A38
Derby Junctions

Scheme Assessment Report (Non-Technical Summary)

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Option 2C assessment summary

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EXECUTIVE SUMMARY

The A38 is the strategic route from Birmingham to Derby and through to the M1 at junction 28. It carries significant volumes of north-south long distance traffic. Where the A38 passes through Derby, significant volumes of traffic making local journeys cross or join and leave the A38 which disrupts, and is disrupted by, the strategic traffic resulting in congestion and delay at the 3 at-grade roundabout junctions, to the west and north of Derby City Centre. The 3 junctions are:

- A38/A5111 Kingsway roundabout.
- A38/A52 Markeaton roundabout.
- A38/A61 Little Eaton roundabout

The existing junction layouts create conflict with local traffic crossing the A38 and non-motorised users and all 3 junctions suffer from long periods of congestion on weekdays, and also occasionally at weekends, throughout the year. The consequences of doing nothing are that users currently travelling on congested local roads would not benefit from improvements to the 3 junctions, hence queues and delays on local roads around Derby would remain. Because of this the A38 maintains its relative unattractiveness to long-distance strategic trips, and hence discourages both car and freight trips to use the route in peak traffic flow periods.

Do-nothing options: traffic and economics

The A38 is a part of the strategic road network (SRN) and carries a relatively large proportion of heavy goods vehicles. Where the A38 passes through the City of Derby, the road also fulfils other functions, specifically:

- An alternative route to the congested city roads
- A high-capacity road crossing of the River Derwent
- A means of distributing the home-to-work journeys between the alternative radial routes
- A means of travel that is safer than on local roads, which have more frequent junctions and numerous accesses
- Road capacity to cope with the additional traffic generated by development sites identified in the local plans of Derby City, South Derbyshire, Amber Valley and Erewash
- A reliable route for buses

Alternative schemes

Following the options development of the scheme from the early 2000s to the present day, many options have been investigated and there has been extensive consultation with stakeholders.

The investigations into the possible grade-separation of the 3 junctions began with a Road Based Study (RBS) in 2002. This had a public consultation which was followed by a supplementary consultation for Little Eaton junction in 2003. The scheme was subsequently refined and a Technical Appraisal Report (TAR) was produced in 2009.

Following the scheme re-commencing in 2014, a public consultation was carried out in 2015 to update our understanding of the public's views on the scheme. The options that emerged as the preferred options in the TAR were presented at an exhibition along with some of the previously discounted options and it was the

presented options for each junction that emerged from the consultation as the best options to progress.

A number of alternative options were identified from responses to the 2015 public consultation. Additional options were subsequently proposed by local stakeholders, particularly, the Breadsall A38 Action Group, for the Little Eaton junction. This included an option devised at a meeting in early 2017 between the Transport Minister, the Highways England Major Projects Director, the local MP and members of the project team.

Each of the alternative options was subjected to an initial assessment to determine the viability of the proposal; for those options which passed a further detailed assessment was carried out. In every case, the options proposed by the members of the public failed to perform as well as the presented options (in terms of cost, engineering, environment and traffic & economics as described in Section 9).

Traffic, economics and costs

Traffic forecasting and economics assessments were carried out for the scheme based on the presented option at each junction. The scheme costs based on 2010 prices are as follows:

- Construction = £144.3 million
- Land = £19.7 million
- Preparation = £13.8 million
- Supervision = £3.5 million

The extra costs required to maintain the various new elements of the scheme over a 60-year appraisal period would be £66.1 million.

For the purpose of comparing the scheme's costs and monetised-benefits, all costs and the monetised benefits were converted to 2010 prices. The annual cost-expenditure profiles from 2016 up to the horizon-year of 2083 (60-years after the open-to-traffic year) were used to produce a present value of costs (PVC).

The total PVC of the scheme is forecast to be £170.8 million.

The transport economic efficiency (TEE) benefits of the scheme were calculated using data from a traffic model that simulated: the main Derby City road network, the A38 route between the M1 J28 junction to the north and as far south as Burton-on-Trent, including the A50 to the south of Derby and the M1 motorway to the east of Derby. The rest of the UK highway network was also represented at various levels of detail and thus the whole length of those road-users' journeys travelling through the study area were represented.

The journey-times and travel-distances were extracted from the traffic model and used to compute a monetised value for the TEE benefits.

The present value of benefits (PVB) would be £418.8 million.

The benefit to cost ratio (BCR) is 2.45. In transport economy terms, the A38 Derby Junctions scheme would provide high value for money.

A monetised assessment of the likely improvements to journey time reliability has been evaluated at £14 million. Because of the uncertainty inherent within the assessment method, the reliability benefits are not included within the above PVB and BCR values.

Operational and maintenance assessment

Discussions with the maintaining authorities have confirmed that there are safe ways to maintain the completed scheme. Further detailed development of the maintenance requirements and operations will be undertaken in the next design stage.

Environmental assessment

The potential environmental effects associated with the proposed scheme have been reported in an Environmental Assessment Report (EAR). This indicates that designing to avoid impacts together with mitigation, most potential environmental effects would be reduced to non-significant levels (i.e. minor or negligible effects). However, the EAR indicates that some potential moderate or major/large effects have been identified. Some of these would be temporary construction phase effects (e.g. noise, visual, ecological, pedestrian and cyclist facilities and severance) that would reduce during the proposed scheme operational phase due to:

- landscape/ecological planting becoming mature
- the segregation of local and through traffic which would reduce severance and increase journey reliability.

The preferred route

The conclusion of the option selection phase is to recommend that the following options for each junction are taken forward into the next stage of the development phase:

- A38/A5111 Kingsway Junction – presented option
- A38/A52 Markeaton Junction – presented option
- A38/A61 Little Eaton Junction – presented option

Plans showing these layouts are included in appendix 1.

1 INTRODUCTION

1.1 Purpose of the report

1.1.1 The purpose of this report is to provide an updated non-technical summary of the Scheme Assessment Report (SAR) that was produced in 2016.

1.1.2 The 2016 SAR itself is a summary of the Technical Appraisal Report (TAR) that was produced in 2009, the more recent (2015) Report on Public Consultation and the options development and assessment work undertaken in 2015/16. The conclusion was to recommend a preferred route.

2 SUMMARY OF EXISTING CONDITIONS

2.1 Scheme brief

2.1.1 Having been put on hold in 2008, work on the scheme re-commenced in response to the Government's 2013 spending review.

2.1.2 The scheme comprises grade-separation of the 3 remaining at-grade junctions located at Derby on the A38 between the M6 Toll and the M1. The A52 Markeaton and A5111 Kingsway junctions are within the Derby City urban area. The A61 Little Eaton junction is in the Erewash Borough and Derbyshire County areas.

2.1.3 An overall objective is to provide a scheme that is affordable and delivers high value for money.

2.1.4 Scheme-specific objectives (as confirmed within the Highways England Client Scheme Requirements) as follows have been set for the proposed scheme:

Economy

- To reduce delays and increase reliability of journeys on the strategic corridor
- Assist in bringing forward development and regeneration opportunities in the surrounding area and immediately adjacent to the scheme
- To minimise traffic disruption due to construction works and incidents
- To achieve optimal whole-life cost taking into account future maintenance, operation and disruption to users

Environment

- To minimise impacts on both the natural and built environment, including designated landscape/biodiversity features
- To seek to mitigate impacts on air quality or noise
- To ensure effective measures are in place to protect watercourses from pollutant spillage on the highway
- To investigate and to encourage the use of environmentally friendly operations and products throughout the project life cycle

Society

- To improve the safety for all road users
- To manage the safety for road workers in accordance with the requirements of GD04/12 – Standard for the Safety Risk Assessment on the Strategic Road Network and the Health and Safety at Work 1974 Act to be So Far As Is Reasonably Practicable (SFAIRP)
- To improve safety for residents in the vicinity of the junctions
- To facilitate integration with other transport modes where applicable
- To ensure a consistent high standard of signing relating to the junctions
- To reduce severance by maintaining or providing appropriate facilities for crossing, and travelling along the route for pedestrians and cyclists

Public accounts

- To be affordable and represent high value for money according to Department for Transport (DfT) appraisal criteria

Scheme specific objectives

- Improve integration by supporting the local transport plan
- Facilitate regional development and growth in Derby City and its surrounding areas and increase capacity of the strategic road network to absorb growth

2.2 Locality and existing highway network

2.2.1 The A38 runs roughly northeast from Birmingham to the M1 at junction 28 and forms part of the Derby ring road as it passes to the west and north of the City of Derby. On the section of A38 around Derby there are 6 junctions, 3 of which are the at-grade roundabouts that are to be improved under the scheme, these are shown in figure 2/1 below.

Figure 2/1: A38 Derby junctions – location plan

2.3 Statement of the problem

2.3.1 The existing junction layouts create conflict with local traffic crossing the A38 and non-motorised users. All 3 junctions suffer from long periods of congestion on weekdays, and also occasionally at weekends, throughout the year.

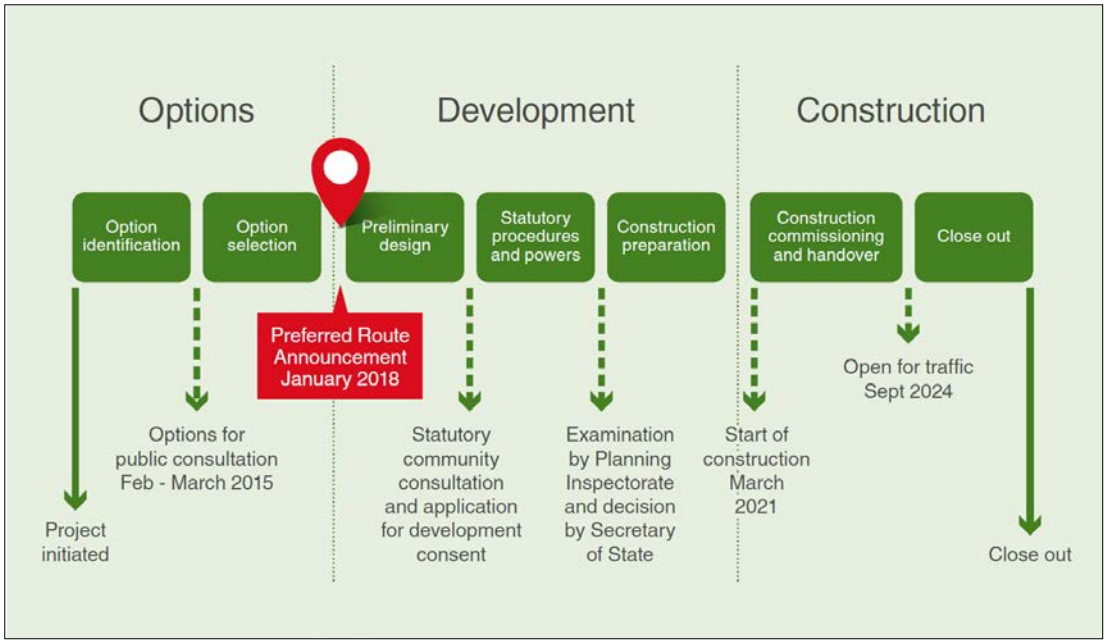
3 PLANNING FACTORS

3.1 Planning procedure

3.1.1 The proposed scheme is to be assessed against the requirements of the Planning Act, 2008.

3.1.2 It is currently considered that the proposed scheme constitutes a Nationally Significant Infrastructure Project (NSIP). Thus following preferred route announcement, it is anticipated that in order for the necessary statutory provisions to be secured and to enable the proposed scheme to proceed, it will be necessary to make a Development Consent Order (DCO) application to the Planning Inspectorate (PINS).

3.1.3 Below is the stage by stage diagram of the process to get to a DCO submission, examination by the Planning Inspectorate, Secretary of State decision, start of construction to final fully open to traffic and scheme close out.



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4 SUMMARY OF DO-NOTHING CONSEQUENCES

4.1 Traffic and economics

4.1.1 The A38 is part of the Strategic Road Network (SRN) and as such carries a significant number of inter-urban car trips and a large number of freight trips when compared to local authority maintained routes.

4.1.2 The A38, where it routes through Derby, also fulfils a number of other functions. For example, the A38 crosses the River Derwent flood plain and provides one of seven opportunities for Derby City's road vehicles to cross the River Derwent. Thus the length of the A38 between the Kingsway and Little Eaton junctions not only provides for strategic trips but also carries trips between local origins and destinations.

4.1.3 Some of the potential local trips that could make use of the A38 might be avoiding it because of the congestion and delays. However, a capacity improvement of the junctions could attract existing road users into the A38 route corridor. It is possible that the quicker journey times could also induce new trips onto the highway network.

4.1.4 The consequences of doing nothing are that users currently travelling on congested local roads would not benefit from improvements to the 3 junctions, hence queues and delays on local roads around Derby would remain.

4.1.5 A consequence of doing nothing would be that the A38 maintains its relative unattractiveness to long-distance strategic trips, and hence discourages both car and freight trips to use the route in peak traffic flow periods.

4.1.6 As a further safety issue, because the 3 Derby junctions are at-grade, long-distance and heavy-goods vehicle trips using the strategic road network come into conflict with local intra-urban trips and pedestrian and cyclist movements. These conflicts are a risk to road safety that would not exist if the junctions were grade-separated.

4.1.7 The Derby Local Plan identifies the A38 as key to economic and development growth in the Derby area. Derby and its immediate surrounding area is expected to accommodate significant housing and employment growth. As a result, the traffic demands on the A38 are expected to grow quicker than the national average.

4.1.8 Whilst the strategic economic plan is being taken forward independently from transport infrastructure improvement schemes, the A38 improvement scheme will facilitate this regeneration.

4.1.9 The A38 grade separation proposals also form one of the key bus corridor improvement measures within the "Derby Local Transport Plan, LTP3 2011-2026" LTP3 strategy. It can therefore be assumed that the bus corridors crossing the A38 are supported by the A38 improvements.

5 SUMMARY OF ALTERNATIVE SCHEMES

5.1 Description of scheme options

5.1.1 Since 2001, there have been several phases of development of the scheme that have resulted in carrying out the assessment of different alternative options for each of the junctions, these can be summarised as follows:

- 2002 road based study – this looked at short term interim improvements (mainly involving signalisation and relining of parts of the junction) as well as long term solutions for each junction. The long term solutions comprised some form of grade separation. There was a public consultation exercise carried out at this time and the road based study (RBS) concluded with a preferred solution for each junction.
- 2003 supplementary consultation for Little Eaton junction – following the road based study, some further alternatives for Little Eaton were investigated and presented at a supplementary public consultation exhibition – from this a new preferred option emerged.
- Design development at Kingsway and Markeaton junctions - a number of operational and design limitations were identified with the road based study preferred options and some basic modifications were made – Kingsway was modified so that the main line was placed in an underpass below the level of the existing junction (the RBS solution was for an embankment over the junction) and, at Markeaton, the single bridge for the A52 over the A38 was replaced with a 2 bridge roundabout.
- Further design development up to 2008 when the scheme was put on hold;
- Design development from 2014 to the 2015 public consultation;
- Alternative options emerging from the 2015 public consultation and the earlier options design stage.
- Further option assessment (of the option devised at a meeting in early 2017 between the Transport Minister, the Highways England Major Projects Director, the local MP and members of the project team) and further design development from January to December 2017.

5.2 A38/A5111 Kingsway junction alternative options

Road based study (2002) options

5.2.1 Two options for grade separation emerged from the road based study:

- Option 1 was a free-flowing arrangement with links from the A5111 to the A38 south, from the A5111 to the A38 north (with a flyover across the A38 that remained at existing ground level) and a link from the A38 (southbound) to the A5111. Traffic flow from the northbound A38 to the A5111 was not catered for.
- Option 2 was for a partial dumbbell arrangement with provision for the express bus route (this provision prevented the movement of traffic from the northbound A38 and the Greenwich Drive South link to the A5111). The A38 main line passed over the dumbbell link on an embankment.

5.2.2 Option 2 emerged as the preferred option from the road based study. For the layout of this option refer to appendix 2.

Design development (2002 – 2008)

5.2.3 As a number of operational and design limitations were identified with the road based study preferred options some basic modifications were made. The main limitations were the lack of provision for all turning movements and the visual intrusion of the A38 embankment.

5.2.4 Due to the existing constraints it was considered that reversing the preferred arrangement such that the A38 passed through the existing roundabout at low level would offer cost, traffic management, construction, operational and environmental benefits.

5.2.5 From this concept, 3 options were developed for evaluation and assessment, i.e.:

- Option K8 - retain the existing gyratory roundabout and re-align the A38 through it at low level
- Option K7 - retain as much as possible of the existing gyratory roundabout and re-align the A38 through it at low level
- Option K6 - as option K7 but with a dumbbell roundabout layout

5.2.6 Each of these options was divided into 4 sub-options:

- Basic layout with no provision for the express bus route
- Basic layout with provision for express bus route sharing the junction
- Provision for a totally separated express bus route with signalised at grade crossings of the approach road and slip roads
- Provision for a totally separated express bus route with an underbridge on the approach road and signalised at grade crossings of the slip roads

5.2.7 As the express bus route is no longer being promoted by Derby City Council, the options that provide for this are not discussed further in this report.

5.2.8 Options K7 and K8 were discounted as there was a fundamental problem. The existing roundabout falls 2m north to south, whilst the existing ground level within the roundabout rises north to south. As a consequence, adequate clearance can be achieved at the north bridge location, but not at the southern bridge location. This means that either the roundabout needs to be lifted, which would defeat the objective of retaining as much of the existing gyratory carriageway, or the A38 alignment lowered. Lowering the A38 alignment would mean that drainage of surface and sub-grade water by gravity would not be possible and a concrete trough with a pumping station would be necessary. These options are unlikely to offer significant cost savings as they all require 2 new bridge crossings of the A38. For these reasons the options were not considered further.

5.2.9 Option K6 was therefore identified as the preferred option to be entered into the roads programme when the scheme was put on hold in 2008.

Developments up to 2015 public consultation

5.2.10 Work recommenced on the scheme in 2014 and a public consultation exhibition was held early in 2015. Design work prior to consultation focussed on re-affirming that the design option could accommodate the forecast traffic flows for the new design year. It was the arrangement described above that was presented to the public at the consultation (referred to as the ‘presented option’ hereafter).

5.2.11 The consultation showed 3 options for providing local access to the Mackworth area as variants to the previously developed scheme. These were:

- Local access option K1 – link to Greenwich Drive north from the west dumbbell roundabout
- Local access option K2 – link to Kingsway Park Close from the east dumbbell roundabout
- Local access option K3 – no local access link provided – traffic heading into Mackworth would need to leave the A38 at the Markeaton junction

5.2.12 The outcome of the public consultation supported the development of local access option K2. Of the 578 consultation responses received, there was no clear preference shown. However, when examining the responses of the communities within the immediate vicinity of the junction, the clear preference was for Option K2 (49%). As there was no overall impact on traffic benefits for either local access option K1 or K2, it was recommended that option K2 was progressed.

Alternative options emerging after the 2015 public consultation

5.2.13 Following the public consultation in early 2015, several alternative solutions or variations were put forward by members of the public. All of the alternatives received were subject to a two-stage assessment process, comprising the following:

- An initial sifting assessment following the Department for Transport's web-based Transport Analysis Guidance (WebTAG) - The Transport Appraisal Process
- Options passing initial sifting were then subject to the more detailed qualitative assessment

5.2.14 The purpose of the initial sifting assessment was to identify those options that were potentially viable and worthy of further consideration. The initial sifting assessment entailed a preliminary examination of each alternative option using information as provided by the consultee and the Department for Transport's guidance document - The Transport Appraisal Process. The performance of the various alternatives were assessed against the following criteria:

- Achieving the scheme objectives
- Deliverability
- Feasibility

5.2.15 Options had to achieve a baseline score against each of these criteria in order to pass the initial sift. The sifting assessment included the relevant options published for the public consultation events in order to form a baseline for comparison. Alternative options were then compared to the relevant baselined published option, combination of options or the whole scheme, as appropriate.

- The outcomes of the assessment are described in more detail in the report on public consultation that is available on the Highways England scheme's website.

5.2.16 Table 5/1 presents the options for Kingsway junction that passed the initial sift and which were subsequently subjected to further assessment. This further assessment entailed the analysis of the following:

- Costs estimates

- Engineering assessment (including constraints; structures; design standards; geometry; public utilities; non-motorised users; drainage; geotechnics; construction phasing and programme);
- Environmental assessment (including the qualitative consideration of air quality; archaeology and cultural heritage; landscape and visual impacts; nature conservation; geology and soils; materials; noise and vibration; effects on all travellers; community and private assets; and road drainage and the water environment (including flood risk))
- Traffic and economics assessment

5.2.17 An overview of the assessment findings for the following alternative options at Kingsway junction is provided in Table 5/1

- Presented Junction layout with local access option K1
- Presented Junction layout with local access option K2
- Consultee J's alternative with local access option K1

For the layouts of these options refer to Appendix 2

5.2.18 Following the public consultation exercise and the subsequent alternative options assessment, the presented option with local access option K2 emerged as the preferred option. The main reasons for this were:

- Access into the Mackworth estate was maintained
- Impact of traffic, including heavy goods vehicles, adjacent to residential properties (particularly on Greenwich Drive South) is reduced
- Virtual severance of the public open space from properties on Greenwich Drive South and surrounding area would be removed

5.2.19 Details of the assessments are summarised in appendix 3.

Table 5/1 Summary of Qualitative Alternative options Assessment for Kingsway Junction

Options	Key elements of option	Summary of qualitative environmental appraisal	Assessment outcomes
Kingsway junction			
Presented junction layout with option K1 (see appendix 2)	This option is based upon the preferred option as presented at the 2015 public exhibitions, but with local access option K1. As a result of having to close existing local access routes to and from Brackensdale Avenue and Raleigh Street, option K1 would enable residents in the Mackworth area to access the A38 via Greenwich Drive South.	The presented junction layout with option K2 offers the potential to significantly reduce the loss of public open space (by approximately 1,500 m^2) and reduce landscape and visual effects. Whilst option K2 would result in the loss of some public open space, given that losses would be significantly smaller than with option K1 (approximately 500 m^2), sourcing potential exchange land would be less problematic (whilst also avoiding public open space severance). Option K2 would also be less visible to residential receptors than option K1, thus requiring less landscape mitigation. The presented junction layout with option K2 would potentially perform slightly worse than the presented junction layout with option K1 in terms of (unmitigated) effects upon geology and soils, materials and water resources due to option K2 being located over an area of former landfilling. However, with adherence to standard construction practices and appropriate design, adverse residual effects could be readily reduced to non-significant levels (such that residual effects would be similar to those that would be experienced with the presented junction layout with option K1). Option K2 would avoid the significant traffic noise level increases along Greenwich Drive South (as associated with the presented junction layout with option K1). However, option K2 would transfer the moderate/large adverse noise effect identified for the presented junction layout with option K1 from Greenwich Drive South onto Kingsway Park Close. The consultee J option would potentially perform worse than the presented junction layout with option K1 in terms of effects upon air quality and noise along a section of the A5111 which would be used as a diversion, and along any minor local roads used by traffic avoiding the congestion at the Kingsway retail park roundabout.	Based upon the results of the costs estimates, engineering, environmental and traffic and economics assessments, option K2 was identified as being preferred as it performs better in terms of engineering and traffic and economics, whilst it reduces long-term impacts upon an area of public open space, and reduces traffic severance issues along Greenwich Drive South. The consultee J option performed worst in each of these categories. Based on the assessment of the options, it was recommended that option K2 was progressed with the presented junction layout as the preferred option for grade separation of Kingsway junction. Option K2 has thus been integrated into the proposed scheme design as illustrated in appendix 1 (figures 1.1, 1.2 and 1.3).
Presented Junction layout option K2 (see appendix 2)	This option is based upon the preferred option as presented at the 2015 public exhibitions, but with local access option K2. This option would provide local access for residents in the Mackworth area, but via a link road to the east of the proposed Kingsway junction (link to Kingsway Park Close). The proposed link would pass at-grade behind the existing Kingsway Retail Park and in cutting across a historic landfill site and dismantled railway.		
Consultee J option with option K1 (see appendix 2)	This option is a variant of the presented Junction Layout, but replaces the east roundabout, originally accommodating A38 southbound and Kingsway traffic movement, with a merge and a diverge slip road from and to the A38 southbound. This option has been amended to accommodate the K1 local access route. Due to the removal of the roundabout located to the east, it was not possible to accommodate the option with K2.		

