Public Document Pack

CABINET – 9TH MAY 2017

APPENDICES TO ITEM 7 – A500 DUALLING

This page is intentionally left blank

Cheshire East Council
Highways

A500, M6 to A5020

DfT Large Local Major Transport Schemes Funding Bid

B1832076/OD/013
Revision 0

July 2016

A500, M6 to A5020

Project No:	B1832076
Document Title:	DfT Large Local Major Transport Schemes Funding Bid
Document No.:	B1832076-OD-13
Revision:	R0
Date:	July 2016
Client name:	Cheshire East Council
Project manager:	Dan Teasdale
Author:	Rob Minton
File name:	Large Local Transport Schemes_A500 Dualling_Draft Final – with cover

Jacobs U.K. Limited

Document history and status

Rev	Date	Description	By	Review	Approved
R0	27/07/16	For submission	R Minton	A Curley	D Teasdale

Large Local Major Transport Schemes

Application for Scheme Development Costs – Main Round

Scheme Name	A500 Dualling
Lead LEP	Cheshire and Warrington Local Enterprise Partnership
Other supporting LEPs *(if applicable - see 2.4 below)*	Stoke and Staffordshire Local Enterprise Partnership
Promoting Authority	Cheshire East Council
Is this an update of a bid that was unsuccessful in the fast track round	No

1. Introduction

1.1 Description

Please describe the scheme (and attach a map if available)

The A500 dualling scheme will upgrade a 3.2km section of the A500 from single carriageway to dual carriageway standard along with associated works to increase the capacity of the A500 / A531 / B5742 junction to the west. The extents of the scheme extend from Junction 16 of the M6 to the east to the junction of the A500 / A531 / B5742 to the west. A plan of the extents of the scheme can be seen in Figure 1.1.

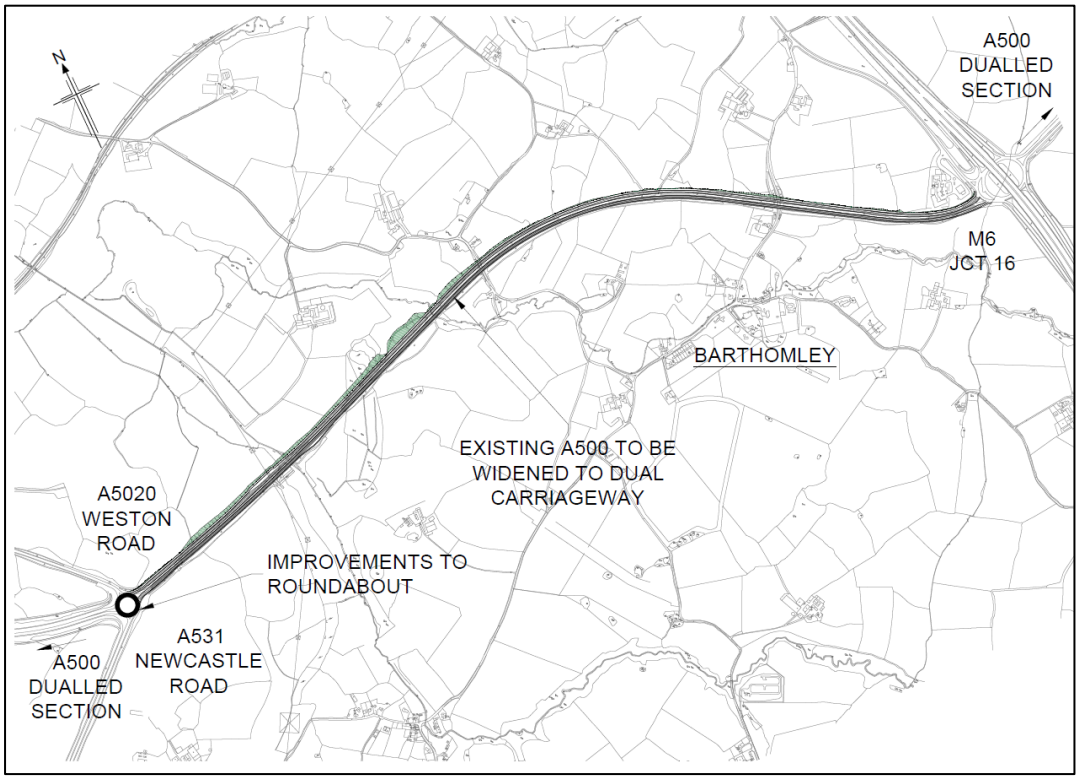


Figure 1.1: Proposed Scheme Alignment

The A500 is a key strategic route in Cheshire which provides the main route from the south of Crewe, the future High Speed 2 (HS2) hub station and Nantwich to the M6 (junction 16) and the wider Cheshire East, Stoke and Staffordshire region. The area currently suffers from congestion issues and the implementation of the scheme is vital to ensure that future growth aspirations can be met.

To prepare for future growth plans in Crewe a number of highway capacity upgrades have recently been implemented along the A500 corridor between Crewe and the M6. These upgrades include:

- A Highways England pinch point scheme to improve capacity at Junction 16 of the M6;
- The recent completion of the A5020 link road which provides access from the A500 to the southeast of Crewe; and
- The recent completion of the B5071 Basford West Spine Road which provides access from the A500 to the southwest of Crewe.

A plan of the schemes along the route can be seen in Figure 1.2. The remaining sections of the A500 corridor between Crewe and the M6 are of dual carriageway standard and the proposed scheme would therefore remove the final pinch point along the corridor and complete the highway capacity upgrades in the area, providing the capacity needed to accommodate future growth. As well as growth within Crewe, the A500 will also serve as the main route from the proposed HS2 hub station at Crewe (which would also be accessed from the A500) to the M6 and the wider region.

Other committed highway schemes in Crewe include capacity upgrades of the Crewe Green Roundabout and Sydney Road bridge to improve links in the north of the town and can be seen in Figure 1.2.

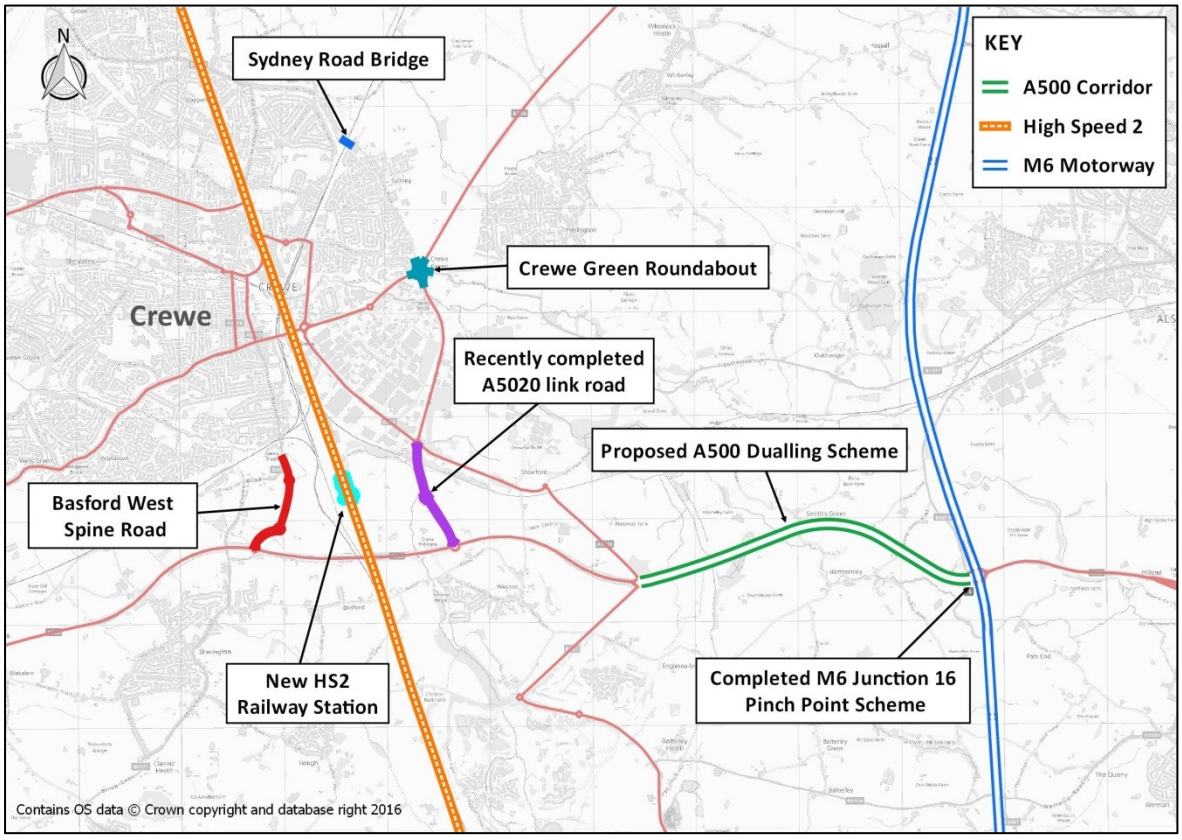


Figure 1.2: Highway Capacity Upgrades

As set out in the strategic case of this pro-forma, the delivery of the scheme is critical for a number of key strategic benefits including:

- Accommodating future growth in Crewe proposed in the Cheshire East Local Plan Strategy including the Northern Development Gateway Zone. This growth will include 100,000 new homes and 120,000 new jobs;
- Accommodating additional traffic associated with the construction and operation of the HS2 hub station and railway line to improve connectivity with other areas in the region, allowing them to benefit from HS2; and
- Removing existing congestion issues on the A500 route.

The A500 dualling scheme will be designed to standards set out in the Design Manual for Roads and Bridges (DMRB) and will comprise a 3.2 km section of dual carriageway designed to a 70mph standard.

2. Strategic Case

2.1 Problem Identification

Please describe the problem that the scheme is designed to solve. Please illustrate with evidence and provide hyperlinks to any online material

The strategic need for the scheme is set out in the following sections.

Barriers to Economic Growth and Housing Delivery

The proposed scheme would increase the capacity of the A500 which links the south of Crewe and Nantwich with the M6, and the Stoke and Staffordshire region, facilitating access to housing and employment opportunities. Ambitious plans are in place to develop the region as part of the Northern Gateway Development Zone (NGDZ), as set out below, with Crewe a crucial part of this initiative. The A500 presently suffers from peak hour congestion issues (as demonstrated later in this section) which will hinder this growth and as set out previously (and shown in Figure 1.2) the scheme is the final pinch point of highway upgrades along this corridor.

The benefits of the scheme on realising the growth ambitions of the NGDZ and Cheshire East Local Plan Strategy are set out in the following sections.

Northern Development Gateway Zone

The Northern Gateway Partnership is a collaboration including the Cheshire and Warrington and Stoke-on-Trent and Staffordshire Local Enterprise Partnerships and seven local authorities - Cheshire East Council, Cheshire West and Chester Council, Newcastle-Under-Lyme Borough Council, Stafford Borough Council, Staffordshire County Council, Staffordshire Moorlands District Council and Stoke-on-Trent Council. The Northern Gateway spans Cheshire and North Staffordshire including the city of Stoke on Trent, Crewe and the A500 corridor. The approximate boundaries of the NGDZ are shown in Figure 2.1.

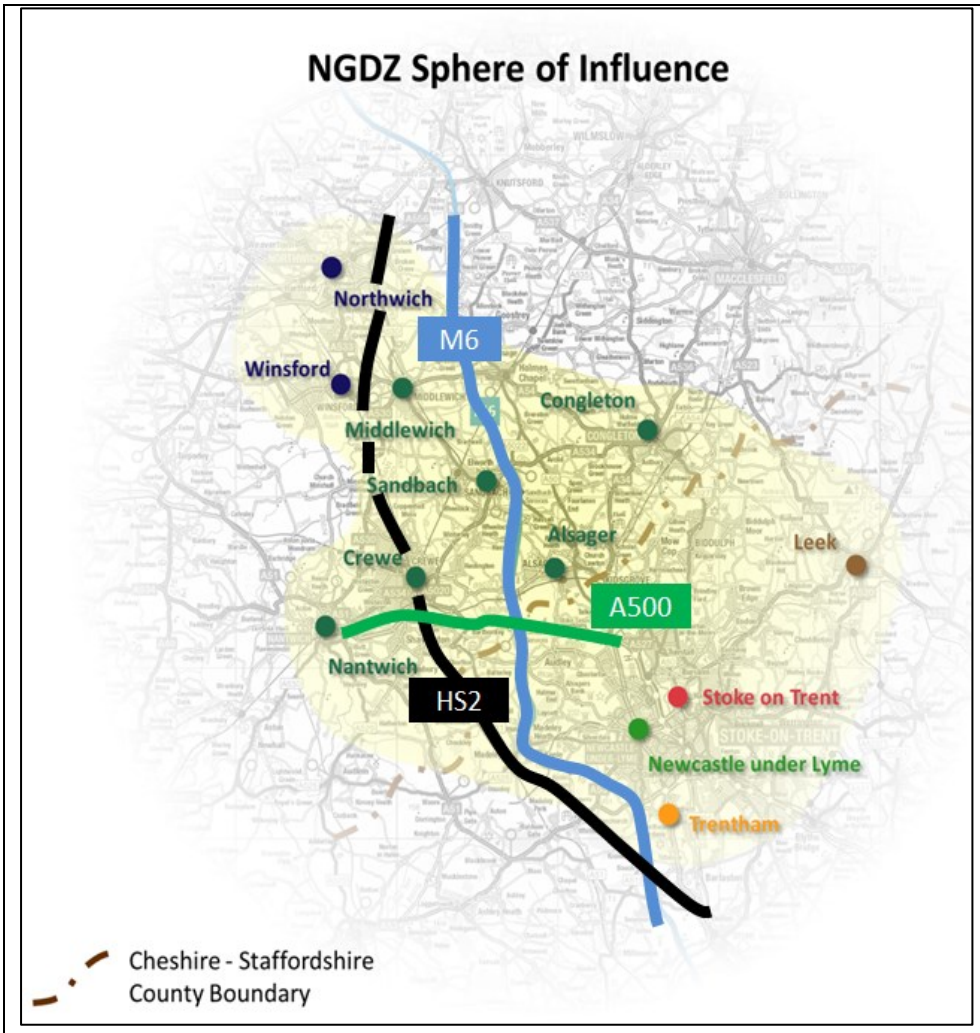


Figure 2.1: Approximate Boundaries of the NGDZ

The aim of the partnership is to unlock major new growth and investment opportunities which could deliver more than 100,000 new homes and 120,000 new jobs by 2040 by creating a new growth zone at the gateway to the Northern Powerhouse and Midlands economic engine.

To drive the project forward, the two LEPs have signed a concordat committing them, supported by the wider network of local authority partners, to work together to ensure plan-led sustainable targeted growth and optimise the benefits of HS2 investment.

One of the key drivers of the NGDZ is the future HS2 hub station which will be situated in the south of Crewe and accessed via the A500. As shown in Figure 2.1, the A500 is the main link from the south of Crewe to the M6 and into the NGDZ region and will thus be vital in ensuring the area can tap into the future benefits of HS2, supporting future growth. Some of the future development sites coming forward in the region are shown in Figure 2.2.

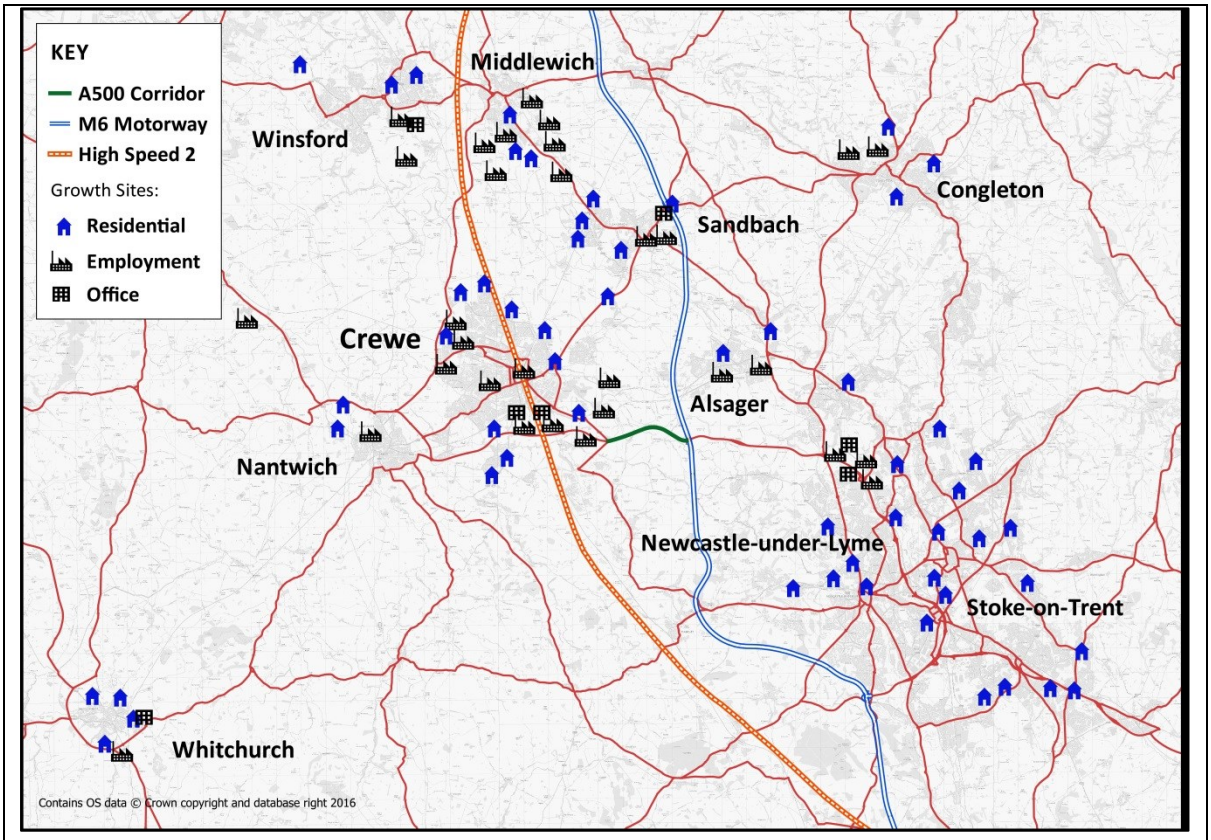


Figure 2.2: Connectivity with the Wider Region

As outlined previously, the A500 currently suffers from congestion issues and the scheme will deliver further highway capacity along this arterial corridor, to support future development coming forward as part of the NGDZ proposals in the region. To emphasise the importance of the scheme a letter of support has been received from the Stoke and Staffordshire LEP and is included in Appendix A.

Cheshire East Local Plan Strategy

Cheshire East Council recently published the Local Plan Strategy – Proposed Changes Consultation Draft (March 2016). The Local Plan Strategy includes major growth coming forward in Crewe which benefits from not only being located in one of the most prosperous parts of the UK but also one of the best connected areas. This thus creates the perfect location for job creation, growth and development. The jobs-led vision encapsulated by the Local Plan Strategy provides the opportunity for decentralisation of the economy outside of London and the South East, creating a 'hub' of investment in science, automotive and rail engineering.

To realise this vision, the Local Plan Strategy includes a series of ambitious targets for growth in housing and employment around Crewe and Nantwich. The wider growth plans in Crewe can be seen in Figure 2.3 which shows committed and Local Plan development sites in the area.

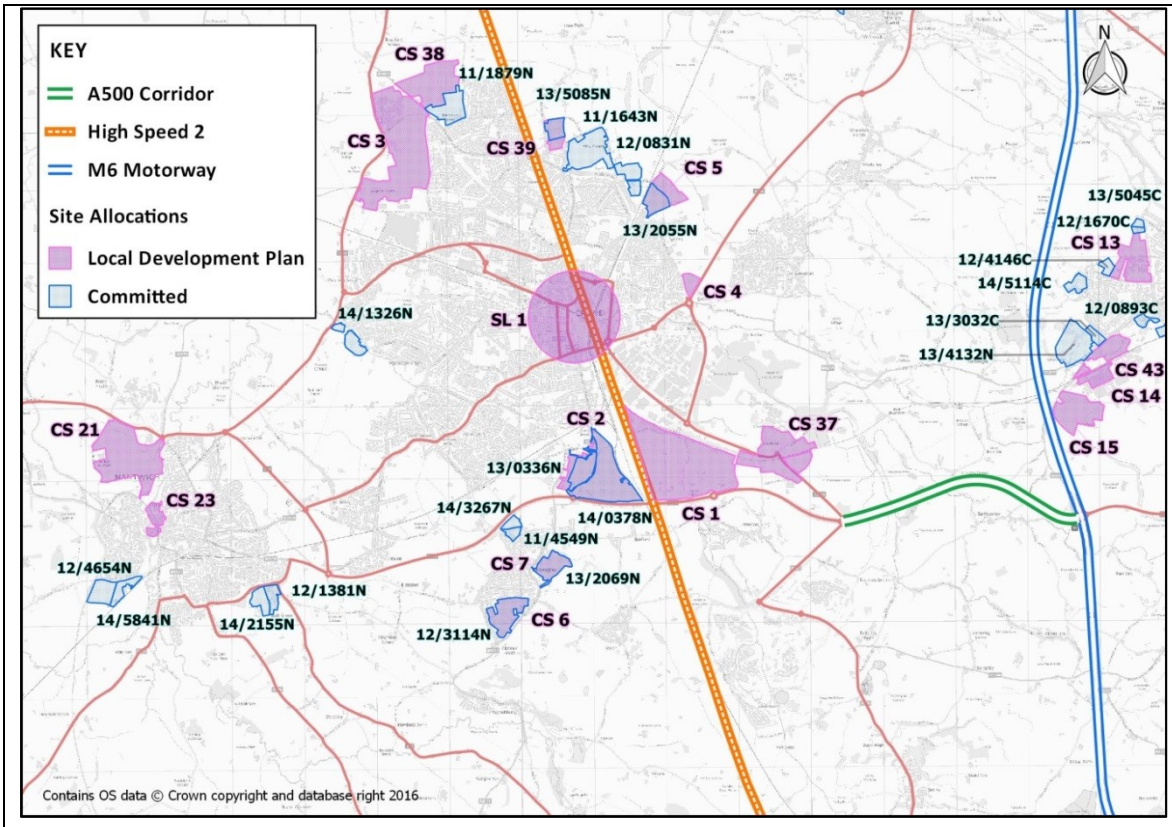


Figure 2.3: Site allocations in the scheme area of interest

The scheme would particularly support development sites in Crewe which are listed in Appendix B with the associated number of jobs and homes that would be delivered.

As can be seen from the figures in Appendix B, the scheme would support over 12,000 homes and 12,000 jobs coming forward as well as supporting the NGDZ. It should be noted that the development sites include the Basford East and West sites which will be situated adjacent to the proposed HS2 station hub. These sites are described in the Cheshire and Warrington Strategic Economic Plan as "one of the UK's prime development opportunities over the next 20 years being located at the heart of the UK's economic geography" and represent a huge opportunity for a landmark development in Crewe.

Should the scheme not be completed, the A500 will continue to be a congestion constraint for traffic travelling between the south of Crewe and the M6 / the wider Cheshire East, Stoke and Staffordshire region. This would thus hinder the future development plans in the area including the NGDZ and the Cheshire East Local Plan growth targets.

Local & Strategic Connectivity

As previously set out, scheme would assist the delivery of 100,000 new homes and 120,000 new jobs by 2040 as part of the NGDZ. The scheme will also however boost existing residents and businesses in the wider area, both locally, through reduced congestion along the key strategic link to the M6, and across the wider Stoke and Staffordshire region for traffic travelling to and from Crewe and the future HS2 hub.

The future HS2 station is located at the centre of a strategic road and rail network with 4.9 million people within one hour's travel of the site. The areas likely to be served by the HS2 hub are shown in Figure 2.4 and traffic from the areas to the east of the M6 is likely to use the A500 from

Junction 16 of the M6 to travel to the HS2 hub station.

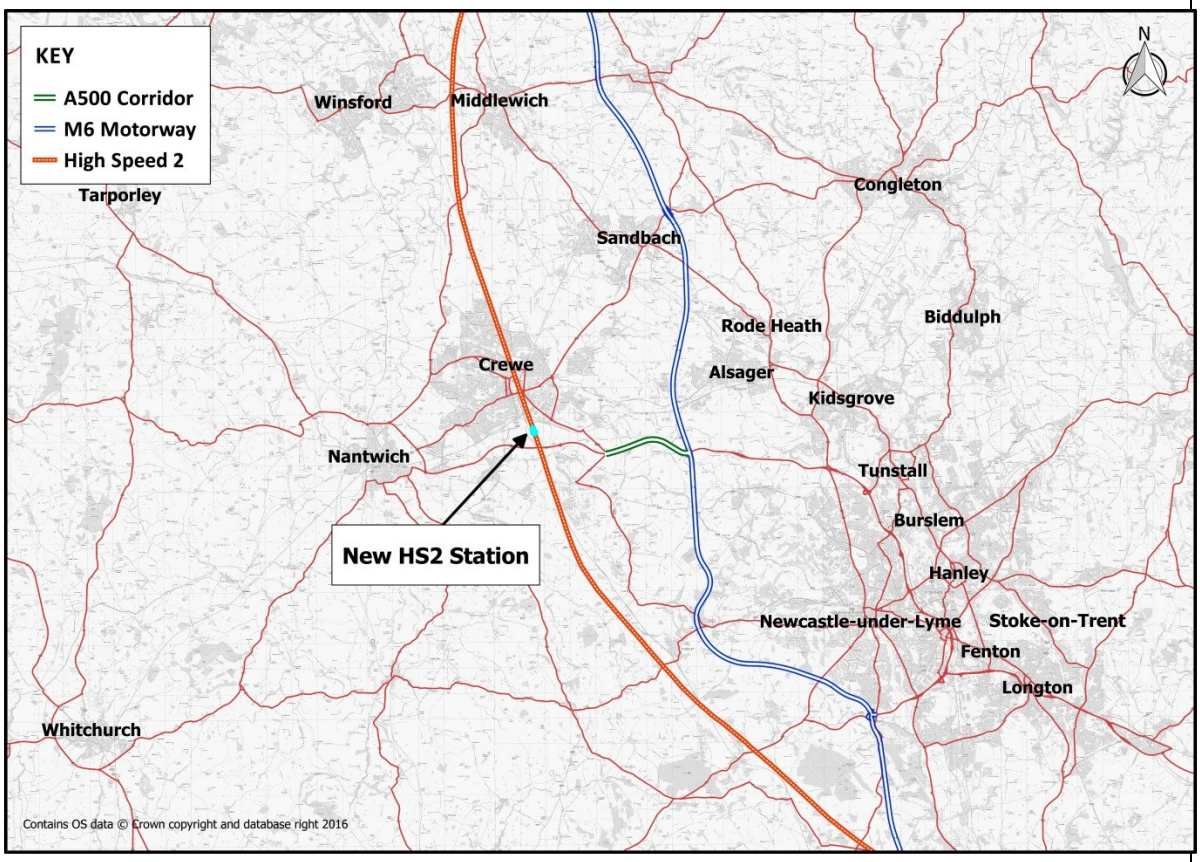


Figure 2.4: Areas served by HS2 Hub Station in Crewe

As noted later in this section, this section of the A500 currently suffers from peak hour congestion issues even before additional traffic from the Local Plan or further strategic traffic from HS2, both of which would be expected to exacerbate existing issues. The delivery of the scheme is thus vital in ensuring that the benefits of HS2 are realised in Crewe and the wider Cheshire East, Stoke and Staffordshire region.

High Speed 2 Construction Route

The future HS2 line will include a hub station in Crewe which is expected to open in 2027. During the construction of the HS2 line and the hub station it is expected that a significant number of HGV movements will use the A500 to travel between the M6 and the HS2 construction access point. This additional traffic is expected to exacerbate the existing congestion issues experienced along the link, increasing delay.

The section of the A500 which would be upgraded as part of this scheme is currently single carriageway and subject to the National Speed Limit. The alignment of this section limits forward visibility in places and the high volume of traffic already using the route makes conditions difficult for overtaking. There are concerns that during the construction period of HS2, the significant increase in slower moving HGV traffic could result in an increase in the number of collisions along this section of the A500 as other vehicles overtake construction traffic. This would obviously be alleviated through the scheme which would provide dual carriageway along this section of the A500, allowing cars and other vehicles to safely overtake construction traffic.

It should be noted that from the timetable above that the scheme would open in Spring 2021, the approximate time when construction of the HS2 line and hub are likely to commence. If the

scheme is not selected for funding from this funding round, it is unlikely that the scheme could be built before construction of the HS2 line needs to commence.

Existing Congestion Issues

The scheme proposes to dual the remaining single carriageway section of the A500 between the south of Crewe and Junction 16 of the M6 and as shown previously in Figure 1.2, the scheme will remove the final pinch point along the corridor between the south of Crewe and the M6

The A500 currently suffers from existing congestion issues, particularly during the AM and PM peak periods. The current Average Annual Daily Traffic Flow along the corridor is approximately 28,000 vehicles a day. TA 46/97 (Design Manual for Roads and Bridges (DMRB) section 5.1.3) sets out Congestion Reference Flows which define the flow at which the carriageway is likely to be 'congested' in the peak periods on an average day. According to the DMRB standards, the current standard of the existing A500 carriageway would have a Congestion Reference Flow of around 23,000 vehicles a day. As mentioned above, it is estimated that approximately 28,000 vehicles a day currently using this link, thus resulting in the peak hour congestion currently experienced.

The existing congestion is further evidences from the SATURN modelling undertaken to demonstrate the Value for Money Economic case in Section 3.1 of this submission. The Volume over Capacity (V/C) results for the A500 for the 2034 Future Year assessment are summarised in Table 2.1 for the Do Nothing (without A500 dualling) and Do Something (with A500 dualling) scenarios. In SATURN modelling results, any link forecast to operate with a V/C value above 85 would expect to result in congestion with a value of 100 representing the absolute capacity for the link.

Table 2.1: V/C Results from SATURN Modelling for Proposed Scheme

Ref	Do Nothing (existing single carriageway) V/C Ratio	Do Something (with dualling) V/C Ratio
A500 Eastbound – AM Peak	82	40
A500 Westbound – AM Peak	97	57-86*
A500 Eastbound – PM Peak	86	42
A500 Westbound – PM Peak	100-106	67-98*
*The V/C ratio for westbound traffic increases as the A500 / A531 / B5742 roundabout junction at the western extent of the scheme is modelled to have insufficient capacity.		

As can be seen from Table 2.2, the current single carriageway alignment is forecast to be operating at or above capacity in the modelled scenario. The higher V/C ratios set out in Table 2.2 are as a result of there being insufficient capacity at the A500 / A531 / B5742 roundabout junction. As part of the onwards development of the scheme the capacity of this junction will be improved, with the V/C expected to reduce to the lower value shown.

With improvements to the capacity of the A500 / A531 / B5742 roundabout, the benefits of the scheme are expected to increase beyond those modelled for this submission.

Public Transport

As highlighted previously, the A500 is expected to form one of the main routes to the proposed HS2 hub station. When HS2 is operational, the A500 is also expected to be an important public

transport corridor for bus services linking HS2 with Stoke and Staffordshire. If the proposed scheme does not go ahead, the existing congestion on the A500 would affect the reliability of bus services reducing the accessibility and benefits of HS2 and encouraging more people to travel by car using less suitable alternative routes.

Policy Alignment

The following section demonstrates that the strategic need for the scheme is established at a local, sub regional and national level and aligns with associated policies.

Local Policy Alignment

The need for the scheme is clearly established in the Cheshire East Local Plan Strategy, identifying from the outset the need to improve transport connections to deliver the Plan, including the proposed scheme on the A500.

By providing additional highway capacity to cater for additional traffic from development, the scheme would support the establishment of the Local Plan Strategy and the NGDZ. The scheme is thus considered to be in line with local policy and essential for the delivery of the future economic growth plans of Cheshire East.

Sub National Policy Alignment

The scheme will play an important role in delivering the NGDZ which aims to deliver 100,000 new homes and 120,000 new jobs. Both Cheshire and Warrington and Stoke and Staffordshire LEPs are committed partners of the NGDZ with the A500 a critical corridor between the areas. The scheme will also play a key role in delivering the Cheshire and Warrington Strategic Economic Plan[1] (SEP). Intervention Priority 3 in the SEP supports the creation of Crewe: High Growth City which now forms part of the NGDZ.

The improvement of the A500 is also included in the Draft Action Plan within the SEP. Outcome 2 looks to improve connectivity between Crewe, M6 and mid-Cheshire towns to unlock development in Crewe with the improvement of the A500 to the south of Crewe listed as being one of the key activities to achieving this outcome.

This transformational economic change will play a key role in delivering the Governments' vision of a Northern Powerhouse to revitalise the north and rebalance the UK economy. The Crewe High Growth City programme will also play a key role in linking the Northern Powerhouse with the Midlands Engine, bridging the gap between the two areas.

National Policy Alignment

The delivery of HS2 and a new hub station in Crewe is central to the future growth aspirations in Crewe and the wider region. The A500 is expected to provide one of the access routes from the M6 for the construction of the HS2 line and once complete, it is expected that the redeveloped Crewe railway station will be accessed directly from the A500. The scheme will thus improve access from the new HS2 station to the M6 motorway network and the Midlands, allowing the

[1] Cheshire and Warrington Strategic Economic Plan (2014). http://www.871candwep.co.uk/content/uploads/2015/05/Strategic-and-Economic-Plan-and-Growth-Plan-for-Cheshire-and-Warrington.pdf

benefits of HS2 to spread across the region.

Conclusion

The A500 forms a key strategic link between Crewe and the M6 and wider the wider Cheshire East, Stoke and Staffordshire region. The current network is constrained by peak hour congestion and acts as a barrier to delivering the ambitious development proposals in the NGDZ and the Cheshire East Local Plan Strategy. A summary of the key issues resolved by the scheme is set out below.

Theme	Problem	Solution
Enabling Economic Growth	Existing congestion on A500 will hinder delivery of regionally significant planned growth in new housing and jobs detailed in Local Plans.	The scheme will provide increased highway capacity to unlock new development sites in Crewe and Nantwich, support the NGDZ initiative in addition to mitigating traffic generated by new development.
Connectivity	Existing highway infrastructure will be unable to cater for future demands associated with the HS2 line, limiting the opportunities for HS2 to benefit the wider Cheshire East, Stoke and Staffordshire region.	The scheme will provide additional capacity to cater for additional traffic demand to the HS2 hub station.
Congestion	Existing capacity issues on A500	Scheme will provide further capacity on the A500 and remove existing capacity issues.
HS2 Construction Traffic	Increase in construction traffic along A500 during the construction of HS2	Scheme will also other traffic to safely overtake construction traffic and will provide additional capacity for additional vehicles during construction works
Public Transport	Congestion on A500 affecting reliability of public transport services serving future HS2 hub station at Crewe	Scheme will provide additional vehicle capacity, thereby removing reliability issues.

2.2 Option development

Please describe what option development work has been done to date or is planned during 2016/17, and reference with hyperlinks or attachments. In particular, illustrate why alternative/lower cost/phased options have been ruled out.

Have any of the following documents been produced? (If Y please attach to this bid)

Option Appraisal Report (OAR)	*Y*
Appraisal Specification Report (ASR)	*N*
Strategic Outline Business Case (SOBC)	*N*

A Scheme Assessment Report for the A500 link road has been produced and is enclosed in Appendix B. The report assesses 3 potential route alignments against engineering and environmental constraints. This has been supported by cost estimation work, preliminary environmental walk-over surveys, desk based geotechnical studies, and consultation with a local rights of way group. The report makes a recommendation to widen the existing A500 to the north

to create a new dual carriageway.

The assessed options all travel along the existing A500 corridor and create a dual carriageway, with an option to widen to the north; an option to widen to the south, and; an option that alternates between widening to the north and south, avoiding significant constraints. It is considered that these are the three realistically available options that meet the scheme objectives. The assessment has shown that all of the options are feasible, and that the options to widen to the north and widen to the south should be taken forward for consultation. The option that alternates between widening to the north and south has been rejected because it has the greatest environmental impact, the highest scheme costs, and the greatest engineering/construction challenges.

During 2016, the report will be supplemented by traffic modelling and scheme economics work to outline the scheme benefits, and consultation with selected stakeholders including landowners and Highways England. The scheme has an interface with the motorway network at M6 J16, where there is a potential improvement scheme. Ecological surveys will commence in October, and continue through to November 2017. Once this work has been done, the findings of the Scheme Assessment Report will be verified, an following this a Preferred Route Announcement will be made.

An Appraisal Specification Report and Strategic Outline Business Case will be produced in Autumn 2016.

2.3 Alignment with LEP Strategic Economic Plan

Please illustrate how the proposal links with the aims of the SEP and the degree to which it would enhance the SEP. Please make any necessary cross reference to your bid for Growth Deal funding.

The Cheshire and Warrington Sub Region

The Cheshire and Warrington sub-region is located favourably between Liverpool and Manchester, two large economic areas within the Northern Powerhouse. The Cheshire and Warrington economy is currently worth £20bn per annum, led by hi-tech manufacturing, research and development and international Headquarters, and is more significant in terms of output and population than Leeds, Sheffield and Newcastle. With close to one million people, the Cheshire and Warrington economy has a workplace GVA per head above the national average, and 30% higher than any other economy in the North of England.

The Cheshire and Warrington sub-region is identified spatially in the Figure 2.5.

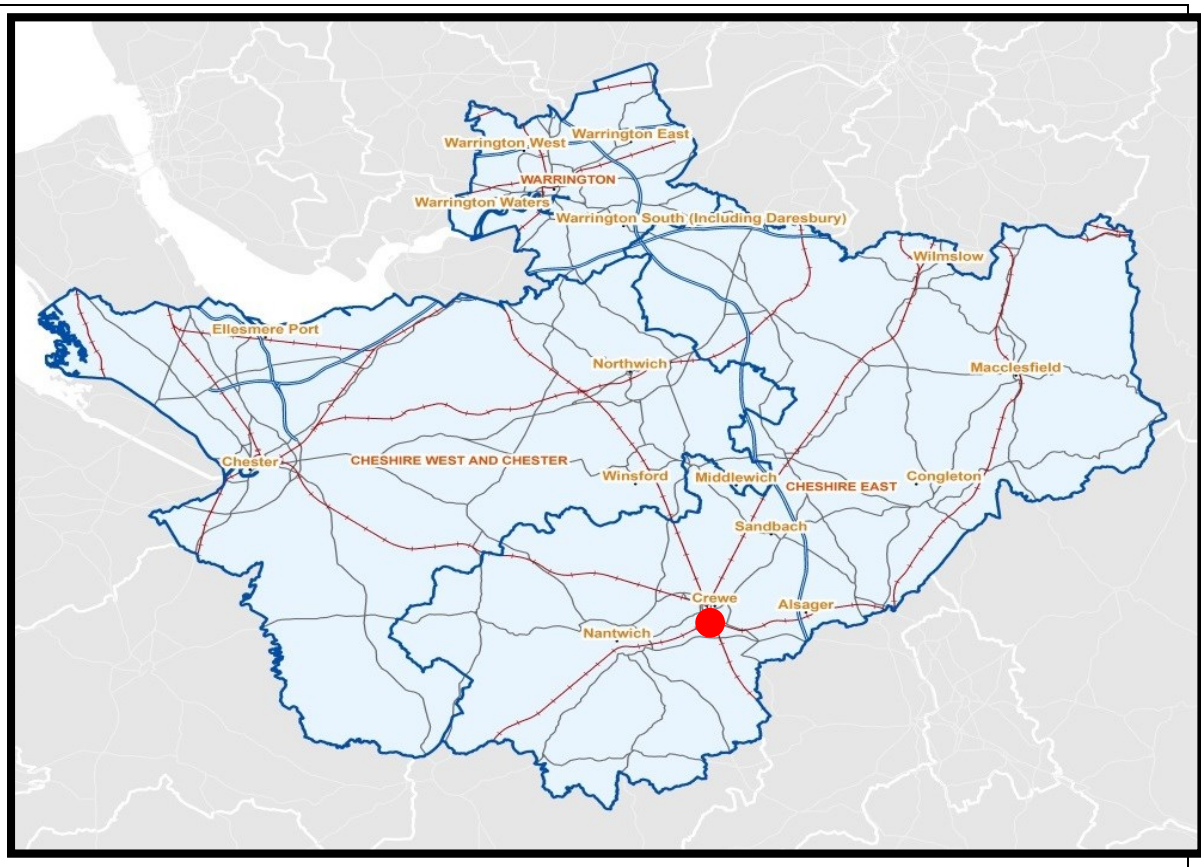


Figure 2.5: Cheshire and Warrington Sub-Region

Cheshire and Warrington Strategic Economic Plan

Vision

The Strategic Economic Plan (SEP) sets out the agenda for transformational growth over the next 10 years in the region. The SEP is guided by an overall vision for the region which is summarised in the table below alongside the benefits the proposed scheme would provide to assist in realising this vision.

Vision	Scheme Benefit
Delivering economic growth consistently above the UK level, achieving GVA per head of 110% of the UK average and an economy of £26.6 billion by 2021 making progress towards re-establishing fully our productivity premium advantage, with GVA per head of at least 115% of the UK average and an economy of around £35 billion by 2030	Scheme will assist in facilitating economic growth in region, providing highway capacity in order to enable future development and employment to come forward in Crewe.
By 2030 to grow our population by 100,000, create 75,000 new jobs and 70,000 new homes	Scheme will directly support the objectives of the NGDZ which looks to create 100,000 new homes and 120,000 new jobs. The scheme will particularly facilitate over 12,000 homes and 12,000 jobs in Crewe and Nantwich

Recognised as a modern, strong, sophisticated and attractive business and residential location, both urban and rural and known increasingly for our innovation, enterprise and skills.	Scheme will improve the attractiveness of the area for business and residential development, removing existing congestion. Scheme will also provide additional highway capacity to improve connectivity between the proposed HS2 hub station and other parts of the Cheshire and Warrington and the Stoke and Staffordshire LEP regions.

The A500 dualling scheme is a constituent part of a more significant solution to deliver improved connectivity across the Cheshire and Warrington area. This is critical to the delivery of the SEP, both in terms of strategic economic benefits associated with journey time savings, but also locally in terms of unlocking and improving the attractiveness of significant development aspirations around Crewe and Nantwich.

SEP Intervention Priorities

The SEP sets out three Intervention Priorities which, by virtue of their spatial scale, economic relevance, profile, and long-term potential offer the prospects for substantial and accelerated growth. The scheme will assist in delivering the following intervention priority of the SEP:

SEP Intervention	Scheme Benefit
Crewe High Growth City : placing Crewe at the heart of HS2 as a superhub central to the countries' major infrastructure network	Scheme will provide additional highway capacity to facilitate growth in Crewe and connect the proposed HS2 station hub to the Strategic Road Network and the wider East Cheshire, Stoke and Staffordshire area.

Crewe: High Growth City now forms part of the Northern Development Gateway Zone (NGDZ) which will play a critical role in delivering the SEP.

As seen previously in Figure 1.2, the scheme will provide a vital increase in highway capacity in the linkages between the HS2 hub and the M6 and is thus key to the Crewe High Growth City / NGDZ intervention. The outputs of the Crewe High Growth City are set out in the SEP as:

"GVA will increase by £379m pa GVA by 2031, 25,000 homes, 10,000 jobs created and 320 ha of additional employment land will be delivered."

SEP Key Challenges

The key challenges facing the realisation of Cheshire and Warrington's Growth Deal aspirations through the SEP are identified below, and have been aligned to the anticipated benefits of the A500 scheme:

Key Growth Deal Challenges	Scheme benefits
Unlocking key growth sites through removal of pinch points or site-specific remediation issues	The proposed scheme will provide additional highway capacity along the A500 corridor which will unlock development sites in Crewe and Nantwich. These sites include the Basford East and West sites which will be situated to adjacent to the proposed HS2 station hub, which the SEP describes as "one of the UK's prime development opportunities over the next 20 years being located at the heart of the UK's economic geography."
Improving connectivity between our LEP area, Liverpool and Manchester City Regions and North Wales in order to increase access to employment opportunities	The delivery of the scheme will provide additional highway capacity between the HS2 hub station at Crewe and the M6 and wider the wider Cheshire East, Stoke and Staffordshire region, providing significant connectivity benefits to surrounding LEP regions.
The ongoing repercussions of the financial crisis on access to finance and scheme viability for some development projects	The scheme will act as a facilitator for 120,000 jobs as part of the NGDZ as well as the growth aspirations of Cheshire East, the Cheshire and Warrington sub-region and the Northern Powerhouse.
Ensuring effective and consistent support locally and sub-regionally to our businesses	The scheme will result in a net discounted GVA of £63,110,216

Key Success Factors

The SEP recognises the quality and growth potential of the Cheshire and Warrington economy, and its spatial positioning as an attractor for inward investment. It identifies its key success factors as follows with the contribution of the proposed scheme also shown:

SEP Success Factors	Scheme Benefit
One of the strongest and best performing economies in England	Unlocks key economic sites, provides additional capacity to spread the future benefits of HS2.
A major economy with a large cohort of world-leading firms	The scheme would support economic growth in Crewe and the NGDZ. The scheme would also directly facilitate the Basford East and West sites adjacent to the HS2 hub station site which are described in the SEP as "one of the UK's prime development opportunities over the next 20 years being located at the heart of the UK's economic geography."
A diversified and internationally-oriented economy	Opens up access to Crewe and the future HS2 station hub
A private sector-led and knowledge-rich economy	Significant levels of employment growth projected in Crewe which will all be supported

	by the scheme.
A connected economy, with long established linkages to Manchester and Liverpool and their city centres	Scheme will enhance connectivity with the M6 J16 and the Highways England Smart Motorway scheme as well as connections to the south of the region.

The SEP recognises the need to support and facilitate growth with the necessary transport infrastructure and unlock development opportunities without compromise to the existing critical functions (strategic and local) of the transport network.

Conclusion

As outlined above it is clear that there is an extremely strong alignment between the Cheshire and Warrington SEP and the delivery of the A500 dualling scheme. The scheme will help realise a substantial number of jobs and houses which will significantly contribute to the overall aim of the SEP to grow the Cheshire and Warrington economy.

2.4 Cross LEP support

If this bid has been endorsed by more than one LEP as an agreed priority over a multi-LEP area please confirm which LEPs (and any other bodies) support this bid and provide any further information on the strategic rationale.

The A500 dualling scheme is fully supported by the Stoke and Staffordshire LEP. A letter of support for the scheme is included in Appendix A.

The Stoke and Staffordshire Strategic Economic Plan sets out the importance of transport links and in particular in capitalising on connections to the HS2 hub station at Crewe. This is set out in the vision and objectives of the LEP which states:

"The LEP will need to maximise the opportunities presented by strategic infrastructure investments, including High Speed 2 phase 2. Currently, the proposed HS2 route may actually supress potential growth in the economy of parts of the LEP area if it is bypassed."

As set out previously, the proposed scheme provides the main route from the proposed HS2 hub station at Crewe to the M6 and the wider Stoke and Staffordshire region. The scheme will thus provide additional highway capacity along this key corridor to eliminate existing congestion on the A500 and connect the Stoke and Staffordshire region to the HS2 network.

3. Economic Case

3.1 Value for money

Please summarise your current understanding of the likely costs and benefits of the scheme and reference any reports on this to date (please provide hyperlinks or attachments). If more than one option please detail the relative costs and benefits of each, if available. In doing so, please make clear the age and source of the underlying data and any assumptions.

Outputs from the Crewe SATURN Model have been used to derive monetised benefits of the scheme using TUBA. These models have previously been built to test interventions in the mid-

Cheshire area and has been revalidated to a Base Year of 2013. The modelling assumptions assume the HS2 Hub Station is in place at Crewe with associated passenger numbers.

The model has since been updated to forecast traffic conditions with Local Plan and committed developments in place for a 2021 Opening Year and a 2036 Future Year; both with and without the scheme.

The monetised scheme benefits from the SATURN models and TUBA assessment have been offset against costs supplied from the initial scheme cost estimate which has been undertaken by a professional Quantity Surveying assessment.

In line with WebTAG guidance for an economic assessment, an initial 44% optimism bias has been applied, and includes provisions for construction, environmental management, preliminaries, traffic management and fees (planning, design, site supervision, etc.)

A cost breakdown is provided below using current prices for 2016:

Cost Item	Cost (£) 2016 Prices
Construction	£20,108,755
Preliminaries	£3,841,752
Traffic Management	£3,192,023
Statutory Undertaker diversions and protections	£6,720,000
Fees	£5,964,291
Optimism Bias (44%)	£16,703,528
Land Costs and Part 1 Claims	£832,000
Total Scheme Costs	£57,362,350

To allow for direct comparison with the monetised benefits, the appraisal costs were discounted and converted to the DfT's standard present value year for appraisal meaning all further costs and benefits in this Economic Case are stated in 2010 prices, discounted to 2010 (unless explicitly stated).

The discounted cost of the scheme has been estimated as £45,115,000.

In terms of monetised benefits, the journey time savings brought about by the scheme have been calculated over a 60 year period from the opening year (2081).

The monetised benefits associated with the scheme are summarised over the page:

Benefits Item		Benefits (£) 2010 Prices
Commuter Travel Benefits	Time Savings	£17,694,000
	Vehicle Operating Cost Savings	-£1,585,000
Business Travel Benefits	Time Savings	£45,022,000
	Vehicle Operating Cost Savings	-£1,331,000
Other Travel Benefits	Time Savings	£21,622,000
	Vehicle Operating Cost Savings	-£2,080,000
Greenhouse Gas Benefits		-£763,000
Indirect Taxation Revenues		£1,754,000
Total Scheme Benefits		**£80,333,000**

The greenhouse gas benefits stated above have only been derived from the TUBA appraisal, not from an Air Quality assessment.

Using these assumptions, the initial economic benefits of the scheme are summarised in the following table.

Benefits Summary	Benefits (£) 2010 Prices
Total Scheme Benefits	£80,333,000
Total Scheme Costs	£45,115,000
Net Present Value	£35,218,000
Benefit to Cost Ratio	**1.781**

The outputs from the TUBA assessment indicate that the scheme will provide medium Value for money at this stage of the appraisal process. As noted previously, the SATURN modelling undertaken has shown that the benefits of the scheme are constrained by the capacity of the A500 / A531 / B5742 roundabout at the western extent. The capacity of this junction would be reviewed as part of the development of the scheme and **it is likely that the scheme benefits will increase above the 1.781 calculated at this stage.**

An initial assessment of the likely wider benefits has also been conducted by estimating the Gross Value Added (GVA) benefits of unlocking jobs in the area and the associated economic benefits that this would bring. The net benefit of these jobs is summarized below, but given that they represent outline estimates, these have not been included within the wider BCR calculations.

Benefits Summary	Undiscounted	Discounted
Benefits in 2021	£141,541	£96,948
Benefits in 2031	£1,725,375	£837,792
Benefits over 60 years	£153,985,558	£63,110,216

It should be noted that the above economic assessment does not include any accident analysis using COBALT or maintenance using QUADRO. It also excludes any detailed analysis of the wider economic benefits associated with the delivery of the scheme.

4. Financial Case

4.1 Cost of producing OBC

Please provide a breakdown of the estimated costs from 2017/18 of producing an Outline Business Case. As a minimum we would expect costs to be broken down into categories such as (but not necessarily restricted to) the following: transport surveys; geotechnical surveys; other surveys; transport modelling; transport appraisal; consultation; preparing business case material; although we would be happy to receive a more detailed breakdown as an Annex. We would also like you to provide us with a short, but clear, description of the work that is planned under each category, cross-referring, if necessary, to the work already detailed at 2.2 and 3.2 above.

Please exclude costs incurred, or planned, up to and including 2016/17 but state these in the table at 4.2 below.

The cost estimate for developing the OBC has been developed and informed by the Council's recent successful progression of schemes of a similar scale and complexity through the business case framework and statutory processes. Therefore it is considered that the costs outlined below can be considered to be robust.

Activity	£m	Commentary
Project Management and framework management costs	0.263	
Environmental surveys	0.291	Summer and winter ecology, agricultural land assessment, NMU, landscape, heritage and noise surveys
Topographical survey	0.020	
Ground investigation	0.150	
Consultations	0.050	Key stakeholder engagement to inform the preferred route, further stakeholder consultation during scheme design, and pre-planning public consultation
Preferred Route validation and PRA	0.014	To validate the findings of the SAR, as described under Section 2.2
Environmental Statement	0.236	
Traffic modelling	0.289	Includes a contribution to a new Crewe wide traffic model to appraise the scheme
Business Case	0.103	

Design	0.374	Design of highways, structures, and environmental mitigation. Includes an allowance for liaising with HE in regard to any proposals to upgrade M6 J16
CEC costs	0.678	
TOTAL	**2.468**	

4.2 Funding requirement

Please break the total of producing the OBC into financial years and indicate how much is being sought from DfT. (Please express in £m to three decimal points)

	2016/17 and before	2017/18	2018/19	2019/20	TOTAL
Funding sought from DfT large local majors fund		£ 1.815	£ 0.153	£ -	£ 1.968
Local funding	£ 0.260	£ 0.500	£ -	£ -	£ 0.760
TOTAL	**£ 0.260**	**£ 2.315**	**£ 0.153**	**£ -**	**£ 2.728**

The total cost from 2017/18 onwards should match the cost quoted in 4.1 above

Please confirm whether or not the funding sought from DfT can be capitalised (you may provide additional comments or qualifications as necessary)?

Yes, project development costs could be capitalised on commencement of on-site works

4.3 Capital cost of scheme

Please provide your best estimate of the capital cost of the scheme (excluding the costs of producing an OBC above).

We recognise that the scope and cost of the scheme may be approximate at this stage, but if possible, please

- provide the cost of each option if more than one. And please express as a range if necessary.
- use outturn prices, but ensure that the current prices and inflation uplift can be separately identified.
- include and separately identify the preparation costs (between OBC and start of construction)
- include a reasonable estimate of risk/contingency but do not add an additional optimism bias uplift (reference webtag guidance if unclear)

The following format would be helpful but is not mandatory.

Currently, the preferred route is to widen to the north, but further work is required to validate the decision (see Scheme Assessment Report in Appendix B). Therefore, the capital cost of widening to the south is also provided below.

