental Impact Assessment would be required). From a consenting perspective public pre-application consultation is not essential, though politically consultation would be required due to the scale of the Scheme and expenditure of public funds. Consultation with key statutory consultees is advised at the earliest opportunity to ensure that there are no unexpected representations during the determination period of the planning application.

The current programme envisages a planning application submission date of June 2020, it is essential that Section 1 of the Local Plan is adopted prior to submission as without this there is no plan policy justification for the development.

For ECC to take responsibility for the design and delivery the new junction on A120 this would require Highways England (HE) to delegate their powers temporarily through a Section 6 (Highways Act 1980) Agreement and the Scheme will need to meet HE design standards.

EIA Requirements:

The need for an Environmental Impact Assessment (EIA) for highways Schemes is governed by the Town and Country Planning (EIA) Regulations 2017 (SI17/571). An EIA is required where significant effects on the environment is likely as a result of the proposed Scheme.

Any of the route Options developed further as a preferred route are considered to require an Environmental Impact Assessment. It would be necessary for the developer to identify the likely significant effects of the Scheme when submitting its Screening and Scoping Report for the preferred option, The Scoping Opinion returned from Essex County Council would then form the framework for the Environmental Impact Assessment.

4 Environmental Options Appraisal

Environmental Topic	Comparison of proposed route options							
	Option 1A	**Option 1B**	**Option 1C**	**Option 1D**	**Option 2A**	**Option 2B**	**Option 2C**	**Option 3**
Air Quality	There are no Air Quality Management Areas within the study area. There are no SSSIs, SPAs, SACs or Ramsar sites within 200m of the study area that could be sensitive to air quality changes. All routes potentially impact sensitive receptors (dwellings, schools, care homes and hospitals, within 200m).							
	Few existing sensitive receptors (Allen's Farm and dwellings on Wivenhoe Road and Clacton Road). Large numbers of future receptors within the proposed Garden Community, west of the route, could be adversely affected.	Few existing sensitive receptors (Allen's Farm and dwellings on Clacton Road). Large numbers of future receptors within the proposed Garden Community, west of the route, could be adversely affected.	Few existing sensitive receptors (Allen's Farm and dwellings on Wivenhoe Road and Clacton Road). Large numbers of future receptors within the proposed Garden Community, west of the route, could be adversely affected.	Few existing sensitive receptors (Dwellings on Wivenhoe Road and Clacton Road). Large numbers of future receptors within the proposed Garden Community, west of the route, could be adversely affected.	Few existing sensitive receptors include Elmstead Hall and Parish Church, Allens Farm and properties on Tye Road and Clacton Road. Option 2A, 2B and 2C are likely to have the least adverse impact, as the route is positioned further west from the proposed Garden Community and thus there are fewer sensitive receptors.	Option 2A, 2B and 2C are likely to have the least adverse impact, as the route is position further west from the proposed Garden Community and thus there are fewer sensitive receptors.	Option 2A, 2B and 2C are likely to have the least adverse impact, as the route is position further west from the proposed Garden Community and thus there are fewer sensitive receptors.	Existing sensitive receptors include properties in the north west of the Scheme and through connectivity to Walls Wood ASNW within 200m of the northern slip roads. Large numbers of future receptors within the proposed Garden Community, west of the route, could be adversely affected.
	Rank 2	**Rank 2**	**Rank 2**	**Rank 3**	**Rank 1**	**Rank 1**	**Rank 1**	**Rank 3**
Noise & Vibration	The operation of the Scheme once in place will provide an increase in noise levels for the area for which there may be adverse effects on sensitive receptors within 600m to consider.							
	Option 1A has few existing sensitive receptors (Allen's Farm and approximately 12 dwellings). However large number of future receptors within the proposed Garden Community, west of the route, could be adversely affected.	Few existing sensitive receptors (Allen's Farm and some dwellings). However, the southern length of the route would have large numbers of future receptors within the proposed Garden Community to the west could be adversely affected.	Few existing sensitive receptors (Allen's Farm and some dwellings). However, the southern length of the route would have large numbers of future receptors within the proposed Garden Community to the west could be adversely affected.	Very few existing sensitive receptors. However, large numbers of future receptors within the proposed Garden Community to the east and west could be adversely affected.	Few existing sensitive receptors including Allen's Farm, Elmstead properties and Ball's Farm. Future potential receptors include dwellings within the proposed Garden Community to the west of the southern part of Option 2A.	Option 2B has sensitive receptors within Elmstead Market (dwellings and school). There are also approximately 13 other sensitive receptors which may be adversely affected. Future potential receptors include dwellings within the proposed Garden Community to the west of the southern part of Option 2B.	Option 2C has sensitive receptors within Elmstead Market (dwellings and school), there are also approximately 16 other sensitive receptors which may be adversely affected.	The northern junction of Option 3 would directly impact on two Noise Important Areas (NIAs). NIA ID 4781 is within the area of proposed works for the overbridge replacement and proposed slip roads. NIA ID 4782 would be directly impacted by the northern slip roads. Additional receptors from other Options, North West of the study area. Future receptors within the proposed Garden Community could be adversely affected.
	Rank 2	**Rank 2**	**Rank 2**	**Rank 1**	**Rank 2**	**Rank 3**	**Rank 2**	**Rank 3**