5.3 A38/A52 Markeaton junction alternative options

Road based study (2002) options

5.3.1 Four options for grade separation emerged from the road based study (RBS):

- Option 1 was for the A38 to pass beneath the junction in an underpass. There would be a single bridge carrying the A52 over the A38 with slip road providing all turning movements between the A38 and A52. The slip roads would join the A52 at signalised junctions. Additional land required to accommodate the underpass and slip roads would be on the east side of the A38 to avoid impacts on Markeaton Park and the petrol filling station and fast food restaurant on the west side of the junction. This would adversely affect 16 detached houses on Queensway, 2 semi-detached houses on Ashbourne Road and would require land from the Kingsway Army Reserves centre.
- Option 2 is similar to option 1 except that the additional land required to accommodate the underpass and slip roads would be on the west side of the A38 to avoid impacts on the houses on Queensway and Ashbourne Road. Land would be taken from Markeaton Park, the petrol filling station and fast food restaurant on the west side of the junction.
- Option 3 is similar to option 1 but with the A38 being on embankment over the junction as opposed to being in an underpass.
- Option 4 is similar to option 2 but with the A38 being on embankment over the junction as opposed to being in an underpass.

5.3.2 The RBS concluded that option 1 was the preferred option. The primary reason being that an underpass solution was considered preferable to an embankment and flyover as it would be less visually obtrusive in the urban and parkland setting. It was also considered preferable to reduce the impact on the Markeaton Park and petrol filling station and fast food restaurant (McDonald's) at the expense of increased impact on the residential properties on Queensway.

Design development (2002 – 2008)

5.3.3 Traffic modelling of the RBS preferred option highlighted operational issues in that the signalised single bridge junction could not effectively accommodate the forecast traffic flows. This led to the layout becoming amended such that the A38 passed through the junction at low level with a roundabout on the A52 above. It was considered that this would offer traffic management, construction and operational benefits. This alternative became known as option M6.

5.3.4 As part of the development of this option, consideration was given to revisions required to increase the speed limit from 40mph to 50mph through Kingsway and Markeaton junctions. A major issue is the distance between the Markeaton and Kedleston Road junctions where there is insufficient weaving length for a higher design speed. An option to remove the need for weaving by closing the existing A38 slip roads at Kedleston Road and providing link roads for local traffic between Kedleston Road and Markeaton junction was investigated as a possible solution. This alternative was assessed and the results can be summarised as:

- The proposed layout of the link roads option would be capable of operating satisfactorily up to the design year with the projected traffic flows.

- Although no additional properties would be required to be purchased for this option, an additional 2.5ha of public open space (POS) would be required at the Markeaton Park area, and therefore an equivalent (or greater) additional area of POS exchange land would be required.
- The link roads option would result in some increased adverse environmental impacts, which are all related to the effect on the Markeaton Park area.

5.3.5 Although the link roads option had the potential to deliver the scheme requirements, it had a major disadvantage in the need for an additional POS exchange land due to the encroachment into Markeaton Park. It may be very difficult to find sufficient suitable exchange land in an acceptable location. In addition this encroachment is likely to generate strong opposition to the scheme from the general public and stakeholders due to impacts on Markeaton Park. It was considered that the other options should be considered further as these would be likely to provide better value for money and would avoid encroachment into Markeaton Park.

5.3.6 The layout was then further developed as follows:

- A38 realigned slightly further to the east
- Vertical alignment steepened from 5% to 8% resulting in shorter slip roads and less retaining walls to reduce cost
- Speed limit increased from 40mph to 50mph through and to each side of the junction, terminating just north of the Kedleston Road slip roads
- Partly signalised roundabout replaced signalised A52/slip road junctions
- An additional lane for weaving between the Kingsway and Markeaton junctions and between the Markeaton and Kedleston Road junctions, northbound and southbound
- Third traffic lane southbound and third maintenance lane northbound through Markeaton junction
- Parallel southbound merge in place of taper merge
- Two properties on Ashbourne Road require demolition, in addition to those on Queensway
- Land required from 2 further properties on Ashbourne Road and 2 on Sutton Close for access to properties

5.3.7 In addition, engineering design was developed in much greater detail, sufficient to determine land required and provide a more robust cost estimate.

5.3.8 15 detached and 2 semi-detached residential properties would need to be purchased and demolished and the existing access to Sutton Close off Ashbourne Road closed and a revised access provided, which would require purchase of land from 4 further residential properties.

5.3.9 This was identified as the preferred option to be entered into the roads programme when the scheme was put on hold in 2008.

Developments up to 2015 public consultation

5.3.10 Work recommenced on the scheme in 2014 and a public consultation exhibition was held early in 2015. Design work prior to consultation focussed on re-affirming that the design option could accommodate the forecast traffic flows for the new design year. It

was the arrangement described above that was presented to the public at the consultation (referred to as the 'presented option' hereafter).

5.3.11 Overall 67% of consultation respondents agreed with the presented option.

5.3.12 The public were also asked whether the existing footbridge at Markeaton Park should be replaced with a new bridge or not; as the existing bridge would require demolition under the scheme proposals to accommodate the widened carriageway.

5.3.13 As a result of the consultation process, and discussions with Derby City Council, it was concluded that the footbridge should be replaced with a new one.

Alternative options emerging after the 2015 public consultation

5.3.14 Although some alternative options were received for Markeaton junction (e.g. tunnel from south of Kingsway junction to the north of Markeaton junction; new trunk road from A38/A50 Toyota junction to north of Little Eaton junction), none of these options passed the initial sifting process (as described in paragraphs 5.2.13 – 5.2.15) and were thus excluded from further assessment due to technical, cost or environmental reasons.

Design development post-2015 public consultation

5.3.15 Following the completion of the 2015 public consultation, further design work was undertaken to focus on specific aspects of the junction to ensure the option was feasible and deliverable. These included:

- Reviewing the layout of the roundabout with a view to it operating under traffic signal control. This was identified as a necessary measure to accommodate the latest design traffic flows and to accommodate controlled pedestrian crossings on all arms of the roundabout
- Examining the operation of the short weaving length between Markeaton junction and Kedleston Road
- Developing the outline design for facilities for non-motorised users based upon feedback received during the consultation
- Developing designs for maintaining access to Markeaton Park and the McDonalds/petrol filling station site
- Conducting environmental surveys and assessments to quantify the adverse impacts and positive benefits of the scheme; and to inform the design of mitigation measures

5.4 A38/A61 Little Eaton junction

Road based study (2002) options

5.4.1 Two options for grade separation emerged from the road based study (RBS):

- Option 1 would entail the A38 passing on embankment to the north of the existing Little Eaton junction. This option would result in the loss of the mobile home park, Starbucks and the property 'Fourways' as well as having an adverse impact on the garden centre car park.
- Option 2 was similar to option 1 but the alignment of the A38 was moved further to the north so as to reduce the impact on the mobile homes but at the expense of increasing the impact on the garden centre.

5.4.2 At the time of the RBS, these options were based on a 40mph speed limit being imposed (70kph design speed). Option 2 emerged as the preferred option from the road based study.

Design development (2002 – 2008)

5.4.3 During the review of the RBS options for the Little Eaton junction, a number of operational and design limitations were identified. Option 2, which had emerged as the preferred option, was designed for an operational speed limit of 40mph, whereas it was agreed with the Highways Agency (as Highways England was known at the time) that the speed limit used in the design should be increased to 60mph for safety reasons (this junction being at the end of a long section of high speed rural dual carriageway from the M1 junction 28 to the north). It was envisaged that motorists would not expect a large reduction in speed at this semi-rural location. Also, the layout did not include any over-widening for visibility and the radius of the loop connecting the north roundabout to the A38 northbound carriageway was too small and hence the connecting gradient was too steep to comply with current standards.

5.4.4 As a consequence, the impact of the RBS preferred option on the garden centre, the mobile home park, the Little Chef (now Starbucks) and the property "Fourways" was underestimated. Further preliminary studies of the options were undertaken to establish the potential impact when designed to current standards and to consider the impact of a further option to the south of the existing roundabout which would avoid the garden centre, the mobile home park, Starbucks and "Fourways".

5.4.5 A supplementary public consultation was carried out in 2003 to seek the public's views on these options.

5.4.6 The options presented at the supplementary consultation were:

- Option 7 - As the road based study option 2 (the RBS preferred option), but to a design speed of 100kph (a 60mph speed limit was envisaged). The objective was to minimise the impact on "Fourways", the mobile home park and the garden centre. This was presented at the exhibition as option 2.
- Option 8 - A completely new option to the south of the existing at grade roundabout to a design speed of 100kph – this included a dumbbell arrangement with the A61 being on embankment over a link for the A61/B6179. The objective was to eliminate any impact on "Fourways", the mobile home park and the garden centre.
- Option 9 - As the road based study option 1, but to a design speed of 100kph. The objective was to minimise the impact on the garden centre. This was presented at the exhibition as option 1.
- During the development of option 8, a variation, option 8(a), was identified for consideration. This was a variation of option 8 whereby the A38 alignment was moved closer to the existing alignment – this had a single roundabout and 2 bridges in place of the dumbbell roundabout of option 8. The objective was to eliminate any impact on "Fourways", the mobile home park and the garden centre, whilst keeping the alignment as far as possible from the village of Breadsall to the southeast. This was presented at the exhibition as option 3.

5.4.7 In response to the consultation, a single issue petition was also received from Breadsall Parish Council and the Local MP for Amber Valley/Mid Derbyshire wrote on behalf of 30 residents of Breadsall. The petition was signed by 343 people, of which 283 were identified as residing in Breadsall. This petition objected to option 8a (identified in the consultation materials as option 3), the closest to Breadsall, without stating any preference for any of the other options.

5.4.8 66% of the other respondents were in favour of option 8a, 17% in favour of option 7 (identified in the consultation materials as option 2) and 2% in favour of option 9 (identified in the consultation materials as option 1). 84% of the respondents resided in Allestree, Breadsall or Little Eaton, which were the residential areas closest to the proposed junction improvement.

5.4.9 From a comparison of these options, options 7 and 8 were eliminated as they were less preferable than options 9 and 8(a) respectively in terms of engineering, traffic and economics. The decision was then whether to recommend option 8(a) to the south and east of the existing A38 or option 9 to the north.

5.4.10 The key issue identified was how to subjectively balance the environmental impact of option 8(a) with the impact of option 9 on the garden centre, “Fourways”, the Little Chef (now Starbucks) and particularly the residents of the mobile home park. A meeting with statutory consultees, confirmed this was the key issue, particularly the impact on the residents. Opinion was divided with the Local Authorities supporting option 8(a) and the Environment Agency, English Nature and English Heritage seeking the least impact but without making a choice of preferred option, and hence no clear preference was established.

5.4.11 The residents of the mobile home park would be unaffected by option 8(a) but would need to be re-housed if option 9 were selected. They form a community that would be lost if they were re-housed and may suffer distress if relocated against their wishes.

5.4.12 From the supplementary public consultation in 2003, the public identified that reducing the impact on the local residents and commercial premises was their major concern. In this respect, the impact of option 8(a) is considerably less than that of option 9.

5.4.13 There was very little to differentiate between options 8(a) and 9, both having advantages and disadvantages. However, it was felt on balance that option 8(a) was preferable to option 9, because, whilst the environmental impacts of option 8(a) could be largely mitigated, the impacts of option 9, particularly on the residents of the mobile home park, could not.

Options 8(a) and 8(b)

5.4.14 After the supplementary public consultation, the Highways Agency carried out a cost challenge workshop in August 2004 with the aim of identifying measures that could reduce the scheme cost whilst remaining within the brief for grade separation of all 3 Derby junctions. From this it emerged that reducing the design speed of the A38 at Little Eaton from 100kph to 85kph (by introducing a mandatory 50mph speed limit) would allow considerable environmental benefits and cost savings to be made at the Little Eaton junction. The lower design speed would lead to shorter forward visibility requirements, thereby reducing verge and central reserve widths, also, the tighter curves would allow the alignment to be closer to the existing A38 with reduced land take and associated impacts. This revised option became option 8(b).

5.4.15 Option 8(b) offered considerable savings in construction cost, and has benefits over option 8(a) in engineering terms, principally as it does not affect the River Derwent bridge or the water treatment works access bridge and requires less compensatory flood storage area. The traffic and economic benefits would be slightly reduced for option 8(b) but it still represented good value for money. The main disadvantage of option 8(b) over option 8(a) is that option 8(b) requires the closure of Ford Lane (to/from Allestree) on safety grounds.

5.4.16 Option 8(b) was identified as the preferred option to be entered into the roads programme.

5.4.17 No announcement was made on the preferred option emerging from the supplementary public consultation at Little Eaton before the scheme was put on hold in 2008.

Developments up to 2015 public consultation

5.4.18 Work recommenced on the scheme in 2014 and a public consultation exhibition was held early in 2015. Design work prior to consultation focussed on re-affirming that the design option could accommodate the forecast traffic flows for the new design year. option 8(b) was presented to the public at the consultation (referred to as the 'presented option' hereafter). A layout of this option is included in appendix 1 (figure 1.3).

5.4.19 The public were also asked whether a new link should be provided to replace the junction of Ford Lane with the A38 that would be closed under the proposals. The options proposed were:

- **Option L1:** This option would close the Ford Lane access onto the new A38, with no alternative link road being provided.
- **Option L2:** This option would also close Ford Lane, but a new link road would run to the north and parallel to the A38, crossing the railway and the River Derwent flood plain at grade and on embankment to join the B6179. The link road would be one-way to prevent it being used as a rat-run between the A38 and A6. It would entail construction of a new embankment within the Derwent Valley Mills World Heritage Site and within the River Derwent floodplain – with consequent adverse effects upon cultural heritage, landscape, ecology and flood risks.

5.4.20 Following the public consultation, the public responded marginally in favour of the new link being provided. However, considering the cost and small benefit of this link, it was felt that the outcome was not sufficiently conclusive to warrant the additional expenditure and environmental impacts. The additional link between Ford lane and the B6179 was removed from the scheme proposals.

Alternative options emerging after the 2015 public consultation

5.4.21 Following the public consultation exercise in early 2015, several alternative solutions or variations were put forward by members of the public. All of the alternatives received were subject to a two-stage assessment process, comprising the following:

- An initial sifting assessment
- Options passing initial sifting were then subject to the more detailed qualitative assessment

5.4.22 The assessment process is described in paragraphs 5.2.13 – 5.2.15. The outcomes of the assessment are described in more detail in the Report on Public Consultation (available on Highways England's A38 scheme website)

5.4.23 Table 5/2 presents the options for Little Eaton junction that passed the initial sift (see sections 5.2.13 to 5.2.15 for further details of the initial sift exercise) and which were subsequently subjected to further assessment. This further assessment entailed the analysis of the following:

- Costs estimates
- Engineering assessment (including constraints; structures; design standards; geometry; public utilities; non-motorised users; drainage; geotechnics; construction phasing and programme)
- Environmental assessment (including the qualitative consideration of air quality; archaeology and cultural heritage; landscape and visual impacts; nature conservation; geology and soils; materials; noise and vibration; effects on all travellers; community and private assets; and road drainage and the water environment (including flood risk))
- Traffic and economics assessment

5.4.24 An overview of the assessment findings for the following alternative options at Little Eaton junction is provided in Table 5/2

- Option 2 (as presented at the 2003 supplementary public exhibition)
- The presented option (modified option 3 at the 2003 supplementary public exhibition) – see appendix 1 (Figure 1.3).
- Option 3A (proposed by Breadsall Parish Council)
- Southern sweep

5.4.25 The latter 2 options were provided by members of the public who had a specific interest in the impacts of the scheme on Breadsall village; they are essentially variants on the presented option but with the alignment more closely following the existing A38 (so introducing construction challenges) in an effort to move it further away from the village. There were also other respondents who considered option 2 should still be offered as an option as the 2003 consultation was never formally concluded. For layouts of all 4 options refer to appendix 4.

5.4.26 Following the public consultation and the subsequent alternative options assessment, the presented option emerged as the preferred option.

5.4.27 Details of the assessments are summarised in appendix 3.

Post-consultation alternative options

5.4.28 Having been made aware at local reference group meetings, the residents of Breadsall, represented by the Breadsall Action Group (which is supported by Breadsall Parish Council), were not content with the conclusions of the alternative options assessment report. Their preference, as illustrated by the southern sweep alternative option, was to find a solution that performed as well as the presented option but also reduced their perceived impacts to Breadsall village.

5.4.29 To facilitate dialogue with the action group and other interested parties, a reference group was set up for the Little Eaton junction. Through the reference group, the following further alternative options were received:

- Option 2A received from the Breadsall A38 Action Group. This is a development of option 2 as presented at both the 2003 supplementary consultation and the 2015 consultation where the northbound slip roads are re-configured and the southbound slip roads reuse the existing A38 carriageway;

- Option 2B received from the Breadsall A38 Action Group. This was a variation of option 2A whereby the A38 southbound slip roads are adjacent to the main carriageway to form a conventional two-bridge grade-separated layout with a single roundabout. The existing roundabout and slip roads would be removed and landscaped;
- Option X received from Little Eaton Parish Council. This option was developed with the intention of retaining the existing A38 in order to balance the alignment between Little Eaton and Breadsall. The option retains the A38 on its existing horizontal and vertical alignment, diverts the B6179 to the north of the garden centre to pass under the A38 to a new roundabout on the A61; and
- Option X1 received from the Breadsall Action Group in response to Little Eaton's "option X". It replaces the long looping links of option X (needed to connect the A61 and B6179 to the A61 via a bridge under the A38 north of the garden centre) with an overbridge for the A61 thereby providing a more direct route. The notes submitted by the Action Group state the design intention as "retaining the A38 at grade, while reducing the lengthy circulation routes".

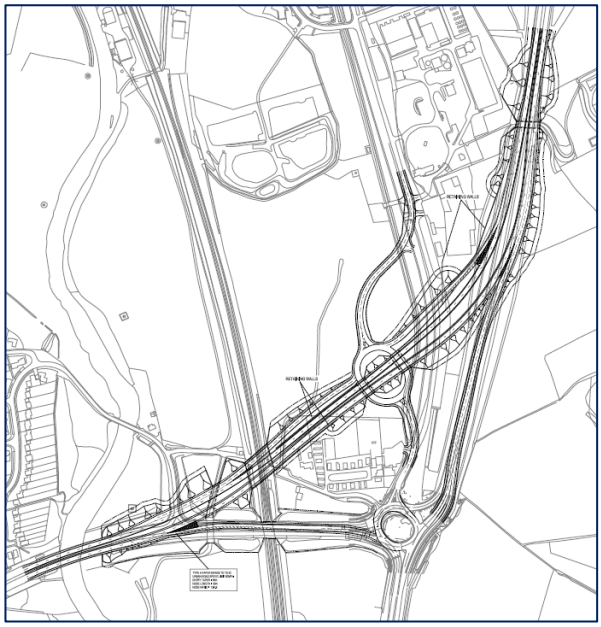
5.4.30 In assessing these post-consultation alternative options, opportunities to address deficiencies in the options or refine the proposals further while retaining the overall intention of the original proposer were identified. This led to the following additional variants being developed and assessed:

- Development of option 2A with a re-designed southbound entry slip road to address a safety issue;
- Development of option 2A using a dumbbell roundabout arrangement such that only a single underbridge is needed to the A38.

5.4.31 To inform the assessment of the options, engineering plans or design sketches were developed for each of these options. This ensured the layouts complied with design standards as appropriate and the land impacts were fully understood. The layouts are shown in Figure 5/1.

Figure 5/1: Layouts of the alternative options received in 2016 in relation to A38/A61 Little Eaton junction

Option 2A

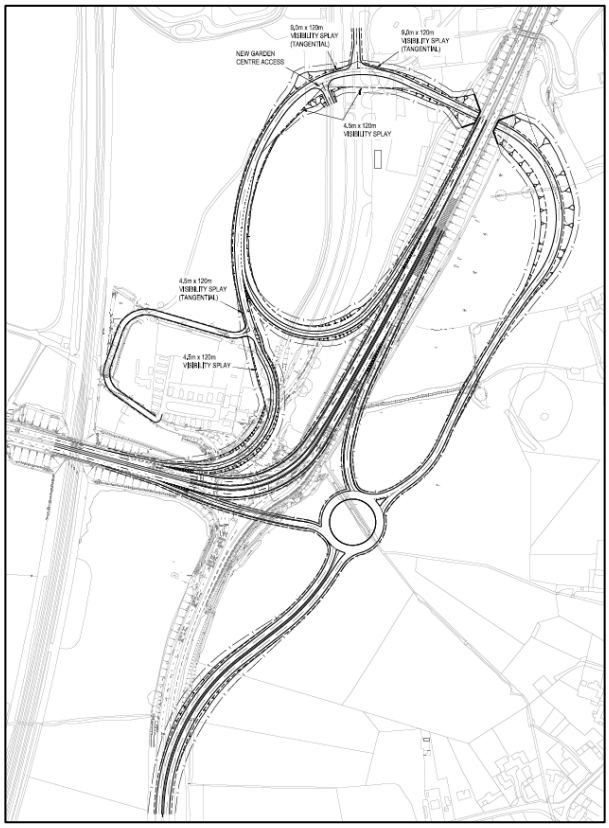


Option 2B

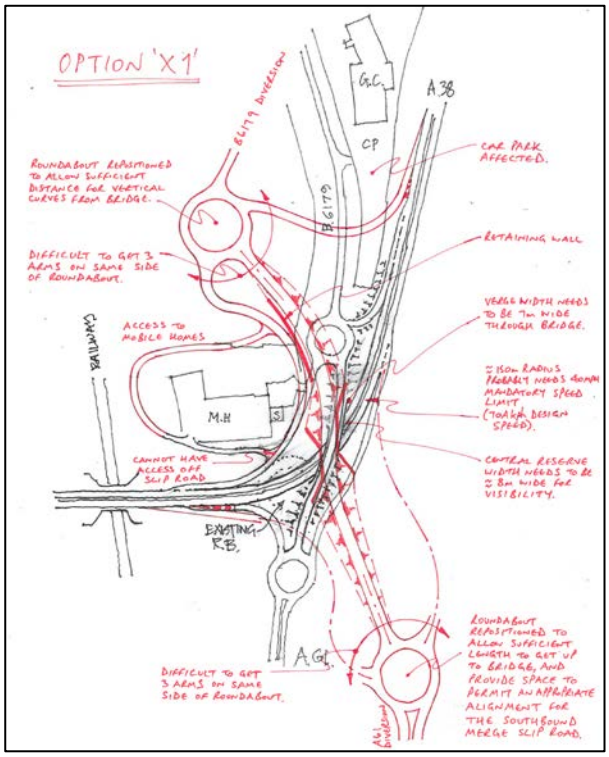
Option 2A - variant with re-designed southbound entry slip road

Option 2A - variant with single overbridge

Option X



Option X1



5.4.32 These alternative options were subjected to the initial sifting assessment as described in paragraphs 5.2.13 – 5.2.15. The results of the assessment indicated that none of these options passed initial sifting as they would not perform satisfactorily in terms of supporting the achievement of the defined scheme objectives, whilst they presented a number of technical and planning challenges affecting the option feasibility.

