

M25 junction 28 improvement scheme

TR010029

9.52 Outline Traffic Management Plan

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9.52 Outline Traffic Management Plan

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Table of contents

| Chapter | Pages |
|--|-----------|
| 1. Introduction | 4 |
| 1.1 Purpose and objective | 4 |
| 1.2 The Scheme | 5 |
| 1.3 Challenges and considerations | 6 |
| 2. Outline Traffic Management Plan (TMP) | 8 |
| 2.1 Customer requirements | 8 |
| 2.2 Nature of the works | 13 |
| 2.3 Proposed traffic management measures | 17 |
| 2.4 Proposals for management of network occupancy | 38 |
| 2.5 Implications of traffic management measures | 38 |
| Appendix A: Roadworks principles | 40 |
| Appendix B: Proposed traffic management layouts and diversion routes | 45 |
| Appendix C: Customer impact assessment tool | 57 |
| Appendix D: Dynamic roadworks benchmarking template | 59 |
| Appendix E: Petersfield Avenue vehicle swept path analysis | 63 |
| Appendix F: Estimated construction vehicle trip generation | 65 |
| Appendix G: Implementation the highest safe speed within road works checklist | 67 |
| Appendix H: High level risk assessment | 70 |
| Appendix I: Outline traffic management programme | 72 |
| Figures | |
| Figure 1.1 Location of M25 junction 28 improvement scheme | 6 |
| Figure 2.1 Site compound access | 18 |
| Tables | |
| Table 2-1: Customer requirements | 8 |
| Table 2-3: Customer view principles | 11 |
| Table 2-4: Proposed traffic management requirements | 13 |
| Table 2-5: Length and duration of traffic management | 21 |
| Table 2-6: Carriageway and slip road closures | 24 |
| Table 2-7: Bank holiday and embargos | 27 |
| Table 2-8: Incursion risk management | 28 |
| Table 2-9: Diversion routes | 31 |
| Table 2-10: Safety risk mitigation measures | 36 |

1. Introduction

1.1 Purpose and objective

- 1.1.1 The purpose of this outline traffic management plan (outline TMP) is to set out the proposed approach to the temporary traffic management measures required during construction of the M25 junction 28 scheme (“the Scheme”) and how the approach will deliver the following key objectives:
- **Safety:** No one should be harmed when travelling or working on the strategic road network. We care about each other, our suppliers, our customers and communities.
 - **Good customer service:** We should tailor our way of working to minimise our impact on customers and stakeholders.
 - **Projects delivered on time and efficiently:** Projects should be planned and managed in a way that work is carried out efficiently, and as a result delivered on time.
- 1.1.2 The proposed approach to the temporary traffic management arrangements to achieve these objectives has been informed by the identification of key constraints, opportunities and challenges associated with construction of the Scheme. The Scheme’s communications engagement plan will identify key stakeholders and customers that will be consulted regarding the outline TMP to ensure their views are fully considered during the subsequent refinement of the proposed traffic management measures for inclusion in the TMP for approval by the Secretary of State, prior to commencement of construction.
- 1.1.3 This outline TMP has been developed by John Graham Construction Limited in conjunction with Atkins.
- 1.1.4 Highways England’s dynamic road works vision statement clarifies how traffic management should support good customer service. It identifies five key themes to measure how well proposed traffic management arrangements support the vision, with a red, amber or green (RAG) rating being given against each theme. The five themes considered are: speed; length; closures and diversions; delivering quicker; and explaining activity.
- 1.1.5 This outline TMP is based on a relatively high-level approach to construction commensurate with the current preliminary design being considered at this stage of the Scheme. The temporary traffic arrangements will therefore be refined as the design of the Scheme and the construction methodology are developed further in more detail. The outline TMP will form the basis of the traffic management plan that will be prepared prior to commencement of construction and issued to the Secretary of State for approval under Requirement 10 in the DCO.
- 1.1.6 A detailed TMP, based on this outline TMP will be developed in consultation with stakeholders following the appointment by Highways England of the Delivery Partner and submitted to the Secretary of State for approval prior to commencement of construction under Requirement 10 of the DCO. Under paragraph (2) of Requirement 10, the final TMP must be substantially in accordance with the Outline Traffic Management Plan (TR010029/EXAM/9.52)