Environmental Topic	Comparison of proposed route options							
	Option 1A	**Option 1B**	**Option 1C**	**Option 1D**	**Option 2A**	**Option 2B**	**Option 2C**	**Option 3**
Landscape & Visual	All proposed options would result in significant adverse effects on landscape character and views. There would be loss of vegetation, including characteristic hedgerows with hedgerow trees that subdivide the open arable landscape. The significance of effect would be greatest for receptors in close proximity to the route. Noting the proposed Garden Community Development, any impact on receptors within the proposed development is likely to be temporary and will be incorporated into the overall landscape changes of the Garden Community development.							
	Option 1A would directly impact on Turnip Lodge Lane Protected Lane. Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; users of PRoW crossing route north-west of Allen's Farm; and users of cycle route on the A133. Option 1A would potentially pass through the residential and mixed use areas of the proposed Garden Community. The landscape character of this area would potentially be significantly adversely affected as part of this development.	Option 1B would directly impact on Turnip Lodge Lane Protected Lane. Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; users of PRoW crossing route north-west of Allen's Farm; and users of cycle route on the A133.	Option 1C would directly impact on Turnip Lodge Lane Protected Lane. Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; users of PRoW crossing route north-west of Allen's Farm; and users of cycle route on the A133.	Option 1D would directly impact on Turnip Lodge Lane Protected Lane. Key visual receptors with close-range views would include scattered properties near the proposed route; users of PRoW crossing route north-west of Allen's Farm; and users of cycle route on the A133. Option 1D would potentially pass through the residential and mixed use areas of the proposed Garden Community. The landscape character of this area would potentially be significantly adversely affected as part of this development.	Option 2A would directly impact on Turnip Lodge Lane Protected Lane. Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; visitors to St Anne & St Lawrence's Church and Elmstead Hall; users of PRoW crossing route east of Allen's Farm; and users of cycle route on the A133. Option 2A would potentially pass through the residential and mixed use areas of the proposed Garden Community at the southern end of the route but would increase the extent of direct effects on the landscape to the north.	Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; residents and users of open spaces on the western and northern edge of Elmstead Market town; visitors to St Anne & St Lawrence's Church and Elmstead Hall; users of PRoW crossing route east of Allen's Farm; and users of cycle route on the A133. Option 2B would potentially pass through the residential and mixed use areas of the proposed Garden Community at the southern end of the route but would increase the extent of direct effects on the landscape to the north. The cumulative effect on landscape character of Option 2B in combination with this development would potentially be greater than that of Options 1A, 1B, 1C, 1D and 3.	Key visual receptors with close-range views would include residents at Allen's Farm and other scattered properties near the proposed route; residents and users of open spaces on the western and northern edge of Elmstead Market town; visitors to St Anne & St Lawrence's Church and Elmstead Hall; and users of PRoW crossing route east of Allen's Farm. Option 2C would be almost entirely beyond the extent of the proposed Garden Community and would increase the extent of direct effects on the landscape to the north. The cumulative effect on landscape character of Option 2C in combination with this development would potentially be the greatest of all the options.	Option 3 would directly impact on Turnip Lodge Lane Protected Lane. Slip roads for this Option are in close proximity to three Tree Preservation Order tree along Bromley Road. Key visual receptors with close-range views would include residents in scattered properties near the proposed route and at Crockleford Heath; users of PRoW crossing route north-west of Allen's Farm; and users of cycle route on the A133. Option 3 would potentially pass through the residential and mixed use areas of the proposed Garden Community. The landscape character of this area would potentially be significantly adversely affected as part of this development.
	Rank 2	**Rank 1**	**Rank 1**	**Rank 2**	**Rank 3**	**Rank 3**	**Rank 3**	**Rank 2**