5.4.33 The action group's aim in developing options 2A and 2B was to provide a route which was further from Breadsall but without excessive impacts on the communities around Little Eaton. The options also had the effect of enabling the scheme to provide a higher design speed due to the improved alignment.

5.4.34 However, options 2A and 2B would require the purchase of 3rd party land in order to mitigate for the loss of parking for the garden centre. As this additional land is not an integral part of the main scheme, its purchase is not possible under Highways England's powers for compulsory purchase set out in the Planning Act 2008. The powers do not allow the compulsorily acquisition of land for the purpose of providing replacement facilities for a local landowner/business and the use of compulsory acquisition powers for this purpose would be considered an abuse of Highways England's powers and as such, would be indefensible if challenged.

5.4.35 An alternative option to purchasing land to mitigate the garden centre's car parking loss would be the purchase of the garden centre completely. This would result in an arrangement previously considered as option 7 (identified in the 2003 consultation as option 2) and discounted.

5.4.36 The main principle of options X and X1 was to maintain the A38 as close as possible on its existing alignment both horizontally and vertically. Option X had long link roads connecting a roundabout on the A61 to the south of the junction to the B6179 and slip roads with the northbound A38 on the north side of the junction. Option X1 replaced the long links with a more conventional 'dumbbell' type arrangement to allow all turning movements at the junction. The link between the dumbbell roundabouts was a bridge over the A38. A number of changes were required to the submitted sketch including relocating the roundabouts to ensure there was adequate distance for the road to get from the bridge level down to ground level.

5.4.37 Consequently, as they didn't pass the initial sift, these post-consultation alternative options were not subjected to further assessment. The preferred option remained option 8(b) (identified at the 2003 consultation as option 3, and presented in the 2015 consultation).

5.4.38 At the reference group meeting held on 18 May 2016, the outcome of the assessment of options 2A and 2B was discussed. This was confirmed by letter to the action group on 20 May 2016. The outcomes of assessing options X and X1 were subsequently confirmed to the reference group on 10 June 2016 and 8 July 2016 respectively.

5.4.39 In 2017 HE revisited the original Little Eaton options to try to mitigate the perceived impacts on Breadsall village. It had been concluded that the presented option has a perceived adverse impact on the residents of Breadsall village so a further option should be considered to try to reduce this impact.

5.4.40 In developing this option, the removal of the mobile home park and other buildings as a design constraint should be considered. This resulted in option 2C being developed. At the time option 2C was assessed, the scheme assessment report had already been produced concluding the presented options for each junction represented the best solution; therefore, option 2C was assessed against the presented option only.

5.4.41 The layout of option 2C is included in appendix 5.

5.4.42 For a summary of the assessment of option 2C against the presented option, see sections 9.6.8 – 9.6.12 and appendix 6.

5.5 Preferred scheme

5.5.1 The various alternative options assessments resulted in a preferred option for each junction. These preferred options were subject to a more detailed assessment which is included in section 9 and appendix 3 of this report.

Table 5/2 Summary of qualitative alternative options assessment for Little Eaton junction

Options	Key Elements of option	Summary of Qualitative Environmental Appraisal	Assessment Outcomes
Little Eaton Junction			
Presented option (see Appendix 4)	This solution would provide full grade separation (two level) of the junction, with the A38 realigned to the south of the existing roundabout. This option would avoid any impact on "Fourways", Ford Farm Mobile Home Park, Starbucks and the garden centre. However, the resulting alignment means that it lies to the south and east of the current dual carriageway and as a consequence is closer to the village of Breadsall to the east but further from Allestree to the west.	The qualitative environmental assessment indicated that option 3A and the southern sweep option offer the potential to reduce environmental and community effects as compared to the presented option due to reduced permanent land take requirements, as well as marginally reduce noise effects upon Breadsall village. However, option 3A and the southern sweep option would perform slightly worse than the presented option in terms of effects upon travellers due to an extended construction programme. Option 3A also performs worse due to the need for travellers from the B6179 (Alfreton Rd) to use the A61 roundabout to access the A38 southbound carriageway. Both option 3A and the southern sweep would require a temporary diversion route during the construction phase (covering an area of approximately 0.7ha). Construction and use of the temporary diversion route would exacerbate land take effects and construction phase effects. Although the diversion route would only be required for the duration of the construction works, and not post-construction, the effects on land use and nature conservation would be longer lasting. This includes the loss of some of the existing tree plantation between the western edge of Breadsall village and the A38. The environmental assessment indicated that the potential environmental effects of the presented option and the southern sweep are closely matched and the differences in the assessments were marginal. The potential environmental effects of options 2 and 2C would be higher as compared to the presented option, with elevated effects in terms of cultural heritage, landscape, nature conservation, geology and soils, materials, community and private assets, water resources and flood risk.	The assessment considered the various Little Eaton junction options in terms of cost estimates, engineering, environmental and traffic/economic considerations. Each of the options were compared to the presented option. This comparison indicated that whilst the presented option may not rank highest in each category or sub-category, in overall terms, the presented option performed the best. However, there were areas where the presented option would have a potentially greater impact than the alternative options and thus detailed mitigation strategies should be developed for each of these aspects in conjunction with key stakeholders. Based on the assessment of the options and bearing in mind the limitations of the study as described in the report, it is recommended that the presented option is progressed as the preferred option for grade separation of Little Eaton junction. In order to minimise the impact of the presented option, particularly in terms of design geometry, noise, permanent land use, nature conservation and flood risk, it is important that appropriate mitigation measures are considered as part of the ongoing scheme assessment and incorporated into the final designs.
Option 2 (see Appendix 4)	This solution would provide full grade separation (two level) of this junction with the A38 realigned along a sinuous horizontal alignment to minimise the impact on "Fourways", the mobile home park, Starbucks, and the garden centre. Extensive widening would be required both in the central reserve and the northbound verge to provide the minimum desirable stopping sight distance.		
Option 3A (see Appendix 4)	This solution would provide full grade separation (two level) of the junction, with the A38 following the existing alignment as closely as possible, but still maintaining the horizontal alignment standards that have been adopted for the presented option.		
Southern sweep (see Appendix 4)	This solution would provide full grade separation (two level) of the junction. It is a variant of option 3A above with the A38 following the existing alignment through the centre of the existing roundabout; this results in it swinging away south of its current alignment to cross the railway then swinging back before crossing the River Derwent.		
Option 2C (see Appendix 5)	This solution would provide full grade separation (two level) of this junction with the A38 realigned along a smooth horizontal alignment permitting national speed limit to be applied without an advisory speed limit. This would require acquisition of "Fourways", the majority of the mobile home park and a large part of the garden centre's car park. Extensive widening would be required both in the central reserve and the northbound verge to provide the minimum desirable stopping sight distance.		

6 SUMMARY OF ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL DESIGN

6.1 Introduction

6.1.1 This chapter initially summarises the environmental baseline conditions in the vicinity of the proposed scheme, followed by a summary of the environmental inputs to the selection of the proposed scheme. Thereafter, a summary of the potential environmental effects associated with proposed scheme construction and operation are detailed. These take into account impact avoidance measures embedded into the proposed scheme design, and standard management activities that would be adopted.

6.2 Assessment of environmental effects

6.2.1 Following the option assessment process as detailed in chapter 5 and confirmation of the proposed scheme design, an Environmental Assessment Report (EAR) was prepared following all relevant guidance documents.

6.2.2 The sections below provide a summary of the main EAR findings across the following topics which were scoped into the environmental assessment, namely:

- Air quality;
- Cultural heritage;
- Landscape and visual impacts;
- Nature conservation;
- Geology and soils
- Materials;
- Noise and vibration;
- People and communities;
- Road drainage and the water environment; and
- Cumulative impacts.

6.2.3 The assessment of environmental effects reported in the EAR took into account impact avoidance measures embedded into the proposed scheme design, and standard management activities that would be adopted.

6.3 Summary of key environmental issues

6.3.1 Table 6/1 provides a summary of identified key significant environmental effects as defined above as identified within the EAR, highlighting those effects that have been assessed as being moderate or major/large (includes both beneficial and adverse effects).

Table 6/1: Summary of environmental effects assessed as moderate or major/large (adverse and beneficial)

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
Air quality				
No air quality effects assessed as being of moderate or major/large (identified air quality effects assessed as being not significant).				
Cultural heritage				
No cultural heritage effects assessed as being of moderate or major/large (all identified effects assessed as being neutral or slight adverse				
Landscape and visual Landscape, effects defined as moderate or major are identified below – all other identified effects assessed as negligible or minor adverse				
Construction	Visual effect of construction activity (including movement and noise) on Viewpoint 18 (NR54 within Greenwich Drive South open space adjacent to Kingsway junction)	Best practice construction methods	N/A	Major adverse (temporary)
Operation	Visual effect of operational scheme on Viewpoint 18 (Year 1 and Year 15)	Landscape planting and appropriate on-going landscape maintenance	N/A (maturation of landscape planting reduces effect with time)	Major adverse at year 1, reducing to moderate adverse by year 15
Construction	Visual effect of construction activity (including movement and noise) on Viewpoint 6 (Derwent Valley Heritage Way at Breadsall footpath 7 near Little Eaton junction)	Best practice construction methods	N/A	Moderate adverse (temporary)
Operation	Visual effect of operational scheme on viewpoint 6 (Year 1)	Landscape planting and appropriate on-going landscape maintenance	N/A (maturation of landscape planting reduces effect with time)	Major adverse, reducing to minor adverse by year 15
Operation	Visual effect of operational scheme on viewpoint 4 (Year 1) (Breadsall footpath 2 near Little Eaton junction)	Landscape planting and appropriate on-going landscape maintenance	N/A (maturation of landscape planting reduces effect with time)	Moderate adverse (summer), minor adverse – winter year 1; reducing to minor adverse (summer), negligible adverse (winter) by year 15
Nature conservation Nature conservation, effects defined as moderate or large are identified below – all other identified effects assessed as neutral or slight negative/positive				

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
Construction	Habitat loss at A38 Kingsway roundabout local wildlife site (LWS)	Appropriate environmental design and management	Opportunities would be explored for the translocation of grassland habitats to off-site receptor areas, potentially located adjacent to the proposed scheme at Mackworth Park, and associated habitat enhancements.	Moderate significant negative effect at the county/unitary authority level
Construction	Habitat loss at Alfreton Road grassland LWS	Appropriate environmental design and management	Opportunities would be explored for the translocation of grassland habitats to off-site receptor areas, potentially located adjacent to the proposed scheme at Mackworth Park, and associated habitat enhancements.	Moderate significant negative effect at the county/unitary authority level
Construction and operation	Habitat loss of semi-natural broadleaved woodland	Appropriate environmental design and management	Opportunities for the creation of semi-natural broadleaved woodland within and adjacent to the proposed scheme would be pursued. Opportunities for the enhancement of woodland habitats adjacent to the proposed scheme would also be explored with the aim of enhancing connectivity. More woodland would be planted than lost, and enhancement through the provision of other features e.g. dead wood piles and understorey planting with native herb species would ensure replacement woodland is of higher quality than that lost.	Moderate significant negative effect at the county/unitary authority level, in the short to medium term[1], changing to slight significant positive effect in the long-term at the local level[2] once replacement planting has established.
Construction and operation	Loss of habitats of value to foraging and commuting bats	Appropriate environmental design and management	To compensate for habitat losses, provision would be made for the creation and enhancement of habitats of value to foraging and commuting bats at both on- and off-site mitigation areas associated with the proposed scheme of equivalent size and value to foraging bats. Linear habitat features including hedgerows would also be incorporated into the landscape design to enhance ecological connectivity within and across the proposed scheme, and into the wider landscape. Opportunities for further reducing construction impacts on foraging and commuting bats through the provision of advance planting and the phasing of vegetation clearance would also be explored.	Moderate significant negative effect at up to the county/unitary authority level in the short term[3], changing to a slight positive significant effect in the medium to long term at the Local level[4] once replacement planting has established.

1 'Short-term' in regards to woodland is considered to be in the region of 5 to 10 years; 'medium-term' 10 to15 years; and 'long-term' >15 years.

2 The positive significant effect is not considered to be at the same level the resource is valued at i.e. the effect is considered to be more significant at a Local rather than County/Unitary Authority level, given the time for habitat to establish.

3 'Short-term' in regards to bats is considered to be in the region of 1 to 2 years; 'medium-term' 2 to 5 years; and 'long-term' > 5 years

4 The positive significant effect is not considered to be at the same level the resource is valued at i.e. the effect is considered to be more significant at a Local rather than County/Unitary Authority level, given the time for habitat to establish.

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
			Monitoring of bat crossing points would be undertaken during and post-construction to ensure mitigation measures are adequate and effective.	
Construction and operation	An assemblage of terrestrial invertebrates, including notable species recorded at various locations within the extent of the proposed scheme – loss of habitat	Appropriate environmental design and management	Habitat creation to compensate for that lost at least on a 1:1 ratio. Opportunities for enhancing habitat e.g. road side verges; varied topography and log piles. Felled trees would be retained on site as whole boughs and trunks which would benefit invertebrates. Plant species would be beneficial for notable species. Potential translocation of grassland habitat to off-site mitigation areas from the A38 Roundabout LWS at Kingsway may also be beneficial for invertebrate species.	Moderate significant negative effect at up to county/unitary authority level in the short term[5], changing to a slight significant positive effect at the Local level[6] in the medium to long term once replacement planting has established.
Construction and operation	Foraging and commuting bats - a breeding population of whiskered bats in the vicinity of Little Eaton junction. Effects due to killing/injury through collision with motor vehicles.	Appropriate environmental design and management	Planting of linear features and other habitats to compensate for that lost. Careful design of landscaping to encourage bats towards the flood arch underpass would assist in minimising impacts.	Large significant negative effect in the short-term[7] at up to the regional level; reducing to no significant (neutral) effect in the medium to long term once planting has established.
Construction and operation	Foraging and commuting bats - populations of common species (common pipistrelle; soprano pipistrelle) at various locations including at the River Derwent, Markeaton Park and Earl of Harington Lake. Effects due to killing/injury through collision with motor vehicles.	Appropriate environmental design and management	Planting, including linear features across the proposed scheme, would be undertaken to compensate for that lost. Dense and interspersed planting to facilitate bats continuing to use the flyway across the A38 at Markeaton would be incorporated into the landscape design.	Moderate significant negative effect in the short term[8] at up to the county/unitary authority level; reducing to not significant (neutral) in the medium to long term once planting has established.
Geology and soils				
Geology and Soils, no effects assessed as being of moderate or major/large (all identified effects identified assessed as being negligible to minor adverse				

5 'Short-term' in regards to terrestrial invertebrates is considered to be in the region of 1 to 2 years; 'medium-term' 2 to 5 years; and 'long-term' > 5 years

6 The positive significant effect is not considered to be at the same level the resource is valued at i.e. the effect is considered to be more significant at a Local rather than County/Unitary Authority level, given the time for habitat to establish.

7 Short-term' in regards to bats is considered to be in the region of 1 to 2 years; 'medium-term' 2 to 5 years; and 'long-term' > 5 years

8 Short-term' in regards to bats is considered to be in the region of 1 to 2 years; 'medium-term' 2 to 5 years; and 'long-term' > 5 years

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
Materials				
Materials, no effects assessed as being of moderate or major/large (all identified effects identified assessed as being not significant				
Noise and vibration Noise and Vibration, effects defined as moderate or large (adverse and beneficial) are identified below – all other identified effects assessed as slight adverse/beneficial				
Construction noise	Construction noise effects upon residential properties, educational and medical facilities of high sensitivity	Best practice mitigation measures	The need for specific mitigation measures to be defined during the DCO environmental assessment with advice from construction contractor – such measures have the aim of reducing the significance of potential effects.	Potential for large adverse (temporary) – may be reduced with additional mitigation
Construction vibration - annoyance	Construction vibration effects upon residential properties, educational and medical facilities of high sensitivity	Best practice mitigation measures	The need for specific mitigation measures to be defined during the DCO environmental assessment with advice from construction contractor – such measures have the aim of reducing the significance of potential effects.	Potential for moderate adverse (temporary) – may be reduced with additional mitigation
Operational road traffic noise inside the detailed noise prediction study area	Operation noise effects upon residential properties, educational and medical facilities of high sensitivity – includes the Royal School for the Deaf located east of Markeaton junction	Use of low noise surfacing across the proposed scheme. Proposed scheme design would place A38 mainline at Kingsway junction and Markeaton junction within deep cuttings	Areas of potential additional mitigation identified - to be confirmed during DCO environmental assessment. Includes noise barriers to shield specific sensitive receptors such as the Royal School for the Deaf.	Large adverse (i.e. at the Royal School for the Deaf) to moderate beneficial (permanent) – adverse effects may be reduced with additional mitigation
People and communities People and Communities, effects defined as moderate or large (adverse and beneficial) are identified below – all other identified effects assessed as neutral or low/minor/slight adverse/beneficial				
Construction	Markeaton Park footbridge – closure and diversions	Good construction site practices, minimise closure requirements and temporary diversions plus appropriate community communications	N/A	Moderate adverse (temporary)
Construction	Bonnie Prince Charlie Walk (National trail) – closure and diversions	Good construction site practices, minimise closure requirements and temporary diversions plus appropriate community communications	N/A	Moderate adverse (temporary)
Operation	Regional cycle route 66 (Markeaton junction); Pedestrian	Incorporation of pedestrian and cyclist facilities into the	N/A	Moderate beneficial

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
	crossings and cycle tracks at Markeaton junction; Markeaton Park access; national cycle route 54 at Little Eaton junction	proposed scheme design		
Construction	Demolition of private property: • Demolition of 15 residential properties on Queensway and 2 semi-detached properties on A52 Ashbourne Road; • Land-take from 4 residential properties to reconfigure access to Sutton Close off Ashbourne Road.	Proposed scheme design aims to minimise land take requirements outside existing highway boundary Affected landowner compensation	N/A	Large adverse (demolition) Moderate adverse (residential land-take)
Construction	Community severance – closure of Ford Lane	Proposed scheme design aims to segregate local and through traffic – requires some accesses to/from the A38 to be closed	N/A	Moderate adverse
Operation	Community severance	Proposed scheme design aims to segregate local and through traffic – requires some accesses to/from the A38 to be closed	N/A	Moderate beneficial
Operation	Effects on agricultural land holdings (Little Eaton junction)	Proposed scheme design aims to minimise land take requirements outside existing highway boundary, as well as enable continued access	Further investigation of access arrangements for turf production site	Moderate adverse effect on two holdings (only turf production site is engaged in commercial agriculture) - alternative access for the turf production site would reduce effects to non-significant levels Moderate/minor effect on 1 holding
Operation	Vehicle travellers – driver stress	Appropriate design of	N/A	Large beneficial

Stage	Description of effect	Summary of proposed mitigation	Further mitigation requirements	Residual effect
		proposed scheme and landscape planting		
Road drainage and the water environment				
Road drainage and the water environment, no effects assessed as being of moderate or major/large (all identified effects identified assessed as being neutral to slight adverse				
Cumulative effects				
Assessment of cumulative effects, no effects assessed as being of moderate or major/large (all identified effects identified assessed as being not significant or minor adverse				

6.4 Sources of information

6.4.1 The information as presented herein is sourced from the options selection stage Environmental Assessment Report (EAR) and the Environmental Risk Assessment (ERA) Report.

6.5 Consultations

6.5.1 Consultation activities have been undertaken with statutory and non-statutory organisations throughout the development of the proposed scheme design and the assessment of options. Ad hoc consultation with statutory and non-statutory bodies by environmental disciplines includes consultation with the Environment Agency, Derby City Council, Derbyshire County Council, the Derbyshire Wildlife Trust, Natural England, Severn Trent Water, the A38 highway maintaining agent etc.

6.5.2 Of note is that the 2015 scoping report which highlighted the environmental topics to be considered with the EAR, and the assessment methods to be applied, was submitted to a range of statutory advisors for comment as follows:

- A38 Managing Agent Contractor (Aone+)
- Amber Valley Borough Council
- Breadsall Parish Council
- Derby City Council
- Derbyshire County Council
- Derbyshire Wildlife Trust
- Environment Agency
- Erewash Borough Council
- Historic England
- Little Eaton Parish Council
- Little Eaton and Stanley Ward
- Natural England
- South Derbyshire District Council

6.5.3 Comments as received were taken into account during the preparation of the EAR.

6.6 Next stages

6.6.1 It is currently considered that the proposed scheme constitutes a Nationally Significant Infrastructure Project (NSIP). Thus following preferred route announcement, it is anticipated that in order for the necessary statutory provisions to be secured and to enable the proposed scheme to proceed, it will be necessary to make a Development Consent Order (DCO) application to the Planning Inspectorate (PINS). Given the likely NSIP status of the proposed scheme, it is anticipated that the DCO application will need to be accompanied by an Environmental Impact Assessment (EIA) as reported within an environmental statement. The assessment as presented within the EAR will be further developed and expanded in the environmental statement as applicable, capturing proposed scheme design evolutions as applicable.

7 SUMMARY OF PUBLIC CONSULTATION

7.1 Consultation arrangements

7.1.1 Prior to making an application to the Planning Inspectorate, consultation must be undertaken in accordance with the requirements of the Planning Act 2008 and associated guidance

7.1.2 Highways England's undertook a non-statutory consultation in 2015 to help inform the early proposals ahead of undertaking its statutory assessments for the statutory consultation. This was so that in the early phases of scheme development, public views are incorporated into the scheme design.

7.1.3 The consultation period was from 2 February 2015 to 13 March 2015. The main exhibition event was held at the University of Derby on Friday 6 February 2015 and Saturday 7 February 2015. Supplementary exhibitions were held at Breadsall Memorial Hall, Little Eaton Village Hall and Mackworth Youth and Community Centre.

7.2 Next steps

7.2.1 Engagement with stakeholders has continued since the formal public consultation period and will continue throughout the development of the scheme.

7.2.2 Having sought initial views and ideas on the proposals through a non-statutory consultation, assessment of options has continued and will continue up to preferred route announcement. Following this, a statutory public consultation will be undertaken prior to the DCO application.

8 CONCLUSION

8.1 Introduction

8.1.1 This section summarises the main findings of the Scheme Assessment Report in order to recommend an option for the Preferred Route Announcement.

8.2 Do-nothing options: traffic and economics

8.2.1 The A38 is a part of the strategic road network (SRN) and carries a relatively large proportion of freight trips. Where the A38 routes through the City of Derby, the road also fulfils other functions, specifically:

- An alternative route to the congested urban roads
- A high-capacity road crossing of the River Derwent
- A means of distributing the home-to-work commuting trips between the alternative radial routes
- A means of travel that is safer than on local roads, which have more frequent junctions and numerous accesses
- Road capacity to meet the additional trip demands generated by development sites identified in the Local Plans of Derby City, South Derbyshire, Amber Valley and Erewash councils
- A reliable route for bus trips

8.2.2 In a do-nothing option, it is possible that some of the development sites identified in the various Local Plans may not be permitted.

8.2.3 The national planning policy statements require an assessment of alternative travel modes. However, there are no improvements to alternative-modes of travel that would address the problems at the A38 junction or provide a similar type of solution for a similar level of cost.

8.3 Alternative schemes

8.3.1 Following the extensive options phase of the scheme from the early 2000s to the present day, many options have been investigated and there has been extensive consultation with stakeholders.

8.3.2 The investigations into the possible grade-separation of the three junctions began with the road based study (and associated consultation exercise) in 2002. This was followed by the supplementary consultation for Little Eaton junction in 2003. The scheme was subsequently refined and a Technical Appraisal Report (TAR) was produced in 2009.

8.3.3 Following the scheme re-commencing in 2014, public consultation was undertaken in 2015 to update our understanding of the public's views on the scheme. The options that emerged as the preferred options in the TAR were presented at an exhibition along with some of the previously discounted options.

