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Statement

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A38 Derby Junctions

**Maintenance and Repair Strategy Statement
PCF Stage 3**

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EXECUTIVE SUMMARY

Introduction

This Maintenance and Repair Strategy Statement (MRSS) provides a strategy and guidance for the post implementation maintenance and repair of the A38 Derby Junctions Improvement Scheme. To develop this strategy, consultation is taking place with relevant organisations and to appropriate standards to meet ensuring the scheme has been designed for maintenance. This has been achieved by:

- Complying with the Construction (Design and Management) (CDM) Regulations 2015, and applying IAN 69/15 “Designing for Maintenance”.
- Consulting maintenance service providers (MSPs) to determine various design issues including:
 - The existing road lighting asset details and as-built drawings;
 - Information regarding local equipment preferences;
 - Existing network issues (and mitigations thereof);
 - Agreeing safe means of accessing assets for maintenance and appropriate traffic management measures¹;
- Keeping maintainers apprised of the design as it develops and contributing to the final design proposal;
- Taking into account the risk based approach to defining inspection and maintenance requirements as defined in the Asset Maintenance and Operational Requirements (AMOR)².

The scheme must also consider the need for asset renewal to be included within scheme works. These issues will be fully identified, confirmed and documented during detailed design. Surveys into the condition of various assets are on-going.

Meeting the Road Worker (Maintenance) Safety Objective

To meet the road worker safety objective and Health and Safety (H&S) legislative requirements for road workers, the Scheme has incorporated a design for safe traffic management deployment (described above), rigid concrete barrier (RCB) and recommends cyclical off peak lane closures to further rationalise maintenance activities

The safety assessment work that has been undertaken suggests that, provided the proposed mitigation measures are implemented, the safety objective for maintenance workers is likely to be met and is documented in the Safety Plan, and Combined Safety and Hazard Log report.

Key Measures to Facilitate Maintenance

The substantive measures that are intended to minimise frequency of interventions, once construction is complete and the road is operational, are as follows:

- It is possible to close down either the nearside or offside lane for maintenance while keeping open the remaining lanes rather than implementing a full road closure.

¹ This is still needed to be checked and agreed with the Area 7 before submitting the detailed design

² It is still needed to review the MRP (Maintenance Response Plan) to make it compatible with the present MRSS

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- Provision of a rigid concrete barrier in the central reserve will reduce the requirement for maintenance interventions following a collision hence it will reduce the exposure of road workers to risk.

The substantive measures that minimise safety risks, once construction is complete and the road is operational are:

- The parallel shared footway/cycleway adjacent to the southbound carriageway will help to reduce road worker exposure.

Summary

This MRSS document evidences that the scheme can be maintained in a safe and cost-effective manner.

This document allows service providers to plan ahead and create suitable revised access and Maintenance Plans that take account of the scheme design.

Appendix A of the MRSS includes answers to the key questions set out in the PCF template.

Further updates

This Maintenance and Repair Strategy Statement is a live document and represents the thinking current at Stage 3 Preliminary Design. Any further developments that may result as the design develops will be incorporated into subsequent revisions of this document as the scheme progresses to handover to EMAD.

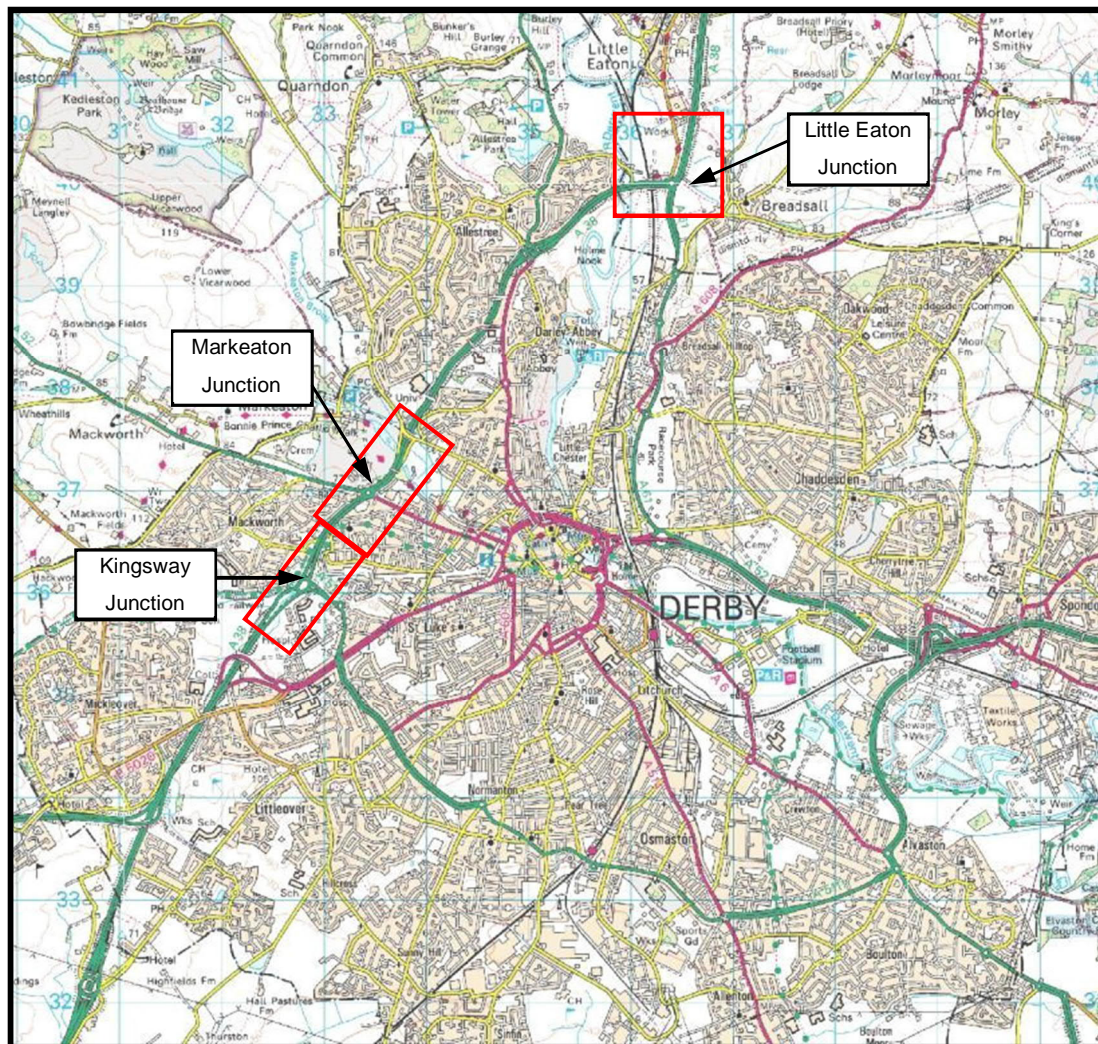
1 INTRODUCTION

1.1 The A38 Derby Junctions Improvement Scheme background

1.1.1 The A38 is the strategic route from Birmingham to Derby and through to the M1 at Junction 28. The carriageway carries significant volumes of north-south long distance traffic. The location 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 three at-grade roundabout junctions, to the west and north of Derby City Centre. The three junctions are listed below:

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

Figure 1-1 Shows the location of the scheme



1.1.2 The main objective of the project is to minimise the traffic delays that occur at the Kingsway, Markeaton and Little Eaton roundabouts around Derby. These roundabouts are the only at-grade junctions on the A38 between the M1 at junction 28 and Lichfield to the south. The main purposes of the scheme are to:

- improve road safety
- decrease congestion
- increase capacity
- improve journey time reliability
- support local regeneration and development plans

1.1.3 In June 2013, the Government announced a programme of improvements to the national road network. A38 Derby Junctions was included in the SR13 programme, subject to value for money and deliverability.

1.1.4 The A38 Derby Junctions Scheme proposals were previously developed for the Highways Agency by Scott Wilson, under a number of separate PSF Task Orders. This work developed the Scheme from the options identified in the Road-Based Study (Faber Maunsell, 2002). The Scheme achieved SGAR1 in March 2009 before being placed on hold.

1.1.5 In July 2014, AECOM was appointed by the Highways Agency to update the scheme and progress it through a combined PCF Stage 1/ 2 to reach SGAR 2.

1.1.6 The scheme is currently being developed by AECOM to Preliminary Design for PCF Stage 3 which commenced in January 2017.

1.2 Purpose and Objectives of this Report

1.2.1 The purpose of this document is to outline key design assumptions and requirements on how maintenance of the A38 Derby Junctions Scheme could be carried out during its lifetime and the likely effect on network availability and safety issues for road users and operatives.

1.2.2 Through the drafting of this report the aim is to ensure that:

- design for maintenance is considered in the design of the road, roadside structures and associated infrastructure so that maintenance can be carried out safely; and
- future maintenance interventions where road workers are at risk are minimised.

1.2.3 The MRSS describes the maintenance philosophy for the A38 Derby Junctions Improvement Scheme. In accordance with the guidance contained in IAN 69/15, only those maintenance tasks that are not obvious or are of a high risk nature have been considered. The report therefore focuses on the key design features relating to maintenance activities which:

- Must be undertaken in a particular manner;
- Do not have an obvious approach;

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- Are potentially hazardous to those undertaking the work or others who may be affected by it; and,
 - Require a disciplined approach.
- 1.2.4 In addition to the fulfilment of the Designer responsibilities in terms of Construction Design Management (CDM) 2015, this report has also been completed to fulfil HE's Project Control Framework (PCF) product requirements.
- 1.2.5 A number of potential maintenance hazards are likely to be identified and recorded in the Project CDM Designer's Hazard Assessment and Reduction (DHAR) Schedule. Some of these hazards will however be mitigated during the detailed design stage, residual risks will be passed on to EMAD.
- 1.2.6 The MRSS will be used to support the handover of this Scheme and contributes to meeting the requirements of the CDM Regulations, IAN 105/08 and IAN 69/15 – Designing for Maintenance.
- 1.2.7 For further background, generic information on the Scheme, please refer to HE's Client Scheme Requirements PCF product, which details the following:
- Description and location;
 - Challenges, issues and constraints;
 - Objectives;
 - Programme timescales;
 - Contact details of project team.
- 1.2.8 The procedures and operational arrangements for winter maintenance will also be impacted by the scheme. Further details are provided in Section 8.
- 1.2.9 For a list of acronyms and abbreviations used in this document, refer to Appendix B.
- 1.3 Scheme Impacts**
- 1.3.1 As well as changes to junction arrangements, earthworks, retaining walls, road restraint systems and drainage, the implementation of the scheme will introduce additional assets to the existing infrastructure including overhead gantries, fixed signing, road markings, new bridge structures and a pumping station.
- 1.3.2 This report describes the maintenance philosophy relating to the new assets that will be introduced as a part of the scheme and also to those existing maintenance regimes that may be affected by the introduction of the Scheme.
- 1.4 Existing Situation**
- 1.4.1 The maintenance of the existing A38 is currently carried out by the HE EMAD.
- 1.4.2 The input of EMAD into the proposed maintenance strategy for this improvement scheme has been, and will continue to be, sought through the design development and construction phases.
- 1.4.3 The existing technology assets in Area 7 are already maintained by Area 9 Regional Technology Maintenance Contractor (RTMC), however, they currently do not have any assets within the scheme extents to maintain.

1.5 Stakeholder Consultation

- 1.5.1 Appropriate stakeholder consultation has taken place throughout the development of the outline design; the current Asset Led Delivery Model (ALDM) Area 7 HE. Further consultations are going to be held during this SGAR 3 to SGAR 5 stage to ensure the maintainer has been given the opportunity to review and influence the detailed design as well as being informed of new changes and/or new assets to be incorporated into the scheme.
- 1.5.2 Details of stakeholder engagement undertaken can be found in Section 13.

1.6 Overseeing Organisations

- 1.6.1 Highways England is a Government owned company and is responsible for operating, maintaining and modernising the strategic road network in England in the interests of customers. The contact details for Highways England are:

Highways England Company Ltd
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

2 KEY MAINTENANCE ISSUES

2.1 Existing Maintenance Tasks

2.1.1 The maintenance tasks that are required on the existing section of the A38 are as set out in Appendix C. HE and their MSPs have undertaken this work for many years. The existing maintenance tasks will still apply once the scheme is in operation.

2.2 Proposed and existing assets

2.2.1 The grade separation of the three junctions and associated works will introduce new arrangements which will replace much of the existing infrastructure. The proposed and existing assets are identified in Table 1.