Option 1 – Widening to the North					
	Preparation costs (between OBC and construction)	Land purchase and Part 1 Claims	Construction costs	Statutory Undertaker diversions and protections	TOTAL
Base cost	£ 2.033	£ 0.815	£ 28.046	£ 6.720	**£ 37.614**
Risk	£ 0.894	£ 0.122	£ 12.340	£ 2.957	**£ 16.314**
Inflation	£ 0.410	£ 0.087	£ 5.654	£ 1.355	**£ 7.506**
TOTAL	**£ 3.338**	**£ 1.024**	**£ 46.040**	**£ 11.032**	**£ 61.433**

Option 2 – Widening to the South					
	Preparation costs (between OBC and construction)	Land purchase and Part 1 Claims	Construction costs	Statutory Undertaker diversions and protections	TOTAL
Base cost	£ 2.082	£ 0.832	£ 28.877	£ 6.720	**£ 38.511**
Risk	£ 0.916	£ 0.125	£ 12.706	£ 2.957	**£ 16.704**
Inflation	£ 0.420	£ 0.089	£ 5.822	£ 1.355	**£ 7.685**
TOTAL	**£ 3.417**	**£ 1.046**	**£ 47.405**	**£ 11.032**	**£ 62.899**

Construction base costs estimated at Q1 2016, and includes

- *construction of the mainline*
- *construction of the overbridges and side roads (Barthomely Road Option A, and Radway Green Road Option A have been assumed)*
- *one temporary bridge during construction*
- *site supervision and design support, taken at 5% of (the above construction costs + statutory undertaker works + land costs)*

Preparation base costs taken at 6% of (construction costs, excluding fees + statutory undertaker works + land costs)
Risk taken at 44% for preparation, construction and statutory undertaker costs
Risk taken at 15% for land costs
Inflation taken at 14% to Q3 2020 for construction and preparation costs
Inflation taken at 3% per annum for land costs

4.4 Affordability

Is the likely total capital cost of the scheme (as detailed in 4.3 above) below the guideline threshold for your LEP at Annex A	N
Is the scheme in an area that has Devolution Deal/Gainshare funding?	N
Is the scheme on the strategic road or rail network?	N
Is the scheme composed of elements that could be delivered independently of each other over a longer timescale?	N

If you have answered YES to <u>any</u> of the above questions please provide additional explanation of why you feel the scheme is unaffordable other than via a bid to the large majors fund.

Not applicable

5. Management Case

5.1 Outline Business Case delivery

Please provide a timeline for the production of an OBC (a full GANNT chart is not necessary, just the basic milestones and dates) cross-referring if possible to the key tasks mentioned in 4.1 above

September 2016: Completion of Strategic Element of Outline Business Case
October 2016 to November 2017: Ecology surveys
January to December 2017: Traffic modelling
June to November 2017: Scheme Design
December 2017: Environmental Statement complete
December 2017: All elements of Outline Business Case complete

5.2 Outline Business Case Governance

Please set out the basic governance arrangements for production of the OBC, roles, responsibilities, resources etc.

Previous Delivery Expertise

Cheshire East Council has an established project governance structure which is compliant with PRINCE2 guidance and has successfully delivered a number of major schemes including some of those detailed below.

In 2013 the Council was awarded DfT Pinch Point funding for two schemes; Basford West Spine Road and widening of the A500 at Junction 16 of the M6. Both of these schemes were delivered in July 2015.

The Basford West Spine Road was delivered in partnership with the developer of the adjacent employment site and has facilitated the delivery of 370 new homes, which are now being constructed, and over 22ha of employment land. The M6 Junction 16/A500 scheme was delivered along with Highways England as part of a wider improvement to the motorway junction. This scheme has delivered significant benefits to traffic using the A500 by addressing a key bottleneck on the local strategic road network.

In December 2015 Crewe Green Link Road South was opened. This scheme received funding from the DfT as a Local Authority Major scheme in 2011 and completed the strategic link from the A500 to A534. The scheme provides access to existing employment areas to the east of Crewe, including Crewe Business Park, together with opening up the Basford East strategic housing and employment site in the Cheshire East Local Plan Strategy.

Crewe Rail Exchange was opened in May 2014 and was a £7m improvement to Crewe Railway Station. CEC successfully bid for funding from the DfT's Station Commercial Project Facility (SCPF) at the end of 2011; further funding was provided from the DfT's Access for All Fund and the National Stations Infrastructure Programme, with CEC also contributing £500k to the project. The scheme included the demolition of former Royal Mail buildings, the construction of a high quality new entrance building, a 254 space car park and the refurbishment of an existing subway to enable it to be opened up to the public. The project was delivered to programme and within budget.

In November 2010 the Council delivered A34 Alderley Edge and Nether Alderley Bypass. The five kilometre (3 miles) route runs to the west of Alderley Edge, starting at Harden Park roundabout and rejoins the existing A34 to the south of Nether Alderley village. The construction of the Bypass included three road bridges, a rail bridge over the West Coast Mainline, a footbridge, 1km of bentonite slurry wall and a bored pile retaining wall. The works also included construction of a new roundabout and modifications to an existing roundabout.

The scheme was first mooted before the Second World War and received funding from the Department of Transport. Cheshire East Council received £48.224 million from the Government and contributed £3.424 million itself.

Project Governance

The Executive Monitoring Board (EMB) will provide the necessary authority to allow the scheme to progress at a number of key stages in the project lifecycle, with the relevant Executive Members sitting on the Cabinet approval.

The Project Board meets monthly will be chaired by the SRO, **Chris Hindle** (Transport Policy and Strategy Manager), and is responsible for setting the strategic direction of the project in line with the end-user requirements and authority provided by the EMB. The specific remit of the Project Board members is to assist the Senior Responsible Owner (SRO) in decision making and on-going progress of the project. Project Board members include the delivery team, partners from Cheshire West and Chester, representatives of the LEP and key stakeholders.

The SRO will report to the Cheshire East Strategic Highways Programme Board (SHPB), which meets monthly and is responsible for the delivery of CEC's wider infrastructure programme. **Andrew Ross** (Director of Infrastructure and Transportation) leads the SHPB and reports to the Council's Senior Management Team and Management Group.

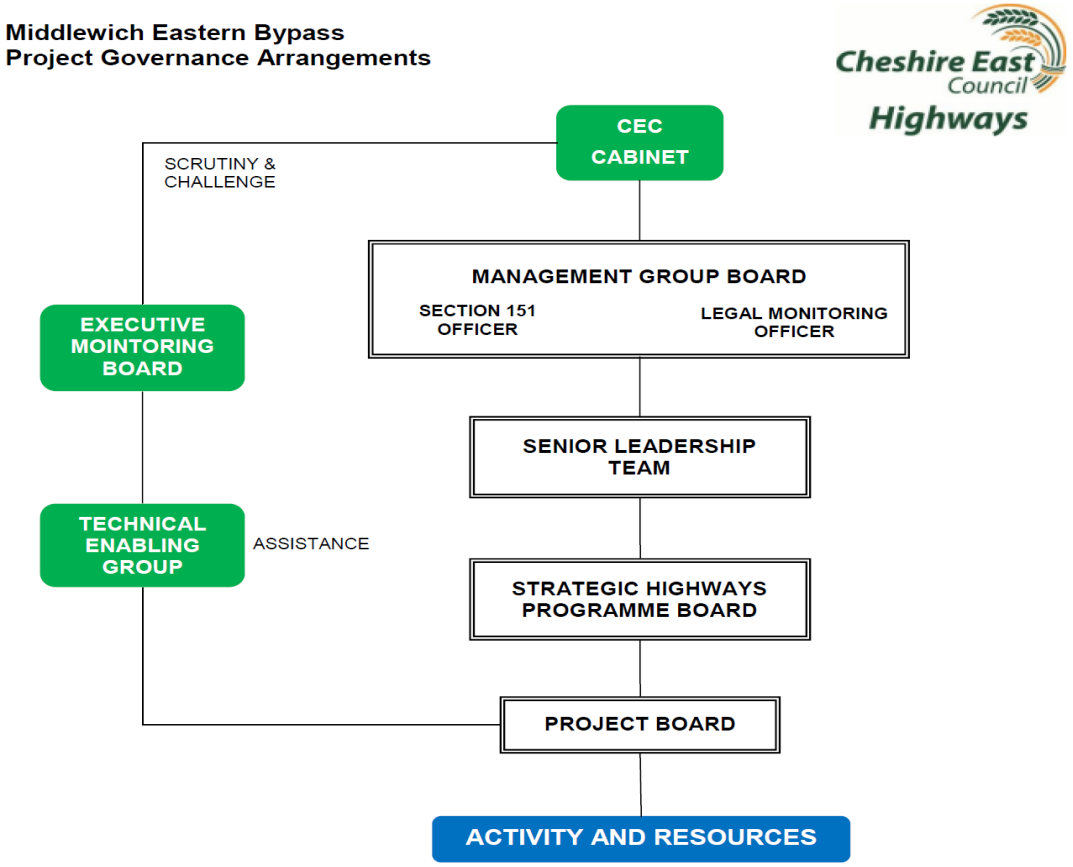
The Core Management Team will be responsible to the Project Board and specifically the Project Director for the consideration and resolution of detailed project issues. The Core Management Team will consist of members capable of making decisions of a technical and, where appropriate, strategic nature. The Core Management Team will be led by **Paul Goodwin**, CEC Project Manager.

The Project Delivery Team will be responsible to the Core Management Team and specifically the Project Director for the delivery of the scheme in all respects. The Project Delivery Team will be led by the Project Manager.

A summary of the key roles and responsibilities is provided in the table below:

Programme Board Director: Andrew Ross – Director of Infrastructure and Transportation	Andrew is responsible for ensuring that the project / programme meetings its objectives, delivers the projected benefits, maintains its business focus and is well managed with clear authority, context and control of risk.
Senior Responsible Owner: Chris Hindle –Transport Policy and Strategy Manager	Richard is responsible for the specification of the needs of all those who will use the final product, for user liaison with the project team and for monitoring to ensure the solution will meet those needs within the constraints of the business case in terms of quality, functionality and ease of use.
Senior Supplier: Brian Thompson – Director of	Brian represents the interests of the team designing, developing, procuring and implementing the scheme. He is

Operations (Jacobs)	accountable for the quality of products delivered by the supply chain and has the authority to commit or acquire the necessary supplier resources.
Project Sponsor: Paul Griffiths – CEC Infrastructure Project Manager	Paul will provide the interface between the project ownership and delivery on the client side. He is the single point of contact with the project team for the day to day management of the scheme.



5.3 Scheme delivery

Please provide an outline timeline for the delivery of the scheme itself (a full GANNT chart is not necessary, just the basic milestones and dates).

The timetable for delivering the proposed scheme is set out below:

September 2016: Stakeholder engagement
October 2016 to November 2017: Ecology surveys
Mar 2017: Preferred Route Announcement
October 2017: Pre-planning consultation
January 2018: Planning submission

April 2018: Publish Orders
December 2018: SoS decision
January 2019: Contractor appointment
April 2019: Construction commences
Spring 2021: Road opens

It should be noted that from the timetable above that the scheme would open in Spring 2021, the approximate time when construction of the HS2 line and hub are likely to commence. If the scheme is not selected for funding from this funding round, it is unlikely that the scheme could be built before construction of the HS2 line needs to commence.

5.4 Stakeholder support
Please provide evidence of support for this scheme prior to the development of this bid, referencing activity from businesses, campaign groups, MPs etc.

It would be helpful to include any relevant links to news stories, campaign websites etc.

The scheme has strong support from a number of key stakeholders. Letters of support are included in Appendix A from the following key stakeholders:

- **Stoke and Staffordshire Local Enterprise Partnership** – neighbouring LEP likely to benefit significantly from the scheme through additional highway capacity to link their region with the future HS2 hub station at Crewe. Stoke and Staffordshire LEP, along with Cheshire and Warrington LEP, are also one of the partners of the NGDZ initiative to deliver 100,000 new homes and 120,000 new jobs by 2040 which the scheme will play an important role in facilitating.
- **High Speed 2 Ltd** – the scheme would provide additional capacity ahead of the construction of the HS2 line and hub station at Crewe and facilitate access to the hub station once complete;
- **Network Rail** –– the scheme will improve access to the future HS2 hub station at Crewe once complete;
- **Housing and Communities Agency** –scheme would facilitate access to future development sites;
- **Highways England** – Junction 16 of the M6 is situated directly to the east of the scheme; and
- **Duchy of Lancaster** – landowner for large areas of the land around the scheme.

6. Optional

6.1 RIS2 funding
Would you like to flag this scheme for potential RIS2 funding if it is close to, and could possibly help the Strategic Road network? Y/N

If Y, please briefly describe, with any evidence, the scheme's potential to help the Strategic Road Network.

Yes, future capacity improvements are likely to be required at Junction 16 of the M6 and should thus be flagged for potential RIS2 funding. It should be noted that the proposed scheme would not prejudice future junction improvements at Junction 16 of the M6 and a letter of support for the scheme has been received by Highways England and is enclosed in Appendix A.

7. Declarations

7.1 Lead LEP officer

I confirm that this bid has the full support of [*name of LEP*] and hereby submit it to DfT on the LEPs behalf for consideration.

Name: Position: Phone: Email:	Signed:

7.2 Section 151 Officer declaration

As Section 151 Officer for [*name of promoting authority*] I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that [*name of authority*]

- has allocated sufficient budget to produce the Outline Business Case on the basis of its proposed funding contribution
- accepts responsibility for meeting any costs of producing an Outline Business Case over and above the DfT contribution requested, including potential cost overruns
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested

Name:	Signed:

Please email this completed form to:
LT.plans@dft.gsi.gov.uk

by **midday 28th July 2016**

Please note that the size limit for attachments to a single incoming email to DfT is 20MB. If your bid is larger than this please submit separate emails, use a zip folder, or convert large files to an alternative format.

Appendix A Letters of Support for Scheme

Andrew Ross
Director of Highways and Transportation
Cheshire East Council
Delamere House,
Delamere Street,
Crewe
CW1 2J

Andrew Went
Development Director Crewe Hub
Network Rail
Square One,
4 Travis Street
Manchester
M1 2NY

26 July 2016

Dear Andrew Ross,

Re: Letter of support for A500 funding

I write to support Cheshire East Council's bid for funding to improve the A500 link to the M6 and access from Crewe Station to the strategic road network.

Network Rail are currently remitted by the DfT to develop options for a Crewe Hub Station to accommodate future market growth and proposed HS2 services. This scheme is as yet uncommitted but has political backing from the local authority and the DfT. Work to date has shown significant potential for growth in passenger numbers at Crewe Station, and initial modelling indicates that a large number of passengers may access the station using the road network (bike, bus or car) which is shown to be congested today. During construction it is likely that there would also be a temporary increase in traffic directly related to the scheme. Consequently, Network Rail is supportive of Cheshire East Council's ambition to improve the A500 link to the M6 and access from Crewe Station to the strategic road network.

Yours sincerely,

Andrew Went
Development Director Crewe Hub

GRIFFITHS, Paul

Subject: FW: A500 DfT Local Major Scheme Funding Bid

From: Peter Molyneux [mailto:Peter.Molyneux@transportforthenorth.com]
Sent: 27 July 2016 10:28
To: SELLORS, Andrew
Cc: ROSS, Andrew; Robin Miller-Stott; Gaynor Kindon; Nigel Foster
Subject: A500 DfT Local Major Scheme Funding Bid

Andrew

Thank you for your email.

Transport for the North would be supportive of your funding bid to develop a strategic outline business case for the A500 dualling scheme between the M6 and the proposed HS2 Hub Station at Crewe. TfN are aware of Cheshire East Council's aspirations and ambitions for growth linked to the delivery of the HS2 Hub Station at Crewe, as well as growth linked to the Local Plan Strategy, which includes the allocation of several development sites in Crewe, including on land adjacent/close to the A500 corridor.

We are aware of the necessity of delivering improvements to the road network including this strategic link, both as a requirement of existing development delivery plans and in the context of Crewe's future expansion. The A500 scheme will also improve connectivity to neighbouring areas within the Northern Gateway Development Zone promoting further growth, including Stoke-on-Trent and Newcastle-under-Lyme.

We would suggest that the scope includes identifying the impacts of your proposed scheme on strategic and key route networks adjacent to the new road. Our understanding is that Highways England's Regional Transport Model and the Department for Transport's Land Use/Transport Interaction Model will be available in the autumn. It would be prudent to run your scheme through these models to identify its impacts.

TfN therefore supports Cheshire East Council's bid for development funding to further develop these proposals. We will continue to be a supportive partner as these plans take shape, and work with the Council and its partners to integrate them with the wider plans for strategic road and rail investment that TFN is developing.

Regards
Peter

Peter Molyneux
Strategic Road Network Director
Transport for the North
2nd Floor, 4 Piccadilly Place, Manchester, M1 3BN
www.transportforthenorth.com

Email: peter.molyneux@transportforthenorth.com

Mobile: 07841781175

highways england

Mr P Griffiths
Cheshire East Council
Infrastructure Delivery Manager
Strategic Highways and Transportation
6th Floor Delamere House
Delamere Street
Crewe
Cheshire
CW1 2LL

Shaun Reynolds
Asset Manager
810
Piccadilly Gate
Store Street
Manchester M1 2WD

Direct Line: 0300 470 5299

20 July 2016

Dear Paul,

Highways England is responsible for the Strategic Road network. This includes Junction 16 of the M6 and the A500 to the East of the Motorway towards Stoke. The A500 towards Crewe was formerly part of the strategic road network before being de-trunked; with responsibility transferring to the Local Authority in 2005.

Highways England and Cheshire East Council have recently jointly delivered a 'Pinch-point' scheme at Junction 16 of the M6 which opened in early 2015. However, whilst this scheme has been successful in meeting its objectives, there are longer term growth aspirations that need to be addressed on the road network.

Part of Highway England's remit is to plan for the future. We do this through our Route Strategies and, with the Department for Transport, look to secure improvement funding through the Roads Investment Strategy process. As part of this process we have actively been looking at what the future requirements are at Junction 16, mindful of the role Crewe plays as a national rail hub; one that can only increase the attractiveness of this corridor should the HS2 links to Crewe be confirmed.

We see the upgrade of the A500 from Junction 16 westbound towards Crewe as an essential component of this strategy and we wish to put on record our support for Cheshire East Council's bid for development funding for this project.

Yours sincerely

Shaun Reynolds
NDD North West Asset Development Team
Email: shaun.reynolds@highways.gsi.gov.uk

Homes &
Communities
Agency

Rt Hon Chris Grayling MP
Secretary of State for Transport
Department for Transport
Great Minster House
33 Horseferry Road
London
SW1P 4DR

27th July 2016

Dear Sir,

Re: A500 Department for Transport Local Major Scheme Funding Bid

HCA is actively engaged in supporting Cheshire East and its partners in the production of a masterplan to maximise the potential which a HS2 Hub Station at Crewe offers and deliver the Local Plan growth ambitions associated with this. These proposals will include the allocation of a number of development sites within Crewe and on land adjacent or close to the A500 corridor.
HCA recognises the importance of delivering improvements to the road network including this strategic link, both as a requirement of existing development delivery plans and in the context of Crewe's future expansion. The A500 scheme being proposed by Cheshire East will improve connectivity to neighbouring areas including Stoke on Trent and Newcastle under Lyme which are important contributors to the Northern Gateway Development Zone growth proposals.
HCA therefore is fully supportive of the council's bid for funding to develop these proposals and will continue to be an active and supportive partner as the plans progress.

Yours faithfully,

D G Inglis

Duncan Inglis MRICS
Head of Area Cheshire and Warrington

Homes and Communities Agency
Arpley House, 110 Birchwood Boulevard, Birchwood, Warrington, WA3 4DJ

0300 1234 500
homesandcommunities.co.uk

Duncan Inglis
Duncan.Inglis@hca.gsi.gov.uk
01925644627

DUCHY of LANCASTER
1 Lancaster Place, Strand, London WC2E 7ED

Ref: CBS/af

26TH July 2016.

TO WHOM IT MAY CONCERN

Dear Sirs,

The Duchy of Lancaster is one of the largest land owners in South Cheshire and we control the majority of the land required to widen and improve the A500.

We have been actively engaged in the formation of the Council's submitted Local Plan which has led to the allocation of several development sites in Crewe, including our proposed 'South Cheshire Growth Village' delivering around 650 new homes on land adjacent/ close to the A500 corridor.

We are aware of the necessity of delivering improvements to this important link, both as a requirement of our own development plans and in the context of Crewe's future expansion.

The Duchy therefore fully supports Cheshire East Council's bid for development funding to further develop these proposals and seeks to be an active and supportive partner as these plans take shape.

Yours faithfully,

pp

Christopher B Sparrow BSc (Hons) MRICS
Head of Rural

Telephone 020 7269 1700 Fax 020 7269 1710

Email csparrow@duchyoflancaster.co.uk

Website www.duchyoflancaster.co.uk

Stoke-on-Trent & Staffordshire Enterprise Partnership

Paul Griffiths
Infrastructure Delivery Manager
Strategic Highways and Transportation
Cheshire East Council

28th July 2016

Dear Paul,

A500 Dualling

I am pleased to confirm the support of the Stoke-on-Trent and Staffordshire Local Enterprise Partnership for the dualling of the A500 to the west of Junction 16 of the M6 and your application for development funding.

We are working with yourselves, Cheshire and Warrington LEP and others to develop the Northern Gateway Development Zone as a means of maximising the benefits of HS2. The A500 forms a key part of this areas infrastructure linking employment sites to the M6 and A50. This section of single carriageway is a major constraint on the route and connection between the Crewe and the north of Staffordshire and Stoke-on-Trent. Developing an improvement will no doubt contribute to our efforts to maximise the benefit of the NGDZ.

Yours sincerely

Peter Davenport
Partnership Manager - Stoke-on-Trent & Staffordshire Local Enterprise Partnership

1st Floor, Broad Eye Building, Earl Street, Stafford, ST16 2QR
t: +44(0) 1785 719000 **e**: contactus@stokestaffslep.org.uk **www.stokestaffslep.org.uk**

LCR

4th floor, One Kemble Street London WC2B 4AN
t. +44 (0)20 7391 4300
f. +44 (0)20 7391 4401
w. www.lcrhq.co.uk

27 July 2016

Rt. Hon. Chris Grayling, Secretary of State for Transport
Department for Transport
Great Minster House
33 Horseferry Road
London
SW1P 4DR

Dear Mr Grayling

London & Continental Railways Ltd, (LCR), working through its HS2 Growth Partnership with HS2 Ltd., is supporting HS2 Places in the preparation and delivery of their HS2 Growth Strategies, with particular reference to HS2 station-led development and regeneration. In this capacity, we have been actively engaged in the ongoing masterplanning of Cheshire East Council's aspirations and ambitions for growth linked to the delivery of the HS2 Hub Station at Crewe, as well as growth linked to the Local Plan Strategy, which includes the allocation of several development sites in Crewe, including on land adjacent/close to the A500 corridor.

We are aware of the necessity of delivering improvements to the road network including this strategic link, both as a requirement of existing development delivery plans and in the context of Crewe's future expansion. The A500 scheme will also improve connectivity to neighbouring areas within the Northern Gateway Development Zone promoting further growth, including Stoke-on-Trent and Newcastle-under-Lyme.

We are aware of Cheshire East Council's bid for development funding to further develop these proposals, and would like to confirm that in our view the proposals will support the realisation of the growth benefits from the Government's investment in HS2.

Yours faithfully

David Joy
Chief Executive

Appendix B – Development Support by Scheme

Ref	Settlement	Site	Homes	Jobs	Local Plan Strategic Site	Committted Development
CS 1	Crewe	Basford East	850	2,071	✓	
CS 2	Crewe	Basford West	370	2,581	✓	
CS 4	Crewe	Crewe Green	150	-	✓	
CS37	Crewe	South Cheshire Growth Village	650	-	✓	
SL1	Crewe	Central Crewe	53	68	✓	
CS3	Crewe	Leighton West, Crewe	850	-	✓	
CS38	Crewe	Leighton, Crewe	500	-	✓	
CS5	Crewe	Sydney Road, Crewe	525	-	✓	
CS39	Crewe	Broughton Road	825	-	✓	
11/1 643N	Crewe	Coppenhall East	650	-		■
11/1 879N	Crewe	Land North of Parkers Road	400	-		■
12/0 831N	Crewe	Maw Green Farm	165	-		■
13/2 055N	Crewe	138, Sydney Road & Land to the North East of Sydney Road	240	-		✓
13/4 132N	Crewe	Land at and adjacent to White Moss Quarry	350	-		✓
13/5 085N	Crewe	Waldrow View, Broughton Road	124	-		✓
E02	Crewe	Land adjoining the Crewe Green Link Road	265	-		
E11	Crewe	East of Quakers Coppice	217	-		
E17	Crewe	Plot 1 Electra Way	223	-		
E30	Crewe	Plot 1a Electra Way	173	-		
E33	Crewe	Crewe Business Park	774	-		
E40	Crewe	Gallaher Group PLC (Crewe 3 Warehouse) Weston Road	67	-		
E46	Crewe	Orion Park, East of Quakers Coppice	88	-		
E50	Crewe	Land on the Corner of Gateway and Quakers Coppice, Gateway	79	-		
E54	Crewe	Meadow Bridge, Crewe Gateway, Land Near Beswick Drive	51	-		
H10	Crewe	Dunwoody Way/Richard Moon Street	-	79		
H20	Crewe	South Cheshire College, Dane Bank Avenue	-	91		
H21	Crewe	Off Rose Terrace	-	74		

H33	Crewe	South Crewe/Rope	-	180		
H38	Crewe	Crewe Green	-	150		
H43	Crewe	South Cheshire Growth Village	-	650		
H45	Crewe	Sydney Road and Land to the North East of Sydney Road	-	525		
H46	Crewe	Bombardier Site	-	119		
CS6	Shavington	The Shavington / Wybunbury Triangle	400	-	✓	
CS7	Shavington	East Shavington	275	-	✓	
CS21	Nantwich	Kingsley Fields	1,100	-	✓	
CS23	Nantwich	Snow Hill	24	-	✓	
11/4549N	Shavington	Rope Lane	80	-		✓
14/3267N	Shavington	Land East of Rope Lane	53	-		✓
CS13	Alsager	Former Manchester Metropolitan University (MMU) Campus	400	-	✓	
CS14	Alsager	Radway Green Brownfield, Alsager	169	1,395	✓	
CS15	Alsager	Radway Green Extension, Alsager	-	3,488	✓	
CS 43	Alsager	Radway Green North, Alsager	-	-	✓	
12/0893C	Alsager	Land south of Crewe Road	65	-		✓
12/1670C	Alsager	Land North of MMU Campus	30	-		✓
12/4146C	Alsager	Land at Sunnyside Farm	95	-		✓
13/3032C	Alsager	Land at Rhodes Field	110	-		✓
13/5045C	Alsager	Land adjacent to Heath End Farm	30	-		✓
14/5114C	Alsager	Land at Close Lane	74	-		✓
site 7	Alsager	Land south of Crewe Road	-	65		
site 8	Alsager	Land off Hall Drive	-	109		
Site 10	Alsager	Cardway Site	-	550		
12/4654N	Nantwich	Malbank Waters	270	-		✓
14/5841N	Nantwich	Queen's Drive, Phase 2	118	-		✓
14/2155N	Nantwich	Stapeley Water Gardens: Phase 2	250	-		✓
12/1	Nantwich	Stapeley Water Gardens	146	-		✓

381N						
Ref 2974	Nantwich	Land at COG Training and Conference Centre, Crewe Road	-	59		
14/1 326N	Wistaston	Land to the north of Wistaston Green Road	150	-		✓
Total			**12,478**	**12,254**		

Appendix C - Scheme Assessment Report

Cheshire East Council
Highways

A500, M6 to A5020

Scheme Assessment Report

Revision 1

March 2017

Cheshire East Council
Highways

A500, M6 to A5020

Project No:	B1832076
Document Title:	Scheme Assessment Report
Document No.:	B1832076-OD-01
Revision:	R1
Date:	March 2017
Client name:	Cheshire East Council
Project manager:	Dan Teasdale
Author:	Emily Lachlan / Javier Horas
File name:	B1832076-OD-01 – Scheme Assessment Report

Jacobs U.K. Limited

Document history and status

Rev	Date	Description	By	Review	Approved
R0	01/04/16	Draft Issue	K. Huxley	D. Teasdale	S. Kar
R1	31/03/17	Updated following consultations	E. Lachlan	J. Horas	D. Teasdale

Cheshire East Council
Highways

Contents

Cheshire East Council
Highways

1 Introduction

1.1 Scheme Description

'A500, M6 to A5020' ("the scheme") is a proposed upgrade of the existing 3.3km single lane carriageway road, between M6 Junction 16 and the A5020 roundabout, to a dual carriageway. The scheme is to the southeast of Crewe and is one of two main routes from the town to the M6 motorway. The scheme is currently being developed by Cheshire East Council (CEC), and is considered to be an integral part of the Local Plan.

1.2 Context for the scheme

Crewe and Nantwich are settlements within Cheshire East and have over 45,664 households and a population of over 84,000. They are situated approximately 30 miles south of Manchester, and 48 miles north of Birmingham. Crewe is the largest town in Cheshire East, and is a major employment centre with a diversified base in education, manufacturing, services and distribution. It is also the primary shopping centre in the south of the Borough.

Crewe and Nantwich are the closest large towns to the scheme, and the A500 is one of two main routes to the motorway network (the other being the A534 which travels to the northeast of Crewe to meet M6 Junction 17).

The A500 begins at Nantwich as a dual carriageway, then travels eastwards, passing to the south of Crewe, until its junction with the A5020 to the southeast of Crewe. It then continues as a single carriageway road to M6 Junction 16 – this is the section of road included in the scheme. To the east of the M6, the A500 continues as a dual carriageway towards Stoke and 'the potteries'.

1.3 Statement of Problem and Objectives

Cheshire East Council have aspirations for the development of Crewe, and the existing single carriageway section of the A500 is considered to be a barrier to realising the full potential of that development.

'All Change for Crewe: High Growth City', published by CEC in September 2013, states that;

- "New strategic highways investment corridors will be created within Cheshire East. Firstly, linking the planned SEMMMS relief road in the north via Macclesfield and Congleton to the M6 at J17 and then on to Crewe. Secondly, developing plans with the Highways Agency for the A500 corridor to become an "Expressway" between Crewe and the Potteries. These corridors will act as the catalyst for growth for both existing businesses and new areas for development and growth, all of which will be linked into the expansion and connectivity benefits provided at Crewe as part of the wider High Growth City concept."

- A500 widening will facilitate growth, and create the right conditions for future growth and development.

The Cheshire East Local Plan had a second public examination in September / October 2016, and modifications are currently out for consultation. The aim is for it to be adopted by Summer 2017. It states that;

- "This Plan is strongly underpinned by a need to improve transport connections across the Borough. New projects are planned in all towns as part of the Plan, to address congestion issues. These include the Congleton Link Road, South Macclesfield Link Road, and improvements on the A51, A530 and A500 Barthomley Link."

- The Local Plan includes the following development sites in the vicinity of the scheme;

    - Basford East and Basford West.
    - South Cheshire Growth Village.
    - White Moss Quarry, at Alsager
    - Radway Green Extension, at Alsager

- The Local Plan says of the development site at Basford East; "The delivery of the employment elements of the site, as well as the contributions that it will make towards infrastructure improvements, including the A500, Crewe Green Link Road, Junction 16 of the M6 and the spine road, are considered to be of vital importance to the delivery of 'All Change for Crewe'".

The Infrastructure Delivery Plan, which covers the period from 2014 to 2030 and is included in the Local Plan submission, states that;

- "There is a need to improve traffic flow at Junction 16 of the M6 and link capacity on the A500 Barthomley Link."

The schemes objectives are as follows;

- To support the economic, physical and social regeneration of Crewe and the Northern Gateway
- Improve journey time and reliability
- Improve the reliability of public transport
- Improve connectivity between important economic centres, LEP and local authority areas, regions and to North Wales
- Support delivery of key national infrastructure, i.e. HS2 and the Crewe Hub Station
- Support delivery of key employment and housing allocations
- Boost business integration and productivity; improve the efficiency and reliability of the highway network, reduce the conflict between the local and strategic traffic, and provide an improved route for freight and business travel
- Facilitate future improvements to M6 J16

1.4 Background to Scheme

The A500 between M6 J16 and the A5020 was constructed in the mid-1980's, but developments in eastern Crewe and the construction of the A500 Hough Shavington Bypass immediately to the west (opened to traffic in 2003) have generated a significant increase in traffic flows, causing congestion. The proposed developments required to deliver 'All Change for Crewe' and included in the Local Plan will generate more traffic, and exacerbate problems on the link.

A study was undertaken in 2014 'A500 Dualling and Widening – Preliminary Cost Study Report', which considered three design options and provided a cost estimate for each. The design options were to add a new carriageway to the north to create a dual carriageway; to add a new carriageway to the south to create a new dual carriageway, and; to add a third lane to the existing single carriageway. The cost estimates found that the two options to create a dual carriageway had a similar cost, and the option to create a three lane single carriageway had a cost of approximately 60% of the dual carriageway options.

1.5 Purpose of Report

This Scheme Assessment Report has been based upon the Design Manual for Roads and Bridges, TD 37/93 – Scheme Assessment Reporting. The guidance describes the different stages of scheme assessment and how these should be reported.

The purpose of a Scheme Assessment Report is to provide an assessment of the engineering, environmental and traffic advantages, disadvantages and constraints of a proposed scheme.

This report is nominally based on a Stage 2 Scheme Assessment Report, and will recommend a preferred route, but will also cover the requirements of a Stage 1 report. However, it will not provide all of the details normally included at this stage.

The reason for this is because of the nature of the scheme. There is already an existing single carriageway along the A500, and the proposal is to widen to a dual carriageway. The options are therefore limited to three; widening to the north, widening to the south and; a hybrid option that alternates between widening to the north and south. All options will use the existing carriageway and will tie into the existing junctions. The options are therefore already well defined, and in terms of engineering can proceed straight to a Stage 2 level assessment.

Constraints are identified in this report, as required by a Stage 1 scheme assessment. Generally they have not influenced the broadly defined improvement options, because of the limitations on what can be provided. But they have resulted in the hybrid option being included, which attempts to avoid the majority of constraints.

In terms of environment, the level of assessment is equivalent to Stage 2, but it is less detailed than what would normally be provided at this stage. The level of assessment is considered to be appropriate, and will identify the main factors that will influence the choice between the options.

A traffic and economic assessment has not been undertaken, which would normally be done at Stages 1 and 2. This is because the options that are being considered are very similar, and their performance in traffic and economic terms would not help to differentiate between the options. The scheme will also help to realise wider economic benefits, and not just the immediate benefits of improved traffic flows, which will be set out in the business case.

2 Existing Conditions and Constraints

2.1 Introduction

This section summarises the existing engineering and environmental conditions, within the 'A500, M6 to A5020' study area.

2.2 Study Area

Existing engineering conditions have been identified within a study area that includes the existing A500 between the A5020 and M6, and the immediate surrounding area.

Existing environmental conditions have been typically identified within an area 500m offset from the existing A500, but in some cases up to 2km from the proposed scheme. See report no. 'B1832076/OD/04 – Route Options Environmental Assessment Report for further details.

2.3 Constraints Map

A review of the study area has been undertaken to identify potential constraints to the proposed route. The existing Highways, Environmental, Geotechnical and Contaminated Land Constraints have been identified and the most important features are shown on the Constraints Plan on B1832076_P_1017 in Appendix A.

2.4 Existing Conditions and Constraints: Engineering

The following section presents a high level overview of the primary engineering conditions and constraints.

2.4.1 Existing A500

Within the study area, the existing A500 is a single carriageway road, with a 3.65m wide lane in each direction. There are 1.0m hard-strips and approximately 2.5m wide verges on each side. At its western end it ties into a roundabout junction with the A5020 and A531, and then proceeds in an easterly direction. The road has a slight fall downhill eastwards, away from the roundabout.

Travelling eastwards from the junction, there are private accesses to fields on each side of the road after approximately 175m, and after a further 350m there is a layby on the northern side. Continuing 90m there are more private accesses to fields on either side of the road, and after a further 80m the road passes over Englesea Underpass and Englesea Brook Culvert. Both are box culverts, with the underpass at a higher level, used for agricultural purposes. Approximately 150m east of the culverts is a layby on the southern side of the road. There is also a low point in the road's vertical alignment at this location, following which the road begins to rise slowly upwards. This section of road from the junction is initially in cut but the majority is in fill.

The road continues to rise slowly upwards until approximately 1.1km east of the roundabout junction, where it begins to rise more steeply and enters a section of cut up to 14m deep. After a further 300m the road crosses Barthomley Brook, which is a culverted watercourse. The road continues to rise in cut, and then passes under Barthomley Road Underbridge approximately 1.6km from the western roundabout, and where there are properties 70m to the north (Orchard Cottage and Jasmine Cottage) and 60m to the south along Barthomley Road (Cyprus Cottage, Yew Tree Cottage and Poppy Cottage).

The road then begins to bend round to the right, and continues to do so over the following kilometre, where it remains in shallow cutting throughout with typical depths of 2m deep. There is also a property 50m north of the road (The Alms House) at Smithy Lane. The road rises less steeply to the east of the Barthomley Road Bridge, but does continue to rise all the way to M6 J16. There are private accesses to fields on either side of the road approximately 400m east of Barthomley Road Bridge.

Approximately 1.1km after Barthomley Road Overbridge, the A500 passes under Radway Green Road Overbridge. Immediately to the west of Radway Green Road Overbridge, Bluemire Farm is adjacent to the southern boundary of the A500 and is the closest property to the scheme.

The road then continues in cut up to M6 Junction 16, where recent improvements have been made to the A500 as part of Department for Transport's Pinch Point programme.

2.4.2 Pinch Point Scheme

The Pinch Point scheme was completed in 2015 with the purpose of improving the capacity of the A500 on the approach to M6 J16. The scheme commenced to the east of Radway Green Road Overbridge, and widened the carriageway to create two eastbound lanes on the approach to M6 Junction 16. It then widens out to three eastbound lanes approximately 80m before the junction give way line. The scheme also included the installation of new traffic signals at the junction.

In order to achieve the widened layout within the existing highway boundary, two retaining walls were constructed as part of the Pinch Point scheme. The first is on the northern side of the road starts approximately 45m east of Radway Green Overbridge, and is 220m long. The second is on the southern side of the road starts 240m west of M6 Junction 16, and continues westwards for 75m.

In total, the A500 is 3.3km long between the A5020 and M6 Junction 16.

2.4.3 Topography and Land Use

The land within the study area consists of the existing A500, including its embankment and cutting slopes and land to the north and south. The existing A500 is described in the section above, and this section describes the land to the north and south.

The land use is predominantly agricultural with areas of woodland, the local road network, a commercial development and residential properties.

At the western end of the study area the ground level lies at approximately 65m AOD and is gently undulating, falling towards Englesea Brook. The land use in this area is predominantly agricultural grassland, interspersed with hedgerows, ditches and the brook. There is an area of woodland immediately to the north of the A5020 roundabout, and approximately 280m east of the brook there is an area of woodland to the north and south of the A500.

To the east of the area of woodland are the most significant natural features along the scheme. Firstly there is a pond, known locally as the duckaries, which lies to the north of the A500. Secondly is a ridgeline that rises from a level of 60m AOD at the pond, up to a level of 80m AOD, and then back down to a level of 70m AOD at Barthomley Brook. This results in cuttings on the existing A500 up to a depth of approximately 14m. The land use in this area is predominantly agricultural grassland, interspersed with trees and hedgerows. The pond and its surroundings are located to the north of the A500, and; Barthomley Brook and its surrounding banks are on both sides of the A500.

To the immediate east of Barthomley Brook the land rises relatively steeply to approximately 80m AOD, and from then continues to gently undulate all the way to M6 Junction 16 at the eastern end of the A500, rising to a level of 92m AOD. The land use in this section is mainly agricultural grassland interspersed with hedgerows and trees. The existing road network is also crossed at Barthomley Road and Radway Green Road, and Smithy Lane lies immediately to the north of the A500. All three roads have adjacent properties, with Blue Mire Farm adjacent to Radway Green Road being the closest property to the route; The Alms House adjacent to Smithy Land, and; Jasmine Cottage, Orchard Cottage, Cyprus Cottage, Yew Tree Cottage and Poppy Cottage all adjacent to Barthomley Road. There is also an existing commercial development to the northwest of M6 Junction 16, which includes a petrol station, hotel and restaurant.

2.4.4 Geology, Made Ground and Soils

The following section is a summary, and further information can be found in report no. 'B1832076/OD/06 – Preliminary Sources Study Report'.

Geology

The geological profile for the A500 shows that the site is dominated by superficial deposits, mostly glacial till and glacio-fluvial deposits underlain by the Wilkesley Halite member and the Wych / Byley Mudstone Formation.

Superficial Geology

The route is underlain by recent localised peat and alluvium deposits above the Devensian deposits of lacustrine clay, glacio-fluvial sands and gravels above the glacial till. Lacustrine (laminated lake) deposits are present in the western part of the site in the vicinity of Englesea Brook. Glacio-fluvial deposits consist of sands, sand and gravel and occasional clay layers. Glacial till underlies the whole site and is present at the surface in the central and eastern parts of the route.

Areas of peat are located underneath the existing embankment and west of the pond near Monneley Farm to the north west of the scheme. Borehole data describes the peat as being black to dark brown and fibrous with occasional pieces of wood. Lacustrine deposits (clay and silt) are also found in the west of the study area. A thin strip of alluvium (clay, silt, sand and gravel) is marked in the vicinity of the north-west trending brook on the western side of the scheme.

Bedrock Geology

Previous records show that boreholes have been drilled close to the A500, and that they didn't encounter any bedrock. Exploratory boreholes drilled by Cheshire County Council extended up to 25m below ground level and did not encounter bedrock, and an archive BGS borehole SJ75SE298 located at the junction of the A500 and M6 was drilled to 59mbgl and did not encounter bedrock.

Although unproven, bedrock is expected at significant depth (at least 40m). The Mercia Mudstone Group is below the glacial deposits in the western side of the site, and consists of the Wilkesley Halite Member, composed of halite interbedded with red-brown mudstone. This unit is composed of approximately 25% mudstone and 75% halite.

The 1:10,000 scale geological map indicates the presence of subsidence features in the western part of the site, which may be associated with ground collapse due to brine subsidence. The pond located to the north of the A500 near to Monneley Farm, known as the duckaries, is described on the map as a subsidence crater. Directly to the southwest of this pond, linear subsidence features are shown to extend beneath the A500 and further to the south west, which are shown as ditches at ground level. The location of the subsidence features indicated by the 1:10,000 scale geological map are shown on the Constraints Plan on B1832076_P_1017 in Appendix A.

The east end of the study area is underlain by the Wych/Byley mudstones of the Mercia Mudstone Group, comprising of red-brown mudstone and siltstone which is mostly structureless. Nodules of gypsum and anhydrite are present throughout this unit.

Made Ground

The A500 crosses a number of pre-existing roads, and therefore Made Ground will be encountered at these locations. BGS mapping shows an area of Made Ground in the vicinity of the northern slip road of the M6, but this is outside the scheme area and it is not expected that the proposed works will disturb this.

Historical mapping and Groundsure data indicate there have been numerous ponds and pits in the study area. Many of these are not shown on current mapping and aerial imagery, and therefore Made Ground may be present as infilled material.

There is also evidence of historical landfills in the vicinity of the A500. These are shown on the Constraints Plan on B1832076_P_1017 in Appendix A.

Soils

The top soils present in the A500 and surrounding area are Clifton and Salwick soils which are described as stagnogleyic soils, Altcar soil which is 'an earthy fibrous peat soil' and the Newport soil composed of 'typical brown calcareous earths'.

2.4.5 Hydrology and Hydrogeology

Hydrology

There are three main brooks which intersect the A500: Englesea Brook, Barthomley Brook, and an un-named watercourse between the A5020 roundabout and Englesea Brook. They all flow from north to south and have localised alluvium deposits around

them. There are a number of drains in the surrounding area that feed into Englesea Brook, and it is likely these were installed as an attempt to control and dewater the surrounding land. The two brooks meet at a confluence to the north west of Old Park Road, approximately 1.75 km north-west of where Englesea Brook passes under the A500.

According to the Environment Agency Flood Risk for Planning Map three areas along the length of the A500 are at high risk of flooding. These are linked to the location of Englesea Brook.

An active abstraction point is located adjacent to Barthomley Brook and is downstream of the A500.

Hydrogeology

Definitive groundwater levels have not been defined in previous ground investigations of the site. The Glacio-fluvial deposits which underlie most of the route are classified as a Secondary A Aquifer.

The Glacial Till in the vicinity of the A500 is classified as Unproductive Deposits, as the permeability is too low for the deposits to have a significant effect on river flow or water supply. It is likely that the Glacial Till will contain water bearing granular beds that may be discrete or continuous. It is also possible that perched water may exist within the granular Glacio-fluvial deposits overlying the Glacial Till.

There are three areas of the scheme which are classified by the Environment Agency as having soils with a High Leaching Potential (Minor Aquifer). The locations of these are linked to the presence of Glacio-fluvial material.

The entire study area falls within a Nitrate Vulnerable Zone.

2.4.6 Structures

The highway structures that have been identified as being affected by the scheme are as follows:

Table 2.1 - Structures

Structure	Approximate Chainage	OS Grid Reference	Description
Un-named Watercourse Culvert	270	374740 352462	Culvert
Englesea Brook Underpass	700	375144 352579	Reinforced concrete box underpass
Englesea Brook Culvert	700	375151 352581	Reinforced concrete box culvert
Barthomley Brook Culvert	1395	375800 352825	Reinforced concrete box culvert
Barthomley Road Bridge	1630	376012 352901	3 span concrete bridge
Radway Green Road Bridge	2690	377014 352665	3 span concrete bridge
Retaining Wall 1	2840	377150 352589	Brick faced retaining wall

Structure	Approximate Chainage	OS Grid Reference	Description
Retaining Wall 2	3140	377400 352429	Brick faced retaining wall

Un-named Watercourse Culvert

This culvert carries the A500 over an un-named watercourse, half way between the A5020 roundabout and Englesea Brook. No information is currently known about the culvert, and although it is named here as a structure, it may be that is classified as non-structural if its internal diameter is less than 900mm.

Englesea Brook Underpass

Englesea Brook Underpass is a farm accommodation underpass carrying the A500 over a farm access track. It is an in situ reinforced concrete box structure with an internal span of 4.0m and an internal height of 3.3m. The underpass is aligned square to the A500. The fill above the underpass, to the level of the highway, is approximately 0.5m. The reinforced concrete wingwalls have been provided with vertical feature grooves; they abut with the wingwalls of Englesea Brook Culvert to the east of the underpass and extend to the top of a 1 in 2 side slope to the west of the underpass.

Englesea Brook Culvert

Englesea Brook Culvert carries the A500 over Englesea Brook. It is an in situ reinforced concrete box structure with an internal span of 4.0m and an internal height of 4.0m. The culvert is aligned square to the A500. The fill above the culvert, to the level of the highway, is approximately 1.75m. The reinforced concrete wingwalls have been provided with vertical feature grooves; they abut with the wingwalls of Englesea Brook Underpass to the west of the culvert and extend to the top of a 1 in 2 side slope to the east of the culvert.

Barthomley Brook Culvert

Barthomley Brook Culvert carries the A500 over Barthomley Brook. It is an in situ reinforced concrete box structure with an internal span of 2.0m and an internal height of 2.0m. The culvert is aligned square to the A500. The fill above the culvert, to the level of the highway, is approximately 0.6m. There is no head wall to the culvert. The wingwalls are splayed at 45°; they are constructed from reinforced concrete and have been provided with a plain finish. On the northern, upstream entrance of the culvert a barrier has been constructed from scaffold poles and timbers, it is presumed that the barrier is intended to deter farm stock from entering the culvert. Also at the entrance and exit to the culvert 600mm diameter pipes running parallel with the A500 discharge water into the brook from the east. Immediately to the west of the culvert is a 600mm diameter pipe running parallel with the culvert beneath the highway, it is presumed that this is a mammal tunnel.

Barthomley Road Bridge

Barthomley Road Bridge is a three span (14.4m:18.0m:14.4m) bridge carrying Barthomley Road over the A500. The deck is constructed from pre-stressed, precast concrete inverted T beams with a reinforced concrete infill. Each span is simply supported. The substructure comprises two reinforced concrete leaf piers on

reinforced concrete spread footings and reinforced concrete bankseat abutments on spread footings. The reinforced concrete wingwalls are relatively short and cantilever from the bankseats.

At the site of the bridge Barthomley Road is straight and crosses the A500 at askew of approximately 14°. The A500 is in cut leading to the bridge being accessed by shallow approach embankments. At the end of the northern approach embankment residential properties are located on both sides of the highway. At the end of the southern approach embankment residential properties are located on western side of Barthomley Road only.

The cut slopes of the A500 at the site of the bridge are covered with semi-mature trees.

Radway Green Road Bridge

Radway Green Road Bridge is a three span (12.35m:13.1m:12.35m) bridge carrying Radway Green Road over the A500. The deck is constructed from pre-stressed, precast concrete inverted T beams with a reinforced concrete infill. Each span is simply supported. The substructure comprises two reinforced concrete leaf piers on reinforced concrete spread footings and reinforced concrete bankseat abutments on spread footings. The reinforced concrete wingwalls are relatively short and cantilever from the bankseats.

At the site of the bridge Radway Green Road is on a horizontal curve. The precast beams of the deck are straight but the skew of each deck has been adjusted to accommodate the curve and minimise the bridge deck width, the skew of the deck varies between approximately 0° and 11°. The A500 is in a shallow cut leading to the bridge being accessed by approach embankments. There are no residential properties immediately to the north of the bridge but to the south, on the west side of Radway Green Road there is a small development of residential and commercial properties.

The cut slopes of the A500 at the site of the bridge are covered with semi-mature trees.

Retaining Wall 1

Retaining Wall 1 is a recently constructed wall retaining the northern cutting slope of the A500. It is located some 45m to the east of Radway Green Road Bridge and extends for approximately 220m. The retained height is zero at either end rising to 2½m. The wall is brick faced with a concrete coping. A timber post and four rail fence has been positioned behind the wall.

Retaining Wall 2

Retaining Wall 2 is a recently constructed wall retaining the southern cutting slope of the A500. It is located to the west of Junction 16 of the M6 Motorway and extends for approximately 75m. The retained height is 1.8m. The wall is brick faced with a concrete coping.

2.4.7 Public Utilities

Gattica Associates Ltd have been appointed to identify services within the scheme study area.

A number of Statutory Undertakers were contacted in relation to potential underground or overhead services. For the full list that were contacted see Gattica's full report 'Feasibility Report (Utilities) A500 Road Widening Scheme' and accompanying plans. To date, the following Statutory Undertakers have been found to have apparatus within the study area;

- Mainline Pipelines Ltd
- National Grid Gas
- National Grid Electric
- Western Power Distribution
- Zayo Group UK
- BT Openreach
- SP Energy Networks

2.5 Existing Conditions and Constraints: Environment

An assessment of the baseline environmental conditions has been undertaken in accordance with a 'simple' level assessment in Interim Advice Note 135/10 (IAN 135/10), and is summarised below. It includes a study area of up to 2km from the scheme. Further details can be found in report no. B1832076/OD/04 – Route Options Environmental Assessment Report'.

2.5.1 Landscape and Visual

Landscape

Topography in the study area is gently undulating between 105m Above Ordnance Datum (AOD) near the eastern end of the existing A500, and 60m AOD near the western end (this differs from the levels provided in section 2.4.2, because of the wider 'environmental' study area compared to the 'engineering' study area). Several ponds are found scattered within the farmland, including large ponds at Henbury Lee Meadows Local Wildlife Site and north of the A500 near Monneley Farm (the Duckaries). Two brooks cross the study area and flow beneath the A500; Englesea Brook which is towards the western end of the A500, and Barthomley Brook near Monneley Farm. A ridgeline runs through the study area between Bridgehouse Farm in the north and Englesea-Brook village in the south in the same north-south alignment as the two brooks. The ridgeline is at a height of between 70m and 83m AOD and where the A500 crosses the ridgeline it is in deep cutting. In addition to the two brooks, there are also smaller watercourses and ditches that the A500 cross.

Land Cover

Farmland to both sides of the A500 is predominantly made up of pastoral fields, with some scattered arable fields, and much of this farmland lies within the green belt. Field boundaries are often hedgerows with trees, which help to contribute to the 'well wooded' feel in the landscape. Other vegetation blocks are found along roads, railways and streams, at farms and villages and around ponds, and there is an area of ancient woodland 300m to the south of the A500 near Townhouse Farm. The

A500 is lined by vegetation for much of its course between the M6 and the A5020, and there are large blocks of woodland near Monneley Farm and at Meremoor Moss.

Landscape Pattern

Fields along the A500 are small to medium in size and semi-regular in shape. The field pattern is broken up by vegetation blocks, ponds and isolated farmsteads, and is crossed by linear infrastructure including the existing A500 and M6, and the railway between Crewe and Kidsgrove. Larger settlement is present at Barthomley, Weston and Englesea-Brook, all three of which contain Conservation Areas with Listed Buildings. The urban edge of Crewe is approximately 3km to the north-west, and there is a Registered Park and Garden at Crewe Hall 1km to the north-west.

Landscape Character

At a district level, the A500 lies within Cheshire County Council's Lower Farms and Woods 7, Barthomley Character Area. This is an area of gently undulating farmland with small to large, regular to irregular fields. Medieval and post-medieval fields have been adapted leading to loss of boundaries and an increase in field sizes in places. Settlement is of medium density with many nucleated or dispersed villages within farmland, as well as the built up area of Crewe, where golf courses, large warehouses and housing estates are noticeable. The area is influenced by transport infrastructure such as the M6, A500 and Crewe to Kidsgrove railway, and roadside planting is particularly conspicuous within the field pattern. Away from built up areas the landscape has a more rural and tranquil feel, with woodland blocks, hedgerows and hedgerow trees providing a sense of enclosure. The study area corresponds to the published landscape character assessment description.

Visual Amenity and Visual Receptors

In much of the study area there is a 'well wooded' feel, which in turn limits longer distance views. This is due to the presence of hedgerows, hedgerow trees and vegetation blocks. In less vegetated areas such as around Monneley Mere, or elevated areas such as along the ridgeline between Bridgehouse Farm and Englesea-Brook village, longer distance, open views are possible including eastwards towards the Peak District hills.

Transport infrastructure is a noticeable feature in many views, in particular the M6 corridor with its numerous overbridges. The A500 is relatively well contained by vegetation, and some of the road travels in cutting. This limits the number of available views towards traffic on the road. A pylon line crosses the study area from south-west to north-east, which is a detractor in the landscape.

There are a number of public rights of way (PRoW) and the Cheshire Cycleway Regional Route 70 that are within the immediate surroundings of the A500 and many of these PRoW's abut the road and would have the potential for views of the road. These are all shown on B1832076_P_1050 in Appendix B.

