Cheshire East Council
Highways

Congleton Link Road

Preferred Route Announcement Report (including Assessment of Alternative Alignments suggested at Public Consultation)
OD025

April 2014

Cheshire East Council
Highways

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1 Introduction

1.1 Background

As part of its development plan for Congleton, Cheshire East Council (CEC) has identified a Development Strategy which is founded on employment-led growth. Expansion of existing firms which operate within the area and inward investment are seen as pivotal to the Development Strategy, hence the future success of Congleton.

To achieve this, it was necessary to address the logistical, economic and social problems associated with the town and its location within the larger highway network; specifically the convergence of five strategic road routes and the impact this has on vehicle movements through and around the town.

The Stage 1 Scheme Assessment Report (Doc. Ref. B1832001/OD004) documents the appraisal procedures which were carried out to identify a preferred Improvement Strategy. The report concluded that a link road between the A534 Sandbach Road and the A536 Macclesfield Road was the preferred Improvement Strategy as it had a high contribution to the Scheme Objectives and also helped to resolve the traffic problems currently experienced by Congleton.

Following this, a number of link road route options were developed and appraised. This process is documented in the Route Appraisal Report (Doc. Ref. B1832001/OD015). A total of four link road options were identified, which were assessed specifically from an Engineering, Environment and Traffic perspective in the Stage 2 Scheme Assessment Report (Doc. Ref. B1832001/OD018).

The four link road options were presented at a Public Consultation in January/February 2014. The intention of the Public Consultation was to gauge public interest in the scheme, capture public opinion of the four link road options presented and help identify any constraints/considerations which may have been previously overlooked. The Public Consultation strategy, key issues raised by members of the public and the results from a consultation questionnaire are presented in the Public Consultation Report (Doc. Ref. B1832001/OD020).

1.2 Report Scope

This report brings together the findings and conclusions from previous assessment and appraisal work, and establishes a Preferred Route for the Congleton Link Road.

The report documents the methodology used to define the Preferred Route. It provides the reasoning and justification for the decisions made in establishing the Preferred Route, and explains the scoring/weighting system used to rank the four options that were taken to Public Consultation.

Following feedback received from members of the public, modifications to the alignments taken to Public Consultation were developed. These alignment modifications were presented in Section 8 of the Public Consultation Report. This report provides an assessment of the alignment modifications, and provides reasoning and justification for any of the alignment modifications which have been incorporated into the Preferred Route Alignment.

1.3 Report Structure

Chapter 1 provides a background to the scheme and explains the scope of the report.

Chapter 2 provides an assessment of the four link road options taken to Public Consultation. A qualitative assessment is provided which appraises the link road options against factors such as Scheme Cost, Engineering Constraints, Public Endorsement and Environmental Impacts.

In addition, a corresponding quantitative assessment is presented, where scores have been assigned to each link road option. Each of the assessment topics/factors have been weighted based on their relative importance and significance. The rationale used to weight the individual factors is also explained. Chapter 2 concludes by summarising the assessments and provides a decision as to which route option should be endorsed as the Preferred Route.

Chapter 3 documents and appraises the alignment modifications which have been prepared following feedback from the Public Consultation. The alignment modifications which were shown to be an improvement on the existing design have been incorporated into the Preferred Route.

Chapter 4 brings together the findings from the numerous assessments and appraisals which have been conducted, and a final Preferred Route for the Congleton Link Road is presented.

1.4 Purpose of Report

The purpose of this report is to inform a Preferred Route Announcement Cabinet Paper, which is to be prepared by Cheshire East Council in anticipation of the May 2014 Cabinet Meeting.

2 Assessment of Link Road Options Presented at the Public Consultation

2.1 Introduction to Assessment

This Chapter documents the assessment of the four link road options presented at the Public Consultation and provides a decision as to which option should be adopted as the Preferred Route.

2.2 Qualitative Assessment of Link Road Options

The qualitative assessment of the four link road options was carried out using findings from other reports and sources of information:

- **Scheme Cost Estimate** – taken from the Scheme Cost Estimate Report (Doc. Ref. B1832001/OD003).
- **Benefit to Cost Ratio (BCR)** - taken from the Economic Assessment Report (Doc. Ref. B1832001/OD016)
- **Quality of Local Plan** – taken from various meetings and discussions with Cheshire East Council. Based on the area of developable land that could be opened up to the south of the link road scheme.
- **Scheme Length** and **Earthworks Volume** – determined from analysis of each link road alignment model.
- **Engineering Constraints** – taken from the Stage 2 Scheme Assessment Report (Doc. Ref. B1832001/OD018).
- **Road User Safety** – determined from design checks carried out on each link road alignment model.
- **Public Endorsement** – taken from the Public Consultation Report.
- **Environmental Impacts** – taken from the Stage 2 Scheme Assessment Report.

The four link road options were assigned indicative arrow symbols which signified how each option performed against each of the defined assessment criteria. The scoring was based on a simple 5-point scale, which is explained overleaf.

B1832001 – Congleton Link Road
Qualitative Assessment of Options Taken to Public Consultation

KEY:

				
Significantly Beneficial	Beneficial	Neutral	Adverse	Significantly Adverse

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Scheme Cost Estimate – excluding connections to RPTE and CBP				
	£70.9 Million	£87.7 Million	£81.6 Million	£79.7 Million
Benefit to Cost Ratio (BCR)				
	BCR = 3.1 Considered High Value for Money (VfM) by the Department for Transport (DfT).	BCR = 2.5 Considered High Value for Money (VfM) by the Department for Transport (DfT).	BCR = 3.0 Considered High Value for Money (VfM) by the Department for Transport (DfT).	BCR = 2.5 Considered High Value for Money (VfM) by the Department for Transport (DfT).

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Quality of Local Plan (area unlocked for development)				
	High	Very High	High	Very High
Public Endorsement				
	Of all the questionnaire responses which were 'in support' of the link road scheme (i.e. were in support of at least one option) 59% were in support of the Red Option. This information is taken from the Public Consultation Report.	Of all the questionnaire responses which were 'in support' of the link road scheme (i.e. were in support of at least one option) 59% were in support of the Blue Option. This information is taken from the Public Consultation Report.	Of all the questionnaire responses which were 'in support' of the link road scheme (i.e. were in support of at least one option) 51% were in support of the Green Option. This information is taken from the Public Consultation Report.	Of all the questionnaire responses which were 'in support' of the link road scheme (i.e. were in support of at least one option) 79% were in support of the Purple Option. This information is taken from the Public Consultation Report.
Scheme Length – excluding connections to RPTE and CBP	5.5km	6.2km	6.2km	5.5km

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Engineering Constraints				
	Crosses the River Dane at a location where landslips have been recorded. Severs Giantswood Lane – overbridge to be provided. 80m long, multi-span bridge structure required to cross River Dane and associated floodplain. 60m long, multi-span bridge structure required to cross Loach Brook.	Passes adjacent to Eaton Hall Quarry. Access/underbridge to be provided to Quarry. Severs Giantswood Lane – overbridge to be provided. 200m long, multi-span bridge structure required to cross River Dane and associated floodplain. 60m long, multi-span bridge structure required to cross Loach Brook.	Crosses the River Dane at a location where landslips have been recorded. Passes adjacent to Eaton Hall Quarry. Access/overbridge would have to be provided. Severs Giantswood Lane – overbridge to be provided. 80m long, multi-span bridge structure required to cross River Dane and associated floodplain. 60m long, multi-span bridge structure required to cross Loach Brook.	Severs Giantswood Lane – overbridge to be provided. 200m long, multi-span bridge structure required to cross River Dane and associated floodplain. 60m long, multi-span bridge structure required to cross Loach Brook. Severs Giantswood Lane – overbridge to be provided.
Earthworks – Cut/Fill Ratio				
	200,000m^3 : 215,000m^3	286,000m^3 : 122,000m^3	206,000m^3 : 219,000m^3	311,000m^3 : 155,000m^3

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Road User Safety				
	100kph Design Speed Horizontal Alignment designed fully to standard (no relaxations or departures). Vertical Alignment designed fully to standard (no relaxations or departures). Local verge widening will be required to achieve Stopping Sight Distance (SSD) of 215m along some of the 720m radius bends. Local verge widening will mean that full SSD can be achieved along the full scheme length.			
Landscape and Visual Impact				
	Removal of vegetation, such as woodland adjacent to River Dane. Negative impact to character of the Dane Valley. Least effect on views as it is the furthest distance from properties.	Negative impacts to character of the North Congleton Plain. Significant impact on views, in particular to properties on Smithy Lane, Chelford Road, Back Lane and the village of Eaton.	Removal of vegetation, such as woodland adjacent to River Dane. Negative impact to character of the Dane Valley. Impact on the views from properties on Smithy Lane and in the village of Eaton.	Negative impacts to character of the Dane Valley and the North Congleton Plain. Some impact on the views from properties on Giantswood Lane.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Ecology				
	Loss of deciduous woodland, including ancient woodland (Radnor Wood,) 4 ponds and at least 23 species-poor hedgerows.	Loss of deciduous woodland, 3 ponds, at least 2 species-rich hedgerows and at least 20 species-poor hedgerows.	Loss of deciduous woodland, including ancient woodland (Radnor Wood,) 2 ponds and at least 22 species-poor hedgerows.	Loss of deciduous woodland, 3 ponds, at least 2 species-rich hedgerows and at least 23 species-poor hedgerows.
Cultural Heritage				
	Negative impact on a small number of non-designated historic sites (including a medieval village and two archaeological crop mark sites). No impact to scheduled monuments or listed buildings.	Negative impact on setting of two Grade II listed buildings. Negative impact to a large number of non-designated historic sites (including a medieval village and two archaeological crop mark sites).	Negative impact on setting of one Grade II listed building. Negative impact to a number of non-designated historic sites (including a medieval village and two archaeological crop mark sites).	Negative impact on setting of one Grade II listed building. Negative impact to a large number of non-designated historic sites (including a medieval village and two archaeological crop mark sites).

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Air Quality				
	Large beneficial impacts for 10 receptors and medium impact for 12 receptors within two AQMAs. Increased traffic on the A536 passing Eaton, leading to lower air quality.	Large beneficial impacts to 22 receptors within two AQMA's.	Large beneficial impacts for 10 receptors, (including all of the receptors in one of AQMAs) and medium impact for 12 receptors within two AQMAs. Increased traffic on the A536 passing Eaton, leading to lower air quality.	Medium beneficial impacts to 22 receptors within two AQMA's.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Noise and Vibration				
	For construction noise and vibration impacts, the red option has the smallest number sensitive receptors close to the route. For the short-term and long-term operational impacts this option would provide a benefit to the smallest number of receptors. Increased traffic on the A536 passing Eaton, leading to greater noise pollution.	For construction noise and vibration impacts, this option has the largest number of sensitive receptors close to the route. For the short-term and long-term operational impacts, the Blue option would provide a benefit to the largest number of receptors.	For construction noise and vibration impacts, this option has the second largest number of sensitive receptors close to the route. For the long-term operational impact, this option would provide a benefit to the second largest number of receptors. Increased traffic on the A536 passing Eaton, leading to greater noise pollution.	For construction noise and vibration impacts, this option has the smallest number sensitive receptors close to the route. For the short-term operational impact this option would provide a benefit to the second largest number of receptors.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Soils, Geology and Hydrogeology				
	This option may pass through an area of in-filled sand and gravel extraction pits, which could cause a negative impact through the disturbance of contamination.	This option may pass through an area of in-filled sand and gravel extraction pits, which could cause a negative impact through the disturbance of contamination. This option would pass through the area allocated for future silica sand extraction, which would have a negative impact.	This option may pass through an area of in-filled sand and gravel extraction pits, which could cause a negative impact through the disturbance of contamination. This option would pass through the area allocated for future silica sand extraction, which would have a negative impact.	This option may pass through an area of in-filled sand and gravel extraction pits, which could cause a negative impact through the disturbance of contamination.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
The Water Environment				
	Potential construction and operational impacts on Loach Brook. Similar construction and operational impacts to River Dane.	Potential construction and operational impacts on Loach Brook. Similar construction and operational impacts to River Dane. Potential to cause greatest impact to the water quality of other surface watercourses. Potential to cause greatest risk of groundwater pollution during construction and operation. This option would include a viaduct crossing, construction on floodplain, and would also have the largest runoff, both of which would have the potential to cause flood risk.	Potential construction and operational impacts on Loach Brook. Similar construction and operational impacts to River Dane.	Potential construction and operational impacts on Loach Brook. Similar construction and operational impacts to River Dane (larger than the other options). This option would include a viaduct crossing, construction on floodplain, which would have the potential to cause flood risk.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Water Framework Directive				
	Bridge crossing over Loach Brook and a bridge over a narrow section of River Dane and two crossing points (in culverts) over un-named tributaries. Negative impacts to the watercourses, (smallest for this option)	Bridge crossing over Loach Brook and a bridge over a wide section of River Dane and five crossing points (in culverts) over un-named tributaries. Negative impacts to the watercourses, (largest for this option). Crosses a meander section of River Dane, which may experience movement in the future.	Bridge crossing over Loach Brook and a bridge over a narrow section of River Dane and two crossing points (in culverts) over un-named tributaries. Negative impacts to the watercourses.	Bridge crossing over Loach Brook and a bridge over a wide section of River Dane and five crossing points (in culverts) over un-named tributaries. Negative impacts to the watercourses. Crosses a meander section of River Dane, which may experience movement in the future.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Private and Community Assets				
	Negative impact on farm businesses and landowners, as a result of land take, (smallest for this option). Negative impacts would also be caused to community of Somerford through the stopping up of roads and accesses. Positive impacts would be created through improved accessibility between communities and with Congleton as a result of this option. Access to the two business parks would be improved and the option would open up the land to the south, which forms a number of strategic development sites, (development area would be smallest for this option).	Negative impact on farm businesses and landowners, as a result of land take, (largest for this option). Negative impacts would also be caused to communities of Eaton through the stopping up of roads and accesses. Positive impacts would be created through improved accessibility between communities and with Congleton as a result of this option. Access to the two business parks would be improved and the option would open up the land to the south, which forms a number of strategic development sites, (development area would be largest for this option).	Negative impact on farm businesses and landowners, as a result of land take. Negative impacts would also be caused to community of Eaton through the stopping up of roads and accesses. Positive impacts would be created through improved accessibility between communities and with Congleton as a result of this option. Access to the two business parks would be improved and the option would open up the land to the south, which forms a number of strategic development sites.	Negative impact on farm businesses and landowners, as a result of land take. Negative impacts would also be caused to community of Somerford through the stopping up of roads and accesses. Positive impacts would be created through improved accessibility between communities and with Congleton as a result of this option. Access to the two business parks would be improved and the option would open up the land to the south, which forms a number of strategic development sites.