Environmental Topic	Comparison of proposed route options							
	Option 1A	**Option 1B**	**Option 1C**	**Option 1D**	**Option 2A**	**Option 2B**	**Option 2C**	**Option 3**
Cultural Heritage	Across the wider study area, there are a total of 19 historic buildings, comprising 1 Grade I, 2 Grade II* and 16 Grade II listed buildings. No listed buildings are situated within the footprint of the route options themselves, however there is potential for impact to the settings of these assets in the wider study area. There is known presence of non-designated archaeological remains and high potential for unknown archaeological remains across all route options.							
	High potential for unknown archaeological remains. Option 1A is located approximately 250m west of Grade II listed Allen's Farmhouse. Potential effect on the setting of this asset through noise and visual intrusion during construction and operation.	High potential for unknown archaeological remains. Option 1B is located within 250m of Grade II listed Allen's Farmhouse. Potential effect on the setting of this asset through noise and visual intrusion during construction and operation.	High potential for unknown archaeological remains. Option 1C is located within 250m of Grade II listed Allen's Farmhouse. Potential effect on the setting of this asset through noise and visual intrusion during construction and operation.	High potential for unknown archaeological remains. No likely potential effects on high-value assets.	High potential for unknown archaeological remains. Potential significant effect on the setting of high value assets: Grade I listed Church of St Anne and St Lawrence and Grade II* listed Elmstead Hall, and on Grade II listed tombstones Allen's Farmhouse, all within 250m of the proposed route.	High potential for unknown archaeological remains. Option 2B and 2C have potential significant effect on Grade II* listed Elmstead Hall, Grade I listed Church of St Anne and St Lawrence and group of 3 Grade II listed tombstones situated approximately 200m to the southeast of the proposed route. Grade II listed Allen's Farmhouse situated approx. 550m to the northwest of the proposed route across the deep water (lake).	High potential for unknown archaeological remains. Option 2B and 2C have potential significant effect on Grade II* listed Elmstead Hall, Grade I listed Church of St Anne and St Lawrence and group of 3 Grade II listed tombstones situated approximately 200m to the southeast of the proposed route. Grade II listed Allen's Farmhouse situated approx. 550m to the northwest of the proposed route across	High potential for unknown archaeological remains. No likely potential effects on high-value assets.
	Rank 2	**Rank 2**	**Rank 2**	**Rank 1**	**Rank 3**	**Rank 3**	**Rank 3**	**Rank 1**
Biodiversity	There are no statutory sites designated for ecological importance within 1km of the options. Salary Brook Local Nature Reserve is located 1.3km west of the Scheme. Walls Wood, ASNW is located north west of the Scheme straddling the A120. All proposed routes would cause adverse impacts to nature conservation receptors and result in the loss and severance of habitats within the study area. From desk study information alone, it is not possible to fully represent the constraints present on site without completion of Phase 1 Habitat Survey and further habitat and species surveys.							
	There is potential for impacts to protected species and habitats for each of the proposed options. In addition, Option 1A would result in the permanent loss of deciduous woodland and priority habitat, Strawberry Grove. There are two ponds within 250m of the route that may provide	There is potential for impact to protected species and habitats for each of the proposed options. The slip roads at the northern junction of Option 1B would remove all existing connectivity between Strawberry Grove and the natural landscape and likely result in the permanent loss of the	There is potential for impact to protected species and habitats for each of the proposed options. The slip roads at the northern junction of Option 1C would remove existing connectivity between Strawberry Grove and the natural landscape and likely result in the	There is potential for impact to protected species and habitats, and permanent loss of part of Strawberry Grove woodland. There are two ponds within 250m that may provide breeding opportunities for protected species, GCN.	Options 2A, 2B and 2C are in close proximity to a former sand and gravel extraction pit for which there may be potential for notable species associated with the site. There is potential for impacts to protected species and habitats for each of the proposed options.	Options 2A, 2B and 2C are in close proximity to a former sand and gravel extraction pit for which there may be potential for notable species associated with the site. There is potential for impacts to protected species and habitats for each of the proposed options.	There is potential for impacts to protected species and habitats for each of the proposed options. Options 2A, 2B and 2C are near a former sand and gravel extraction pit. There may be potential for notable species associated with this site. However Option 2c appears to have least	There is potential for impacts to protected species and habitats for each of the proposed options. The proposed slip roads of the northern junction are within 200m of Walls Wood ASNW and may impact the woodland buffer between the proposed road and the area of ASNW.

Environmental Topic	Comparison of proposed route options							
	Option 1A	**Option 1B**	**Option 1C**	**Option 1D**	**Option 2A**	**Option 2B**	**Option 2C**	**Option 3**
	breeding opportunities for protected species GCN.	majority of the woodland. In addition, there are three ponds within 250m of the route that may provide breeding opportunities for protected species GCN.	permanent loss of some woodland. There are four ponds within 250m that may provide breeding opportunities for protected species, GCN.		Option 2A would result in the permanent loss of a large pond north of the extraction pit. There are in addition, six ponds within 250m that may provide breeding habitat for protected species. This option would also result in the permanent loss of priority woodland habitat south of the route.	Option 2B would result in the permanent loss of conifer woodland habitat. In addition, there are four ponds located within 250m south east of the route that may provide breeding habitat for protected species GCN.	impact upon known ecological receptors at this early stage. Of note, there are four ponds located within 250m of the route.	Of note are four ponds located within 250m of the option.
	Rank 3	**Rank 3**	**Rank 3**	**Rank 2**	**Rank 3**	**Rank 2**	**Rank 1**	**Rank 1**
Geology & Soils	Overall, there is a low risk from contaminated soils/water. Options 1A, 1B and 3 are at risk of contamination associated with the adjacent waste transfer station and petrol station which will be determined following Ground Investigation (GI). Information gained as part of the desk study indicate that general area is within Agricultural Land Classification of Grade 1 (Excellent). In addition, an emerging safeguarded sand and gravel extraction allocation has been identified. Both of these are to be investigated further and may place constraints on development within the area.							
	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects the current WTS and fuelling station.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects the current WTS and fuelling station.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects the current WTS and fuelling station.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects the current WTS and fuelling station.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects areas of potentially infilled ground. Potential impact upon emerging safeguarded sand and gravel extraction allocation.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects of potentially infilled ground which should be further investigated. Potential impact upon emerging safeguarded sand and gravel extraction allocation.	Medium risk from contaminated soils/water associated with current/historical potential sources of contamination where the route intersects of potentially infilled ground which should be further investigated. Potential impact upon emerging safeguarded sand and gravel extraction allocation.	Based on the proposed location within 250m of potentially infilled land, the risk of an environmental impact should be considered. The route is also within proximity of an area identified by the British Geological Survey as artificial ground which should be further investigated. .
	Rank 1	**Rank 1**	**Rank 1**	**Rank 1**	**Rank 3**	**Rank 3**	**Rank 3**	**Rank 2**
Road Drainage & Water Environment	All options would potentially impact on Sixpenny Brook, a Water Framework Directive (WFD) watercourse and main river, and an ordinary watercourse. All route options are predominantly within areas of very low surface water flood risk, however there are some localised areas of med-high risk of surface water flooding. Although at risk of groundwater flooding, there have been very few reported incidents of groundwater flooding across the district. Fluvial risk is considered low for all options. No major constraints to any of the options have been identified at this stage, with mitigation measures likely to be incorporated.							
	Interaction with one watercourse (Sixpenny Brook).	Interaction with one watercourse (Sixpenny Brook).	Interaction with one watercourse (Sixpenny Brook). Med-High surface water flood risk near Allen's	Interaction with one watercourse (Sixpenny Brook) Some areas of low-med surface water flood risk	Interaction with two watercourses (Bromley Brook and Sixpenny Brook).	Interaction with two watercourses (Bromley Brook and Sixpenny Brook).	Interaction with two watercourses (Bromley Brook and Sixpenny Brook).	Interaction with one watercourse (Sixpenny Brook).