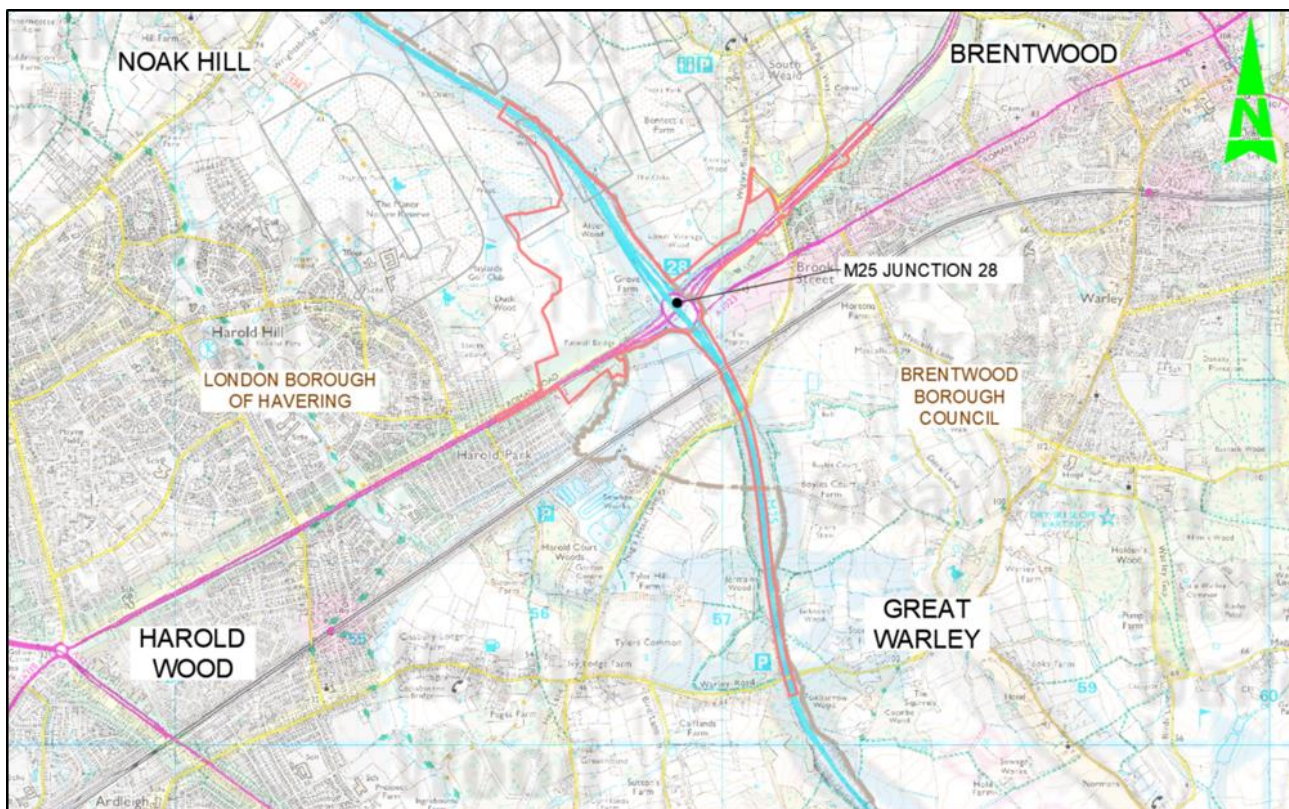
and reflect the relevant mitigation measures set out in the REAC (TR010029/APP/7.3), which will both documents certified under Schedule 10 of the DCO.

- 1.1.7 A Traffic Safety Control Officer will be responsible for managing the TMP on-site, and traffic management logs will be retained on-site, with incidents recorded in the Contractor's progress report.