Topic/Factor	Red Option	Blue Option	Green Option	Purple Option
Effects on all Travellers				
	All four options cross the route of seven footpaths and four cycle routes. This would cause a negative impact to the users of these Non- Motorised Users (NMU) facilities, which would be mitigated through the use of diversions and new crossings. All options would include a combined cycleway and footway, alongside the road verge, which would join up with a number of NMU routes that the options would cross. This would improve connectivity between the different NMU routes, providing a positive impact. All the options would result in a reduction of vehicle numbers through the town centre and on the local road network, which would reduce driver stress and have a positive impact. This reduction in vehicle numbers would also have a positive impact on public transport (buses), using the local road network.			

2.3 Quantitative Assessment of Link Road Options

In addition to the qualitative assessment presented in Section 2.2, a quantitative assessment of the four link road options was carried out. The quantitative assessment formed part of the agenda for a Preferred Route Announcement (PRA) Workshop, which was held on the 24th February 2014 at the Cheshire East Council Municipal Building in Crewe. The workshop was attended by members of the Jacobs UK Ltd Project Team and members of Cheshire East Council.

At the PRA Workshop, it was decided that scores should be assigned to the link road options relative to their performance against each of the assessment criteria. This would allow a quantitative comparison of the four options, and also allow them to be ranked in order of performance against the assessment criteria.

The 5-point scale used in Section 2.2 was subsequently adapted and the following scores were assigned: Significantly Beneficial (+2); Beneficial (+1); Neutral (0); Adverse (-1); and Significantly Adverse (-2).

Weighting was also assigned to each assessment topic/factor 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 assessment topic/factor was discussed and confirmed at the PRA Workshop. It was vital that Cheshire East Council had input into the weighting process so that the assessment topics/factors were weighted in a manner that was consistent with the Council's priorities and aspirations.

The quantitative assessment of the four link road options is shown overleaf. The Total Weighted Score produced from the quantitative assessment for each option is as follows:

- Total Weighted Score of Red Option: **12.8**
- Total Weighted Score of Blue Option: **7.2**
- Total Weighted Score of Green Option: **8.2**
- Total Weighted Score of Purple Option: **11.4**

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Quantitative Assessment of Options Taken To Public Consultation: Weighted Assessment (includes CEC Input)

		Unweighted Scores				Weighted Scores			
Topic / Factor	Weighting	Red Option	Blue Option	Green Option	Purple Option	Red Option	Blue Option	Green Option	Purple Option
Scheme Cost Estimate	2	2	0	1	1	4	0	2	2
Benefit to Cost Ratio (BCR)	2	2	1	2	1	4	2	4	2
Quality of Local Plan	1	1	2	1	2	1	2	1	2
Public Endorsement	2	1	1	0	2	2	2	0	4
Engineering Constraints	0	-1	-2	-2	0	0	0	0	0
Road User Safety	1	2	2	2	2	2	2	2	2
Landscape and Visual Impact	0.2	-1	-2	-2	-2	-0.2	-0.4	-0.4	-0.4
Ecology	0.2	-2	-2	-2	-2	-0.4	-0.4	-0.4	-0.4
Cultural Heritage	0.2	0	-1	-1	-1	0	-0.2	-0.2	-0.2
Air Quality	0.2	1	1	1	1	0.2	0.2	0.2	0.2
Noise and Vibration	0.2	1	1	1	1	0.2	0.2	0.2	0.2
Soils, Geology and Hydrogeology	0.2	0	-1	-1	0	0	-0.2	-0.2	0
The Water Environment	0.2	-1	-1	-1	-1	-0.2	-0.2	-0.2	-0.2
Water Framework Directive	0.2	-1	-1	-1	-1	-0.2	-0.2	-0.2	-0.2
Effects on All Travellers	0.2	1	1	1	1	0.2	0.2	0.2	0.2
Private and Community Assets	0.2	1	1	1	1	0.2	0.2	0.2	0.2
		Total Unweighted Scores				**Total Weighted Scores**			
		6	**0**	**0**	**5**	**12.8**	**7.2**	**8.2**	**11.4**

Key:

Significantly Beneficial	2
Beneficial	1
Neutral	0
Adverse	-1
Significantly Adverse	-2

2.3.1 Explanation of Weighting

It should be appreciated that assigning weighting to the assessment topics/factors was a subjective process, and that the weighing system was developed so that the factors deemed most important to Cheshire East Council and their future aspirations for Congleton were given a higher weighting to reflect their relative importance. All assessment topics/factors were given a weighting score of between 0 and 2.

The **Scheme Cost Estimate** was given a weighting of 2. The primary source of funding for the scheme is expected to be Central Government Funding. Cheshire and Warrington Local Enterprise Partnership (LEP) will be allocated funds by Central Government which can be used to deliver local authority schemes within the LEP area. Funds will be limited and the LEP will be keen to optimise its allocation across the LEP area. It will seek to meet its objectives with the minimum level of funding for individual schemes. A relatively low scheme cost will mean that the link road is more competitive when compared to other projects elsewhere in the LEP area and would therefore be more likely to receive funding. Conversely, relatively high scheme cost will mean that the link road is competitive and would therefore be less likely to receive funding. Without external funding the scheme is effectively undeliverable.

The **Benefit to Cost Ratio** (BCR) was given a weighting of 2. In order to secure funding, the link road scheme must demonstrate that it provides good Value for Money (VfM) and delivers economic benefits to the area. An Economic Assessment has been undertaken to establish the potential economic benefits of the scheme. The assessment has been based on a standard economic appraisal methodology. Scheme costs have been estimated for all the route options proposed. Scheme benefits and disbenefits have been calculated with regard to changes in journey time, vehicle operating costs, and accidents. Standard industry approaches have been used to calculate and define the relative benefits of the scheme options through the use of Department for Transport (DfT) approved software packages TUBA and COBA-LT that are linked to the traffic model. Schemes which have a BCR in excess of 2 are considered to be 'High Value for Money' projects by the DfT. The value of the BCR is a key consideration when allocating funds to schemes.

The **Quality of Local Plan** was given a weighting of 1. It has been assumed that the options which open up the most land to the south of the link road would act to deliver a higher quality Local Plan (larger residential/public areas, more local facilities/amenities etc). However, the scheme has the ability to deliver the development outlined in the Local Plan, regardless of the link road option selected. Therefore, the Quality of Local Plan is viewed as a less important topic/factor than the Scheme Cost Estimate or the Benefit to Cost Ratio.

Public Endorsement was given a weighting of 2. An extensive Public Consultation was carried out to assess both public interest in the link road scheme and also to capture public opinion of the four link road options. Public endorsement of the link road options was considered an important factor when appraising the options as the scheme would have a significant effect the town of Congleton. For this reason, an option which satisfies the Scheme Objectives **and** which was also supported by the public was desirable.

Engineering Constraints was given a weighting of zero. The engineering constraints and challenges specific to each option are important and should be considered. However, if is felt that all four link road options are deliverable from a technical perspective, and none of the engineering constraints identified in Section 2.2 would prevent the scheme from being constructed. Furthermore, the engineering

challenges identified in Section 2.2 could be overcome, but would result in increased scheme costs. Engineering constraints/difficulties are therefore reflected in the Scheme Cost Estimate assessment topic/factor.

Road User Safety was given a weighting of 1. All four options have been designed to standard and do not feature relaxations or departures from standard. However, relaxations can be added at the discretion of the designer with relatively little impact on road user safety. Additionally, if departures from standard are necessary, their impact can be reduced through effective mitigation measures. Essentially, it is felt that relaxations or departures from standard could be introduced if necessary without compromising road user safety.

The remaining 10 topics/factors are collectively classed as **Environmental Impacts** and were each given a weighing of 0.2 so that collectively, Environmental Impacts were given a weighting of 2. All 10 Environmental Impact topics/factors were considered to have equal weighting. The collective weighting of 2 for the Environmental Impacts reflects the fact that collectively, the Environmental Impacts are considered a key factor in the assessment.

2.3.2 Sensitivity Testing

In order to confirm that the results which were obtained from the assessment in Section 2.3 were robust, a series of sensitivity tests were carried out. The tests were used to investigate whether the outcome/results of the quantitative assessment would be altered if the weighing values were adjusted i.e. whether the results were sensitive to changes in the weighing values assigned to each assessment topic/factor.

Sensitivity tests were carried out by varying the weighting assigned to each assessment topic/factor. Weighting was varied by using the '=RAND()' function in Microsoft Excel to generate random % changes to each weighting value.

Three sensitivity tests were carried out in total. Test 1 limited the % change of the weighting to a maximum of +/-10% of its original value, Test 2 limited the % change of the weighting to a maximum of +/-25% of its original value and Test 3 limited the % change of the weighting to a maximum of +/-40% of its original value. The original weighting values are those which are shown in the quantitative assessment table on Page 17.

For each test, a total of 10 iterations (different scenarios) were investigated (i.e. by generating 10 sets of weighting values and applying them to the 'Unweighted Scores' shown in the assessment table in Section 2.3.

Each test could be viewed as a limited Monte Carlo Simulation (with only 10 iterations,) where the only variable was the '% change to the original weighting' value. Microsoft Excel was used to generate the random variable. It is assumed that these followed a discrete uniform probability distribution.

Test 1 (where the weighting of each assessment topic was randomly varied by a maximum of +/-10% of its original value) showed that the Red Option was the highest scoring option in all in all 10 iterations investigated, outscoring the Purple Option (2nd highest ranked option) by an average of 1.45 points. Further to this, the Purple Option comfortably outscored the Blue Option (by an average of 4.08 points) and the Green Option (by an average of 3.04 points) in all 10 iterations investigated.

Test 2 (where the weighting of each assessment topic was randomly varied by a maximum of +/-25% of its original value) showed that the Red Option was the highest scoring option in all in all 10 iterations investigated, outscoring the Purple Option (2nd highest ranked option) by an average of 1.49 points. Further to this, the Purple Option comfortably outscored the Blue Option (by an average of 4.12 points) and the Green Option (by an average of 3.02 points) in all 10 iterations investigated.

Test 3 (where the weighting of each assessment topic was randomly varied by a maximum of +/-40% of its original value) showed that the Red Option was the highest scoring option in all in all but one of the 10 iterations investigated, outscoring the Purple Option (2nd highest ranked option) by an average of 1.55 points. Further to this, the Purple Option comfortably outscored the Blue Option (by an average of 4.29 points) and the Green Option (by an average of 3.13 points) in all 10 iterations investigated.

The results from the sensitivity tests confirm that the conclusions reached in Section 2.3 are robust and are not sensitive to variations in the weighting values assigned to the assessment topics. The results of the sensitivity tests show that the outcome of the assessment (the Red Option being the highest scoring option closely followed by the Purple Option, with the Blue and Green Options achieving lower scores) remains consistent even when a the weighting values' maximum range is set at +/-40% (Test 3). Results tables showing the outcome of the sensitivity tests can be found in Appendix A.

2.4 Summary and Recommendations

A quantitative and qualitative assessment of the four link road options taken to Public Consultation has been carried out. The qualitative assessment describes how the four link roads perform against the assessment topics/factors identified, while the quantitative assessment assigns scores to each link road option to allow them to be ranked in order of performance (where the highest score indicates the best option).

The scores from the quantitative assessment are as follows:

- Total Weighted Score of Red Option: **12.8** (Highest scoring option)
- Total Weighted Score of Purple Option: **11.4** (2nd highest scoring option)
- Total Weighted Score of Green Option: **8.2** (3rd highest scoring option)
- Total Weighted Score of Blue Option: **7.2** (Lowest scoring option)

It can be seen from the results of the assessment that the Red and Purple Options outscore the Blue and Green Options. Based on the results of the assessment, it would seem rational to discount the 'low scoring options' (Blue and Green Options) at this point, while continuing to investigate the 'high scoring options' (Red and Purple Options). The sensitivity tests carried out in Section 2.3.2 confirm that the results obtained are robust, meaning that there is confidence in the assessment procedure which has been used.

Both the Red and Purple Options have been shown to have different strengths. The Red Option performs particularly well in the areas of Scheme Cost and BCR, and also has a relatively low impact on the environment. Conversely, the Purple Option is anticipated to allow a Local Plan of 'very high' quality to be delivered and was the option which was most supported by the public.

It should therefore be concluded that the optimum or 'best' option would be a combination of the Red and Purple Options. It is recommended that the Red Option is taken forward as the Preferred Route but is modified immediately east of the River Dane so that it ties in with the Purple Option. This would act to increase the area of developable land to the south of the Scheme, thereby enhancing the Quality of the Local Plan.

It should be noted that the Red and Purple Options which were taken to Public Consultation are similar, and are actually identical in Zone A, Zone B, Zone F and a large proportion of Zone E.

Finally, following feedback received from members of the public, modifications to the alignment in some areas have been investigated. In order to reach a final Preferred Route alignment, the modifications must be considered and incorporated into the alignment if they are considered to be an improvement on the existing design. The modifications/alternative alignments are presented and appraised in Chapter 3 of this report.