Environmental Topic	Comparison of proposed route options							
	Option 1A	**Option 1B**	**Option 1C**	**Option 1D**	**Option 2A**	**Option 2B**	**Option 2C**	**Option 3**
	Low risk of groundwater flooding. Medium-High surface water flood risk only at junction with A120 and south of Strawberry Grove. Option intersects surface water flow path.	Very low surface water flood risk.	Farm south of this option.	near junction with A120. Low risk of groundwater flooding.	Medium risk of groundwater flooding. Med-High surface water flood risk near Allen's Farm in the north. Option intersects surface water flow path.	Medium risk of groundwater flooding. Option crosses a surface water flow path.	High and medium risk of groundwater flooding watercourse. Medium surface water flood risk at southern junction with A133. Option crosses a surface water flow path.	Low risk of groundwater flooding. Some areas of Med-High surface water flood risk at northern junction with A120.
	Rank 2	**Rank 1**	**Rank 2**	**Rank 2**	**Rank 2**	**Rank 2**	**Rank 2**	**Rank 1**
Population and Human Health	All schemes will have loss of agricultural land, some of which may be classified as "Excellent" in accordance with Agricultural Land Classification. There will be some additional land loss and there will be some intersection with existing roads which may need to be stopped up or bridge crossings installed. None of the routes are likely to impact on known community facilities and severance of communities will be limited. All routes will affect Public Rights of Way (PRoW) which will need to be stopped up or diverted.							
	Additional land take outside the proposed Garden Community to accommodate a junction and slips roads will be limited to land north of A120 for the junction. Intersection with PRoW 162_21.	Additional land take outside the proposed Garden Community to accommodate a junction and slip roads will be limited to land north of A120 for the junction. Intersection PRoW 162_21.	Additional land take outside the proposed Garden Community to accommodate a junction and slip roads will be limited to land north of A120 for the junction. Intersection PRoW 162_21.	Additional land take outside the proposed Garden Community to accommodate a junction and slip roads will be limited to land north of A120 for the junction. Intersection PRoW 162_21.	Additional land take would be required outside of the proposed Garden Community for approximately 600m of the route in the north as well as the A120 junction and associated slips. PRoW 162_3 would be severely impacted by the proposed junction and slip roads along the A120.	Approximately 1.2km of the northern section of the route will be outside the Garden Community and will require additional land as well as the A120 junction and associated slips. PRoW 162_3 would be severely impacted by the proposed junction and slip roads along the A120.	This option is outside the Garden Community and will require land take for the entire route as well as the A120 junction and associated slips. This route crosses a limited number of land parcels. PRoW 162_3 would be severely impacted by the proposed junction and slip roads along the A120.	Additional land take outside Garden Community will be limited to land north of A120 for the junction and associated slips. PRoW 158_36/162_21 would be severely impacted by the proposed junction here.
	Rank 1	**Rank 1**	**Rank 1**	**Rank 1**	**Rank 2**	**Rank 3**	**Rank 3**	**Rank 2**
Materials & Waste								
	Option 1A, 1B, 1C and 1D are shorter than other options, therefore material use and waste generation will be less.	Option 1A, 1B, 1C and 1D are shorter than other options, therefore material use and waste generation will be less.	Option 1A, 1B, 1C and 1D are shorter than other options, therefore material use and waste generation will be less.	Option 1A, 1B, 1C and 1D are shorter than other options, therefore material use and waste generation will be less.	Material use and waste generation will be similar to Options 2B, 2C and 3.	Material use and waste generation will be similar to Options 2A, 2C and 3.	Material use and waste generation will be similar to Options 2A, 2B and 3.	Material use and waste generation will be similar to Options 2A, 2B and 2C.
	Rank 1	**Rank 1**	**Rank 1**	**Rank 1**	**Rank 2**	**Rank 2**	**Rank 2**	**Rank 2**
Cumulative Impacts	Cumulative impacts have not been considered for this preliminary options appraisal.							