8.3.4 A number of alternative options were identified from responses to the 2015 public consultation. Additional options were subsequently proposed by local stakeholders, particularly, the Breadsall A38 Action Group, for the Little Eaton junction.

8.3.5 Each of the alternative options was subjected to an initial assessment to determine the viability of the proposal; for those options which passed a further detailed assessment was carried out. In every case, the options proposed by the members of the public failed to perform as well as the presented options.

8.4 Traffic, economics and costs

8.4.1 Traffic forecasting and economics assessments were carried out for the scheme based on the presented option at each junction. The scheme costs based on 2010 prices are as follows:

- Construction = £144.3 million
- Land = £19.7 million
- Preparation = £13.8 million
- Supervision = £3.5 million

8.4.2 The extra costs required to maintain the various new elements of the scheme over a 60-year appraisal period would be £66.1 million.

8.4.3 For the purpose of comparing the scheme's costs and monetised-benefits, all costs and the monetised benefits were converted to 2010 prices. The annual cost-expenditure profiles from 2016 up to the horizon-year of 2083 (60-years after the open-to-traffic year) were used to produce a present value of costs (PVC).

8.4.4 The total PVC of the scheme is forecast to be £170.8 million.

8.4.5 The transport economic efficiency (TEE) benefits of the scheme were calculated using data from a traffic model that simulated: the main Derby City road network, the A38 route between the M1 J28 junction to the north and as far south as Burton-on-Trent, including the A50 to the south of Derby and the M1 motorway to the east of Derby. The rest of the UK highway network was also represented at various levels of details and thus the whole length of those road-users' trips travelling through the study area was represented.

8.4.6 The trip journey-times and travel-distances were extracted from the traffic model and used to compute a monetised value for the TEE benefits.

8.4.7 The present value of benefits (PVB) would be £418.8 million when taking account of the November 2016 Value of Travel Time Savings (VTTS).

8.4.8 The benefit to cost ratio (BCR) is 2.45. In transport economy terms, the A38 Derby Junctions scheme would provide high value for money.

8.4.9 A monetised assessment of the likely improvements to journey time reliability has been evaluated at £14 million. Because of the uncertainty inherent within the assessment method, the reliability benefits are not included within the above PVB and BCR values.

8.5 Operational and maintenance assessment

8.5.1 The proposals for the improvements to each of the three junctions would result in an arrangement that would be safe to operate in terms of motorised and non-motorised road users. The scheme would also provide an economic solution in terms of achieved benefits when compared with the cost of the scheme. Discussions with the maintaining authorities have confirmed that there are safe means of conducting planned and unplanned maintenance on the completed scheme. Further detailed development of the maintenance requirements and operations will be undertaken in the next design stage.

8.6 Environmental assessment of options

8.6.1 The environmental implications of various options have been qualitatively evaluated and fed into the option selection process – taking into account specified environmental objectives. Some of the options selected and taken forward for inclusion in the preferred scheme design were those options that would reduce environmental effects (e.g. selection of option K2 at Kingsway junction would reduce the loss of public open space as compared to the option published for consultation which includes a link road to Greenwich Drive South). However, of the alternative options considered at Little Eaton junction, the qualitative environmental assessment indicated that option 3A and the southern sweep option would offer the potential to reduce environmental and community effects as compared to the presented option due to reduced permanent land take requirements, as well as marginally reduce noise effects upon Breadsall village. However, the assessment indicated that while the presented option may not rank highest in each category or sub-category, in overall terms, the presented option performed the best, and that where the presented option would have a potentially greater impact than the alternative options, detailed mitigation strategies should be developed for each of these aspects in conjunction with key stakeholders.

8.7 Environmental assessment of proposed scheme

8.7.1 The potential environmental effects associated with the proposed scheme have been reported in an Environmental Assessment Report (EAR). This indicates that the integration of impact avoidance and mitigation features into the proposed scheme design, and through adherence to good construction site practices and operational management practices, most potential environmental effects would be reduced to non-significant levels (i.e. minor or negligible effects). However, the EAR indicates that some potential moderate or major/large effects have been identified. Some of these would be temporary construction phase effects (e.g. noise, visual, ecological, pedestrians/cyclists and severance) that would reduce during the proposed scheme operational phase due to maturation of landscape/ecological planting and the segregation of local and through traffic which would reduce severance and increase journey reliability.

During the environmental assessment to support the DCO application, further environmental mitigation requirements will be investigated with the aim of reducing identified moderate or major/large effects – this includes the development of specific noise mitigation measures such as noise barriers to shield specific sensitive receptors. Proposed scheme construction would, however, result in a potential large adverse effect due to demolition of properties at Markeaton junction and moderate negative effects (at a county/unitary authority level) due to habitat loss at the A38 Roundabout Local Wildlife Site (LWS) (located within the existing Kingsway junction) and the Alfreton Road Grassland LWS (located to the south of the existing Little Eaton junction). Proposed scheme operation is anticipated to deliver long-term environmental benefits with regard to the provision of pedestrian and cyclist facilities, reducing driver stress and community severance. In addition, the proposed approach to ecological mitigation and enhancement has the potential to improve the wildlife corridor function of the proposed scheme relative to the existing scheme, potentially resulting in an overall slight positive effect on nature conservation at the local level in the medium to long term.

9 THE RECOMMENDED ROUTE

9.1 Introduction

9.1.1 The scheme assessment initially considered a single option for the improvement of each junction. These options were the result of the design development work undertaken between 2002 and 2008 and had been prepared for entry into the roads programme.

9.1.2 Following the public consultation in 2015, a number of alternative options have been considered for the A38/A5111 Kingsway junction and A38/A61 Little Eaton junction.

9.2 Process for selecting the preferred route

9.2.1 A two-stage process was implemented for assessing the original junction proposals and the alternative options comprising

- An Initial Sifting Assessment; and
- Options passing the initial sifting were then subject to a more detailed qualitative assessment.

9.2.2 The Initial Sift Assessment provided a preliminary examination of each alternative option based on the information provided by the consultation respondent. The assessment followed the Department for Transport's web-based Transport Analysis Guidance - The Transport Appraisal Process[9] and considered the following criteria:

- How the option achieved the scheme objectives;
- Deliverability of the option (e.g. risks, stakeholder support or challenge, political issues and planning or legal considerations); and
- Feasibility of the option (e.g. compliance with design standards, technical feasibility and safety).

9.2.3 The scheme objectives used for the assessment are shown in Table 9/1.

[9] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/370529/webtag-tag-transport-appraisal-process.pdf

Table 9/1: Scheme objectives used in the initial assessment

Category	Detailed transport objective
Economy	To reduce congestion and increase reliability of journey times on the strategic corridor
	To minimise traffic disruption due to construction works and incidents
	To achieve optimum whole life costs taking into account future maintenance and operation, and disruption to users
Environment	To minimise impacts on both the natural and built environment, including designated landscape/biodiversity features
	To seek to mitigate impacts on air quality and noise
Society	To improve the safety for all road users
	To seek to reduce severance by maintaining or providing appropriate facilities for crossing, and travelling along the route for pedestrians and cyclists
Public accounts	To be affordable and represent high value for money according to DfT's appraisal criteria

9.2.4 Options achieving a baseline score against each of these criteria were then subjected to further, more detailed assessment. The detailed options assessment was based on Highways England's guidance documents TD37/93, Scheme Assessment Reporting and the web-based guidance - Transport Appraisal process. The assessment entailed the analysis of the following:

- Costs estimates;
- Engineering assessment (including constraints; structures; design standards; geometry; public utilities; non-motorised users; drainage; geotechnics; construction phasing and programme);
- Environmental assessment (including the qualitative consideration of air quality; archaeology and cultural heritage; landscape and visual impacts; nature conservation; geology and soils; materials; noise and vibration; effects on all travellers; community and private assets; and road drainage and the water environment (including flood risk)); and
- Traffic and economics assessment.

9.2.5 The options for each junction that emerged as the 'preferred' options during the 2002 to 2008 scheme development work were included in the assessments to provide a baseline for comparison and to ensure that all options were given equal consideration in the process.

9.3 Comparing the options

Initial sift assessment

9.3.1 The options which were subjected to the initial sifting assessment and the outcome of the assessment are described in Section 5 and summarised in Appendix 3. Table 9/2 lists those alternatives which passed the Initial Sifting Assessment and were subjected to a further detailed assessment.

Table 9/2 Options assessed under the initial sift.

Option	Summary of alternative option
Multi-junction options	
None	
A38/A5111 Kingsway junction	
Presented option published for consultation	Option presented at 2015 consultation and derived from the 2003 supplementary consultation. Included local access option K1 – via Greenwich Drive South.
Variant of presented option published for consultation (K2)	As for the presented option but including local access option K2 – via Kingsway Park Close
Consultee J - variant	Variant to consultee J but including local access via Kingsway Park Close.
A38/A52 Markeaton junction	
No alternative options received.	
A38/A61 Little Eaton junction	
Presented option published for consultation	Option presented at 2015 consultation and derived from the 2003 supplementary consultation.
Option 2	Published at the 2015 consultation as a rejected option on the basis of the 2003 supplementary consultation.
Option 3A	Similar to the current preferred Little Eaton option but carriageway realigned to closely follow the existing A38 corridor.
Southern sweep	A38 alignment retained across the existing roundabout and extended across the floodplain to the south of the existing route.
Option 2C	This option was developed following a meeting in Jan 17 between the Transport Minister, the Highways England Director, the local MP and members of the project team. It was assessed against the presented option only as the

Option	Summary of alternative option
	earlier options assessment work had been completed (with the presented option coming out as the preferred option)

Detailed options assessment

9.3.2 The alternative options were developed to 1:2500 scale to indicate the approximate dimensions of the embankment and cuttings and the locations of principal structures. From these layout plans, the engineering, environmental, traffic and economic advantages, disadvantages and constraints associated with the options were identified and cost estimates were developed. These, were used to evaluate and compare the options on a qualitative basis.

9.3.3 Options were assessed and ranked in order of preference across a number of sub-headings for each other the themes: cost, engineering, environment and traffic and economics. A ranking of 1 has been assigned to the best performing option.

9.3.4 Tables 9/3 9/4 and 9/5 summarise the results for the alternatives options at A38/A5111 Kingsway junction and A38/A61 Little Eaton junction.

Table 9/3 Summary of the alternatives options assessment for A38/A5111 Kingsway junction.

	Presented Junction Layout with option K1	Presented Junction Layout with option K2	Consultee J option (with option K1)
Cost	1	2	1
Engineering	2	1	3
Environment	1	1	2
Traffic	2	1	3
Overall ranking	**2**	**1**	**3**

*Cost section greyed out due to negligible differences between options.

Table 9/4 Summary of the alternatives options assessment for A38/A61 Little Eaton junction.

	Presented option	Option 2	Option 3A	Southern sweep
Cost	1	3	4	2
Engineering	2	1	4	3
Environment	3	4	2	1
Traffic & economics	1	3	4	2
Overall ranking	**1**	**3**	**4**	**2**

Table 9/5 Summary of option 2C assessment for A38/A61 Little Eaton junction.

	Presented option	Option 2C
Cost	1	2
Engineering	2	1
Environment	1	2
Traffic & economics	1	2
Overall ranking	**1**	**2**

9.4 A38/A5111 Kingsway junction

9.4.1 The detailed assessment matrix is contained in Appendix 3.

9.4.2 Differences between the layouts of the three options assessed were confined to the local access arrangements and roundabout layout. The overall principle of the preferred option was unchanged in that the A38 passes under an interchange at or close to current ground level.

9.4.3 In comparing the options, cost variations were excluded from the assessment as the options only change a small part of the junction layout and variations in the estimated costs were small.

9.4.4 In engineering terms, all three options were closely matched as differences were small. The presented option with option K2 cuts across an existing landfill site requiring additional work to manage the deposited materials safely, has a greater impact on existing public utilities thereby requiring additional diversions but offers benefits to pedestrians and cyclists through retaining an existing national cycle route which would be severed by the other options.

9.4.5 In environmental terms, the presented option ranked equally with both access options. Where option K2 ranked lower than option K1, this is caused by option K2 crossing the landfill area. However, by comparison, option K1 ranked lower for landscape and visual and community & private assets, and noise. This is due to the severance to public open space caused by the link and increased traffic on Greenwich Drive South.

9.4.6 Consultee J option ranked the same as or worse than the presented Junction layout with option K1 in each sub-category.

9.4.7 In terms of traffic and economics, option K2 ranked the highest in all sub-categories, providing better road safety and re-assigning traffic more efficiently. Consultee J option ranked as the worst option.

9.4.8 The outcome of the assessment was that the presented option with local access option K2 performed the best in overall terms.

9.5 A38/A52 Markeaton junction

9.5.1 The outcome of the design development leading up to the 2015 consultation was that the presented option which had developed from option M6, best met the objectives of the scheme.

9.5.2 No further alternative options were proposed as part of the 2015 public consultation.

9.6 A38/A61 Little Eaton junction

9.6.1 The detailed assessment matrix is contained in Appendix 3.

9.6.2 Option 3A performed poorly across a number of the assessment headings and was consequently, least preferred. This was principally due to the cost of construction associated with the temporary diversion route and longer construction period compared to the presented option; the need for a temporary diversion and the higher traffic disruption expected during construction; and the effects of the restricted turning movements at the junction itself.

9.6.3 While option 2 offered a number of benefits due to the improved highway alignment and that the route could be constructed with least impact upon existing A38 traffic, the cost was noticeably higher than the presented option principally due to the high impact of land take affecting residential properties and local businesses. Similarly, the high land take contributes to the low environmental performance. In addition, the benefits of the improved alignment of the A38 in comparison to the other options was largely offset by the more complex slip road loops. This resulted in a net increase in daily vehicle-kilometres and potential road safety problems.

9.6.4 Overall the presented option and the southern sweep were closely matched and the differences between the options were small. The presented option can be delivered for considerably lower cost principally as a result of the southern sweep requiring construction and maintenance of a temporary diversion route and a longer construction period. Although the southern sweep was preferred in environmental terms, the differences were marginal and it should be noted that the construction and use of the temporary diversion route were likely to exacerbate land take effects and construction phase effects.

9.6.5 Although the presented option requires permanent land-take to the south and east of the existing junction within an area of open, previously undeveloped land, the southern sweep would also impact some of this area, as a result of the temporary diversion route. Despite the diversion route only being required for the duration of the construction works, and not post-construction, the effects on land use and nature conservation would be longer lasting. This includes the loss of some of the existing tree plantation between the western edge of Breadsall village and the A38.

9.6.6 The assessment showed that, compared to the southern sweep, the presented option was preferred as it performed better in terms of engineering aspects; and traffic and economics, while offering a considerable cost saving.

9.6.7 The outcome of the assessment was that the presented option performed marginally better than the other options, noticeably the southern sweep, and had advantages in terms of buildability while maintaining traffic flows during construction.

Option 2C v presented option

9.6.8 A Summary of the option 2C assessment is contained in appendix 6

9.6.9 Option 2C has advantages over the presented option in terms of engineering design and perceived impacts on Breadsall village (in terms of noise, air quality and visual intrusion). It also reduces the impact on agricultural land within the designated green belt.

9.6.10 The main disadvantages of option 2C are the impacts on the property Fourways (and associated businesses) and the mobile home park; the impacts to the residents' community; and the increased scheme construction costs.

9.6.11 Delivery of option 2C could be achieved approx. 12 months after the programme for the presented option.

9.6.12 In terms of outturn cost, the cost estimates for the whole scheme, including option 2C, represent an increase of £24.45 million compared to the current budget for the presented option.

9.7 The Recommended route

9.7.1 The conclusion of the option selection phase is to recommend that the following options for each junction are taken forward into the Preliminary Design stage of the Development Phase:

- A38/A5111 Kingsway Junction – presented option with local access option K2
- A38/A52 Markeaton Junction – presented option
- A38/A61 Little Eaton Junction – presented option

The layouts for these options are included in appendix 1 (figures 1.1, 1.2 and 1.3) and can be briefly summarised as follows:

- Kingsway junction – A38 main line to pass beneath the level of the junction with a dumbbell arrangement at approximately the level of the existing roundabout to provide for all turning movements. A link from the east dumbbell roundabout to Kingsway Park Close would provide local access to the Mackworth residential area.
- Markeaton junction - A38 main line to pass beneath the level of the junction in a retained trough arrangement with a two-bridge roundabout at approximately the level of the existing roundabout and slip roads would provide for all turning movements.
- Little Eaton junction - A38 main line to pass to the east and south of the existing roundabout on embankment and crossing a new larger roundabout via two bridges. The new roundabout would be at approximately the level of the existing roundabout and slip roads would provide for all turning movements.

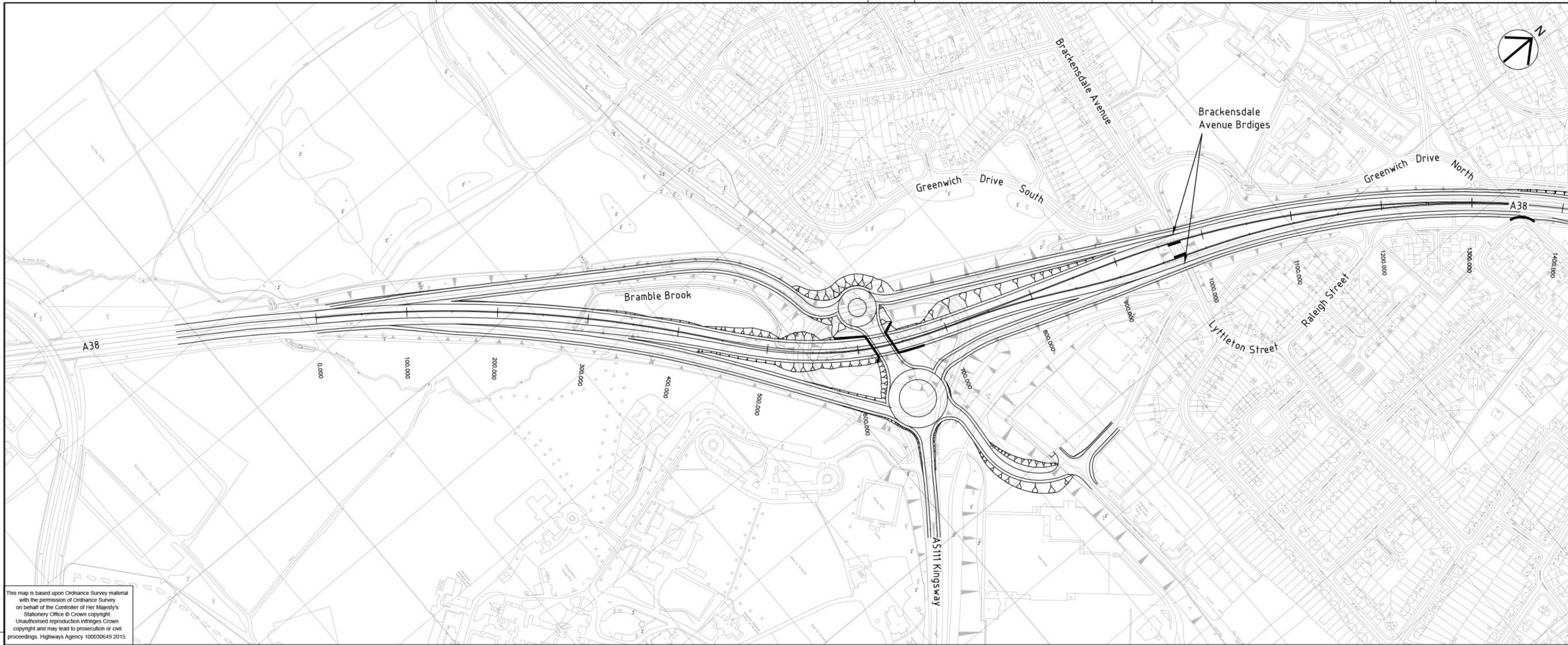
9.7.2 The benefit to cost ratio (BCR) is 2.45 (when taking account of the November 2016 value of travel time savings update). In transport economy terms, the A38 Derby Junctions scheme would provide high value for money.

9.7.3 The tables in appendix 7 provide an analysis of how the proposed scheme meets the scheme objective (see paragraph 2.1.4) and how the proposed scheme could contribute to the achievement of Highways England's latest performance specification key performance indicators.

9.7.4 Further design work will be required in the next stage (preliminary design) to develop the scheme in a number of areas and define the exact scheme footprint prior to the statutory planning process. These include determining the sizes of the roundabouts at A38/A5111 Kingsway necessary to accommodate the design traffic flows; developing the roundabout layout at A38/A52 Markeaton junction to operate under signalised control; defining the mitigation works required (particularly with regards to noise and ecology mitigation); and identifying the land required for the necessary flood alleviation, surface water alleviation and public open space exchange areas.

Appendix 1

Scheme layout plans



HEALTH AND SAFETY INFORMATION

EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

CONSTRUCTION

NO EXCEPTIONAL RISKS RELATING TO THE WORKS SHOWN ON THIS DRAWING HAVE BEEN IDENTIFIED DURING THE DESIGN.

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

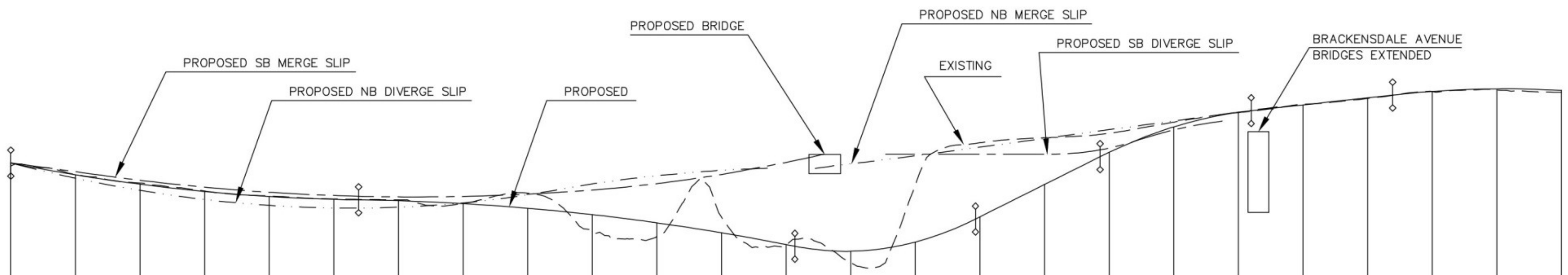
NO EXCEPTIONAL RISKS RELATING TO THE WORKS SHOWN ON THIS DRAWING HAVE BEEN IDENTIFIED DURING THE DESIGN.

WORK CAN ONLY BE CARRIED OUT BY SUITABLY TRAINED AND BRIEFED PERSONNEL.