3 Appraisal of Proposed Alternative Alignments

3.1 Reason for Alternative Alignment Development

Following feedback received from members of the public throughout the consultation period, it was necessary to consider and develop alternative alignments/modifications to the alignments presented at Public Consultation in certain areas along the route corridor. The alternative alignments were developed in an attempt to mitigate the impact on properties, dwellings and woodland areas situated adjacent to the proposed link road options.

This Chapter of the report describes the 13 alternative alignments which were developed following the Public Consultation. An appraisal of the alternative alignments is also presented. The alternative alignments which were shown to be an improvement on the designs taken to Public Consultation will be integrated into the Preferred Route. Justification for the inclusion of the alternative alignment designs is given throughout this Chapter.

3.2 Description of Alternative Alignments

Sections 3.2.1 to 3.2.4 detail the alternative alignments developed in Zone A, Zone B/C, Zone D/E and Zone F.

3.2.1 Description of Zone A Alternative Alignments

The alignment alterations in Zone A were developed in an attempt to minimise the severance of agricultural land by moving the link road alignment to the east (so that the road ran closer to Sandy Lane). In addition, the potential for tying in the link road further to the south-west along the A534 was investigated. Doing this would reduce the traffic flows on a section of the A534 which contains two small radius bends. Table 1 gives a description of the 4 additional alignments developed in Zone A. A plan showing the alternative alignments in Zone A (Drawing Ref. B1832001/SK/31) can be found in Appendix B.

Table 1 – Description of Alternative Alignments Developed in Zone A

Drawing Reference	Zone	Description of Change	Option Description
B1832001/SK/31	Zone A	Modification to alignment in Zone A. Alignment changed so that link road will run closer to Sandy Lane, thereby reducing the land take to the west of Sandy Lane. 4 Options prepared which tie into the A534 at different points.	**Option 1** - From the junction with the A54, the alignment moves south adjacent to Sandy Lane. Sufficient highway width of Sandy Lane remains to use it as an access track to adjacent fields. New proposed roundabout on the A534 to also tie into Pitcher Lane.
			Option 2 - From the junction with the A54, the alignment moves south adjacent to Sandy Lane. Sufficient highway width of Sandy Lane remains to use it as an access track to adjacent fields. Eastbound link road traffic would avoid the 2 'small radius bends' on the A534 if Option 2 is used.
			Option 3 - From the junction with the A54, the alignment moves south adjacent to Sandy Lane. Sufficient highway width of Sandy Lane remains to use it as an access track to adjacent fields. Proposed that Sandy Lane is stopped up at the junction with the A534. Removes one of the 'small radius bends' on the A534.
			Option 4 – From the junction with the A54, the alignment moves south, running parallel to (and between) the alignment presented at Public Consultation and Sandy Lane. Option 4 runs approximately 60-70m to the east of the alignment presented at Public Consultation and approximately 100-120m to the west of Sandy Lane. Removes one of the 'small radius bends' on the A534.

3.2.2 Description of Zone B/C Alternative Alignments

The alignment alterations in Zone B/C were required to reduce the impact of the link road on properties located on Chelford Road and Back Lane. Instead of providing a junction to tie the link road into Chelford Road, the alternative alignments provide a road bridge which will take Chelford Road over the proposed link road. This will mean that the proposed link road will be in a cutting, thereby reducing visual and noise impacts. Removing the junction between the proposed link road and Chelford Road will also prevent traffic leaving the link road at this point and using Chelford Road to enter Congleton. Table 2 gives a description of the 5 additional alignments developed in Zone B/C. Plans showing the alternative alignments in Zone B/C (Drawing Ref. B1832001/SK/32, B1832001/SK/33 and B1832001/SK/34) can be found in Appendix C.

Table 2 - Description of Alternative Alignments Developed in Zone B/C

Drawing Reference	Zone	Description of Change	Option Description
B1832001/SK/32	Zone B/C	Modification to the Blue/Purple Option in Zone B/C. Junction at Chelford Road has been removed and small radius horizontal curves have been used to create an alignment through the centre of two sets of dwellings. Retaining walls or engineered slopes will need to be used to limit impact of cut sections on adjacent properties.	**Option 1A** - From the junction with the A54, alignment runs north and crosses Chelford Road between two sets of dwellings before joining the roundabout on the Blue/Purple alignment on the western escarpment of the River Dane. This option assumes free drainage from the overbridge at the intersection with Chelford Road to the River Dane (at a longfall gradient of -0.3%).
			Option 1B - From the junction with the A54, alignment runs north and crosses Chelford Road between two sets of dwellings before joining the roundabout on the Blue/Purple alignment on the western escarpment of the River Dane. This option assumes that a pumping station will be incorporated to pump highway runoff out of the trapped cutting at the intersection with Chelford Road.
		Modification to the Red/Green Option in Zone B/C. Junction at Chelford Road has been removed and small radius horizontal curves have been used to create an alignment through the centre of two sets of dwellings. Retaining walls or engineered slopes will need to be used to limit impact of cut sections on adjacent properties.	**Option 2A** - From the junction with the A54, alignment runs north and crosses Chelford Road between two sets of dwellings before joining the roundabout on the Red/Green alignment on the western escarpment of the River Dane. This option assumes free drainage from the overbridge at the intersection with Chelford Road to the River Dane (at a longfall gradient of -0.3%).
			Option 2B - From the junction with the A54, alignment runs north and crosses Chelford Road between two sets of dwellings before joining the roundabout on the Red/Green alignment on the western escarpment of the River Dane. This option assumes that a pumping station will be incorporated to pump highway runoff out of the trapped cutting at the intersection with Chelford Road.
		Further modification to the Red/Green Option in Zone B/C.	**Option 3A** - Similar alignment to Option 2B but alignment sweeps further to the west before crossing Chelford Road in order to minimise severance of the land in that area. It should be acknowledged that this option features a trapped cutting. A 'free drainage' option could be provided if required.

3.2.3 Description of Zone D/E Alternative Alignment

The alignment alteration in Zone D/E was required to move the link road alignment to the south of Church Wood in order to minimise the impact on the Ancient Woodland. This alteration also had the benefit of moving the link road further away from the properties in Hulme Walfield. Table 3 gives a description of the additional alignment developed in Zone D/E. A plan showing the alternative alignment in Zone D/E (Drawing Ref. B1832001/H/WD/047) can be found in Appendix D.

Table 3 - Description of Alternative Alignment Developed in Zone D/E

Drawing Reference	Zone	Description of Change	Option Description
B1832001/H/WD/047	Zone D/E	Modification to the Blue/Purple Option in Zone D/E. Alignment has been changed to avoid properties in Hulme Walfield and Church Wood, which lies to the south-west of St. Michael's Church.	After crossing the River Dane, the alignment extends to the south of Church Wood before extending north-east to tie into the proposed roundabout located on the A34.

3.2.4 Description of Zone F Alternative Alignments

The alignment alterations in Zone F were required to investigate whether the link road could be moved further away from the village of Eaton and tie into the A536 further to the north. Table 4 gives a description of the 3 alternative alignments developed in Zone F. A plan showing the alternative alignments in Zone F (Drawing Ref. B1832001/SK/29) can be found in Appendix E.

Table 4 - Description of Alternative Alignments Developed in Zone F

Drawing Reference	Zone	Description of Change	Option Description
B1832001/SK/29	Zone F	Modification to the Blue/Purple Option in Zone F. Alignment has been moved further away from Eaton and now ties into the A536 further to the north.	**Option 1** – After following the existing alignment along School Lane, the alignment moves north, bisecting the wooded area before tying into the A536 via a roundabout junction adjacent to Old Brickbank Wood.
			Option 2 – This option is similar to Option 1 but would have a less severe impact on the wooded area.
			Option 3 - After following the existing alignment along School Lane, the alignment moves north, severing a relatively small portion of the wooded area before tying into the A536 via a roundabout junction to the north of Old Brickbank Wood. This option would sever access to the large wooded area to the west of the A536.

3.3 Appraisal of Alternative Alignments

This section of the report provides an appraisal of the additional/alternative alignments which have been developed following the Public Consultation. By identifying the advantages and disadvantages of each alternative alignment option, a comparison with the option taken to Public Consultation could be made.

Alternative alignment options which have been shown to be an improvement on the original design have been incorporated into the Preferred Route. Sections 3.3.1 to 3.3.4 detail the appraisal of the alternative alignment options and state whether the alternative option is to be considered further and provides an explanation as to why certain alternative alignments have been taken forward and incorporated into the Preferred Route.

It should be noted that the alternative alignment options were investigated prior to the quantitative assessment presented in Section 2.3. Therefore, as a result of the Preferred Route being identified following the quantitative assessment, some of the additional alignments automatically became inappropriate and were naturally discounted. For example, 3 additional options were developed in Zone F for the Blue/Green Option taken to Public Consultation (i.e. to the north of Eaton Hall Quarry). However, as the Preferred Route ties into the A536 to the south of Eaton Hall Quarry, the 3 additional options in Zone F could not be considered as part of the Preferred Route.

The appraisals of all alternative alignments which were prepared (regardless of whether they were immediately discounted or not) are included within this report for completeness and also to illustrate the effort and time that was taken in an attempt to improve the link road design following requests made throughout the consultation period.

3.3.1 Appraisal of Alternative Alignments in Zone A

Within Tables 5 to 8, the options which are to be taken forward as part of the Preferred Route are shown in Green, whereas the options which are to be discounted are shown in Red.

Table 5 – Appraisal of Alternative Alignments in Zone A

Zone	Option	Advantages	Disadvantages	Verdict
Zone A	**Option taken to Public Consultation**	- Contains no horizontal or vertical alignment relaxations/departures from standard. - Full Stopping Sight Distance (SSD) along link. - Removes one 'small radius bend' on the A534. Site of 4No accidents in last 5 years. - Sandy Lane is unaffected by this option. - Affected land owners have confirmed that this option is preferred over options which run along Sandy Lane (Options 1, 2 and 3). - Fields to east of alignment could still be accessed from Sandy Lane.	- Does not remove both 'small radius bends' on the A534. - Assumed to increase traffic volumes passing dwellings on A534 'small radius bends.' - Significant earthworks (at this stage of design development) as Zone A was initially assigned as an overtaking section. However, it is assumed that earthwork quantities could be reduced considerably through design development.	Option taken to Public Consultation will not be taken forward as part of the Preferred Route as Option 4 is considered an improved alignment in Zone A.
	Option 1	- Removes both 'small radius bends' on A534 (for eastbound traffic). Site of 4No accidents in last 5 years. - Aligned with Sandy Lane so that land take/severance of landowner plots CH442523 and CH617321 is limited. - Sandy Lane could remain open as an access road to adjacent fields. - (Assumed) reduced traffic on A534 would make it safer to enter/exit the properties located on the 'small radius bends'.	- Increase in scheme length: 548m - Significant land take/severance of land owner plot CH239821. - Would require remodelling of junction with Pitcher Lane. - 3No 360m horizontal curves and 1No 510m horizontal curve (although assumed that this does not reduce/jeopardised road user safety). - Assumed SSD relaxations. - Meetings with affected land owners confirmed that the alignment presented at Public Consultation was preferred over the additional alignment options which ran close to Sandy Lane (Options1, 2 and 3). - No provision for mitigation measures (screening/bunds etc) to reduce the effects of the link road on the 'Loachbrook Farm' development. -Would impact on numerous ponds within Zone A.	Option 1 has not been shown to be an improvement on the existing alignment and will not be taken forward as part of the Preferred Route.

Zone	Option	Advantages	Disadvantages	Verdict
Zone A	Option 2	- Removes both 'small radius bends' on A534 (for eastbound traffic). Site of 4No accidents in last 5 years. - Aligned with Sandy Lane so that land take/severance of landowner plots CH442523 and CH617321 is limited. - Sandy Lane could remain open as an access road to adjacent fields. - (Assumed) reduced traffic on A534 would make it safer to enter/exit the properties located on the 'small radius bends'.	- Increase in scheme length: 479m - Significant land take/severance of land owner plot CH239821. - Tie in with A534 is near small radius bend (safety issue – poor visibility). - 2No 360m horizontal curves and 2No 720m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Assumed SSD relaxations. - Meetings with affected land owners confirmed that the alignment presented at Public Consultation was preferred over the additional alignment options which ran close to Sandy Lane (Options1, 2 and 3). - No provision for mitigation measures (screening/bunds etc) to reduce the effects of the link road on the 'Loachbrook Farm' development. - Would impact on numerous ponds within Zone A.	Option 2 has not been shown to be an improvement on the existing alignment and will not be taken forward as part of the Preferred Route.
	Option 3	- No increase in scheme length. - Aligned with Sandy Lane so that land take/severance is limited. - Removes one 'small radius bend' on the A534. Site of 4No accidents in last 5 years. - Sandy Lane could remain open as an access road to adjacent fields.	- Does not remove both 'small radius bends' on the A534. - Assumed to increase traffic volumes passing dwellings on A534 'small radius bends.' - Sandy Lane might have to be stopped up at the junction with the A534 if this option is used. - 2No 360m horizontal curves and 1No 720m horizontal curve (although assumed that this does not reduce/jeopardise road user safety). - Assumed SSD relaxations. - Meetings with affected land owners confirmed that the alignment presented at Public Consultation was preferred over the additional alignment options which ran close to Sandy Lane (Options1, 2 and 3). - No provision for mitigation measures (screening/bunds etc) to reduce the effects of the link road on the 'Loachbrook Farm development.' - Would impact on numerous ponds within Zone A.	Option 3 has not been shown to be an improvement on the existing alignment and will not be taken forward as part of the Preferred Route.