5 Conclusion

All eight Options being considered at Stage 2 are considered likely to impact upon environmental receptors, the magnitude of which cannot be determined at this early stage. Key constraints identified from the Options Appraisal and relevant to all Options are summarised as follows:

- Adverse effects on landscape
- Likely presence of archaeological remains
- Potential impacts to species and habitats
- Potential impact to watercourse
- Severance of PRoWs
- Direct impact to cycle route
- Additional land take outside proposed Garden Community

In addition, key constraints specific to Options are summarised as follows:

Option 1A

- Large number of future receptors to noise and air quality effects west of route
- Direct impact to Turnip Lodge Protected Lane
- Potential effect on setting of Grade II listed Allen's Farmhouse
- Permanent loss of Strawberry Grove, priority habitat
- Potential land contamination risk from intersection of areas of a fuelling station and waste transfer station
- Potential impact to watercourse
- Areas of surface water flood risk
- Intersects a surface water flow path

Option 1B

- Direct impact to Turnip Lodge Protected Lane
- Potential effect on setting of Grade II listed Allen's Farmhouse
- Isolation of Strawberry Grove, priority habitat
- Potential land contamination risk from intersection of areas of a fuelling station and waste transfer station

Option 1C

- Direct impact to Turnip Lodge Protected Lane
- Potential effect on setting of Grade II listed Allen's Farmhouse.
- Isolation of Strawberry Grove, priority habitat
- Potential land contamination risk from intersection of areas of a fuelling station and waste transfer station

Option 1D

- Large number of future receptors to noise and air quality effects to east and west of route
- Direct impact to Turnip Lodge Protected Lane
- Potential effect on setting of Grade II listed Allen's Farmhouse
- Potential land contamination risk from intersection of areas of a fuelling station and waste transfer station

Option 2A

- Potential effect on the setting of four listed buildings
- Direct impact to Turnip Lodge Protected Lane
- Impact to priority habitat

- Potential land contamination risk from proximity to potentially infilled land and an area of artificial ground
- Potential impact to safeguarded sand and gravel extraction allocation
- Severe impact to PRoWs
- Substantial land take required outside of the proposed Garden Community

Option 2B

- Potential effect on the setting of three listed buildings
- Potential land contamination risk from proximity to potentially infilled land and an area of artificial ground
- Potential impact to safeguarded sand and gravel extraction allocation
- Severe impact to PRoWs
- Substantial land take required outside of the proposed Garden Community

Option 2C

- Potential effect on the setting of three listed buildings
- Potential land contamination risk from proximity to potentially infilled land and an area of artificial ground
- Potential impact to safeguarded sand and gravel extraction allocation
- Almost entirely beyond the extent of the proposed Garden Community
- Severe impact to PRoWs

Option 3

- Large number of future receptors to noise and air quality effects east and west of route
- Impact to two Noise Important Areas
- Direct impact to Turnip Lodge Protected Lane
- Potential impact to Walls Wood ASNW
- Potential land contamination risk from proximity to potentially infilled land and an area of artificial ground
- Severe impact to PRoWs

Any of the route Options developed further as a preferred route will require an Environmental Impact Assessment. Likely significant effects of the preferred route will be identified and presented within the Scoping Report for a formal Scoping Opinion from Essex County Council. This forms the framework for the Environmental Impact Assessment.

References

DEFRA (2018) AQMAs Interactive Map [online] Available at https://ukair.defra.gov.uk/aqma/maps [Accessed 08/04/2019].

Design Manual for Roads and Bridges (DMRB) (1993) Pedestrians, Cyclists, Equestrians and Community Effects, Volume 11, Section 3, Part 8

Environment Agency (2019) Catchment Data Explorer [online] Available at: https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3077 [Accessed 08/04/2019].

Environment Agency (2019) Long term flood risk information [online] Available at: https://flood-warning-information.service.gov.uk/long-term-flood-risk/map [Accessed 04/08/2019].

Essex Asset Management Map (2019) iShare - Solo. [online] Available at: http://essex.astuntechnology.com/atEssexHighwaysSolhtml [Accessed 08/04/2019].

Essex County Council (2019) Check if you're at risk of flooding [online] Available at: https://flood.essex.gov.uk/know-your-flood-risk/check-if-you-re-at-risk-of-flooding/ [Accessed 04/08/2019].

Extrium (2016) England Noise Map Viewer – Defra strategic noise and mapping exercise [online] Available at http://www.extrium.co.uk/noiseviewer.html [Accessed 04/08/2019].