NOTES

THIS DRAWING IS DRAFT ONLY AND WILL BE SUBJECT TO CHANGE AS THE DESIGN IS DEVELOPED

PRELIMINARY



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PROPOSED	75.446	74.542	73.809	73.248	72.858	72.639	72.533	72.311	71.953	71.457	70.824	70.053	69.145
EXISTING	75.220	74.570	73.902	73.287	72.901	72.666	72.605	72.317	73.123	70.205	69.761	71.276	69.126

CHAINAGE	650.000	700.000	750.000	800.000	850.000	900.000	950.000	1000.000	1050.000	1100.000	1150.000	1200.000
PROPOSED	68.619	69.330	71.288	73.788	76.280	78.247	79.382	79.949	80.500	80.992	81.189	81.068
EXISTING	67.727	73.743	77.020	77.404	77.758	78.606	79.354	80.013	80.451	80.978	81.110	80.927

HORIZONTAL	R=1440.000 L=426.054	CL	CL	R=−360.000 L=124.993	CL=90.000	D=147.193	CL	R=1020.000 L=201.837	R=1150.000 L=250.486

VERTICAL	R=14592.808 L=269.109	R=−18200.000 L=337.641	R=2000.000 L=139.808	P=5.000% L=96.488	R=−3000.000 L=116.942	P=1.102% L=109.475	R=−7851.167 L=169.245

Rev #	Revision Details					
	Drawn By	Date	Checked By	Date	Approved By	Date
4	KINGSWAY PARK CLOSE LINK ADDED, GREENWICH DRIVE SOUTH LINK DELETED					
	JRH	13/05/15	AW	13/05/15	AW	13/05/15
3	DRAFT NOTE ADDED					
	JRH	18/02/15	SLS	18/02/15	AW	19/02/15
2	ANNOTATION ADDED TO PLAN					
	JRH	26/01/15	IWM	26/01/15	SLS	27/01/15
1	SLIP ROAD ALIGNMENTS ADDED TO SECTION					
	JRH	03/12/14	IWM	03/12/14	AW	03/12/14
0	DRAWING CREATED FROM SCOTT WILSON DRAWING D114946/GD/001 REV A WITHOUT FURTHER AMENDMENT					
	JRH	11/09/14	AW	12/09/14		
P	PRELIMINARY				27/01/15	SLS

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

KINGSWAY JUNCTION
PLAN AND SECTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		P

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
	JRH	AW	AW	SS

Scale at A1	Originated	Date
1:2500	CH-ROADS	

Highways England
Major Projects
Piccadilly Gate
Store Street
Manchester
M1 2WD

AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
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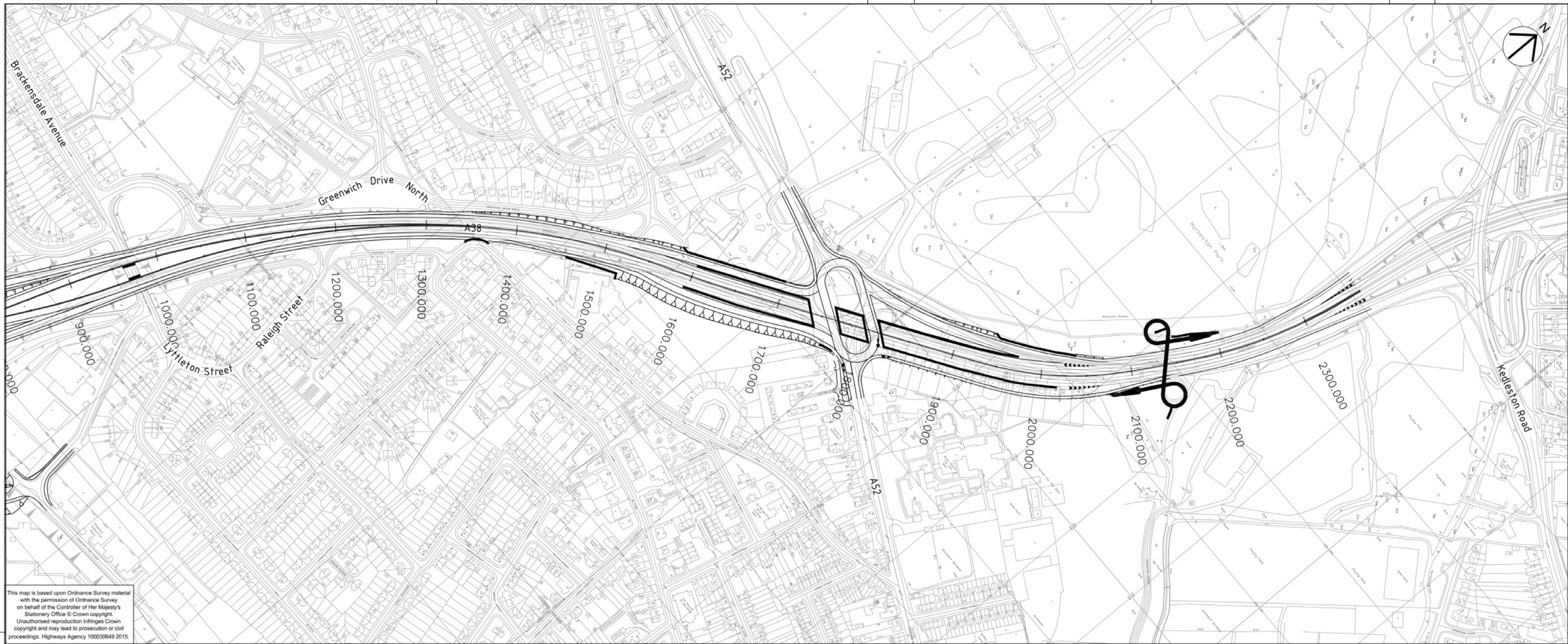
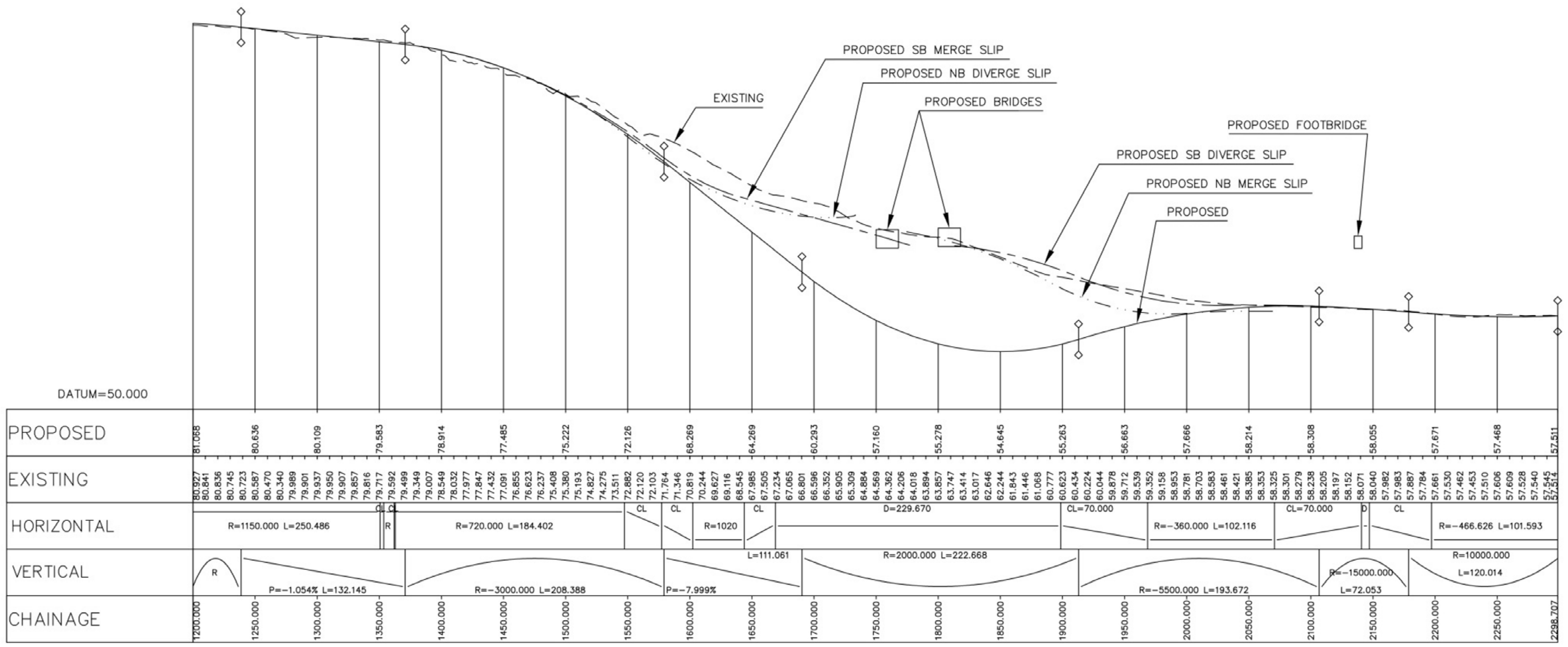
Drawing Number

HA514503-URS-06-DR-GD-25.010-4P

Figure 1.1: Proposed Scheme Layout – Kingsway Junction





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Rev #	Revision Details					
	Drawn By	Date	Checked By	Date	Approved By	Date
4	FOOTBRIDGE RELOCATED					
	AMCB	24/02/16	AW	24/02/16	AW	24/02/16
3	DRAFT NOTE ADDED					
	JRH	18/02/15	SLS	18/02/15	AW	19/02/15
2	ANNOTATION ADDED TO PLAN					
	JRH	26/01/15	IWM	26/01/15	SLS	27/01/15
1	SLIP ROAD ALIGNMENTS ADDED TO SECTION					
	JRH	03/12/14	IWM	03/12/14	AW	03/12/14
0	DRAWING CREATED FROM SCOTT WILSON DRAWING D114946/GD/002 REV A WITHOUT FURTHER AMENDMENT					
	JRH	11/09/14	AW	12/09/14		
P	PRELIMINARY				27/01/15	SLS

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

MARKEATON JUNCTION
PLAN AND SECTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		P

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
	JRH	AW	AW	SS

Scale at A1	Originated	Date
1:2500	CH-ROADS	

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Major Projects
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Store Street
Manchester
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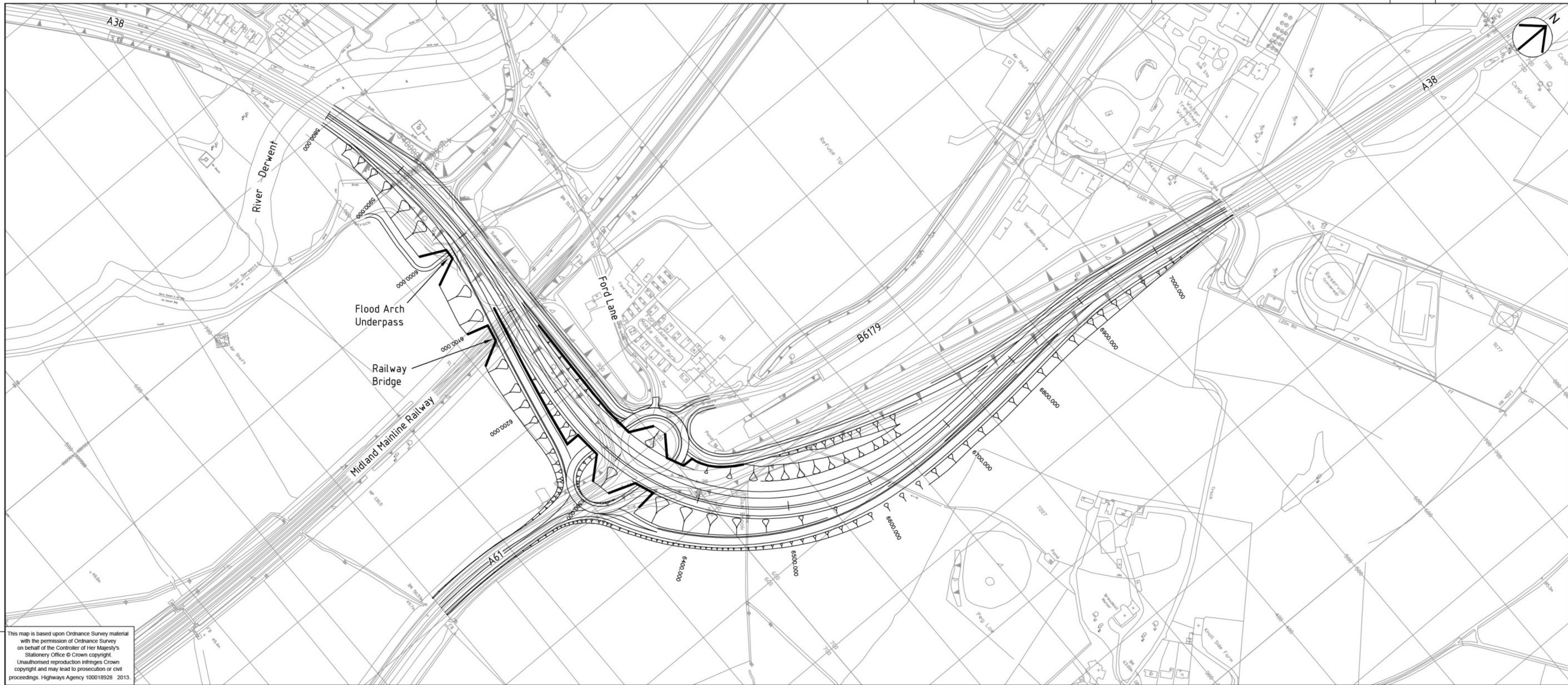
Drawing Number

HA514503-URS-06-DR-GD-25.011-4P

Figure 1.2: Proposed Scheme Layout – Markeaton Junction



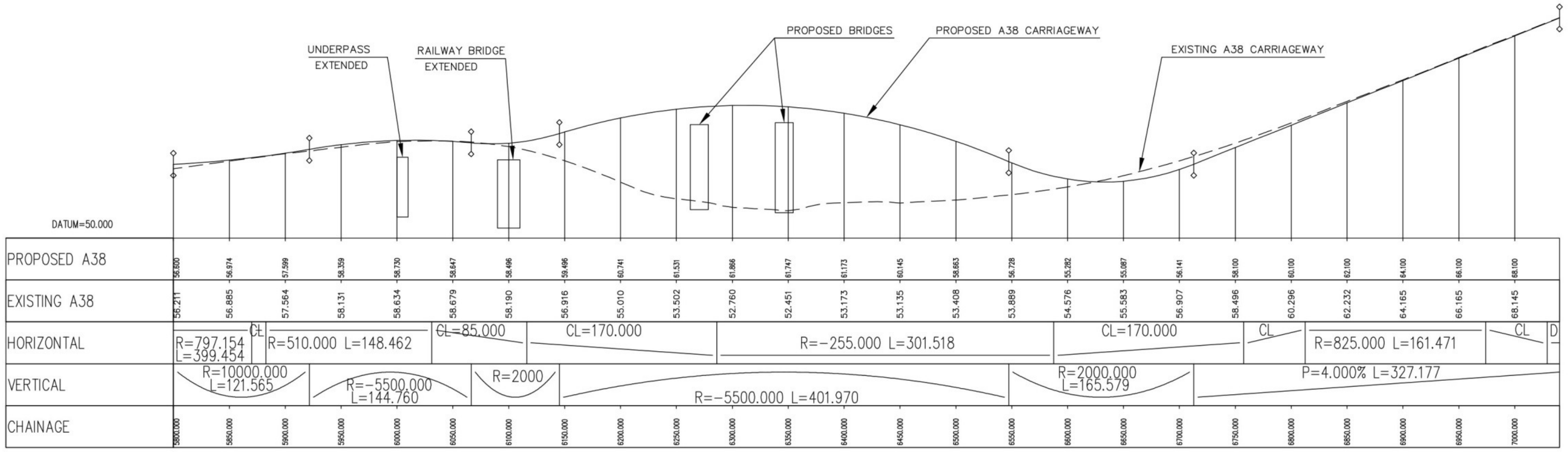


Figure 1.3: Proposed Scheme Layout – Little Eaton Junction

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PRELIMINARY

Rev #	Revision Details / Drawn By	Date	Checked By	Date	Approved By	Date
5	CROSS SECTION TEXT COLOUR AMENDED					
	LE	21/08/15	GG	21/08/15	AW	21/08/15
4	DRAFT NOTE ADDED					
	JRH	18/02/15	SLS	18/02/15	AW	19/02/15
3	EXISTING CARRIAGEWAY LEVELS ADDED, SLIP AND EXISTING LEVELS OF PROPOSED CENTRELINE REMOVED					
	JRH	03/02/15	AP	03/02/15	AW	03/02/15
2	ANNOTATION ADDED TO PLAN					
	JRH	26/01/15	IWM	26/01/15	SLS	27/01/15
1	SLIP ROAD ALIGNMENTS ADDED TO SECTION					
	JRH	03/12/14	IWM	03/12/14	AW	03/12/14
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	JRH	11/09/14	AW	12/09/14		
P	PRELIMINARY					27/01/15 SS

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

LITTLE EATON JUNCTION
PLAN AND SECTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		P

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
	JRH	AW	AW	SS

Scale at A1	Originated	Date
1:2500	CH-ROADS	11/09/14

Highways England
Major Projects
Piccadilly Gate
Store Street
Manchester
M1 2WD

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Royal Court
Basil Close, Chesterfield
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Drawing Number

HA514503-URS-06-DR-GD-25.012-5P

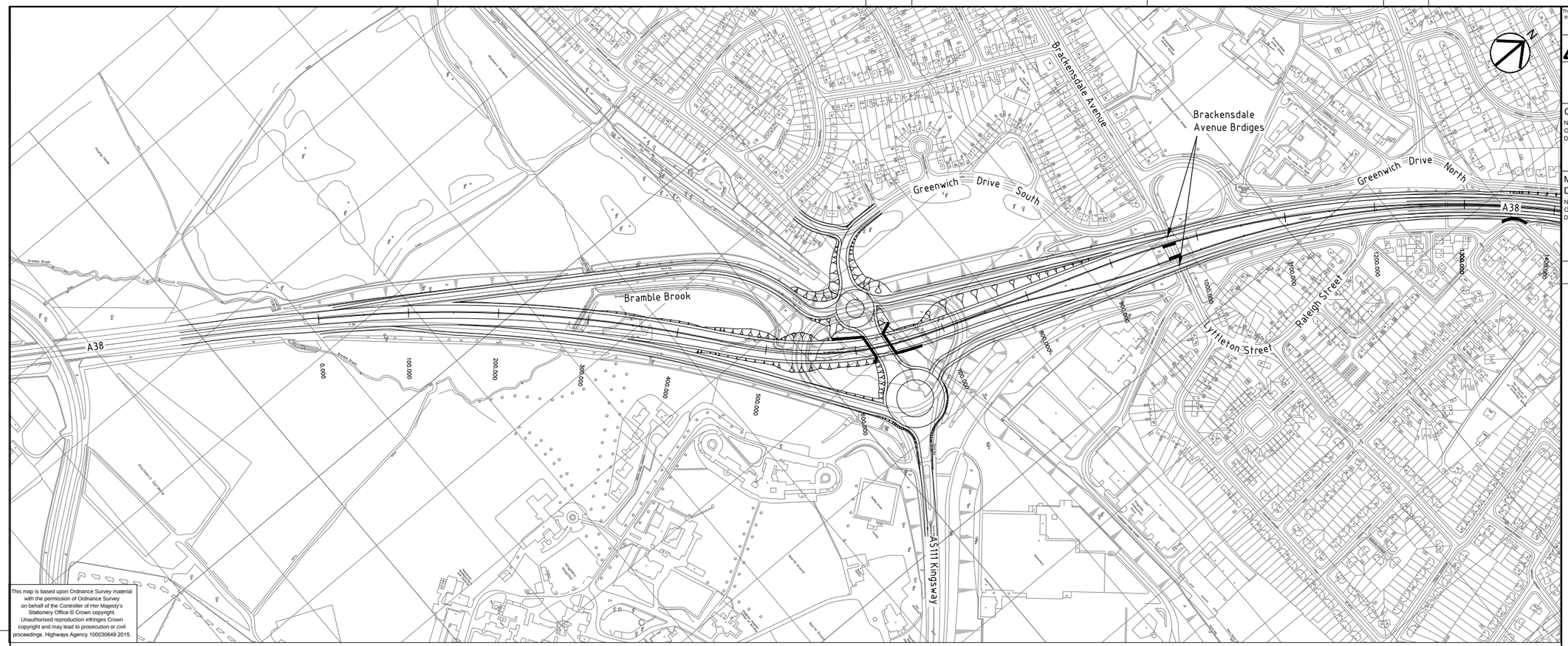
Appendix 2

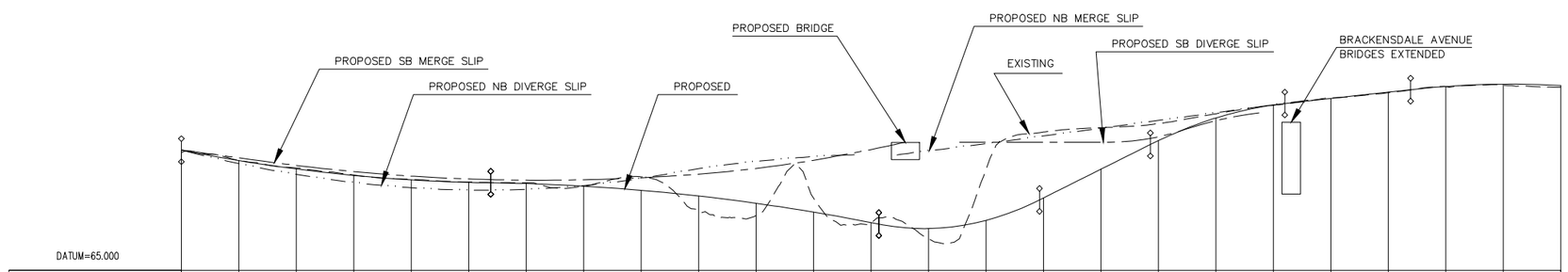
Kingsway junction options (post-2015 consultation)

Kingsway junction, option K1

Kingsway junction, option K2

Kingsway junction, consultee J's option





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EXISTING	75.220	74.570	73.902	73.287	72.901	72.666	72.605	72.317	73.123	70.205	69.761	71.276	69.126	67.727	73.743	77.020	71.404	77.758	78.606	79.354	80.013	80.451	80.978	81.110	80.927
HORIZONTAL	R=1440.000 L=426.054									CL	CL	R=-360.000 L=124.993		CL=90.000		D=147.193		CL	R=1020.000 L=201.837					R=1150.000 L=250.486	
VERTICAL	R=14592.808 L=269.109							R=-18200.000 L=337.641						R=2000.000 L=139.808		P=5.000% L=96.488		R=-3000.000 L=116.942		P=1.102% L=109.475		R=-7851.167 L=169.245			
CHAINAGE	0.000	50.000	100.000	150.000	200.000	250.000	300.000	350.000	400.000	450.000	500.000	550.000	600.000	650.000	700.000	750.000	800.000	850.000	900.000	950.000	1000.000	1050.000	1100.000	1150.000	1200.000

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PRELIMINARY

Rev #							
0	DRAFT ISSUE						
	LE	14/09/15					
	Revision Details						
	Drawn By	Date	Checked By	Date	Approved By	Date	
D	DRAFT					14/09/15	LE