1.2 The Scheme

- 1.2.1 The Scheme forms part of the second Road Investment Strategy (RIS) for 2020-2025. The RIS identified improvements to the M25 junction 28 as one of the key investments in the Strategic Road Network (SRN) for the London and south east region. The M25 junction 28 lies in the north east quadrant of the M25 orbital motorway (Figure 1.1). Junction 28 plays a key role in connecting the M25 motorway with the A12 to London and east of England, as well for local traffic to and from Brentwood. The focus of the project is on delivering operational outcomes on the network, to increase capacity, reduce congestion, improve safety and support future economic growth and development.
- 1.2.2 The Scheme connects the M25 anticlockwise with the A12 east via a two-lane (reducing to a single lane at the A12 merge) cloverleaf type link road, with hard shoulder, located to the north-west of junction 28.
- 1.2.3 Providing the diverge from the M25 for the new link to the north of junction 28 requires realigning the existing M25 northbound on-slip road to pass under the new link road. Following the diverge, the new link loops in an anticlockwise direction through land to the northwest of the existing junction to merge with the A12 eastbound carriageway to the west of the junction 28.
- 1.2.4 A 50mph speed limit is proposed for the loop. The existing 50mph speed limit on the A12 eastbound will be extended to the carriageway beneath Poplars Bridge East that supports the junction 28 roundabout.

Figure 1.1: Location of M25 junction 28 improvement scheme



1.3 Challenges and considerations

1.3.1 Engagement with relevant stakeholders, including relevant authorities, emergency services, local businesses has taken place over the design development phase and will continue as the Scheme progresses.

1.3.2 The key challenges and considerations likely to impact temporary traffic management arrangements are:

- **High traffic flows.** The A12 and M25 junction 28 experience high volumes of traffic at peak times making it important to minimise traffic disruption and delay caused by any reductions in capacity due to proposed temporary traffic management measures.
- **Access to Grove Farm.** The entrance and exit to Grove Farm need to be maintained at all times.
- **Construction Compound Access.** The access to the main construction compound is off the A12 eastbound carriageway and will be left in/left out only. Consequently, construction traffic arriving from the A12 (east) and the M25 (north) will need to make a U-turn along the A12 to the west of the site access at Gallows Corner.
- **No right turn into or out of Woodstock Avenue and Maylands Golf Club off A12.** Residents of Woodstock Avenue and users of Maylands Golf Club currently need to make a U-turn at junction 28 to head west on the A12. Any temporary road closure at junction 28 which would prevent this manoeuvre will result in a lengthy diversion.

- **Statutory undertaker's equipment diversions.** Significant diversions are required including high pressure gas, high voltage electricity, water & communications. Some may be undertaken as advanced works, but this will extend the period that temporary traffic management is required on the road network.

2. Outline Traffic Management Plan (TMP)

2.1 Customer requirements

2.1.1 Table 2.1 summarises the key customers with whom liaison and consideration are key.

Table 2-1: Customer requirements

| Customer Group | Who is Affected by this project? | What are their requirements and how are they impacted? | How has the TMP taken these requirements into account and proposed mitigations using the customer principles? |
|----------------|----------------------------------|--|---|
| Customers | HGV drivers | <ul style="list-style-type: none"> Journey time reliability Advance warning of closures and/or diversions Appropriate diversion routes Maximised lane widths where possible | <ul style="list-style-type: none"> Minimising road space occupancy Communication plan for warning of closures and/or diversions Closure clashes – not having closures on alternative routes used for diversions Diversion routes avoid narrow roads and low bridges |
| | Commuters | <ul style="list-style-type: none"> Journey time reliability Advance warning of closures and/or diversions Appropriate diversion routes Maximise lane availability during peak periods | <ul style="list-style-type: none"> Provision of journey time information Communication plan for warning of closures and/or diversions Diversion routes agreed with local authority Minimise lane closures where possible |
| | Walkers and cyclists | <ul style="list-style-type: none"> Connectivity maintained during works Temporary safe routes provided through works (including provision for users with reduced mobility, visibility or other disability) Diversion routes minimised | <ul style="list-style-type: none"> Safety features such as temporary signalised pedestrian crossings Suitable surface material for temporary footways |
| | Disabled car drivers | <ul style="list-style-type: none"> Method of recovery that is suitable for people with restricted mobility and their vehicles Suitable roadside facilities for disabled users (toileting and medication stops) | <ul style="list-style-type: none"> Recovery vehicles are wheelchair accessible Customer care points with disabled access and welfare |