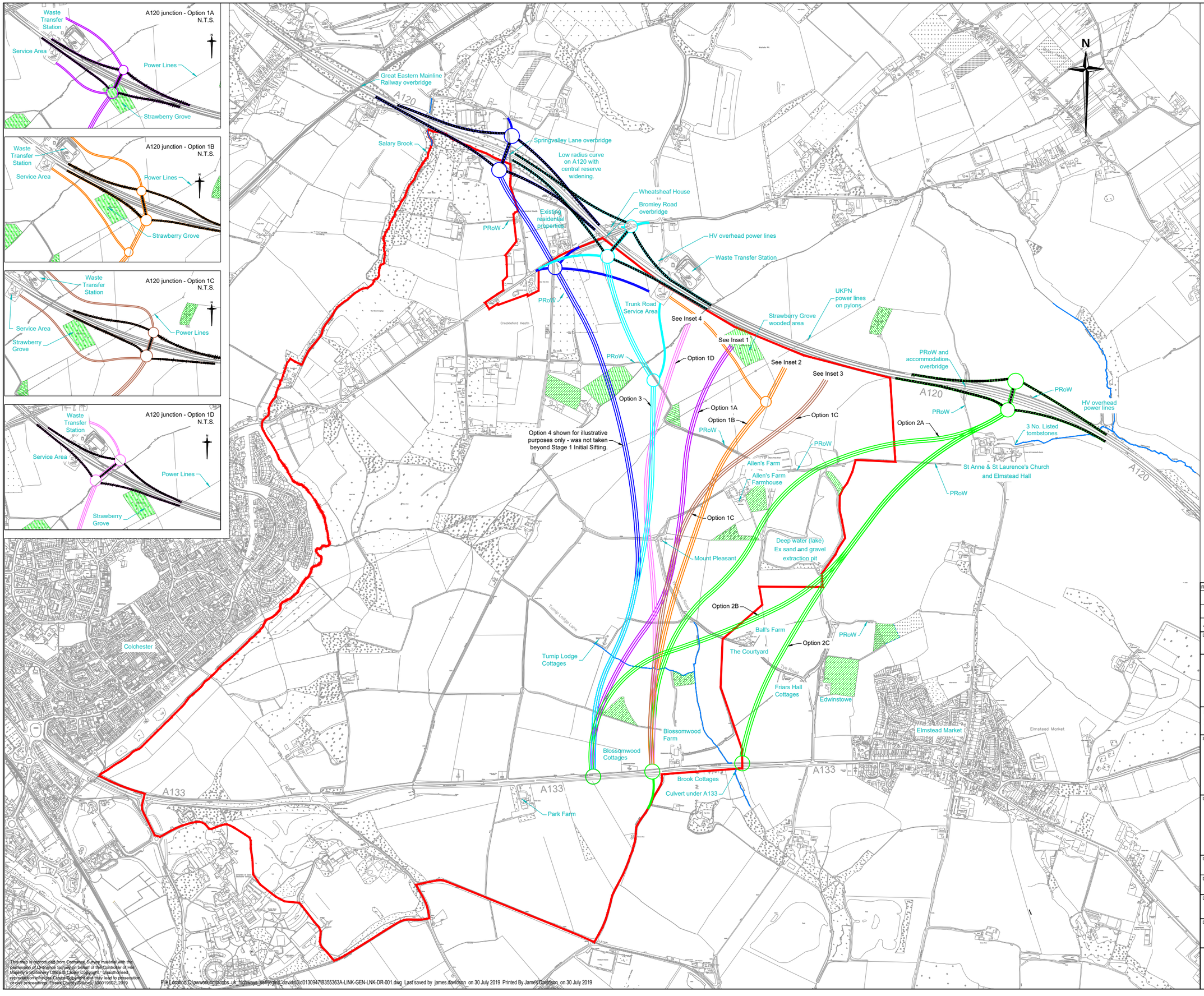
MAGIC Map (2019) Interactive Mapping Service – Natural England [online] Available at: https://magic.defra.gov.uk/MagicMap.aspx [Accessed 08/04/2019].

Natural England (2010) Agricultural Land Classification: East Region [pdf] Available at: http://publications.naturalengland.org.uk/publication/127056?category=5954148537204736 [Accessed 7th Jan. 2019].

Woodland Trust (2017) Planning for Ancient Woodland – Planners' Manual for Ancient Woodland and Veteran Trees (Practical Guidance) [pdf] [Accessed 24 Apr. 2019] Available at: http://www.woodlandtrust.org.uk/mediafile/100820918/pg-wt-220917-planners-manual-for-ancient-woodland-and-veteran-trees.pdf?cb=e92c090a3d9f4b29809117c6c175678f

Visit Colchester (2019) Visit Colchester – *Salary Brook Local Nature Reserve* [online] [Accessed on 8 Apr. 2019] Available at: https://www.visitcolchester.com/thedms.aspx?dms=3&venue=0654742

Appendix A: All Proposed Options Plan



Notes

1. Do not scale.
2. Link road based on 85kph (50mph) design speed dual two-lane carriageway.

Key

- Assumed site boundary
- abc — Constraints
- Lengths of carriageway anticipated to form part of the Highways England network once constructed.
- Areas of woodland within the site
- Highlighted watercourses

Rev.	Date	Description of revision	Drawn	Checked	Reviewed	Approved
A	07/19	Minor adjustment to Option 3 to avoid pylon directly south of service area	JGD	MM	PK	PK

DRAWING STATUS

FEASIBILITY

Essex Highways

Essex Highways, Seax House, Victoria Road South, Chelmsford, CM1 1QH.
Tel: 0345 6037631

SCHEME TITLE

A120/A133 LINK ROAD & RTS

DRAWING TITLE

A120/A133 LINK ROAD ALL PROPOSED OPTIONS PLAN

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
JGD	JGD	PK	MM	PK
DATE	DATE	DATE	DATE	DATE
JUN 19	JUN 19	JUL 19	JUL 19	JUL 19

DRAWING UNITS U.N.O.
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A1 (841X594mm)
N.T.S.