Potential visual receptors other than those listed above include:

- Farms including Meremoor Farm, Monneley Farm, Smith's Green Farm, Daisy Bank Farm, New Farm and Cherrytree Farm to the north, and Town House Farm, Old Hall Farm, Churchfield Farm and Bluemire Farm to the south.

- Residential properties at Smith's Green just north of the A500 (Smith's Green Cottages, Jasmine Cottage, Orchard Cottage, Duchy House).
- Residential properties at Smith's Green just south of the A500 (Cyprus Cottage, Poppy Cottage, Yew Tree Cottage).
- A residential property just north of A500 on Smithy Lane (The Alms House).
- Residential properties on the northern periphery of Barthomley within the Conservation Area.
- Residential properties on Radway Green Road west of Barthomley (Fir Tree Cottages, Hungerford Place).
- Residential properties on the north-western periphery of Englesea-Brook.
- Smith's Green Livery & Riding Centre at Smith's Green Farm, north of the scheme.
- The Travelodge at the M6 Junction 16 services.

There are unlikely to be views from Crewe Hall Registered Park and Garden or the Conservation Areas at Weston and Englesea-Brook.

2.5.2 Ecology

A desk study identified three statutory designated sites, ten non-statutory designated sites, and three ancient woodland sites within a study area up to 2km from the scheme.

An ecological walkover survey was also undertaken, and it identified 13 habitat types, and the potential for 12 species, or species groups to occur in the survey area. The habitats include water environments, different types of woodland, hedgerows, trees and farmland. Within those habitats, there is the potential for the following species;

- Badger
- Otter
- Water Vole
- Bats
- Birds
- Barn owl
- Reptiles
- Amphibians
- Fish
- White-clawed crayfish
- Other invertebrates

The sites, habitats and species / species groups are described in more detail in report no. 'B1832024/OD/08 - A500 Widening, M6 to A5020 Preliminary Ecological Walkover Survey Report'.

2.5.3 Cultural Heritage

A total of 45 Heritage Assets have been identified within the study area. These are summarised below.

Table 2.2 – Cultural Heritage Baseline

Asset No.	Asset Name	Designation	Value
1138666	Crewe Hall, Crewe Green	Grade I Listed Building	High
1330063	The Church of St Bertoline, Barthomley	Grade I Listed Building	High
1138667	Former Stables at Crewe Hall, Crewe Green	Grade II* Listed Building	High
1312453	Hollyhedge Farmhouse, Weston	Grade II* Listed Building	High
1138707	Churchfield Farmhouse, Barthomley	Grade II* Listed Building	High
1138700	The White Lion Inn, Barthomley	Grade II* Listed Building	High
1038615	Audley Mill, Millend, Audley Rural	Grade II Listed Building	Medium
1138706	Cherry Tree Farmhouse, Barthomley	Grade II Listed Building	Medium
1136009	Mill Farmhouse, Barthomley	Grade II Listed Building	Medium
1330072	The Church of St Luke, Haslington	Grade II Listed Building	Medium
1138665	Bridgehouse Farm House, Crewe Green	Grade II Listed Building	Medium
1138671	Farm Buildings 40 metres North of Crewe Hall Farm House, Crewe Green	Grade II Listed Building	Medium
1330085	Farm Buildings 10 metres East of Crewe Hall Farm House, Crewe Green	Grade II Listed Building	Medium
1330084	Crewe Hall Farm House, Crewe Green	Grade II Listed Building	Medium
1137194	Stowford Lodge, Weston	Grade II Listed Building	Medium
1138477	Beach Tree Cottage Elm Tree Cottage Oak Tre Cottage Walnut Tree Cottage, Weston	Grade II Listed Building	Medium
1137182	Smithy Smithy Cottage, Weston	Grade II Listed Building	Medium
1330152	Magnolia Cottage Stowford Cottage, Weston	Grade II Listed Building	Medium
1137196	Golden Gates Lodge and Entrance Screen, Weston	Grade II Listed Building	Medium
1138669	Gate, Piers and Wall at North End of Crewe Hall Drive, Crewe Green	Grade II Listed Building	Medium
1137242	Signpost, Weston	Grade II Listed Building	Medium
1138475	Red Lion Farmhouse, Weston	Grade II Listed Building	Medium
1330191	Barn Cottage Elder Cottage, Weston	Grade II Listed Building	Medium
1137180	Gentian Cottage, Weston	Grade II Listed Building	Medium
1138476	41, Main Road, Weston	Grade II Listed Building	Medium
1312457	Weston House, Weston	Grade II Listed Building	Medium
1330190	Church of All Saints, Weston	Grade II Listed Building	Medium
1137175	White Lion Inn, Weston	Grade II Listed Building	Medium

Asset No.	Asset Name	Designation	Value
1330189	Monument to the Venerable High Bourne in Primitive Methodist Graveyard, Weston	Grade II Listed Building	Medium
1137132	Methodist Chapel and Sunday School, Weston	Grade II Listed Building	Medium
1330064	Manor Farmhouse, Barthomley	Grade II Listed Building	Medium
1330061	Town House Farmhouse, Barthomley	Grade II Listed Building	Medium
1138701	Old Hall Farmhouse, Barthomley	Grade II Listed Building	Medium
1330062	The Smithy, Barthomley	Grade II Listed Building	Medium
1138702	Fir Tree Cottages, Barthomley	Grade II Listed Building	Medium
1138704	Church Bank, Barthomley	Grade II Listed Building	Medium
1330060	The Former Rectory, Barthomley	Grade II Listed Building	Medium
1138703	Brookside Cottage, Barthomley	Grade II Listed Building	Medium
1136018	White Lion Cottages, Barthomley	Grade II Listed Building	Medium
1138705	Bank Cottage, Barthomley	Grade II Listed Building	Medium
1038612	Domvilles Farmhouse, Audley Rural	Grade II Listed Building	Medium
1000124	Crew Hall, Crewe Green	Grade II Registered Park and Garden	Medium
667	Barthomley Conservation Area	Conservation Area	Medium
676	Englesea Brook Conservation Area	Conservation Area	Medium
718	Weston Conservation Area	Conservation Area	Medium

In summary a total of 45 heritage assets consisting of 41 historic buildings, one historic park and gardens, and three Conservation Areas have been identified within the study area. These comprise of:

- 6 heritage assets of High value.
- 39 heritage assets of Medium value.

2.5.4 Air Quality

Existing monitoring data collected by Cheshire East Council (CEC) within Crewe city centre indicates that measured concentrations of annual mean nitrogen dioxide (NO2) exceed the air quality objective limit value of 40µg/m3. The closest air quality monitoring site to the proposed scheme is located at Crewe Golf Club, approximately 3km north of the scheme. The most recent annual average was taken in 2013 and measured 14.6µg/m3, giving an indication that the air quality improves in open, rural areas outside of the urbanised city centre of Crewe.

There are three Air Quality Management Areas (AQMAs) declared for Nitrogen Dioxide (NO2) within 5km of the scheme. The AQMAs are located within the town centre of Crewe. The largest AQMA is located along a stretch of the A534 Crewe Road, between Ruskin Road and Gresty Road, west of Crewe train station. The second AQMA is located along a short stretch of Wisaston Road, at the signalised crossroads with Flag Lane. The third AQMA located within the centre of Crewe, along a stretch of the A532 adjacent to the Grand Junction Retail Park.

2.5.5 Noise and Vibration

The existing section of the A500 is used by a high number of private vehicles and HGVs due its close proximity to Crewe city centre to the west and its connection to M6 J16 at its eastern end. As a result, the existing A500 and the M6 are both current sources of traffic noise.

Most traffic noise, for traffic flowing freely at moderate to high speeds, comes from the interaction of tyres with the road surface, and noise levels are directly related to speed.

An area directly to the east of the M6, less than 1km north of the A500 is designated as a Noise Action Planning Important Area. This area has been identified as a result of national noise mapping by Defra as a noise 'hotspot'. It is the responsibility of Highway England to manage the level of noise within this area as a result of traffic moving along the M6.

A review of the current data available has identified a number of properties/ buildings that may be susceptible to construction noise, vibration and operational noise. This review identified 6 buildings within a 100m extent of the existing A500 carriageway that would be susceptible to road noise effects. It is anticipated that around half of these are sufficiently close and will most likely be affected by some road related vibration effects.

2.5.6 The Water Environment

There are three watercourses that are crossed by the existing A500. The main watercourse is Englesea Brook, and the other two are tributaries of this brook. Englesea Brook flows from south to north through a culvert under the existing A500. The tributary to the east of the scheme is named as Barthomley Brook, as it flows through the village of Barthomley, then heads north, through a culvert under the A500 before joining Englesea Brook to the north of the scheme. The tributary to the west of the scheme is unnamed and flows from south to north, under the existing A500 through a culvert.

Approximately half of the existing A500 passes above a Secondary B Aquifer. This aquifer starts from the middle of the existing route and continues east, past the M6 J16. This aquifer is in the bedrock and sections of the aquifer are shown on the Environment Agency (EA) website to be highly vulnerable to groundwater contamination. In addition, nearly the whole length of the existing route passes above a Secondary undifferentiated aquifer in the superficial deposits. The EA website does not show the vulnerability of this aquifer.

2.5.7 Effects on All Travellers

The A500 is one of two strategic routes from Crewe to the M6 motorway, the other being the A534 which travels to the northeast of Crewe to M6 J17. The A500 also provides a west to east route from Nantwich to M6 J16, and then onwards turning south eastwards towards Stoke and 'the potteries'. To the west of Nantwich the A534 continues on towards Wrexham.

The A500 also provides a route for local traffic. The villages of Balterley, Chorlton, Weston and Barthomley are to the south and connect into the A5020 roundabout via local roads and the A531. Radway Green and Alsager are to the northeast of the scheme and connect into M6 J16 via local roads, including the B5078.

Details of the NMU network in the study area are provided in Paragraph 2.6.3.

2.5.8 Private and Community Assets

The villages of Barthomley, Oakhanger and Weston, within the Cheshire East Council Local Authority, and Balterley Green and Balterley Heath, located within the Staffordshire Local Authority, are within 2km of the proposed route options. There are a number of community assets located within the study area:

- Weston Village Primary School;
- Weston cricket club;
- Stepping Stones nursery, Weston;
- White Lion Hotel, Weston;
- Post Office, Weston;
- Wychwood Village Hall, Weston;
- All Saints Church, Weston;
- St Bertoline's Church, Barthomley; and
- The Church of St Luke, Oakhanger.

The private assets within the study area are primarily agricultural farmland and residential properties. The closest residential properties to the scheme are Jasmine Cottage, Orchard Cottage and Smith's Green Cottages off Barthomley Road to the north; Cyprus Cottage, Yew Tree Cottage and Poppy Cottage off Barthomley Road to the south; The Alms House (formerly Thadion House) off Smithy Lane to the north, and; Bluemire Farm off Radway Green Road to the south.

The other private assets within the 2km study area are:

- Crewe Hall registered park and garden; and
- Crewe/ Barthomley Travelodge Hotel.

2.6 Existing Conditions: Traffic

2.6.1 Mainline

At this stage of the scheme, current traffic data for the network is unavailable.

Highway England's Traffic Flow Data System (TRADs) includes some historic flow data along the A500, and 2005 is the last year for which a full set of data is available. It shows that the Annual Average Daily Traffic (AADT) figures for 2005 were;

- Eastbound 24 hour AADT = 13,757
- Westbound 24 hour AADT = 14,392

This gives a two way AADT flow of over 28,000 vehicles.

TA 46/97 (DMRB 5.1.3) gives example Congestion Reference Flows for different categories of road with average peak hour flows and average proportions of heavy vehicles. The Congestion Reference Flow is defined as the flow at which the carriageway is likely to be 'congested' in the peak periods on an average day. The example shows that a typical single carriageway principal road, like the A500, would reach its Congestion Reference Flow at 23,000 vehicles.

2.6.2 Collision Analysis

A study of collision data has been undertaken, looking at the A500 between the A5020 Roundabout to M6 Junction 16. Data from between July 2010 and June 2015 has been reviewed in order to try and identify any trends. A summary is provided below, and for further details see report no. 'B1832076/OD/10 – Collision Analysis Note'.

Any collisions on local roads and on the M6 have been omitted from the collision data received from Cheshire East Council, and so the following only considers the A500 mainline.

Collision Area 1 – A5020 Roundabout (including 200m east on the A500)

Four of the loss of control type collisions, which included two positive breath test collisions, have had the descriptions removed at source. It has therefore not been possible to identify any patterns with certainty for this collision type due to the lack of information available. However, the number of loss of control type collisions at the roundabout could suggest that approach speeds may be high. Three of the four collisions which didn't have a contributory factor of alcohol occurred on a weekend when flows may be lower and higher speeds could be obtained. A review of the street view imagery of the site shows changes to the central roundabout chevrons on both A500 approaches to the roundabout, from signs on standard steel posts to Chevroflex over recent years. Chevroflex are often installed if there is a history of vehicles over running the give way and damaging the signs, although maintenance records are not available at this time, and so it is not possible to confirm that this is the reason for their installation at this site. The images show that the sign on the westbound approach has been damaged since the installation of the Chevroflex. This may not be recorded in the collision data as it could be a result of non-injury collisions.

Additionally, it seems that the high friction surfacing on both approaches to the A500 give way at the roundabout have been removed approximately 4 years ago, although it is unknown if it has been replaced with a high PSV stone value appropriate for the approach.

These issues suggest that a review of the approach to the roundabout should be undertaken as part of the detailed design. A two lane approach may result in high speeds and care should be taken to ensure drivers are aware of the presence of the roundabout and adequate deflection is achieved to ensure drivers are slowed on the approach.

Collision Area 2 – A500 Carriageway

Seven nose-to-tail collisions are spread out along the length of the A500 between the two roundabouts. Four of the seven side impact collisions involved vehicles

accessing/egressing the A500 to/from farmers' fields or the laybys on either side of the A500.

The introduction of a central barrier will remove the possibility of undertaking U-turns and right turns from private accesses, removing these types of collisions.

Collision Area 3 – M6 Junction 16 Roundabout (including 200m west on the A500)

No patterns in collisions were identified in Collision Area 3.

2.6.3 Side Roads

As part of this study, Automatic Traffic Counters (ATCs) were installed on Barthomley Road and Radway Green Road in the vicinity of the bridges, for a week during November 2015. The results showed the following average number of vehicles per day (7 day average);

- Barthomley Road
    - Northbound = 188
    - Southbound = 205
- Radway Green Road
    - Northbound = 617
    - Southbound = 551

2.6.4 Non-Motorised Users

The existing NMU network is shown on B1832076_P_1050 in Appendix B. The following footpaths and cycle routes are located in the vicinity of the scheme;

- Barthomley FP04 – This footpath crosses the A500 approximately 450m east of Englesea Brook, where there is an at-grade uncontrolled crossing. Barthomley FP04 then continues in both a north-easterly and southerly direction away from the A500. To the northeast, it connects with Barthomley FP 27 and then continues to run almost parallel to the carriageway until it reaches Barthomley Road.

- Barthomley FP05 – This footpath starts at Barthomley Road, approximately 50m south of its bridge over the A500. The footpath then continues in a southerly direction along a track.

- National Cycle Network; Route 70 – This route runs north to south along Barthomley Road, and uses Barthomley Road Overbridge to cross the A500. To the south it continues along Barthomley Road, and to the north it turns north-eastwards along Mill Lane.

- Barthomley FP17 – This footpath crosses the A500 approximately 150m east of Barthomley Road Overbridge, where there is an at-grade uncontrolled crossing. It continues north-westerly to meet Mill Lane, and to the southeast continues as Barthomley FP 17.

- Barthomley FP18 – This footpath is to the north of the A500 and travels south from Daisy Bank Farm to cross the carriageway at Smithy Lane at an at-grade, uncontrolled crossing. To the south of the A500 the footpath splits into Barthomley FP33 and Barthomley FP7, which both continue in a southerly direction.

- Barthomley FP33 – See Barthomley FP18.

- Barthomley FP7 – See Barthomley FP18.

- Barthomley FP25 – This footpath starts on the north side of the A500 approximately 400m east of Radway Green Overbridge, and where there is an at-grade uncontrolled crossing to footpath Barthomley FP15 to the south of the A500. It continues north-westwards until it meets Radway Green Road.

- Barthomley FP15 – This footpath starts at Radway Green Road to the south of the A500, then goes eastwards approximately parallel to the A500 until it meets M6 Junction 16. Part way along the path there is an at-grade uncontrolled crossing over the A500 to footpath Barthomley FP25 to the north.

At this stage of the scheme, usage data for the NMU network is unavailable. NMU surveys will be undertaken during the preliminary design stage in order to assess NMU usage.

Cheshire East Council
Highways

PAGE NOT USED

3 Description of the Route Options

3.1 Introduction

A Preliminary Cost Study Report was undertaken in January 2014, and it considered three options for widening the A500 – dual carriageway widening to the north, dual carriageway widening to the south, and a three lane single carriageway. The report didn't include any recommendations.

The dual carriageway options have been considered again in this report, but the single carriageway option has since been discounted, as described under section 3.9. A third dual carriageway option has been introduced that alternates between widening to the north and to the south, and was identified by the Project Team during this study as an alignment that would avoid the majority of the constraints.

The options included in this report are considered to be the only viable options to provide a dual carriageway, given the limitations of widening an existing single carriageway route. They have been developed sufficiently to enable them to be comparatively assessed.

The section below provides a high level description of the three options;

- Option 1 – Widening to the North,
- Option 2 – Widening to the South and
- Option 3 – Alternating between widening to the North and South (referred to as the Hybrid Option).

Included in each of the three options are the outline proposals for the tie-ins at M6 Junction 16 to the east, and to the west at the roundabout junction with the A5020. At this stage it has been assumed that no further modifications are required to the junctions to increase their capacity, but this will need to be determined at a later stage once traffic data is available.

Options have also been developed for the replacement of Barthomley Road Bridge and Radway Green Road Bridge, as described in Sections 3.5 and 3.6 below.

3.2 Option 1 – Widening to the North

Option 1 continues along the same route as the existing A500, and provides an additional carriageway to the north, as shown on B1832076_P_1003 to 1005 in Appendix C. The majority of the existing carriageway is retained, which will become the southern carriageway of a dual carriageway. The vertical profile of the new carriageway is the same as the existing.

In cross-section, each carriageway has two 3.65m wide lanes, with 1m hardstrips on both sides (D2AP in accordance with TD 27/05). A 6m wide central reserve has been provided between the two carriageways, widened to 9m at the two overbridges. The existing southern verge remains 2.5m wide, and the northern verge is 5.6m wide to accommodate a haul road during construction, to facilitate the movement of materials along the site.

The widening will impact both of the overbridges along the scheme, which will need to be extended to accommodate the proposed dual carriageway. Options have been developed for on-line and off-line replacements for the overbridges, and these are described in Sections 3.5 and 3.6. The two culverts and the underpass will also need to be extended, as described under Section 3.7.

At the eastern end of the scheme, the existing retaining wall to the north will be removed as it clashes with the proposed alignment. The second retaining wall to the south will remain in position as it is not impacted by the widening.

The large pond (known as the duckaries) situated approximately 500m upstream of Barthomley Road overbridge to the north of the A500 will be impacted by the proposed earthworks.

At the western end of the scheme, the dual carriageway will tie into the existing A5020 roundabout and will not require any modifications to the layout of the circulatory carriageway. At the eastern end, the eastbound carriageway will tie into the existing highway layout just before M6 Junction 16, and the westbound carriageway will tie in slightly to the south of the existing carriageway, but with no modifications to the layout of the existing circulatory carriageway.

3.3 Option 2 – Widening to the South

Option 2 continues along the same route as the existing A500, and provides an additional carriageway to the south, as shown on B1832076_P_1006 to 1008 in Appendix C. The majority of the existing carriageway is retained, which will become the northern carriageway of a dual carriageway. The vertical profile of the new carriageway is the same as the existing.

In cross-section, each carriageway has two 3.65m wide lanes, with 1m hard-strips on both sides (D2AP in accordance with TD 27/05). A 6m wide central reserve has been provided between the two carriageways, widened to 9m at the two overbridges. The existing northern verge remains 2.5m wide, and the southern verge is 5.6m wide to accommodate a haul road during construction, to facilitate the movement of materials along the site.

The widening will impact both of the overbridges along the scheme, which will need to be extended to accommodate the proposed dual carriageway. Options have been developed for on-line and off-line replacements for the overbridges, and these are described in Section 3.5 and 3.6. The two culverts and the underpass will also need to be extended, as described in Section 3.7.

At the eastern end of the scheme, the existing retaining wall to the north will be retained in position as it is not impacted by the widening. The second retaining wall to the south will be removed as it clashes with the proposed alignment.

At the western end of the scheme, the dual carriageway will tie into the existing A5020 roundabout and will require the circulatory carriageway to be modified by extending it southwards by approximately 9m. At the eastern end, the eastbound carriageway will tie into the existing highway layout just west of M6 Junction 16, and the westbound carriageway will tie in slightly to the south of the existing carriageway, but with no modifications to the layout of the existing circulatory carriageway.

3.4 Option 3 – Widening to both the North and South (Hybrid)

Option 3 continues along the same route as the existing A500, and provides an additional carriageway which alternates between the north and south of the existing A500, and which crosses the existing carriageway along the route, as shown on B1832076_P_1009 to 1011 in Appendix C. Approximately half of the existing carriageway is retained, which will become either the northern or southern carriageway of a dual carriageway.

At the western end of the scheme the existing carriageway forms the northern half of the dual carriageway, and the new carriageway is to the south. Continuing eastwards the northern carriageway continues along the existing alignment until about ch.450, where it starts to deviate. It gradually moves to the north until, at approximately ch.1500, the southern carriageway ties into the existing, and the carriageway to the north is new.

Continuing eastwards, the southern carriageway remains on the alignment of the existing carriageway until about ch.2450, where it starts to deviate and move to the south. At about ch.3000 the northern carriageway almost ties into the existing, but moves away again on the approach to M6 J16.

The vertical profile of the new carriageway is broadly the same as the existing.

In cross-section, each carriageway has two 3.65m wide lanes, with 1m hard-strips on both sides (D2AP in accordance with TD 27/05). A 6m wide central reserve has been provided between the two carriageways, widened to 9m at the two overbridges. The existing verge, either on the north or south remains 2.5m wide, and the proposed new verge is 5.6m wide to accommodate a haul road during construction, to facilitate the movement of materials along the site.

The widening will impact both of the overbridges along the scheme, which will need to be extended to accommodate the proposed dual carriageway. Options have been developed for on-line and off-line replacements for the overbridges, and these are described in Section 3.5 and 3.6. The two culverts and the underpass will also need to be extended, as described in Section 3.7.

At the eastern end of the scheme, the existing retaining wall to the north will be partially removed, by approximately half, 110m, as it clashes with the proposed alignment. The second retaining wall to the south will be removed as it clashes with the proposed alignment.

The large pond (known as the duckaries) situated approximately 500m west of Barthomley Road overbridge to the north of the A500 will be slightly impacted by the proposed earthworks – the base of the earthworks will be at the pond edge.

At the western end of the scheme, the dual carriageway will tie into the existing A5020 roundabout and will require the circulatory carriageway to be modified by extending it southwards by approximately 9m. At the eastern end, the eastbound carriageway will tie into the existing highway layout just before M6 Junction 16, and the westbound carriageway will tie in slightly to the south of the existing carriageway, but with no modifications to the layout of the existing circulatory carriageway.

3.5 Barthomley Road Overbridge

As part of the proposed widening the existing Barthomley Road Bridge would need to be replaced by a longer structure that would span the dual carriageway. As such, the following options have been considered for on-line and off-line replacements of the bridge;

- Barthomley Option A – Off-line option to the west
- Barthomley Option B – Off-line option off Mill Lane
- Barthomley Option C – Off-line option to the east
- Barthomley Option D – On-line option

The three off-line options are shown on B1832076_P_1012 to 1014 in Appendix C. They have been designed to minimise disruption to the nearby properties off Barthomley Road.

The on-line option is shown on B1832076_P_1048 in Appendix C.

The cross-section of the new bridge has been designed to have two 3.65m lanes, 1m hardstrips and a 5.3m wide verge on one side. The verge would include a 3m wide shared footway, cycleway and equestrian facility, offset 1.8m from the carriageway edge. At this stage this is assumed to be a suitable facility to accommodate National Cycle Route 70, which travels along Barthomley Road, and any equestrians, given that there is a riding school approximately 300m to the north.

3.6 Radway Green Road Overbridge

Radway Green Bridge would also need to be lengthened to span the proposed dual carriageway. As such, the following options have been considered for on-line and off-line replacements of the bridge;

- Radway Green Option A – Off-line option to the west
- Radway Green option B – Off-line option to the east
- Radway Green Option C – On-line option

The two off-line options and one on-line option are shown in Appendix C on B1832076_P_1015 to 1016 and B1832076_P_1049.

The cross-section of the new bridge has been designed to have two 3.65m lanes, 1m hardstrips with 3.5m wide verge on one side. The verge includes a 2m wide footway/cycleway, offset 1m from the carriageway.

3.7 Culverts

3.7.1 Un-named Watercourse Culvert

As part of the proposed dual carriageway widening, the existing un-named watercourse culvert would need to be extended. However, there is no information currently available for the culvert, so it is currently not possible to comment on the proposed method of construction.

3.7.2 Englesea Brook Culvert

As part of the proposed dual carriageway widening, details required to extend the existing Englesea Brook Culvert have been considered for all mainline options. The extension would be adjacent to the direction of widening and would provide an in situ reinforced concrete box structure similar to the existing culvert with internal dimensions similar to the existing culvert.

For all options the top of the existing wingwalls and headwall would be cropped and new wingwalls and a headwall would be provided to the entrance of the extension similar to the existing layout.

3.7.3 Barthomley Brook Culvert

As part of the proposed dual carriageway widening, details required to extend the existing Barthomley Brook Culvert have been considered for all mainline options. The extension would be adjacent to the direction of widening and would be constructed from precast reinforced concrete box units, with 2m x 2m internal dimensions.

For all options reinforced concrete wingwalls will be provided, similar to the existing layout.

Option 3 would require further consideration depending on the relative position of the joint in the culvert joint and the carriageway. If this is the case, an in situ reinforced concrete transition may be cast to reduce differential settlement and a short reinforced concrete extension to the south would be provided.

3.8 Existing Drainage

There are no as-built records for the existing A500 drainage networks, except to the east where improvements have recently been made on the approach to M6 Junction 16 as part of the Highways England Pinch Point Programme.

Assumptions have been made about the existing drainage on the A500, which have been based on observations from site visits and conversations with Cheshire East Highways staff. As a brief summary, it has been assumed that the existing drainage for the A500 consists of filter drains in the verges and filter drains at the tops of cuttings and bases of embankments.

3.9 Discounted Options

A Preliminary Cost Study Report was undertaken in January 2014. It included the following options that have since been discounted, and are not considered in this assessment;

- An option was included for widening the existing carriageway to the north to create a single 10.95m wide carriageway, plus 1m hardstrips. The carriageway could then be marked as a 'Wide Single 2+1' road, i.e. two lanes in one direction and one lane in the other, which could be alternated part way along the route.

  This option has since been discounted, primarily because it would not provide the same standard of road as the rest of the A500, and may therefore still act as an impediment to traffic flows and to the future development of Crewe. It would also not provide a road to the same standard of safety compared to the other proposed options, because it would not include a central reserve and barrier.

- The 2014 report assumed that there would be a new footbridge at approximately ch.3000, between Radway Green Road and M6 J16, to join footpaths Barthomley FP25 and FP15.

  This report has assumed that there will not be a footbridge at this location, because the footpaths do not appear to be extensively used, and an alternative route via Radway Green Road Bridge would be provided which would require a diversion of less than 400m. On that basis the cost of a new footbridge at this location would not be justified.

  However, this option should be re-assessed once the footpath usages have been determined during the later stages of the scheme.

3.10 Scheme Cost Estimate

The following section of this report summarises the cost estimates for each individual route option. The figures stated in this section allow for a comparison between the options and it is from these values that the feasibility of the schemes, from a financial perspective, can be assessed. It should be noted that the costs stated in this section are the outline scheme costs based upon this stage of the project, and as such are subject to change once the preferred route is established and the design is developed further.

3.10.1 Basis of Construction Costs

The Cost Estimate for the A500 has been prepared using an elemental method for the major elements of the Works (Method of Measurement for Highway Works) that reflects the understanding of the proposed scheme, and can be split into these categories;

- Highway Works Estimate – costs associated at this stage, e.g. preliminaries, roadworks, structures and facilitating works.

- Risk Estimate – including design, construction and employer risk.

An allowance of 44% based on Treasury Optimism Bias has been included in this estimate for design development risks, construction risks, employer change risks and employer other risks.

This cost estimate has an accuracy level of -30% to +30%, which is reflected in the by the cost estimate range reported for each option.

Inflation has not been accounted for at this stage, as recommended in DMRB 37/93 Paragraph 4.3. For a detailed breakdown of the estimated scheme costs please refer to report no. 'B1832076/OD/02 - A500 Dualling and Widening Scheme – Options Estimate No. 1 – Construction Cost'.

An allowance for the diversion and protection of Statutory Undertakers equipment has not been included. Statutory Undertakers have not yet been contacted to provide an estimate for these works, but an estimate has been provided by Gattica Associates. In total, they estimate that the total cost of diversions and protections would be £6.72m for each mainline option. However, further investigation is needed to confirm the cost, including contacting the Statutory Undertakers to provide estimates for the work, and it is considered that there is significant uncertainty associated with this figure. It has therefore been excluded from the overall cost estimate figures.

Costs associated with land acquisition and Part 1 Claims are reported separately, under Section 3.11.2.

3.10.2 Assumptions

- Construction works will generally be undertaken during normal working hours unless specifically identified as being undertaken out of normal working hours (evenings and weekends).
- Access to the site is unrestricted.
- Works to water courses limited to the extension of the brook culverts.
- Barthomley Road Bridge is a four span bridge deck. Size 67.6m long x 14.0m wide.
- Radway Green Bridge is a four span bridge deck. Size 67.6m long x 12.3m wide.
- No lighting required to Barthomley Road or Radway Green Road.

3.10.3 Exclusions

- Toxic / hazardous material removal including removal of toxic or hazardous parts of building fabric and hazardous materials or components from existing services installations.
- Removal and/or treatment of contaminated ground material.
- Eradication of invasive plant growth.

- Ground gas venting measures including gas proof membranes, perforated collection pipes, proprietary gas dispersal fin layers, radon sumps and vent pipes.

- Soil stabilisation measures including cement or chemical grouting, electrochemical stabilisation, sand stowing, soil nailing, ground anchors, compacting, and freezing of groundwater and subsoil.

- Site dewatering and pumping to lower the ground water level of the site, including forming well points, filling, drain tubes and ring mains, sumps, pumps and pumping, off-site disposal of water, running costs and attendance.

- Extraordinary site investigation works including archaeological investigation, reptile/wildlife mitigation measures and other site investigation works.

- Any environmental mitigation measures.

- Works by Statutory Undertakers

- Works by Other Bodies.

- Accommodation Works.

- Charges, rates on temporary accommodation, licences in connection with hoardings, scaffolding, gantries and the like and licences in connection with crossovers, parking permits, parking bay suspension and the like.

- Decanting and relocation costs, temporary relocation costs, temporary accommodation, rents and other running costs.

- Employer finance costs, costs in connection with funding of project.

- Fixtures, fittings and equipment.

3.10.4 Option 1 – North Estimate

The cost estimate range (excluding inflation) for Option 1 - North is approximately £16.9 million to £31.3 million.

3.10.5 Option 2 – South Estimate

The cost estimate range (excluding inflation) for Option 2 - South is approximately £17.7 million to £32.9 million.

3.10.6 Option 3 – Hybrid Estimate

The cost estimate range (excluding inflation) for Option 3 - Hybrid is approximately £19.4 million to £36.0 million.

3.10.7 Barthomley Road Bridge Estimates

The cost estimate range (excluding inflation) for Barthomley Road Bridge Option A is approximately £4.5 million to £8.3 million.

The cost estimate range (excluding inflation) for Barthomley Road Bridge Option B is approximately £4.8 million to £8.8 million.

The cost estimate range (excluding inflation) for Barthomley Road Bridge Option C is approximately £4.1 million to £7.7 million.

The cost estimate range (excluding inflation) for Barthomley Road Bridge Option D is approximately £3.3 million to £6.2 million.

The above estimates do not include for the cost of a temporary bridge, which may be required depending on the method of construction, the construction programme, and the desire to maintain a through route for traffic during construction. It is estimated that the cost of a temporary bridge, temporary access roads and reinstatement once the bridge has been taken down would be £1.3 million (including Optimum Bias).

The on-line bridge option (Option D) is considered the most likely to need a temporary bridge. The other off-line bridges (Options A, B and C) could be constructed before the existing bridge is demolished. So although Option D has the lowest cost estimate, if the cost of a temporary bridge is included it has a similar cost to the other options.

3.10.8 Radway Green Road Bridge Estimates

The cost estimate range (excluding inflation) for Radway Green Road Bridge Option A is approximately £4.3 million to £7.9 million.

The cost estimate range (excluding inflation) for Radway Green Road Bridge Option B is approximately £4.5 million to £8.3 million.

The cost estimate range (excluding inflation) for Radway Green Road Bridge Option C is approximately £3.0 million to £5.6 million.

The above estimates do not include for the cost of a temporary bridge, which may be required, and is estimated to be £1.3 million (including Optimum Bias).

The on-line bridge option (Option C) is considered the most likely to need a temporary bridge, so although Option C has the lowest cost estimate, if the cost of a temporary bridge is included it has a similar cost to the other options.

3.11 Land

3.11.1 Land Ownership and Land Tenancy

For a detailed plan with land ownership references, see the Land Ownership Plans in Appendix D on B1832076_P_5006 to 5008.

The land use adjacent to the A500 is predominately agricultural land, the majority of which is in the ownership of the Duchy of Lancaster and therefore Crown Land. At the western end of the scheme, plots to the north and south are under the ownership of the Co-op, and there are a number of privately owned properties to the north and south of the A500 along the scheme.

Land owned by the Duchy and the Co-op is let under farm tenancies.

3.11.2 Land Acquisition and Part 1 Claims

An assessment has been made of the potential land take compensation liability associated with each mainline option. It includes an allowance for the market value of any land take, inclusive of any severance, injurious affection, disturbance, loss payments, fees and Part 1 Claims. For full details of the assessment, refer to report no. 'B1832076/OD/03 – Likely Compensation Assessment Report'.

The potential compensation liability for each option is;

- Option 1 - £815,000
- Option 2 - £832,000
- Option 3 - £830,000

4 Engineering Assessment

4.1 Design Standards

The geometric design of the route options and side road options have been developed in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 6 (Road Geometry), with particular reference to the following design standards:

- TD9/93 – Highway Link Design.
- TD27/05 – Cross-Sections and Headrooms.
- TD16/07 – Geometric Design of Roundabouts.

The three mainline options have a Design Speed of 120kph. In cross-section they have a dual 2 lane carriageway (D2AP - 7.3m carriageways and 1.0m hard-strips), as shown on B1832076_P_1002 in Appendix E. The verges are 2.5m wide, except the nearside verge on the new carriageway side which has been made 5.6m wide to accommodate a haul road during the construction phase.

Each route option includes a minimum 6m wide central reserve, widened to 9m at the overbridges. The rationale is that this width will allow a temporary safety barrier to be installed in the existing carriageway verge, and then the majority of construction activities can take place behind the barrier, including the construction of the permanent concrete barrier and the overbridge central piers. This will have the least impact on traffic flows, because once the temporary barrier is in place, traffic on the A500 can continue at the national speed limit. Once the new carriageway is complete, two-way traffic can be switched onto it to allow the existing carriageway to be re-surfaced and finishing works to the central reserve.

The Design Speed for Barthomley Road is 60kph, and for Radway Green Road is 70kph. In cross-section they have a 7.3m wide single carriageway.

The four side road options at Barthomley Road include a shared footway/cycleway and equestrian facility on one side. The verge is 5.3m wide, which includes the 3m wide shared facility offset 1.8m from the carriageway edge.

The three side road options at Radway Green Road have a 3.5m verge on one side, which includes a 2m footway/cycleway offset 1m from the carriageway edge.

4.2 Topography and Land Use

All three mainline options run broadly along and parallel to the existing A500, whose topography and adjacent land use is described in Section 2.4 above. All options have been designed to have the same vertical profile as the existing A500. As such, the proposed earthworks are generally a widening of the existing embankments and cuttings.

At the western end of the scheme all options would pass through agricultural land, beginning at the A5020 roundabout in shallow cut then travelling eastwards for approximately 200m, before moving onto embankment up to 4m high at Englesea

Brook. After the brook the options would continue on embankment through agricultural land and then woodland, with Option 1 reaching a height of 7.2m, Option 2 4.2m and Option 3 7.6m. Within the woodland, Option 1 would require land from an existing pond (known as the duckaries), and the embankment of Option 3 would go up to the edge of the pond. Constructing through this pond is likely to be difficult, but that issue has not been considered here, but under 'Section 4.3 – Geology, Geomorphology and Ground Conditions' below.

Continuing eastwards, all options would enter a section of deep cutting up to 10.7m deep for a distance of approximately 180m, before moving onto shallow embankment over Barthomley Brook, and back into cutting up to 6.4m deep up to Barthomley Road Bridge. Options 1 and 2 would require cut and fill on either the north or south, whereas Option 3 would require cut and fill on both sides. The land is agricultural in this section, and the existing cutting slopes have well established vegetation and trees.

To the east of Barthomley Road Bridge all options continue in shallow cut to Radway Green Road Bridge, and then alternate between slight cut and slight fill up to M6 J16. The majority of the land is agricultural through this section, except to the south of Radway Green Road Bridge where there is a residential / commercial property, Bluemire Farm. However, the impact on Bluemire Farm is not considered here, but under 'Section 5.10 – Community and Private Assets'.

Overall, the topography and land use is very similar for all options, and is not a differentiating factor.

Table 4.1 : Topography and Land Use Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

4.3 Geology, Geomorphology and Ground Conditions

A number of geotechnical risks have been identified associated with the scheme, which are detailed in report no. 'B1832076-OD-06 – Preliminary Sources Study Report'. These include;

- Constructing the embankment at the western end of the scheme, between the A5020 roundabout and Englesea Brook, which would be above an area of peat.
- Achieving an earthworks balance, so that excessive import or export of materials is not required.
- The excavated materials are likely to be sensitive to moisture content changes, potentially changing them from acceptable to unacceptable in terms of embankment fill.
- The presence of subsidence features in the western part of the site in the area of the pond known as the duckaries, and spanning to the north and south of the A500. These features may be associated with ground collapse due to brine subsidence, and could present significant engineering or

constructability issues. The existing A500 was successfully constructed through this area, although during consultations (see Section 7) it was noted that several people independently said that construction of the original A500 experienced difficulties in this area, and large amounts of imported fill were required.

These features extend to the north and south of the A500, and so will affect all the widening options. However, the duckaries pond located to the north of the A500 is described as a crater subsidence and could present significant additional engineering issues. During consultations, the pond was said anecdotally to be very deep.

- Encountering historic landfills.
- The impact of constructing new structures adjacent to existing assets.

Therefore, Option 1, which passes over the crater subsidence, is the least preferred option. Option 2 avoids the crater subsidence and is therefore the preferred option. Option 3 passes over the edge of the crater subsidence, but to a lesser extent than Option 1.

Table 4.2 : Geology, Geomorphology and Ground Conditions Rankings

Option 1	Option 2	Option 3
3rd	1st	2nd

4.4 Departures from Standards

4.4.1 Mainline

The Design Speed for the mainline is 120kph.

All of the mainline options have a sub-standard horizontal curve immediately to the west of M6 J16. Option 1 has a 510m radius curve, which is a 2 step relaxation; Option 2 has a 720m curve (1 step relaxation) leading to a 510m curve, and; Option 3 has a 720m radius curve.

All options have reduced visibility for vehicles travelling eastbound on the right hand curve between the two overbridges. Visibility is restricted by the central reserve barrier, and for all options a minimum stopping sight distance of 215m is achieved, which is 1 step below Desirable Minimum and is a relaxation.

Vehicles travelling westbound between the two overbridges also have reduced visibility. Visibility is restricted by the cutting slopes, and for all options a minimum stopping sight distance of 215m is achieved. For 'Option 1 – Widening to the North', the nearside westbound lane of the dual carriageway is the same as the existing A500 westbound lane. On this basis, it has been assumed that this relaxation is acceptable, and has been adopted for all the options.

On the eastbound approach to M6 J16, the visibility is restricted by the back of verge to the north, as the road curves around to the left. For Options 1 and 3, a minimum stopping sight distance of 120m is achieved, which is 3 steps below

Desirable Minimum. For Option 2 a minimum stopping sight distance of 160m is achieved, which is 2 steps below Desirable Minimum. In all cases this constitutes a Departure, because design standards require that full visibility is achieved on the approach to a junction. A full justification for this departure would need to be provided as the scheme progresses, but at this stage it is assumed that it would be acceptable because the existing A500 provides a similar level of visibility and the accident data doesn't suggest that there is a problem.

The visibility on the westbound exit from M6 J16 is restricted by the safety barrier in the central reserve, as the road bends to the right. For all options a minimum stopping sight distance of 160m is achieved, which is 2 steps below Desirable Minimum and in combination with the sub-standard horizontal curve constitutes a Departure. A full justification for this departure would need to be provided as the scheme progresses, but at this stage it is assumed that it would be acceptable because it is on the immediate exit from the junction, where vehicle speeds will be low.

In terms of Departures and Relaxations from standards, all of the mainline options are broadly the same. Therefore there is no preferred option.

Table 4.3 : Departure from Standards Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

4.4.2 Barthomley Road

A design Speed of 60kph has been used for Barthomley Road.

From the south, Barthomley Road Option A uses a 90m radius curve, which is 3 steps below Desirable Minimum. For vehicles travelling in a southbound direction, visibility is restricted to 70m by the back of the verge, which is 1 step below Desirable Minimum. These are both relaxations in their own right, but as a combination they constitute a Departure.

Continuing northwards, Barthomley Road Option A has a vertical crest curve of K = 13 from ch.116 to ch.301. This is a relaxation, until its northern end where it is in combination with another 90m horizontal curve, and with visibility which is restricted to 50m in the southbound direction, which is 2 steps below Desirable Minimum SSD. These are all relaxations in their own right, but as combinations they are Departures. The curve and reduced visibility are a result of the road passing Jasmine Cottage.

There are no relaxations or departures associated with Barthomley Road Option B.

From the south, Barthomley Road Option C has a 70m radius horizontal curve up to ch.40, which 1 step below Desirable Minimum. There is also a vertical sag curve of K = 9 from ch.7 to ch.61, which is 1 step below Absolute Minimum. These are acceptable relaxations in their own right, but constitute a Departure in combination.

Continuing north, Barthomley Road Option C uses a 127m horizontal curve where it spans the mainline, which is 2 steps below Desirable Minimum. There is also a vertical crest curve of K = 10 from ch.61 to ch.183, which is 1 step below Desirable Minimum. Visibility is also restricted by the bridge parapet and approach barrier in the northbound direction, and reaches a minimum of 50m from ch.114 to ch.188,

which is 2 steps below Desirable Minimum. These are all allowable relaxations in their own right, but constitute a Departure where they are in combination.

Where the route ties into existing at Jasmine Cottage, Barthomley Road Option C has a vertical crest sag of K = 9 from ch.183 to ch.217, which is 1 step below Absolute Minimum. There is also restricted visibility past the bridge parapet, and achieves a minimum of 70m from ch.190 to ch.201. These are both relaxations.

Barthomley Road Option D follows the existing road. It is on a horizontal straight over the mainline, and to the south ties has a 90m radius curve.

4.4.3 Radway Green Road

A Design Speed of 70kph has been used for Radway Green Road.

At its southern tie-in, Radway Green Road Option A has a 180m radius horizontal curve up to ch.54, which is 2 steps below Desirable Minimum. There is also a vertical crest curve of K = 25, which is approximately a ½ step below Desirable Minimum. Visibility is restricted in the northbound direction up to ch.25, and achieves a minimum of 90m which is 1 step below Desirable Minimum SSD. These would be allowable relaxations on their own, but the combination of the vertical curve with the other sub-standard features constitutes a Departure.

Continuing northwards, Radway Green Option A uses a 300m horizontal radius curve to the southwest of Bluemire Farm, which is approximately a ½ step below Desirable Minimum and is a relaxation. Further north, vehicles travelling in the southbound direction would have restricted visibility from ch.247 to ch.213 because of the bridge parapet and approach barrier. A minimum visibility of 90m is achieved, which is 1 step below Desirable Minimum SSD and is a relaxation.

Radway Green Option B has a 180m horizontal curve at its southern end, up to ch.48, which is 2 steps below Desirable Minim and a relaxation. It also has a 165m horizontal curve where it spans the mainline, from ch.191 to ch.331, which is over 2 steps below Desirable Minimum, and a relaxation. Visibility is restricted to 80m in the northbound direction from ch.80 to ch.160, and in the southbound direction is restricted to 90m between ch.120 to ch.130, and again form ch.250 to ch.260. These are all allowable relaxations.

At its northern tie-in, Radway Green Option B has a 136m horizontal curve, which is almost 3 steps below Desirable Minimum. Visibility is also restricted, achieving 80m in the northbound direction (1 ½ steps below Desirable Minimum) and 90m in the southbound direction (1 step below Desirable Minimum). These are acceptable relaxations in their own right, but constitute a Departure in combination.

Radway Green Option C would continue along its existing route, which has an approximate 150m radius horizontal curve spanning the mainline.

4.5 Public Utilities

Gattica Associates Ltd have been commissioned to identify all Statutory Undertaker's apparatus within the study area. Full details are in their report 'Feasibility Report (Utilities) A500 Road Widening Scheme', and the plans are included in Appendix F.

There are several areas where Statutory Undertaker apparatus crosses the proposed A500 Widening options, some of which are on the two overbridges. The most notable of these are a mainline fuel pipeline to the east of Englesea Brook; a national high pressure gas main half way between Barthomley Road and Smithy Lane, and; another national high pressure gas main just west of Smithy Lane.

There is no apparatus within the verges of the existing A500, except for an electricity cable immediately adjacent to the commercial development at the eastern end of the scheme. There is, however, some apparatus that runs parallel to the northern edge of the existing A500 between Smithy Lane and M6 J16 (underground BT cable between Smithy Lane and Radway Green Road, and underground electricity cables to the west of M6 J16).

The table below gives a brief summary of which utility company's apparatus would be affected by each option;

Table 4.4 – Public Utilities Affected

Utility Company	Type	Affected by Option 1 North	Affected by Option 2 South	Affected by Option 3 Hybrid	Affected by Over-bridges
SP Energy Networks	Electricity	Yes	Yes	Yes	No
Western Power Distribution	Electricity	Yes (M6 J16 Rbt)	No	No	No
National Grid (Gas)	Gas	No	Yes (West of the A5020 Rbt)	Yes (West of the A5020 Rbt)	No
National Grid (Transmission)	Gas	Yes	Yes	Yes	No
Mainline Pipelines	Fuel	Yes	Yes	Yes	No
United Utilities	Potable Water	Yes	Yes	Yes	Yes
BT Openreach	Telecom	Yes	No	No	Yes
Zayo	Telecom	Yes	Yes	Yes	No

The affected apparatus will be similar for all of the proposed options due to the majority of the apparatus crossing the scheme in a north-south direction. The only differentiating factor is the apparatus running to the north of the existing A500 between Smithy Lane and M6 J16. The least preferred option is therefore Option 1, which would need these services to be diverted. Option 3 also impacts on this apparatus, but to a lesser extent. Option 2 is the preferred option in terms of public utilities.

Table 4.5 – Public Utility Rankings

Option 1	Option 2	Option 3
3rd	1st	2nd

4.6 Structures

4.6.1 Introduction

Eight existing structures that would be affected by the scheme have been identified and are summarised below:

- Un-named Watercourse Culvert - Unknown
- Englesea Brook Underpass – Reinforced concrete box underpass
- Englesea Brook Culvert – Reinforced concrete box culvert
- Barthomley Brook Culvert – Reinforced concrete box culvert
- Barthomley Road Bridge – 3 span concrete bridge
- Radway Green Road Bridge – 3 span concrete bridge
- Retaining Wall 1 – Brick faced retaining wall
- Retaining Wall 2 – Brick faced retaining wall

A detailed description of each structure is presented in Section 2.4.6.

The alternative treatments available at each structure for the various main line options are described and discussed in this section. Recommendations are made as appropriate. Where feasible, prefabricated structural elements will be proposed as this would reduce the duration of construction and may lead to an overall shortening of the construction programme.

4.6.2 Un-named Watercourse Culvert

The main features of the un-named watercourse culvert are currently unknown.

Main Line Option 1 would require an extension to the north of the culvert. Main Line Options 2 and 3 would require an extension to the south of the culvert. It is unknown what the method of construction would be, due to the current lack of information.

4.6.3 Englesea Brook Underpass

The main features of Englesea Brook Underpass are:

- It carries the A500 over a farm access track.
- It is an in situ reinforced concrete box structure with an internal span of 4.0m and an internal height of 3.3m.
- The underpass is aligned square to the A500.
- The fill above the underpass is approximately 0.5m.
- The reinforced concrete wingwalls abut with the wingwalls of Englesea Brook Culvert to the east of the underpass and extend to the top of a 1 in 2 side slope to the west of the underpass.
- Peat deposits have been found in the locality of the underpass, these could give rise to large total and differential settlements.

Main Line Option 1 would require an extension of the underpass to the north of the underpass. Main Line Options 2 and 3 would require an extension to the south of the underpass. An extension to the north would be treated in exactly the same way as an extension to the south and so the following extension descriptions are applicable to all main line options.

The extension would be an in situ reinforced concrete box structure similar to the existing underpass, the internal dimensions would be the same as the existing. One set of wingwalls and headwall would be buried by the new highway embankment. The tops of the buried walls would be cropped to avoid hard spots in the fill and to allow transverse passage of service ducts. New wingwalls and a headwall at the new entrance of the extension would be similar to the existing.

The advantage of providing an in situ concrete extension is that the articulation would be the same as the existing. This would reduce the risk of secondary forces being generated at the joint and would allow the consideration of providing continuity at the joint, which would improve durability.

Using a proprietary precast concrete modular box structure was considered but the articulation would be different from the existing, which may give rise to secondary forces at the joint between the existing underpass and the extension. Also the system would be more flexible and prone to distortion caused by total and differential settlements, given the presence of peat this was a major consideration.

4.6.4 Englesea Brook Culvert

Englesea Brook Culvert is separated from Englesea Brook Underpass by 5.8m of highway embankment. The two structures are similar with the main features of Englesea Brook Culvert being:

- It carries the A500 over Englesea Brook.
- It is an in situ reinforced concrete box structure with an internal span of 4.0m and an internal height of 4.0m.
- The culvert is aligned square to the A500.
- The fill above the culvert is approximately 1.75m.
- The reinforced concrete wingwalls abut with the wingwalls of Englesea Brook Underpass to the west of the culvert and extend to the top of a 1 in 2 side slope to the east of the culvert.
- Peat deposits have been found in the locality of the underpass, these could give rise to large total and differential settlements.

All the comments made about the adjacent underpass are applicable to the culvert and are summarised as:

- An extension to the north for Main Line Option 1 would be similar to a southern extension required for Options 2 and 3.
- The extension would be an in situ reinforced concrete box structure with internal dimensions being the same as the existing culvert.
- The cropping of existing wingwalls and the headwall would be undertaken as for underpass.
- New wingwalls and a headwall would be provided as for the underpass.
- A proprietary precast concrete modular box structure would not be appropriate.

In addition the inlet or outlet apron would be constructed from in situ reinforced concrete.

4.6.5 Barthomley Brook Culvert

The main features of Barthomley Brook Culvert are:

- It carries the A500 over Barthomley Brook.
- It is an in situ reinforced concrete box structure with an internal span of 2.0m and an internal height of 2.0m.
- The culvert is aligned square to the A500.
- The fill above the culvert, to the level of the highway, is approximately 0.6m.
- There is no head wall to the culvert and he reinforced concrete wingwalls are splayed at 45°.
- At both entrances a 600mm diameter pipe running parallel with the A500 discharges water into the brook from the east.
- Immediately to the west of the culvert is a 600mm diameter pipe running parallel with the culvert beneath the highway, it is believed that this is a mammal tunnel.

Main Line Options 1 would extend the culvert downstream of the existing, because of the gradient of the natural stream bed the exit details may need special consideration. Main Line Option 2 would extend the culvert upstream of the existing, because of the natural gradient of the stream bed the entry details may require special consideration. Apart from this, an extension to the north would be similar to an extension to the south.

For Main Line Option 3 the culvert lies in the transition zone from widening to the south of the existing main line to widening to the north of the existing main line. The extension to the north would be in the order of 13m whereas that to the south would be approximately 1.5m.

The culvert extension for Main Line Options 1 and 2 would utilise precast reinforced concrete box units. The inlet or outlet aprons would be in situ reinforced concrete, as would the wingwalls.

The northern extension for Main Line Option 3 would similarly utilise precast reinforced concrete box units. The joint between the existing culvert and the northern extension would be very close to or beneath the carriageway, with the low cover there would be a risk of any differential movement causing cracks in the carriageway surface. This risk will be considered in some detail and if appropriate a short in situ concrete section will be designed to minimise the risk.

The southern extension for Main Line Option 3 would be short and current proposals show the joint between the existing culvert and the extension as being beneath the verge. If feasible a precast reinforced concrete box unit would be used for the extension otherwise an in situ concrete extension would be provided.

As with the other main line options the aprons and wingwalls would be in situ reinforced concrete.

4.6.6 Barthomley Road Bridge and Radway Green Road Bridge

The existing and proposed Barthomley Road Bridge and Radway Green Road Bridge are similar and can be considered together. The existing bridges are both three span structures and are described in Section 4.2.5.

All options will require the demolition of the existing bridges.

The proposed bridges will span the two carriageways of the proposed widened A500. Different span arrangements have been considered and are briefly described below:

- Crossing both carriageways in a single span. It is a requirement that traffic be maintained on the A500 at all times. To fulfil this condition and construct a single span over both carriageways would require the provision of temporary mid span supports for the deck beams. There would be the risk that the temporary supports would be impacted and demolished by a vehicle. This risk could be reduced by suitable protection but it could not be eliminated. By rejecting the single span option the risk could be eliminated and so this option was not considered further.
- Providing a support in the central reserve and considering the following span options:
  - 4 spans with a central pier, two side piers and bankseat abutments.
  - 2 spans with a central pier and bankseat abutments.
  - 2 spans with a central pier and full height abutments behind the verges.
  -

On the basis of cost, ease of construction and environmental considerations the 4 span option has been assumed at this stage.