| Customer Group | Who is Affected by this project? | What are their requirements and how are they impacted? | How has the TMP taken these requirements into account and proposed mitigations using the customer principles? |
|----------------|---|--|--|
| Stakeholders | Grove Farm | Closures/diversions that may impact on journey time reliability to and from the property Minimal impact on their business and residential premises | One to one communication between contractor and landowner Weekly project update detailing forthcoming traffic management (TM) Diversion routes to guarantee their access to the road network |
| | Maylands Golf Club | Closures/diversion that may impact on journey time reliability to and from the facility Cleanliness of site access/egress | One to one communication between contractor and landowner Weekly project update detailing forthcoming TM Traffic management that maintains access to their facilities |
| | Glebelands | Closures/diversion that may impact on journey time reliability to and from their land. Cleanliness of site access/egress | One to one communication between contractor and landowner Weekly project update detailing forthcoming TM Traffic management that maintains access to their facilities |
| Partners | Aggregate suppliers | Clear route for ease of delivery Journey time reliability to site Suitable access and egress | Manage haul roads to facilitate site deliveries Access and egress points clearly marked and close to delivery site |
| | Operations Directorate (OD) | Communications plan with OD to minimise impact on the network Avoid clash of road space between scheme and maintenance work | Sufficient notification of closures Integrated traffic management meetings to avoid clashes on the strategic network and local diversion routes |
| | Essex County Council (ECC) and Transport for London (TfL) | Minimise closures/diversions that may impact on network highway maintenance activities Avoid clash of road space Seasonal traffic management embargoes | ECC & TfL representative to be invited to TM meetings Advance notice of closures/diversions Consider TM requirements during public holiday periods |

| Customer Group | Who is Affected by this project? | What are their requirements and how are they impacted? | How has the TMP taken these requirements into account and proposed mitigations using the customer principles? |
|----------------|----------------------------------|--|---|
| | Local councils | Minimise closures/diversions that may impact on network highway maintenance activities Seasonal traffic management embargoes | Advance notice of closures/diversions Consider TM requirements during public holiday periods |
| | Bus operators | Minimise delays/diversions to bus routes Maintain existing accessibility on A12 | Closures and TM to be clearly communicated to the operators and users of the bus routes on the A12 Agreement with bus operators on appropriate diversion routes during road closures |
| | Emergency services | Access through haul road during emergencies Suitable diversion routes Advance warning of closures and/or diversions | Process and procedure for allowing blue-light travel through the works/haul road Diversion routes avoid narrow roads and low bridges Sufficient notification of closures |
| Communities | Affected residents | Advance warning of closures and/or diversions Minimise disruption due to works including environmental factors (e.g. noise, dust, lighting) and diversion routes Appropriate and regular communication on scheme development | Notification and liaison with individuals and/or local group representatives Activity curfews e.g. no piling between 22:00 to 06:00 (confirm through CEMP) Diversion route signs and information to meet driver requirements and optimise usability to reduce opportunities for error and therefore reduce congestion |

2.1.2 The twenty principles detailed in the Highways England document ‘*Roadworks: a Customer View*’ have been considered during the scheme development and will be fully taken into account when designing the traffic management for the Scheme during detailed design. See Table 2-2 and Appendix A.

Table 2-2: Customer view principles

| Principle | | Comment |
|-----------|----------------------------------|--|
| 01 | Other roadworks and improvements | At this stage no other schemes planned for concurrent construction, other than Lower Thames Crossing (LTC), have been identified in the vicinity of the scheme. This will be continually reviewed through the scheme’s lifecycle. Close engagement will be maintained with the LTC project and local authorities to phase the traffic management plans and minimise disruption as far as practicable. |
| 02 | Speed of delivery | Elements of the design have been simplified to help facilitate construction through Early Contractor Involvement. This will be further reviewed during detailed design. |
| 03 | Length of roadworks | Opportunities for a sectional approach to the works will be investigated as the construction strategy develops to minimise the length and durations of carriageway occupancy as far as practicable. |
| 04 | Lane width | The A12 is heavily constrained and there is limited opportunity to widen lanes due to cross-section constraints. |
| 05 | Speed limit | Speed limits during construction will be reduced only when maintaining existing speed limits would be unsafe. The opportunity to investigate varying speed limits depending on traffic flows and works phases, will also be considered during detailed design. |
| 06 | Line demarcation | Permanent quality white lines to be used with existing lines removed where appropriate. Details to be determined in detailed design. |
| 07 | Visibility of temporary barrier | White lines and reflectors to be used to delineate barriers with high frequency maintenance. |
| 08 | Night-time visibility | The M25, A12 and roundabout circulatory have permanent street lighting. During detailed design, the phasing of works, including switching off existing lighting or lighting phases will be reviewed. Temporary lighting to maintain existing |