DRAWING No.
B355363A-LINK-GEN-LNK-DR-001

REV.
A

Ringway Jacobs — Integrated expertise

Essex County Council

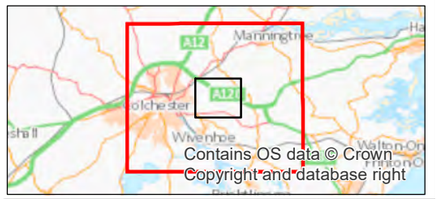
File Location C:\pwworking\jacobs_uk_highways_3s4\regina_davids3\d0130947\B355363A-LINK-GEN-LNK-DR-001.dwg Last saved by james.davidson on 30 July 2019 Printed By James Davidson on 30 July 2019

Appendix B: Environmental Constraints Plan

Dedham Vale AONB
ARDLEIGH
COLCHESTER
Ardleigh Gravel Pit SSSI
Ardleigh Gravel Pit SSSI
Bullock Wood SSSI
3
1D
1A
1B
1C
2A
2B
2C
COLCHESTER
Salary Brook LNR
ELMSTEAD MARKET
Wivenhoe Park Registered Park and Garden
Upper Colne Marshes - SSSI
Colne - LNR
Wivenhoe Gravel Pit - SSSI
WIVENHOE
Upper Colne Marshes - SSSI
Roman River SSSI
Upper Colne Marshes - SSSI
Upper Colne Marshes - SSSI
Colne Estuary SPA
Essex Estuaries SAC
Colne Estuary RAMSAR
0 500 1,000 1,500 2,000 Metres

Key

- A120-A133 Link Route 1A
- A120-A133 Link Route 1B
- A120-A133 Link Route 1C
- A120-A133 Link Route 1D
- A120-A133 Link Route 3
- A120-A133 Link Routes 2A, 2B, 2C
- A120-A133 Link Routes - 2km Buffer
- A120-A133 Link Routes - 5km Buffer
- Tree Preservation Order - indvidual trees (2014/2015)
- Tree Preservation Order - tree groups (2014/2015)
- Essex Cycle Network
- Main Rivers
- Ordinary Watercourses
- Tendring Colchester Borders Garden Community
- Air Quality Management Area (AQMA)
- Noise Important Area (NIA)
- Scheduled Monument
- Registered Park and Garden
- Priority Habitat
- Local Nature Reserve (LNR)
- Site of Special Scientific Interest (SSSI)
- Area of Outstanding Natural Beauty
- Special Protection Areas (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Ancient Woodlands
- Ponds/Waterbodies



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	08/19	Draft	JB	VS	NB	UW

Drawing Status
FOR INFORMATION

Essex Highways

Essex Highways, Seax House, Victoria Road South, Chelmsford, CM1 1QH.
Tel: 0345 6037631