Table 1 Proposed and existing assets

Asset Type	Junction	Description	New/existing
Highways	Kingsway	Flexible pavement on mainline (northbound & southbound), Ch. 1000 to 2200	New
Highways	Kingsway	Surface water drainage – pipes, drainage, outfalls, other, etc., Ch. 1000 to 2200	New
Highways	Kingsway	Flexible pavement on slip roads at junction, northbound & southbound merges and diverges	New
Highways	Kingsway	West dumbbell roundabout	New
Highways	Kingsway	East dumbbell roundabout	New
Highways	Kingsway	Highway drainage water access – west & east dumbbell roundabouts	New
Highways	Kingsway	Kingsway junction over-bridge, Ch. 1650	New
Structure	Kingsway	Central reserve RCB, Ch. 710 to 2200	New
Structure	Kingsway	Southbound overhead gantry, Ch. 1850	New
Structure	Kingsway	Southbound overhead gantry, Ch. 2080	New
Structure	Kingsway	Overhead gantry, Ch. 2350	New
Structure	Kingsway	Northbound overhead gantry, Ch. 2500	New
Structure	Kingsway	Bramble Brook culvert no. 1, Ch. 1300, to be extended	Existing
Structure	Kingsway	Bramble Brook culvert no. 2, Ch. 1680, to be extended	Existing
Structure	Kingsway	Highway drainage attenuation ponds, between carriageway and northbound diverge	New
Structure	Kingsway	Retaining wall, east dumbbell, Ch. 1600 to 1650	New

Structure	Kingsway	Brackendale Ave west under-bridge, Ch. 1980, to be widened	Existing
Structure	Kingsway	Brackendale Ave east under-bridge, Ch. 1980, to be widened	Existing
Highways	Markeaton	Flexible pavement on mainline (northbound & southbound), Ch. 2200 to 3400	New
Highways	Markeaton	Surface water drainage – pipes, drainage, outfalls, other, etc., Ch. 2200 to 3400	New
Highways	Markeaton	Flexible pavement on slip roads at junction, northbound & southbound merges and diverges	New
Highways	Markeaton	Flexible pavement on Kedleston Road northbound diverge and southbound merge	New
Structure	Markeaton	Central reserve rigid concrete barrier (RCB), Ch. 2200 to 3400	New
Structure	Markeaton	Southbound overhead gantry, Ch. 2895	New
Structure	Markeaton	Overhead gantry, Ch. 3260	New
Structure	Markeaton	Overhead gantry, Ch. 3360	New
Structure	Markeaton	Windmill Hill Lane retaining wall, Ch. 2340 to 2360	Existing
Structure	Markeaton	Southeast slip road retaining wall, Ch. 2380 to 2530	New
Structure	Markeaton	Southwest slip road retaining wall, Ch. 2300 to 2530	New
Structure	Markeaton	Southwest to northwest retaining wall, Ch. 2500 to 2930	New
Structure	Markeaton	Southeast to northeast retaining wall, Ch. 2590 to 3010	New
Structure	Markeaton	Underground water attenuation, northeast of junction	New
Structure	Markeaton	Markeaton Park footbridge, Ch. 3140	New
Structure	Markeaton	South bridge, Ch. 2770	New
Structure	Markeaton	North bridge, Ch. 2820	New
Technology	Markeaton	Pumping station, Ch. 2860	New
Highways	Little Eaton	Flexible pavement on mainline (northbound & southbound), Ch. 6800 to 8100	New
Highways	Little Eaton	Surface water drainage – pipes, drainage, outfalls, other, etc., Ch. 6800 to 8100	New
Highways	Little Eaton	Flexible pavement on slip roads at junction,	New

		northbound & southbound merges and diverges	
Structure	Little Eaton	Central reserve rigid concrete barrier (RCB), Ch. 6800 to 8100	New
Structure	Little Eaton	Flood arch, Ch. 7000, to be extended	Existing
Structure	Little Eaton	No. 11B railway bridge, Midland railway mainline, to be extended	Existing
Structure	Little Eaton	Northwest retaining wall, Ch. 7160 to 7300	New
Structure	Little Eaton	Southwest retaining wall, Ch. 7170 to 7300	New
Structure	Little Eaton	Southbridge, Ch. 7300	New
Structure	Little Eaton	Northbridge, Ch. 7300	New
Structure	Little Eaton	Northeast retaining wall, Ch. 7320 to 7440	New
Structure	Little Eaton	Southeast retaining wall, Ch. 7320 to 7440	New
Structure	Little Eaton	Surface water attenuation ponds, northeast of junction	New
	Little Eaton	Dam Brook, diversion northeast of junction	Existing

2.3 Current Proposed Maintenance Tasks

2.3.1 The following key new pieces of equipment identified to be maintained include:

- new sign gantries;
- additional bridge and retaining structures;
- surface water drainage attenuation ponds and;
- surface water drainage pumping station.
- Noise barriers

2.3.2 Many of the above items will only be carried out during off-peak times with Lane Closures and traffic management in accordance with Chapter 8 to provide protection to the workers carrying out the task.

2.3.3 It is noted that some of the future maintenance activities could be influenced by key HE policy decisions already taken or those that may have to be incorporated as a result of existing IANs and future changes to the rules that control the design processes – Design Manual for Roads and Bridges, Specification for Highway Works, Traffic Signs Manual, etc.

3 DESIGN FOR MAINTENANCE

3.1 Designing for Maintenance Approach

3.1.1 Key design assumptions and decisions are documented in the design strategy record (DSR). In developing this solution to date, the design has been cognisant of:

- Complying with the Construction (Design and Management) (CDM) Regulations through application of IAN 69/15 “Designing for Maintenance”.
- Adopting a design for maintenance approach in line with IAN 69/15. No major maintenance risks have been identified.

3.2 General Principles

3.2.1 Maintenance responsibilities will be assigned according to the existing maintenance contracts. It is the responsibility of the MSP to identify and implement appropriate methods of work for the required maintenance activities, including any permission required to access the network.

3.3 New and Existing Maintainable Assets

3.3.1 Existing infrastructure is currently maintained by the HE EMAD. The MSP will be continually engaged through design development and construction phase of the scheme on the maintenance strategy. Existing infrastructure elements include:

- Road pavements
- Road restraints
- Drainage
- Earthworks
- Signage
- Street Lighting
- Soft Estate

3.3.2 Most of the existing elements within the scheme extents will be removed and replaced as part of the grade separation of the junctions. The HE EMAD will need to consider the maintenance access strategy and consider the changes introduced by the scheme.