Zone	Option	Advantages	Disadvantages	Verdict
Zone A	**Option 4**	- Contains no horizontal or vertical alignment relaxations/departures from standard. - Full Stopping Sight Distance (SSD) along link. - Removes one 'small radius bend' on the A534. Site of 4No accidents in last 5 years. - Sandy Lane is unaffected by this option. - Fields to east of alignment could still be accessed from Sandy Lane. - Significantly less severance of agricultural land than the alignment taken to Public Consultation. - Mitigation measures (screening/bunds) could be placed in the fields to the west of Sandy Lane to reduce the effects of the link road on the 'Loachbrook Farm development'. - Affected land owners have confirmed that options which run close to/along Sandy Lane are not preferred. - No increase in scheme length.	- Does not remove both 'small radius bends' on the A534. - Assumed to increase traffic volumes passing dwellings on A534 'small radius bends.' - More land severance than Options 1, 2 and 3. - Would impact on 2/3 ponds within Zone A.	Option 4 will be taken forward as part of the Preferred Route. It is considered to be an improvement on the Option taken to Public Consultation and also the best solution of all the additional options presented.

In Zone A, 4 additional alignments were designed and appraised. After Public Consultation, it was felt that moving the alignment closer to Sandy Lane in order to minimise land severance should be investigated. However, the options which ran immediately adjacent to Sandy Lane (Options 1, 2 and 3) made no provision for mitigation measures (such as screening/bunds) to lessen the impact of the link road (and thus the compensation claims) on the proposed 'Loachbrook Farm development.' It was decided that Option 4 should be taken forward as part of the Preferred Route as it reduced the severance of the agricultural land (when compared to the option taken to Public Consultation) whilst also allowing for future mitigation measures to be developed in the strip of land between Sandy Lane and the proposed link road.

3.3.2 Appraisal of Alternative Alignments in Zone B/C

Table 6 – Appraisal of Alternative Alignments in Zone B/C

Zone	Option	Advantages	Disadvantages	Verdict
Zone B/C	**Option Taken to Public Consultation**	- Contains no horizontal or vertical alignment relaxations/departures from standard. - Full SSD along link. - No retaining walls or overbridge required at Chelford Road (reduced construction cost). - Minimal earthworks required as alignment is 'at grade.' - No pumping station required.	- Junction created at Chelford Road. Potential for higher traffic flows on Chelford Road and Black Firs Lane. - Severe/significant impact on numerous properties to the north of Back Lane. - Severance of horse paddocks to the west of Sandy Lane. - Significant opposition from public (following consultation).	Option taken to Public Consultation will not be taken forward as part of the Preferred Route as Option 3A is considered an improved alignment in Zone B/C. The severe/significant impact on numerous properties around Chelford Road/Black Firs Lane was deemed to be unacceptable.
	Option 1A	- Considerably lower impact on the properties around Chelford Road/Back Lane/Black Firs Lane as this option passes between the two sets of dwellings. - No new junction at Chelford Road will mean that traffic volume on Chelford Road and Black Firs Lane would be relatively low when compared to option taken to Public Consultation. - No additional costs related to pumping station construction. - No ongoing cost associated with maintenance/inspection of pumping equipment.	- Retaining walls / engineered slopes required to maintain adequate distance between highway boundary and dwellings on Chelford Road, Back Lane and Jagerhof. - Large cost associated with earthworks volume required to construct this option. - Large footprint area required if overbridge is introduced at Chelford Road (due to free drainage of highway to River Dane). - Potential 'tying in' problems with rest of (vertical) alignment. - 3No 360m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Assumed SSD relaxations. - Disturbance to Radnor Hall Farm.	The Preferred Route (identified in Section 2.4) does not follow the Blue/Purple alignment in this area. Therefore, this option will not form part of the Preferred Route.

Zone	Option	Advantages	Disadvantages	Verdict
Zone B/C	**Option 1B**	- Considerably lower impact on the properties around Chelford Road/Back Lane/Black Firs Lane as this option passes between the two sets of dwellings. - No new junction at Chelford Road will mean that traffic volumes on Chelford Road and Black Firs Lane would be relatively low when compared to the option taken to Public Consultation. - Relatively small land take requirements. Earthworks can be minimised if a pump is used in trapped cutting. - A retaining wall at Jagerhof is not required for this option (it is for Option 1A- free drainage). - Assumed lower impact on environment (smaller footprint area than Option 1A- free drainage). - Significantly lower construction costs than the free drainage option (Option 1A) due to less earthworks.	- Retaining walls / engineered slopes required to maintain adequate distance between highway boundary and dwellings on Chelford Road and Back Lane. - Additional cost of pumping station construction. - Additional cost required to operate and maintain pumping station. - Potential flooding of trapped cutting if pump breaks. - 3No 360m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Assumed SSD relaxations. - Disturbance to Radnor Hall Farm.	The Preferred Route (identified in Section 2.4) does not follow the Blue/Purple alignment in this area. Therefore, this option will not form part of the Preferred Route.
	Option 2A	- Considerably lower impact on the properties around Chelford Road/Back Lane/Black Firs Lane as this option passes between the two sets of dwellings. - No new junction at Chelford Road will mean that traffic volume on Chelford Road and Black Firs Lane would be relatively low when compared to option taken to Public Consultation. - No additional costs related to pumping station construction. - No ongoing cost associated with operation and maintenance of pumping equipment. - No disturbance to Radnor Hall Farm. - Reduced disturbance to Jagerhof when compared to Options 1A and 2B.	- Retaining walls / engineered slopes required to maintain adequate distance between highway boundary and dwellings on Chelford Road and Back Lane. - Large cost associated with earthworks volume required to construct this option. - Large footprint area required if overbridge is introduced at Chelford Road (due to free drainage of highway). - Potential 'tying in' problems with rest of (vertical) alignment. - 1No 360m horizontal curve curves (although assumed that this does not reduce/jeopardise road user safety). - Assumed SSD relaxations.	Option 2A will not be taken forward as part of the Preferred Route as Option 3A is considered the best design solution in Zone B/C. Option 2A is considered unfeasible due to the large footprint area of land required to achieve this 'free drainage' solution, and also the high earthworks cost associated with this option.

Zone	Option	Advantages	Disadvantages	Verdict
Zone B/C	**Option 2B**	- Considerably lower impact on the properties around Chelford Road/Back Lane/Black Firs Lane as this option passes between the two sets of dwellings. - No new junction at Chelford Road will mean that traffic volume on Chelford Road and Black Firs Lane would be relatively low when compared to option taken to Public Consultation. - Relatively small land take requirements. Earthworks can be minimised if a pump is used in trapped cutting. - Assumed lower impact on environment (smaller footprint area than free drainage option). - No problems tying link to rest of (vertical) alignment. - No disturbance to Radnor Hall Farm. - Less disturbance to Jagerhof then Option 1A and 2B. - Significantly lower construction costs than the free drainage option (Option 2A) due to less earthworks.	- Retaining walls / engineered slopes required to maintain adequate distance between highway boundary and dwellings on Chelford Road and Back Lane. - Additional cost of pumping station construction. - Additional cost required to operate and maintain pumping equipment. - Potential flooding of trapped cutting if pump breaks. - 1No 360m horizontal curve (although assumed that this does not reduce jeopardise road user safety). - Assumed SSD relaxations.	Option 2B will not be taken forward as part of the Preferred Route as Option 3A is considered the best design solution in Zone B/C.

Zone	Option	Advantages	Disadvantages	Verdict
Zone B/C	**Option 3A**	- Considerably lower impact on the properties around Chelford Road/Back Lane/Black Firs Lane as this option passes between the two sets of dwellings. - No new junction at Chelford Road will mean that traffic volume on Chelford Road and Black Firs Lane would be relatively low when compared to option taken to Public Consultation. - Reduced severance of land plots to the west of Chelford Road/Black Firs Lane junction. - Relatively small land take requirements. Earthworks can be minimised if a pump is used in trapped cutting. - No disturbance to Radnor Hall Farm. - Reduced disturbance to Jagerhof when compared to Options 1A and 2B. - Significantly lower construction costs than the free drainage option (Option 2A) due to less earthworks.	- See Disadvantages for Option 2B. - Only available for the Red/Green route. A similar alignment for the Blue/Purple route would probably require a 3 step horizontal reduction.	Option 3A will be taken forward as part of the Preferred Route. It is considered to be an improvement on the Option taken to Public Consultation and also the best solution of all the additional options presented.

In Zone B/C, a total of 5 additional alignments were designed and appraised. The severe/significant impact on the properties around Chelford Road which would be caused by the existing design was thought to be both unacceptable and avoidable. Therefore, all 5 of the additional alignments were thought to be an improvement on the original design. However, some of the options (Options 1A and 1B) had to be automatically discounted on the basis that they were a modification to the Blue/Purple Option, which does not form part of the Preferred Route (identified in Section 2.4).

Further to this, Option 2A was discounted on the basis that unfeasible earthwork quantities would be required to facilitate free drainage of the highway runoff to the River Dane. The cost associated with the volume of earthworks required to deliver Option 2A would also be extremely high and would likely decrease the BCR substantially.

Options 2B and 3A (pumping station situated in the trapped cutting) were seen as much more cost effective solutions and would have a smaller associated footprint area, meaning the impact of the road on the environment would be much lower. Options 2A and 3A were very similar; Option 3A was ultimately taken forward as part of the Preferred Route as it was aligned further to the west around the rear of Chelford Road, meaning less severance of the Horse Paddocks in that area.

3.3.3 Appraisal of Alternative Alignments in Zone D/E

Table 7 – Appraisal of Alternative Alignment in Zone D/E

Zone	Option	Advantages	Disadvantages	Verdict
Zone D/E	**Option taken to Public Consultation**	- Contains no horizontal or vertical alignment relaxations/departures from standard. - Full SSD along link.	- Severs Church Wood. - Relatively close to properties in Hulme Walfield and St Michael's Church. - Significant opposition from public (following consultation).	The Preferred Route (identified in Section 2.4) does not follow the Blue/Purple alignment in this area and does not pass close to Church Wood/St Michael's Church. Therefore, this option will not form part of the Preferred Route.
	Option 1	- Avoids Church Wood. - Further away from Hulme Walfield and St Michael's Church.	- Reductions in horizontal alignment standards and SSD (when compared to Option taken to Public Consultation). However, it is assumed that this does not reduce/jeopardised road user safety.	The Preferred Route (identified in Section 2.4) does not follow the Blue/Purple alignment in this area and does not pass close to Church Wood/St Michael's Church. Therefore, this option will not form part of the Preferred Route.

In Zone D/E, 1 additional alignment was designed and appraised. This alternative alignment option was shown to be an improvement on the existing alignment as it passed further to the south of Hulme Walfield and avoided Church Wood (ancient woodland). However, the additional alignment in Zone D/E was automatically discounted on the basis that it is a modification to the Blue/Purple Option, and does not form part of the Preferred Route.

3.3.4 Appraisal of Alternative Alignments in Zone F

Table 8 – Appraisal of Alternative Alignments in Zone F

Zone	Option	Advantages	Disadvantages	Verdict
Zone F	**Option taken to Public Consultation**	- Contains no horizontal or vertical alignment relaxations/departures from standard. - Full SSD along link. - Minimal severance of wooded area. -Minimal severance of farm land to the north of Eaton. - Would reduce traffic on the A536 around Eaton (5No accidents in last 5 years).	- Does not remove 'small radius bend' on A536. - Encroaches on Preferred Area for Mineral Extraction. - Severs Bebbington Lane and Back Lane. - Closer to the north of Eaton than other options.	It was recommended that the Red/Purple Option should be taken forward as the Preferred Route following the quantitative assessment presented in Section 2.3.This option is specific to the Blue and Green Options only, so will not be taken forward as part of the Preferred Route.
	Option 1	- Removes 'small radius bend' on A536 adjacent to Old Brickbank Wood (3No accidents in last 5 years). - Would reduce traffic on the A536 around Eaton (5No accidents in last 5 years). - 2No 720m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Further away from Eaton than original option.	- Increase in scheme length: 350m. - Encroaches on Preferred Area for Mineral Extraction. - Severance of wooded area. - Severs Bebbington Lane and Back Lane. - Disturbance to properties on the A536. - Proposed roundabout requires small radius entry and exit arms – potential safety issue.	It was recommended that the Red/Purple Option should be taken forward as the Preferred Route following the quantitative assessment presented in Section 2.3.This option is specific to the Blue and Green Options only, so will not be taken forward as part of the Preferred Route.

Zone	Option	Advantages	Disadvantages	Verdict
Zone F	Option 2	- Removes 'small radius bend' on A536 adjacent to Old Brickbank Wood (3No accidents in last 5 years). - Would reduce traffic on the A536 around Eaton (5No accidents in last 5 years). - Relatively low degree of severance of wooded area. - Further away from Eaton than original option.	- Increase in scheme length: 360m. - Encroaches on Preferred Area for Mineral Extraction. - Severs Bebbington Lane and Back Lane. - 2No 360m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Disturbance to properties on the A536. - Proposed roundabout requires small radius entry and exit arms – potential safety issue.	It was recommended that the Red/Purple Option should be taken forward as the Preferred Route following the quantitative assessment presented in Section 2.3.This option is specific to the Blue and Green Options only, so will not be taken forward as part of the Preferred Route.
	Option 3	- Would reduce traffic on the A536 around Eaton (5No accidents in last 5 years). - Further away from Eaton than original option.	- Increase in scheme length: 540m. - Encroaches on Preferred Area for Mineral Extraction. - Does not remove 'small radius bend' on A534 adjacent to Old Brickbank Wood. - Severs access to wooded area to west of A536. New access would have to be provided. - Severs Bebbington Lane and Back Lane. - 2No 360m horizontal curves (although assumed that this does not reduce/jeopardise road user safety). - Disturbance to properties on the A536.	It was recommended that the Red/Purple Option should be taken forward as the Preferred Route following the quantitative assessment presented in Section 2.3.This option is specific to the Blue and Green Options only, so will not be taken forward as part of the Preferred Route.

In Zone F, 3 additional alignments were designed and appraised. Following the selection of the Preferred Route (Section 2.4,) it became apparent that none of the alternative options in Zone F were now relevant and therefore would not form part of the Preferred Route Alignment. The reason for this was that they were modifications of the Blue/Green Option (to the north of Eaton Hall Quarry) and the selected Preferred Route followed the Red/Purple Option alignment (to the south of Eaton Hall Quarry).