Scheme Title
A120-A133 Link Road

Drawing Title
ENVIRONMENTAL CONSTRAINTS PLAN
SHEET 1 of 2

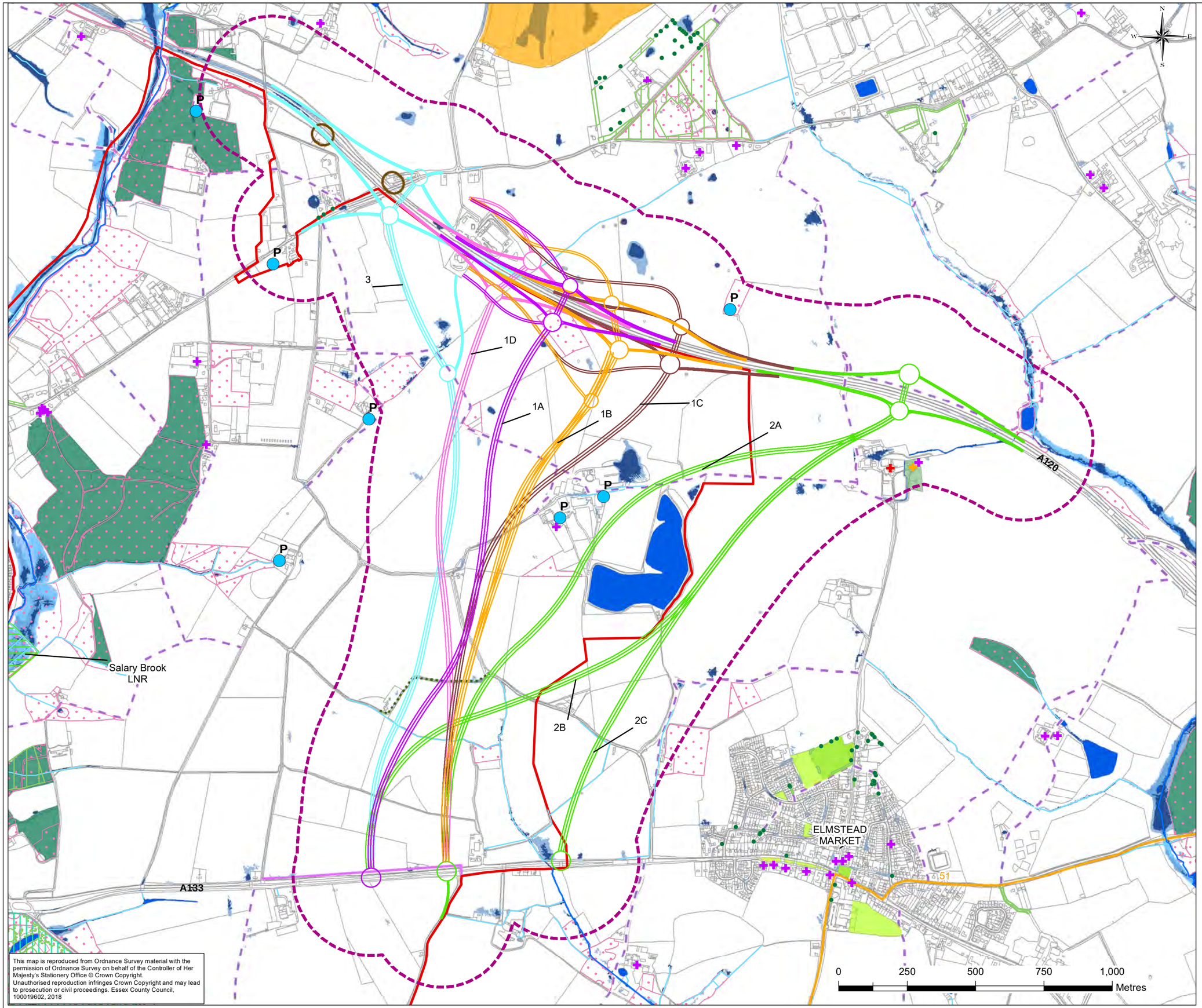
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
JB	JB	VS	NB	UW
DATE	DATE	DATE	DATE	DATE
OCT19	OCT19	OCT19	OCT19	OCT19

DRAWING UNITS U.N.O.
SCALE AT A3 (420 x 297 mm) 1:50,000

DRAWING NO. B355363A-LNK-EGN-LNK-DR-001
REV. 1

RINGWAY JACOBS integrated expertise
Essex County Council

G:\B355363A_A133_A120_HIF\ArcGIS\Environment\B355363A_A133_A120_HIF_Environmental_Constraints_Rev_1_Sheet_1.mxd

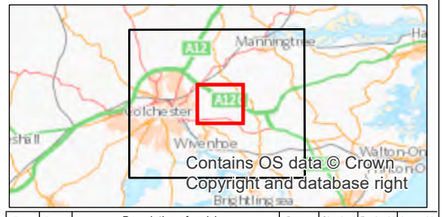


Key

- A120-A133 Link Routes - 250m Buffer
- A120-A133 Link Route 1A
- A120-A133 Link Route 1B
- A120-A133 Link Route 1C
- A120-A133 Link Route 1D
- A120-A133 Link Route 3
- A120-A133 Link Routes 2A, 2B, 2C
- Tree Preservation Order - indvidual trees (2014/2015)
- Tree Preservation Order - tree groups (2014/2015)
- Ponds
- Listed Building Grade I
- Listed Building Grade II*
- Listed Building Grade II
- Tendring Protected Lanes
- Essex Cycle Network
- National Cycle Network Route
- Public Right of Way
- Main Rivers
- Ordinary Watercourses
- Tendring Colchester Borders Garden Community
- Noise Important Area (NIA)
- Registered Park and Garden
- Priority Habitat
- Local Nature Reserve (LNR)
- Special Protection Areas (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Authorised Landfill Sites
- Safeguarded Local Green Spaces
- Open Greenspace
- Ancient Woodlands
- Ponds/Waterbodies
- Flood Zone 2
- Flood Zone 3

Flood Risk from Surface Water

- High
- Medium



Rev.	Date	Description of revision	Drawn	Checked	Reviewed	Approved
1	08/19	Draft	JB	VS	NB	UW

Drawing Status: FOR INFORMATION

Essex Highways

Essex Highways, Seax House, Victoria Road South, Chelmsford, CM1 1QH.
Tel: 0345 6037631

Scheme Title: A120-A133 Link Road

Drawing Title: ENVIRONMENTAL CONSTRAINTS PLAN SHEET of

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
JB	JB	VS	NB	UW
DATE	DATE	DATE	DATE	DATE
OCT19	OCT19	OCT19	OCT19	OCT19

DRAWING UNITS U.N.O. | SCALE AT A3 (420 x 297 mm): 1:13,000

DRAWING NO.: B355363A-LNK-EGN-LNK-DR-001 | REV.: 1

RINGWAY JACOBS integrated expertise | Essex County Council

G:\B355363A_A133_A120_HIF\ArcGIS\Environment\B355363A_A133_A120_HIF_Environmental_Constraints_Rev_1_Sheet_2.mxd