3.3.3 The scheme will introduce new & partially retained infrastructure elements, including but not limited to:

- Bridges at Kingsway, Markeaton, and Little Eaton
- New retaining structures
- New footbridge north of Markeaton
- Overhead gantries
- Fixed signing
- Road markings
- Street lighting

-
- Drainage attenuation ponds
 - Pumping station
 - Noise barriers at all junctions
 - Soft Estate

3.4 Hard Shoulder and Maintenance Area Provision

3.4.1 As the A38 is classified as an A road, there is no hard shoulder provision throughout the scheme.

3.4.2 Maintenance areas will be provided at roundabout locations for vehicles to park and undertake routine maintenance activities. They will be marked on the as-built drawings, but will be inconspicuous enough to not draw the attention of the general travelling public.

3.5 Asset Renewal Requirements

3.5.1 The scheme must also consider, where appropriate, the need for asset renewal to be included within scheme works. These issues will be fully identified, confirmed and documented at detailed design. Surveys into the condition of various assets are on-going.

3.6 Proposed Traffic Management Arrangements

3.6.1 It has been assumed that a minimum of one lane of the section of the A38 in question (in each direction) will be kept in operation during routine maintenance works. The implementation of temporary lane closures overnight where possible should however mitigate the impacts of these closures on the A38 traffic. In order to provide the required lateral clearance to the maintenance works, reduced running lane widths may also be required. It is noted that, for major maintenance activities, closure of the entire carriageway is preferred/required in such instances with associated diversion routes for affected traffic. All traffic management will be in accordance with TSRGD 2016.

3.7 Maintenance Service Provider Interface Responsibilities for Assets

3.7.1 An initial meeting was held on the 12 June 2016 to determine responsibilities and boundaries for the new grade separated junctions.

3.7.2 Coloured plans will also be produced showing confirmed maintenance boundaries. Lighting and drainage drawings will also be produced showing the extent of maintenance boundaries where they differ from carriageway boundaries.

3.7.3 Discussions will continue between relevant parties to ensure that any other interface issues that arise will be addressed.

4 ACCESS TO FEATURES IN VERGE

4.1 Structures/Retaining Walls/Culverts

4.1.1 New bridges and retaining walls are proposed along the scheme to enable the grade separation of the three junctions. There will also be culvert extensions, which will increase their maintenance and inspection duration. Otherwise, no significant maintenance issues specific to structures have been identified at this stage of the design process.

4.2 Drainage

4.2.1 The new gullies and manholes will be accessible from the verge to allow for existing maintenance and repair procedures. There will be locations however where surface water channels will be located within the central reserve. During detailed design, self-cleaning systems should be considered to minimise maintenance requirements for the new assets.

4.2.2 Safe access to drainage infrastructure, outfalls, manholes and catch-pits to carry out maintenance activities will require TTM lane closures, as large plant may be required on site.

4.2.3 The scheme also includes a number of attenuation ponds, underground water storage areas, and associated pumping station that will also need maintenance.

4.3 Parapets

4.3.1 The grade separated junctions will introduce new bridge parapets that will need to be maintained. Maintenance tasks will include inspections and repairs following incidents.

4.4 Signage

4.4.1 New signs will be introduced on the scheme to compliment the new layout and integrating recent standards. The signs will require inspection and cleaning annually.

4.5 Fixed Taper Positions (FTPs)

4.5.1 FTPs are usually associated with remotely operated temporary traffic management signs (ROTTMS), usually on smart motorway schemes and these are not envisaged on this scheme. However, safe taper positions are currently used by EMAD and the impact the scheme will have on these will be assessed and, if necessary modified in agreement with EMAD during the next design stage. The existing safe taper positions used by A-one+ are shown on the drawing in Appendix D.

4.6 Means of safe access

4.6.1 For the inspection of retaining walls and bridge pier and abutments, it is assumed that access will be provided from a hard standing maintenance area (i.e. the maintenance areas located at the roundabouts) or on-foot from another safe stopping place. If this is not possible, then lane closures will be required to provide safe access.

4.6.2 For the cutting of grass on verge visibility splays and the maintenance of drainage and signage assets, it is assumed that operatives, on foot, will undertake the required maintenance work in the verges and across slip road nosings. This will be done under the protection of lane closure traffic management measures.

4.6.3 The attenuation ponds and pumping station will have dedicated access for maintenance vehicles. Under normal circumstances, they will not require lane closures.

4.7 Traffic management

4.7.1 If safe on-foot access is not an option, then lane closures will be required to provide safe access. EMAD will be required to set out a TTM lane 1 closure during off-peak periods in accordance with TSM Chapter 8 methods.

4.8 Additional verge assets

4.8.1 Noise Barriers will be introduced on the scheme, these will need inspecting in accordance with manufactures recommendations. Access may require TTM lane closures, and/or, access from the local road network.

5 ACCESS TO OVERHEAD MOUNTED EQUIPMENT

5.1 Lane specific Advanced Motorway Indicators (AMIs)

5.1.1 N/A

5.2 Message Signs Type 4 (MS4) and Type 3 (MS3)

5.2.1 N/A

5.3 Advance Direction Signs

5.3.1 See section 5.8, Sign Gantries.

5.4 Digital Enforcement Camera Systems (HADECS)

5.4.1 N/A

5.5 CCTV cameras

5.5.1 Existing CCTV cameras will be replaced. Locations of the masts to be confirmed.

5.6 Cabling and Power

5.6.1 N/A

5.7 Gantry – Ancillary Equipment

5.7.1 N/A

5.8 Sign Gantries

5.8.1 Due to the new retaining walls and verge space constraints on the scheme, several sign gantries with direction signs are proposed on the scheme. The signs and gantries will require inspection and maintenance.

5.8.2 The signs on the gantries will require lighting, the power supplies and the lighting will need inspection and maintenance in conjunction all other maintenance activities on the gantries.

5.9 Lighting

5.9.1 New lighting will installed throughout the scheme, including along the mainline and the slip roads. The new lighting infrastructure will be required to be inspected in accordance with DMRB, TD 23/99.

5.10 Means of safe access

5.10.1 For the inspection and maintenance of new sign gantries for the A38 Scheme, it is assumed that operatives will undertake the required work via a mobile elevated platform manoeuvred into position as required under the protection of lane closure traffic management measures. However, during the detailed design phase, risk assessments will be undertaken to determine whether man-access gantries would be more beneficial in terms of safety in accordance with MPI 39.

5.10.2 Similarly, the installed lighting will also be inspected via mobile elevated platform with lane closure protection.

5.11 Traffic Management

5.11.1 EMAD will be required to set out any TTM lane closures during off-peak periods in accordance with TSM Chapter 8 methods.

6 ACCESS TO FEATURES IN THE CENTRAL RESERVE

6.1 Vehicle Restraint System

6.1.1 The existing steel road restraint system (RRS) in the central reserve will be replaced with a rigid concrete barrier (RCB). The RCB requires less future maintenance activities than the current steel RRS, particularly there would be fewer repairs required following collisions and so this will serve to reduce the exposure of road workers to risk to carry out such repairs.