4 Summary and Conclusions

4.1 Summary

This report documents an assessment of the four link road options presented at the Public Consultation. The four options were initially assessed qualitatively, by identifying the main features and characteristics of each option and appraising them against a set of assessment topics/factors.

Further to this, a quantitative assessment of the four options was conducted, where the scores which were assigned to each link road option related to how the option performed against the assessment topic/factors. Weighting for the assessment topics/factors was determined at a PRA Workshop with input from Cheshire East Council.

The Total Weighted Scores for each option following the quantitative assessment were as follows:

- Total Weighted Score of Red Option: **12.8**
- Total Weighted Score of Blue Option: **7.2**
- Total Weighted Score of Green Option: **8.2**
- Total Weighted Score of Purple Option: **11.4**

The assessment showed that the Red and Purple Options outscored the Blue and Green options. Therefore, the Red and Purple Options were considered further with a view to combining the two options in order to develop a Preferred Route. Sensitivity testing confirmed that the results of the assessment were robust.

It was felt that the Red Option should be taken forward as the Preferred Route, but should be modified in the central section so that it tied in with the Purple Option. This would increase the developable land to the south of the scheme, thereby increasing the quality of the Local Plan.

It should be noted that the Red and Purple Options which were taken to Public Consultation are similar, and are actually identical in Zone A, Zone B, Zone F and a large proportion of Zone E.

Feedback received from members of the public throughout the consultation process resulted in numerous alternative alignments being considered and designed. Each of the alternative alignments were individually appraised and compared to the alignment taken to Public Consultation. Options which were deemed to be an improvement on the original alignment were incorporated into the Preferred Route.

It can be seen that within Zone A, the Preferred Route follows the alternative alignment detailed in Appendix B (Option 4,) which is slightly different to the alignment which was presented at Public Consultation. Through Zone B, the Preferred Route follows the alternative alignment detailed in Appendix C (Option 3A). In Zone C, the Preferred Route follows the alignment of the Red Option. In Zone D, the Preferred Route extends over the River Dane and ties in with the Purple

Option. The Preferred Route then follows the alignment of the Purple and Red Options in Zones E and F.

4.2 Cost

A scheme cost estimate has been developed following the determination of a Preferred Route. The Preferred Route has been estimated to have an outturn scheme cost of approximately £77.5 Million; this is approximately £6.6 Million more than the Red Option taken to Public Consultation (£70.9 Million) and £2.2 Million less than the Purple Option taken to Public Consultation (£79.7 Million).

The scheme cost estimate for the Preferred Route has been developed in the same way as the scheme cost estimates for the four options taken to Public Consultation. The Preferred Route Scheme Cost Estimate Report (Doc. Ref. B1832001/OD003a) details the assumptions made when developing the cost estimate, and unless explicitly stated, these are the same as the assumptions made when developing the scheme cost estimates for the four options taken to Public Consultation.

It should be appreciated that even though the scheme cost for the Preferred Route is higher than the Red Option, the Preferred Route opens up more potentially developable land to the south of the link road, thereby enhancing the quality of the Local Plan. It should also be acknowledged that the scheme cost for the Preferred Route includes an allowance for high-cost elements such as the new Chelford Road bridge and associated retaining wall structures, as well as the cost of a pumping station which is now thought to be required. These high-cost elements were incorporated into the Preferred Route through design development/feedback from the public, and did not form part of the four original scheme cost estimates.

4.3 Conclusion

The final Preferred Route, which is to be recommended to Cheshire East Council, has been determined through various assessments which are documented in Sections 2 and 3 of this report. The Preferred Route is shown in Appendix F (Drawing Ref. B1832001/H/WD/68 and B1832001/H/WD/69).

As with the options presented at Public Consultation, earthwork details and other construction lines have been omitted from the plan to reflect the relatively early stage of the scheme.

Appendix A Sensitivity Testing Results

B1832001 - Congleton Link Road

Sensitivity Test 1: Maximum variation of +/- 10% to original weighting

Topic / Factor	Scenario 1 Weighting	Scenario 2 Weighting	Scenario 3 Weighting	Scenario 4 Weighting	Scenario 5 Weighting	Scenario 6 Weighting	Scenario 7 Weighting	Scenario 8 Weighting	Scenario 9 Weighting	Scenario 10 Weighting	Unweighted Scores			
											Red Option	Blue Option	Green Option	Purple Option
Scheme Cost Estimate	1.840	2.120	1.920	1.940	1.800	2.120	1.940	1.820	2.020	1.880	2	0	1	1
Benefit to Cost Ratio (BCR)	1.800	2.200	2.140	1.840	2.100	2.140	2.020	2.140	1.940	1.880	2	1	2	1
Quality of Local Plan	0.910	1.000	1.000	0.980	0.990	0.970	0.990	0.970	0.950	0.930	1	2	1	2
Public Endorsement	2.000	2.140	1.860	1.960	1.840	1.820	2.000	1.940	1.920	1.980	1	1	0	2
Engineering Constraints	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1	-2	-2	0
Road User Safety	0.990	0.910	0.950	1.040	1.020	0.960	0.940	1.040	1.020	0.950	2	2	2	2
Landscape and Visual Impact	0.214	0.208	0.184	0.182	0.198	0.208	0.218	0.190	0.214	0.218	-1	-2	-2	-2
Ecology	0.186	0.200	0.184	0.184	0.212	0.206	0.218	0.190	0.182	0.190	-2	-2	-2	-2
Cultural Heritage	0.196	0.202	0.204	0.182	0.220	0.182	0.218	0.198	0.218	0.202	0	-1	-1	-1
Air Quality	0.192	0.184	0.190	0.220	0.182	0.186	0.198	0.210	0.212	0.192	1	1	1	1
Noise and Vibration	0.216	0.216	0.210	0.214	0.208	0.212	0.188	0.204	0.204	0.186	1	1	1	1
Soils, Geology and Hydrogeology	0.188	0.214	0.184	0.180	0.194	0.212	0.196	0.204	0.204	0.182	0	-1	-1	0
The Water Environment	0.190	0.190	0.216	0.208	0.186	0.194	0.182	0.198	0.200	0.180	-1	-1	-1	-1
Water Framework Directive	0.200	0.200	0.220	0.204	0.188	0.216	0.192	0.204	0.204	0.200	-1	-1	-1	-1
Effects on All Travellers	0.192	0.200	0.180	0.204	0.210	0.208	0.210	0.180	0.184	0.184	1	1	1	1
Private and Community Assets	0.220	0.210	0.208	0.212	0.192	0.220	0.202	0.196	0.218	0.194	1	1	1	1

	Total Weighted Scores			
	Red Option	Blue Option	Green Option	Purple Option
Scenario 1	**12.014**	**6.846**	**7.576**	**10.874**
Scenario 2	**13.412**	**7.348**	**8.528**	**11.822**
Scenario 3	**12.68**	**7.128**	**8.328**	**11.092**
Scenario 4	**12.468**	**7.184**	**8.024**	**11.264**
Scenario 5	**12.466**	**7.144**	**8.214**	**10.978**
Scenario 6	**13.026**	**7.014**	**8.484**	**11.166**
Scenario 7	**12.56**	**7.018**	**7.988**	**11.154**
Scenario 8	**12.728**	**7.326**	**8.376**	**11.29**
Scenario 9	**12.666**	**7**	**8.09**	**11.144**
Scenario 10	**12.108**	**6.796**	**7.646**	**10.838**
Average	**12.6128**	**7.0804**	**8.1254**	**11.1622**

	Sensitivity Assessment		
	Red - Purple	Purple - Blue	Purple - Green
Scenario 1	1.14	4.028	3.298
Scenario 2	1.59	4.474	3.294
Scenario 3	1.588	3.964	2.764
Scenario 4	1.204	4.08	3.24
Scenario 5	1.488	3.834	2.764
Scenario 6	1.86	4.152	2.682
Scenario 7	1.406	4.136	3.166
Scenario 8	1.438	3.964	2.914
Scenario 9	1.522	4.144	3.054
Scenario 10	1.27	4.042	3.192
Average	**1.4506**	**4.0818**	**3.0368**

Red Option shown to be highest scoring option in all 10 iterations. Outscores Purple Option by an average of 1.45 points.

Purple Option shown to outscore Blue Option in all 10 iterations (by average of 4.08 points).

Purple Option shown to outscore Green Option in all 10 iterations (by average of 3.04 points).

B1832001 - Congleton Link Road

Sensitivity Test 2: Maximum variation of +/- 25% to original weighting

Topic / Factor	Iteration 1 Weighting	Iteration 2 Weighting	Iteration 3 Weighting	Iteration 4 Weighting	Iteration 5 Weighting	Iteration 6 Weighting	Iteration 7 Weighting	Iteration 8 Weighting	Iteration 9 Weighting	Iteration 10 Weighting	Unweighted Scores			
											Red Option	Blue Option	Green Option	Purple Option
Scheme Cost Estimate	1.820	1.540	1.780	2.320	2.500	1.560	2.360	1.880	2.420	2.400	2	0	1	1
Benefit to Cost Ratio (BCR)	2.220	1.640	2.020	2.160	1.800	1.520	2.380	1.980	1.840	1.640	2	1	2	1
Quality of Local Plan	1.010	0.770	1.200	1.170	1.160	0.800	0.760	0.860	1.190	1.160	1	2	1	2
Public Endorsement	2.240	1.600	2.080	2.120	1.680	1.680	2.040	2.020	1.740	1.500	1	1	0	2
Engineering Constraints	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1	-2	-2	0
Road User Safety	0.990	1.110	0.920	0.780	0.910	0.840	1.220	0.820	1.120	0.980	2	2	2	2
Landscape and Visual Impact	0.212	0.192	0.198	0.210	0.174	0.176	0.218	0.246	0.166	0.186	-1	-2	-2	-2
Ecology	0.188	0.188	0.244	0.186	0.240	0.202	0.240	0.206	0.236	0.184	-2	-2	-2	-2
Cultural Heritage	0.202	0.152	0.150	0.240	0.218	0.242	0.172	0.180	0.162	0.230	0	-1	-1	-1
Air Quality	0.160	0.216	0.204	0.150	0.240	0.192	0.158	0.160	0.162	0.152	1	1	1	1
Noise and Vibration	0.232	0.158	0.220	0.184	0.234	0.178	0.216	0.150	0.160	0.230	1	1	1	1
Soils, Geology and Hydrogeology	0.182	0.196	0.198	0.174	0.238	0.184	0.230	0.192	0.192	0.182	0	-1	-1	0
The Water Environment	0.210	0.156	0.236	0.198	0.156	0.242	0.210	0.178	0.218	0.238	-1	-1	-1	-1
Water Framework Directive	0.224	0.152	0.240	0.210	0.168	0.154	0.198	0.194	0.154	0.178	-1	-1	-1	-1
Effects on All Travellers	0.166	0.150	0.194	0.230	0.226	0.164	0.178	0.230	0.248	0.242	1	1	1	1
Private and Community Assets	0.174	0.216	0.198	0.166	0.228	0.204	0.194	0.236	0.168	0.218	1	1	1	1

	Total Weighted Scores			
	Red Option	Blue Option	Green Option	Purple Option
Iteration 1	**13.02**	**7.574**	**8.364**	**11.816**
Iteration 2	**10.814**	**6.324**	**7.134**	**9.66**
Iteration 3	**12.374**	**7.448**	**7.968**	**11.506**
Iteration 4	**13.55**	**7.296**	**8.486**	**11.91**
Iteration 5	**13.21**	**6.94**	**8.4**	**11.358**
Iteration 6	**10.082**	**5.64**	**6.24**	**9.064**
Iteration 7	**14.36**	**7.4**	**9.34**	**12.03**
Iteration 8	**11.986**	**6.488**	**7.468**	**10.58**
Iteration 9	**13.418**	**7.408**	**8.738**	**11.76**
Iteration 10	**12.572**	**6.694**	**8.074**	**10.776**
Average	**12.5386**	**6.9212**	**8.0212**	**11.046**

	Sensitivity Assessment		
	Red - Purple	Purple - Blue	Purple - Green
Iteration 1	1.204	4.242	3.452
Iteration 2	1.154	3.336	2.526
Iteration 3	0.868	4.058	3.538
Iteration 4	1.64	4.614	3.424
Iteration 5	1.852	4.418	2.958
Iteration 6	1.018	3.424	2.824
Iteration 7	2.33	4.63	2.69
Iteration 8	1.406	4.092	3.112
Iteration 9	1.658	4.352	3.022
Iteration 10	1.796	4.082	2.702
Average	**1.4926**	**4.1248**	**3.0248**

Red Option shown to be highest scoring option in all 10 iterations. Outscores Purple Option by an average of 1.49 points.

Purple Option shown to outscore Blue Option in all 10 iterations (by average of 4.12 points).

Purple Option shown to outscore Green Option in all 10 iterations (by average of 3.02 points).