The deck would be continuous with no expansion joints except at the bankseat supports, where a semi integral abutment would be provided. The spans over the A500 would be about 17m and the side spans would be up to 17m depending on the side road vertical alignment. Both steel beams with a reinforced concrete deck and pre-stressed precast concrete beams with a reinforced concrete deck would be suitable for this length of span. It is therefore appropriate to defer a decision on the type of deck until more information is available. If steel girders were to be used weathering steel would be proposed.

The side road options for Barthomley Road are described in section 3.5, those for Radway Green Road are described in section 3.6.In both cases an on line option is being considered.

For all side road options the bridges would be accessed by approach embankments. In most cases the main line would also be in a cut and so the heights of the embankments would depend on the depth of the cut. The lengths of the side spans would be a function of the depth of cut, height of embankment and the vertical alignment of the side road. The proposed four span bridge option is sufficiently flexible to cater for the foreseen variation in each of the side road options.

The side road horizontal alignment options produce crossings varying from the straight to those with significant horizontal curves. Again, the four span bridge option provides sufficient flexibility to cater for the variation amongst the side road options proposed.

It should be noted that pre-stressed concrete beams can only be produced in straight lengths. A curved horizontal alignment would favour a steel girder deck over a concrete beam deck as the steel girders could be shaped to follow the horizontal and vertical alignments of the deck. This is not so with a concrete beam deck, where the deck would have to be over-widened to accommodate the highway curvature or the deck would have to be staggered in a series of straights.

The existing bridges are supported on spread footings and it is anticipated that the proposed bridges would also be supported on spread footings. The existing bridge decks are simply supported, which is an arrangement more tolerant of differential

settlement than a continuous deck. If the differential settlements with spread footings are too large for a continuous deck piled foundations would be provided.

4.6.7 Retaining Walls 1 and 2

Both these walls are at the eastern end of the main line, near the junction with the M6 Motorway. A brief description of each wall is presented in Section 2.4.6. Wall 1 retains the northern cutting slope and Wall 2 retains the southern cutting slope.

Main Line Option 1, the widening to the north, would require the demolition of Wall 1. Because of the proximity to the M6 Junction and the approach alignment it is also likely that Wall 2 would also be demolished.

Main Line Option 2, the widening to the south, would require the demolition of Wall 2. It is unlikely that Wall 1 would be affected, though it is close to the M6 Junction and may be affected by the approach alignment towards the roundabout of the junction.

Main Line Option 3, the hybrid option, would require the demolition of Wall 2. There is the likelihood that the western end of Wall 1 would be affected but the detailed design may be able to avoid this.

Whether or not the demolished walls would be replaced would depend on the available land. It is not anticipated that there would be any technical reasons why the walls could not be replaced, but at this stage it has been assumed that they wouldn't be, and the widened road will be accommodated by normal earthwork cuttings.

There are feasible solutions to construct all of the structures along the scheme, for all the mainline and side road options. In terms of the overbridges and retaining walls, there is no preference for which mainline option is chosen from a structural point of view. In terms of the culverts and underpasses, the preference would be to extend on only one side and not both, and therefore Option 3 is the least preferred option. Therefore, overall Options 1 and 2 are preferred.

Table 4.6 : Structure Rankings

Option 1	Option 2	Option 3
1st	1st	3rd

4.7 Reputation

Overall, the construction of any of the mainline options is likely to enhance the reputation of Cheshire East Council, by removing congestion and providing a free-flowing link. However, the M6 J16 Pinch Point scheme has only recently been constructed, and any significant alterations may give the perception of poor infrastructure planning, and have the potential to damage the reputation of the Council.

The retaining walls are one of the most visible and recognisable aspects of the Pinch Point scheme. As described in Section 4.6 above Option 1 would require the demolition of the retaining wall to the north, which is the longer of the two walls. Option 2 would require the demolition of the retaining wall to the south. Option 3

would require the partial demolition of the retaining wall to the north (approximately 100m at it western end), and the demolition of the wall to the south.

Option 1 is therefore the least preferred option, because the full length of the wall to the north would need to be demolished, and has the potential to cause most reputational damage to the Council. Option 2 is the preferred option because only the shorter southern wall would need to be demolished.

Table 4.7 : Reputation Rankings

Option 1	Option 2	Option 3
3rd	1st	2nd

4.8 Constructability

Jackson Civil Engineering have been appointed to provide constructability advice in relation to the different options. They produced a report 'A500 Dualling and Widening Scheme – Option Construction and Methodology Report No. 1', which identified the various factors that need to be considered in relation to the construction of the scheme, and states which are the preferred options in terms of constructability. Their report is summarised below.

4.8.1 Earthworks Balance

Earthwork quantities have been derived for each of the mainline options. However, LIDAR data has been used as the ground model, and it is considered that it has not accurately modelled the cut and embankment slopes of the existing A500. An attempt has been made to compensate for this by creating a model of the existing A500. The earthwork quantities for each option have then been calculated as the difference between the 'option' model and the 'existing' model.

As a result, it is considered that the derived earthwork quantities will be the correct order of magnitude, but that when determining a preference between the options they should not be given too much weighting because they may not be accurate.

The material excavated on site is assumed to produce material suitable to be re-used as embankment fill (Class 1 and 2), as well as unsuitable fill (Classes 4, U1 and U2), some of which may become suitable if treated.

Option 1 currently shows a shortfall of material, even taking into account treatment of unsuitable fill. It would therefore need materials to be imported to site, which would be expensive. It also requires works in the existing pond at ch.1100, which would involve extra work and costs. Option 1 is therefore the least preferred option.

Option 2 has a surplus of Class 1 and 2 materials. Therefore, costs associated with improving unsuitable fill are avoided. However, it would require the surplus material to be disposed of, preferably on site otherwise disposal costs would be significant.

Option 3 also has a small deficit of Class 1 and 2 materials, and so would require approximately 8,000m^3 of unsuitable material to be improved. However, it has significantly less material to be disposed of compared to Option 2, and therefore Option 3 is the preferred option in terms of earthworks balance.

4.8.2 Embankment Options

The embankment at the western end of the scheme between the A5020 roundabout and Englesea Brook will be constructed in an area of peat. The method of construction in this area could be staged construction, whereby the embankment is built in increments of 1.5m deep, and left for a period of 6 to 9 months between each stage to allow for settlement. An alternative method would be to use piles beneath the embankment.

The preferred method would be to use piles, specifically Controlled Modulus Columns. This would allow a much quicker programme, avoid the costs associated with being on site for longer, and would also avoid the risk of causing the existing A500 embankment to settle.

The area of peat is common to all three mainline options, and so does not differentiate the choice between the options.

4.8.3 Traffic Management

Mainline Options 1 and 2 are very similar with regard to traffic management and the effect upon the public throughout construction. Both Options would employ a simple system of traffic management which will have minimal influence upon the flow of the traffic along the existing A500 carriageway during the course of construction.

The traffic management for Mainline Option 3 would be more complicated, because the existing carriageway crosses the path of the new carriageways. Plant crossings would therefore be required, which would likely consist of manually operated temporary traffic signals. This would have a significant impact on the flow of traffic, and would be an impediment to construction activities, particularly the haul of bulk earthwork materials.

4.8.4 Haul Road at Overbridges

All three mainline options include a widened verge on the new carriageway side, to act as a haul route during construction. At the two overbridges it would be possible to accommodate the haul roads past the structure without demolishing them, but would require traffic management due to its proximity to the existing carriageway. This would go against the methodology of the design, and the principle for providing a widened central reserve, which is to allow the free movement of traffic as much as possible during construction.

Another approach would be to provide ramps up to the side roads, and so the overbridge structures would be avoided. Traffic management would be required on the side roads, which would likely be manned crossings. The best approach in terms of hauling materials would be to demolish the two overbridges early during construction. However, the current approach is to keep the two roads open, and so would require temporary bridges to be put in place at significant cost.

4.8.5 Bridge Options

All of the off-line options are preferred over the on-line Barthomley Road Bridge Option D and Radway Green Road Bridge Option C for the following reasons:

- The likelihood that a temporary bridge access would need to be provided, requiring additional construction activity

- The extra road closures, time and cost involved in constructing, launching, and subsequent removal of the temporary bridges
- The extra work and cost of providing temporary approach roads together with subsequent removal and making good
- The extra TM required.

In terms of sequencing the main line construction there is no preference for which off-line Bridge Option is chosen. The extra construction work required prior to demolish the existing bridges would impact on the start to the new embankment works.

4.8.6 Programme

Options 1 and 2 are preferred, and are estimated to have a 67 week construction programme, assuming that the embankment in the area of peat is constructed using Controlled Modulus Columns. This compares to Option 3 which has a 94 week construction period using the same method of construction.

4.8.7 Retention and Re-use of Existing Carriageway

Options 1 and 2 are preferred for maximising the amount of existing infrastructure that is re-used.

Option 3 loses a significant amount of existing carriageway beneath the proposed central reserve, and a significant amount of existing drainage would need to be abandoned. It would also lead to long lengths of existing carriageway less than 2m wide, where it would be difficult to retain the structural integrity. At the cross-over locations the existing carriageway would need to be re-profiled to suit the cross-fall of the new carriageway. Tying into existing carriageway and drainage infrastructure could lead to unexpected problems if the condition is not as anticipated.

4.8.8 Duckaries Pond

The duckaries pond to the north of the A500 is an area that would present significant construction challenges. The area immediately to the south of the A500 is also in area of potential subsidence so also presents challenging conditions, but not to the same extent as the northern side where it is thought significant subsidence has already taken place. However, this issue has already been taken into account under 'Section 4.3 - Geology, Geomorphology and Ground Conditions', so has not been considered as a factor in this category.

Overall, Option 2 is preferred in terms of its constructability, closely followed by Option 1. Option 2 is preferred because of its earthworks balance but, as noted above, there shouldn't be too great a significance placed on the earthwork quantities due to the inaccuracies of the survey data. Therefore, Options 1 and 2 are considered to be equally preferred. Option 3 is the least preferred.

Table 4.8 : Constructability Rankings

Option 1	Option 2	Option 3
1st	1st	3rd

4.9 Operational Safety

A study of collision data has been undertaken and is described in Section 2.7.

Widening the A500 to a dual carriageway with a central barrier may affect traffic in a number of ways, potentially preventing collisions but also potentially increasing risk in other areas. The central barrier will remove the ability to undertake right turns and U-turns on the A500 from private accesses and lay-bys, preventing a number of collision types. However widening the A500 making it a dual carriageway may inadvertently promote higher speeds, which could result in an increase in loss of control and nose to tail collisions especially on the approach to and on the roundabouts. Further investigations into the PSV value on the roundabouts is required to establish if the surface provides an adequate skid resistance. Additional signing could be introduced to further highlight the roundabouts, especially during the hours of darkness.

These potential operational safety analysis are common to all three mainline options, and so there is not a preferred route.

For further information, see the report no. 'B1832076-OD-10 – Collision Analysis Note'.

Table 4.9 : Operational Safety Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

Cheshire East Council
Highways

PAGE NOT USED

5 Environmental Assessment

5.1 Introduction

This chapter outlines the potential impacts on the environmental topics for the three route alignment options and the two overbridges. The environmental constraints are shown on B1832076_P_1020 in Appendix A and for the full report see 'B1832076-OD-04 – Route Options Environmental Assessment Report'.

5.2 Landscape

5.2.1 Mainline

There is unlikely to be an effect on the green belt designation due to the presence of the existing road in the landscape. No ancient woodland blocks would be affected by the three options.

Options 1 – 3 would result in new earthworks to the north and/or south of the existing road, but these would be of a similar character to existing; therefore all three options would have a neutral effect on topography. Options 1 and 3 would result in the partial loss of the duckaries pond to the north of the existing A500, resulting in an effect on the hydrology, otherwise effects on hydrology would be barely perceptible in the wider landscape. All three options would have an effect on land cover due to the loss of vegetation to the north and/or south of the A500. It is likely that Option 3 would result in the greatest amount of vegetation removal as the widening occurs to both the north and south in some locations, so vegetation would be lost to both sides of the road.

Effects on landscape pattern would be barely perceptible for all three options due to the presence of the existing road in the landscape. All three options would result in an effect on the Barthomley Character Area primarily due to the loss of vegetation, but also the reduction in the 'well wooded' feel of the landscape. Option 3 is likely to result in the greatest change.

The greatest change in views due to Option 1 would be from receptors to the north of the A500. In particular, receptors at Smith's Green to the north of the A500 would experience a large adverse effect due to the loss of vegetation, which would change the character of views and result in taller traffic and road infrastructure being visible. Conversely, the greatest change in views due to Option 2 would be from receptors to the south of the A500. In particular, receptors at Smith's Green to the south of the A500 and at Bluemire Farm would experience a large adverse effect due to the loss of vegetation, which would open up views of the road and taller moving vehicles. Option 3 is likely to result in the greatest change in views because a larger number of receptors would notice a change in their view compared to Option 1 or 2. As for Option 1, receptors at Smith's Green to the north of the A500 would experience a large adverse effect. In addition, there would be a moderate adverse effect on views from Barthomley FP15 , Bluemire Farm and receptors at Barthomley FP18, Daisy Bank Farm and The Alms House, predominantly due to vegetation loss along the road.

5.2.2 Barthomley Road Overbridge

There is unlikely to be an effect on the green belt designation due to the presence of the existing road in the landscape. No ancient woodland blocks would be affected by the three offline bridge options and the fourth of an online bridge option.

Options A, B and D would have a neutral effect on topography as the extent of new earthworks would not be significantly different to the existing bridge. Option B is likely to have the greatest effect on topography as the bridge would form a wider footprint in the landscape, resulting in a slight adverse effect. Options A, C and D would have a neutral effect on hydrology as no features would be affected. Option B would have a slight adverse effect on hydrology as a section of a pond would be lost. Options A – C would have a slight adverse effect on land cover as the new bridge would result in the partial loss of tree belts along the A500 and hedgerow boundaries in adjacent fields. Options B and C are likely to result in the greatest amount of vegetation removal due to the wider footprint of Option B, there is also vegetation loss along Barthomley Road for Option C.

Options A, C and D would have a neutral effect on landscape pattern as the new bridge would not result in a significant change to the adjacent field pattern. However, Option B would alter the size and shape of several fields as it would be located to the east of the existing bridge, resulting in a slight adverse effect. Options A, C and D would have a neutral effect on the Barthomley Character Area due to the localised nature of the changes. Option B would result in a slight adverse effect due to its location further east in the landscape, leading to changes in topography and landscape pattern.

Visual effects for all options would be relatively localised, and Option D would result in only neutral effects due to the use of the existing bridge. Option B is likely to result in the greatest change in views, although some of the changes would be beneficial. Receptors at Smith's Green to the north and south of the A500 are likely to experience a slight beneficial effect due to the bridge and road being located further away. Conversely, receptors at Barthomley FP18, Daisy Bank Farm and The Alms House, at the residential properties on the northern periphery of Barthomley within the Conservation Area, Barthomley FP7 and Barthomley FP6 and, finally, at the residential properties on Radway Green Road west of Barthomley (Fir Tree Cottages, Hungerford Place) and Old Hall Farm would experience a sight adverse effect as the bridge would move closer. Option A would result in a slight adverse effect on views from receptors at Smith's Green to the north and south of the A500, primarily due to vegetation removal being noticeable. Receptors at Smith's Green to the north would experience a similar effect for Option C as for Option A. However, those to the south would experience a moderate adverse effect due to the proximity of new earthworks and vegetation loss along Barthomley Road.

5.2.3 Radway Green Road Overbridge

There is unlikely to be an effect on the green belt designation due to the presence of the existing road in the landscape. No ancient woodland blocks would be affected by the three options.

All options would have a neutral effect on topography as the extent of new earthworks would not be significantly different to the existing bridge. Option B would result in a slight adverse effect on hydrology due to the loss of a small pond east of Radway Green Road, but there would be a neutral effect in the case of Options A and C. There would be limited vegetation removal for Option C, therefore, there would be a neutral effect on land cover. However, Options A and B would result in

vegetation removal along the A500 and the bisection of some hedgerow field boundaries, resulting in a slight adverse effect.

All options would have a neutral effect on landscape pattern as the new bridge would not result in a significant change to the adjacent field pattern. Similarly, all options would result in a neutral effect on the Barthomley Character Area due to the localised nature of the changes.

Visual effects for all options would be relatively localised, and Option C would result in only neutral effects due to the use of the existing bridge. Option B is likely to result in the greatest change in views, as Barthomley FP15 would be crossed by the bridge, resulting in close range views and a moderate adverse effect. There would also be a slight adverse effect on views from receptors at New Farm, Cherrytree Farm, Barthomley FP14 and Barthomley FP25 due to the new bridge being closer, and at Bluemire Farm as vegetation removal and new earthworks would be noticeable. Option A is likely to result in a slight adverse effect on views from Barthomley FP18, Daisy Bank Farm and The Alms House and New Farm, Cherrytree Farm, Barthomley FP14 and Barthomley FP25 in the north due to the new bridge being in closer proximity, residential properties on the northern periphery of Barthomley within the Conservation Area, Barthomley FP7and Barthomley FP6 at Barthomley due to the bridge being closer in views directly north and at Bluemire Farm due to the bridge being visible in relatively undeveloped views.

Table 5.2 : Landscape Rankings

Option 1	Option 2	Option 3
1st	1st	3rd

5.3 Ecology

5.3.1 Mainline

The three main line options all involve widening an existing section of road and therefore the direct impacts are only slightly different.

For the designated site ecological features, the different options are unlikely to have a discernible difference in terms of impacts or likely effects.

Option 1 directly impacts the most habitat features identified, Option 2 impacts the least, and Option 3 impacts an intermediate number, but doesn't impact standing water or broad-leaved semi-natural woodland.

The extent to which each option impacts each habitat features is also not consistent. The key differences primarily relate to the extent that water habitat features are impacted. Option 1 would directly impact two sections of running water and one pond. Option 2 would directly impact two sections of running water and one pond; and Option 3 would directly impact three sections of running water and one pond.

All three options are considered likely to impact all 12 species features identified as potentially present in the survey area. The scale of the impact will be informed by the presence and distribution of the species potentially present. This will be identified in future Phase 2 Ecological Surveys and assessed, and reported, for the preferred option in an Environmental Impact Assessment. At this stage, the likely scale of the impacts has been identified based on the extent and location of suitable

habitats impacted. This has identified key differences in the scale of likely impacts for five of the species features, namely: water vole; bats; amphibians; fish; and white-clawed crayfish.

Although Option 1 requires the removal of a small area of broadleaved semi-natural woodland, the extent of the broadleaved plantation woodland impacted in the centre of the scheme (at a potential key crossing location) under Option 1, would mostly be restricted to one side of the carriageway. Option 2 would be the reverse of Option 1, and would require the removal of a small area of broadleaved semi-natural woodland to the south of the existing carriageway. Although additional mitigation (in the form of connective habitat planting) would be likely to be required, this may allow the retention of a potential bat crossing point in this location. Option 3 would not allow this retention, even on only one side of the carriageway.

Because of the way that the water habitat features are impacted, potential water vole, fish, great crested newts and white-clawed crayfish habitat is impacted to a greater extent by Option 3, than Option 1 or Option 2.

There were fewer ponds identified (8) on the north side of the proposed scheme than on the south side (17) of the scheme. Great crested newts can travel up to 1.3 km from breeding sites but the area up to 500 m from a breeding pond is generally considered the core terrestrial great crested newt habitat. The amount of this area impacted is therefore key to identifying the potential impact to great crested newts.

A Stakeholder Workshop was held on 16th February 2017 (see Section 7) to gain initial views and route option preferences from key stakeholders who will be consulted throughout the development of the scheme design. The Principal Nature Conservation Officer from Cheshire East and the Evidence and Planning Manager from Cheshire Wildlife Trust (CWT) were in attendance. Both indicated a slight preference for widening to the south (Option 2) due to the ecological importance of the duckaries area and associated habitats to the north of the A500, which they advised may support priority wet woodland habitat. Townhouse Wood to the south of the A500 has been identified as a potential Local Wildlife Site, although part of the woodland consists of hybrid poplar plantation. It was also noted after the meeting by CWT that a large area of land to the east of the scheme, adjacent to the southern side of the A500 and west of the M6 has been identified by Natural England as priority habitat. Using aerial photography, CWT concluded that this habitat may be of lower quality than the duckaries and associated habitats and therefore option 2 would lead to a smaller area of semi-natural priority wet woodland lost to the scheme.

These potential areas of priority habitat are unconfirmed and current status would be determined on completion of the full Extended Phase 1 Survey.

5.3.2 Barthomley Road and Radway Green Road Overbridges

It has been assumed that the works required for Radway Bridge Option C and Barthomley Bridge Option D would be relatively close to the existing bridges, and therefore these options are likely to cause the least ecological impact. As such these options have not been further assessed below.

For the designated site ecological features, the different options are unlikely to have a discernible difference in terms of impacts or likely effects.

Radway Bridge Option B and Barthomley Bridge Option C both directly impact the most habitat features identified.

The key difference between the impacts to habitat ecological features associated with the Radway Bridge options and the Barthomley Bridge options relate to the potential impact to standing water. Radway Bridge Option B and Barthomley Bridge Option B would directly impact one pond each. Barthomley Bridge Option C would also impact broadleaved plantation woodland and scattered broad-leaved trees which are not affected by the other Barthomley Bridge Options.

A badger sett has been identified in the vicinity of the southern end of Barthomley Bridge Option B while all three Barthomley Bridge options have the potential to impact the badgers using this sett, the proximity of Option B is likely to cause licensable disturbance.

The loss of mature vegetation near the road as a result of Radway Bridge Option B and all of the Barthomley Bridge options may impact the bats ability to cross the road in these locations. However, if Main Line Option 1 is chosen, the additional vegetation clearance (in this key location) required to facilitate Barthomley Bridge Option C is likely to be minor.

The impact to water vole, amphibians, and white-clawed crayfish as a result of Radway Bridge Option B or Barthomley Bridge Option B is likely to be higher than other options due to the loss of a pond.

No other differences between the two Radway Bridge options or the three Barthomley Bridge Options were identified.

Table 5.3 : Ecology Rankings

Option 1	Option 2	Option 3
2nd	1st	2nd

5.4 Cultural Heritage

5.4.1 Mainline

None of the route options would result in substantial harm to any designated assets identified in the study area.

As no designated assets are located within the footprint of any of the route options, the proposed scheme would not have a physical impact on any of the assets identified in this assessment.

The construction of the three route options may have an impact on the setting of 15 designated assets through either noise and or visual intrusion due to the proximity of the route to these assets. Most of these assets are located to the south of the proposed scheme within the village of Barthomley which has been designated as a Conservation Area, and includes one Grade I Listed Building, two Grade II* Listed Buildings and 8 Grade II Listed Buildings. There is one further Grade II listed building located to the south of the scheme, west of Barthomley Conservation Area. There are also two Grade II assets located to the north of the proposed scheme.

During construction of any of the three route options there is the potential for adverse noise impacts associated with the construction traffic. There is also the potential for visual intrusion as a result of the removal of existing trees and vegetation to facilitate the construction of the new carriageway. These would be limited to the construction phase, as the new carriageway would be 'cut in' and sunk at lower levels than the heritage assets, thus removing its wider visibility and construction traffic would vacate the site once the construction phase has been completed. The construction phase of any of the three Options may also have an impact on archaeological remains which are present below ground, as the scheme would involve additional land take to the north or south of the existing carriageway. Thus the excavation works would cause physical damage to any buried archaeological remains, if present. The potential discovery of significant unknown archaeological remains poses a risk to the scheme.

No impacts are predicted to occur to the remaining 30 designated assets identified in this assessment during both the construction and operation phase. This is due to the fact that these assets are located a significant distance from all three route options (beyond 500m) and existing trees, vegetation and/or structures between the assets and the proposed scheme, prevent open views to the proposals.

During operation, Option 1 would bring traffic and its associated visual, noise and air quality impacts closer north to two Grade II listed buildings (Mill Farm and Cherry Tree Farm) which may affect the setting of these listed buildings during the operation of the scheme. Option 2 would move traffic and its associated visual, noise and air quality impacts further south and in closer proximity to Barthomley Conservation area, its associated listed buildings and a Grade II Listed Building, Town House Farm to the west of Barthomley Conservation Area. Option 3 would move traffic further south at the eastern and western ends of the scheme and traffic would be moved north in the central section of the scheme. Option 3 would therefore have fewer air, noise and visual impacts on the setting of Barthomley Conservation Area than Option 2, but more impact than Option 1. Option 1 would therefore have the fewest effects on the assets identified within the study area, however due to the relatively small difference in the distances between these assets and the three route options, the level of difference between these effects would be relatively small.

Table 5.4 : Cultural Heritage Rankings

Option 1	Option 2	Option 3
1st	3rd	2nd

5.4.2 Barthomley Road Overbridge

None of the three options for Barthomley Road Overbridge scheme would have a substantial harm to any designated assets identified in this assessment. There would potentially be temporary noise and visual intrusion to six assets during construction. There are not considered to be any significant impacts during operation.

5.4.3 Radway Green Road Overbridge

For all of the bridge options, the construction phase has the potential for temporary noise and visual impacts on 13 assets. During operation, all of the bridge options have the potential to impact on 7 assets, although they would be replacing the existing bridge and so the significance of the impact would be reduced.

5.5 Air Quality

5.5.1 Mainline

For the assessment of air quality effects due to the three route options, the location of sensitive receptors has been considered, in terms of impacts from construction and operation.

Construction phase impacts are unknown at this stage. There is likely to be dust related impacts to residential areas close to the widening works, which would be the same for all three options. However this impact would be minimised with the adoption of best practice measures.

During operation it is expected that for each of the route options, the same number of air quality receptors would experience a minor adverse impact as a result of increased traffic flowing closer to the residential receptors as the result of the dualled carriageway. Dualling is also likely to increase daily average speed due to the reduction in congestion, which could have an adverse impact on air quality within 200m of the road. There are approximately nine properties within 200m of the road that would potentially be affected.

Existing air quality conditions are assumed to be good due to the open, rural location and it is considered very unlikely that any of the three dualling options would result in concentrations of any pollutant equal to or exceeding any the Air Quality Objective level of 40 µg/m³ for nitrogen dioxide.

Table 5.5 : Air Quality Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

5.5.2 Barthomley Road and Radway Green Road Overbridges

The existing air quality conditions would not be affected by the overbridge options. Therefore all the options would have a neutral effect on air quality.

5.6 Greenhouse Gases

5.6.1 Mainline

All three dualling options would increase embedded carbon (as significant construction works would be required) and reduce efficiency (as vehicle speed is expected to increase, which would increase fuel per vehicle/km). This would be the same for all three alignment options and would cause a slight adverse effect. There would be no beneficial impacts to offset these adverse impacts, such as an increase in public transport.

Table 5.6 : Greenhouse Gas Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

5.6.2 Barthomley Road and Radway Green Road Overbridges

For the overbridge options it is assumed that the alteration to the existing bridge (namely Barthomley Road option D and Radway Green option C), would require less construction and therefore less new materials. As a consequence, less embedded carbon would be required. Therefore, there would be slight less greenhouse gas created by the construction of these options.

A detailed assessment of carbon production due to the construction of the preferred option would be carried out as part of the air quality assessment.

5.7 Noise and Vibration

5.7.1 Mainline

For the assessment of noise and vibration effects due to the three route options, the location of sensitive receptors has been considered, in terms of impacts from construction and operation.

For each proposed route widening option, where the route would be widened to the north, traffic would move closer to properties located on the northern side of the existing road. Where the route would be widened to the south, traffic would move closer to properties located on the southern side of the existing road. However, each route option has a similar number of sensitive receptors within 100m of the proposed scheme as the receptors are at broadly similar distances for each of the three options. There is likely to be very little difference in terms of construction and operation noise impact between the three route options due to the close proximity of the sensitive receptors on either side of the road.

Table 5.7 : Noise and Vibration Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

5.7.2 Barthomley Road Overbridge

Option A would have a minor reduction in noise levels from vehicles for Cyprus Cottage, Poppy Cottage and Yew Tree Cottage as the overbridge is moved further away from these properties. Jasmine Cottage and Smith's Green Cottages would experience no change in noise levels.

For Option B, Cyprus Cottage, Poppy Cottage and Yew Tree Cottage, Jasmine Cottage and Smith's Green Cottages would experience a reduction in noise levels as the overbridge is moved further east away from these properties.

There would be a minor increase in noise experienced for Duchy House as overbridge is moved closer towards this property.

Option C would have no change in noise levels for nearby properties.

The widening of the existing overbridge, Option D is unlikely to have a significant impact existing noise levels.

There would be no significant changes in noise levels for properties affected by any of the overbridge options.

5.7.3 Radway Green Road Overbridge

Option A would provide a slight reduction in noise for Bluemire Farm as the road would be located further west, away from the property.

There would be a negligible reduction in noise for Bluemire farm for Option B, as the bridge will be moved slightly east.

Option C, to widen the existing overbridge, is unlikely to have a significant impact on existing noise levels.

There would be no significant changes in noise levels for properties affected by any of the overbridge options.

5.8 The Water Environment

As the scheme progresses to the next stage, assessments will be undertaken to determine the requirements for attenuating the rate of flow from the new highway drainage systems, and for treating water to improve its quality before discharge into receiving watercourses. It is likely that a vegetative treatment system will be incorporated into the design to attenuate and treat the flow, and at this stage it has been assumed that attenuation ponds will be provided either side of Englesea Brook and to the east of Barthomley Brook, as shown on plans B1832076_P_1045 to 1047 in Appendix G. The requirement would be the same for all three options, and so there is no preference in relation to this aspect. The pond at Barthomley Brook may present some engineering difficulties, because of the steep sided slopes on either side, but the problem is not considered to be insurmountable, and is common to all options. For further details see report no. 'B1832076/OD/12 - Drainage Strategy Report'.

The three existing watercourses will be crossed by each of the three widening options. All of the proposed route options would require the same types of construction activities; there are no activities that are unique to one of the Route Options. In addition, all the Route Options would involve construction works and operational activities that would affect the same watercourses. To cross these watercourses, the existing culverts would be extended to the north for Option 1 and the south for Option 2. For Option 3, the unnamed tributary culvert would be extended south, Englesea Brook's culvert would be extended to the north and south, and Barthomley Brook's culvert would be extended to the north. As a result, Option 3 is the least favourable option as it would involve extending Englesea Brook's culvert to the north and south. Potential slight adverse effects to water quality and geomorphology are likely to result from these construction works.

The construction of all three options would involve constructing the carriageway on land designated as Flood Zone 3 with a 1 in 100 or greater annual probability of river flooding. Englesea Brook has the widest floodplain of the three watercourses that are crossed by the A500. This would have a moderate adverse effect on floodplain storage for all three options.

All three of the route options would require areas of cut. The quality of the water within any aquifers present could be adversely impacted during construction as a result of accidental spillages during such earthworks. Groundwater supply may also

be affected if the works require dewatering. During operation, any discharges to groundwater could also have an adverse impact on these aquifers. However, with appropriate mitigation in place adverse impacts during construction and operation are unlikely to occur.

Table 5.8 : Water Environment Rankings

Option 1	Option 2	Option 3
1st	1st	3rd

5.9 Effects on All Travellers

5.9.1 Vehicle Travellers

With the introduction of any of the route options, traffic flow would improve along the A500. The scheme would reduce congestion, thereby creating a beneficial impact on driver stress due to overall reductions in driver frustration and fear of accidents.

As the existing route is predominantly in cutting, it is unlikely that there will be any change to drivers' views from the road for any of the widening options.

Once operational, the scheme is anticipated to improve traffic flows along the A500, which would improve journey times for public transport services. As a result it is anticipated that the scheme would have a slight beneficial effect on public transport.

5.9.2 Non-motorised Users

Option 1 would widen the existing route to the north and would impact on a number of sections of footpath adjacent to the north of the existing route. The footpaths affected would be Barthomley FP4, Barthomley FP17, Barthomley FP18 and Barthomley FP25.

Widening to the south of the existing route for Option 2 would impact on a number of sections of footpath adjacent to the south of the existing route. The footpaths affected would be Barthomley FP15, Barthomley FP7, Barthomley FP33, Barthomley FP17 and Barthomley FP4.

For Option 3 where there would be proposed widening to sections to the north and south, this would sever the following footpaths: sections of Barthomley FP4 adjacent to the south and north of the existing route alignment; a section of FP17 north of existing route alignment; and a section of FP15, south of the existing route alignment.

None of the widening options would have an impact on regional cycle route 70.

To improve safety for NMUs, Barthomley FP4, FP17 and FP18, which currently have at grade uncontrolled crossings, will be diverted over the closest preferred overbridge option to provide a safer route to cross the A500.

Table 5.9 : Effects on All Travellers Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

5.9.3 Barthomley Road and Radway Green Road Overbridges

Regional cycle route 70 would require diverting over the preferred Barthomley overbridge option once this has determined.

The widening of the A500 and its bridges would lead to long term significant beneficial effects for Non-Motorised Users (NMUs) as a result of improvements to Public Rights of Way (PRoW) connectivity, improved safety and improved amenity throughout the study area.

5.10 Community and Private Assets

5.10.1 Mainline

During construction, there would be no change to the level of community severance between the surrounding communities as the existing A500 would stay open whilst the widened section would be constructed offline. There may be disruptions to traffic flow whilst the new alignment is tied into the existing road network.

Overall, all three route options are expected to relieve congestion on the A500, thereby improving the ease of access to each of the nearby communities. During the construction and operation of any of the route options, there would be no loss of land used by the community.

None of the route options would require the demolition of any private properties or have any impacts on access to private properties during construction. However, Option 2 would require an area of land take from the garden of Bluemire Farm, and is the only residential property directly impacted by any of the proposed options. Permanent agricultural land take would be required for all three options. Options 1 and 3 are therefore considered to have a neutral effect on private properties. Option 2 is considered to have an adverse impact on private properties.

None of the route options would require the demolition of any commercial properties. There are currently no areas of land designated for development adjacent to the proposed route options.

Each of the three route options would have a long-term significant effect on agricultural land. A full agricultural assessment would be carried out at the next stage of assessment for the preferred route option. The assessment would be used to determine the exact effect of the proposed scheme on the Agricultural Land Classification (ALC) grades, determine the use of each field, current and future access to fields, gates and tracks that may be affected and consult with the farmers to gain their views and suggestions.

Potential agricultural effects not considered at this stage include disruption to field drainage (both in ditches and piped) and the potential effects of the contractor's compound, temporary diversion routes during construction, construction site drainage, dust etc. These would be addressed at the preferred route assessment stage.

Option 2 is therefore the least preferred option, based on the impact it has on Bluemire Farm.

Table 5.10 : Community and Private Asset Rankings

Option 1	Option 2	Option 3
1st	3rd	1st

5.10.2 Barthomley Road Overbridge

The four options are unlikely to have any major impacts on community assets as access will be maintained between communities.

All four options would have an effect on agricultural land, with option two having the largest agricultural land take. The agricultural assessment would determine the full extent of this impact for the preferred bridge option.

5.10.3 Radway Green Road Overbridge

The three options are unlikely to have any major impacts on community assets as access will be maintained between communities.

All three options would have an effect on agricultural land. The agricultural assessment would determine the full extent of this impact for the preferred bridge option.

5.11 Planning

5.11.1 Mainline

The layout of the proposed scheme will need to reflect the following planning and environmental constraints in order to be compatible with the policies of the Crewe and Nantwich Local Plan and national planning policy.

It is extremely important to demonstrate that the proposed route represents the practical option that minimises the impact of the development on the openness of the Green Belt. The scheme must also minimise any impacts on the setting of nearby Conservation Areas and Listed Buildings.

Table 5.11 : Planning Rankings

Option 1	Option 2	Option 3
Equal	Equal	Equal

5.11.2 Barthomley Road and Radway Green Road Overbridges

Within the planning policy context set out above, a range of overbridge options are potentially acceptable, subject to the requirement to preserve the openness of the Green Belt as far as it is possible to do so.

6 Ranking Summary and Scoring

6.1 Ranking Summary

A summary of the rankings outlined in Section 4, and rankings of the cost estimate ranges in Section 3, are shown in Table 6.1 below.

Element	Option 1	Option 2	Option 3
Scheme Cost Estimate*	Equal	Equal	Equal
Topography and Land Use	Equal	Equal	Equal
Geology, Geomorphology and Ground Conditions	3rd	1st	2nd
Departures from Standards	Equal	Equal	Equal
Public Utilities	3rd	1st	2nd
Structures	1st	1st	3rd
Reputation	3rd	1st	2nd
Constructability	1st	1st	3rd
Operational Safety	Equal	Equal	Equal
Landscape	1st	1st	3rd
Ecology	2nd	1st	2nd
Cultural Heritage	1st	3rd	2nd
Air Quality	Equal	Equal	Equal
Greenhouse Gases	Equal	Equal	Equal
Noise and Vibration	Equal	Equal	Equal
The Water Environment	1st	1st	3rd
All Travellers	Equal	Equal	Equal
Community and Private Assets	1st	3rd	1st
Planning	Equal	Equal	Equal

Table 6.1: Ranking Summary

* Given that there is a significant overlap between the options' cost estimate ranges, they are considered to be equal.

It is clear that overall Option 3 is the least preferred option. It is not the preferred option in any category, except where it is equally preferred with another option. It has a number of disadvantages compared to the other options, including creating areas where trees and vegetation are removed on both sides of the A500, and introducing crossings of the construction site over the A500, which creates problems for the flow of construction and highway traffic. Option 3 will therefore now be discounted and not taken forward for further assessment.

The clear choice is between Options 1 and 2, and these are taken forward for direct comparison in the section below.

6.2 Scoring

Options 1 and 2 are shown together in Table 6.2 below. Their ranks have been adjusted to reflect the fact that Option 3 has been discounted – they are now ranked 1st, 2nd, or equal.

Each ranking has now also been given a corresponding score, using the following points scoring system;

- 1st Ranking – 2 points
- 2nd Ranking – 1 points
- Where the options are ranked equally, they are both given a score of 2 points

These are the 'unweighted' scores, and have been summed to give an overall score and ranking, as shown on the left hand side of Table 6.2.

Weighting has also been assigned to each assessment element so that the relative importance of each could be established, i.e. so that the factors considered most important had a larger influence on the overall assessment.

The weighting for each element is shown in the central column of Table 6.2, and an explanation of the weightings is given in Section 6.3 below the table. The unweighted scores are multiplied by the weighting, to give the weighted scores as shown in the columns on the right hand side of Table 6.2.

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	Equal (2)	Equal (2)	**1**	2	2
Topography and Land Use	Equal (2)	Equal (2)	**1**	2	2
Geology, Geomorphology and Ground Conditions	2rd (1)	1st (2)	**2**	2	4
Departures from Standards	Equal (2)	Equal (2)	**0.5**	1	1
Public Utilities	2rd (1)	1st (2)	**1**	1	2
Structures	Equal (2)	Equal (2)	**0**	0	0
Reputation	2rd (1)	1st (2)	**0.5**	0.5	1
Constructability	Equal (2)	Equal (2)	**1**	2	2
Operational Safety	Equal (2)	Equal (2)	**1**	2	2
Landscape	Equal (2)	Equal (2)	**0.4**	0.8	0.8
Ecology	2rd (1)	1st (2)	**0.4**	0.4	0.8
Cultural Heritage	1st (2)	2rd (1)	**0.2**	0.4	0.2
Air Quality	Equal (2)	Equal (2)	**0.2**	0.4	0.4
Greenhouse Gases	Equal (2)	Equal (2)	**0.2**	0.4	0.4
Noise and Vibration	Equal (2)	Equal (2)	**0.2**	0.4	0.4
The Water Environment	Equal (2)	Equal (2)	**0.4**	0.8	0.8
All Travellers	Equal (2)	Equal (2)	**0.2**	0.4	0.4
Community and Private Assets	1st (2)	2rd (1)	**0.6**	1.2	0.6
Planning	Equal (2)	Equal (2)	**0.2**	0.4	0.4
OVERALL	**2nd (34)**	**1st (36)**		**2nd (18.1)**	**1st (21.2)**

Table 6.2 : Option Comparison Rankings and Scores

The assessments undertaken in this report show that 'Option 2 – Widening to the South' is the preferred option.

6.3 Explanation of Weighting

It should be appreciated that assigning weighting to the assessment elements is subjective. The weighting system has been developed so that the factors considered by the Project Team to be most important in delivering the project and achieving the scheme objectives are given a higher weighting to reflect their relative importance. All assessment elements have been given a weighting score of between 0 and 2.

Scheme Cost Estimate has been given a weighting of 1. All of the options will provide very similar financial benefits, and so a lower cost scheme will improve its value for money. However, it's noted that the Scheme Cost Estimates are also very similar for each option, and so it is not a differentiating factor.

Topography and Land Use has been given a weighting of 1. The impact of including additional land owners in the scheme could be significant in terms of the land acquisition process, particularly for residential properties.

Geology, Geomorphology and Ground Conditions has been given a weighting of 2. From an engineering perspective, one of the most significant features along the route is the duckaries pond. Anecdotally it is thought to have provided a significant challenge during the construction of the original A500. It is therefore an important factor and has been given a weighting of 2.

Departures from Standards has been given a weighting of 0.5. A road designed fully to standards is likely to provide the safest standard of road. However, there are not expected to be any major Departures from Standards for any of the mainline options.

Public Utilities has been given a weighting of 1. There are some significant utilities that cross the scheme, and could result in significant costs and delay.

Structures has been given a weighting of 0. There are not considered to be any significant technical challenges in providing the structures, so this shouldn't be a factor in determining between the options.

Reputation has been given a weighting of 0.5. Although the reputation of the Council and the perception of the public are important, it is only a temporary matter, to be managed by the Council, and is therefore not given as much weighting as other more important factors.

Constructability has been given a weighting of 1. All of the mainline options are considered to be feasible in terms of their construction, and so shouldn't be a factor in determining between the options. However, this element also takes programme into consideration, and this is an important factor in limiting the disruption to drivers and local residents.

Operational Safety has been given a weighting of 1. Safety is an important factor. However, all route options will be designed to current standards, which indicates that operational safety will not likely be an issue. In addition, there is already a category for Departures from Standards with a weighting of 0.5.

The remaining ten assessment elements are collectively classed as **Environmental Impacts**. These elements have all been given weightings, so that collectively Environmental Impacts has a weighting of 3. The collective weighting of 3 reflects

the fact that collectively the Environmental Impacts are considered a key factor in the assessment. It is considered that;

- Community and Private Assets is the most important environmental factor, because it takes into account the impact on property, and in particular Bluemire Farm which is the closest property to the scheme. It has therefore been given a weighting of 0.6.

- 'Ecology', 'The Water Environment' and 'Landscape' follow as the next most important environmental factors. They have been given a weighting of 0.4.

- The other Environmental Impacts are considered to have equal importance and so have been given a weighting of 0.2 to bring the overall weighting of Environmental Impacts to 3.

6.4 Score Weightings Sensitivity Analysis

A sensitivity analysis has been undertaken on the weightings, and is included in Appendix H. In the analysis, the weightings applied in Table 6.2 above have been altered based on alternative scenarios, as described in the appendix.

The analysis shows that in most scenarios Option 2 is always the preferred option. There is one scenario where Option 1 is the preferred option, and that is where the two elements in which it scores best ('Cultural Heritage' and 'Community and Private Assets') are given a weighting of 2. In this scenario Option 1 is the preferred option by a margin of only 0.1.

There is an argument for giving the 'Community and Private Assets' element a weighting of 2, because it takes into consideration the impact on Bluemire Farm. However it is not considered to be appropriate to give the 'Cultural Heritage' element a score of 2, given that the Barthomley Conservation Area and the listed buildings in Barthomley are some distance away from the road.

7 Consultations

7.1 Consultations on the Options

A number of consultations have been held from December 2016 to March 2017, in order to get feedback from key stakeholders.

Only two of the mainline options were taken for consultation, 'Option 1 – Widening to the North' and 'Option 2 - Widening to the South', because Option 3 was discounted for the reasons given under Section 6.1. All of the bridge options for Barthomley Road Bridge and Radway Green Bridge were also taken for consultation.

7.1.1 Meeting with Highways England

Highway England are the highway authority for M6 J16, the M6, and the A500 to the east of M6 J16. They are therefore a key stakeholder, and any change to the flow of traffic as a result of this scheme will affect the trunk road network.

A meeting was held with Highways England on the 12th December 2016. Overall they are supportive of the scheme, and had no preference for either of the two mainline widening options.

7.1.2 Meetings with Land Owners and Tenants

Meetings have been held with a number of landowners and tenants along the scheme who would be directly affected by the proposed options. The focus has been to meet with owners and tenants who have land on both sides of the A500, who therefore would be affected by Option 1 and Option 2. There are some farm tenants along the scheme who have not been consulted, but they have land on only one side of the A500 so it is assumed that their preference would be for the road to be widened on the opposite side.

There was no clear consensus from these consultations in relation to the preferred mainline option, as shown in the table below.

Option 1 - Widening to the North	Option 2 – Widening to the South	No preference
Preference of landowners and tenants who were consulted		
3	1	3
Assumed preference of farm tenants but with land on one side, but who were not consulted		
1	2	0
TOTAL		
4	**3**	**3**

Table 7.1: Preferred Mainline Option of Landowners and Farm Tenants

With regard to the bridge options, there was a clear consensus from the farm tenants who would be directly affected by the different options. The preference was

for the bridges to be replaced on their existing alignments, because of the impact that the other options would have on farm land.

7.1.3 Stakeholder Workshop

The Key Stakeholders Workshop was held on 16th February 2017 at Cheshire East Council's offices at Delamere House in Crewe. The following people were invited;

Stakeholder	Attendance
Local Enterprise Partnership	Unable to attend
Natural England	Unable to attend
Cheshire Wildlife Trust	Attended
Sustrans	Unable to attend
Shell	Chose not to attend
Little Chef	Chose not to attend
Travelodge	Chose not to attend
Freight Transport Association	Unable to attend
Barthomley Parish Council representative	Attended
Weston and Basford Parish Council representative	Attended
Barthomley Action Group	Attended
Chamber of Commerce and Industry – South Cheshire	Unable to attend
Ramblers Association	Attended
Cheshire East Local Access Forum	Unable to attend (views were represented by the CEC Countryside Access Development Officer)
Cheshire Association of Local Councils	Unable to attend, but a follow up meeting was arranged
CEC Countryside Access Development Officer	Attended
CEC Flood Risk Manager	Unable to attend
CEC Nature Conservation Officer	Attended
CEC Environment Lead / Landscape specialist	Attended
CEC Planning Policy & CIL Manager	Attended
CEC Environmental Protection & Air Quality officer	Attended
CEC Project Sponsor	Attended
Jacobs Project Manager	Attended
Jacobs Highway Engineer	Attended

Table 7.2: Stakeholder Workshop Invitees

A range of views were expressed at the workshop, with some people preferring mainline Option 1, and others Option 2. Reasons given for preferring Option 1 were that it would be further away from Barthomley village, so have less impact on the landscape as viewed from the village, and less impact on the conservation area. From an ecological point of view, it was said that Option 2 was slightly preferred,

because it would avoid the duckaries pond and have slightly less impact on the area along Englesea Brook.

With regard to the bridge options, there was a consensus that the preferred options were for Barthomley Bridge and Radway Green Bridge to be replaced on their existing alignments.

Generally, people were supportive of the scheme.

7.1.4 Parish Council Briefings

The Project Team attended a Barthomley Parish Council meeting on 14th March 2017, and a Weston & Basford Parish council meeting on 16th March. They provided a briefing on the scheme, and took plans of mainline Option 1 and Option 2, and plans of all the bridge options.

The parish councils were generally supportive of the scheme.

7.2 Other Comments Raised During the Consultations

The following comments were also raised during the consultations;

- There was a widely held view that people would not want to see development in the local area as a result of the road widening scheme.
- Several people independently said that difficult ground conditions were encountered at the duckaries pond during the construction of the original A500 road. It was said that a significant amount of material was imported to site for this area, and that the pond was very deep.
- The duckaries pond is valued as an amenity by local people, and as an ecological feature by Cheshire Wildlife Trust and CEC's Nature Conservation Officer.
- The Englsea Brook corridor is valued as an ecological feature by Cheshire Wildlife Trust and CEC's Nature Conservation Officer.
- There was a concern that there would be rat running on the local road network during the construction of the road widening, because of congestion caused by traffic management on the A500, and because of deliveries to the site.
- There was a concern about the impact caused by removing the well-established trees alongside the A500, on whichever side the road was to be widened. In particular, the impact on views and noise levels from Barthomley if the widening is to be to the south.
- The local footpath network should be given appropriate consideration during the design of the road widening scheme
- The central reserve width shown on the option plans seemed to be quite wide.

- Access over the bridges would need to be maintained during construction to access farm land on both sides

- Appropriate road surfacing materials and noise fencing to be included in the design, to minimise noise impacts.

- It was asked if the bridge parapets could be designed in a way that was more sympathetic to the local environment, compared to the existing parapets.

7.3 Consultations Summary

The people involved in the consultation exercise were generally supportive of the scheme.

Overall there was no consensus on the preferred mainline option. There was a consensus on the bridge options; the on-line options for Barthomley Bridge and Radway Green Bridge were preferred.

A number of other comments were raised during the consultations, and these will be taken into consideration as the scheme design is developed. Further consultations will take place as the scheme is progressed.

8 Conclusion

Based on the findings from this report, it is considered that all three of the mainline options are viable solutions, and deliverable from an engineering perspective. The estimated scheme cost is not considered to be prohibitively expensive for any of the options.

The engineering and environmental assessments show that 'Option 3 – Hybrid' is clearly the least preferred option. The decision between 'Option 1 – Widening to the North' and 'Option 2 – Widening to the South' is a finely balanced one, but the assessments conclude that Option 2 is the preferred option.

Consultations were undertaken with selected stakeholders on Option 1 and Option 2. There was no consensus on which is the preferred option. Therefore, the results from the engineering and environmental assessments are not contested, and Option 2 will be taken forward as the preferred option.

All of the options for the replacement of Barthomley Road Bridge and Radway Green Road Bridge are considered to be viable, and deliverable from an engineering perspective.

The engineering assessment identifies certain advantages with the off-line options during the construction period. However, consultations with selected stakeholders show that there is a clear consensus that the on-line bridge options are preferred. Therefore, 'Barthomley Road Bridge – Option D' and 'Radway Green Road Bridge – Option C' will be taken forward as the preferred options.

A number of other comments were raised during the consultations, and these will be taken into consideration as the scheme design is developed.

Cheshire East Council
Highways

Page Not Used

Cheshire East Council
Highways

Appendix A – Constraints Plan

Drawing number / Rev

B1832076/P/1017, W1

N

M6 JUNCTION 16

THADION HOUSE

RADWAY GREEN ROAD OVERBRIDGE

JASMINE COTTAGE

SMITH'S GREEN COTTAGES

BARTHOMLEY ROAD OVERBRIDGE

BLUEMIRE FARM

CYPRUS, YEW TREE & POPPY COTTAGES

BARTHOMLEY BROOK CULVERT

BARTHOMLEY

Barthomley

ENGLESEA BROOK NORTH CULVERT

BRINE SUBSIDENCE
BEDROCK UNDERLYING THE AREA IS THE WILKESLEY HALITE MEMBER AND SIDMOUTH MUDSTONE.THE MUDSTONE HAS BEEN REPORTED TO CONTAIN NODULES OF GYPSUM. THUS NATURAL DISSOLUTION LIKELY. THE SITE IS REPORTED AS A BRINE SUBSIDENCE AFFECTED AREA BY THE COAL AUTHORITY AND IS LISTED ON THE GAZETTEER.

ENGLESEA BROOK UNDERPASS

UNDER BRIDGES
ROAD COLLAPSE DUE TO INCREASED OVERBURDEN ON BRIDGES.

A5020 WESTON ROAD

A531 NEWCASTLE ROAD

PEAT
MAJOR STABILITY AND SETTLEMENT ISSUES EXTENDING UP TO 12m DEEP

HEAD DEPOSITS
UNSURE IF PRESENT.
IF PRESENT,UNIT LIKELY TO CONTAIN LOTS OF SHEAR ZONES SO CONSTRUCTION WORKS FOUNDED ON THIS MATERIAL ARE LIKELY TO BE UNSTABLE.