| Principle | | Comment |
|-----------|--|--|
| | | lighting levels will be considered. Dark patches in lit areas will be avoided. |
| 09 | Advance notice of works | Billboards will be provided at least four weeks prior to commencement of the works. Advanced notice to be provided on variable message signs (VMS) for closures. [Note: All pre-signing requests must be sent to VMSRequests@highwaysengland.co.uk with at least two weeks' notice.] |
| 10 | Scheme information at roadworks | Billboards will be provided in accordance with Highways England Major Projects Instruction (MPI) 48. (see 11 below). |
| 11 | Electronic signage | VMS will be provided in accordance with MPI 54. The benefit of additional provision on the affected local road network will be considered during detailed design. Consideration will also be given to the use of electronic billboards |
| 12 | Travel time variable message signage (TTVMS) | VMS will be provided in accordance with MPI 54. |
| 13 | Visible progress | Due to the constrained nature of the site, progress should be visible to customers. The regularity of updates for billboards during the works for key milestones will be established once sequencing of works is finalised during detailed design. |
| 14 | Engaging and communicating with customers | The detailed construction phase communication plan will be developed during detailed design. |
| 15 | Use multiple media channels, regularly | The detailed construction phase communication plan will be developed during detailed design and will consider all communication including social media as appropriate |
| 16 | Impactful Messages | Impactful messaging has been a feature of the communication strategy to date. The detailed construction phase communication plan will be developed during detailed design utilising the Construction and Roadworks Communication Toolkit. |
| 17 | Explain no activity | Identification of activities which may not be clearly visible but necessitating TM will be carefully considered in detailed design. Some works such as night works in the central reserve will not be |

| Principle | | Comment |
|-----------|--|--|
| | | apparent to road users. Consideration of signing to explain will be developed during detailed design and linked to the electronic signing strategy. |
| 18 | Seek customer feedback on new traffic management | Use of customer audits will be considered. Use of diversions routes during overnight closure will take into consideration the requirements of GG 903 ¹ . |
| 19 | Understanding customer experience | This will be implemented on the scheme in consideration of the Customer and Roadworks Communications Toolkit and agreed prior to construction commencement. |
| 20 | Complete the feedback loop | Customer feedback obtained at regular intervals throughout the construction programme and will be reported and used to inform the approach to future works and measures. |

2.2 Nature of the works

2.2.1 The majority of the construction works for the construction of the loop road and re-alignment of the slip roads will take place “off-line”. Works likely to require temporary traffic management are detailed below (Table 2.3) and in the drawings included in Appendix B. The main impacts relate to: statutory undertakers works; modification, removal and installation of gantries; retaining wall works adjacent to the M25; slip road tie-ins and sheet piling for retaining walls.

Table 2-3: Proposed traffic management requirements

| Type of construction works | Temporary traffic management (TM) requirements | | Reference to proposed traffic management and diversion plans |
|---|--|---|--|
| A12 eastbound off-slip and statutory undertakers work | Setup and removal of narrow lanes. Removal of street lighting columns Mobilisation of Piling rig. Mobilisation of crane for installation of | Work undertaken during full overnight closures of the A12 eastbound off-slip. | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000029 |