B1832001 - Congleton Link Road

Sensitivity Test 3: Maximum variation of +/- 40% to original weighting

Topic / Factor	Iteration 1 Weighting	Iteration 2 Weighting	Iteration 3 Weighting	Iteration 4 Weighting	Iteration 5 Weighting	Iteration 6 Weighting	Iteration 7 Weighting	Iteration 8 Weighting	Iteration 9 Weighting	Iteration 10 Weighting	Unweighted Scores			
											Red Option	Blue Option	Green Option	Purple Option
Scheme Cost Estimate	2.000	1.740	2.560	2.420	2.060	2.240	2.680	2.040	1.220	2.520	2	0	1	1
Benefit to Cost Ratio (BCR)	1.960	2.700	2.220	1.920	1.360	2.220	2.500	1.820	1.220	2.240	2	1	2	1
Quality of Local Plan	1.000	1.250	0.890	0.960	0.630	1.200	0.840	1.330	1.300	0.980	1	2	1	2
Public Endorsement	1.520	2.480	1.940	2.100	1.520	2.240	2.180	1.960	1.860	1.820	1	1	0	2
Engineering Constraints	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1	-2	-2	0
Road User Safety	0.650	0.890	0.780	1.350	1.120	1.370	1.000	0.800	0.830	0.760	2	2	2	2
Landscape and Visual Impact	0.194	0.214	0.220	0.272	0.220	0.234	0.272	0.124	0.226	0.194	-1	-2	-2	-2
Ecology	0.208	0.220	0.252	0.240	0.198	0.178	0.168	0.126	0.180	0.246	-2	-2	-2	-2
Cultural Heritage	0.262	0.206	0.226	0.200	0.124	0.148	0.132	0.130	0.130	0.158	0	-1	-1	-1
Air Quality	0.200	0.136	0.274	0.156	0.278	0.278	0.252	0.120	0.180	0.266	1	1	1	1
Noise and Vibration	0.264	0.200	0.242	0.140	0.220	0.196	0.124	0.218	0.260	0.176	1	1	1	1
Soils, Geology and Hydrogeology	0.120	0.130	0.224	0.226	0.220	0.180	0.124	0.208	0.188	0.182	0	-1	-1	0
The Water Environment	0.214	0.200	0.224	0.234	0.128	0.210	0.278	0.124	0.130	0.250	-1	-1	-1	-1
Water Framework Directive	0.160	0.142	0.242	0.140	0.136	0.196	0.140	0.260	0.280	0.212	-1	-1	-1	-1
Effects on All Travellers	0.262	0.216	0.240	0.238	0.128	0.136	0.160	0.256	0.132	0.172	1	1	1	1
Private and Community Assets	0.264	0.244	0.194	0.228	0.142	0.190	0.132	0.224	0.184	0.204	1	1	1	1

	Total Weighted Scores			
	Red Option	Blue Option	Green Option	Purple Option
Iteration 1	**11.746**	**6.21**	**7.65**	**9.85**
Iteration 2	**14.19**	**8.71**	**9.42**	**13.06**
Iteration 3	**13.71**	**6.59**	**8.54**	**11.314**
Iteration 4	**14.076**	**7.578**	**8.858**	**12.324**
Iteration 5	**11.118**	**5.704**	**6.974**	**9.504**
Iteration 6	**14.904**	**8.842**	**9.862**	**13.502**
Iteration 7	**15.022**	**7.474**	**9.634**	**12.458**
Iteration 8	**12.668**	**7.636**	**8.206**	**11.844**
Iteration 9	**9.46**	**6.556**	**5.836**	**9.824**
Iteration 10	**13.51**	**6.676**	**8.636**	**11.198**
Average	**13.0404**	**7.1976**	**8.3616**	**11.4878**

	Sensitivity Assessment		
	Red - Purple	Purple - Blue	Purple - Green
Iteration 1	1.896	3.64	2.2
Iteration 2	1.13	4.35	3.64
Iteration 3	2.396	4.724	2.774
Iteration 4	1.752	4.746	3.466
Iteration 5	1.614	3.8	2.53
Iteration 6	1.402	4.66	3.64
Iteration 7	2.564	4.984	2.824
Iteration 8	0.824	4.208	3.638
Iteration 9	-0.364	3.268	3.988
Iteration 10	2.312	4.522	2.562
Average	**1.5526**	**4.2902**	**3.1262**

Red Option shown to be highest scoring option in 9 of 10 iterations. Outscores Purple Option by an average of 1.55 points.

Purple Option shown to outscore Blue Option in all 10 iteration (by average of 4.29 points).

Purple Option shown to outscore Green Option in all 10 iterations (by average of 3.13 points).

Appendix B Alternative Alignment Designs in Zone A
(Drawing Ref. B1832001/SK/31)

Drawing number
B1832001_SK_031

Proposed online roundabout

149m

69m

CH239821

CH617321

CH442523

Option 2

Option 4

Proposed alignment for all options

Option 1

Option 3

Sandy Lane to be stopped up at the junction with the A534 if Option 3 is used.

Relocation of proposed roundabout would require significant junction re-modelling. Engineering challenges may also be experienced where Loach Brook is crossed.

Loach Brook

N

KEY:

- Proposed alignment for all options
- Option 1
- Option 2
- Option 3
- Option 4
- Landowner CH442523
- Landowner CH617321
- Landowner CH239821

Option Comparison

Option 1

- Increase in scheme length over existing option presented at Public Consultation: 548m
- 3N° two steps below Desirable Minimum horizontal curves (360m).
- 1N° 510m radius horizontal curve.

Option 2

- Increase in scheme length over existing option presented at Public Consultation: 479m
- 2N° two steps below Desirable Minimum horizontal curves (360m).
- 2N° Desirable Minimum horizontal curves (720m).

Option 3

- Increase in scheme length over existing option presented at Public Consultation: 0m
- 2N° two steps below Desirable Minimum horizontal curves (360m).
- 1N° Desirable Minimum horizontal curves (720m).

Option 4

- Increase in scheme length over existing option presented at Public Consultation: 0m
- 2N° minimum R without elimination of adverse camber and transitions horizontal curves (2040m).

Notes

1. Design is subject to change throughout design development. Drawing is part of route optioneering work and is for information only.

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Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
0	04.02.2014	DRAFT - FOR INFORMATION ONLY	LH	PS	PS	-

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

Drawing title
ADDITIONAL OPTIONS TO THE WEST OF SANDY LANE (ZONE A)

Drawing status

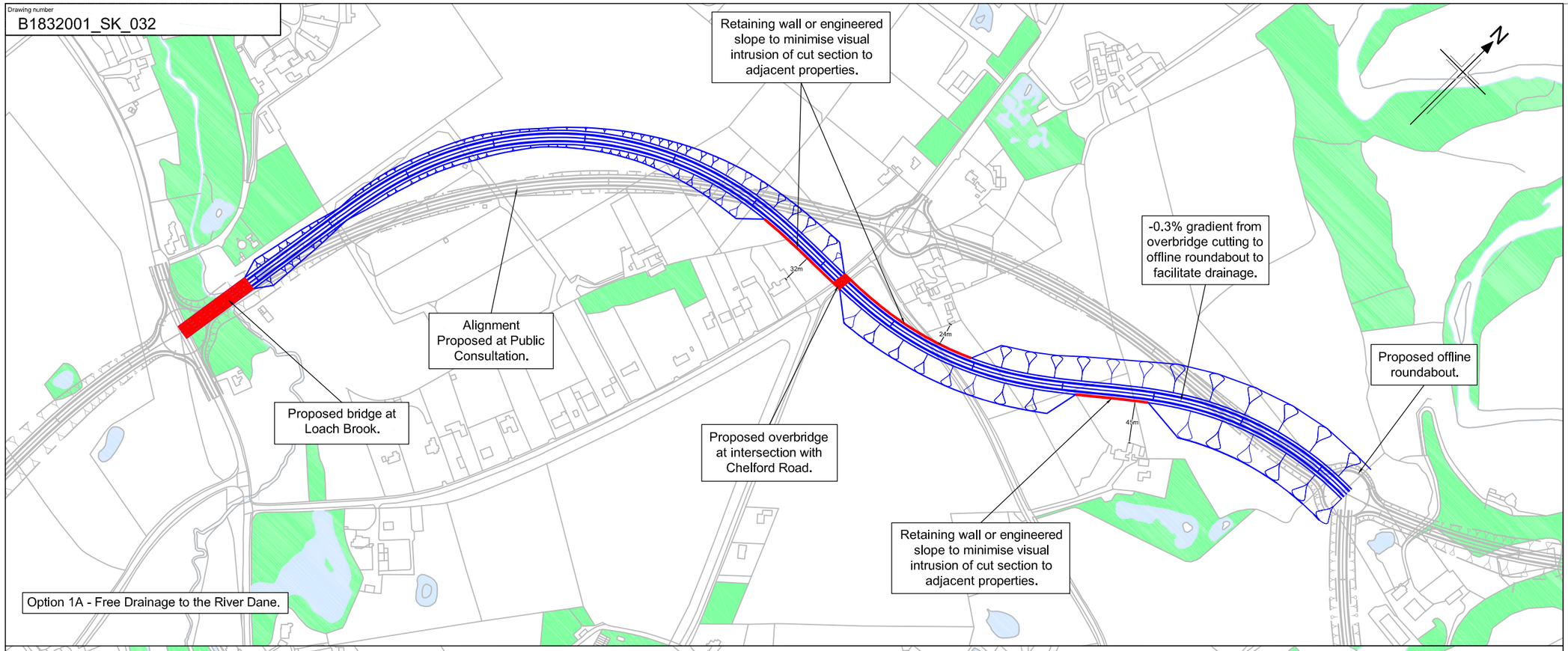
Scale	NTS @ A3	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

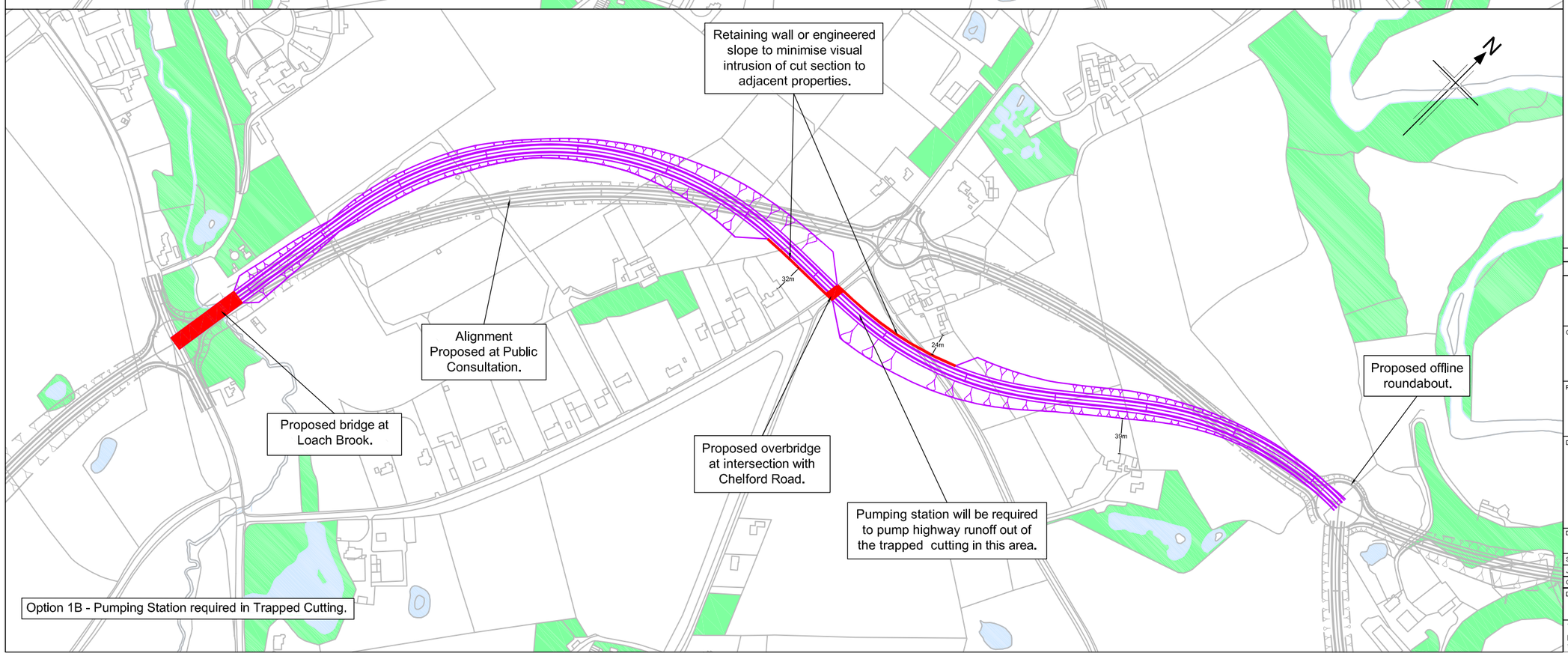
Drawing number
B1832001_SK_031

Rev
0

Appendix C Alternative Alignment Designs in Zone B/C
(Drawing Ref. B1832001/SK/32, SK/33 and SK/34)

Drawing number
B1832001_SK_032





KEY:

- Alignment proposed at Public Consultation
- Option 1A
- Option 1B
- Retaining walls/engineered slopes

Notes:

1. Design is subject to change throughout design development. Drawing is part of route optioneering work and is for information only.

2. Options 1A and 1B have been designed for a Design Speed of 100kph. Both options contain 3No two steps below Desirable minimum horizontal curves (360m).

3. Earthwork slopes of 1 in 3 (1V:3H) have been used throughout.

4. Forward visibility has not been checked. Verge widening could potentially be required to achieve Stopping Sight Distance.