Job Title

A38 DERBY JUNCTIONS IMPROVEMENTS

Drawing Title

KINGSWAY JUNCTION PLAN AND SECTION OPTION K1

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
	LE			

Scale at A1	Originated	Date
1:2500	CH-ROADS	

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Drawing Number

HA514503-URS-06-DR-GD-25.035-0D

Plot Date: 16/09/2015 3:34 PM By Luke Evans
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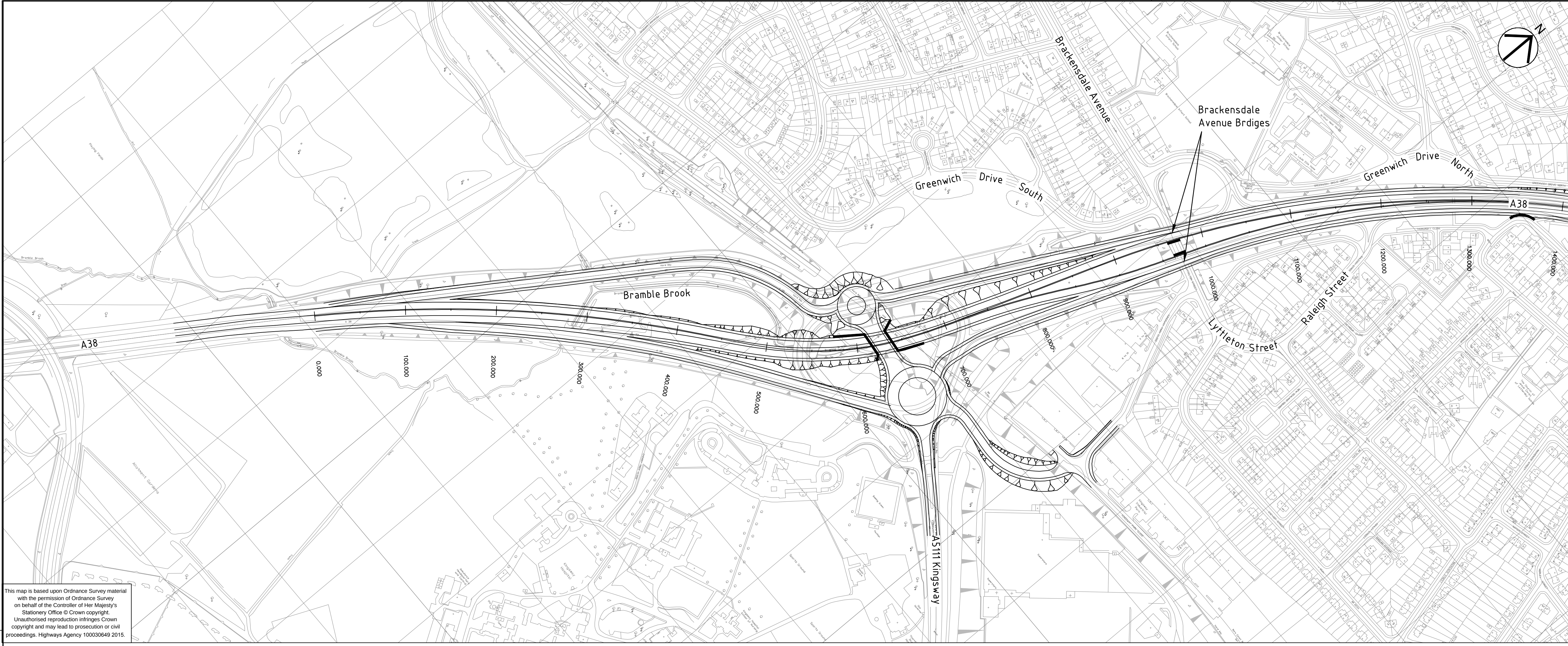
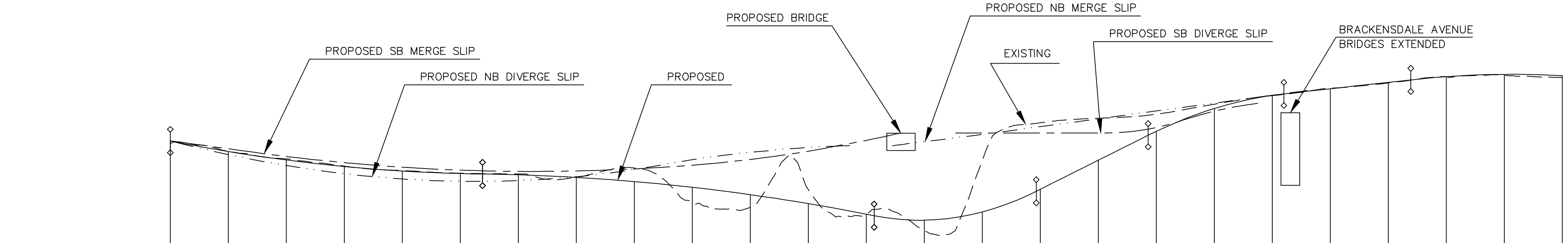
DB1Va





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100.000	73.809	73.902
150.000	73.248	73.287
200.000	72.858	72.901
250.000	72.639	72.666
300.000	72.533	72.605
350.000	72.311	72.317
400.000	71.953	73.123
450.000	71.457	70.205
500.000	70.824	69.761
550.000	70.053	71.276
600.000	69.145	69.126
650.000	68.619	67.727
700.000	69.330	73.743
750.000	71.288	77.020
800.000	73.788	77.404
850.000	76.280	77.758
900.000	78.247	78.606
950.000	79.382	79.354
1000.000	79.949	80.013
1050.000	80.500	80.451
1100.000	80.992	80.978
1150.000	81.189	81.110
1200.000	81.068	80.927

HORIZONTAL: R=1440.000 L=426.054 | CL | CL | R=−360.000 L=124.993 | CL=90.000 | D=147.193 | CL | R=1020.000 L=201.837 | R=1150.000 L=250.486

VERTICAL: R=14592.808 L=269.109 | R=−18200.000 L=337.641 | R=2000.000 L=139.808 | P=5.000% L=96.488 | R=−3000.000 L=116.942 | P=1.102% L=109.475 | R=−7851.167 L=169.245

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Rev #	Revision Details / Drawn By	Date	Checked By	Date	Approved By	Date
4	KINGSWAY PARK CLOSE LINK ADDED, GREENWICH DRIVE SOUTH LINK DELETED					
	JRH	13/05/15	AW	13/05/15	AW	13/05/15
3	DRAFT NOTE ADDED					
	JRH	18/02/15	SLS	18/02/15	AW	19/02/15
2	ANNOTATION ADDED TO PLAN					
	JRH	26/01/15	IWM	26/01/15	SLS	27/01/15
1	SLIP ROAD ALIGNMENTS ADDED TO SECTION					
	JRH	03/12/14	IWM	03/12/14	AW	03/12/14
0	DRAWING CREATED FROM SCOTT WILSON DRAWING D114946/GD/001 REV A WITHOUT FURTHER AMENDMENT					
	JRH	11/09/14	AW	12/09/14		
P	PRELIMINARY				27/01/15	SLS

Job Title

A38 DERBY JUNCTIONS IMPROVEMENTS

Drawing Title

KINGSWAY JUNCTION PLAN AND SECTION K2 OPTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		P

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
	JRH	AW	AW	SS

Scale at A1	Originated	Date
1:2500	CH-ROADS	

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Store Street
Manchester
M1 2WD

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HA514503-URS-06-DR-GD-25.010-4P

Plot Date 18/05/2015 11:18 AM By Luke Evans
File Name K:\A38 Derby Jcns - PD\330\2 CAD\12.1 Current\GD\HA514503-URS-06-DR-GD-25.010-4P.dwg
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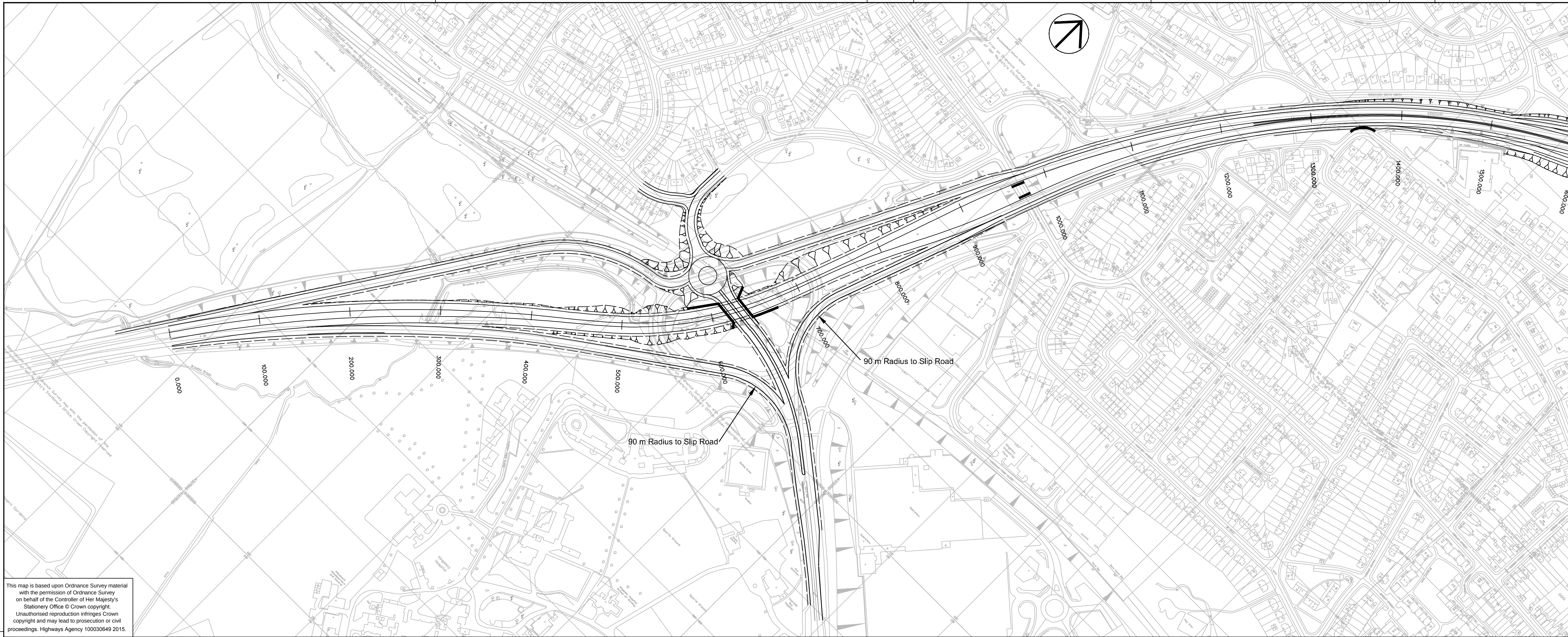
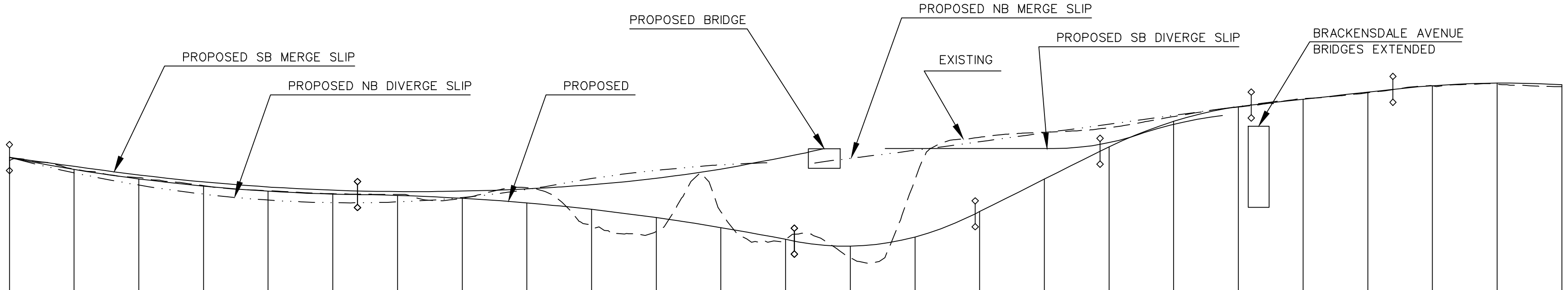
DB1Va





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CHAINAGE	PROPOSED	EXISTING
0.000	75.446	75.220
50.000	74.542	74.570
100.000	73.809	73.902
150.000	73.248	73.287
200.000	72.858	72.901
250.000	72.639	72.666
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350.000	72.311	72.317
400.000	71.953	73.123
450.000	71.457	70.205
500.000	70.824	69.761
550.000	70.053	71.276
600.000	69.145	69.126
650.000	68.619	67.727
700.000	69.330	73.743
750.000	71.288	77.020
800.000	73.788	77.404
850.000	76.280	77.758
900.000	78.247	78.606
950.000	79.382	79.354
1000.000	79.949	80.013
1050.000	80.500	80.451
1100.000	80.992	80.978
1150.000	81.189	81.110
1200.000	81.068	80.927

HORIZONTAL: R=1440.000 L=426.054 | CL | CL | R=-360.000 L=124.993 | CL=90.000 | D=147.193 | CL | R=1020.000 L=201.837 | R=1150.000 L=250.486

VERTICAL: R=14592.808 L=269.109 | R=-18200.000 L=337.641 | R=2000.000 L=139.808 | P=5.000% L=96.488 | R=-3000.000 L=116.942 | P=1.102% L=109.475 | R=-7851.167 L=169.245

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PRELIMINARY

Rev #	Revision Details					
1	GREENWICH DRIVE DESIGN AMENDED					
	LE	08/09/15				
0	DRAFT ISSUE					
	SB	30/07/15				
	Drawn By	Date	Checked By	Date	Approved By	Date

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

KINGSWAY JUNCTION
CONSULTEE J'S ALTERNATIVE
WITH LOCAL ACCESS
OPTION K1

AECOM Internal Project Number	Zone / Mileage	Suitability		
47071319				
Designed: SB	Drawn: SB	Stage 1 check: GJS	Stage 2 check	Approved: AW
Scale at A1: 1:2500		Originated	Date: 30/07/15	

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HA514503-URS-06-DR-GD-25.033-1D

Plot Date: 11/10/2016 12:35 PM By McBain, Adrian
File Name: K:\A38 Derby Jcts - PO\338012 CAD\12.2 Current\GD\HA514503-URS-06-DR-GD-25.033-1D.dwg
Attached Xrefs: | A38 BASEMAP
DB1Va

Appendix 3

Post 2015 consultation options assessment

Summary tables

Initial sift table

Overall assessment results tables

Initial sift table

Option	Summary of alternative option	Option taken forward to detailed assessment
Multi-junction options		
Consultee A	Tunnel from south of Kingsway to north of Markeaton	No
Consultee P	New trunk road from A38/A50 Toyota junction to north of Little Eaton.	No
A38/A5111 Kingsway junction		
Presented option published for consultation	Option presented at 2015 consultation and derived from the 2003 supplementary consultation. Included local access option K1 – via Greenwich Drive South	Yes
Variant of presented option published for consultation (K2)	As for the presented option but including local access option K2 – via Kingsway Park Close	Yes
Variant of presented option published for consultation (K3)	As for the presented option but including local access option K3 – no local access provided.	No
Campaign for Better Transport	Slip road links to the existing local accesses.	No
Consultee B	A single large roundabout in place of the proposed double roundabout.	No
Consultee J	Alternative road layout in lieu of the proposed eastern roundabout.	No
Consultee J - variant	Variant to consultee J but including local access via Kingsway Park Close.	Yes
Consultee P	Local accesses to be kept open by provision of parallel service roads.	No
A38/A52 Markeaton junction		
No alternative options received.		n/a

Option	Summary of alternative option	Option taken forward to detailed assessment
A38/A61 Little Eaton junction		
Presented option published for consultation	Option presented at 2015 consultation and derived from the 2003 supplementary consultation.	Yes
Option 1	Published at the 2015 consultation as a rejected option on the basis of the 2003 supplementary consultation.	No
Option 2	Published at the 2015 consultation as a rejected option on the basis of the 2003 supplementary consultation.	Yes
Consultee A	A61 fly-over A38 with roundabout to north of existing junction.	No
Campaign for Better Transport	A61 flyover.	No
Southern sweep	A38 alignment retained across the existing roundabout and extended across the floodplain to the south of the existing route.	Yes
Option 3A	Similar to the current preferred Little Eaton option but carriageway realigned to closely follow the existing A38 corridor.	Yes
Option 4	Similar to “option 3A” but using a shallower radius for the main line.	No
Option 2A	Development of option 2 with re-configured northbound slip roads and the southbound slip roads reuse the existing A38 carriageway.	No
Option 2B	Variant of option 2A with the A38 southbound slip roads are adjacent to the main carriageway to form a conventional two-bridge grade-separated layout with a single roundabout.	No

Option	Summary of alternative option	Option taken forward to detailed assessment
Option X	Retains the A38 on its existing horizontal and vertical alignment, diverts the B6179 to the north of the garden centre to pass under the A38 to a new roundabout on the A61.	No
Option X1	Development of option X replacing the looping link roads of option X with an overbridge for the A61	No
Option 2A (variant 1)	Development of option 2A with a re-designed southbound entry slip road to address a safety issue	No
Option 2A (variant 2)	Development of option 2A using a dumbbell roundabout arrangement such that only a single underbridge is needed to the A38	No

Kingsway assessment results

Overall assessment results (cost)

Cost sub-category	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Total outturn cost	1	2	1

Overall assessment results (engineering)

Engineering sub-category	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Geometry	2	1	3
Public utilities	1	2	1
pedestrian and cyclist provision	2	1	3
Drainage	1	1	1
Geotechnics	1	2	1
Departures from standards	2	1	3
Construction phasing	1	1	2

Overall assessment results (environment)

Environment sub-category	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Air quality	1	1	2
Cultural heritage	1	1	1
Landscape and visual	2	1	2
Nature conservation	1	1	1
Geology & soils	1	2	1
Materials	1	2	1
Noise	2	1	3
Effect on all travellers	1	1	2

Environment sub-category	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Community & private assets	2	1	2
Water resources	1	2	1
Flood risk	1	1	1

Overall assessment results (traffic & economics)

Traffic & economics sub-category	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Reassignment effects	2	1	3
(TEE post-construction)	1	1	2
Road safety	2	1	3
Delay during construction	1	1	2

Overall assessment results (overall summary)

Summary of results	Presented junction layout with option K1	Presented junction layout with option K2	Consultee J's option (with option K1)
Cost	1	2	1
Engineering	2	1	3
Environment	1	1	2
Traffic	2	1	3
Overall ranking	**2**	**1**	**3**

Little Eaton assessment results

Overall assessment results (cost)

Cost sub-category	Presented option	Option 2	Option 3A	Southern sweep
Total outturn cost	£85,900,000	£99,800,000	£106,400,000	£99,150,000
	1	3	4	2

Overall assessment results (engineering)

Engineering sub-category	Presented option	Option 2	Option 3A	Southern sweep
Geometry	2	1	2	2
Public utilities	1	2	1	1
pedestrian and cyclist provision	1	1	1	1
Drainage	1	1	1	1
Geotechnics	2	1	4	3
Structures	2	4	3	1
Departures from standards	2	1	2	2
Construction phasing	2	1	3	3

Overall assessment results (environment)

Environment sub-category	Presented option	Option 2	Option 3A	Southern sweep
Air quality	1	2	1	1
Cultural heritage	1	2	1	1
Landscape	1	2	1	1
Visual	1	1	1	1
Nature conservation	2	3	1	1
Geology & soils	2	3	1	1
Materials	1	2	1	1
Noise	2	2	1	1
Effect on all travellers	1	1	2	2

Environment sub-category	Presented option	Option 2	Option 3A	Southern sweep
Community & private assets	2	3	1	1
Water resources	1	2	1	1
Flood risk	2	3	1	1

Overall assessment results (traffic & economics)

Traffic & Economics sub-category	Presented option	Option 2	Option 3A	Southern sweep
Reassignment effects	1	1	2	1
Travel benefits (TEE post-construction)	1	2	3	1
Delay during construction	2	1	3	3
Road safety	1	2	3	1

Overall assessment results (overall oummary)

Summary of Results	Presented option	Option 2	Option 3A	Southern sweep
Cost	1	3	4	2
Engineering	2	1	4	3
Environment	2	3	2	1
Traffic	1	3	4	2
Overall ranking	**1**	**3**	**4**	**2**

Appendix 4

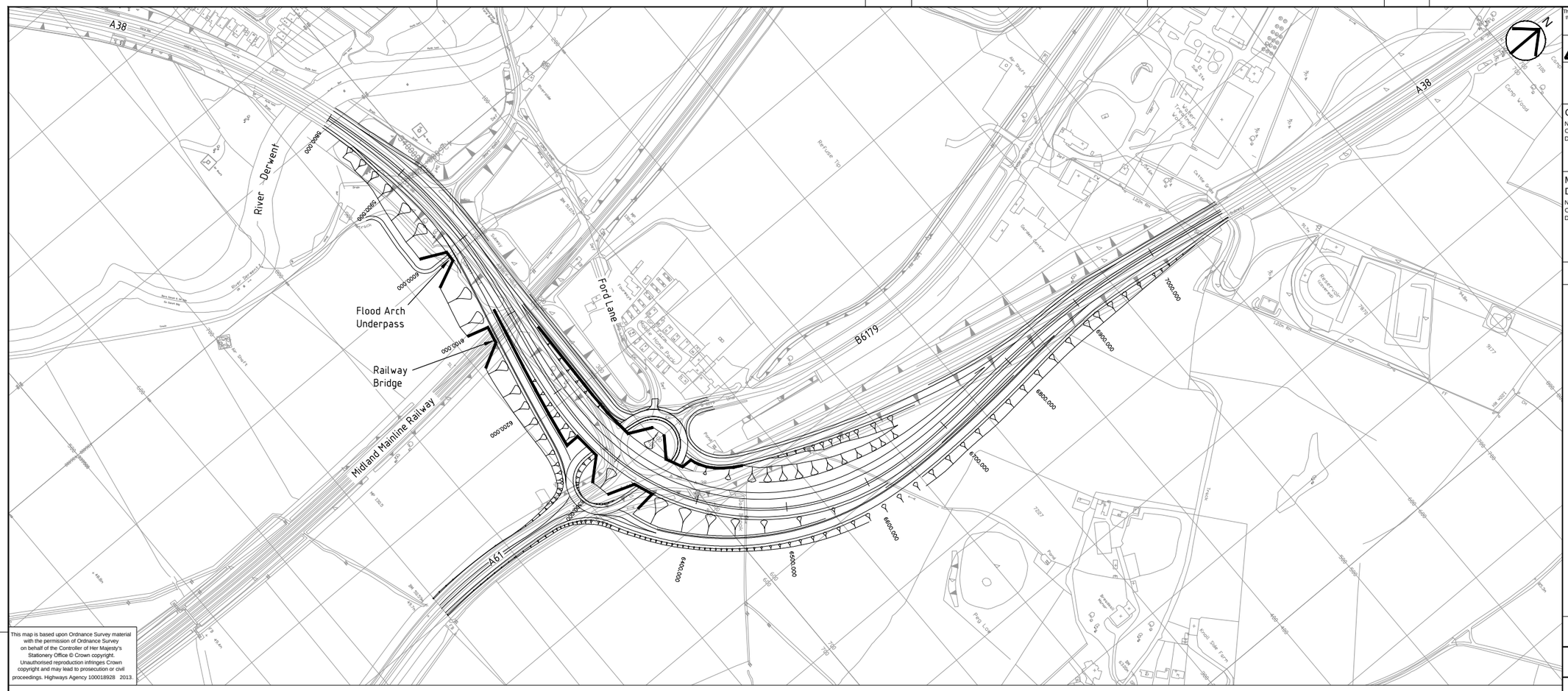
Little Eaton, post-2015 consultation options

Little Eaton Junction, the presented option

Little Eaton Junction, option 2

Little Eaton Junction, option 3a

Little Eaton Junction, the southern sweep option



CHAINAGE	PROPOSED A38	EXISTING A38
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5850.000	56.974	56.885
5900.000	57.599	57.564
5950.000	58.359	58.131
6000.000	58.730	58.634
6050.000	58.647	58.679
6100.000	58.496	58.190
6150.000	59.496	56.916
6200.000	60.741	55.010
6250.000	61.531	53.502
6300.000	61.866	52.760
6350.000	61.747	52.451
6400.000	61.173	53.173
6450.000	60.145	53.135
6500.000	58.663	53.408
6550.000	56.728	53.889
6600.000	55.282	54.576
6650.000	55.087	55.583
6700.000	56.141	56.907
6750.000	58.100	58.496
6800.000	60.100	60.296
6850.000	62.100	62.232
6900.000	64.100	64.165
6950.000	66.100	66.165
7000.000	68.100	68.145

HORIZONTAL

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VERTICAL

R=10000.000 L=121.565 | R=-5500.000 L=144.760 | R=2000 | R=-5500.000 L=401.970 | R=2000.000 L=165.579 | P=4.000% L=327.177