NOTES:

1. All dimensions are in meters, unless stated otherwise.

NOTES:

- OS Base Plan
- M6 Junction 16 Pinch Point Scheme
- M6 Junction 16 Pinch Point Retaining Wall
- Footpath
- Cycle Route - R70
- Watercourses and Waterbodies
- Historical Landfill
- Listed Building (Grade): I, II, II*
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Ancient semi-natural woodland
- Ancient replanted woodland
- Local conservative areas
- Environment Agency - Flood Zone
- Subsidence feature

0 100 200 300 400 500

SCALE 1 : 5000

W1	07/04/2017	DRAFT - FOR INFORMATION	EL	JH	DT	DT
W0	02/12/2015	DRAFT - FOR INFORMATION	PS	SS	DT	SK
Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME OVERALL CONSTRAINTS PLAN

Drawing status: FOR INFORMATION

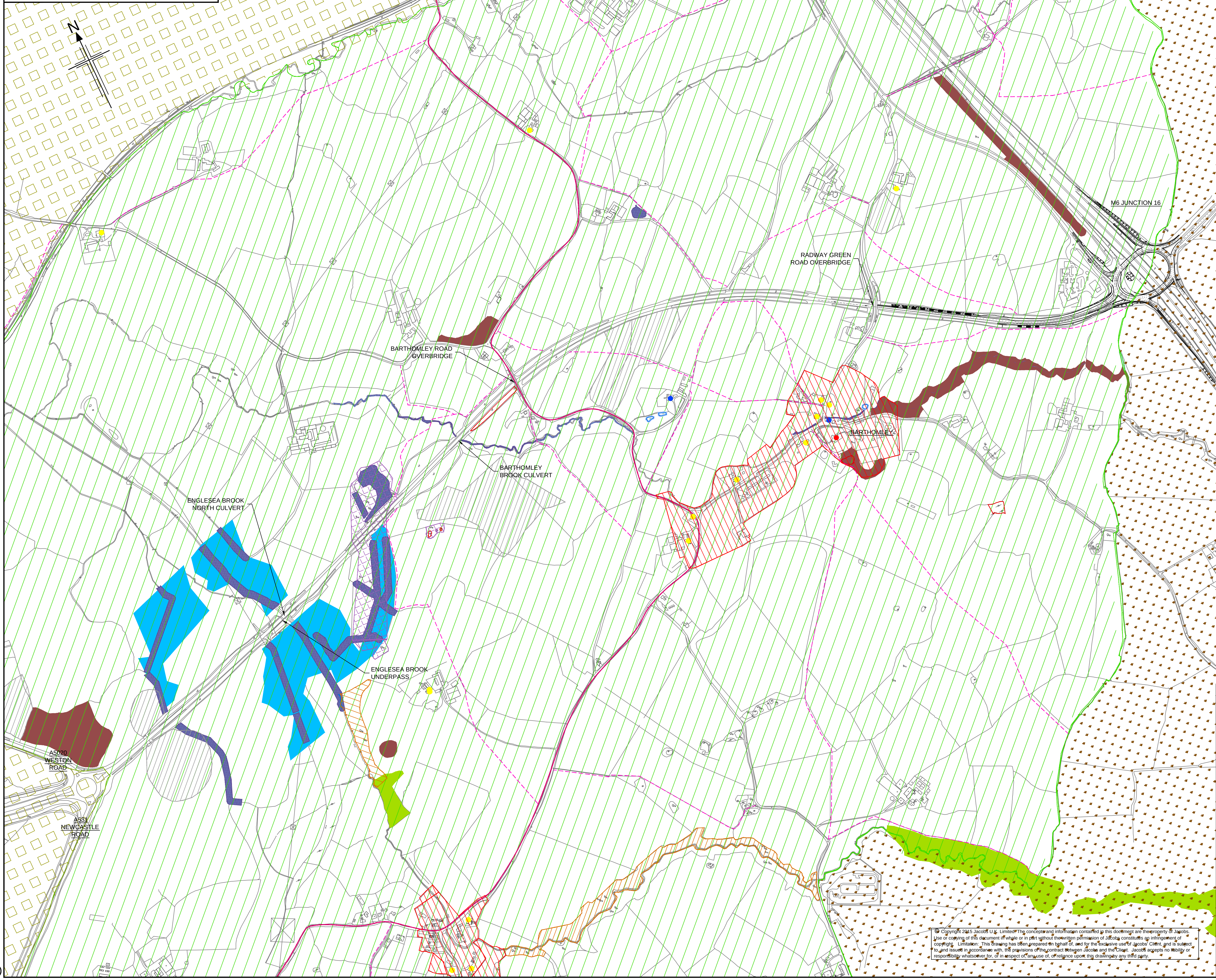
Scale	1:5000	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1017 Rev: W1

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1020, W0



NOTES:

1. All dimensions are in meters, unless stated otherwise.

LEGEND:

- OS Base Plan
- M6 Junction 16 Pinch Point Scheme
- M6 Junction 16 Pinch Point Retaining Wall
- Listed Building (Grade): I, II, II*
- Landfill - Inert
- Ancient Clay Farmlands
- Green Belt
- Lower Farms & Woods
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Ancient semi-natural woodland
- Ancient replanted woodland
- OS Surface ater features
- OS Surface water feature areas
- Local conservation areas
- Environment Agency - Flood Zone
- Buildings
- Public Rights of Way
- Regional Cycle Route

0 100 200 300 400 500

SCALE 1 : 5000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	02/12/2015	DRAFT - FOR INFORMATION	PS	SS	DT	SK

JACOBS®

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME ENVIRONMENTAL CONSTRAINTS PLAN

Drawing status

FOR INFORMATION

Scale	1:5000	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1020 — Rev: W0

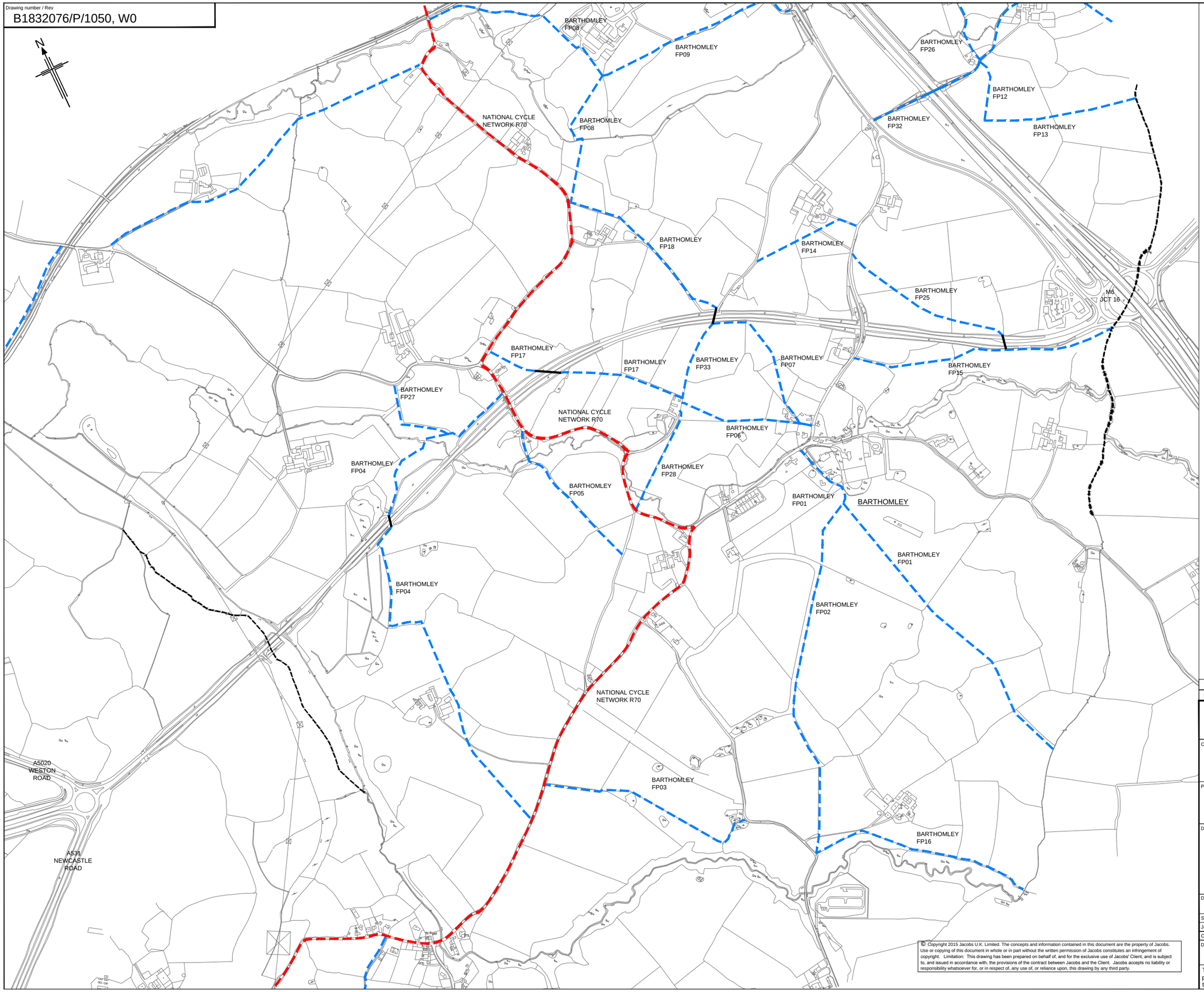
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Cheshire East Council
Highways

Appendix B – Public Rights of Way Plan

Drawing number / Rev

B1832076/P/1050, W0



NOTES:

1. All dimensions are in meters, unless stated otherwise.

LEGEND:

- Parish / district boundary
- Footpath
- Cycleway
- At-grade uncontrolled crossings

0 100 200 300 400 500 m

SCALE 1 : 5000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	30/03/2016	FIRST ISSUE	KH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
PUBLIC RIGHTS OF WAY

Drawing status: FOR INFORMATION

Scale	1:5000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1050 Rev: W0

Cheshire East Council
Highways

Appendix C – General Arrangement Plans

Drawing number / Rev

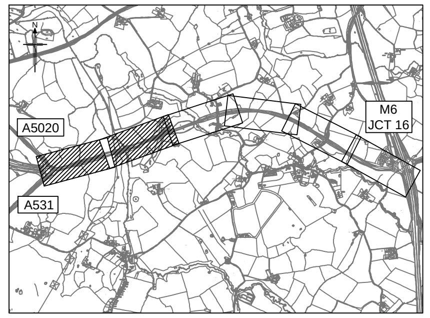
B1832076/P/1003, W2

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS®

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME GENERAL ARRANGEMENT OPTION 1: NORTH - SHEET 1 OF 3

Drawing status

FOR INFORMATION

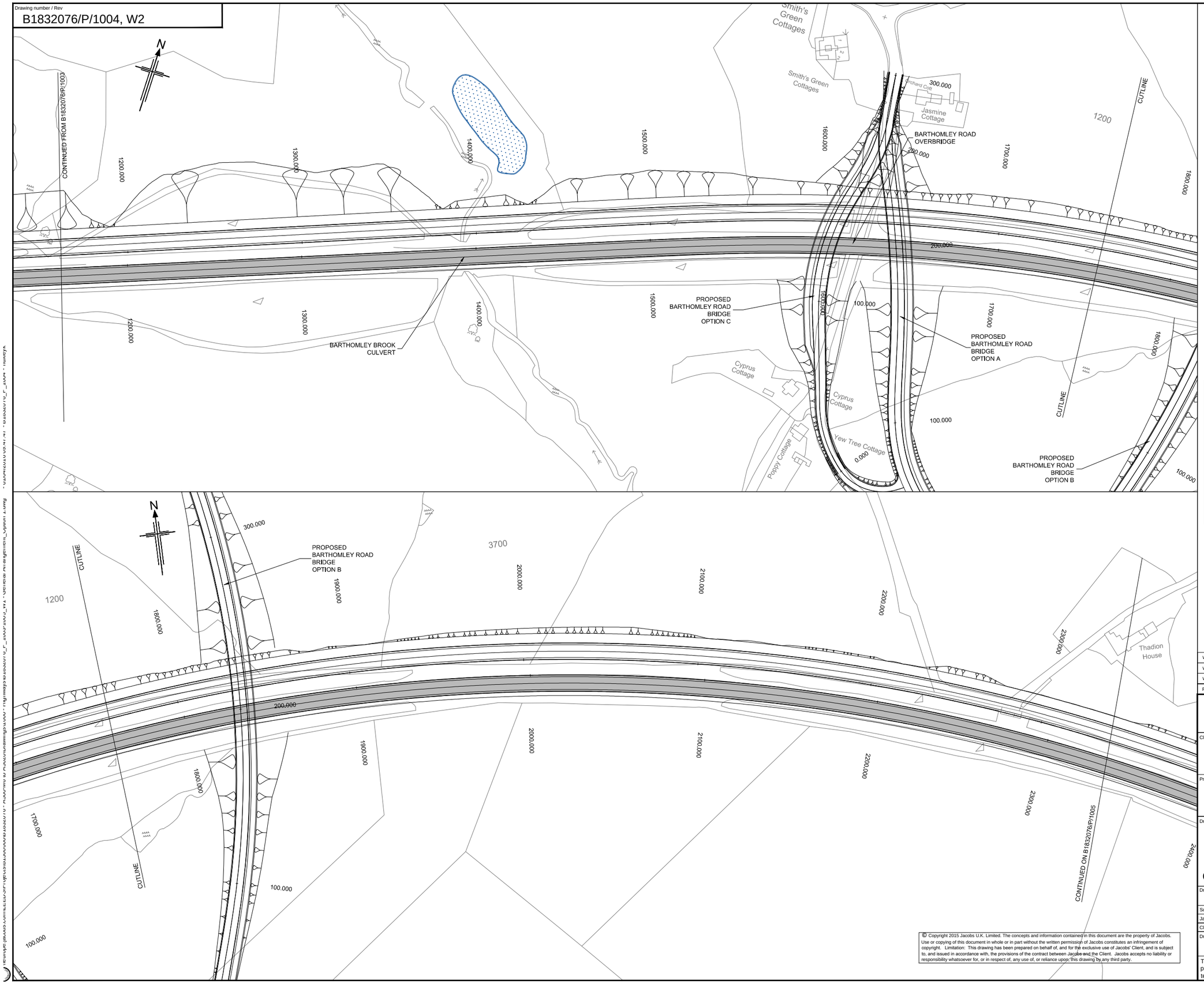
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1003 Rev: W2

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1004, W2

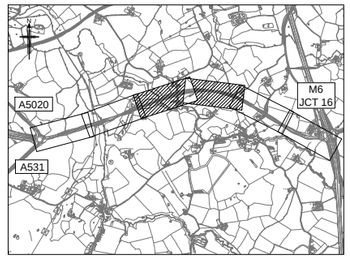


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 1: NORTH - SHEET 2 OF 3

Drawing status: FOR INFORMATION

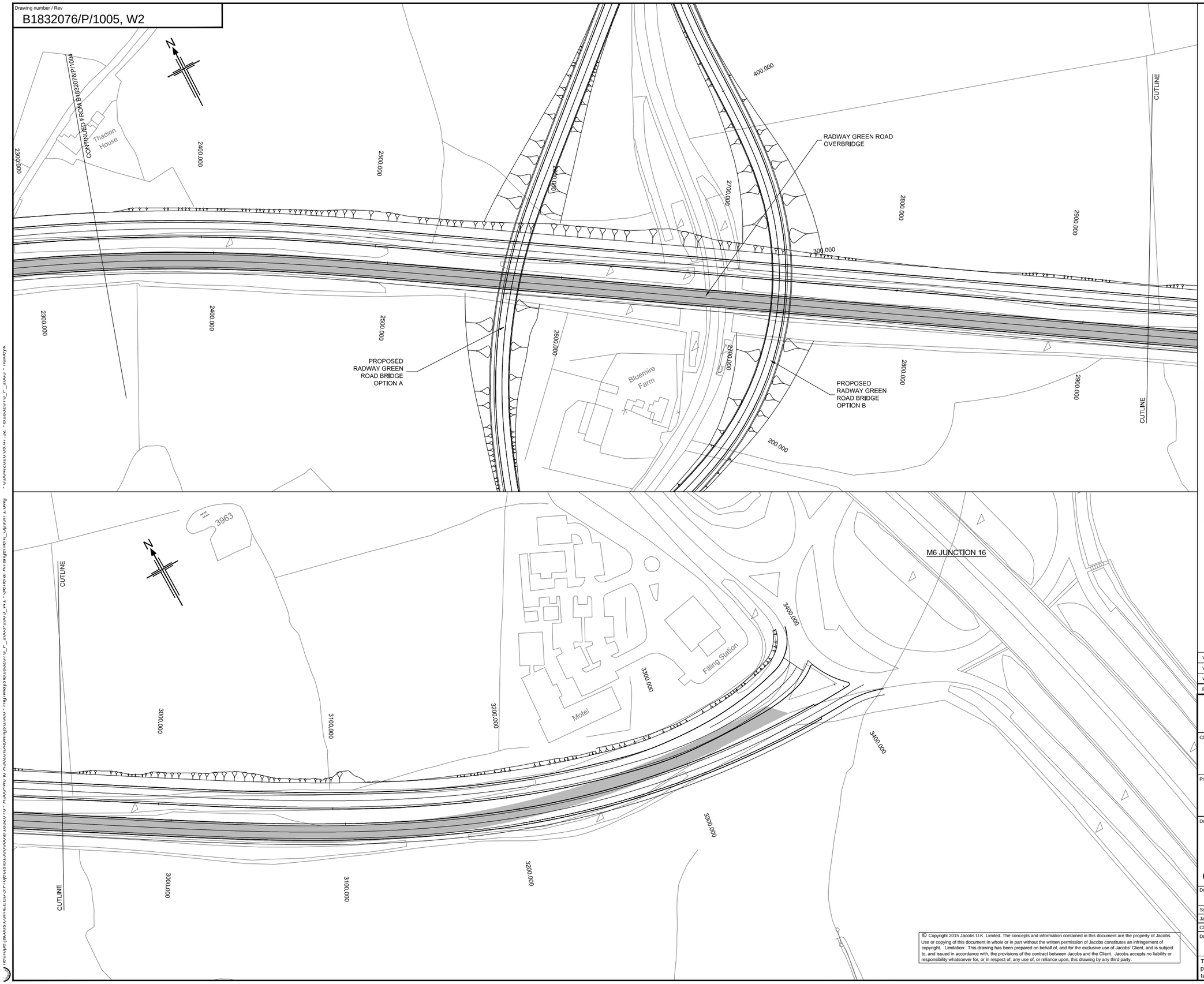
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1004 Rev: W2

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1005, W2

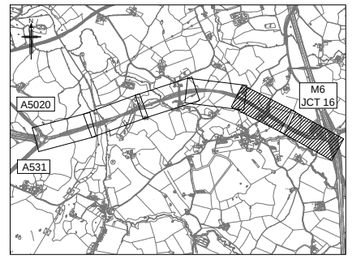


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 1: NORTH - SHEET 3 OF 3

Drawing status: FOR INFORMATION

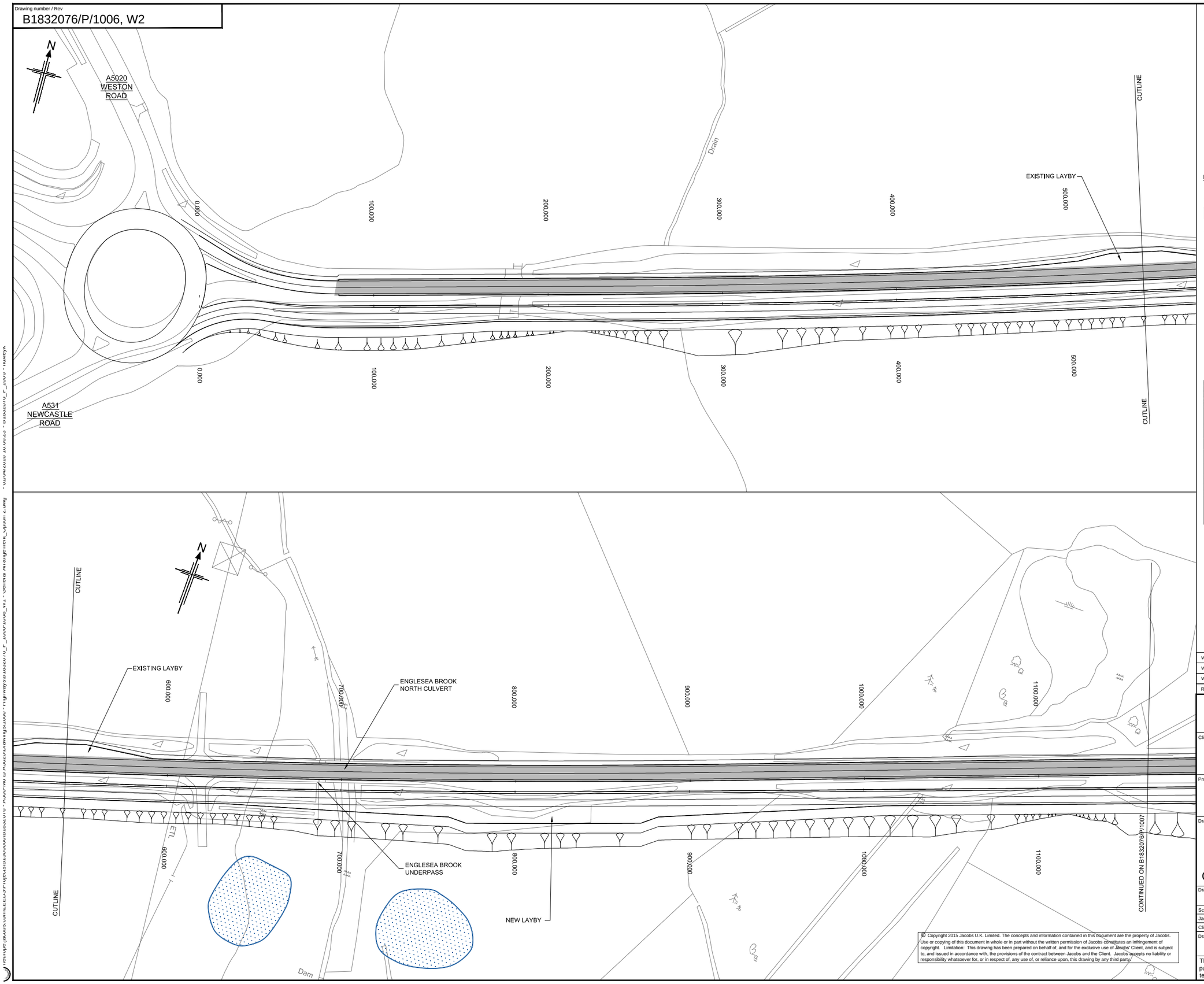
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1005 Rev: W2

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1006, W2

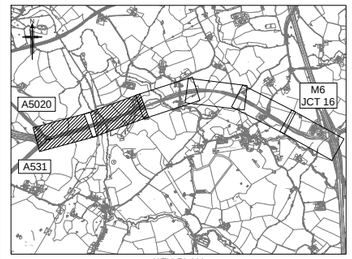


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Revd	Apprvd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 2: SOUTH - SHEET 1 OF 3

Drawing status: FOR INFORMATION

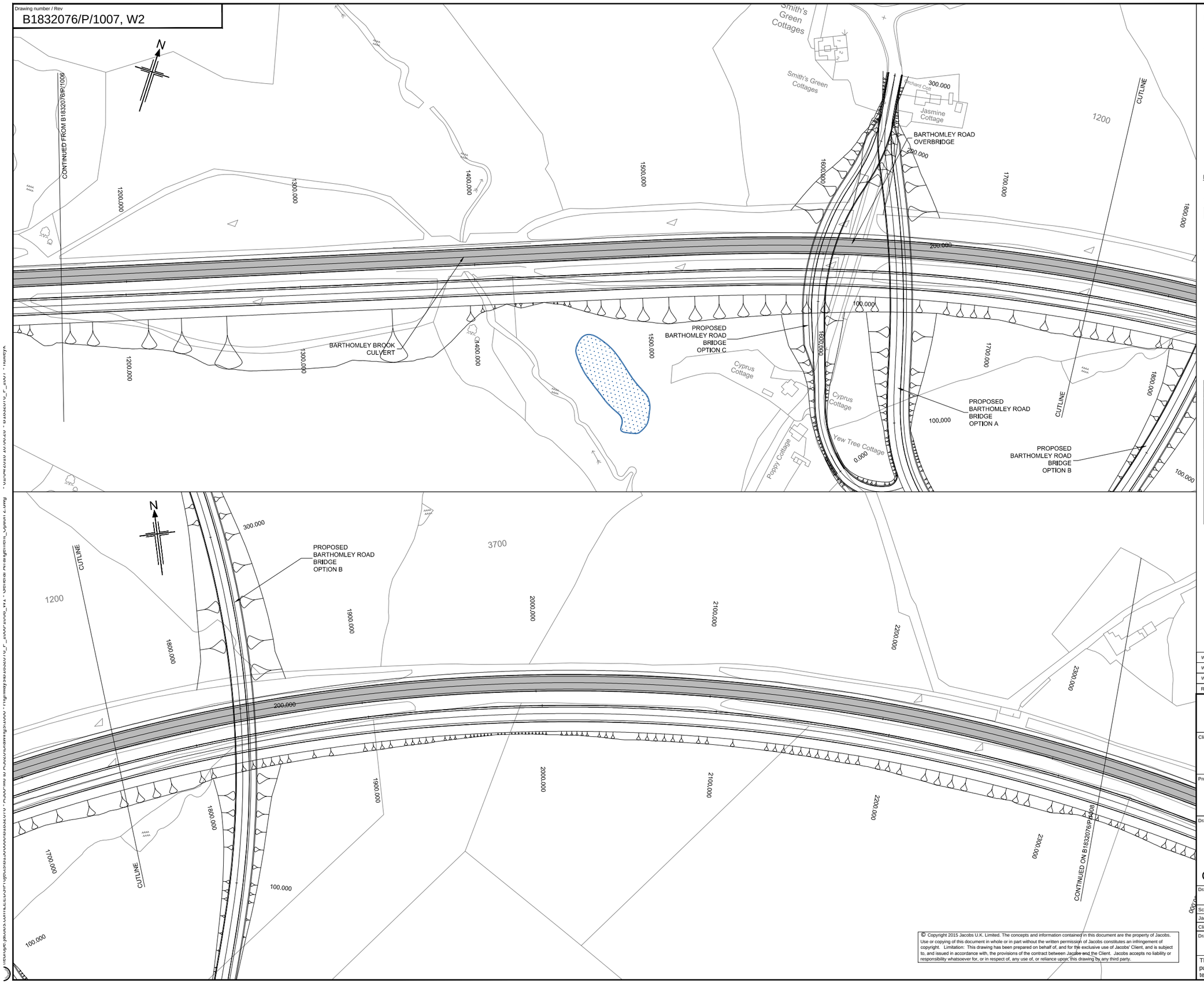
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1006 Rev: W2

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1007, W2

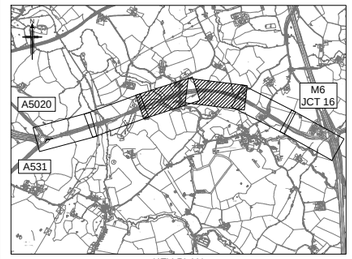


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 2: SOUTH - SHEET 2 OF 3

Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

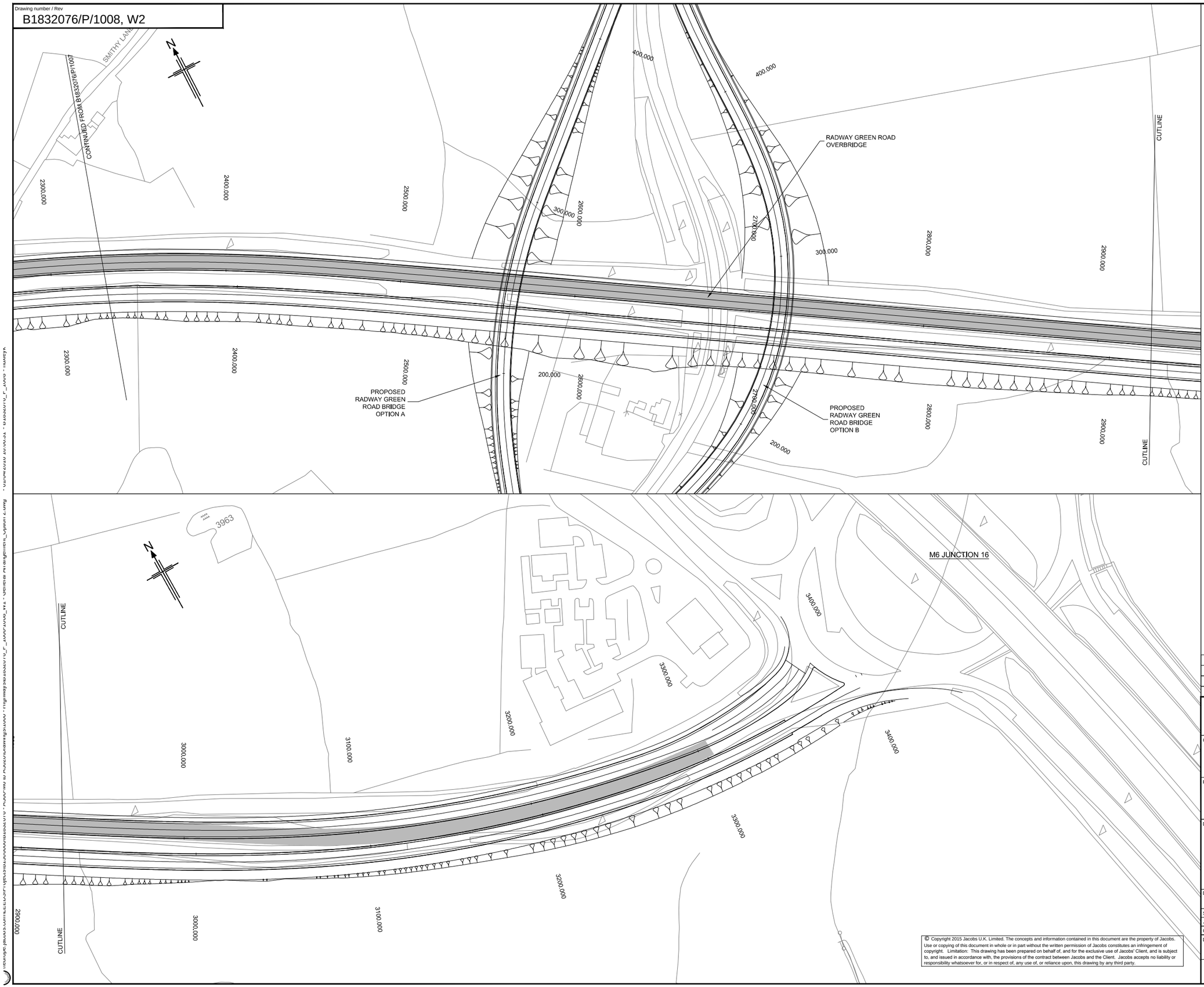
Drawing number: B1832076/P/1007

Rev: W2

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1008, W2

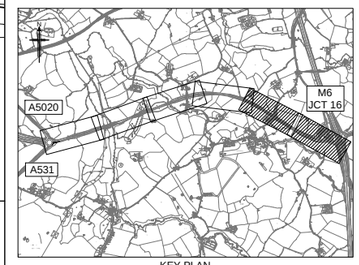


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W2	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W1	21/01/2016	REVISED - FOR INFORMATION	BS	KJH	DT	SK
W0	18/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 2: SOUTH - SHEET 3 OF 3

Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1008 Rev: W2

Drawing number / Rev

B1832076/P/1009, W1

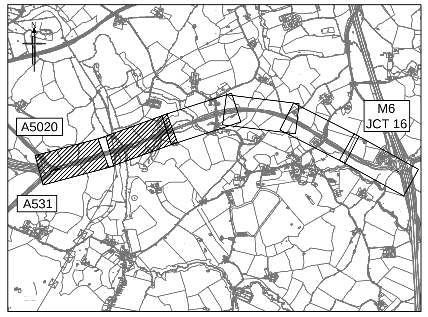
NOTES:

1. All dimensions are in meters, unless stated otherwise.

2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W1	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME GENERAL ARRANGEMENT OPTION 3: HYBRID - SHEET 1 OF 3

Drawing status

FOR INFORMATION

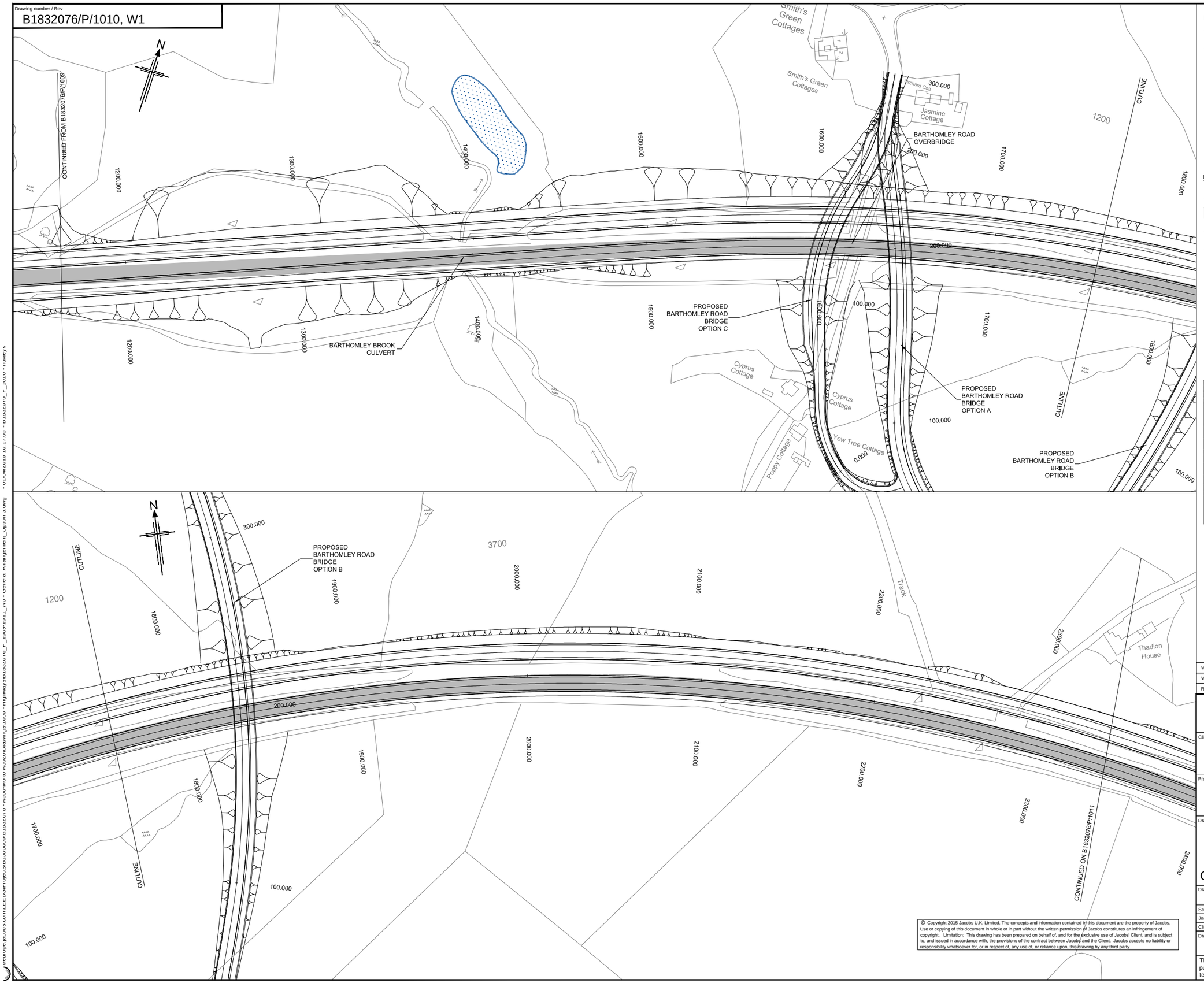
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1009 | Rev: W1

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1010, W1

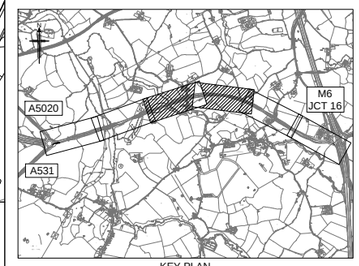


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W1	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 3: HYBRID - SHEET 2 OF 3

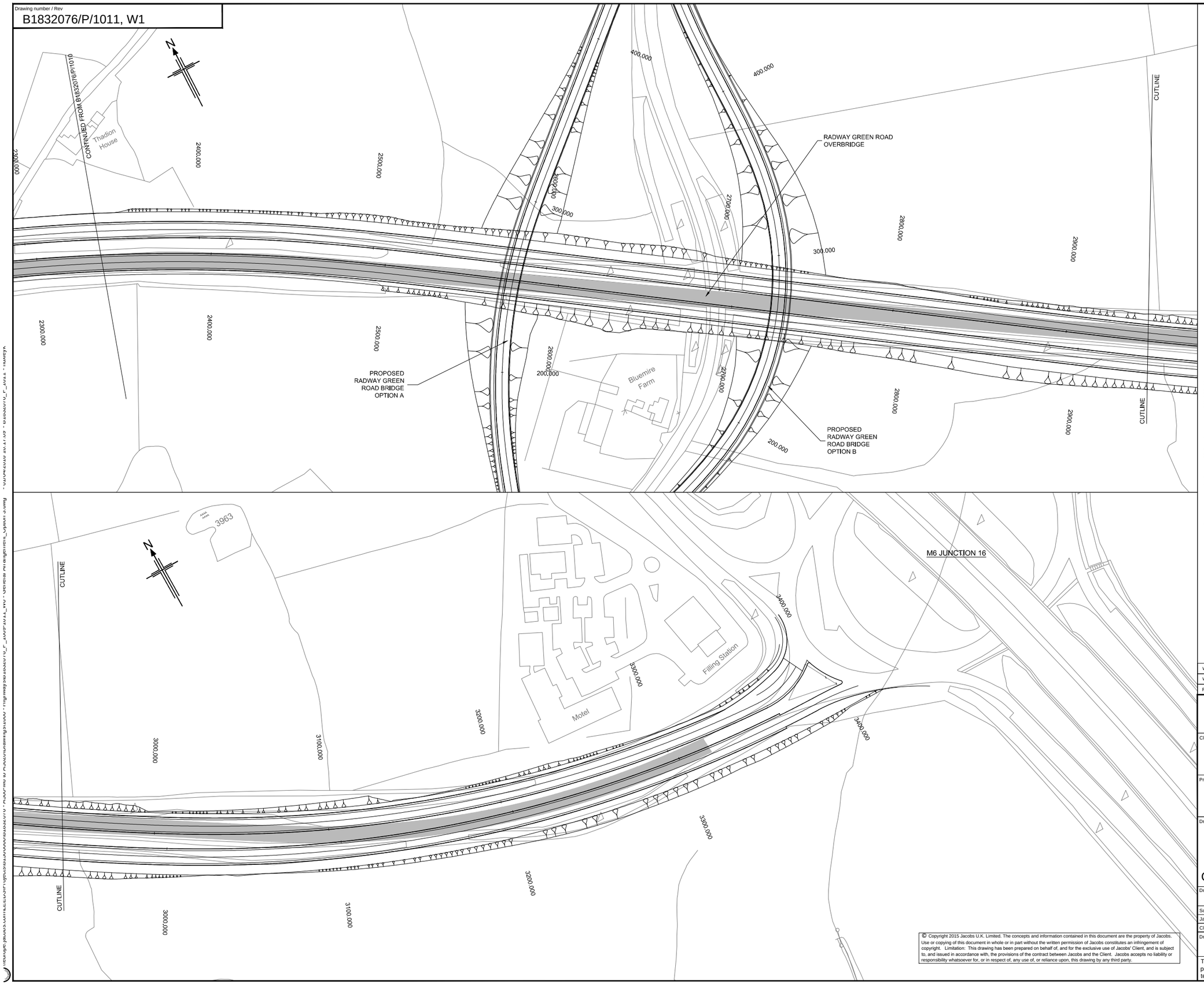
Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1010 Rev: W1

Drawing number / Rev

B1832076/P/1011, W1

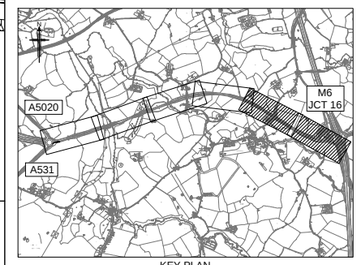


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1012 - General Arrangement Barthomley Option A
   - Dwg No. B1832076/P/1013 - General Arrangement Barthomley Option B
   - Dwg No. B1832076/P/1014 - General Arrangement Barthomley Option C
   - Dwg No. B1832076/P/1015 - General Arrangement Radway Green Option A
   - Dwg No. B1832076/P/1016 - General Arrangement Radway Green Option B

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway
- Proposed Attenuation Ponds



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W1	18/03/2016	ADDITION OF PROPOSED PONDS & BRIDGE OPTIONS RENAMED	KJH	DT	DT	SK
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
OPTION 3: HYBRID - SHEET 3 OF 3

Drawing status: FOR INFORMATION

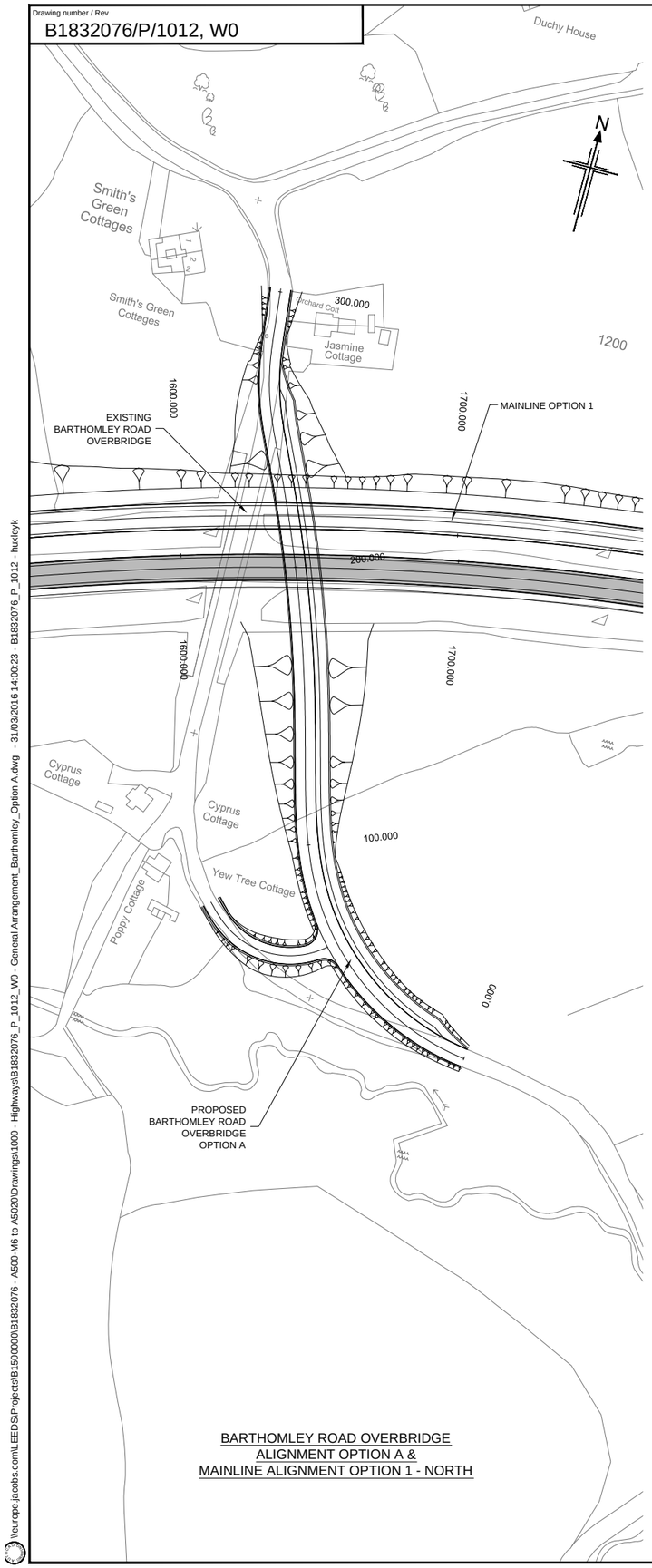
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1011

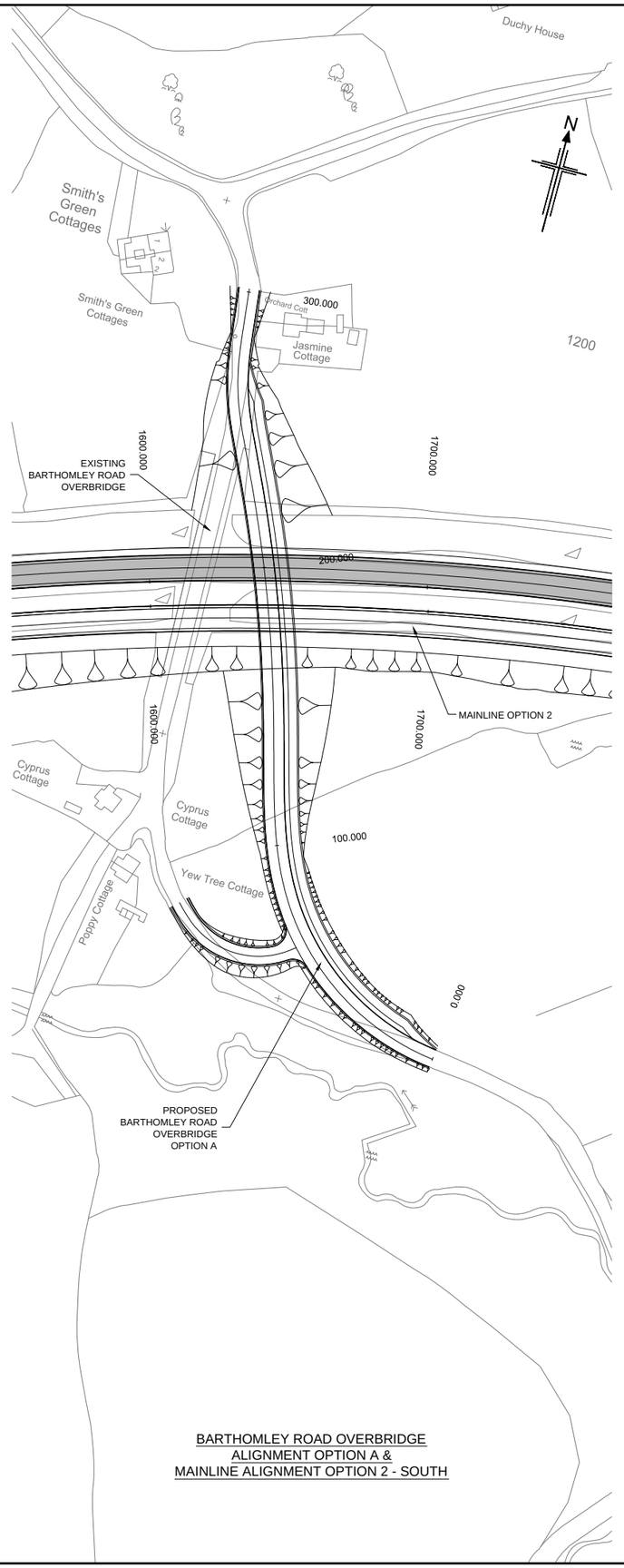
Rev: W1

Drawing number / Rev

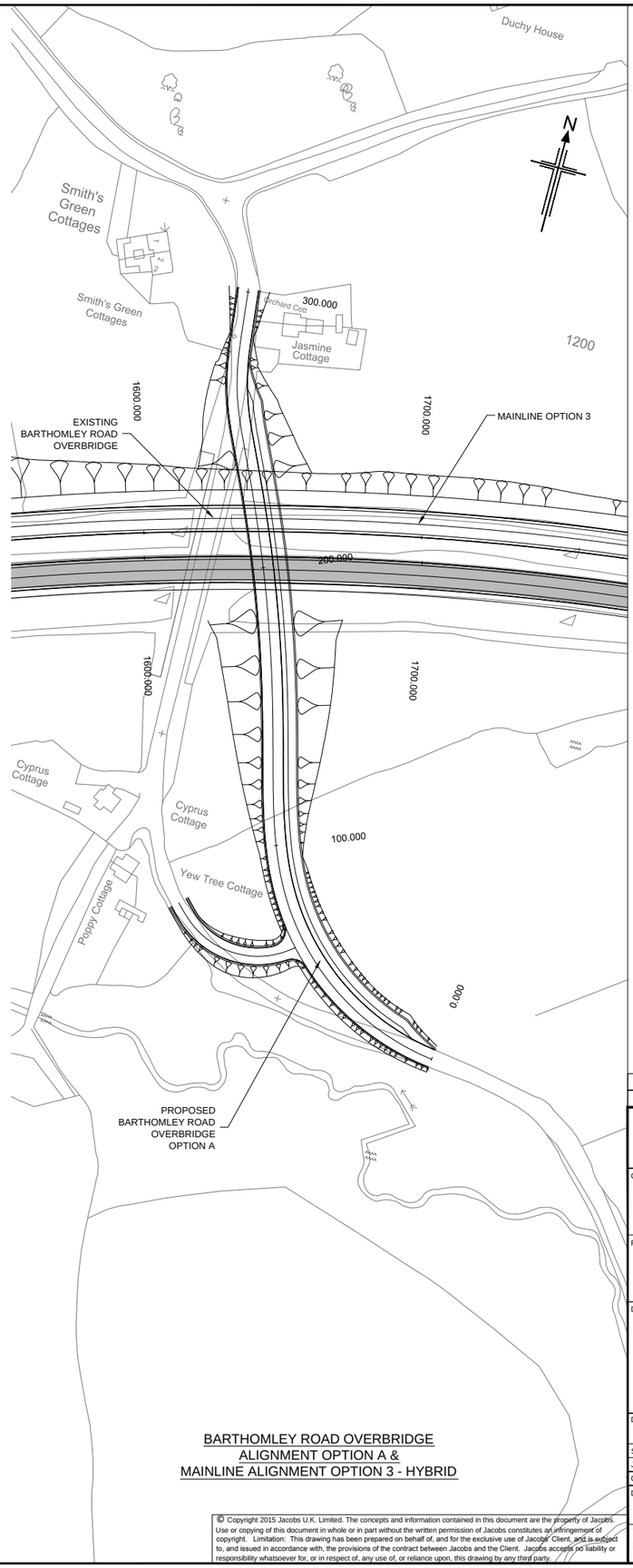
B1832076/P/1012, W0



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 1 - NORTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



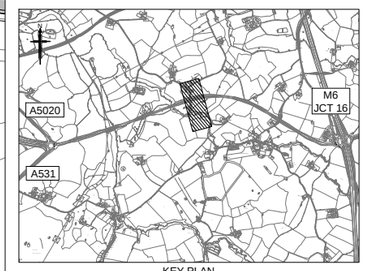
BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
BARTHOMLEY OPTION A

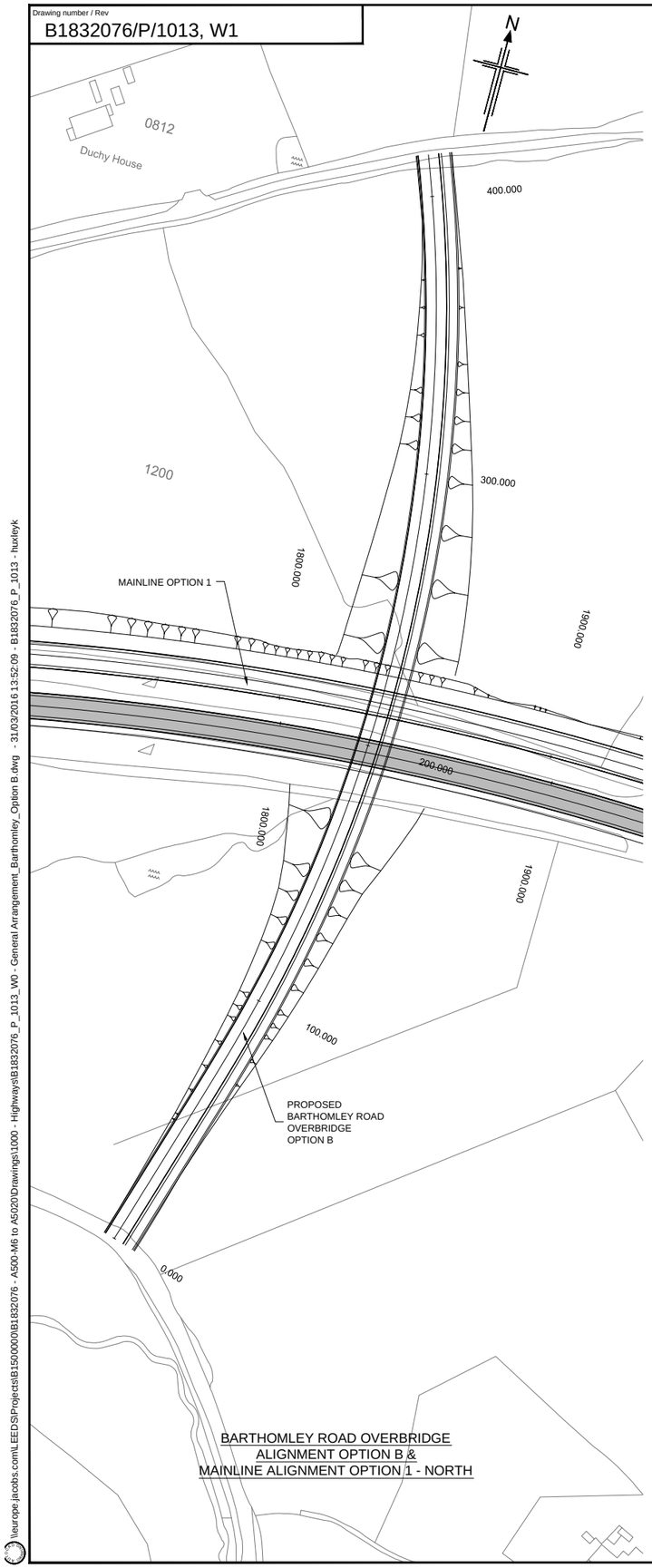
Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