5. Drainage outfall for the trapped cutting in Option 1B has not been identified.

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0	06.02.2014	DRAFT - FOR INFORMATION ONLY	LH	PS	PS	-

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

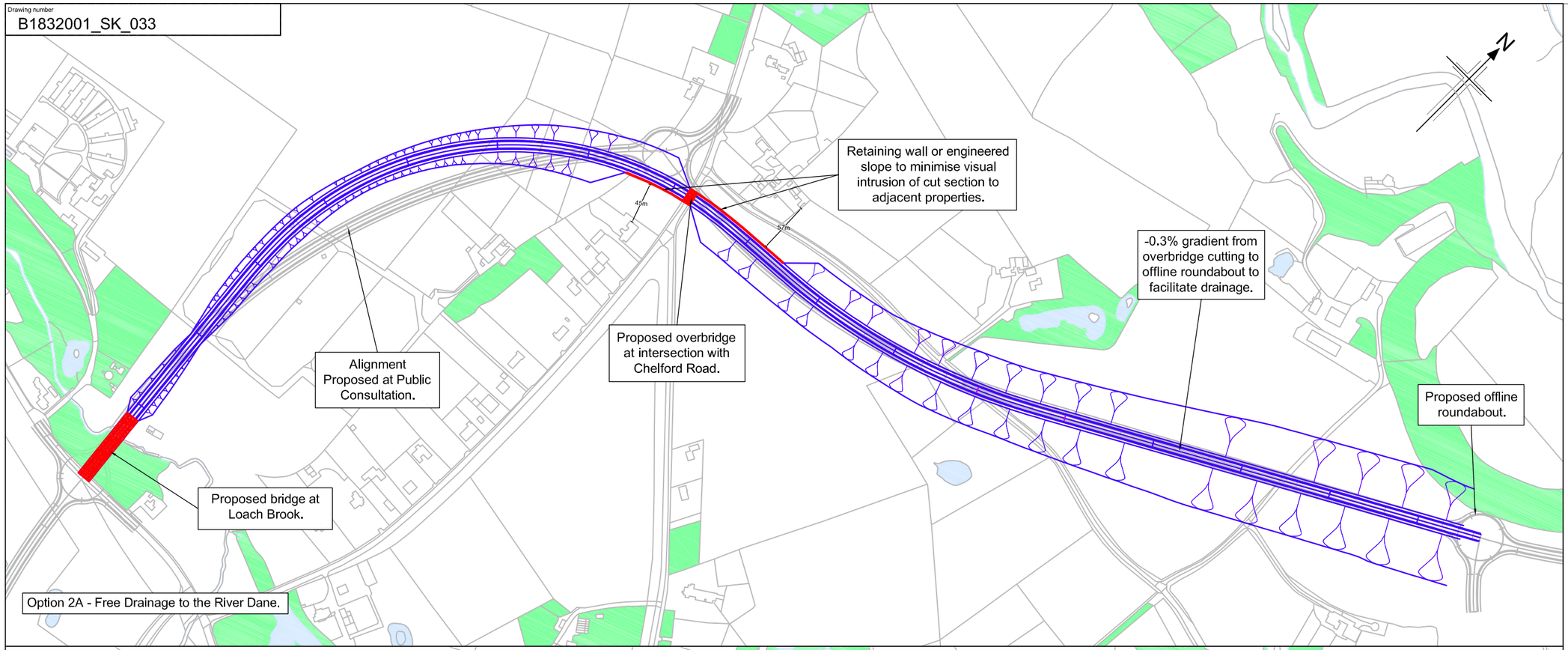
Drawing title
ADDITIONAL OPTIONS AT CHELFORD ROAD INCORPORATING OVERBRIDGE (BLUE/PURPLE OPTION)

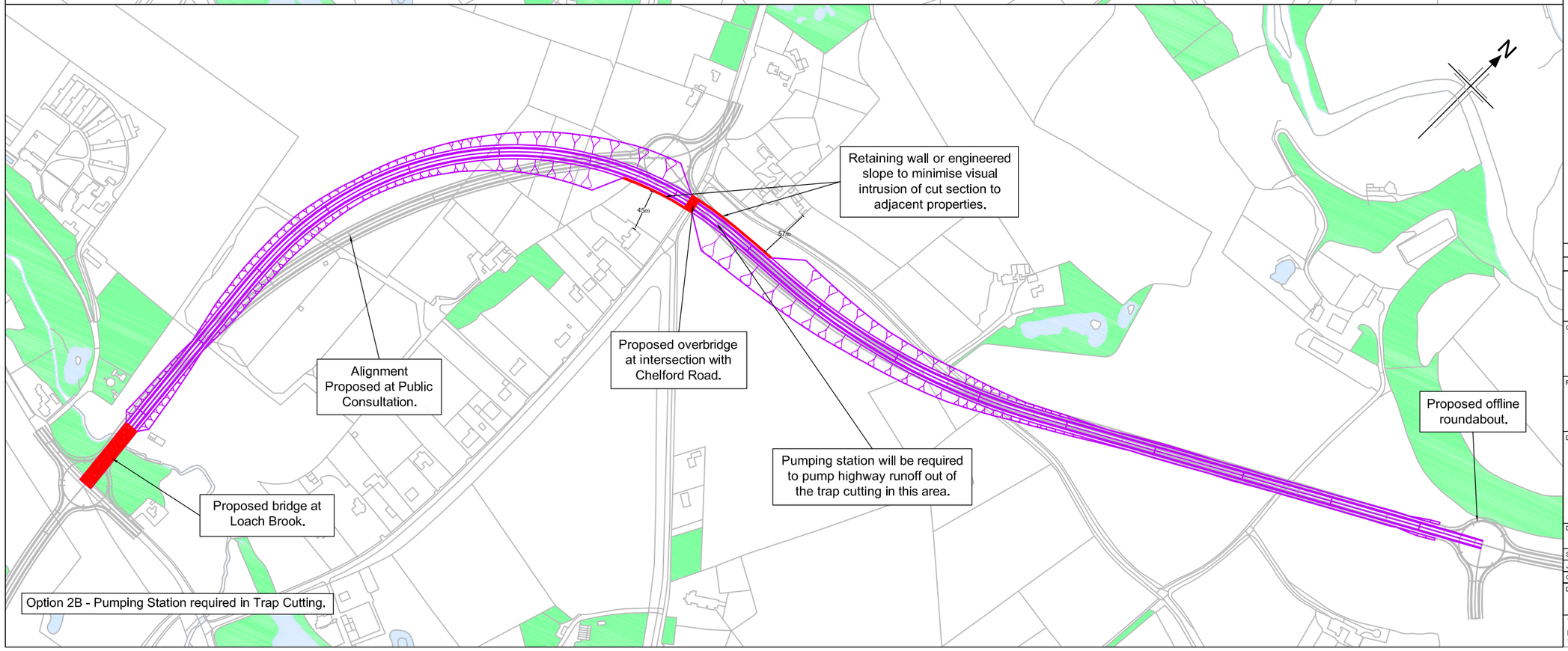
Drawing status

Scale	NTS @ A3	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number: B1832001_SK_032
Rev: 0

Drawing number
B1832001_SK_033





KEY:

- Alignment proposed at Public Consultation
- Option 2A
- Option 2B
- Retaining walls/engineered slopes

Notes:

1. Design is subject to change throughout design development. Drawing is part of route optioneering work and is for information only.

2. Options 2A and 2B have been designed for a Design Speed of 100kph. Both options contain 1No two steps below Desirable minimum horizontal curve (360m).

3. Earthwork slopes of 1 in 3 (1V:3H) have been used throughout.

4. Forward visibility has not been checked. Verge widening could potentially be required to achieve Stopping Sight Distance.

5. Drainage outfall for the trap cutting in Option 2B has not been identified.

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0	06.02.2014	DRAFT - FOR INFORMATION ONLY	LH	PS	PS	-

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

Drawing title
ADDITIONAL OPTIONS AT CHELFORD ROAD INCORPORATING OVERBRIDGE (RED/GREEN OPTION)

Drawing status

Scale	NTS @ A3	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number: B1832001_SK_033 Rev: 0

Drawing number
B1832001_SK_034

Retaining wall or engineered slope to minimise visual intrusion of cut section to adjacent properties.

Alignment proposed at Public Consultation.

Alignment proposed at landowner meeting (7/2/14).

Proposed overbridge at intersection with Chelford Road.

Proposed offline roundabout.

Proposed bridge at Loach Brook.

Pumping station will be required to pump highway runoff out of the trapped cutting in this area.

Option 3A - Pumping Station required in Trapped Cutting.

KEY:

- Alignment proposed at Public Consultation
- Alignment proposed at landowner meeting (2/7/14)
- Option 3A
- Retaining walls/engineered slopes

Notes:

1. Design is subject to change throughout design development. Drawing is part of route optioneering work and is for information only.

2. Option 3A has been designed for a Design Speed of 100kph and contains 1No two steps below Desirable Minimum horizontal curve (360m).

3. Earthwork slopes of 1 in 3 (1V:3H) have been used throughout.

4. Forward visibility has not been checked. Verge widening could potentially be required to achieve Stopping Sight Distance.

5. Drainage outfall for the trapped cutting has not been identified.

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Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
0	07.03.2014	DRAFT - FOR INFORMATION ONLY	LH	PS	PS	-

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Client
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Project
CONGLETON LINK ROAD

Drawing title
ADDITIONAL CHELFORD ROAD OPTION MINIMISING SEVERANCE TO THE WEST OF SANDY LANE (RED/GREEN OPTION)

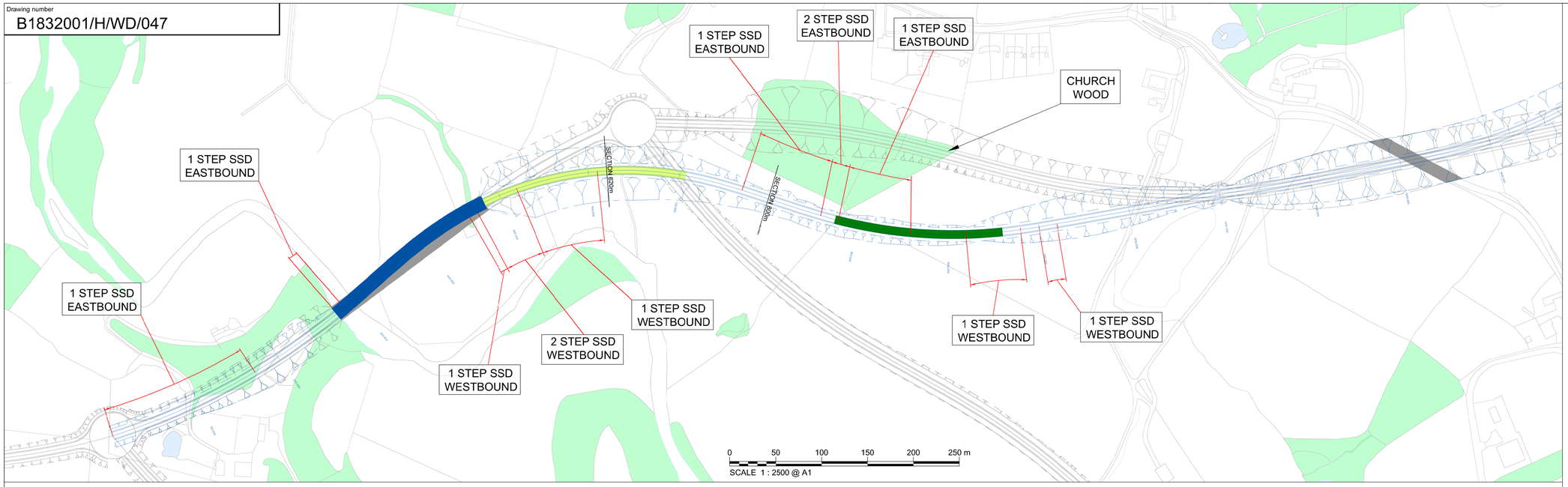
Drawing status

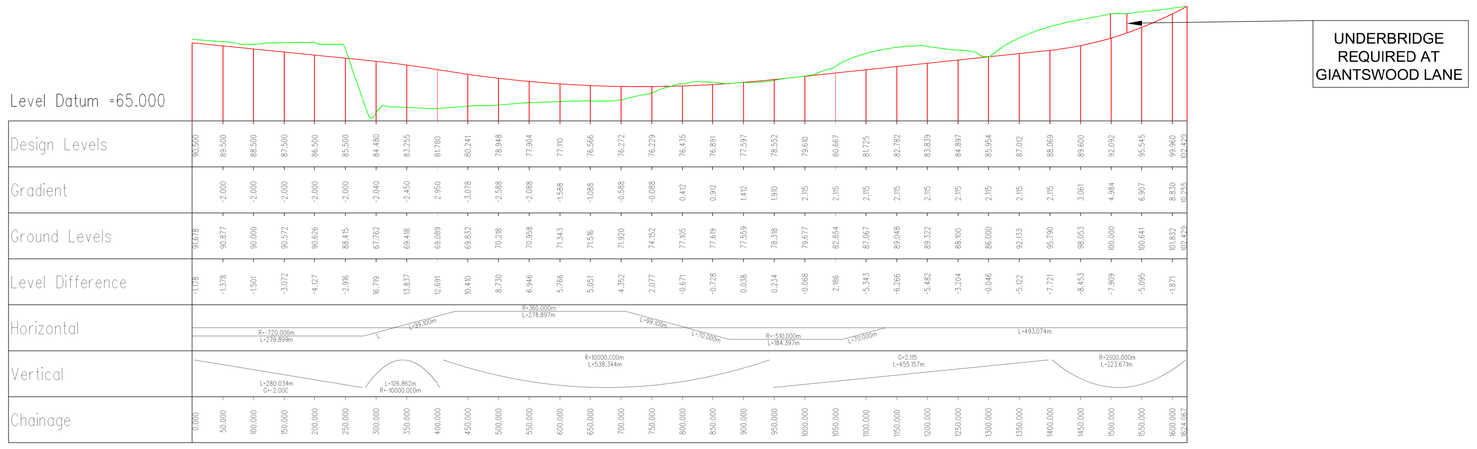
Scale	NTS @ A3	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number B1832001_SK_034 Rev 0

Appendix D Alternative Alignment Design in Zone D/E (Drawing Ref. B1832001/H/WD/47)