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NOTES

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PRELIMINARY

Rev #	Revision Details	Drawn By	Date	Checked By	Date	Approved By	Date
5	CROSS SECTION TEXT COLOUR AMENDED	LE	21/08/15	GG	21/08/15	AW	21/08/15
4	DRAFT NOTE ADDED	JRH	18/02/15	SLS	18/02/15	AW	19/02/15
3	EXISTING CARRIAGEWAY LEVELS ADDED, SLIP AND EXISTING LEVELS OF PROPOSED CENTRELINE REMOVED	JRH	03/02/15	AP	03/02/15	AW	03/02/15
2	ANNOTATION ADDED TO PLAN	JRH	26/01/15	IWM	26/01/15	SLS	27/01/15
1	SLIP ROAD ALIGNMENTS ADDED TO SECTION	JRH	03/12/14	IWM	03/12/14	AW	03/12/14
0	DRAWING CREATED FROM SCOTT WILSON DRAWING D114946/GD/003 REV A, RENAMED TO LITTLE EATON FROM ABBEY HILL	JRH	11/09/14	AW	12/09/14		
P	PRELIMINARY					27/01/15	SS

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

LITTLE EATON JUNCTION
PLAN AND SECTION

The Presented Option

AECOM Internal Project Number 47071319		Zone / Mileage		Suitability P
Designed	Drawn JRH	Stage 1 check AW	Stage 2 check AW	Approved SS
Scale at A1 1:2500		Originated CH-ROADS		Date 11/09/14

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Drawing Number

HA514503-URS-06-DR-GD-25.012-5P

Plot Date : 21/08/2015 2:31 PM By Luke Evans
File Name : K:\A38 Derby Jcns - PO1339\12 CAD\12.2 Current\GD\HA514503-URS-06-DR-GD-25.012-5P.dwg
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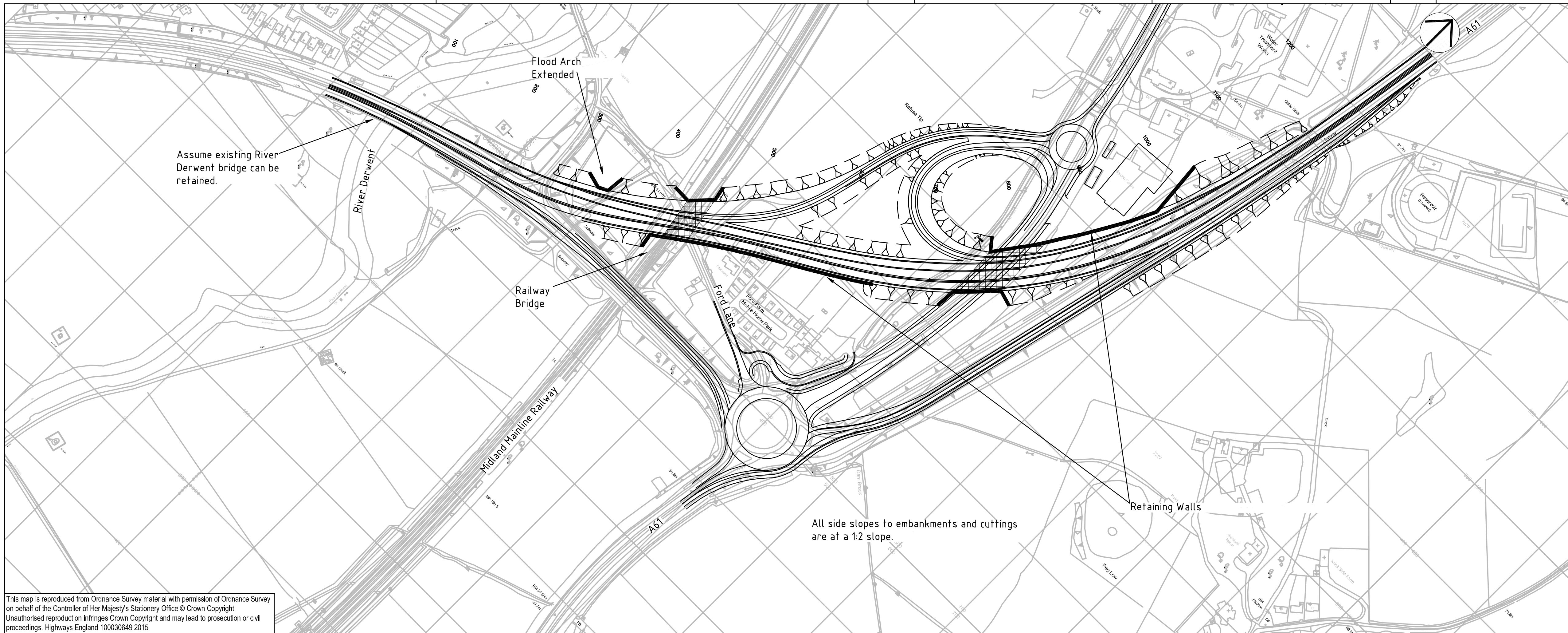

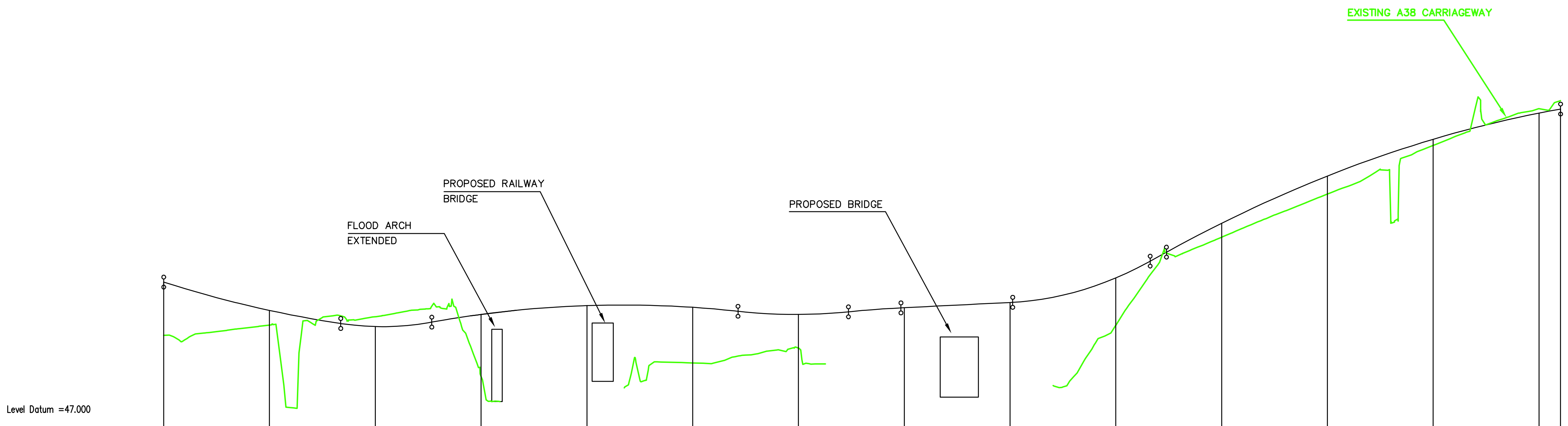

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300.000	57.839	51.961
400.000	58.676	-999.000
500.000	58.513	53.252
600.000	57.840	54.654
700.000	58.474	-999.000
800.000	58.974	-999.000
900.000	61.303	56.810
1000.000	66.464	65.151
1100.000	70.943	69.236
1200.000	74.421	73.842
1300.000	76.900	77.311
1320.364	77.282	78.088

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NOTES

1. Little topographical data available so high risk of variance in earthwork volumes.
2. All side slopes were modeled at 1:2 - it should be noted these are more likely to be 1:2.5 (or 1:3 in flood palin).

PRELIMINARY

Rev #	Revision Details						
1	Additional text added, and drawing re-numbered.						
	SB	15/07/15	GJS	15/07/15	AW	16/07/15	
0	DRAFT ISSUE						
	SB	09/07/15					
	Drawn By	Date	Checked By	Date	Approved By	Date	

Job Title

A38 DERBY JUNCTIONS IMPROVEMENTS

Drawing Title

LITTLE EATON JUNCTION OPTION 2 PLAN AND SECTION

AECOM Internal Project Number: 47071319
Zone / Mileage:
Suitability:
Designed: | Drawn: SB | Stage 1 check: GJS | Stage 2 check: | Approved: AW
Scale at A1: 1:2500 | Originated: | Date:

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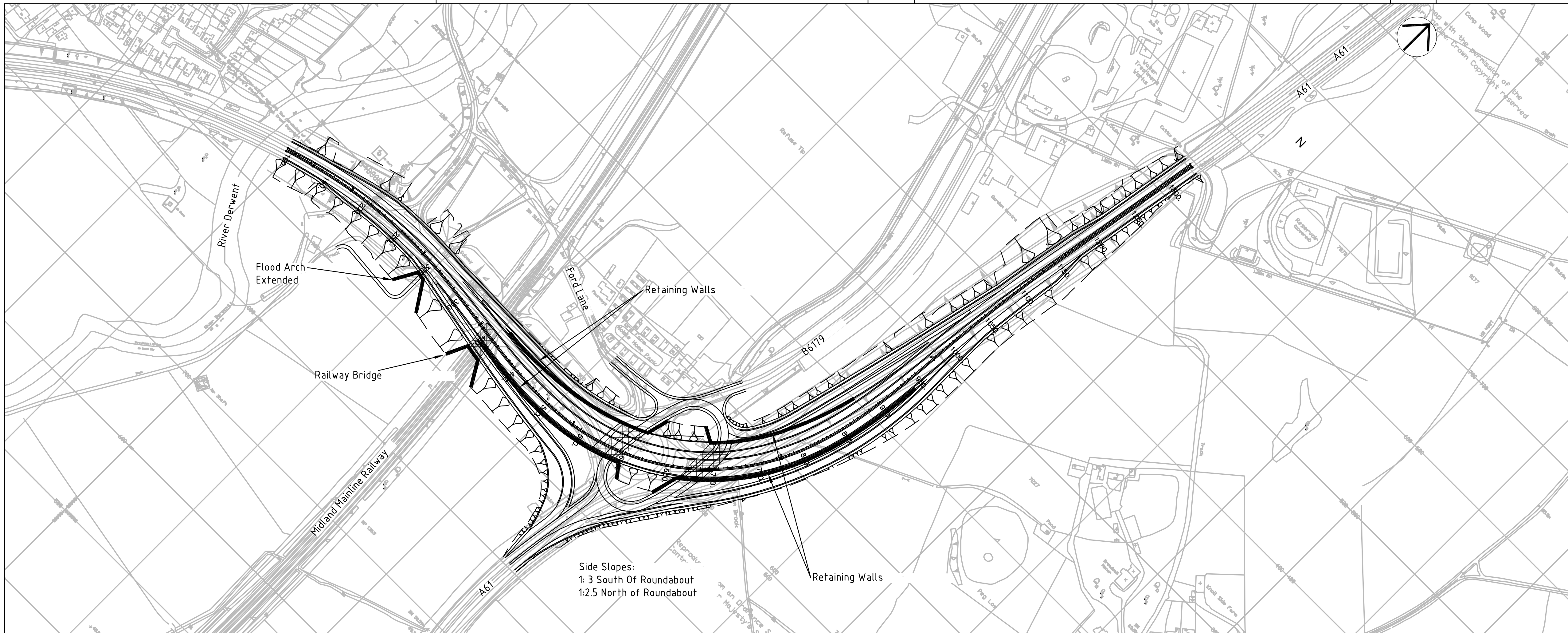
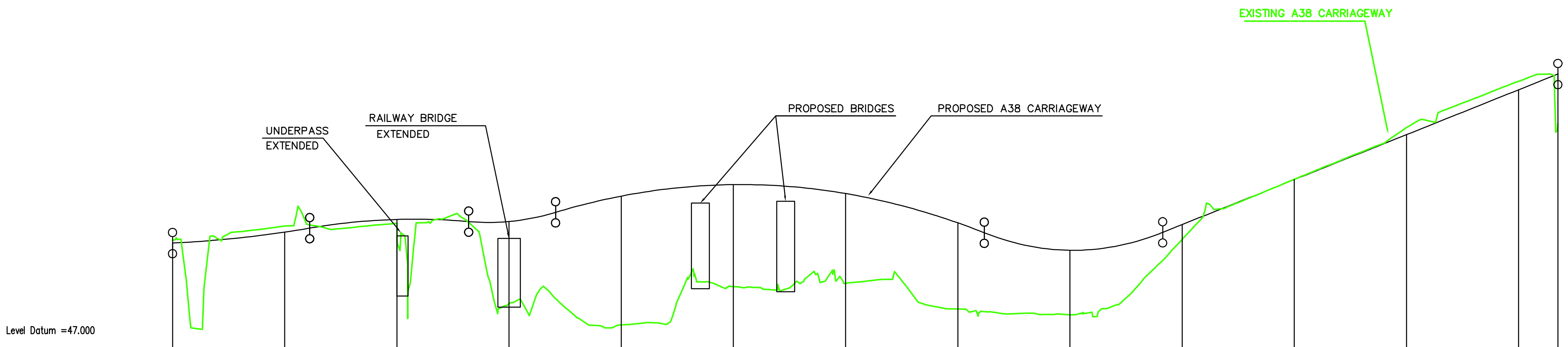
Drawing Number
HA514503-URS-06-DR-GD-25-024-1D

Plot Date: 16/07/2015 2:40 PM By Stephen Boyack
Attached Xrefs: | OPTION 7 LAYOUT JULY 15 DBYVa





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PROPOSED A38	56.627	57.605	58.730	58.551	60.808	61.832	61.039	58.427	55.984	58.276	62.276	66.276	70.276	71.676
EXISTING GROUND LEVELS	56.895	58.133	58.386	51.232	49.347	52.752	53.048	50.771	50.252	56.952	62.299	66.907	71.030	67.242

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NOTES

PRELIMINARY

Rev #	Revision Details	Drawn By	Date	Checked By	Date	Approved By	Date
1	Additional text added, and drawing re-numbered.	SB	15/07/15	GJS	15/07/15	AW	16/07/15
0	DRAFT ISSUE	SB	09/07/15				
D	DRAFT						

Job Title

A38 DERBY JUNCTIONS IMPROVEMENTS

Drawing Title

LITTLE EATON JUNCTION OPTION 3a PLAN AND SECTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
AP	SB	GJS		AW

Scale at A1	Originated	Date
1:2500		

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Drawing Number

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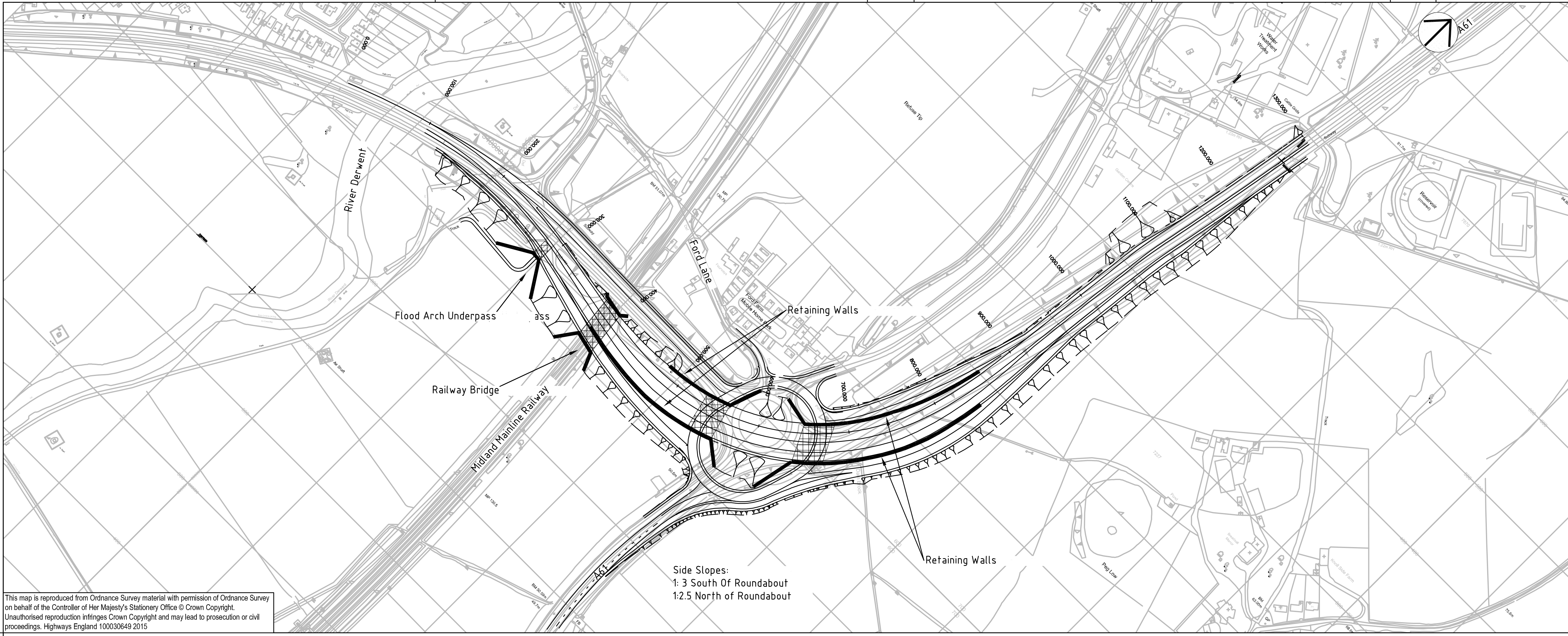
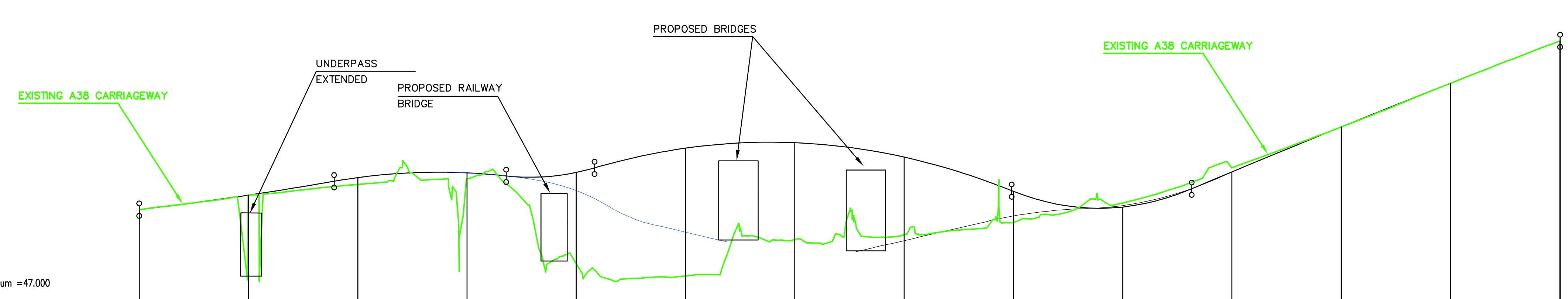
DB1Va





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PROPOSED A38	55.578	56.908	58.510	58.951	58.978	61.202	61.702	60.384	57.248	55.815	59.035	63.151	67.143	71.024
EXISTING GROUND LEVELS	55.578	56.908	57.885	58.394	50.637	49.510	52.853	53.280	54.402	56.183	59.414	63.133	67.138	71.025

SOUTHBOUND SLIP ON: 59.008

SOUTHBOUND SLIP OFF: 51.696, 59.035

HORIZONTAL: R=794.098m L=94.714m | A=43560.000 L=66.145m | R=360.0m L=28.141m | A=61920.000 L=172.000m | A=30855.000 L=121.000m | R=−255.000m L=270.942m | A=43860.000 L=172.000m | L=140.721m | R=510.000m L=45.270m | R=−5451.291m L=189.438m

VERTICAL: R=31114.708m L=178.372m | L=157.435m R=−5500.000m | R=2000.000m L=80.869m | L=381.672m R=−5500.000m | R=2000.000m L=164.810m | L=337.213m R=−80099.266m

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PRELIMINARY

Rev #	Revision Details	Drawn By	Date	Checked By	Date	Approved By	Date
1	Additional text added, and drawing re-numbered.	SB	15/07/15	GJS	15/07/15	AW	16/07/15
0	DRAFT ISSUE	SB	09/07/15				
D	DRAFT						

Job Title

A38
DERBY JUNCTIONS
IMPROVEMENTS

Drawing Title

LITTLE EATON JUNCTION
'SOUTHERN SWEEP' OPTION
PLAN AND SECTION

AECOM Internal Project Number	Zone / Mileage	Suitability
47071319		

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
SB	SB	GJS		AW

Scale at A1	Originated	Date
1:2500		

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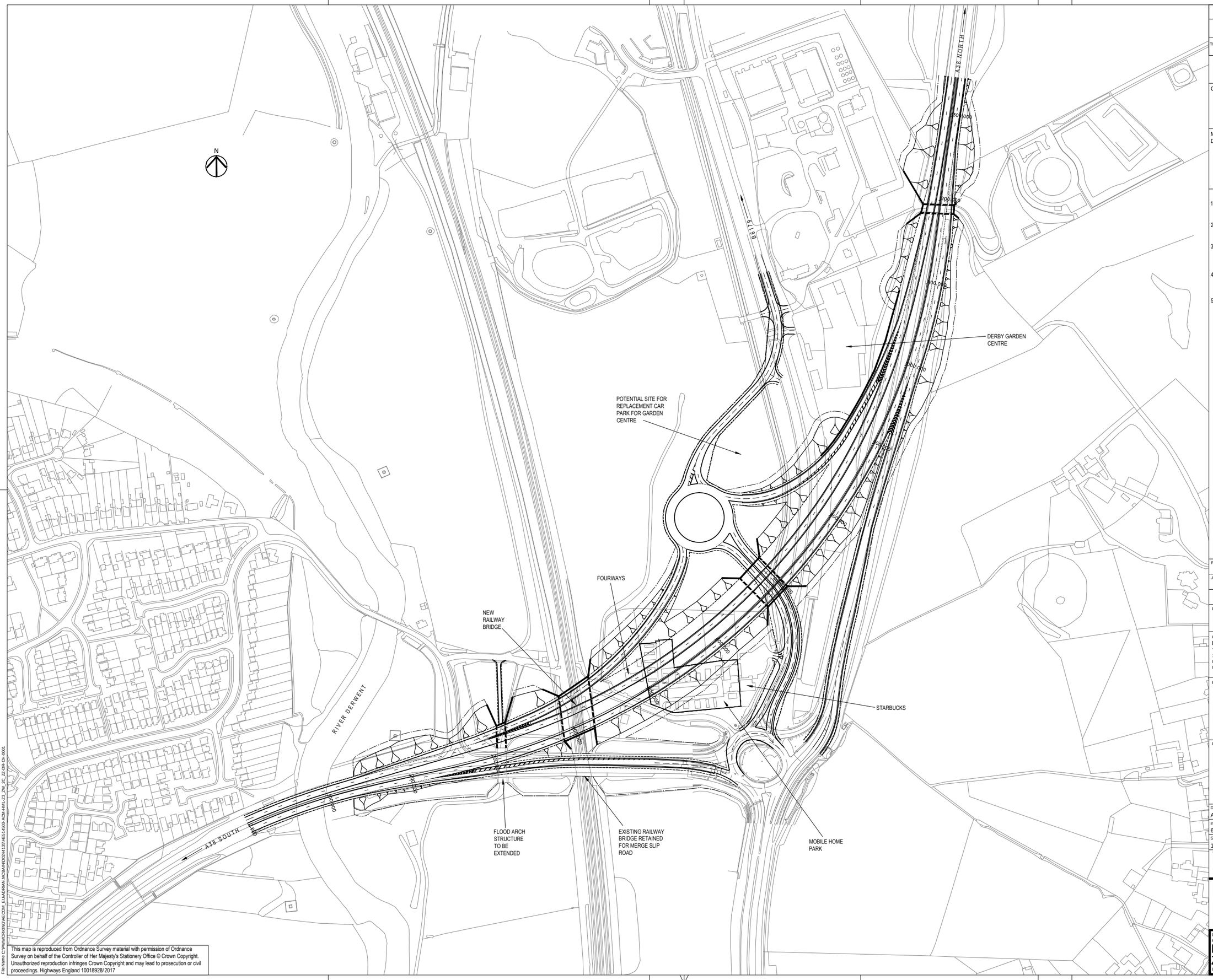
Drawing Number

HA514503-URS-06-DR-GD-25-026-1D

Appendix 5

Little Eaton – option 2C (2017)



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3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.
5. THE JUNCTION POSITION AND LAYOUT SHOWN IS SUBJECT TO DISCUSSIONS WITH AND APPROVAL FROM THE RELEVANT AUTHORITIES. THE CONTENT OF THIS DRAWING SHALL THEREFORE NOT BE RELIED UPON UNTIL SUCH APPROVAL HAS BEEN GRANTED.