6.1.2 No new crossover points have been proposed as part of the scheme.

6.2 Drainage

6.2.1 The proposed central reserve will have a surface water V-channel, as required, to collect carriageway run-off water. The outfalls will be connected to the new drainage system. The V-Channels would require periodic mechanical sweeping with occasional gully/catch-pit emptying.

6.3 Street Lighting

6.3.1 The main carriageway is to be lit by columns mounted on the RCB in the central reserve, this is due to the constraints in the verges along sections of the scheme.

6.3.2 Through consultation with EMAD the central reserve lighting has been extended for ease of maintenance.

6.4 Means of safe access

6.4.1 The combination of the use of RCB and V-Channels will mean the maintenance requirements of the central reserve will change with fewer interventions required for the RCB and V-channels. To access the RCB and V-channel for maintenance, lane closures will be required.

6.5 Traffic Management

6.5.1 EMAD will be required to set out any TTM lane closures during off-peak periods in accordance with TSM Chapter 8 methods.

7 OTHER CARRIAGEWAY WORKS

7.1 Main Issues

7.1.1 This section describes how access will be achieved to maintain other carriageway features.

7.1.2 Maintenance issues that have been identified for the A38 Derby Junctions scheme are:

- Additional carriageway width (i.e. greater area to maintain)
- Junction grade separation

7.2 Means of safe access

7.2.1 Maintenance and renewal of pavement, white lines and road studs will be carried out under traffic management to Traffic Signs Manual (TSM) Chapter 8.

8 WINTER MAINTENANCE

8.1 Winter Salting

8.1.1 The additional pavement area and grade separation of the junctions, increased resources (staff/spreaders etc.) may be required to meet the minimum performance requirements – this will need to be assessed by EMAD and under current contracts could result in additional costs for HE.

8.2 Snow Clearance/Ploughing

8.2.1 Guidance from the National Severe Weather Template on the approach to ploughing in lanes adjacent to solid vertical barriers (Section B5 – Special Consideration) indicates that where RCB is provided in the central reserve, consideration should be given to abandoning the adjacent lane during heavy snowfall.

8.2.2 Additional resources (staff / vehicles etc.) may be required to meet the minimum performance requirements – this will need to be assessed by EMAD and under current contracts could result in additional costs for HE.

8.3 Severe Weather Plan

8.3.1 Proposed winter maintenance arrangements for the scheme should be included in the handover documentation to the Operations Directorate (OD). The MSPs will then need to review this and incorporate it into their Severe Weather Plan (SWP) which describes the procedures and operational arrangements necessary for the delivery of an effective winter service.

9 PLANT

9.1 General

- 9.1.1 The principle changes to be made to the infrastructure means that existing conventional plant types is anticipated to be suitable and no new types of plant has been identified as being required to ensure safe maintenance.
- 9.1.2 The introduction of sign gantries will increase the anticipated amount of work to be carried out using Mobile Elevated Working Platforms (MEWPs). This additional operation to the street lighting maintenance requires consideration as to the choice of MEWP to be used in each situation. This action rests with EMAD.
- 9.1.3 Further discussions are to be held with EMAD to determine the type of plant they use for their current maintenance activities and to ensure that any new asset to be added to the scheme that could create new plant requirements has been consulted on and agreed with them.
- 9.1.4 The inclusion of a surface water drainage pump station at the Markeaton Junction will need further consideration of maintenance method and plant requirements.
- 9.1.5 Other aspect to be determined is the access requirement for the pump station. That is to be agreed with EMAD and included in this document.

10 RISK BASED APPROACH TO ROAD SPACE BOOKINGS

10.1 Requirements for Road Space and Bookings

10.1.1 Access will be governed and managed through the road space booking process. The maintainer, EMAD, is required to arrange access through the road space booking process. The categories and timescales used by EMAD are detailed within their respective Network Occupancy Management plans.

10.2 Response Times

10.2.1 The scheme is not expected to impact response times.

11 NETWORK RESILIENCE

11.1 General

11.1.1 No further resilient strategies have been identified.

12 FUTURE RESILIENCE

12.1 General

12.1.1 Handover shall be carried out in accordance with IAN 182 “Major Schemes: Enabling Handover into Operation and Maintenance”.

12.2 Update of MRSS

12.2.1 The MRSS will be updated throughout the detailed design and construction phases.

12.3 Consultation

12.3.1 The extensive changes to existing drainage and with an increased hard surface area there will be increased surface water run-off. This run-off will be attenuated and cleaned before discharging to the existing drainage and water course systems.

12.3.2 On-going consultation will continue with all maintenance providers as detailed in Section 13.

12.4 Handover Documentation

12.4.1 The required PCF products must be agreed and signed-off or be in a state of agreement between the parties to demonstrate readiness for SGAR6.

12.4.2 Key deliverables include:

- Health and Safety File.
- Asset data as required by the Asset Data Management Manual (ADMM) leading to the Civils Maintenance Handover Documentation and Certificate.
- Operational RCC Handover Documentation and Certificate.
- Winter Maintenance Plan.

12.5 Training

12.5.1 Appropriate training must be provided to maintenance providers for any non-standard assets.

12.6 Maintenance Providers

12.6.1 The document allows MSPs to plan ahead and create suitable revised access and Maintenance Plans that take account of the scheme design.

13 CONSULTATION

13.1 Stakeholders

13.1.1 Stakeholder consultation for the project as a whole is carried out in accordance with the stakeholder consultation plan. Stakeholders engaged include:

- HE EMAD (formerly A-one+)
- HE Major Projects and Operations Directorate (OD)
- Derby City Council (DCiC)
- Derbyshire County Council (DCoC)

13.2 Engagement

13.2.1 EMAD was first engaged in September 2014, and continued engagement has taken place over the development of the scheme, including the transition from A-one+ to HE management of EMAD.

13.2.2 The HE OD team engagement began in October 2014 with a general liaison meeting. DCiC and DCoC engagement also began in December of the same year.

13.2.3 A design risk management process has been adopted which permits stakeholders to input and feedback issues and risks. For example, EMAD has been part of continued liaison meetings to identify any existing and potential future maintenance risks on the network and as far as reasonably practicable, eliminate or mitigate those risks.

13.2.4 Engagement with relevant stakeholders will continue to take place as the scheme progresses through detailed design and into the construction phase.