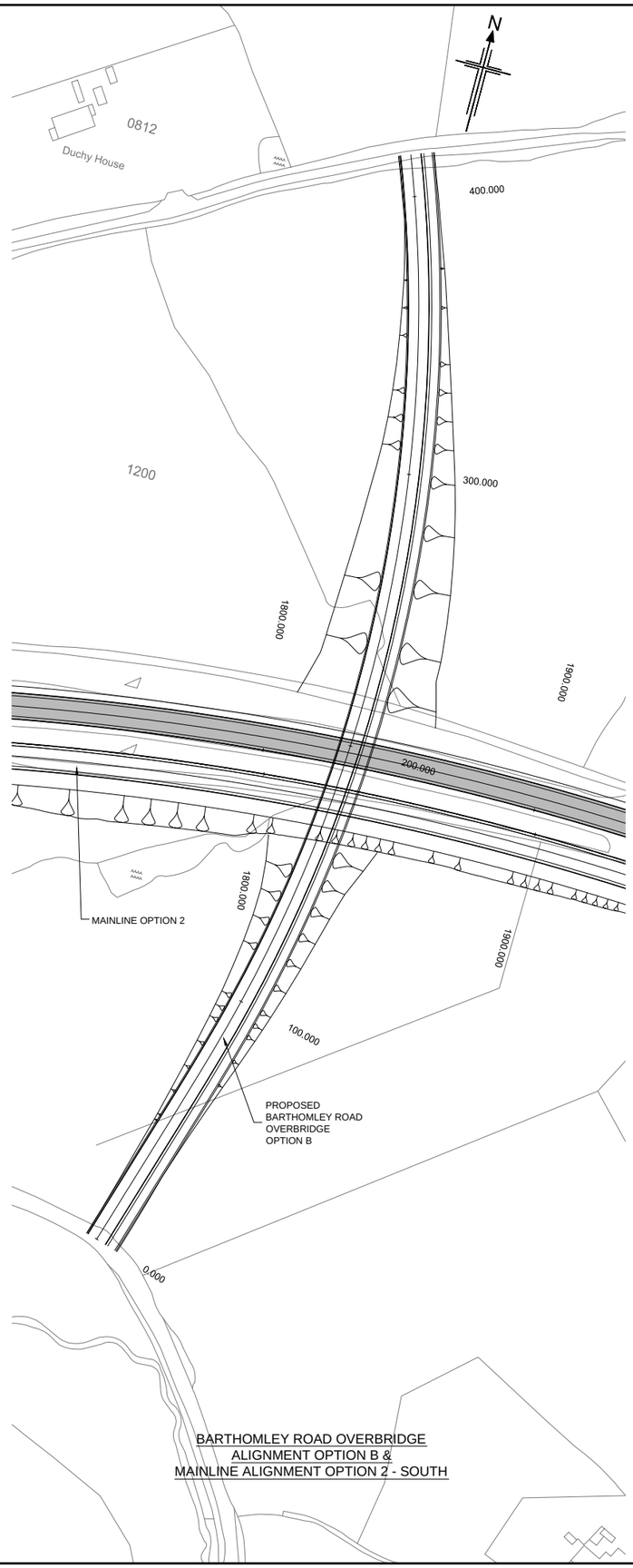
Drawing number: B1832076/P/1012 Rev: W0

Drawing number / Rev

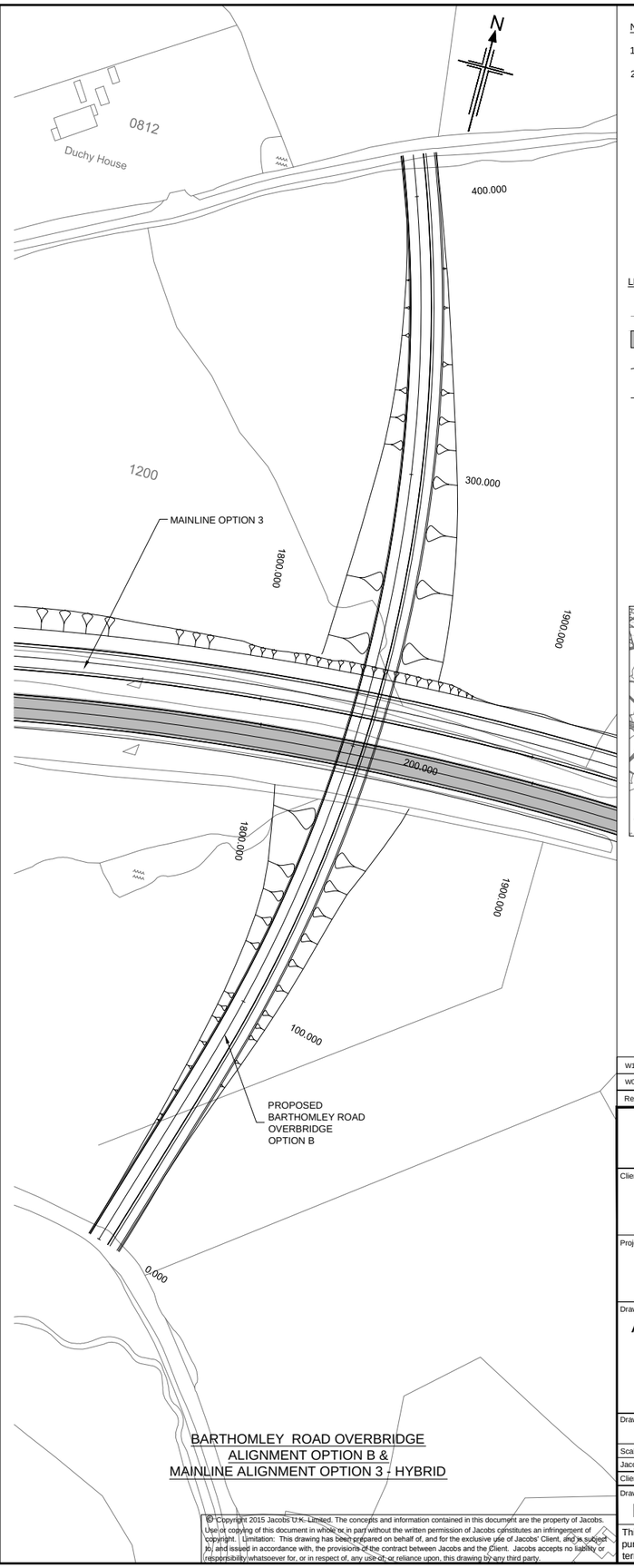
B1832076/P/1013, W1



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 1 - NORTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway

KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W1	29/02/2016	MINOR TITLE AMENDMENT	KJH	DT	DT	SK
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
BARTHOMLEY OPTION B

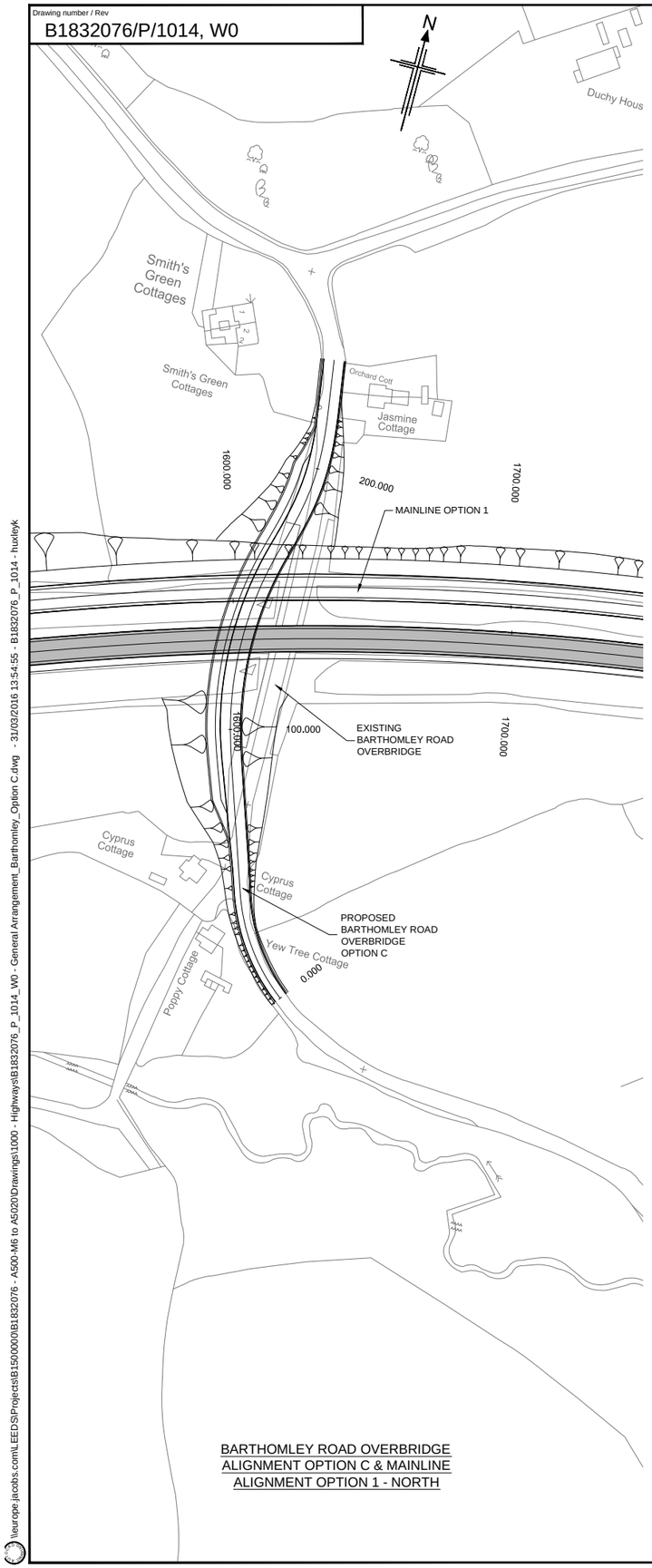
Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

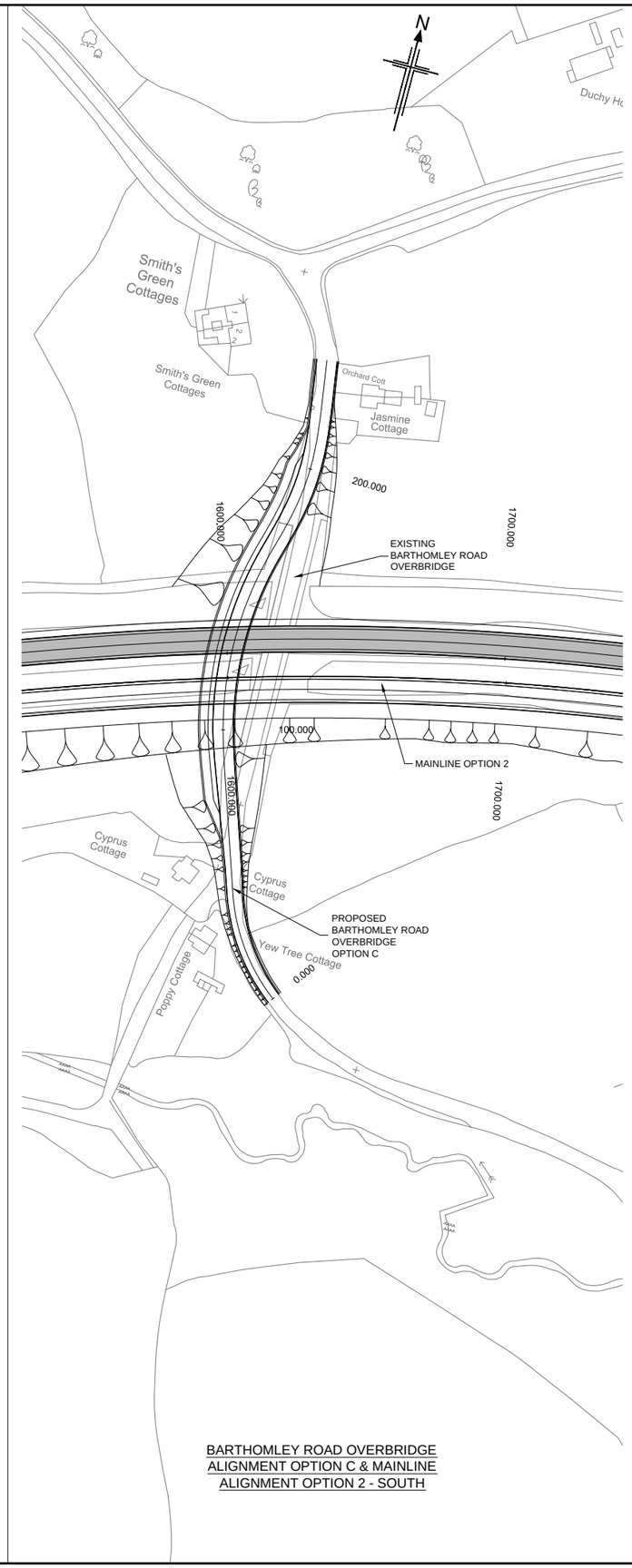
Drawing number: B1832076/P/1013 Rev: W1

Drawing number / Rev

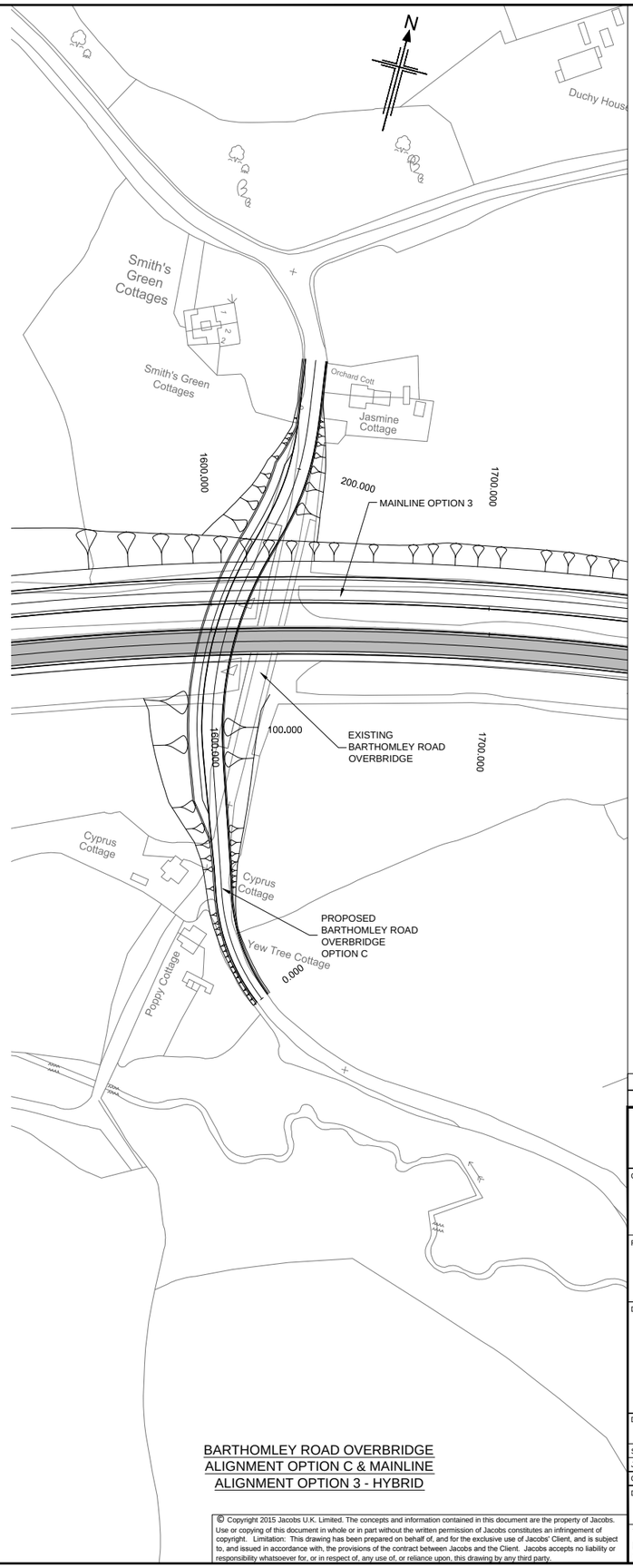
B1832076/P/1014, W0



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION C & MAINLINE
ALIGNMENT OPTION 1 - NORTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION C & MAINLINE
ALIGNMENT OPTION 2 - SOUTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT OPTION C & MAINLINE
ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway

KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
BARTHOMLEY OPTION C

Drawing status: FOR INFORMATION

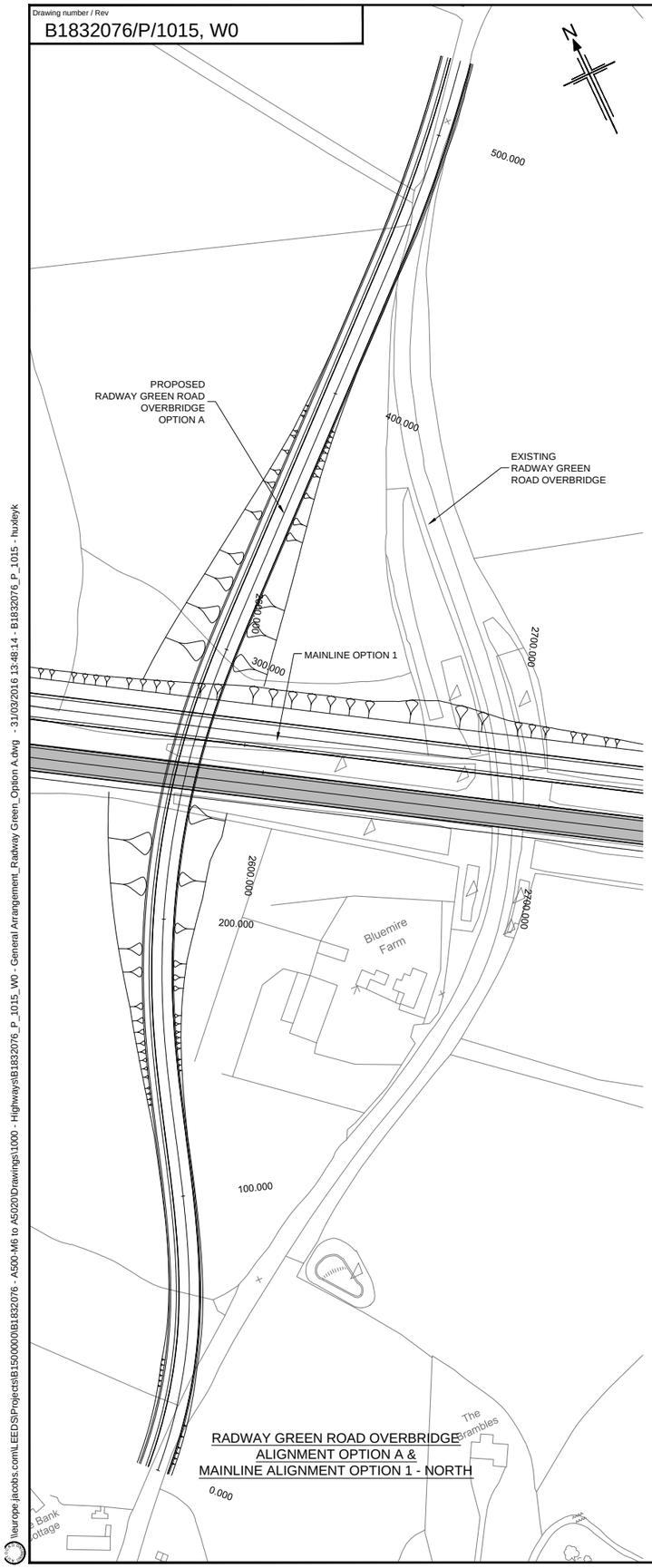
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1014 Rev: W0

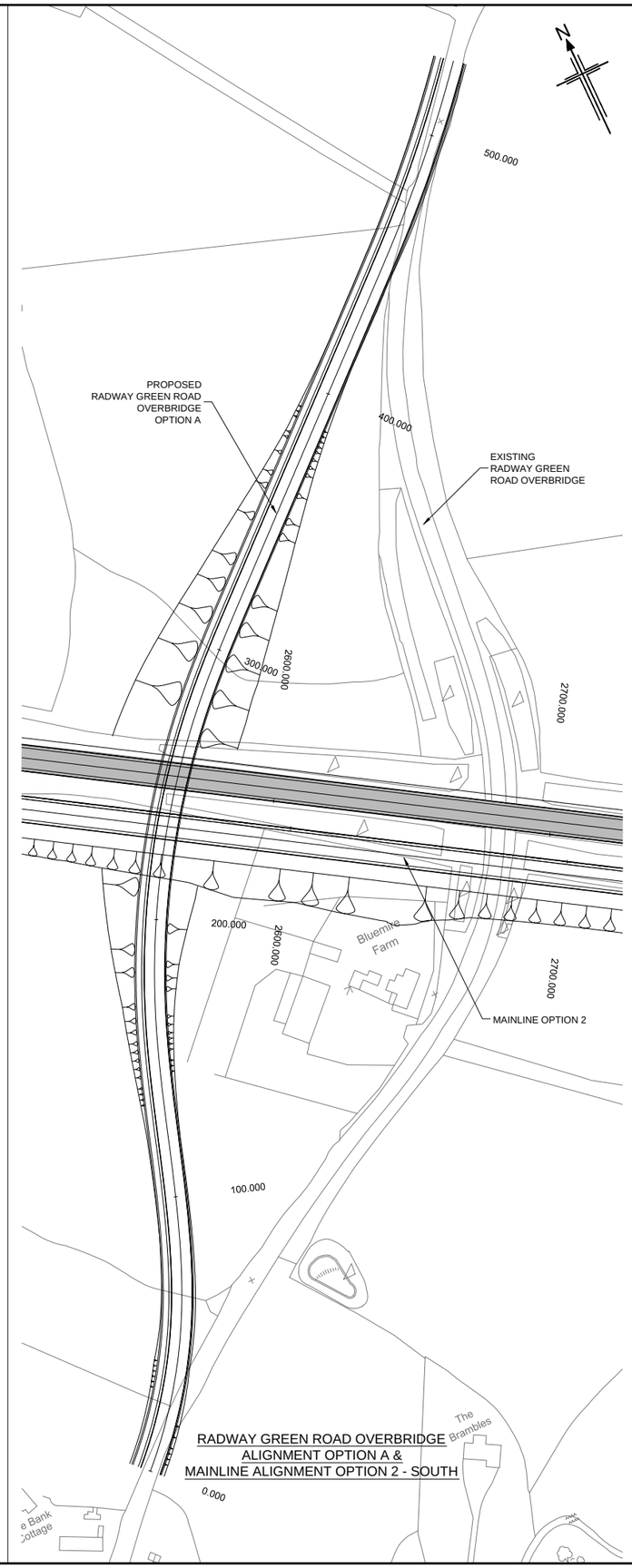
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

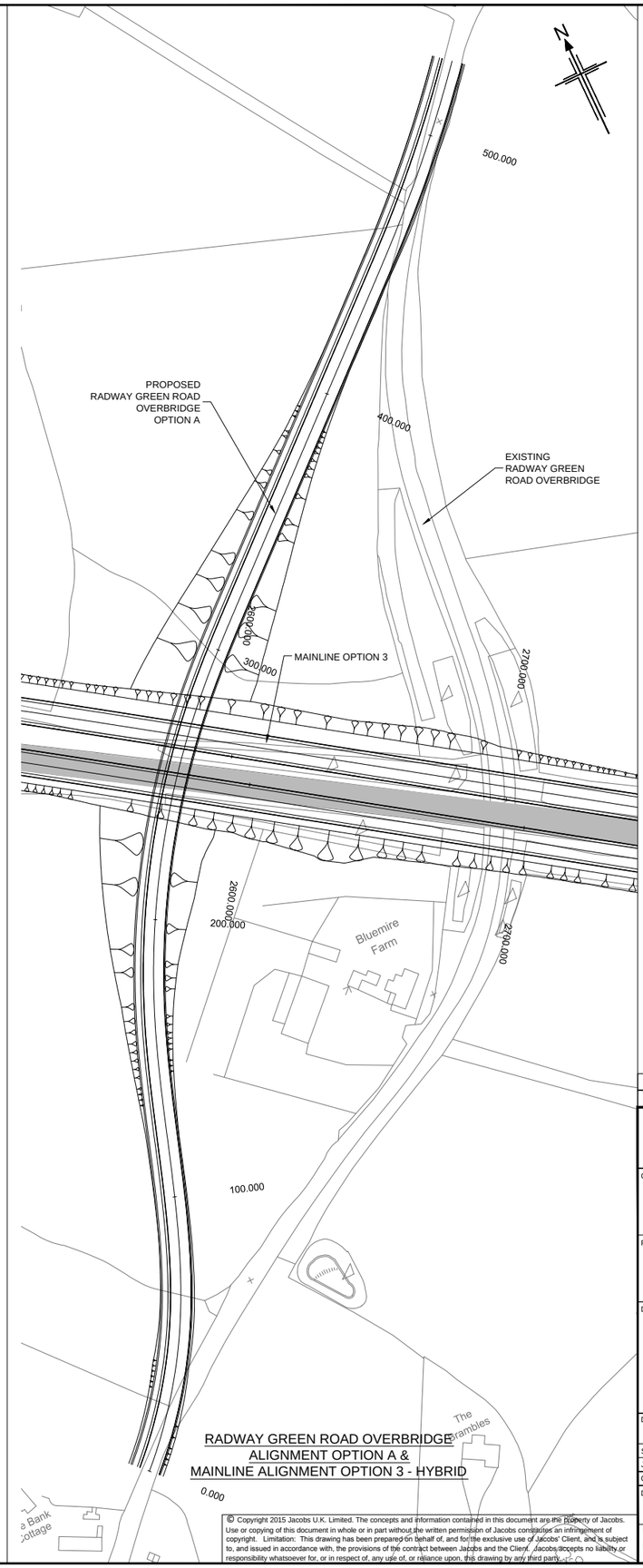
B1832076/P/1015, W0



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 1 - NORTH



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



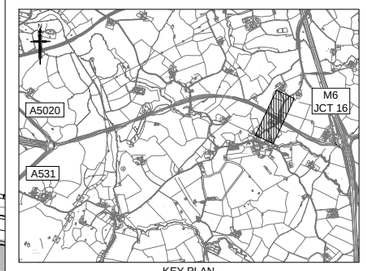
RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION A &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
RADWAY GREEN OPTION A

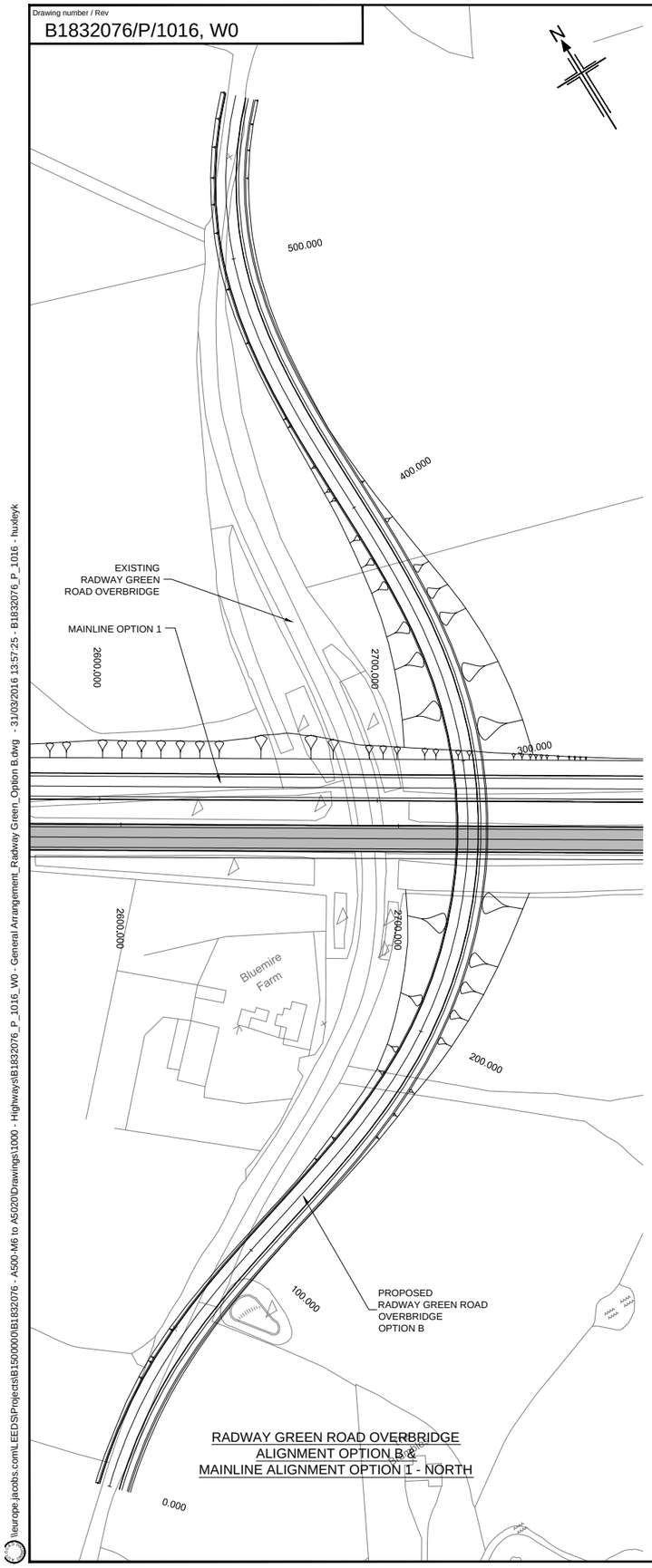
Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

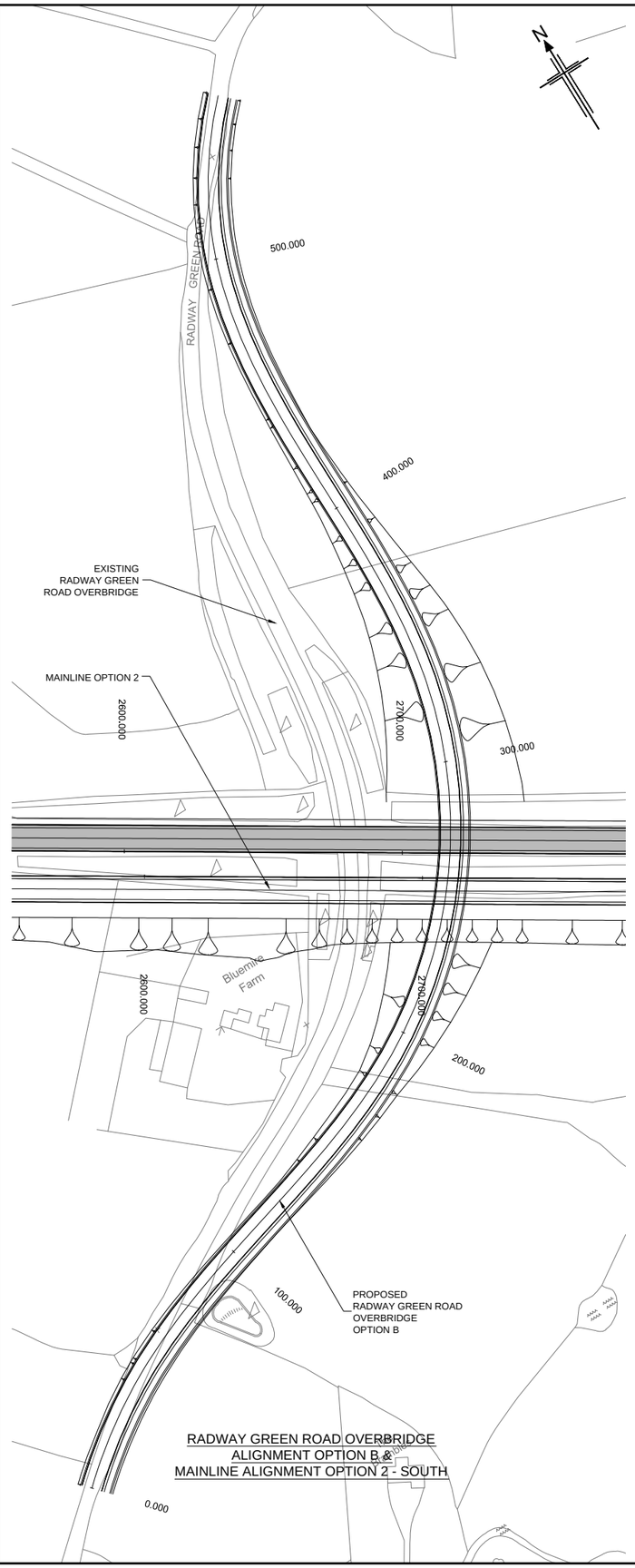
Drawing number: B1832076/P/1015 Rev: W0

Drawing number / Rev

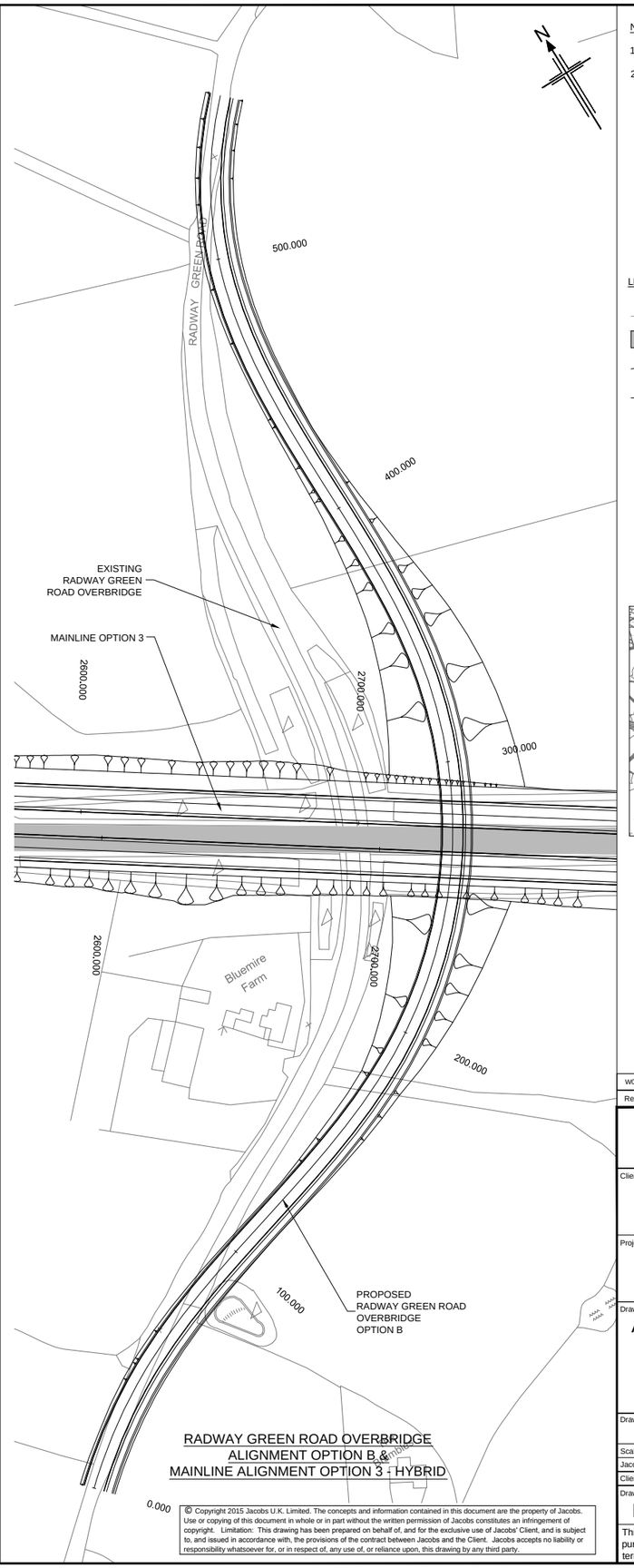
B1832076/P/1016, W0



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 1 - NORTH



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



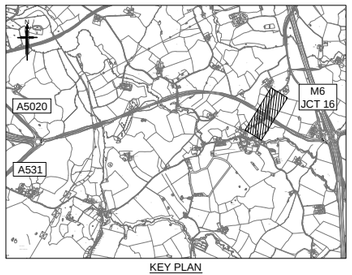
RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT OPTION B &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
RADWAY GREEN OPTION B

Drawing status: FOR INFORMATION

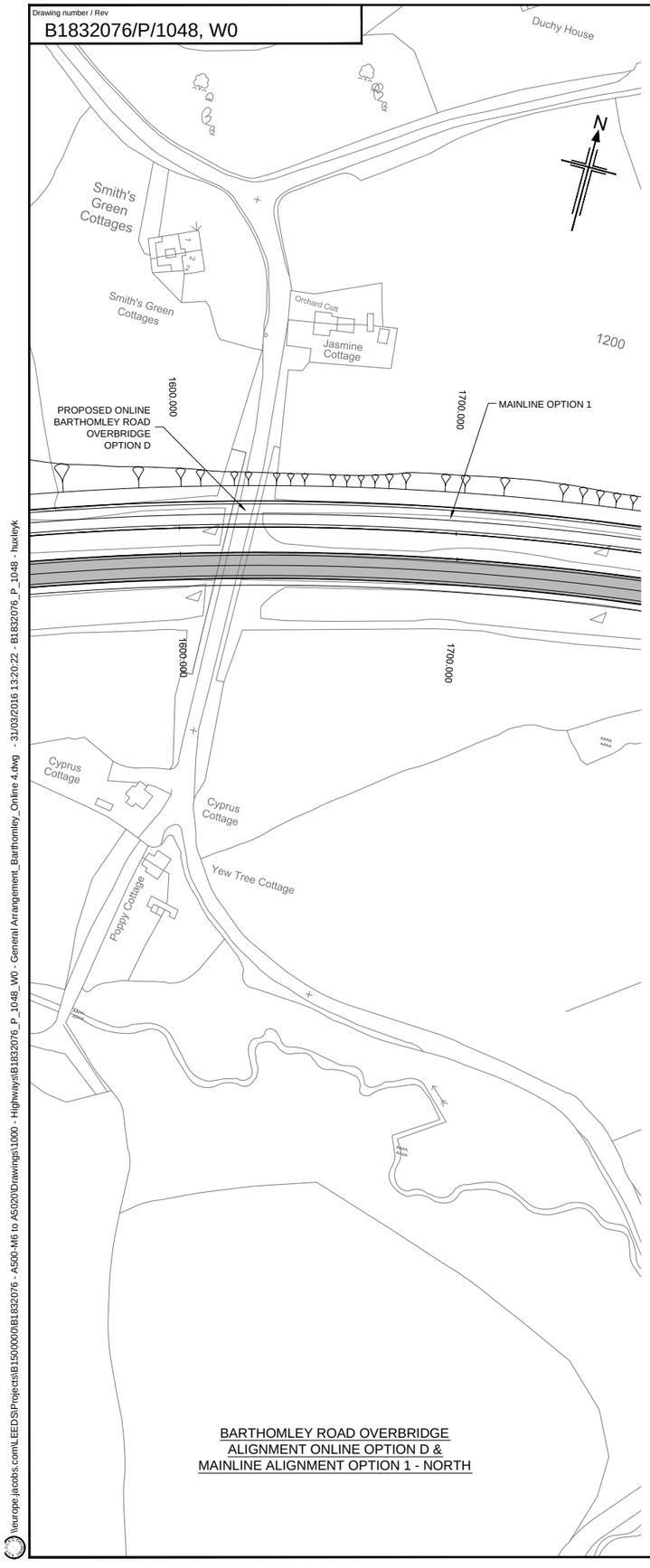
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1016 Rev: W0

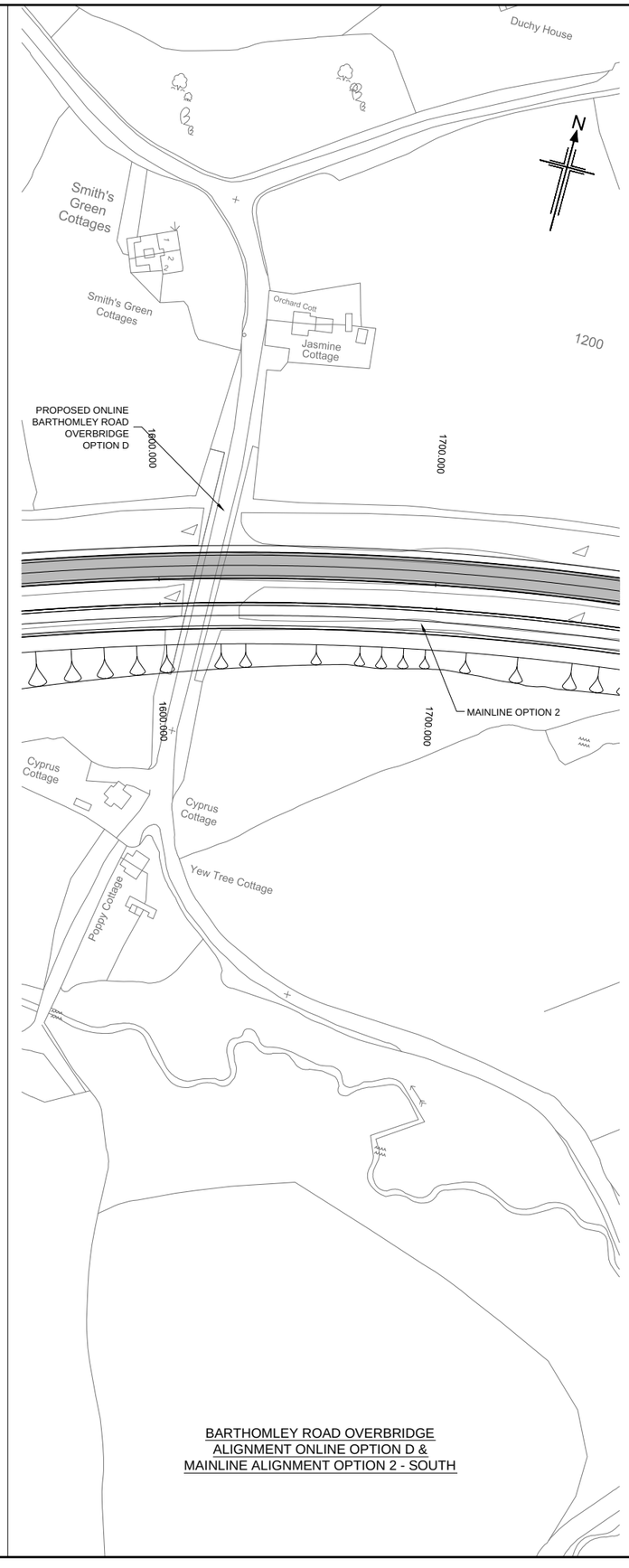
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

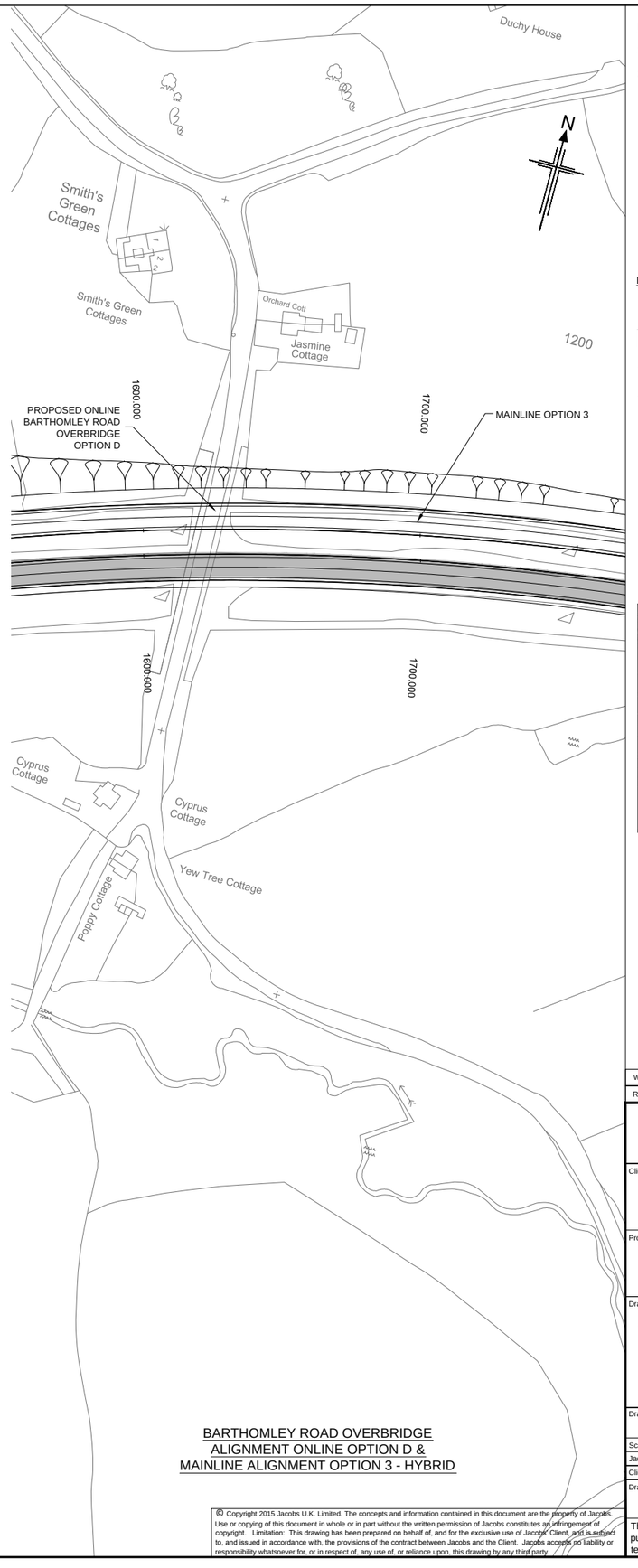
B1832076/P/1048, W0



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION D &
MAINLINE ALIGNMENT OPTION 1 - NORTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION D &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



BARTHOMLEY ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION D &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway

KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
BARTHOMLEY OPTION D

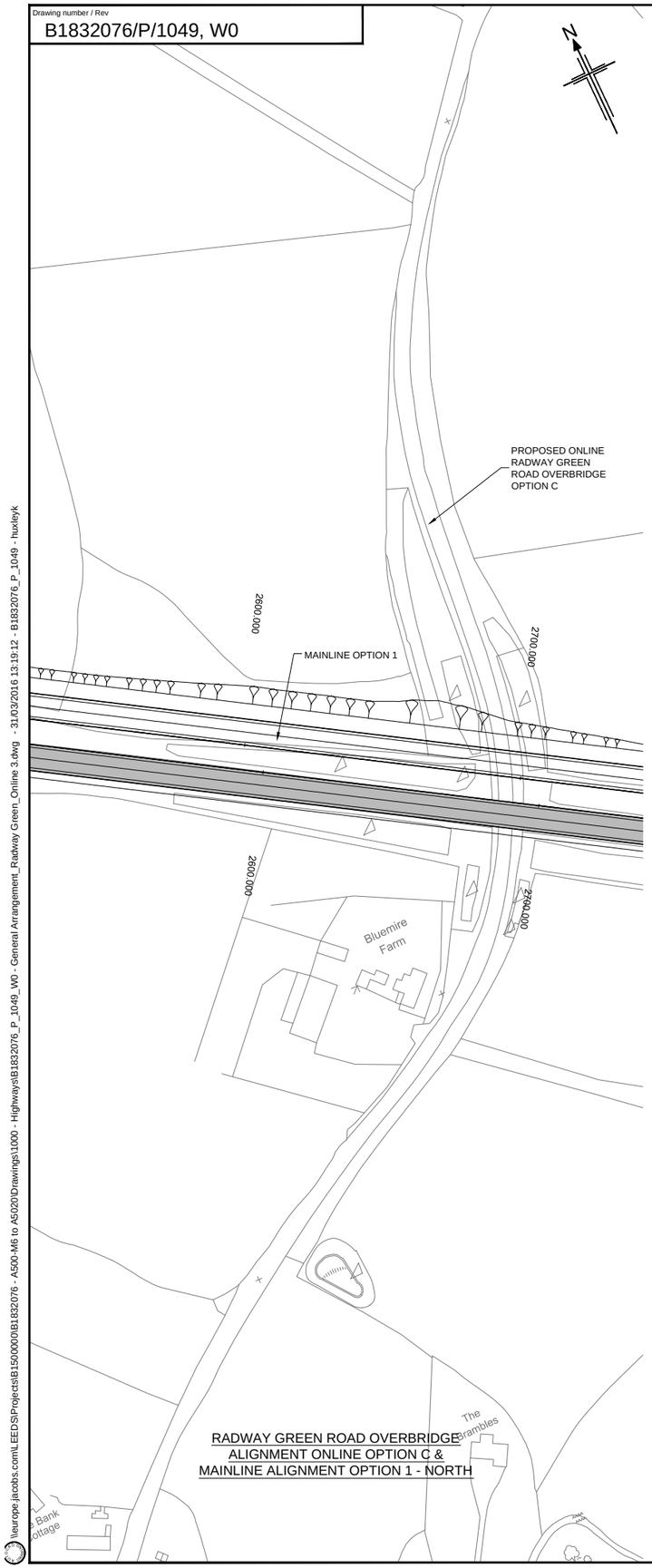
Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

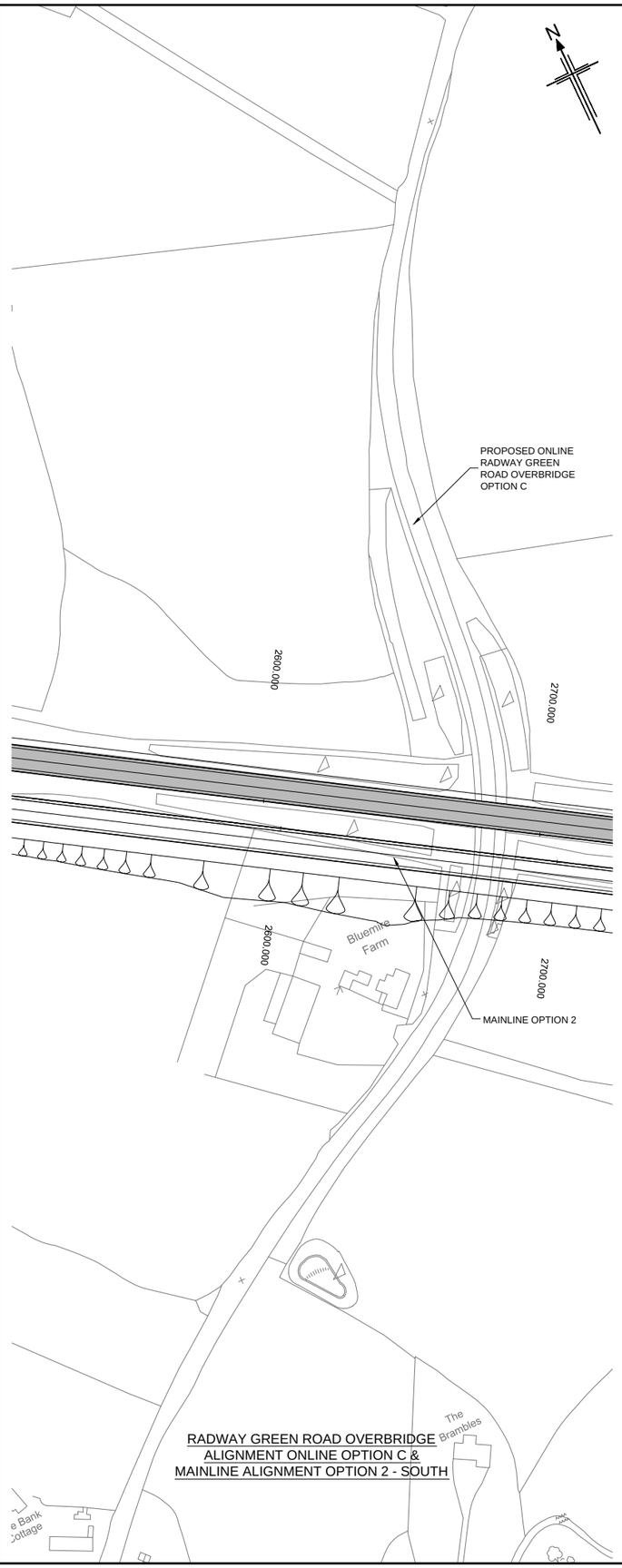
Drawing number: B1832076/P/1048 Rev: W0

Drawing number / Rev

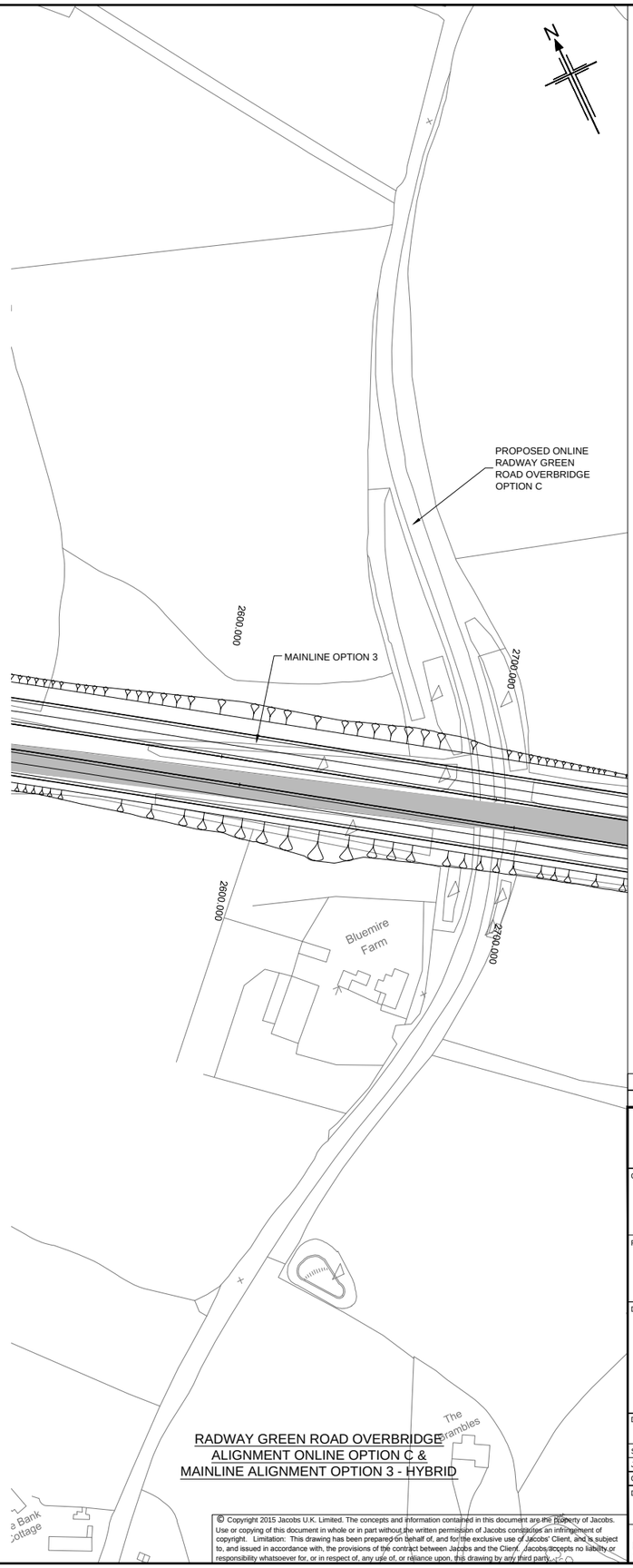
B1832076/P/1049, W0



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION C &
MAINLINE ALIGNMENT OPTION 1 - NORTH



RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION C &
MAINLINE ALIGNMENT OPTION 2 - SOUTH



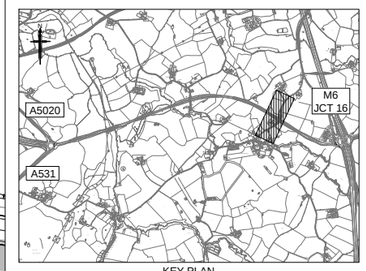
RADWAY GREEN ROAD OVERBRIDGE
ALIGNMENT ONLINE OPTION C &
MAINLINE ALIGNMENT OPTION 3 - HYBRID

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For further details see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
   - Dwg No. B1832076/P/1002 - Proposed Cross Sections
   - Dwg No. B1832076/P/1003-1005 - General Arrangement Option 1 - Sheets 1 to 3
   - Dwg No. B1832076/P/1006-1008 - General Arrangement Option 2 - Sheets 1 to 3
   - Dwg No. B1832076/P/1009-1011 - General Arrangement Option 3 - Sheets 1 to 3

LEGEND:

- OS Base Plan
- Existing Carriageway
- Proposed Earthworks
- Proposed Carriageway



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	21/01/2016	DRAFT - FOR INFORMATION	BS	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
GENERAL ARRANGEMENT
RADWAY GREEN OPTION C