Revision Details	By / Check	Date	Suffix
First Issue	AMCB / AW	31/01/17	P01
Annotation notes added.	AMCB / AW	03/02/17	P02

Purpose of issue

FOR INFORMATION

Client
Highways England
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Working on behalf of highways england

Project Title

A38
DERBY JUNCTIONS

Drawing Title

LITTLE EATON
OPTION 2C
GENERAL LAYOUT
PLAN

Designed	Drawn	Checked	Approved	Date
AMCB	AMCB	GS	AW	03/02/17

Internal Project No.	Suitability
60533462	S2
Scale @ A1	Zone
1:2000	A38/A61 Little Eaton

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Drawing Number			Rev
Highways England PIN / Location	Originator	Volume / Type / Role / Number	
HE514503 Z3_ZW_2C_ZZ	-ACM	-HML -DR-CH-0001	P02

Plot Date : 06 February 2017 13:54:29
File Name C:\PWWORKING\AECOM_EU\ADRIAN.MCBAIN\D0244139\HE514503-ACM-HML-Z3_ZW_2C_ZZ-DR-CH-0001

Appendix 6

Option 2C assessment summary

(NOTE: any reference to dates in the extract were valid when the Assessment Report was written in February 2017)

1 EXECUTIVE SUMMARY

1.1 General

1.1.1 The current proposals (the presented option) for the Little Eaton junction improvement provides full grade separation (two level) of the junction, with the A38 realigned to the south of the existing roundabout. This option avoids any impact on "Fourways", the mobile home park, Starbucks and the garden centre. However, the resulting alignment means that it lies to the south and east of the current dual carriageway and as a consequence is closer to the village of Breadsall to the east but further from Allestree to the west.

1.1.2 A meeting took place on 19th January 2017 with the Minister, John Hayes MP.

1.1.3 The meeting concluded that the presented option has an adverse impact on the residents of Breadsall village – this further assessment considers options that would reduce this impact.

1.1.4 Option 2C has now been developed removing the mobile home park and other buildings as a design constraint and has been assessed against the presented option in this report. The assessment is summarised as follows.

1.2 Engineering Assessment

1.2.1 The assessment indicates that both the presented option and option 2C are feasible options in engineering terms. The various engineering aspects compare as follows:

- Horizontal alignment – option 2C would perform better as it would be designed to full 120kph design speed with no Departures from Standard on the main line – it would operate at the national Speed Limit. The presented option would be designed to 100kph and be subject to a 50mph advisory speed limit to mitigate the Departures from Standards.
- Slip roads – both options would require sub-standard slip road merge and diverge tapers due to the need to avoid any impact on the River Derwent bridge and to minimise impacts on the Severn Trent Water underpass. The sub-standard elements would result in shorter merge/diverge tapers and nose lengths.
- Compared to the presented option, option 2C would require significantly greater works to Statutory Undertaker's equipment. This has been recognised in the cost estimate for the option.
- In comparison to the presented option, option 2C would simplify the junction construction. It is anticipated that the construction programme for the junction would shorten by several months and traffic disruption would be slightly reduced as retaining the existing roundabout would simplify traffic management where the A38 meets the A61. The construction sequence would also enable replacement car parking to be provided for the Derby Garden Centre and Starbucks prior to taking the existing land.

1.3 Traffic Assessment

1.3.1 The traffic forecasts for option 2C were prepared using the same trip demands that were assigned to the presented option. The initial junction design was reviewed against the forecasts. This led to the B6179 link road between the dumbbell roundabouts being increased to a dual carriageway to accommodate the forecast traffic flows.

1.3.2 In the wider sense, the traffic forecasts and resulting traffic performance were similar to those for the presented option – i.e. option 2C performed as effectively as the presented option.

1.3.3 The traffic forecasts informed the economic assessment and the calculation of the scheme benefits described below.

1.4 Estimated Cost

1.4.1 The capital baseline for the overall project including the presented option is £201.6m.

1.4.2 The corresponding range estimate is £183.1m to £284.5m with a most likely out-turn of £223.5m (£208m plus £15.5m programme risk).

1.4.3 The estimated increase if option 2C was taken forward is £18.7m to £32.4m with a most likely increase of £24.5m. Further details are shown in the table below.

Option	Minimum estimated out turn cost	Most Likely estimated out turn cost	Maximum estimated out turn cost
Whole scheme incl. presented option	£183.1m	£223.5m	£284.6m
Whole scheme incl.option 2C	£201.8m	£248.0m	£317.0m
Variance	£18.7m	£24.5m	£32.4m

1.4.4 The design layout only contributes a small proportion of this variance with the option 2C being approximately £2.1m greater than the presented option. Significant contributors to the variance are Lands costs at +£12.3m, uncertainty around the impact of statutory undertakers' plant on the new alignment at +£4.6m and Non-Recoverable VAT at +£3.8m.

1.4.5 The cost estimate was developed by the project team to provide an indication of the expected out-turn costs and to inform an initial economic assessment of the design option to demonstrate the likely value for money. A full commercial estimate would be required to ascertain the true increase in costs.

1.5 Economic Assessment

1.5.1 The economic assessment of option 2C has been undertaken on the same basis and using the same parameters as for the presented option.

1.5.2 The initial assessment indicates that the overall scheme, including option 2C, would achieve:

- Present Value of Benefits of £449 million;
- Present Value of Costs of £189 million.

1.5.3 Compared to the presented option, this is an increase in the Present Value of Benefits of £30m, but also an increase in the Present Value of Costs of £18m.

1.5.4 On this basis, the overall scheme with option 2C could achieve a BCR of 2.38, compared with 2.45 for the presented option. This still indicates high value for money.

1.6 Environmental Assessment

1.6.1 A qualitative comparison of the potential environmental effects associated with the presented option and option 2C has been undertaken as follows:

- Air Quality – both options have no significant impacts
- Cultural Heritage – option 2C would introduce a risk of objection from statutory consultees
- Landscape – impacts of 2C slightly less than presented option
- Visual – presented option would have moderate adverse effects on Breadsall village (reducing to minor after 15 years). Option 2C would have minor effects from the outset.
- Nature Conservation – both options would have non-significant effects after mitigation
- Geology & Soils – mitigation of effects would be technically challenging for option 2C
- Materials – Slightly worse effects for option 2C due to need to manage potentially contaminated material from the former landfill
- Noise & Vibration – both options would have similar effects
- People & Communities – option 2C would have a moderate to major adverse effect due to loss of properties and businesses although provision of a new location for the mobile home park and an alternative car park for the Derby Garden Centre would potentially reduce residual adverse effects upon these receptors to neutral in the long term.
- Water Quality & Drainage – both options would have a similar impact
- Flood Risk – option 2C has a greater risk of objection from the Environment Agency; any flood risk mitigation strategy is likely to be technically more complex and expensive than that needed for the presented option

1.6.2 The environmental assessment indicates that overall, the environmental effects associated with option 2C are worse than those as associated with the presented option. The key environmental issues relating to option 2C are:

- increased flood risks and the technical complexity of determining a workable mitigation strategy
- effects upon the private property which would need to be purchased to provide land for the scheme and residents who would need to be relocated
- managing contaminated materials in the former landfill site
- effects on the Derwent Valley Mills World Heritage Site (WHS).

1.6.3 Effects on private property would be partly mitigated through the provision of a new location for the mobile home park and an alternative car park for the Derby Garden Centre.

1.6.4 Option 2C would pass over land designated as green belt land. However much could be considered as 'brownfield' land due to the current uses. This compares with the presented option which would principally be constructed on designated green belt land which is principally agricultural land.

1.7 Constraints

1.7.1 The table below outlines the key constraints to the design of option 2C.

Constraint	Impact of option 2C	Potential mitigation
Derby Garden Centre	A38 main line and NB merge slip cross the car park on embankment	Provide retaining wall adjacent to merge slip to reduce footprint. Create new car park area on land between diverted and existing B6179 in advance of the main works.
Ford Farm Mobile Home Park	A38 main line footprint covers 80% of area of mobile home park	Fully managed relocation of the mobile homes and residents to a new site.
Fourways and Associated Recycling Business	A38 main line footprint cover the whole of the site	The property would be acquired either through negotiation or under the CPO process and the business may be extinguished. Appropriate compensation payments would be made.
Severn Trent Water Underpass	The verges of the revised A38 alignment fall outside the width of the existing structure.	The structure would require widening to accommodate the increased width of the road cross section. Refinements to the design should be explored (with additional Departures from Standards if required) where the new layout ties in to existing before the underpass.
Network Rail Infrastructure	A38 main line footprint crosses the Midland Mainline railway and a signalling equipment building	A new structure would be required for the railway – the span and headroom would need to be sufficient to be able to retain the building and accommodate future signalling and overhead line equipment.
Starbucks	A38 main line footprint covers all of the recent extension to the car park (approx. 30% of the available parking area)	Obtain land for replacement car parking on the west side of the Starbucks building (land currently occupied by part of the mobile home park expected to be available through negotiation).

1.8 Benefits and Impacts

1.8.1 The following table summarises the key benefits and impacts of the current presented option and option 2C.

	Benefits	Impacts
Presented option	The design option removes congestion by grade-separating the A38 and A61. Avoids the property and business impacts associated with option 2C. Lower impacts to existing statutory undertakers' equipment than other options. The overall scheme achieves high value for money.	Perceived impacts to Breadsall village are not supported by the formal assessments. The distance between the A38 and Breadsall village will be reduced by approximately 22%. For a typical property on the edge of the village this results in the A38 being approximately 320m away. There are short-term environmental impacts following construction which diminish over time, for example when the landscaping establishes. Complex traffic management is required for the construction of the new A38/A61 roundabout which will increase traffic disruption. Engineering difficulties associated with widening the existing embankments to avoid differential settlement. The A38 mainline requires lighting due to its constrained alignment. This increases the visual effects.
Option 2C	The design option removes congestion by grade-separating the A38 and A61. The route will be able to operate at 120kph without any Departures from Standard on the A38 mainline. Reduced construction duration and traffic disruption compared to the presented option. Reduced visual impacts as the route is further from sensitive receptors in Breadsall and the A38 would not require lighting. The overall scheme achieves high value for money.	There are major land impacts associated with acquiring the businesses, providing replacement car parks and relocating the mobile home park residents. Most likely estimated out turn cost increased by £24.5m with a 12 month delay to programme for time to fully assess the option. Engineering difficulties associated with managing construction within the existing landfill area. Increased impacts on the World Heritage Site principally due to the new railway bridge. The route passes through designated greenbelt, although much of the land could be considered brownfield. Increased effects to statutory undertaker's equipment at Ford Lane and the B6179. Flood risk mitigation is likely to be technically more complex and expensive than that needed for the presented option

1.9 Summary of Assessment

1.9.1 As a result of the initial feasibility assessment, option 2C would:

- Be viable in engineering terms.
- Achieve a BCR of 2.38, representing a high value for money scheme.
- Increase the environmental effects of the scheme.

- Increase most likely out-turn costs by approximately £24.5m. It is estimated that this increase could be up to £32.4m.
- Lead to a 12mth delay to the programme for time to fully assess the option.

1.9.2 Not all land required for option 2C could be obtained by CPO due to the Critchell Down rules. However, it is anticipated that the land could be largely obtained by agreement – albeit at a higher cost. HE, generally, will try not to acquire land by agreement due to the potential risks involved. Further legal investigation is required to determine what restrictions would be placed on the subsequent use or sale of any land obtained by agreement.

1.9.3 Any new location of the mobile home park would be subject to agreement with the planning authority and the moving process would need to be fully managed for many of the residents.

1.9.4 It is anticipated that the construction programme for option 2C would be several months shorter than for the presented option. This would not alter the construction duration for the whole scheme as this is driven by the improvements at Markeaton junction.

1.9.5 Option 2C has advantages over the presented option in terms of engineering design and perceived impacts on Breadsall village (in terms of noise, air quality and visual intrusion). It also reduces the impact on agricultural land within the designated green belt.

1.9.6 The main disadvantages of option 2C are the impacts on the property Fourways (and associated businesses) and the mobile home park; the impacts to the residents' community; and the increased scheme construction costs.

1.10 Next Steps

1.10.1 If option 2C is to be considered further, development should include:

- Production of a 3d engineering model of design.
- Undertaking full options stage assessments to provide a comparative assessment of option 2C on the same basis as the existing assessment of the presented option.
- Further exploration of the legal position in relation to the land required.
- Consideration to consulting key stakeholders and the public to minimise future risk at Development Consent Order stage.
- Explore a legal view on obtaining land by agreement and its restrictions for onward sale or use.

Appendix 7

How the scheme meets its objectives

How the proposed scheme meets the scheme objectives

How the proposed scheme could contribute to the achievement of RIS performance specification key performance indicators

How the Proposed Scheme Meets the objectives (from Highways England Client Scheme Requirements)

Criteria	Objective	Commentary
Economy	• To reduce delays and increase reliability of journeys on the strategic corridor. • Assist in bringing forward development and regeneration opportunities in the surrounding area and immediately adjacent to the scheme. • To minimise traffic disruption due to construction works and incidents. • To achieve optimal whole-life cost taking into account future maintenance, operation and disruption to users.	• The grade separation of the at-grade junctions would remove the need for strategic journeys to stop and remove conflicts between local traffic and strategic movements, thus improving capacity, journey times and journey reliability. • The proposed scheme has the potential to unlock current development proposals by relieving roads in Derby City. • The proposed scheme construction phase details are being developed, but would be designed in a manner that aims to minimise delays and incidents. • The proposed scheme seeks to minimise whole-life costs as well as future maintenance and operational requirements.
Environment	• To minimise impacts on both the natural and built environment, including designated landscape/ biodiversity features. • To seek to mitigate impacts on air quality or noise. • To ensure effective measures are in place to protect watercourses from pollutant spillage on the highway. • To investigate and to encourage the use of environmentally friendly operations and products throughout the project life cycle.	• The proposed scheme is being designed in accordance with the Design Manual for Roads and Bridges (DMRB) and other current relevant guidance in a manner that aims to minimise impacts on both the natural and built environment, including designated landscape/ biodiversity features. As reported within the EAR, environmental avoidance features have been incorporated into the proposed scheme design, whilst a range of impact mitigation measures are specified herein that aim to reduce environmental effects. • The proposed scheme effects upon air quality and noise during proposed scheme construction and operation are reported within the Environmental Assessment Report (EAR). The proposed scheme design aims to minimise air quality effects by seeking to reduce delays and smooth traffic flows, whilst the proposed scheme design may include a series of noise barriers (to be confirmed during the environmental assessment to support the DCO application). • The proposed scheme design includes measures to control and manage surface water runoff during operation, such that local watercourses would be protected from any pollutant spillages on the highway (e.g. the surface water drainage strategy would be designed and constructed in compliance with the DMRB guidance, incorporation sustainable drainage systems (SUDs) as applicable • The proposed scheme design considers measures to reduce environmental effects as associated with materials and resources, as well as the management of waste in accordance with the waste hierarchy (e.g. material excavated from Kingsway and Markeaton junctions would be reused at Little Eaton junction where possible)
Society	• To improve the safety for all road users. • To manage the safety for road workers in accordance with the requirements of GD04/12 – Standard for the Safety Risk Assessment on the Strategic Road Network and the Health and Safety at Work 1974 Act to be So Far As Is Reasonably Practicable (SFAIRP). • To improve safety for residents in the vicinity of the junctions. • To facilitate integration with other transport modes where	• The proposed scheme would improve the safety for all road users as grade separation would remove the accident clusters that occur at the existing at-grade roundabouts and rationalise pedestrian and cyclist crossings. • The proposed scheme design takes into account the safety of road workers e.g. proposed scheme design includes a central reserve concrete barrier which would greatly reduce the number of unplanned maintenance interventions that a steel barrier would require. • The proposed scheme design would improve safety for residents in the vicinity of the junctions through improved pedestrian and cyclist facilities and separating trunk road movements from local traffic movements. There would also be large safety benefits from taking traffic off Derby City and Derbyshire

Criteria	Objective	Commentary
	applicable. • To ensure a consistent high standard of signing relating to the junctions. • To reduce severance by maintaining or providing appropriate facilities for crossing, and travelling along the route for pedestrians and cyclists	county maintained roads onto the safer strategic route. • The proposed scheme would improve the reliability and journey times of local bus services. • The proposed scheme design includes a consistent high standard of signing. • The proposed scheme design includes a range of features that aim to reduce severance by rationalising and improving pedestrian and cyclist facilities for crossing and travelling along the route.
Public Accounts	• To be affordable and represent High Value for Money according to Department for Transport (DfT) appraisal criteria.	• The proposed scheme design has been developed in a manner such that it is affordable and would deliver High Value for Money according to DfT appraisal criteria.
Scheme Specific Objectives	• Improve integration by supporting the local transport plan. • Facilitate regional development and growth in Derby City and its surrounding areas and increase capacity of the strategic road network to absorb growth.	• The proposed scheme design is supported by local transport plans and sympathetic to other transportation modes. • The proposed scheme design takes into account planned development and growth in Derby City and its surrounding areas and would increase headroom capacity on both the strategic road network and on local roads. The proposed scheme design takes into account projected growth in traffic due to development proposals for 15 years after opening.

Summary of Road Investment Strategy (2015 - 2020) Performance Specification Key Performance Indicators and Proposed Scheme Contribution

Key performance indicator		Highways England target	Project contribution – qualitative	Project contribution - quantitative
The number of killed or serious injuries (KSIs) on the strategic road network (SRN).	☐	Ongoing reduction in network KSIs to support a decrease of at least 40% by the end of 2020 against the 2005–2009 average baseline.	The scheme will mitigate conflicts between motorised and non-motorised movements and improve safety for pedestrians and cyclists. The segregation of the junctions will also mitigate conflicts between local and strategic traffic and reduce queuing at the roundabouts, which is likely to improve safety for road users.	A total of 10 Killed and seriously injured (KSI) incidents and 12 KSI casualties were recorded at the three junctions over a five years period. The incident data indicates that no fatal incidents occurred over the period analysed. Results indicate that the scheme will reduce the number of personal injury accidents (PIA) across the modelled area by 2,387, with a reduction of 3,180 casualties, including 5 fatal casualties over a 60 years period. (PIA figures also include the large number of slight injuries that KSIs don't include)
Network availability: the percentage of the SRN available to traffic.	☐	Maximise lane availability so that it does not fall below 97% in any one rolling year.	The scheme construction strategy is under review and is aimed at minimising the impact of roadworks. The scheme will also improve journey time reliability and consideration will be given to the provision of enhanced traffic information features as per Expressways standards. The grade separated junctions will allow for free flows along the A38, which will improve Emergency Services access to incidents on the SRN.	
Incident management: percentage of motorway incidents cleared within one hour.	☒	At least 85% of all motorway lane impact closures between 06.00 and 22.00 are cleared within one hour.	N/A not a motorway	
Encouraging economic growth: average delay (time lost per vehicle per mile).	☐	No target – act in way that should minimise delay as far as possible.	Queuing occurs regularly on the A38 arms of the Kingsway, Markeaton and Little Eaton junctions in the AM and PM peaks. The delays continue frequently into the Inter peak periods and also during the lunchtime Saturday	The proposed scheme results in time savings for Commuting and Other users of 1,051,000 person-hours in the opening year.

Key performance indicator		Highways England target	Project contribution – qualitative	Project contribution - quantitative
			peak. The scheme will provide free flow traffic along the A38 corridor and, through separating strategic and local traffic movements, it will also reduce queuing on the roundabouts. Traffic modelling results indicate that the scheme will provide journey time saving in the peak hours of up to 9 minutes. The scheme will also reduce delays during the inter-peak and off-peak hours.	The Value of journey time savings is £226M.
Number of noise important areas mitigated.	☐	Noise: mitigate at least 1,150 noise important areas over roads period 1.	The length of the A38 affected by the scheme contains 6 noise important areas and mitigation will be considered as feasible to minimise the scheme impact on them. The proposed scheme includes low-noise surfacing.	No residential buildings are predicted to experience daytime traffic noise levels >80 dB LAeq,16h (facade). A total of 65 residential buildings are preliminarily identified as potentially qualifying under the Noise Insulation Regulations.
The percentage of pavement asset that does not require further investigation for possible maintenance.	☒	Percentage of the network requiring no further investigation to be maintained at 95% or above.	N/A construction due to complete 2024/25	
Cost savings: savings on capital expenditure.	☐	Cost savings: total savings of at least £1.212 billion over roads period 1 on capital expenditure.		£12.8m of efficiencies have been identified for the scheme so far. This has been fed into the cost estimate, which has reduced by around £7m.
Delivery Plan progress: progress of work, relative to forecasts set out in the *Delivery Plan*, and annual updates to that plan, and expectations at the start of road period 1.	☐	Meet or exceed forecasts.	Approval will help support achievement of revised delivery targets of open for traffic in 2024/25	

Key performance indicator		Highways England target	Project contribution – qualitative	Project contribution - quantitative
Cyclists, walkers and other vulnerable users - the number of new or upgraded crossings.	☐	No target set.	The pedestrian and cyclist facilities included in the proposed scheme design aim to provide at least the level of pedestrian and cyclist provision that exists at present with enhanced provisions where deemed appropriate and reasonable. The assessment presented herein indicates that the proposed pedestrian and cyclist facilities will generate a moderate beneficial effect with regard to encouraging more pedestrian and cyclist facility use due to improved amenity/ convenience and/ or perception of safety	A footbridge over the A38 is also to be replaced as part of the scheme. Safe crossings are to be provided at the three junctions. A footbridge over the A38 will also be provided to provide safe access to Markeaton Park. The crossings and the new footbridge will be Equality Act 2010 compliant.
Delivery of improved biodiversity, as set out in our '*Biodiversity action plan'*.	☐	The company should publish its *Biodiversity Action Plan* by 30 June 2015 and report annually on how it has delivered against the plan to reduce net biodiversity loss on an ongoing annual basis.	Flood risk assessments have been completed to determine the need for flood compensation areas and the impact of building the scheme in the floodplain, potential compensation areas have been identified. Any detrimental environmental effects of the scheme shall be offset by mitigation measures where technically feasible and economic to do so. An application for designated funds has been completed for additional improvements to ecological mitigation; this is expected to be reviewed in October 2016.	
The percentage of *National Road Users' Satisfaction Survey* respondents who are 'very' or 'fairly satisfied'.	☒	Achieve a score of 90% by 31 March 2017 and then maintain or improve it.	N/A scheme not to start construction until late in 2020/21.	