13.2.5 Table 13.1 includes a list of specific meetings, the stakeholders and dates these meetings were held to discuss the scheme where the discussions have impact on maintenance following the construction of the scheme.

Note: This Table is not exhaustive. Dialogue has been continual during the design process through telephone conversations and email as well as the face to face meetings.

Table 13.1 MRSS Stakeholder Meetings

Meeting	Stakeholder	Date
Area 7 MSP Liaison	HA, AECOM, Area 7 MSP A-one+	15 September 2014
NDD general liaison meeting	AECOM, HA (MP) and HA (NDD)	15 October 2014
Steering Group	HA, DCiC, DCoC, AECOM	15 December 2014
A-one+ MRSS meeting	AECOM, Area 7 MSP A-one+	05 February 2015
Steering Group	HE, DCiC, DCoC, AECOM	17 February 2015
Steering Group	HE, DCiC, DCoC, AECOM	9 June 2015
Steering Group	HE, DCiC, DCoC, AECOM	7 October 2015

Meeting	Stakeholder	Date
EMAD Liaison	AECOM, Area 7 MSP A-one+	2 October 2015
EMAD Liaison - Structures	AECOM, EMAD	6 April 2017
EMAD Liaison – MRSS, Lighting	AECOM, EMAD	26 April 2017
EMAD Liaison – MRSS, Drainage	AECOM, EMAD	17 October 2017
EMAD Liaison	AECOM, EMAD	25 January 2018
DCiC Liaison	AECOM, DCiC	27 March 2018
DCiC Liaison, Drainage	AECOM, DCiC	30 May 2018
Maintenance Interface	AECOM, HE, EMAD, DCiC, DCoC	12 June 2018
DCiC Liaison	AECOM, DCiC	23 October 2018
DCiC Liaison	AECOM, DCiC	7 November 2018
EMAD Liaison	AECOM, EMAD	9 November 2018
DCiC Liaison	AECOM, DCiC	25 February 2019

14 CONCLUSIONS

14.1 General

14.1.1 This MRSS document evidences that the scheme can be maintained in a safe and cost-effective manner.

14.1.2 The safety assessment work that has been undertaken suggests that the safety objective for road workers and road users is expected to be met. This work will be documented in the Combined Safety and Hazard Log Report for the A38 at SGAR5.

14.2 Key measures to facilitate maintenance

14.2.1 The substantive measures that are intended to minimise the frequency of interventions, once construction is complete and the road is operational, are as follows:

- Provision of a new concrete barrier in the central reserve (will reduce number of maintenance interventions following vehicle strike)

14.2.2 The substantive measures that minimise safety risks of interventions once construction is complete and the road is operational are:

- The parallel shared footway/cycleway adjacent to the southbound carriageway will help to reduce road worker exposure.
- Sections of the carriageway will have up to three lanes providing extra carriageway width. It is possible to partially close the new lane for verge maintenance while keeping open the other two lanes rather than implementing a full road closure.
- Creation of grade separated junctions will offer the opportunity for complete closure of the intra-junction section of carriageway with vehicles being diverted around the slip roads.

14.2.3 Appendix A sets out a summary of generic questions and our responses drawn from this document.

14.2.4 This document allows maintenance service providers to plan ahead and create suitable revised access and Maintenance Plans that take account of the scheme design.

14.2.5 The development of detailed procedures will be completed by EMAD.

Appendix A General Questions

Question	Response
General questions	
Have Type B/C schemes presented their maintenance proposals to their PSCRG and demonstrated that their safety objective will be met?	The scheme has been categorised as Type A; therefore a PSCRG is not required.
Have schemes presented proposals for maintenance access and any Maintenance Hard Standings to their PSCRG?	N/A
Does the scheme have sections of wider carriageway (5 or more lanes) that require special maintenance considerations?	No
Does the scheme intend to retain existing turnabout points for maintenance vehicles (e.g. gritters) and central reserve crossing points (use of gates with concrete barrier)?	N/A
Has scheme incorporated the programme of works for Service Provider?	Not yet incorporated.
Has the scheme identified asset renewal requirements to include in Construction works to avoid returning in 5-year post completion period?	Replacing the RRS with RCB, as well as the lighting, to make them consistent throughout the scheme extents.
Has the scheme presented the MRSS to the Maintenance Service Provider?	Have been in regular consultation with EMAD, MRSS presented in Stage 2 - not presented the Stage 3 MRSS.
Traffic Management Questions	
How will the scheme manage the use of short duration stops on any isolated lengths of hard strip within main line and slip roads?	Hard shoulders on single lane slip roads may be available for maintenance stops.
What TTM arrangements have been made to provide safer taper locations, fixed TTM signing (both verge and central reserve) and how are these spaced around the gantry signing?	There are no fixed taper points within the scheme.
Are there adequate diversion routes etc. to consider a strategy that involves full carriageway closure to facilitate planned maintenance (e.g. tunnel philosophy 'shut and do')?	The grade separation of each of the junctions means that full closures of the mainline through the junctions and traffic could go up the slip road and over the junctions. Slip road closures can be put in place and traffic diverted to the next junction and back as a simple local diversion.

Use of signalling in support of TM interventions?	
Has a GG104 assessment been undertaken to identify whether there may be a need to provide /Ocentral reserve fixed taper TTM signs?	As above, there are no fixed taper points within the scheme.
Asset Management	
Have the schemes completed their own ERIC assessment (by extending the Highways England generic assessment) of the anticipated maintenance activities and agreed this with the MSP?	ERIC principles have been applied in the development of the scheme, but anticipated maintenance activities are yet to be agreed with EMAD.
What measures have been taken to reduce maintenance requirements, particularly in the central reserve?	The central reserve steel RRS will be replaced with RCB, reducing the maintenance requirements in the central reserve.
What measures have been taken to group infrastructure and to enable access to be gained from off network or from an ERA?	No ERAs are provided on the scheme, but where possible assets have been located near suitable access such as side roads.
Has a local understanding been gained of which current assets are problematic or prone to regular vehicle impact (e.g. parapets on curves or links with high rates of CR 'occurrences')?	Most of the existing infrastructure within the scheme extents will be removed to be replaced with the new arrangements.
Are there any issues with access to any maintenance depots or turnarounds?	No.
Technology	
What measures have been incorporated for remote operating and diagnosis of faults?	N/A
Has the location of cabinets been used to minimise the need for TTM?	N/A
Where equipment (e.g. environmental / weather monitors) has some flexibility in location has this been utilised to ease access?	No environmental / weather monitors on the scheme. There is a pumping station that will have dedicated access.
Have the scheme defined the maintenance and repair priority of the equipment so that suitable response times can be determined (by other)?	N/A
Reactive Maintenance	
What measures have been considered to reduce the risk of damage by third parties and hence reduce the number of critical defects requiring TTM for rectification?	There will be RCB within the central reserve.
Has the use of concrete central barrier been considered and justified taking into account of the age and condition of an existing central reserve safety fences?	Yes – within the central reserve.