Drawing status: FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

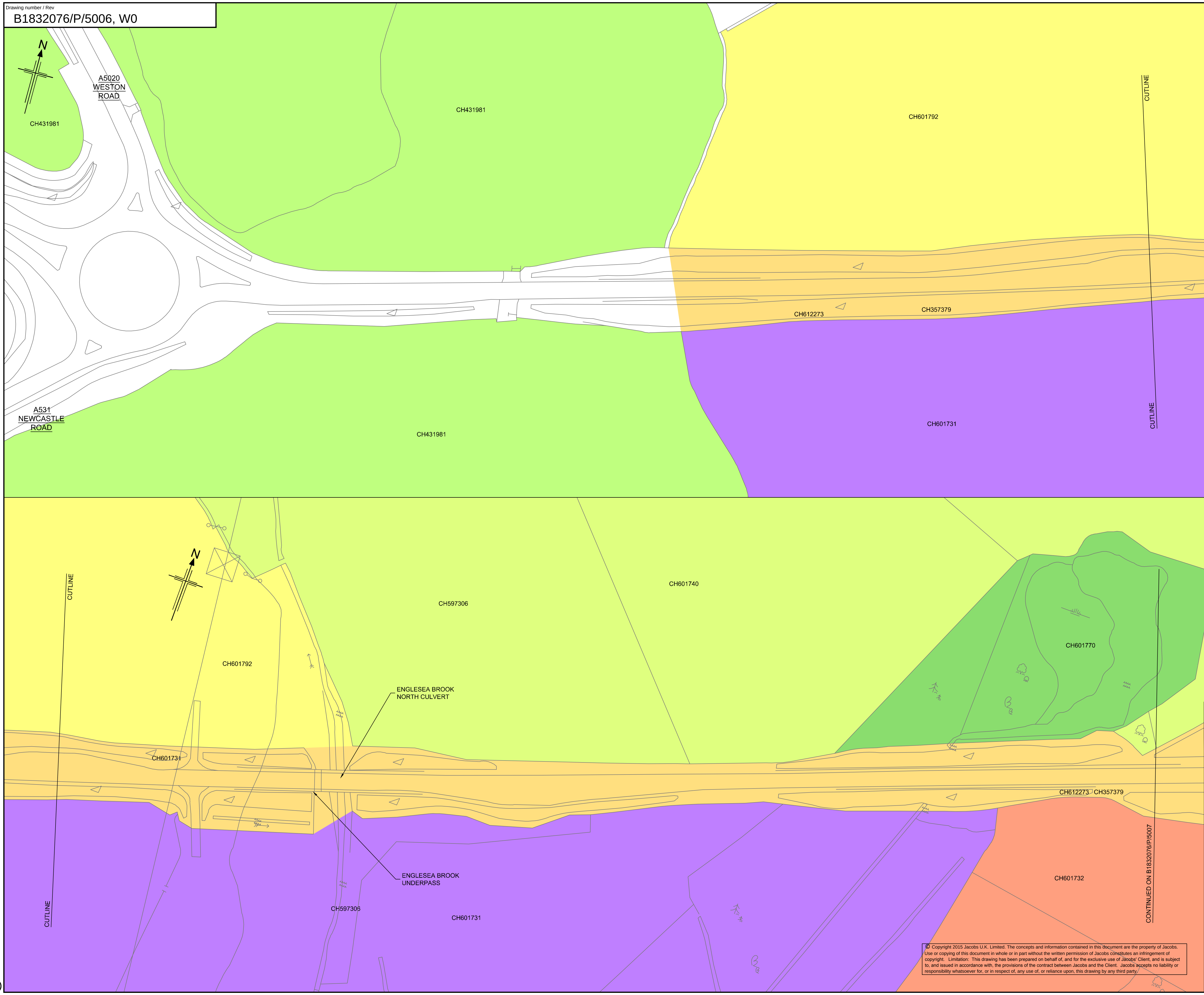
Drawing number: B1832076/P/1049 Rev: W0

Cheshire East Council
Highways

Appendix D – Land Ownership Plan

Drawing number / Rev

B1832076/P/5006, W0

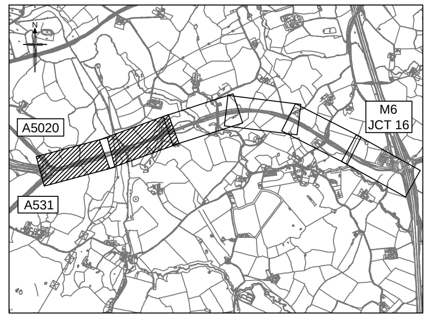


NOTES:

1. All dimensions are in meters, unless stated otherwise.

LAND REFERENCES:

CH357379 - Highways England
CH431981 - Co-op
CH597306 - Mainline Pipes Limited
CH601731 - Duchy
CH601740 - Duchy
CH601770 - Duchy
CH601792 - Duchy
CH612273 - Duchy



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	02/03/2016	DRAFT - FOR INFORMATION	MH	KJH	DT	SK

JACOBS

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME
LAND OWNERSHIP PLANS
SHEET 1 OF 3

Drawing status

FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

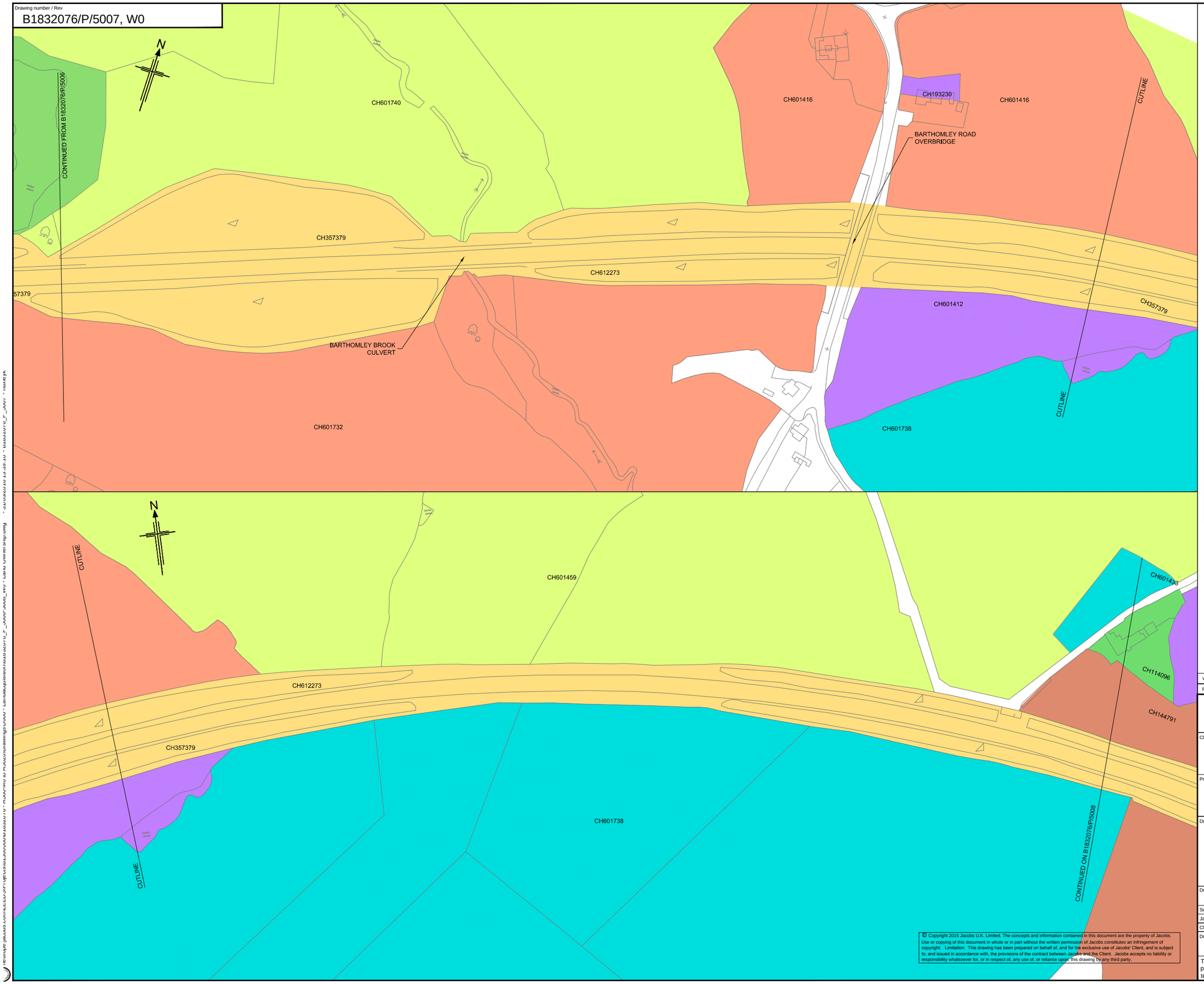
Drawing number: B1832076/P/5006

Rev: W0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/5007, W0

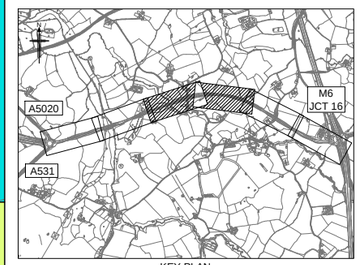


NOTES:

1. All dimensions are in meters, unless stated otherwise.

LAND REFERENCES:

CH193230 - Thomas Watson Wilde
CH357379 - Highways England
CH601412 - Duchy
CH601416 - Duchy
CH601459 - Duchy
CH601732 - Duchy
CH601738 - Duchy
CH601740 - Duchy
CH612273 - Duchy



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	02/03/2016	DRAFT - FOR INFORMATION	MH	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME
LAND OWNERSHIP PLANS
SHEET 2 OF 3

Drawing status: FOR INFORMATION

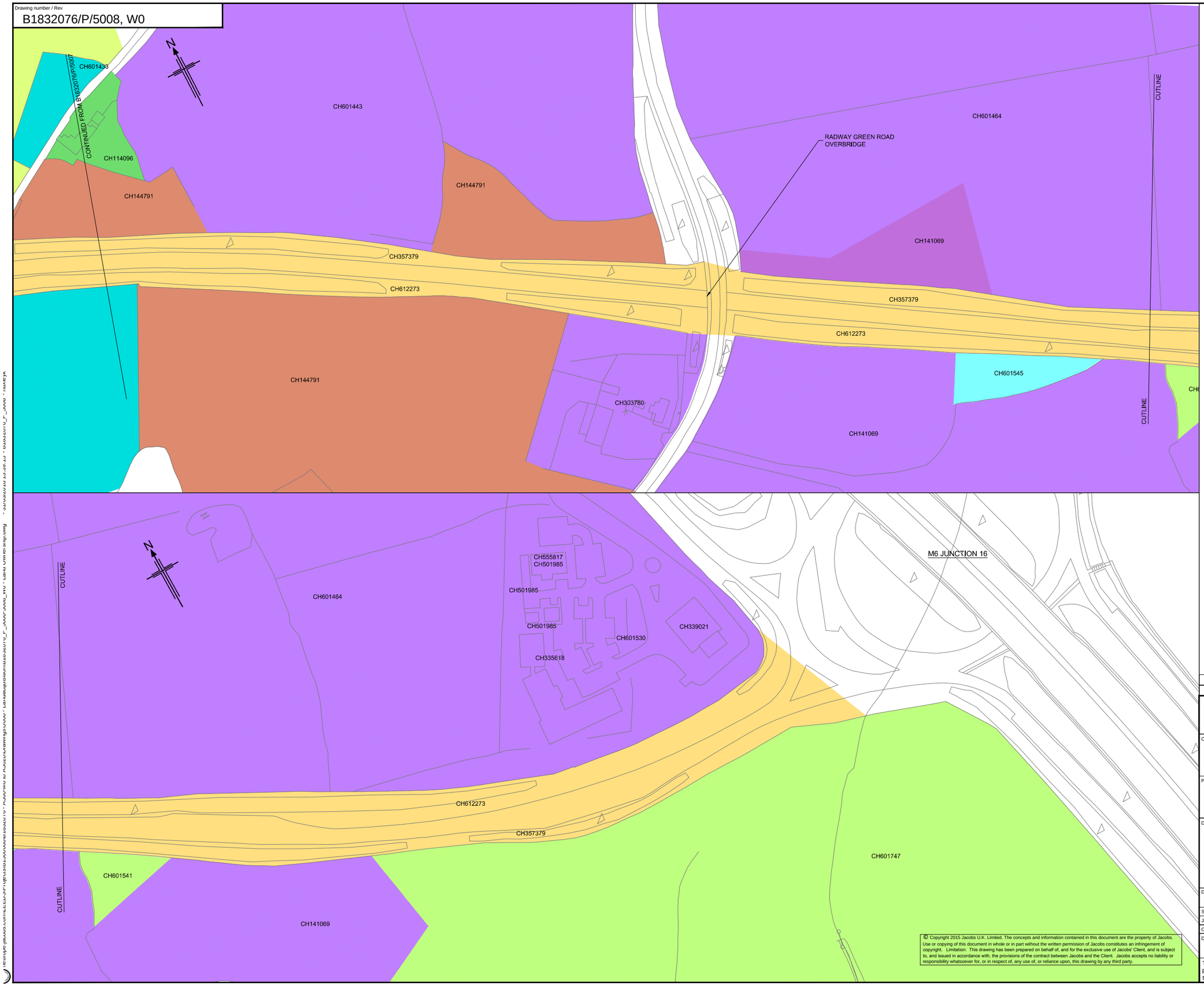
Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/5007 Rev: W0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/5008, W0

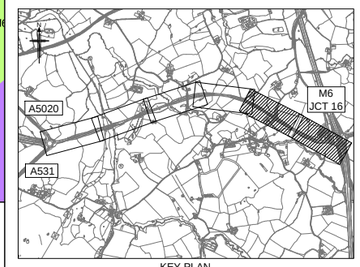


NOTES:

1. All dimensions are in meters, unless stated otherwise.

LAND REFERENCES:

CH114096 - Robert Ernest Oulton
CH144791 - Harry Brian Whittaker
CH141069 - Duchy
CH335618 - Shell Service Station
CH339021 - Shell Service Station
CH357379 - Highways England
CH455406 - Mathew Galbraith
CH501985 - Travelodge Hotels Limited
CH555817 - N/A
CH601443 - Duchy
CH601464 - Duchy
CH601530 - Duchy
CH601541 - Duchy
CH601545 - Duchy
CH601747 - Duchy
CH612273 - Duchy



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	02/03/2016	DRAFT - FOR INFORMATION	MH	KJH	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME
LAND OWNERSHIP PLANS
SHEET 3 OF 3

Drawing status

FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/5008 Rev: W0

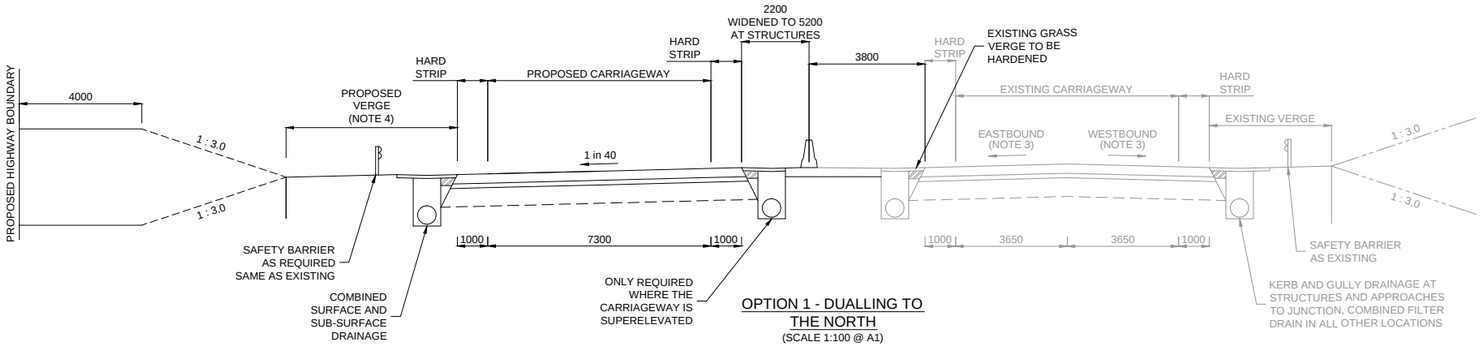
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Cheshire East Council
Highways

Appendix E – Proposed Cross-section Plans

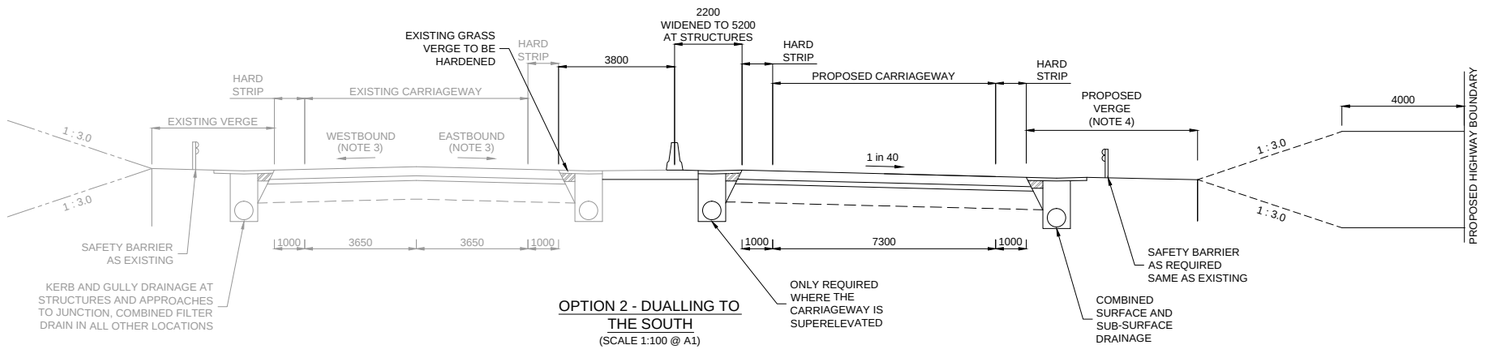
Drawing number / Rev

B1832076/P/1002, W1



OPTION 1 - DUALLING TO THE NORTH

(SCALE 1:100 @ A1)



OPTION 2 - DUALLING TO THE SOUTH

(SCALE 1:100 @ A1)

ASSUMPTIONS

1. SEE DRAWING NO. B1832076/P/1001 FOR ASSUMPTIONS ABOUT THE EXISTING CARRIAGEWAY CROSS-SECTION.
2. THE NEW CARRIAGEWAY WILL HAVE A 'D2AP' CROSS-SECTION.
3. THE NEW CARRIAGEWAY WILL BE DRAINED BY COMBINED SURFACE AND SUB-SURFACE FILTER DRAINS.
4. THE CENTRAL RESERVE WILL HAVE A CONCRETE BARRIER, WITH A WORKING WIDTH 'W2' 0.8m.
5. THE CENTRAL RESERVE BARRIER IS OFFSET A MINIMUM OF 0.5m FROM ADJACENT FILTER DRAINS.
6. NEW EARTHWORK SLOPES ARE AT 1 IN 3.
7. NEW VERGES ARE 5.6m WIDE AND WILL ACT AS A HAUL ROAD DURING CONSTRUCTION.

NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. All assumptions for cross-section dimensions and information have been taken from Ordnance Survey.
3. A normal crossfall of 1:40 has been assumed, except where a superelevation is applied.
4. A widened verge of 5.6m has been proposed throughout, this will act as a haul road during construction.

LEGEND:

Existing batters

Proposed batters

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
1	01/02/2016	REVISED CROSS-SECTIONS	KJH	DT	DT	SK
0	10/09/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client: Cheshire East Council

Project: A500 WIDENING SCHEME

Drawing title: A500 DUALLING AND WIDENING SCHEME PROPOSED CARRIAGEWAY CROSS-SECTIONS

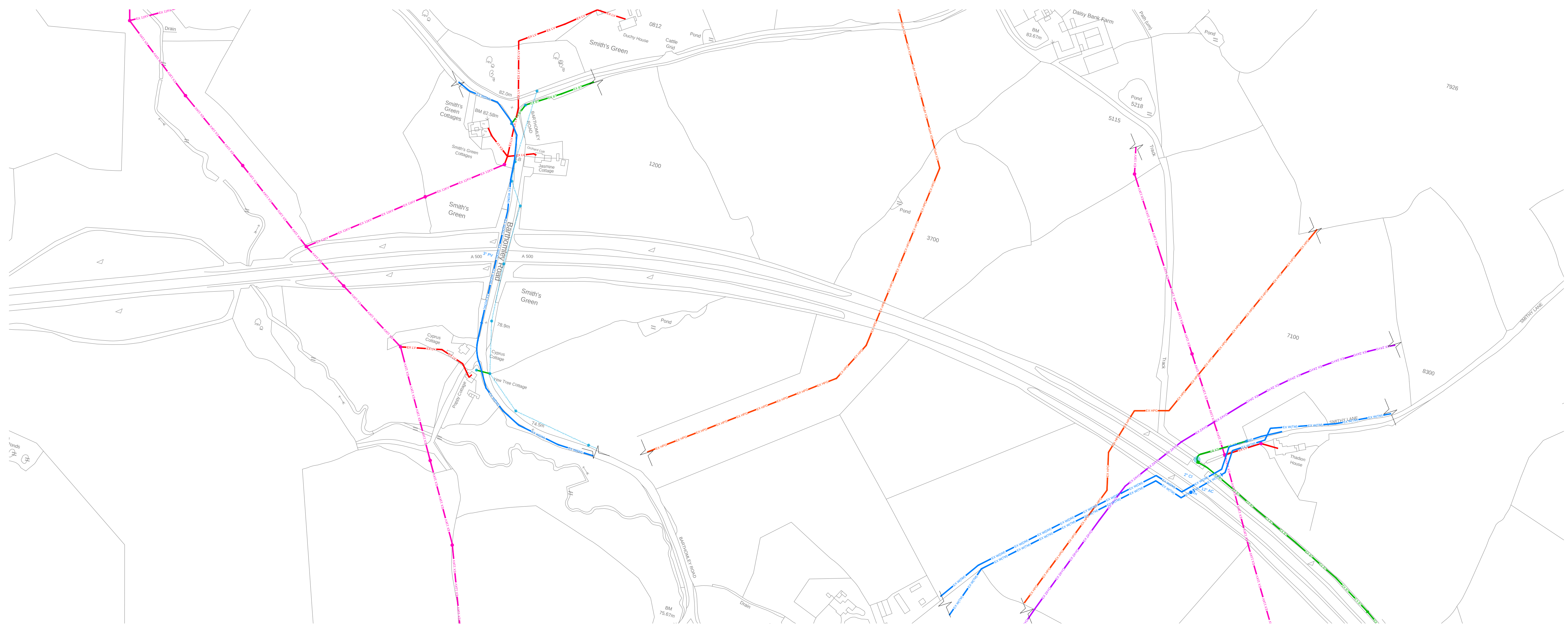
Drawing status: FOR INFORMATION

Scale	1:100 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1002 Rev: W1

Cheshire East Council
Highways

Appendix F – Statutory Undertaker Plans



NOTES
1. Do not scale from this drawing.
2. The information provided on this drawing about the existing utility services is based on historic records provided by the statutory utilities. The actual position and status of any mains and services must be verified and established on site. This drawing is provided for information only.
3. The information on this drawing is given without obligation or warranty. No liability of any kind whatsoever is accepted by Gattica Associates Ltd., its agents or servants for any errors or omissions.
4. Services to buildings are not shown but it must be assumed that any existing building is served with live supplies until proven otherwise. Written confirmation that a supply is dead must be obtained from the relevant utility.
5. Cables to street lighting, road signs and illuminated bollards are not shown but must be assumed to exist.
6. The location of any mains and services must be undertaken by hand dug trial holes. The approval of the appropriate utility must be sought before any mechanical plant is used.
7. Underground services must be located in accordance with HSE Guidance note HS (G) 47.
8. Overhead power lines must be dealt with in accordance with HSE Guidance note GS 6 (Third edition).
9. For clarity existing plant is represented by single lines. Please note, this does not indicate the number of cables, ducts and pipes that may exist in the location indicated.

DRAWING KEY
- LIMIT (UTILITIES BEYOND THIS POINT)
- POINT OF CONNECTION (APPLIES TO GAS AND WATER CONNETIONS)

EXISTING ELECTRICITY KEY
- EX LV — OVERHEAD LOW VOLTAGE CABLE
- BURIED LOW VOLTAGE CABLE
- EX 11KV — OVERHEAD 11kVA HIGH VOLTAGE CABLE
- BURIED 11kVA HIGH VOLTAGE CABLE
- EX EHV — 132kVA EXTRA HIGH VOLTAGE CABLE
- PYLON
- POLE (POSSIBLE POLE MOUNTED TRANSFORMER)

EXISTING GAS / OIL KEY
- EX HPG — LOCAL HIGH PRESSURE GAS MAIN
- EX HPG — NATIONAL HIGH PRESSURE GAS MAIN
- EX OIL — MAINLINE FUEL PIPELINE

EXISTING COMMUNICATIONS KEY
- EX BT — UNDERGROUND BT PLANT
- BT JOINTING CHAMBER
- EX BT — OVERHEAD BT PLANT
- BT TELEGRAPH POLE (UNDERGROUND BT CAN RUN TO AND FROM THE POLE)
- EX ZAYO — UNDERGROUND ZAYO PLANT

EXISTING WATER KEY
- EX W(DM) — POTABLE WATER DISTRIBUTION MAIN
- EX W(TM) — POTABLE WATER TRUNK MAIN
- WATER VALVE
- FH — FIRE HYDRANT

Drawing Layout

0001 0001 0002

References
Background: Xref_B1832076 - OS Base Mapping

Rev	Description	Drawn	Date

SCALING NOTE: Do NOT scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status
FOR INFORMATION

Location
A500 ROAD WIDENING SCHEME
CREWE, CW2
NGR: X: 376006 Y: 352911

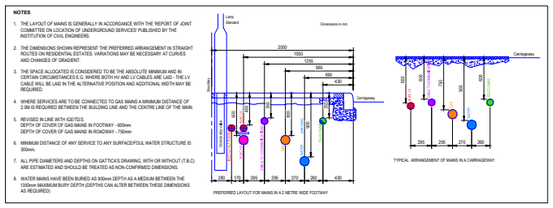
Title
EXISTING SERVICES DRAWING

Client
JACOBS

gattica associates LIMITED
Unit F3 Cumberland Business Park
Northumberland Road
Southsea
Hampshire
PO5 1DS

Tel: +44 (0)1428 648873
Email: info@gatticaassociates.co.uk
www.gatticaassociates.co.uk

Date of 1st Issue: 26/11/2015
Drawn by: AJ
A1 Scale: 1:2000
Checked by: RG
Drawing Number: GAL140043-GAL-VUT-SG-MULTI-DR-C-0001
Revision: -



NOTES

1. Do not scale from this drawing.
2. The information provided on this drawing about the existing utility services is based on historic records provided by the statutory utilities. The actual position and status of any mains and services must be verified and established on site. This drawing is provided for information only.
3. The information on this drawing is given without obligation or warranty. No liability of any kind whatsoever is accepted by Gattica Associates Ltd., its agents or servants for any errors or omissions.
4. Services to buildings are not shown but it must be assumed that any existing building is served with live supplies until proven otherwise. Written confirmation that a supply is dead must be obtained from the relevant utility.
5. Cables to street lighting, road signs and illuminated bollards are not shown but must be assumed to exist.
6. The location of any mains and services must be undertaken by hand dug trial holes. The approval of the appropriate utility must be sought before any mechanical plant is used.
7. Underground services must be located in accordance with HSE Guidance note HS (G) 47.
8. Overhead power lines must be dealt with in accordance with HSE Guidance note GS 6 (Third edition).
9. For clarity existing plant is represented by single lines. Please note, this does not indicate the number of cables, ducts and pipes that may exist in the location indicated.

DRAWING KEY

- LIMIT (UTILITIES BEYOND THIS POINT)
- POINT OF CONNECTION (APPLIES TO GAS AND WATER CONNETIONS)

EXISTING ELECTRICITY KEY

- EX LV — EX LV — OVERHEAD LOW VOLTAGE CABLE
- BURIED LOW VOLTAGE CABLE
- EX 11KV — EX 11KV — OVERHEAD 11kVA HIGH VOLTAGE CABLE
- BURIED 11kVA HIGH VOLTAGE CABLE
- EX EHV — EX EHV — 132kVA EXTRA HIGH VOLTAGE CABLE
- PYLON
- POLE (POSSIBLE POLE MOUNTED TRANSFORMER)

EXISTING GAS / OIL KEY

- EX HPG — EX HPG — LOCAL HIGH PRESSURE GAS MAIN
- EX HPG — EX HPG — NATIONAL HIGH PRESSURE GAS MAIN
- EX OIL — EX OIL — MAINLINE FUEL PIPELINE

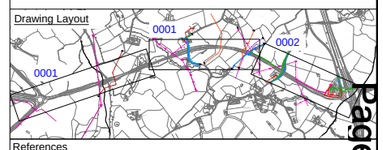
EXISTING COMMUNICATIONS KEY

- EX BT — EX BT — UNDERGROUND BT PLANT
- BT JOINTING CHAMBER
- EX BT — EX BT — OVERHEAD BT PLANT
- BT TELEGRAPH POLE (UNDERGROUND BT CAN RUN TO AND FROM THE POLE)
- EX ZAYO — EX ZAYO — UNDERGROUND ZAYO PLANT

EXISTING WATER KEY

- EX W(DM) — EX W(DM) — POTABLE WATER DISTRIBUTION MAIN
- EX W(TM) — EX W(TM) — POTABLE WATER TRUNK MAIN
- WATER VALVE
- FH — FIRE HYDRANT

Drawing Layout



References

Background: Xref_B1832076 - OS Base Mapping

Rev	Decription	Drawn	Date

SCALING NOTE: Do NOT scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR INFORMATION

Location

A500 ROAD WIDENING SCHEME
CREWE, CW2
NGR: X: 376006 Y: 352911

Title

EXISTING SERVICES DRAWING

Client

JACOBS

gattica associates LIMITED
Unit F3 Cumberland Business Park
Northumberland Road
Southsea
Hampshire
PO5 1DS
Tel: +44 (0)1428 648873
Email: Info@gatticaassociates.co.uk
www.gatticaassociates.co.uk

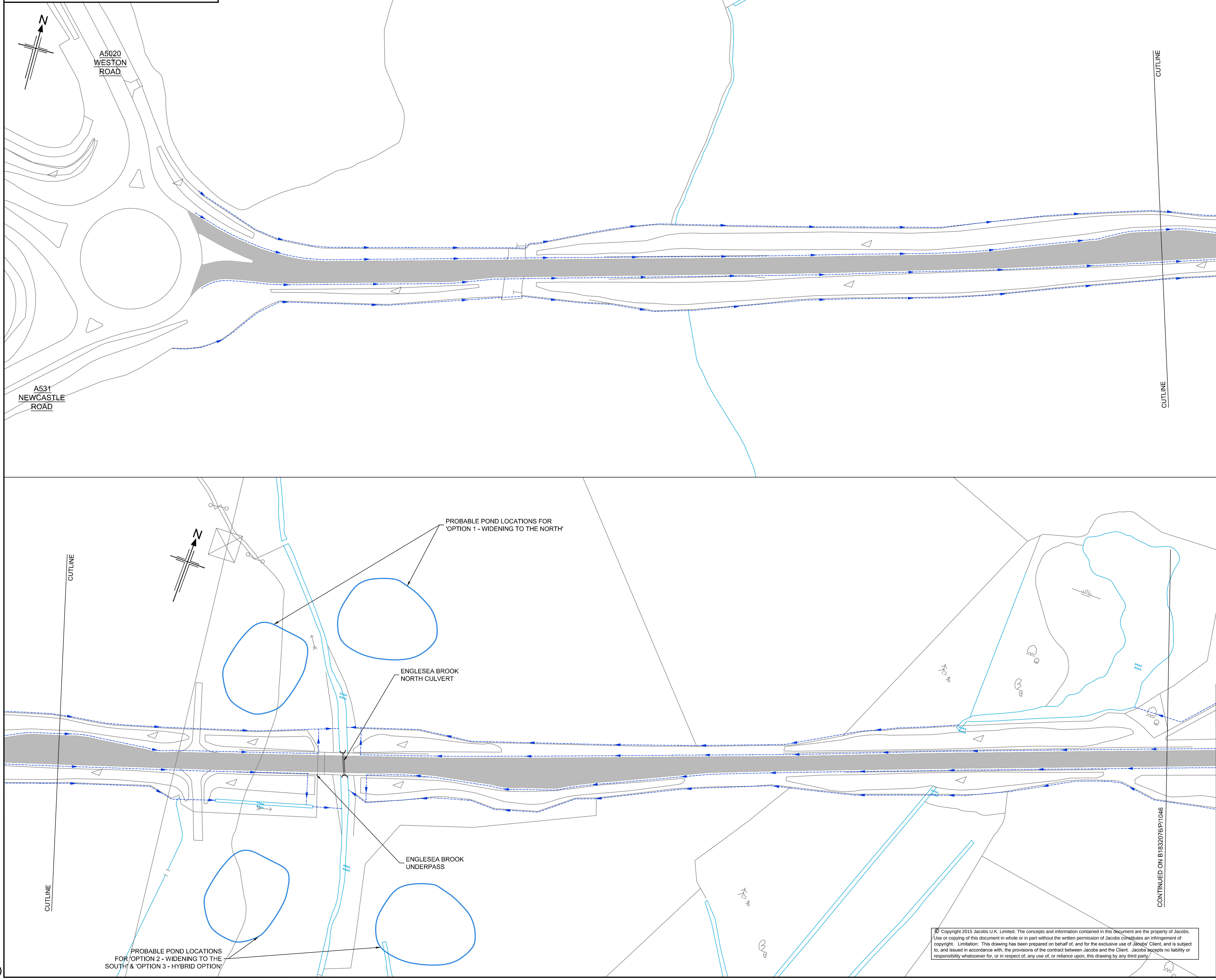
Date of 1st Issue	Drawn by
26/11/2015	AJ
A1 Scale 1:2000	Checked by RG
Drawing Number GAL140043-GAL-VUT-SG-MULTI-M2-C-0002	Revision -

Cheshire East Council
Highways

Appendix G – Assumed Drainage Plans

Drawing number / Rev

B1832076/P/1045, W0

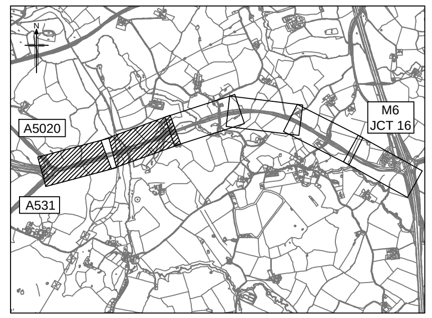


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For other information relating to the scheme see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
3. The layout shown is indicative. All existing filter drains are assumed and shown in the verge or at either the top or toe of embankments. This is based on site observations and discussions with Cheshire East Highways staff. A survey is needed to confirm the layout.

LEGEND:

- Existing Drainage
- Existing Carriageway
- Existing Water Features
- Existing Culvert



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	24/02/2016	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS

Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME
ASSUMED EXISTING DRAINAGE
SHEET 1 OF 3

Drawing status

FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

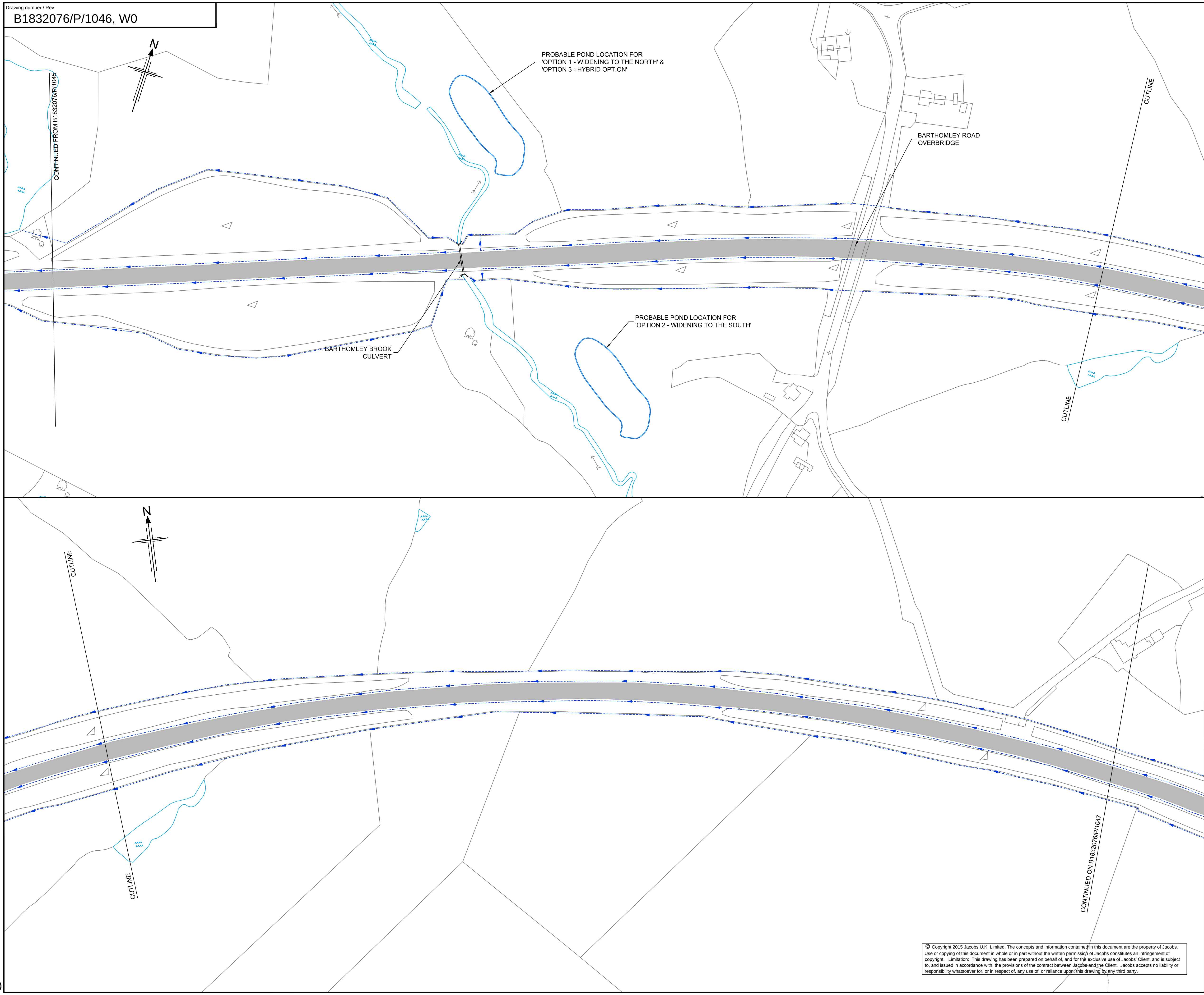
Drawing number: B1832076/P/1045

Rev: W0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Drawing number / Rev

B1832076/P/1046, W0

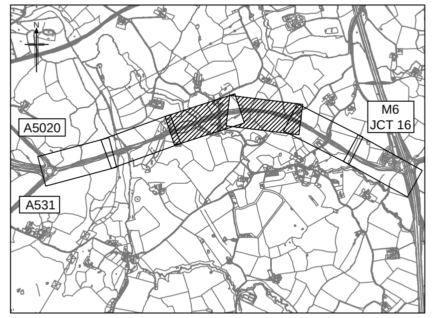


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For other information relating to the scheme see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
3. The layout shown is indicative. All existing filter drains are assumed and shown in the verge or at either the top or toe of embankments. This is based on site observations and discussions with Cheshire East Highways staff. A survey is needed to confirm the layout.

LEGEND:

- Existing Drainage
- Existing Carriageway
- Existing Water Features
- Existing Culvert



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

W0	24/02/2016	DRAFT - FOR INFORMATION	KJH	DT	DT	SK
Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd

JACOBS®
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME ASSUMED EXISTING DRAINAGE SHEET 2 OF 3

Drawing status

FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number

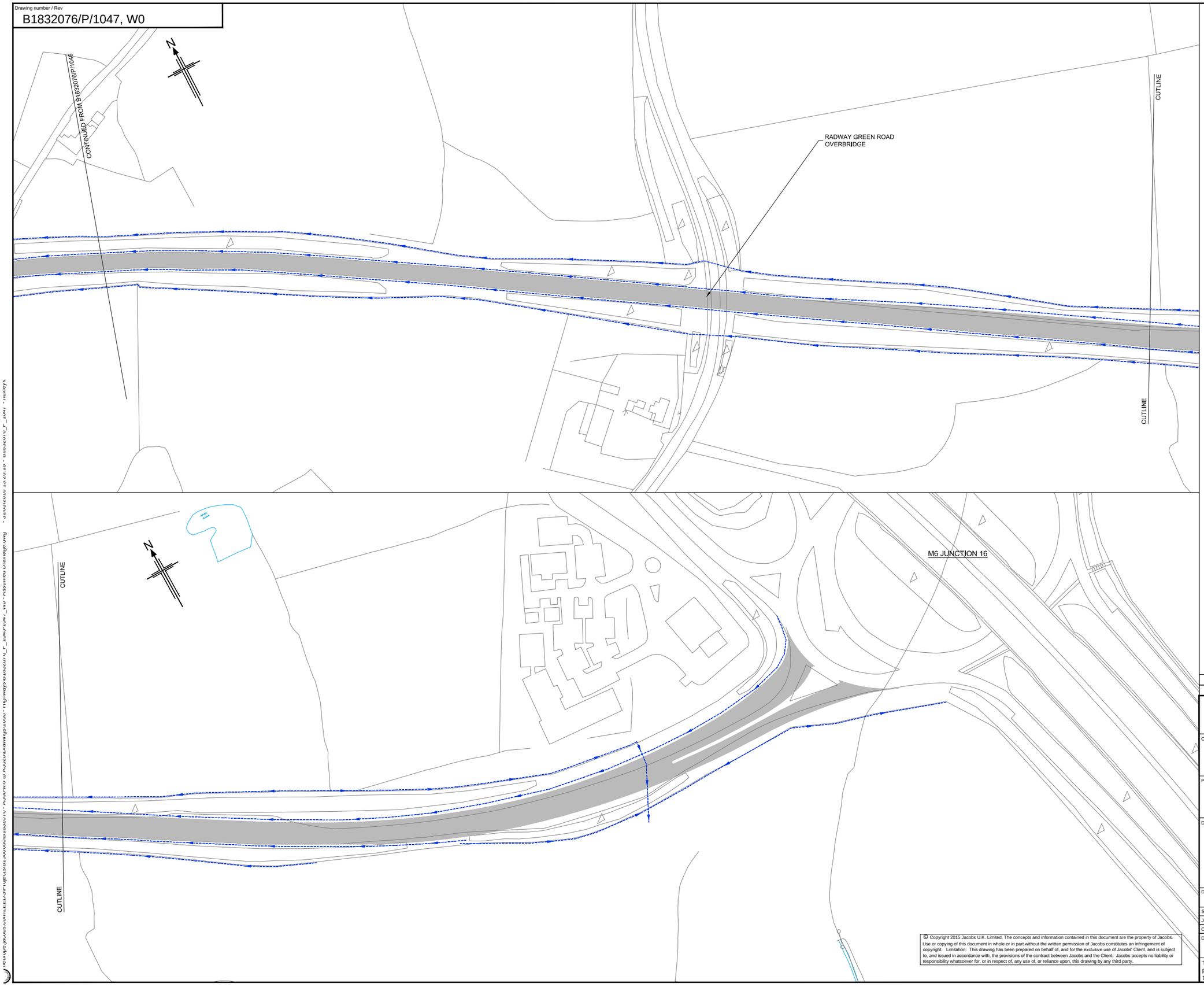
B1832076/P/1046

Rev

W0

Drawing number / Rev

B1832076/P/1047, W0

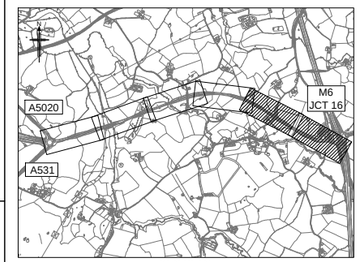


NOTES:

1. All dimensions are in meters, unless stated otherwise.
2. For other information relating to the scheme see;
   - Dwg No. B1832076/WD/0001 - Study Extents
   - Dwg No. B1832076/P/1001 - Existing Cross Section
3. The layout shown is indicative. All existing filter drains are assumed and shown in the verge or at either the top or toe of embankments. This is based on site observations and discussions with Cheshire East Highways staff. A survey is needed to confirm the layout.

LEGEND:

- Existing Drainage
- Existing Carriageway
- Existing Water Features
- Existing Culvert



KEY PLAN

0 20 40 60 80 100 m

SCALE 1 : 1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
W0	24/02/2015	DRAFT - FOR INFORMATION	KJH	DT	DT	SK

JACOBS
Number One Building, 5 First Street, Manchester, M15 4GU
Tel:+44(0)161 235 6000 Fax:+44(0)161 235 6001
www.jacobs.com

Client

Cheshire East Council

Project

A500 WIDENING SCHEME

Drawing title

A500 DUALLING AND WIDENING SCHEME
ASSUMED EXISTING DRAINAGE
SHEET 3 OF 3

Drawing status

FOR INFORMATION

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.	B1832076	
Client no.		

Drawing number: B1832076/P/1047 Rev: W0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Cheshire East Council
Highways

Appendix H – Score Weightings Sensitivity Analysis

B1832076/OD/01 - Scheme Assessment Report
Appendix H - Score Weightings Sensitivity Analysis

The tables below take Table 6.2 from the main report and apply different weightings. The rationale behind the weightings is described for each scenario.

Scenario 1: Original Scenario, as included in the main report

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	2	2	**1**	2	2
Topography and Land Use	2	2	**1**	2	2
Geology, Geomorphology and Ground Conditions	1	2	**2**	2	4
Departures from Standards	2	2	**0.5**	1	1
Public Utilities	1	2	**1**	1	2
Structures	2	2	**0**	0	0
Reputation	1	2	**0.5**	0.5	1
Constructability	2	2	**1**	2	2
Operational Safety	2	2	**1**	2	2
Landscape	2	2	**0.4**	0.8	0.8
Ecology	1	2	**0.4**	0.4	0.8
Cultural Heritage	2	1	**0.2**	0.4	0.2
Air Quality	2	2	**0.2**	0.4	0.4
Greenhouse Gases	2	2	**0.2**	0.4	0.4
Noise and Vibration	2	2	**0.2**	0.4	0.4
The Water Environment	2	2	**0.4**	0.8	0.8
All Travellers	2	2	**0.2**	0.4	0.4
Community and Private Assets	2	1	**0.6**	1.2	0.6
Planning	2	2	**0.2**	0.4	0.4
OVERALL	**34**	**36**		**18.1**	**21.2**

Scenario 2: Weighting of environmental factors doubled

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	2	2	**1**	2	2
Topography and Land Use	2	2	**1**	2	2
Geology, Geomorphology and Ground Conditions	1	2	**2**	2	4
Departures from Standards	2	2	**0.5**	1	1
Public Utilities	1	2	**1**	1	2
Structures	2	2	**0**	0	0
Reputation	1	2	**0.5**	0.5	1
Constructability	2	2	**1**	2	2
Operational Safety	2	2	**1**	2	2
Landscape	2	2	**0.8**	1.6	1.6
Ecology	1	2	**0.8**	0.8	1.6
Cultural Heritage	2	1	**0.4**	0.8	0.4
Air Quality	2	2	**0.4**	0.8	0.8
Greenhouse Gases	2	2	**0.4**	0.8	0.8
Noise and Vibration	2	2	**0.4**	0.8	0.8
The Water Environment	2	2	**0.8**	1.6	1.6
All Travellers	2	2	**0.4**	0.8	0.8
Community and Private Assets	2	1	**1.2**	2.4	1.2
Planning	2	2	**0.4**	0.8	0.8
OVERALL	**34**	**36**		**23.7**	**26.4**

Scenario 3: 'Community and Private Assets element', which factors in the impact on Bluemire Farm, given a weighting of 2, and 'Geology, Geomorphology and Ground Conditions', which factors in the difficulties of constructing through the duckaries pond, given a weighting of 1

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	2	2	**1**	2	2
Topography and Land Use	2	2	**1**	2	2
Geology, Geomorphology and Ground Conditions	1	2	**1**	1	2
Departures from Standards	2	2	**0.5**	1	1
Public Utilities	1	2	**1**	1	2
Structures	2	2	**0**	0	0
Reputation	1	2	**0.5**	0.5	1
Constructability	2	2	**1**	2	2
Operational Safety	2	2	**1**	2	2
Landscape	2	2	**0.4**	0.8	0.8
Ecology	1	2	**0.4**	0.4	0.8
Cultural Heritage	2	1	**0.2**	0.4	0.2
Air Quality	2	2	**0.2**	0.4	0.4
Greenhouse Gases	2	2	**0.2**	0.4	0.4
Noise and Vibration	2	2	**0.2**	0.4	0.4
The Water Environment	2	2	**0.4**	0.8	0.8
All Travellers	2	2	**0.2**	0.4	0.4
Community and Private Assets	2	1	**2**	4	2
Planning	2	2	**0.2**	0.4	0.4
OVERALL	**34**	**36**		**19.9**	**20.6**

Scenario 4: 'Cultural Heritage' and 'Community and Private Assets' elements given a weighting of 2

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	2	2	**1**	2	2
Topography and Land Use	2	2	**1**	2	2
Geology, Geomorphology and Ground Conditions	1	2	**2**	2	4
Departures from Standards	2	2	**0.5**	1	1
Public Utilities	1	2	**1**	1	2
Structures	2	2	**0**	0	0
Reputation	1	2	**0.5**	0.5	1
Constructability	2	2	**1**	2	2
Operational Safety	2	2	**1**	2	2
Landscape	2	2	**0.4**	0.8	0.8
Ecology	1	2	**0.4**	0.4	0.8
Cultural Heritage	2	1	**2**	4	2
Air Quality	2	2	**0.2**	0.4	0.4
Greenhouse Gases	2	2	**0.2**	0.4	0.4
Noise and Vibration	2	2	**0.2**	0.4	0.4
The Water Environment	2	2	**0.4**	0.8	0.8
All Travellers	2	2	**0.2**	0.4	0.4
Community and Private Assets	2	1	**2**	4	2
Planning	2	2	**0.2**	0.4	0.4
OVERALL	**34**	**36**		**24.5**	**24.4**

Scenario 5: Factors that take the duckaries into account, i.e. 'Geology, Geomorphology and Ground Conditions' and 'Ecology', given a weighting of 2

	Unweighted Rankings / Scores			Weighted Scores	
Element	**Option 1**	**Option 2**	**Weighting**	**Option 1**	**Option 2**
Scheme Cost Estimate	2	2	**1**	2	2
Topography and Land Use	2	2	**1**	2	2
Geology, Geomorphology and Ground Conditions	1	2	**2**	2	4
Departures from Standards	2	2	**0.5**	1	1
Public Utilities	1	2	**1**	1	2
Structures	2	2	**0**	0	0
Reputation	1	2	**0.5**	0.5	1
Constructability	2	2	**1**	2	2
Operational Safety	2	2	**1**	2	2
Landscape	2	2	**0.4**	0.8	0.8
Ecology	1	2	**2**	2	4
Cultural Heritage	2	1	**0.2**	0.4	0.2
Air Quality	2	2	**0.2**	0.4	0.4
Greenhouse Gases	2	2	**0.2**	0.4	0.4
Noise and Vibration	2	2	**0.2**	0.4	0.4
The Water Environment	2	2	**0.4**	0.8	0.8
All Travellers	2	2	**0.2**	0.4	0.4
Community and Private Assets	2	1	**0.6**	1.2	0.6
Planning	2	2	**0.2**	0.4	0.4
OVERALL	**34**	**36**		**19.7**	**24.4**

Cheshire East Council
Highways

A500, M6 to A5020

EAST and SWOT Analysis

Revision 0

April 2017

Cheshire East Council
Highways

A500, M6 to A5020

Project No:	B1832076
Document Title:	EAST and SWOT Analysis
Document No.:	B1832076-OD-23
Revision:	R0
Date:	April 2017
Client name:	Cheshire East Council
Project manager:	Dan Teasdale
Author:	Emily Lachlan
File name:	B1832076-OD-23 – Scheme Assessment Report

Jacobs U.K. Limited

Document history and status

Rev	Date	Description	By	Review	Approved
R0	10/04/17	For Information	E. Lachlan	J. Horas	D. Teasdale

Cheshire East Council
Highways

Contents

Cheshire East Council
Highways

1 Introduction

1.1 Scheme Description

A500, M6 to A5020' ("the scheme") is a proposed upgrade of the existing 3.3km single lane carriageway road, between M6 Junction 16 and the A5020 roundabout, to a dual carriageway. The scheme is to the southeast of Crewe and is one of two main routes from the town to the M6 motorway. The scheme is currently being developed by Cheshire East Council (CEC), and is considered to be an integral part of the Local Plan.

1.2 Background to the Scheme

The A500 between M6 J16 and the A5020 was constructed in the mid-1980's, but developments in eastern Crewe and the construction of the A500 Hough Shavington Bypass immediately to the west (opened to traffic in 2003) have generated a significant increase in traffic flows, causing congestion. The proposed developments required to deliver 'All Change for Crewe' and included in the Local Plan will generate more traffic, and exacerbate problems on the link.

The scheme is to the southeast of Crewe and is one of two main routes from the town to the M6 motorway. The scheme is currently being developed by Cheshire East Council (CEC), and is considered to be an integral part of the Local Plan.

1.3 Purpose of the Report

The purpose of the report is to record the findings of the Scheme Objectives Workshop held in January 2017. The workshop was attended by a number of stakeholders, with the purpose of agreeing the problems within the study area; agreeing the Scheme Objectives, and; generating a long list of potential schemes that would solve the problems and meet the Scheme Objectives, either partly of in full.

Following the workshop the long list of potential schemes was subject to en 'Early Assessment and Sifting Tool' analysis, and the best performing options subject to a 'Strengths, Weaknesses, Opportunities, Threats' analysis. This report records the findings and makes a recommendation for a preferred improvement option.

Cheshire East Council
Highways

2 Scheme Objectives Workshop

On January 27, 2017, a Scheme Objectives Workshop was held at Cheshire East Council's Municipal Buildings in Crewe, with the purpose of agreeing the problems within the study area; agreeing the Scheme Objectives, and; generating a long list of potential improvement schemes that would solve the problems and meet the objectives, either partly or in full.