Drawing number
B1832001/H/WD/047





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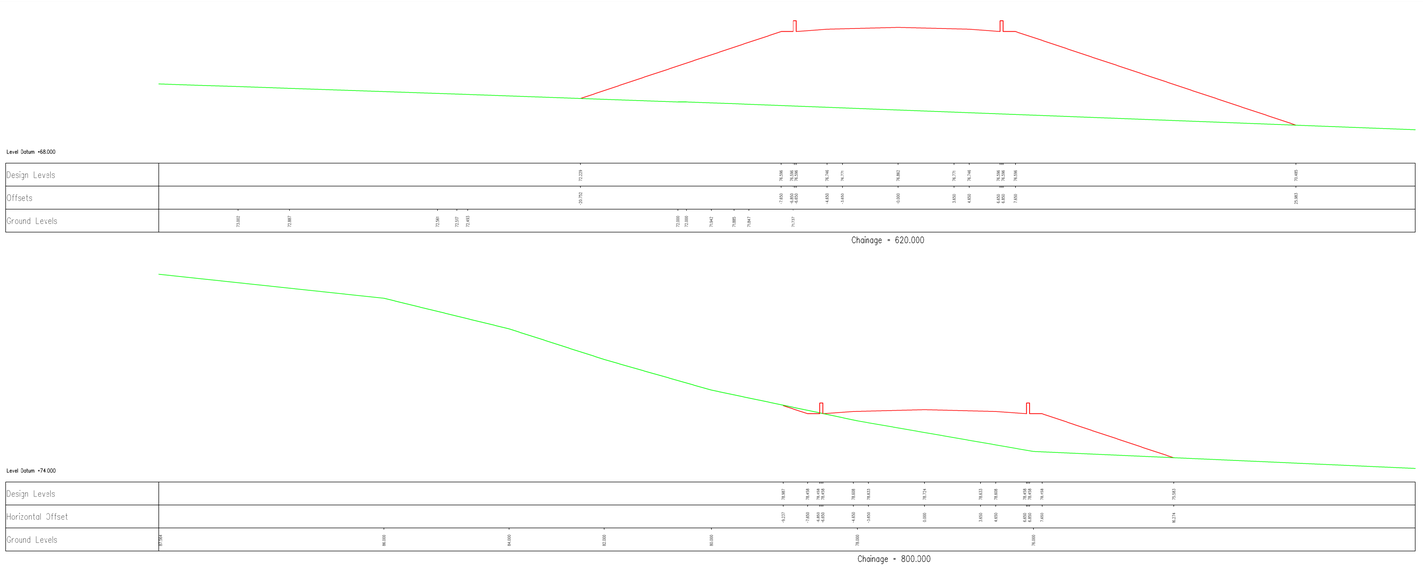
Vertical Scale = 1:1000



Notes:

1. All dimensions are in metres unless otherwise stated
2. The designs proposed are indicative and are subject to change through design development
3. Indicative barrier modeled with a 0.8m working width and 0.7m height

Key:

- Purple route option
- Alternative route option avoiding Church Wood
- Indicative structure location for purple option
- Indicative structure location for alternative option
- River Dane flood plain
- Vegetated areas
- Surface water features
- 1 step relaxation to horizontal curve radii
- 2 step relaxation to horizontal curve radii

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
0	NOV 2013	DRAFT	JS	PS	PS	GW

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

Drawing title
ZONE D
ALTERNATIVE OPTION
AVOIDING CHURCH WOOD

Drawing status

Scale	AS SHOWN ON PLAN	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number
B1832001/H/WD/047
Rev 0

Appendix E Alternative Alignment Designs in Zone F
(Drawing Ref. B1832001/H/WD/29)

Drawing number
B1832001_SK_029

Connection to A536 Macclesfield Road cannot be fully designed as the topographical survey does not cover this area.

Option 3 would sever access to wooded area. New access would need to be provided.

55m

OPTION 3

OPTION 1

69m

Options 1 and 2 remove the small-radius bend on the A536.

All 3 options dissect the wooded area to the north of Eaton. However, Options 2 and 3 have less of an impact due to the 360m radius curves used in the links' horizontal alignments.

38m

98m

17m

OPTION 2

83m

EXISTING BLUE/GREEN OPTION ALIGNMENT

KEY:

- Existing Blue/Green Option Alignment
- Option 1
- Option 2
- Option 3
- Preferred Area for Mineral Safeguarding

Option Comparison

Option 1
- Increase in scheme length over existing Blue/Green Option presented at Public Consultation: 350m
- Option encroaches on the Preferred Area for Mineral Safeguarding.
- 2N° Desirable Minimum horizontal curves (720m).
- 0N° two steps below Desirable Minimum horizontal curves (360m).

Option 2
- Increase in scheme length over existing Blue/Green Option presented at Public Consultation: 360m
- Option encroaches on the Preferred Area for Mineral Safeguarding.
- 0N° Desirable Minimum horizontal curves (720m).
- 2N° two steps below Desirable Minimum horizontal curves (360m).

Option 3
- Increase in scheme length over existing Blue/Green Option presented at Public Consultation: 540m
- Option encroaches on the Preferred Area for Mineral Safeguarding.
- 0N° Desirable Minimum horizontal curves (720m).
- 2N° two steps below Desirable Minimum horizontal curves (360m).

Notes

1. Design is subject to change throughout design development. Drawing is part of route optioneering work and is for information only.

DRAFT

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Revd	Apprv'd
0	29.01.2014	DRAFT - FOR INFORMATION ONLY	LH	PS	PS	-

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

Drawing title
ALTERNATIVE ALIGNMENT OPTIONS TO THE NORTH OF EATON

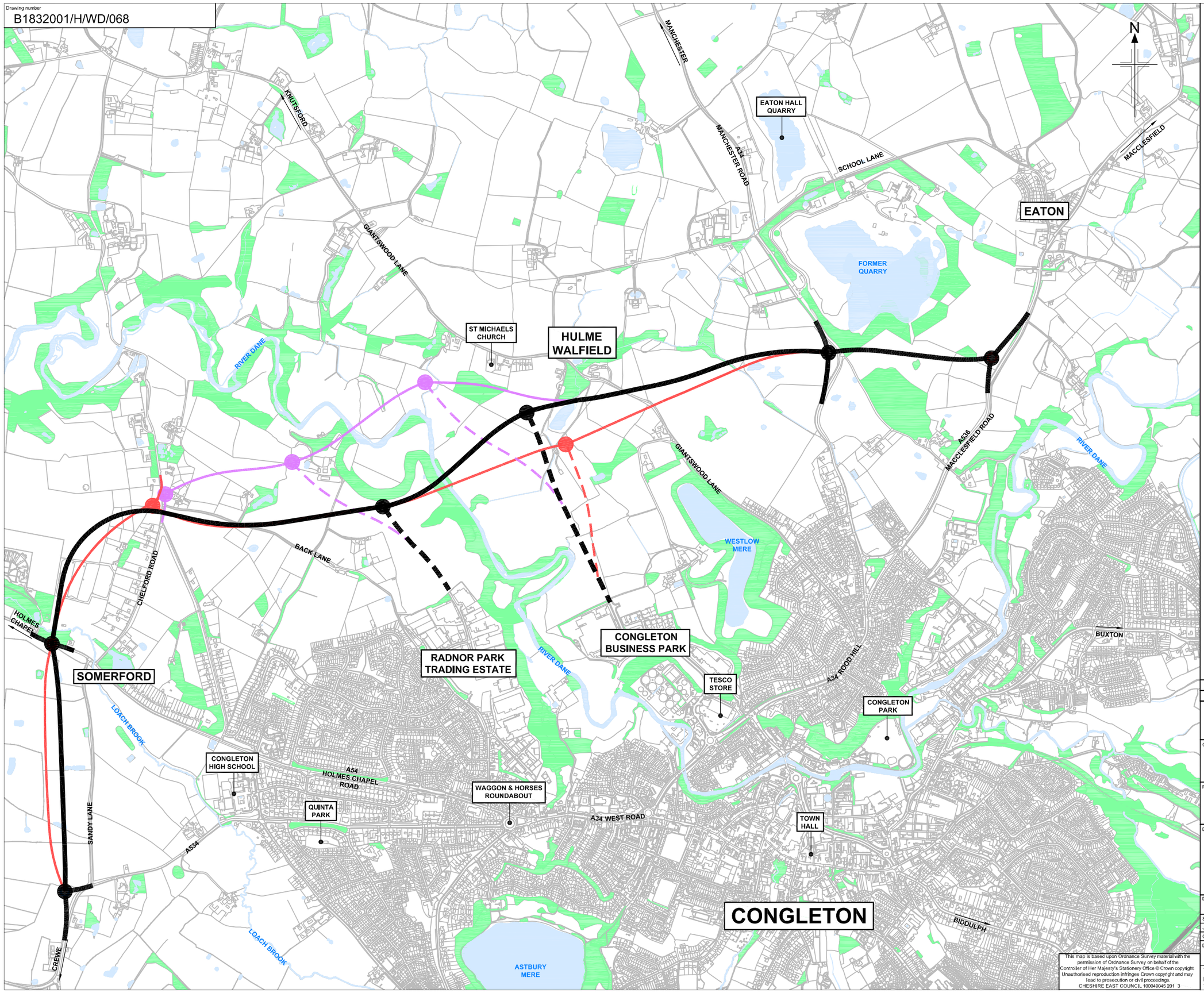
Drawing status

Scale	NTS @ A3	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number B1832001_SK_029 Rev 0

Appendix F Congleton Link Road Preferred Route
(Drawing Ref. B1832001/H/WD/68 and WD/69)

Drawing number
B1832001/H/WD/068



Notes:

1. The designs proposed are indicative and are subject to change through design development

Key:

- Preferred Route
- Red Option Taken to Public Consultation
- Purple Option Taken to Public Consultation
- Connections to Radnor Park Trading Estate and Congleton Business Park
- Watercourse/waterbody
- Vegetated area

0 150 300 450 600 750 m
SCALE 1 : 7500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Appr'd
0	APRIL 2014	DRAFT	JY	LH	LH	GW

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

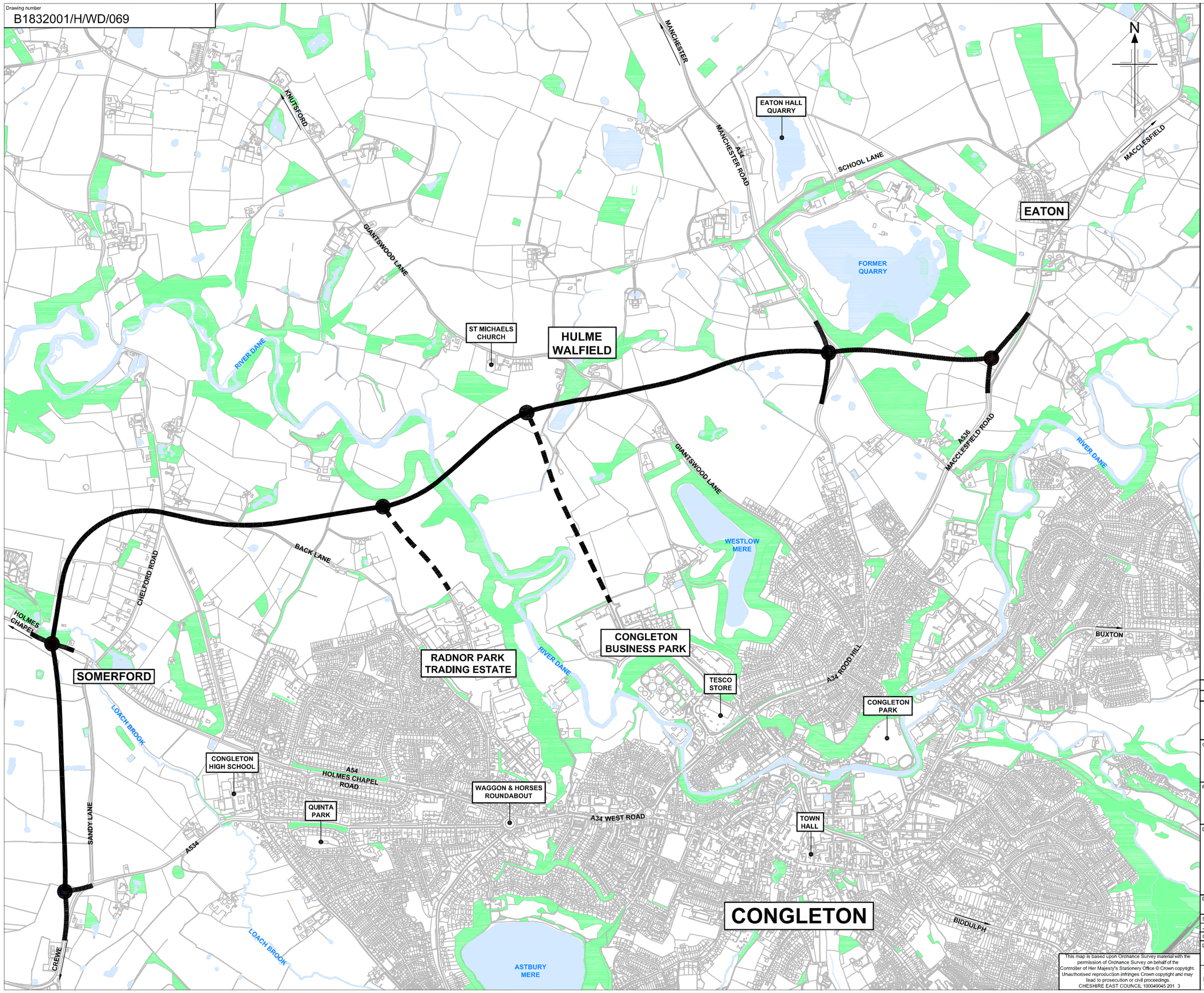
Drawing title
PREFERRED ROUTE ALIGNMENT PLAN (RED AND PURPLE OPTIONS ARE ALSO SHOWN)

Drawing status

Scale	1:7500 @ A1	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number B1832001/H/WD/068 Rev 0

Drawing number
B1832001/H/WD/069



Notes:

1. The designs proposed are indicative and are subject to change through design development

Key:

- Preferred Route
- Connections to Radnor Park Trading Estate and Congleton Business Park
- Watercourse/waterbody
- Vegetated area

0 150 300 450 600 750 m
SCALE 1 : 7500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
0	APRIL 2014	DRAFT	JY	LH	LH	GW

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Client
Cheshire East Council

Project
CONGLETON LINK ROAD

Drawing title
PREFERRED ROUTE ALIGNMENT PLAN

Drawing status

Scale	1:7500 @ A1	DO NOT SCALE
Jacobs No.	B1832001	
Client no.		

Drawing number B1832001/H/WD/069 Rev 0