<p>Idea Generation – Identification of items for discussion / development (by the Technical Leadership Group (TLG)) between designers and MSPs. Communicating these initiatives with appropriate prioritisation (based on programme and risk) to Highways England to ensure that scheme requirements are adequately understood by programme responsibilities, e.g. pre-installation of equipment on gantries; and critically of remote monitoring and fault diagnosis etc.</p>	<p>None.</p>
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Appendix B Glossary of terms and abbreviations

AADT	Annual Average Daily Traffic
ALDM	Asset Led Delivery Model
ALR	All Lane Running
AMI	Advanced Motorway Indicator
AQMA	Air Quality Management Area
AST	Appraisal Summary Table
ATC	Automatic Traffic Count
ATM	Active Traffic Management
Auxiliary Lane	An additional lane at the side of the mainline carriageway to provide increased merge or diverge opportunity or additional space for weaving traffic
BAS	Biodiversity Alert Site
BT	British Telecom
CDM Regulations	Construction (Design and Management) Regulations
Central Reserve	The area that separates the carriageways of a dual carriageway / motorway exclusive of any hard strips
CM	Controlled Motorway
COBA	Cost Benefit Analysis
CR	Collision Rates
CSR	Client Scheme Requirements
CWS	Country Wildlife Site
D3M	Dual three lane motorway
D4M	Dual four lane motorway
DHAR	Designer's Hazard Assessment and Reduction
DHS	Dynamic Use of the Hard Shoulder
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DROBB	Double Rail Open Box Beam (safety barrier)
EAR	Environmental Assessment Report
EcAR	Economic Appraisal Report
EIA	Environmental Impact Assessment
EMMR1TAM	East Midlands M1 Traffic Assessment Model
EMMR	Existing Motorway Minimum Requirements
ERA	Emergency Refuge Area
ERT	Emergency Roadside Telephone
ES	Environmental Statement
ESS	Entry Stop Signal
EU	European Union
FWI	Fatal Weighted Injury
Ghost Island	An area of the carriageway suitably marked to separate lanes of traffic travelling in the same direction on both merge and diverge layouts.
HA	Highways Agency
Headroom	The minimum distance between the surface of the highway cross-section and the deflected structure
HGV	Heavy Goods Vehicle
HSWA	Health and Safety at Work etc. Act 1974
HVCB	Higher Vertical Concrete Barrier

IAN	Interim Advice Note
INCA	INcident Cost-benefit Assessment – economics tools for calculating delays and travel time variability costs
ITR	Indirect Tax Revenue
JTDB	Journey Time Database
KSI	Killed or Seriously Injured
LBS	Lane Below Signal; refer to terminology at the end of this list
LMVR	Local Model Validation Report
LGV	Light Goods Vehicle
LWS	Local Wildlife Sites
MAC	Managing Agent Contractor
Mainline	The carriageway carrying the main flow of traffic (generally traffic passing straight through a junction or interchange)
Maintained Headroom	The minimum value of Headroom that must be preserved at all times
MHS	Maintenance Hard Standing
MCDHW	Manual of Contract Documents for Highway Work
MIDAS	Motorway Incident and Automated Signals
SGAR	Stage Gate Assessment Review
SM	Smart Motorway(s)
SM-ALR	Smart Motorways All Lanes Running
MMDO	Managed Motorways Delivery Office
MMSG	Managed Motorways Steering Group
MRSS	Maintenance and Repair Strategy Statement
MSA	Motorway Service Area
North facing slip roads	The merge and diverge on the north side of a junction
Nose	A paved area, approximately triangular in shape, between the connector road and the mainline at a merge or diverge
NRTS	National Roads Telecommunications Services
NSCRG	National Safety & Control Review Group
NTEM	National Trip End Model
OBB	Open Box Beam (safety barrier)
OD	Operations Directorate
Overbridge	A bridge that spans the road under consideration
Parallel Merge / Diverge	A layout where an auxiliary lane is provided alongside the mainline carriageway
PCF	Project Control Framework
PIA	Personal Injury Accident
PIE	Public Information Exhibition
P4L	Permanent Four Lanes
PL	Project Leader
POP	Police Observation Platforms
POPE	Post Opening Project Evaluation
PSSR	Preliminary Sources Study Report
PSCRG	Project Safety and Control Review Group
PTJR	Permanent Through Junction Running
PTZ	Pan Tilt Zoom (CCTV)
QUADRO	QUeues And Delays at ROadworks – economics programme to evaluate delay impacts during construction
Ramp Metering	The control of vehicles joining the main carriageway from slip roads by the means of traffic lights or similar
RCC	Regional Control Centre
RPI	Retail Price Index
RTMC	Regional Technology Maintenance Contractor