The following report details the outcomes of the workshop. Meeting minutes can be found in Appendix A.

2.1 Problems

The following problems with the existing network:

- Existing capacity issues on the A500 and Meremoor Moss Roundabout cause delay
- A single carriageway A500 is not very resilient, and closures can impact on the M6 and the wider network
- The housing and employment growth identified in the Local Plans, the Northern Gateway Development Zone plans, and as a consequence of the HS2 hub station will generate more travel demand. The A500 will inhibit that growth and employment.
- Increase in construction traffic along the A500 during the construction of HS2
- Congestion on A500 affecting the reliability of public transport services serving the future HS2 hub station at Crewe
- The at-grade uncontrolled pedestrian crossings over a high speed road are undesirable

2.2 Scheme Objectives

Following a group discussion, the objectives were agreed to be the following;

- To support the economic, physical and social regeneration of Crewe and the Northern Gateway
- Improve journey time and reliability
- Improve the reliability of public transport
- Improve connectivity between important economic centres, LEP and local authority areas, regions and to North Wales
- Support delivery of key national infrastructure, i.e. HS2 and the Crewe Hub Station
- Support delivery of key employment and housing allocations

- Boost business integration and productivity; improve the efficiency and reliability of the highway network, reduce the conflict between the local and strategic traffic, and provide an improved route for freight and business travel.

- Facilitate future improvements to M6 J16

2.3 Potential Improvement Options

The following categories were used to facilitate a group discussion and identify potential improvement options;

- online improvements;

- offline improvements;

- public transport;

- demand management; and

- traffic management.

The group identified a total of 20 possible options that would solve the problems and meet the Scheme Objectives, either partly or in full. The long list of options can be found in the minutes in Appendix A.

3 Assessment

Following the workshop the 20 options were taken forward for further assessment. The assessment was undertaken in two stages. The first stage was to use the Department for Transport's 'Early Assessment and Sift Tool' (EAST). The second stage was to use a 'Strengths, Weaknesses, Opportunities, Threats' (SWOT) analysis.

3.1 East Assessment and Sifting Tool (EAST)

The tool analysed the options using strategic, economic, managerial, financial and commercial criteria. Much of the analysis used a rating system of high to low impact on objectives such as carbon emission, connectivity between communities and feasibility.

In addition to the long list of 20 options, a further 5 combinations of those options were identified for assessment.

The full assessment and results can be found in Appendix B.

3.2 SWOT Analysis

A total of six options were identified as the performing the best in the EAST assessment, and were taken forward the SWOT analysis. These options taken forward were:

- Dualling
- Localised improvements at Meremoor Moss Roundabout
- Wide single carriageway
- Tidal flow lane
- High occupancy vehicle lane
- Combination of Express Bus and High Occupancy Vehicle Lane

3.3 Recommendation

The analysis concluded that the best performing option was to dual the A500, and therefore this is taken forward as the preferred option. The option for localised improvements at Meremoor Moss Roundabout also performed well, and so that option will be taken forward as a low cost option, for comparison in later stages of the project.

Cheshire East Council
Highways

Page Not Used

Cheshire East Council
Highways

Appendix A – Scheme Objectives Workshop Minutes

JACOBS

Meeting Minutes

5 First Street
Manchester M15 4GU
United Kingdom
T +44 (0)161 235 6000
F +44 (0)161 235 6001
www.jacobs.com

Subject	**A500- Scheme Objectives Workshop**		
Project	A500, M6 to A5020		
Project No.	B1832076	**File**	A500- Scheme Objectives Workshop
Prepared by	Santosh Pandey	**Phone No.**	01612356125
Location	Municipal Buildings, Crewe	**Date/Time**	27 January 2017
Participants	Daniel Teasdale (Jacobs) Santosh Pandey (Jacobs) Daniel Caffrey (Jacobs) Paul Griffiths (Cheshire East Council) Dominic Flynn (Jacobs) Andrew Sellors (Jacobs) Neil Roberts (Transport Services Solutions) Chris Hindle (Cheshire East Council)		
Copies to	N/A	**Apologies**	Glenn Bubb (Transport Service Solutions)

Notes		**Action**
1	DC gave a summary of the scheme context, followed by a list of problems that DT and DC had generated before the meeting. Following a group discussion, the problems were refined to the following; - Existing capacity issues on the A500 and Meremoor Moss Roundabout cause delay - A single carriageway A500 is not very resilient, and closures can impact on the M6 and the wider network - The housing and employment growth identified in the Local Plans, the Northern Gateway Development Zone plans, and as a consequence of the HS2 hub station will generate more travel demand. The A500 will inhibit that growth and employment. - Increase in construction traffic along the A500 during the construction of HS2 - Congestion on A500 affecting the reliability of public transport services serving the future HS2 hub station at Crewe - The at-grade uncontrolled pedestrian crossings over a high speed road are undesirable The following potential problem was also identified, but further evidence is required to confirm;	PG to confirm - is the A500 is on a diversion route, as evidence to support this problem NR to investigate to

JACOBS

Meeting Minutes

A500- Scheme Objectives Workshop
27 January 2017

Notes		Action
	- Rat-running on local roads causing problems with reliability on public transport and impacting road safety? (evidence – bus delays? Safety stats?)	see if there is any evidence of delays on local bus routes in the vicinity of the A500. PG to provide accident data on local roads
2	The Scheme Objectives that were used in the previous phase were shared with the group. Following a group discussion, the objectives were amended to the following; • To support the economic, physical and social regeneration of Crewe and the Northern Gateway • Improve journey time and reliability • Improve the reliability of public transport • Improve connectivity between important economic centres, LEP and local authority areas, regions and to North Wales • Support delivery of key national infrastructure, i.e. HS2 and the Crewe Hub Station • Support delivery of key employment and housing allocations • Boost business integration and productivity; improve the efficiency and reliability of the highway network, reduce the conflict between the local and strategic traffic, and provide an improved route for freight and business travel. • Facilitate future improvements to M6 J16 In addition, there is the potential for a further objective relating to safety, if it can be demonstrated that rat running on the local roads is causing a safety problem.	
3	A group discussion was had in order to generate potential improvement schemes that could solve (or partially solve) the problems, and meet (or partially meet) the Scheme Objectives. The generated schemes are listed below;	
3.1	<u>Online Improvements</u> • Dualling • Localised improvement at Meremoor Moss roundabout approach. • Wide single carriageway.	

JACOBS

Meeting Minutes

A500- Scheme Objectives Workshop
27 January 2017

Notes		Action
	• Climbing lane on uphill section. • Tidal flow lane.	
3.2	Off-line Improvements • Improve M6 Junction 17 / New M6 Junction 17. • Improve local road network from Alsager to Crewe Green • New link road to connect M6 to J15a at Newcastle. • Dedicated/ alternative HS2 construction route.	
3.3	Public Transport • Improving rail link between Stoke and Crewe • Express bus between Stoke and Crewe • Local Bus services improvements between Crewe, Alsager and Kidsgrove. • Park and ride at M6 J16, plus bus priority lane (bus lane to Crewe) • Bus and high occupancy vehicle lane • Rail freight strategy	
3.4	Demand management • Cycling (park and ride) • Work place charging • Control traffic speed on dualled sections of the A500 with variable speed limits, to restrict flow • Restrict HGV usage during peak times	
3.5	Traffic Management • Interactive signing	
3.6	Following the meeting Jacobs will undertake an 'Early Assessment and Sifting Tool' exercise and a SWOT analysis on the generated options, in accordance with DfT guidance	DT to undertake EAST and SWOT analysis

Cheshire East Council
Highways

Appendix B – Early Assessment and Sifting Tool

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Dualling**	
Date	02/01/2017	
Description	Dualling of the A500 to provide 2 lanes in each direction of travel	

Strategic

Identified problems and objectives	This solution is attempting to resolve capacity issues which cause delays and also risk of impact on wider network in the incident of a closure. In addition it is to provide capacity for increased traffic during and after construction of HS2 hub station	
Scale of impact	4	Expected to significantly alleviate the problem by providing additional capacity and resilience to the network
Fit with wider transport and government objectives	4	Regional connectivity
Fit with other objectives	5. High	Supports HS2, delivery of local plan, NDGZ aspirations
Key uncertainties	Not achieving level of growth forecast (if HS2 is cancelled)	
Degree of consensus over outcomes	3	Some consultation has taken place with general support for solution.

Economic

Economic growth	**5. Green**	Dualling will improve the economic growth of Crewe and wider area associated with the expected new HS2 hub station, local plan and NDGZ.
Carbon emissions	**4. Amber/green**	Increased capacity will reduce queues by improving the flow of traffic along the link and also help reduce queues at M6 Exit.
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Some areas along the scheme will be affected by the increase of traffic. Mitigiation measures will reduce this impact.
Well being	**4. Amber/green**	Frustration in road users and travel time will be reduced due to the reduction in the congestion.
Expected VfM category	3. Medium 1.5-2	Benefit to Cost Ratio of 1.781

Managerial

Implementation timetable	5. 2-5 years	Expected delivery by 2020
Public acceptability	4	Stakeholder engagement so far inidicates a high level of local support for the scheme. Commuters into Crewe are likely to have a high level of support for the scheme.
Practical feasibility	4	CEC would promote and gobern the scheme implementation. Funding would need to be secured from DfT, and the scheme would need to go through the planning process, and possibly some statutory processes
What is the quality of the supporting evidence?	3	Traffic modelling - new WebTAG compliant model to be developed
Key risks	Land aquisition	

Financial

Affordability	4	
Capital Cost (£m)	05. 25-50	This includes 44% optimism bias
Revenue Costs (£m)		
Cost profile		
Overall cost risk	4	

Other costs	Optimism bias included, QRA to be done

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding, private developer contribution	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Localised improvement at MM Rbt**
Date	02/01/2017
Description	Localised improvements on the approach to Meremoor Moss Roundabout by providing an additional lane on each arm of the A500 approaching the roundabout, similar to the pinch point scheme implemented at M6 J16

Strategic

Identified problems and objectives	Improve journey time reliability by resolving existing and future capacity issues at Meremoor Moss Roundabout	
Scale of impact	3	Expected to alleviate some of the problem by providing additional capacity at Meremoor Moss Roundabout
Fit with wider transport and government objectives	3	Regional connectivity
Fit with other objectives	3	Supports Local Plan, but doesn't maximise HS2 and NGDZ benefits
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date, but unlikely to be controversial

Economic

Economic growth	**4. Amber/green**	Limited economic growth impact, support local plan growth but not HS2 + NGDZ
Carbon emissions	**4. Amber/green**	Maybe queues on the A500 Improvements will reduce queues and congestion on the approaches to the roundabout
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Reduced queuing will result in improved air quality.
Well being	**4. Amber/green**	Driver frustration and congestion will be reduced
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	4	Likely to have a high level of support
Practical feasibility	4	Would be delivered and operated by CEC. If improvements were in existing land take then likely to not require planning. External funding would be required.
What is the quality of the supporting evidence?	4	A similar scheme was implemented on the A500 approach to M6 J16
Key risks		

Financial

Affordability	4	Relatively minor works that would be affordable, but may require external funding
Capital Cost (£m)	02. 0-5	
Revenue Costs (£m)		
Cost profile		
Overall cost risk	4	
Other costs		

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding, private developer contribution	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Wide single carriageway**
Date	02/01/2017
Description	Widening of the existing carriageway cross-section to create a Wide Single carriageway (WS2 in accordance with TD 27/05). This could be marked as a WS2+1 layout, i.e. two lanes in one direction and one in the other, alternating half way along the link.

Strategic

Identified problems and objectives	To improve journey time reliability by resolving existing and future capacity issues on the A500	
Scale of impact	3	Expected to have a reasonably signficant impact on the problem by increasing capacity and improving network resilience
Fit with wider transport and government objectives	4	Regional connectivity
Fit with other objectives	4	Supports HS2, delivery of Local Plan, NGDZ aspirations
Key uncertainties	Uncertain whether a Wide Single would have sufficient capacity to accomodate the expected growth.	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**4. Amber/green**	Capacity will be increased which will contribute to the growth of Crewe, but unlikley to be sufficient capacity to fully alleviate future congestion problems
Carbon emissions	**4. Amber/green**	Increased capacity will reduce carbon emmissions, although queues may still fomr where the 'WS2+1' reduces from 2 lanes to 1.
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Some area along the link will suffer from increased traffic, although the increases are likely to be incremental and appropriate mitigation will be included in the design
Well being	**4. Amber/green**	Driver frustration and congestion will be reduced. Safety concerns about this option.
Expected VfM category		Likely to be less than dualling - similar construction costs for less benefit

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	4	Likely to be supported
Practical feasibility	4	
What is the quality of the supporting evidence?	3	Traffic modelling - new model to be developed
Key risks	Land acquisition	

Financial

Affordability	4	
Capital Cost (£m)	05. 25-50	Including Optimum Bias at 44%
Revenue Costs (£m)	Don't know	
Cost profile		

Overall cost risk	4	
Other costs		

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding, private developer contribution	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Climbing lane on uphill section**	
Date	02/01/2017	
Description	Provide an extra lane on the uphill section of the A500, to better accomodate slow moving traffic, particularly HGVs	

Strategic

Identified problems and objectives	Improving journey time reliability for resolving existing and future capacity issues on the A500	
Scale of impact	2	Would have a modest impact on improving link capacity, but insufficient to accomodate future flows
Fit with wider transport and government objectives	3	Regional connectivity
Fit with other objectives	3	Supports Local Plan, but doesn't maximise HS2 and NGDZ objectives
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**4. Amber/green**	Will have a small contirbution to the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Will have a small contribution to a reduction in carbon emissions, as a result of less congestion
Socio-distributional impacts and the regions	**3. Amber**	
Local environment	**3. Amber**	
Well being	**2. Red/amber**	Driver frustration would be reduced in the direction of the climbing lane. However, drivers in the opposite direction may see it as an opportunity to overtake when it is unasfe to do so
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	4	Likely to have public support
Practical feasibility	4	
What is the quality of the supporting evidence?	3	
Key risks	Land acquisition	

Financial

Affordability	4	
Capital Cost (£m)	03. 5-10	Relative to the cost of dualling the entire link
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	4	
Other costs		

Commercial

Flexibility of option	2	

Where is funding coming from?	Major transport funding, private developer contribution	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Tidal flow lane**
Date	02/01/2017
Description	Widen the existing carriageway in order to create an additional central lane, which would chnage direction (eastbound or westbound) in accordance with the direction of peak hour flow

Strategic

Identified problems and objectives	Aims to improve journey time reliability by resvoling existing and future capacity issues on the A500	
Scale of impact	4	Expected to signficantly alleviate the problem by providing additional capacity and adding resilience to the network
Fit with wider transport and government objectives	4	Regional connectivity
Fit with other objectives	5. High	Supports HS2, Local Plan, NGDZ aspirations
Key uncertainties	Not achieveing level of growth forecast (if HS2 is cancelled)	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**5. Green**	Would contribute to the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Would reduce congestion and queues along the link
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Some areas along the link would be affected by the increase in traffic. Appropriate mitigation would be included in the design
Well being	**1. Red**	Frustration and travel time would be reduced. However, the road layout would be unusual for the area and may result in an increase in head-on type road collisions
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	3	Level of public support uncertain
Practical feasibility	2	Would require a new operating regime for CEC
What is the quality of the supporting evidence?	2	
Key risks		

Financial

Affordability	4	
Capital Cost (£m)	05. 25-50	Similar to dualling - less road space, but additional technology and infrastrucutre required
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	2	
Other costs		

Commercial

Flexibility of option	2	

Where is funding coming from?	Major transport funding, private developer contribution	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Improve or new M6 J17**
Date	02/01/2017
Description	Improvements to M6 J17, or relocation of the junction to a location further south. This would improve traffic flows for vehicles travelling southwards from the M6 towards Crewe, and also for vehicles travelling east to west from the direction of Congleton. If the junction was relocated it may also mean that traffic could avoid Sandbach town centre on the way to Crewe.

Strategic

Identified problems and objectives	This solution aims to reduce congestion on the A500 by ensuring that traffic travelling to Crewe from the north exits the M6 at J17, rather than travelling to J16 and via the A500. Aims to improve journey time reliability by solving existing and future capacity issues on the A500.	
Scale of impact	2	Unlikely to change traffic flows - drivers from the north are already likely to use M6 J17
Fit with wider transport and government objectives	1. Low	Does not improve connections between Crewe and Stoke, assist HS2 construction traffic, or maximise the benefits of HS2
Fit with other objectives	4	Improves regional connectivity between Crewe, Sandbach, Congleton and Macclesfield
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date and may be local objectives to the scheme

Economic

Economic growth	**2. Red/amber**	Economic growth in Crewe would still be limited due to the single carriageway along the A500
Carbon emissions	**2. Red/amber**	Traffic flows at M6 J17 would be improved which will reduce carbon emissions, but carbon emissions along the A500 would be largely unaffected
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**4. Amber/green**	The local environment in Sandbach would be improved by removal of through traffic from the town centre. The local environment at the A500 would be unaffected.
Well being	**1. Red**	Driver frustration on the A500 would continue to grow as congestion becomes worse
Expected VfM category		

Managerial

Implementation timetable	6. 5-10 years	
Public acceptability	4	Likely to have local support within Sandbach, and wider support in the region but may have some objections
Practical feasibility	3	
What is the quality of the supporting evidence?	3	
Key risks	Land acquisition, securing funds	

Financial

Affordability	3	

Capital Cost (£m)	06. 50-100	Relocation of junction, including two new structures, and link roads to tie into network. Scheme Cost Estimate has not yet been developed.
Revenue Costs (£m)		
Cost profile		
Overall cost risk	2	
Other costs		

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding, private developed contributions	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Improve local road network**
Date	02/01/2017
Description	Improve the local road network from Alsager to Crewe Green, via the B5077.

Strategic

Identified problems and objectives	Improves the local road network to accomodate rat-running traffic, and reducing problems with reliability on public transport and road safety	
Scale of impact	1. Small impact	Will not provide a solution to existing A500 capacity issues and resilience, and likely to increase the problem of rat-running
Fit with wider transport and government objectives	1. Low	Will not provide a solution to the problems on the A500, and likely to increase the problem of rat-running
Fit with other objectives	Don't know	
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date and possible local objectives

Economic

Economic growth	**1. Red**	Improvements on the local road network would likely do little to benefit the economic growth of Crewe
Carbon emissions	**2. Red/amber**	Traffic would be attracted to the local road network, which would increase carbon emissions
Socio-distributional impacts and the regions	**3. Amber**	
Local environment	**1. Red**	Traffic would be attracted to the local road network, which would negatively affect the local environment
Well being	**1. Red**	Busier local roads would likely increase severance, and make it less likely that people would walk or cycle along the routes
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	2	Will probably be perceived as attracting traffic to the local road network.
Practical feasibility	4	
What is the quality of the supporting evidence?	4	
Key risks		

Financial

Affordability	3	
Capital Cost (£m)	Don’t know	
Revenue Costs (£m)	Don’t know	
Cost profile		
Overall cost risk	Don’t know	
Other costs		

Commercial

Flexibility of option	4	Discrete improvements would mean that the scheme could be easily scaled up or down

Where is funding coming from?	CEC local transport fundings	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**New link road to a new M6 J15a**
Date	02/01/2017
Description	New link road to a new M6 J15a at the A525 to the west of Newcastle-under-Lyme

Strategic

Identified problems and objectives	New link road would create additional capacity for traffic travelling northwards towards Crewe, improving journey time and reliability, and solving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout. It also increase resilience on the road network.	
Scale of impact	4	Expected to signficantly alleviate the problem by adding additonal capacity and greater resilience to the network
Fit with wider transport and government objectives	2	Does not make best use of existing infrastructure
Fit with other objectives	4	Maximises the beenfits of HS2, the Local Plan, and NGDZ aspirations
Key uncertainties	Not achieving level of growth forecast (if HS2 is cancelled and growth aspirations not met)	
Degree of consensus over outcomes	1. Little	No consultation and likely to hence some local objections

Economic

Economic growth	**5. Green**	A new link road would signficantly benefit the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Significant construction work would be required, but a more efficient route would be created that would improve journey times and reduce congestion
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**1. Red**	The creation of a new link road would have significnat adverse impacts on the local environment
Well being	**3. Amber**	Would likely increase severance, but would also provide a safe road, and provide access to the amenities at Crewe
Expected VfM category		Likely to be poor value for money

Managerial

Implementation timetable	6. 5-10 years	
Public acceptability	3	Local support would likely be low due to the environmental impacts, but regional support is likely to be high
Practical feasibility	2	
What is the quality of the supporting evidence?	2	
Key risks	Land acquisition, public approval, acquiring funds and the planning and statutory processes	

Financial

Affordability	1. Not affordable	
Capital Cost (£m)	07. 100-250	Scheme Cost Estimate not yet developed. Costs would be for a new grade seperated junction on the M6, and a new 10km link road
Revenue Costs (£m)	Don't know	
Cost profile		

Overall cost risk	1.High risk	
Other costs		

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Dedicated HS2 construct. route**
Date	02/01/2017
Description	Dedicated HS2 construction route off the existing highway network

Strategic

Identified problems and objectives	This would remove construction traffic from the A500 route, and therefore not impact on journey time reliability during the construction period, and not contribute to existing capacity isues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	1. Small impact	Would provide HS2 construction a dedicated route, but no long term benefit to solving the problems on the A500
Fit with wider transport and government objectives	1. Low	Doesn't support any wider transport objectives
Fit with other objectives	3	Supports HS2 construction
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation has taken place

Economic

Economic growth	**1. Red**	Wouldn't provide any long term economic benefit to Crewe
Carbon emissions	**4. Amber/green**	Would provide a dedicated, efficient route for construction traffic
Socio-distributional impacts and the regions	**3. Amber**	
Local environment	**2. Red/amber**	Would negatively impact the local environment in the vicinity of the route for the duration of the construction period
Well being	**2. Red/amber**	May cause severance.
Expected VfM category		

Managerial

Implementation timetable	6. 5-10 years	HS2 construction is currently programmed from 2021 to 2027
Public acceptability	2	
Practical feasibility	2	
What is the quality of the supporting evidence?	1. Low	
Key risks	Land adquisition	

Financial

Affordability	3	
Capital Cost (£m)	03. 5-10	Dependant on the route - if the construction site were to be used as a route, then the costs would be much lower
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	3	
Other costs		

Commercial

Flexibility of option	1. Static	
Where is funding coming from?	HS2	

Any income generated? (£m)	No

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Improving rail link**
Date	02/01/2017
Description	Improving rail link between Crewe and Stoke

Strategic

Identified problems and objectives	Improving the rail link betweek Crewe and Stoke aims to reduce the number of people commuting between the cities via car, therefore improving journey time reliability, resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout, and improving connectivity between important economic centres	
Scale of impact	2	Only accomodates travellers between Stoke and Crewe and not the wider region, therefore unlikely to have the required impact
Fit with wider transport and government objectives	2	Support long term objective. Improve the rail connectivity in the local area.
Fit with other objectives	3	Doesn't assist HS2 construction. But would improve connections between economic centres of the NGDZ
Key uncertainties	Scheme would need to be progressed by Network Rail. CEC would have little influence.	
Degree of consensus over outcomes	1. Little	No consultation has taken place

Economic

Economic growth	**4. Amber/green**	Would contribute to the economic growth of Crewe by connecting important economic centres
Carbon emissions	**4. Amber/green**	Some commuters would transfer from road to rail, therefore reducing carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	An increase in train frequencies would have a slightly negative impact to some areas along the route
Well being	**5. Green**	Train is a safer form of travel than road, and improved rail link would improve jounrey times and improve reliability
Expected VfM category		

Managerial

Implementation timetable	6. 5-10 years	
Public acceptability	4	
Practical feasibility	2	
What is the quality of the supporting evidence?	2	
Key risks	Land acquisition, funding, works to be delivered by Netowrk Rail	

Financial

Affordability	Don't know	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs		

Commercial

Flexibility of option	1. Static	
Where is funding coming from?	Network Rail.	
Any income generated? (£m)	Yes	Fare Revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Express bus - Stoke and Crewe**	
Date	02/01/2017	
Description	Express bus between Stoke and Crewe	

Strategic

Identified problems and objectives	This option aims to reduce the number of vehicles commuting between Crewe and Stoke, therefore improving journey time reliability, partly resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout, and improving connectivity between important economic centres	
Scale of impact	2	Only accomodates travellers between Stoke and Crewe and not the wider region, so unlikely to have the required impact
Fit with wider transport and government objectives	2	Improve bus links between Stoke and Crewe. Support wider objectives to improve public transport connectivity.
Fit with other objectives	3	Doesn't assist HS2 construction. Unlikley to maximise the benefits of HS2. But improves connections between economic centres in the NGDZ.
Key uncertainties	Uptake	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**4. Amber/green**	May have a slight positive benefit on the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Encouraging drivers to use the bus would reduce carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	Provides better connections between Stoke and Crewe
Local environment	**4. Amber/green**	
Well being	**4. Amber/green**	
Expected VfM category		

Managerial

Implementation timetable	3. 6-12 months	
Public acceptability	5. High	
Practical feasibility	5. High	
What is the quality of the supporting evidence?	3	
Key risks		

Financial

Affordability	4	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	4	
Other costs	May require subsidy support	

Commercial

Flexibility of option	5. Dynamic	

Where is funding coming from?	CEC and Staffordshire Council, Rate Payers	
Any income generated? (£m)	Yes	Rare Revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Local service improvements**
Date	02/01/2017
Description	Local improvements to the bus service between Crewe, Alsager and Kidsgrove

Strategic

Identified problems and objectives	This option aims to encourages commuters away from vehicles driving on the A500, and onto local bus services travelling along the B5077. This will improve the reliability of public transport, improve journey time reliability on the A500, and partly contribute to solving the existing and future capacity problems on the A500 and Meremoor Moss Roundabout	
Scale of impact	2	Would only benefit commuters within a relatively small catchment, and not those from the wider region, so unlikely to have a signficant impact
Fit with wider transport and government objectives	3	Small scale improvement to regional connectivity
Fit with other objectives	2	Does not support HS2 construction. Unlikely to maximise the benefits of HS2.
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultations to date

Economic

Economic growth	**4. Amber/green**	May have a slight benefit to the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Encouraging drivers to use the bus would reduce carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	Local services increase opportunities for low incomes
Local environment	**4. Amber/green**	
Well being	**4. Amber/green**	Increases access to amenities in Crewe. Reduces social exclusion
Expected VfM category		

Managerial

Implementation timetable	3. 6-12 months	
Public acceptability	5. High	
Practical feasibility	4	
What is the quality of the supporting evidence?	3	
Key risks		

Financial

Affordability	Don't know	
Capital Cost (£m)	01. None	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs	May require subsidy of service	

Commercial

Flexibility of option	5. Dynamic	
Where is funding coming from?	CEC and bus operatos	
Any income generated? (£m)	Yes	Fare Revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Park and ride plus bus priority**
Date	02/01/2017
Description	Park and ride at M6 J16 (option amended to remove bus priority element)

Strategic

Identified problems and objectives	Aims to improve journey time reliability by reducing traffic on A500 by moving commuters from low occupancy vehicles onto high occupancy vehicles (bus), and partly resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	2	Assists with capacity issues and local road rat-running, but unlikley to alleviate the problem entirely. Doesn't support HS2 construction or regional connectivity.
Fit with wider transport and government objectives	2	Doesn't support regional connectivity
Fit with other objectives	2	Doesn't support HS2 construction. Unlikely to fully alleviate the capacity problems on the A500, so does not maximise the benefits of HS2 or the NGDZ
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**2. Red/amber**	Compared to driving, journey times are likely to be longer.
Carbon emissions	**4. Amber/green**	Reduced carbon emissions due to reduced number of vehicles.
Socio-distributional impacts and the regions	**3. Amber**	Limited impact, because a car is required to get to the Park and Ride site
Local environment	**2. Red/amber**	Some negative impacts at the location of the Park and Ride site
Well being	**2. Red/amber**	Increases journey times and reduces reliability
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	4	
Practical feasibility	3	
What is the quality of the supporting evidence?	2	
Key risks	Low use of facility	

Financial

Affordability	3
Capital Cost (£m)	04. 10-25
Revenue Costs (£m)	Don't know
Cost profile	
Overall cost risk	2
Other costs	May require subsidy of service

Commercial

Flexibility of option	3
Where is funding coming from?	Major transport funding

Any income generated? (£m)	Yes	Fare Revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**High occupancy vehicle lane**	
Date	02/01/2017	
Description	Existing carriageway widened to create a bus and high occupancy vehicle lane in each direction	

Strategic

Identified problems and objectives	Aims to improve jounrey time reliability and the reliability of public transport by resolving existing and future capacity issues on the A500	
Scale of impact	4	Expected to signficantly alleviate the problem by increasing the network capacity, increasing network resilience, and changing behaivours towards travelling in buses or in the same vehicle
Fit with wider transport and government objectives	4	Would improve regional connectivity
Fit with other objectives	4	Supports HS2, delivery of Local Plan, NGDZ aspirations
Key uncertainties	Unsure whether there would be sufficient shift towards buses and high occupancy vehicles to alleviate existing and future capacity problems	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**5. Green**	Would contribute to the economic growth of Crewe
Carbon emissions	**5. Green**	Would encourage a shift to public transport and sharing of vehicles
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**2. Red/amber**	An increase in traffic would have negative environmental impacts for some areas along the route
Well being	**4. Amber/green**	Driver frustration would be reduced
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	3	General acceptability, but not as high as a dual carriageway option
Practical feasibility	4	
What is the quality of the supporting evidence?	1. Low	
Key risks	Enforcement of lane usage	

Financial

Affordability	4	
Capital Cost (£m)	05. 25-50	Similar to dualling
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	4	
Other costs		

Commercial

Flexibility of option	2	

Where is funding coming from?	Major transport funding, private developer contributions	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Rail freight strategy**
Date	02/01/2017
Description	Develop a rail freight strategy for Crewe, to reduce the volume of road freight on the A500

Strategic

Identified problems and objectives	Improvements to rail freight to reduce volume of road freight, and therefore improving journey time reliability, and resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	2	Unlikely to solve the existing and future A500 capacity issues on its own, would not support the construction of HS2, or maximise the benefits of HS2 and the NGDZ
Fit with wider transport and government objectives	2	Does not improve regional connectivity. May conflict with HS2 proposals
Fit with other objectives	2	Does not contribute to the Local Plan, or maximise the benefits of HS2 and the NGDZ
Key uncertainties	Decision to transport by road or rail is driven by business, little impact on local delivery market	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**4. Amber/green**	Would have some contribution to the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Rail freight has lower emissions than HGVs
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**4. Amber/green**	
Well being	**4. Amber/green**	
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	4	
Practical feasibility	Don't know	
What is the quality of the supporting evidence?	1. Low	
Key risks	Rail network capacity to support increased freight deliveries into Crewe	

Financial

Affordability	Don't know	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs		

Commercial

Flexibility of option	4	
Where is funding coming from?	Network Rail	

Any income generated? (£m)	No	Don't Know

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Cycling (park and cycle)**
Date	02/01/2017
Description	Provide park and cycle facilites at M6 J16

Strategic

Identified problems and objectives	Reduce volume of traffic on A500 by transferring commuters to a different method of transport, thus improving journey time reliability and partly resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	2	Very unlikely to solve the exsiting and future capacity issues on the A500, does not support HS2 construction, does not maximise the benefits of HS2 and the NGDZ
Fit with wider transport and government objectives	2	Does not improve regional connectivity
Fit with other objectives	2	Support local cycle policies.
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**2. Red/amber**	Journey time increased for cyclists, with little improvement expected for drivers. Minimal impact on the economic growth of Crewe.
Carbon emissions	**4. Amber/green**	Encouraging a chnage from car to bike would reduce carbon emissions
Socio-distributional impacts and the regions	**3. Amber**	Positive for affordability, not for the vulnerable or disabled. A car would be required for most people to access the site.
Local environment	**2. Red/amber**	The construction of a new park and cycle site would have some negative evironmental impacts in what is largely a rural site
Well being	**4. Amber/green**	Increased opportunity for physical activity
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	3	
Practical feasibility	3	
What is the quality of the supporting evidence?	1. Low	
Key risks	Public usage	

Financial

Affordability	Don't know	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs	May require revenue subsidy support.	

Commercial

Flexibility of option	2	

Where is funding coming from?	Major transport funding	
Any income generated? (£m)	Yes	Cycle hire and parking charges

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Work place charging**
Date	02/01/2017
Description	Financial implications for businesses based on the number of car parking spaces they provide

Strategic

Identified problems and objectives	Aim to reduce the provision of parking spaces to discourage commuters from driving into work or encourage higher vehicle occupancy. This aims to reduce volume of traffic and therefore improving journey time reliability, and resolving existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	2	Would contribute to the alleviation of capacity issue problems on the A500, but would not support HS2 construction, increase the resilience of the A500, or maximise the benefits of HS2 and the NGDZ
Fit with wider transport and government objectives	2	Does not improve regional connectivity
Fit with other objectives	2	Does not maximise the benefits of HS2 or the NGDZ.
Key uncertainties	Scale of impact is uncertain	
Degree of consensus over outcomes	1. Little	No consultation to date, and may be controversial and recive local objections.

Economic

Economic growth	**1. Red**	Option could reduce the number of business in town due to lack of parking spaces for their employees, or the financial burden of the charging
Carbon emissions	**4. Amber/green**	Will likely result in fewer car journeys into Crewe
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**5. Green**	Could improve air quality in Crewe town centre
Well being	**3. Amber**	Will reduce access to good and services, but may encourage other forms of transport, e.g. cycling
Expected VfM category		

Managerial

Implementation timetable	2. 1-6 months	
Public acceptability	2	Expected limited support from business and commuters
Practical feasibility	5. High	
What is the quality of the supporting evidence?	2	
Key risks	Public and political support	

Financial

Affordability	5. Affordable	
Capital Cost (£m)	01. None	
Revenue Costs (£m)	02. 0-5	
Cost profile		
Overall cost risk	5. Low risk	
Other costs		

Commercial

Flexibility of option	5. Dynamic	
Where is funding coming from?	CEC	
Any income generated? (£m)	Yes	Don't know

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Controlled traffic speed**	
Date	02/01/2017	
Description	Control traffic speed with variable speed limits on the dualled sections of the A500, to the east of M6 J16, and to the west of the A5020. This will control the flow of traffic entering the single carriageway section of the A500 to an appropriate level to suit the capacity of the link	

Strategic

Identified problems and objectives	Aims to resolve congestion and bunching issues by restricting and regulating the flow of traffic.	
Scale of impact	1. Small impact	Would not alleviate the capacity issues on the A500, would not support HS2 construction, and would not maximise the benfits of HS2 and the NGDZ
Fit with wider transport and government objectives	2	Does not improve regional connectivity
Fit with other objectives	2	Does not support the Local Plan, or maximise the benefits of HS2 and the NGDZ
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**1. Red**	Restricting speed limits, and therefore the capacity of the A500, will restrict economic growth in Crewe
Carbon emissions	**4. Amber/green**	Smoother traffic flows will reduce carbon emissions
Socio-distributional impacts and the regions	**3. Amber**	
Local environment	**4. Amber/green**	Smoother traffic flows will improve air quality and noise levels along the route
Well being	**4. Amber/green**	Smoother traffic flows will result in fewer accidents
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	2	Likley to have low levels of support from users of the network
Practical feasibility	3	
What is the quality of the supporting evidence?	1. Low	
Key risks	New technology and operating regime for CEC	

Financial

Affordability	3	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs	May require additional revenue support.	

Commercial

Flexibility of option	3	

Where is funding coming from?	Major transport funding	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Restrict HGV usage**	
Date	02/01/2017	
Description	Ban HGVs from using the A500 during peak times	

Strategic

Identified problems and objectives	Aims to improve journey time reliability and to solve existing and future capacity issues on the A500 and at Meremoor Moss Roundabout.	
Scale of impact	3	Would have a reasonably signficant impact on alleviating existing and future capacity issues on the A500, but would impede HS2 construction
Fit with wider transport and government objectives	3	Would improve regional connectivity
Fit with other objectives	3	Would assist commuters travelling to HS2 and between economic centres of the NGDZ
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**1. Red**	Restricting HGVs would negatively impact the economic growth of Crewe
Carbon emissions	**4. Amber/green**	Restricting HGVs would reduce carbon emissions and improve the flow of other vehicles
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**1. Red**	Less HGV traffic would improve the local environment along the route but HGV may divert to local roads.
Well being	**1. Red**	Less congestion would reduce driver frustration but likely impact on other local roads.
Expected VfM category		

Managerial

Implementation timetable	3. 6-12 months	
Public acceptability	2	Some support from commuters, but low support from business
Practical feasibility	2	Enforcement would be required
What is the quality of the supporting evidence?	1. Low	
Key risks	Implementing and enforcing	

Financial

Affordability	3	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs		

Commercial

Flexibility of option	4	

Where is funding coming from?	CEC	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Interactive signing**	
Date	02/01/2017	
Description	Interactive signing to be provided on the surrounding network to inform drivers of alternative routes, congestion warnings, road closures etc. on the single carriageway section of the A500	

Strategic

Identified problems and objectives	Signing would aim to inform drivers of alternative routes, steady the flow of traffic and reduce congestion	
Scale of impact	1. Small impact	Would not alleviate capacity issues on the A500, would not support HS2 construction, and would not maximise the benefits of HS2 and the NGDZ
Fit with wider transport and government objectives	2	Would have only a very small improvement to regional connectivity, particularly as there are no convenient alternative routes
Fit with other objectives	2	Does not maximise the benefits of HS2 of the NGDZ
Key uncertainties		
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**3. Amber**	Unlikley to have a signficnat affect on the economic growth of Crewe, because of the lack of convenient alternative routes
Carbon emissions	**4. Amber/green**	Slight reduction in carbon emissions as drivers would alter their speed to suit the conditions ahead
Socio-distributional impacts and the regions	**3. Amber**	
Local environment	**3. Amber**	Minimal impact on the local environment
Well being	**4. Amber/green**	Slight reduction in driver frustration
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	3	The scheme is likely to be acceptable to the public
Practical feasibility	5. High	
What is the quality of the supporting evidence?	3	
Key risks	New operating regime for CEC, to ensure messages are regularly updated with accurate information	

Financial

Affordability	2	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs	Ongoing revenue support may be required.	

Commercial

Flexibility of option	2	

Where is funding coming from?	Major transport funding	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Comb- P+R and work place charge**
Date	13/02/2017
Description	Combination of work place charging (option ref.17) to reduce the number of vehicles, combined with park and ride (option ref. 13) to provide an alternative

Strategic

Identified problems and objectives	The aim would be to reduce the number of vehicles commuting on the A500, therefore improving journey time reliability and resolving any existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	3	May have a reasonably significant impact on alleviating the capacity issues on the A500
Fit with wider transport and government objectives	2	Does not improve regional connectivity
Fit with other objectives	2	Does not maximise the benefits of HS2 of the NGDZ
Key uncertainties	The volume of traffic that it would remove from the road is uncertain, and therefore the extent to which it alleviates the capacity issues on the A500	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**1. Red**	Option could make Crewe less attractive to business
Carbon emissions	**5. Green**	Would encourage drivers to switch to public transport
Socio-distributional impacts and the regions	**3. Amber**	A car would be required to access the park and ride site
Local environment	**2. Red/amber**	Some negative impacts to the local environment at the Park and Ride site, which would be in a predominantly rural area
Well being	**2. Red/amber**	Would increase journey times and decrease reliability
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	2	Expected limited support from commuters and businesses
Practical feasibility	3	
What is the quality of the supporting evidence?	1. Low	
Key risks	Landtake required for a Park and Ride site. Public and political support for work place charging unlikely	

Financial

Affordability	4	
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	2	
Other costs		

Commercial

Flexibility of option	3	Park and Ride site is inflexible, but work placed charging is flexible

Where is funding coming from?	Major transport funding	
Any income generated? (£m)	Yes	Parking charge and fare revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Comb- Express bus and hi occ ln**
Date	13/02/2017
Description	Combination of an express bus between Stoke and Crewe (option ref.11) and a high occupancy lane along the A500 (option ref.14)

Strategic

Identified problems and objectives	The aim would be to increase the attractivenes of public transport for those commuting between Stoke and Crewe and improving the reliability of public transport, therefore improving the journey time reliability for all travellers along the A500, resolving existing and future capacity issues along the A500 and at Meremoor Moss Roundabout, and improving connections between important economic centres	
Scale of impact	4	Expected to signficantly alleviate the problem by increasing network capacity, increasing network resilience, and changing driver behaivours to change to busses or sharing vehicles, particularly for commuters travelling from Stoke
Fit with wider transport and government objectives	4	Supports regional connectivity
Fit with other objectives	4	Increases the benefits from HS2 and the NGDZ
Key uncertainties	Unsure whether there would be sufficient shift to busses and high occupancy vehicles to alleviate the existing and future capacity issues on the A500	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**5. Green**	Would support the economic growth of Crewe
Carbon emissions	**5. Green**	Would encourage shift to busses and high occupancy vehicles, reducing carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Positive impact from reduction in cars, but negative impact from construction of lane and likely increase in flows closer to properties
Well being	**4. Amber/green**	Reduced driver frustration
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	3	
Practical feasibility	4	
What is the quality of the supporting evidence?	1. Low	
Key risks	Enforcement of high occupancy lane	

Financial

Affordability	3	
Capital Cost (£m)	05. 25-50	Similar to dualling
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs		

Commercial

Flexibility of option	2	Express bus is flexible, but high occupancy lane is inflexible
Where is funding coming from?	Major transport funding, private developer contributions	
Any income generated? (£m)	Yes	Don't know

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Comb- P+R, hi occ ln + work ch**
Date	13/02/2017
Description	Combination of a Park and Ride at M6 J16 (option ref.13), a bus and high occupancy lane (option ref.14), and work place charging (option ref.17)

Strategic

Identified problems and objectives	The aim of this combination is to reduce vehicles commuting into work and instead provide alternatives of a priority lane for those travelling by bus or car sharing, and a park and ride. This will improve journey time reliability along the A500, and aim to resolve existing and future capacity issues along the A500 and at Meremoor Moss Roundabout.	
Scale of impact	4	Expected to signficantly alleviate the problem by increasing network capacity, increasing network resilience, and changing driver behaivours to travel into Crewe by bus or a high occupancy vehicle
Fit with wider transport and government objectives	4	Improves regional connectivity
Fit with other objectives	3	Increases the benefits from HS2 and the NGDZ
Key uncertainties	Unsure whether there would be sufficient shift to busses and high occupancy vehicles to alleviate the existing and future capacity probelms on the A500	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**3. Amber**	The high occupancy lane would contribute to the economic growth of Crewe, whereas work place charging would detract. It's unclear where the balance would lie.
Carbon emissions	**5. Green**	Would encourage drivers to transfer to busses and high occupancy vehicles
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Positive impact from reduction in cars but negative impact from construction of lane and the Park and Ride site
Well being	**2. Red/amber**	Increased journey times and reduced journey time reliability, compared to travel by car
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	
Public acceptability	2	
Practical feasibility	3	
What is the quality of the supporting evidence?	1. Low	
Key risks	Enforecment of high occupancy lane. Public and political support for work placed charging.	

Financial

Affordability	3	
Capital Cost (£m)	06. 50-100	
Revenue Costs (£m)	Don't know	
Cost profile		

Overall cost risk	2
Other costs	

Commercial

Flexibility of option	2	
Where is funding coming from?	Major transport funding. Private developer contributions.	
Any income generated? (£m)	Yes	Don't know

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Comb - impr rail + work charge**
Date	13/02/2017
Description	Combination of work place charging (option ref.17) and an improved rail link between Crewe and Stoke (option ref.10)

Strategic

Identified problems and objectives	The aim of this combination is to deter people from driving, and therefore to solve existing and future capacity issues on the A500 and at Meremoor Moss Roundaout, and to improve the reliability and frequency of train services as an alternative mode of transport.	
Scale of impact	2	The rail link only benefits commuters from Stoke, so may only have a modest overall impact.
Fit with wider transport and government objectives	2	Support long term objectives of local rail improvements.
Fit with other objectives	3	Does not assist HS2 construction, and will not maximise the benefits of HS2. But would improve connections between important economic centres across the NGDZ
Key uncertainties	Rail scheme would need to be progressed by Network Rail. CEC would have little influence.	
Degree of consensus over outcomes	1. Little	No consultation to date

Economic

Economic growth	**2. Red/amber**	Rail link would contribute to the economic growth in Crewe, whereas work place charging would detract. Overall impact considered to be 'Red/amber'.
Carbon emissions	**5. Green**	Fewer cars, and transfer of some commuters to rail would reduce carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**3. Amber**	Some slight negative local impacts caused by more frequent train journeys
Well being	**5. Green**	Train is a safer form of travel than the car, and improved rail links would improve journey times and relability
Expected VfM category		

Managerial

Implementation timetable	6. 5-10 years	Improvement works to the rail link
Public acceptability	2	High support for improvments to the rail link, but low support for work placed charging
Practical feasibility	2	Assuming works to the rail link
What is the quality of the supporting evidence?	1. Low	
Key risks	Rail link - land acquistion, funding, works to be undertaken by Network Rail. Work placed charging - public and political support.	

Financial

Affordability	3	Assuming works to the rail link
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		

Overall cost risk	Don't know	
Other costs	May require ongoing revenue support.	

Commercial

Flexibility of option	2	Assuming works to the rail link
Where is funding coming from?	Network Rail, CEC	
Any income generated? (£m)	Yes	Fare Revenue

Early Assessment and Sifting Tool (EAST) - *Expanded Print View*

Option Name/No.	**Comb- rail freight+restrict HGV**
Date	14/02/2017
Description	Combination of a rail freight strategy (option ref.15) and banning HGVs along the A500 during peak hours (option ref.19)

Strategic

Identified problems and objectives	The aim of this combination is to transfer the mode of transport for freight from road to rail, therefore improving jounrey time reliability on the A500, and resolving the issue of existing and future capacity issues on the A500 and at Meremoor Moss Roundabout	
Scale of impact	3	Banning HGVs during the peak hours would have a resaonably significant impact on alleviating the capacity issues on the A500, but would impede HS2 construction and also other local roads
Fit with wider transport and government objectives	3	Banning HGVs would improve regional connectivity for commuters on A500 but would affect other local roads
Fit with other objectives	3	Banning HGVs would assist commuters travelling to HS2 and between important economic centres across the NGDZ on A500 but not on other local roads.
Key uncertainties	Unsure whether the rail freight startegy would sufficiently compenstae for banning HGVs	
Degree of consensus over outcomes	1. Little	No consultations to date

Economic

Economic growth	**2. Red/amber**	Restricting HGVs on the road would negatively impact economic growth. This might be somewhat offset by a rail freight strategy, but would limit the choice for businesses
Carbon emissions	**5. Green**	Transfer from road to rail would decrease carbon emissions
Socio-distributional impacts and the regions	**4. Amber/green**	
Local environment	**4. Amber/green**	Fewer HGVs on the road would improve the local environment in those areas
Well being	**4. Amber/green**	Driver frustration would be reduced for commuters
Expected VfM category		

Managerial

Implementation timetable	5. 2-5 years	Assuming improvements to rail
Public acceptability	2	Likely to be acceptable to commuters, but low acceptability to business
Practical feasibility	3	
What is the quality of the supporting evidence?	1. Low	
Key risks	Implementing and enforcing	

Financial

Affordability	3	
Capital Cost (£m)	Don't know	
Revenue Costs (£m)	Don't know	
Cost profile		
Overall cost risk	Don't know	
Other costs		

Commercial

Flexibility of option	5. Dynamic	Both parts of the option would be flexible
Where is funding coming from?	CEC, Network Rail	
Any income generated? (£m)	No	

Cheshire East Council
Highways

Appendix C – SWOT Analysis

Table A: SWOT Analysis	
Option No. 1 - Dualling - Dualling of the A500 to provide 2 lanes in each direction of travel	
STRENGTHS	WEAKNESSES
Alleviates existing and future capacity issues along the A500	Likely to increase traffic flows further into Crewe, leading to capacity issues at some junctions
Increases resilience on the highway network by providing additional capacity, which could better support partial road closures / contraflows	Land acquisition would be required
Additional road capacity would help to accommodate construction traffic associated with delivery of HS2 and the Crewe hub station	Traffic management would impact traffic flows during construction
Improves regional connectivity, and helps to spread the benefits of HS2	
OPPORTUNITIES	THREATS
Removal of existing at-grade, uncontrolled pedestrian crossings over the A500	High costs which impact affordability and value for money.
Potential for significant developer contributions	HS2 hub station is cancelled
Would complement any upgrade to M6J16 by Highways England	Relies on the support of the Duchy of Lancaster, who own the majority of the land along the route

Table B: SWOT Analysis	
Option No. 2 – Localised improvements at Meremoor Moss Roundabout - Providing an additional lane on each arm of the A500 approaching the roundabout, similar to the pinch point scheme implemented at M6 J16.	
STRENGTHS	WEAKNESSES
Low costs associated to the construction of this option, relative to the other options	Unlikely to fully alleviate the future capacity issues along the A500
Land acquisition is probably not required	Land Acquisition maybe required
Is likely to be considered as permitted development	
Similar scheme has been successfully implemented on the approach to M6 J16	
OPPORTUNITIES	THREATS
Potential for significant developer contributions	May not deliver benefit required requiring further schemes in future causing further disruption and cost
Reduced construction period verses other options	

Table C: SWOT Analysis	
Option No. 3 - Wide single carriageway - Widening the existing carriageway cross-section to create a Wide Single carriageway (WS2 in accordance with TD 27/05). This could be marked as a WS2+1 layout, i.e. two lanes in one direction and one in the other, alternating half way along the link.	
STRENGTHS	WEAKNESSES
Contributes to alleviating existing and future capacity issues along the A500	May not sufficiently alleviate future capacity issues along the A500 to justify the investment
Increases resilience on the highway network by providing additional capacity, which could better support partial road closures / contraflows	Land acquisition would be required
Additional road capacity would help to accommodate construction traffic associated with delivery of HS2 and the Crewe hub station	Traffic management would impact traffic flows during construction
Improves regional connectivity, and helps to spread the benefits of HS2	Similar levels of construction and disruption to the dualling option (both bridges would need to be replaced, for example), but with less benefits
	Wide single carriageways can have questionable safety records
OPPORTUNITIES	THREATS
Removal of existing at-grade, uncontrolled pedestrian crossings over the A500	High costs which impact affordability and value for money.
Potential for significant developer contributions	HS2 hub station is cancelled
	Relies on the support of the Duchy of Lancaster, who own the majority of the land along the route

Table D: SWOT Analysis	
Option No. 5 - Tidal flow lane - Widening the existing carriageway to create an additional central lane, which could change direction (eastbound or westbound) in accordance with the direction of peak hour flow.	
STRENGTHS	WEAKNESSES
Contributes to alleviating existing and future capacity issues along the A500	Likely to increase traffic flows further into Crewe, leading to capacity issues at some junctions
Increases resilience on the highway network by providing additional capacity, which could better support partial road closures / contraflows	Land acquisition would be required
Additional road capacity would help to accommodate construction traffic associated with delivery of HS2 and the Crewe hub station	Traffic management would impact traffic flows during construction
Improves regional connectivity, and helps to spread the benefits of HS2	Would introduce new, relatively complex infrastructure for CEC to maintain
	Would require a new operating regime for CEC
	Would introduce a new operating regime for drivers, which would be unique within CEC, and unusual for a rural road.
	May increase the likelihood of head on collisions
OPPORTUNITIES	THREATS
Removal of existing at-grade, uncontrolled pedestrian crossings over the A500	High costs which impact affordability and value for money
Potential for significant developer contributions	HS2 hub station is cancelled
May complement any upgrade to M6J16 by Highways England	Relies on the support of the Duchy of Lancaster, who own the majority of the land along the route
	Potential for local public and political opposition
	Resources unavailable for maintaining and operating the tidal flow lane

Table E: SWOT Analysis	
Option No. 14 - High occupancy vehicle lane. - Existing carriageway widened to create a bus and high occupancy vehicle lane in each direction.	
STRENGTHS	WEAKNESSES
Contributes to alleviating existing and future capacity issues along the A500	Likely to increase traffic flows further into Crewe, leading to capacity issues at some junctions
Increases resilience on the highway network by providing additional capacity, which could better support partial road closures / contraflows	Land acquisition would be required
Additional road capacity would help to accommodate construction traffic associated with delivery of HS2 and the Crewe hub station	Traffic management would impact traffic flows during construction
Improves regional connectivity, and helps to spread the benefits of HS2	Similar levels of construction to the dualling option, but with less benefits in terms of traffic flow
Encourages modal shift to busses and high occupancy vehicles	Would require a new operating regime for CEC, which would require monitoring and enforcement
	Would introduce a new operating regime for drivers, which would be unique within CEC, and unusual for a rural road.
OPPORTUNITIES	THREATS
Removal of existing at-grade, uncontrolled pedestrian crossings over the A500	High costs which impact affordability and value for money
Potential for significant developer contributions	HS2 hub station is cancelled
May complement any upgrade to M6J16 by Highways England	Relies on the support of the Duchy of Lancaster, who own the majority of the land along the route
	Potential for local public and political opposition
	Resources unavailable for on-going enforcement of high occupancy lane.

Table F: SWOT Analysis	
Option No. 22 - Combination of Express Bus and High Occupancy Vehicle Lane. - Combination of an express bus between Stoke and Crewe, and widening the existing carriageway to create an additional bus / high occupancy vehicle lane in each direction.	
STRENGTHS	WEAKNESSES
Contributes to alleviating existing and future capacity issues along the A500	Likely to increase traffic flows further into Crewe, leading to capacity issues at some junctions
Increases resilience on the highway network by providing additional capacity, which could better support partial road closures / contraflows	Land acquisition would be required
Additional road capacity would help to accommodate construction traffic associated with delivery of HS2 and the Crewe hub station	Traffic management would impact traffic flows during construction
Improves regional connectivity, and helps to spread the benefits of HS2	Similar levels of construction to the dualling option, but with less benefits in terms of traffic flow
Encourages modal shift to busses and high occupancy vehicles	Would require a new operating regime for CEC, which would require monitoring and enforcement
Improves public transport reliability for users of the express bus, and any other busses using the route	Would introduce a new operating regime for drivers, which would be unique within CEC, and unusual for a rural road.
OPPORTUNITIES	THREATS
Removal of existing at-grade, uncontrolled pedestrian crossings over the A500	High costs which impact affordability and value for money
Potential for significant developer contributions	HS2 hub station is cancelled
May complement any upgrade to M6J16 by Highways England	Relies on the support of the Duchy of Lancaster, who own the majority of the land along the route
	Potential for local public and political opposition