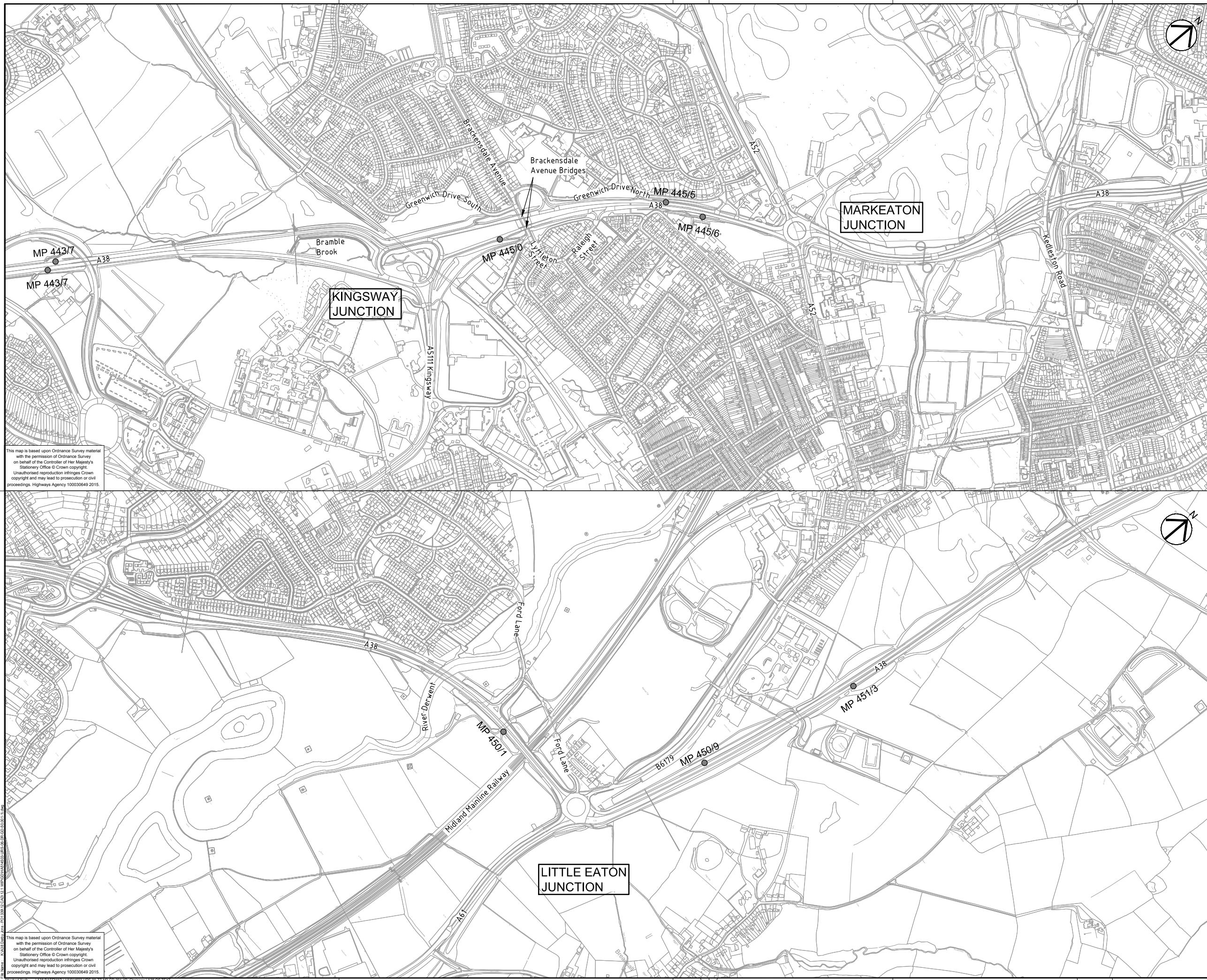
SAR	Scheme Assessment Report
SBI	Site of Biological Importance
SES	Safety Engineer Standard
SFAIRP	So Far As Is Reasonably Practicable
SGAR	Stage Gate Assessment Reviews
SM	Smart Motorway
SMS	Safety Management System
SoS	Secretary of State
South facing slip roads	The merge and diverge on the south side of the junction
SoW	Start of Works
SPZ	Source Protection Zone
SRO	Senior Responsible Owner (Highways Agency)
SSD	Stopping Sight Distance
SSSI	Site of Special Scientific Interest
Taper Merge / Diverge	A layout where merging or diverging traffic joins or leaves the mainline carriageway through an area forming a funnel to or flare from the mainline carriageway
TCB	Tensioned Corrugated Beam (safety barrier)
TIS	Traffic Impact Study
TERN	Trans European Road Network
TFR	Traffic Forecasting Report
TJR	Through Junction Running
TLG	Technical Leadership Group
TOS	Traffic Officer Service
TPI	Targeted Programme of Improvements
TRADS	HE Traffic Information Data base, containing traffic flows for motorways and major trunk roads in England
TM	Traffic Management
TUBA	Transport Users Benefit Appraisal
Underbridge	A bridge that carries the road under consideration
VCB	Vertical Concrete Barrier
Verge	Any nominally flat area between the edge of the paved width and either the start of an adjacent side or slope, in the absence of a side slope, the highway boundary or bridge parapet
VMS	Variable Message Signs
VM SL	Variable Mandatory Speed Limit
VOC	Vehicle Operating Costs
VPH	Vehicles per Hour
VRS	Vehicle Restraint System
Weaving Section	The length of the carriageway between a successive merge or lane gain and diverge or lane drop
WebTAG	Website for Transport Analysis Guidance

Appendix C A38 Maintenance Tasks

Feature	Maintenance Tasks
Earthworks	Maintain vegetation on embankment/cutting slopes
	Inspection of embankments/cuttings
	Inspection of earthworks retaining feature
Drainage system	Gully and catch-pits cleaning
	Channel cleaning
	Piped drainage system inspection
	Ditch cleaning
	Filter medium cleaning
	Culvert maintenance
	Balancing pond maintenance
	Proprietary discharge control device and oil interceptor cleaning
Statutory utilities	Maintenance of and access to apparatus
Pavement and road surface	Structural repairs to carriageways
	Providing new road surfacing including anti-skid
	Reinstating road markings
	Sweeping and cleaning of hard strips, verges, central reserve
	Winter maintenance – de-icing salt spreading, snow ploughing
Verges, central reserve and earthworks slopes	Litter picking
	Soft estate management
Structures	Assessment/inspection of bridges to carry traffic loading, repairs, bearings, joints, faults
	Repairing structures after accidents
	General and Principal inspections of structures
Road Restraint Systems	Repairing road restraint systems and bridge parapets after accidents
	Inspections
Road Lighting system	Facilitate luminaire checks, changes and cleaning
	System testing
	Lighting columns repairs
Signs & Signals	Cleaning signs
	Illuminated signs – luminaire checks
	Repairing/replacing signs and posts after accidents
	Traffic signals inspections and repairs
Communications CCTV	Cameras inspections and repairs

Appendix D **Existing Safe Taper Positions**

Drawings ref: HA514503-URS-06-DR-GD-50.001-2i



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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
● Existing Safe Taper Positions as supplied by Area 7 MAC. MP reference denotes Marker Post.

DRAWING BORDER UPDATED				
2	LE	01/12/15	AW	01/12/15
FIRST ISSUE				
1	JRH	11/03/15	AP	13/03/15
DRAFT ISSUE				
0	JRH	11/03/15		
Revision Details				
Rev #	Drawn By	Date	Checked By	Date
	INFORMATION			13/03/15

Job Title
**A38
DERBY JUNCTIONS
IMPROVEMENT**

Drawing Title
EXISTING SAFE TAPER POSITIONS

AECOM Internal Project Number 47071319	Zone / Mileage	Suitability
Designed AP	Drawn JRH	Stage 1 check AP
Scale at A1 1:50000	Originated CH-ROADS	Approved AW
	Date 13/03/15	

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