¹ <https://www.standardsforhighways.co.uk/prod/attachments/125f41ee-969c-4b6d-8951-c353c4bfd432>

| Type of construction works | Temporary traffic management (TM) requirements | | Reference to proposed traffic management and diversion plans |
|------------------------------|--|---|--|
| | precast culvert units. Tie in works. Statutory undertakers diversions. | | |
| Statutory undertakers work | For statutory undertakers diversions work | A12 eastbound Lane 1 closure and narrow lanes | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000001 Layout 1 and Layout 2 |
| Removal of existing gantries | Removal of existing gantry PS10 (CH 710) | Undertaken during a full closure of the M25 clockwise and anticlockwise at junction 28. New M25 anticlockwise entry slip to be utilised to allow for closure of M25 through the junction only | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000011 |
| | Removal of existing gantry (CH 1010) | Undertaken under a full closure of the M25 clockwise and anticlockwise between junctions 27 and 28 | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000013 |
| | Removal of existing gantry (CH 710) | Carried out under full closure of the M25 clockwise and anticlockwise. Utilisation of slip road to allow closure only through the junction | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000011 |
| | Removal of existing gantry foundation (CH 1010) | Undertaken under full closure of the M25 anticlockwise exit slip and hard shoulder closure of the mainline | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |

| Type of construction works | Temporary traffic management (TM) requirements | | Reference to proposed traffic management and diversion plans |
|---|--|--|--|
| Installation of new gantries and modifications of existing gantries | Gantry Foundation installation | Carried out under full closure of the M25 clockwise off-slip. | HE551519-ATK-TTM-J28-DR-CH-000013 |
| | Installation of gantry PS10 (CH740) | Carried out under full closure of the M25 clockwise and anticlockwise. Utilisation of slip road to allow closure only through the junction | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000011 |
| | Installation of gantry (CH 1800) | Carried out with full closures of the M25 clockwise and anticlockwise between junctions 27 and 28 | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000013 |
| | Installation of cantilever gantry (CH 530) | Undertaken under a full closure of the M25 anticlockwise at junction 28 | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000026 |
| | Modifications to existing gantries | Carried out under full closures of the M25 clockwise and anticlockwise between junctions 28 and 29 | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000027 and 28 |
| Retaining wall works | Piling of the M25 anticlockwise retaining wall between Ch 910 and 1252 to be carried out with a M25 anticlockwise lane 1 and 2 closure | Piling of the M25 anticlockwise on-slip retaining wall to be undertaken once new slip road constructed, under Lane 2 closure of the M25 anticlockwise entry slip | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| Slip road works | Tie in of new A12 eastbound off-slip road | A12 eastbound narrow lane running | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000001 Layout 2 |

| Type of construction works | Temporary traffic management (TM) requirements | | Reference to proposed traffic management and diversion plans |
|-----------------------------|---|---|--|
| | | A12 eastbound lane 1 closure | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000001 Layout 1 |
| | Tie in of new A12 eastbound off-slip to circulatory | A12 eastbound off-slip left hand lane closure | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000001 Layout 3 |
| | Tie in of new A12 eastbound on-slip road | A12 eastbound narrow lane running | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000001 Layout 4 |
| | M25 anticlockwise on-slip earthworks | Narrow lanes on the M25 anticlockwise | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| | M25 anticlockwise verge works | Narrow lanes on the M25 anticlockwise an offside new M25 anticlockwise on-slip | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| | M25 anticlockwise tie in to bottom of new on-slip | Carried out with full slip road closures and lane closures on the roundabout with diversion route | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| | M25 anticlockwise tie in to top of new on-slip | Offside lane closures on the slip road and lane closures on the roundabout | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| | M25 anticlockwise tie in to new off-slip | Narrow lanes on the mainline carriageway | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000002 Layout 5 |
| Surfacing and road markings | Road markings on the A12 eastbound entry slip | Carried out with a full closure of the slip road | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000009 |
| | M25 anticlockwise entry slip road markings | Carried out with a full closure of the slip road. Refer to diversion routes | Appendix B – HE551519-ATK-TTM-J28-DR-CH-000008 |

2.3 Proposed traffic management measures

2.3.1 The following section provides more details on the proposed temporary traffic management arrangements. Customer impacts and proposed mitigations are included in Appendix C and the results of the benchmarking of these measures using the Dynamic Roadworks Benchmarking Template are included in Appendix D.

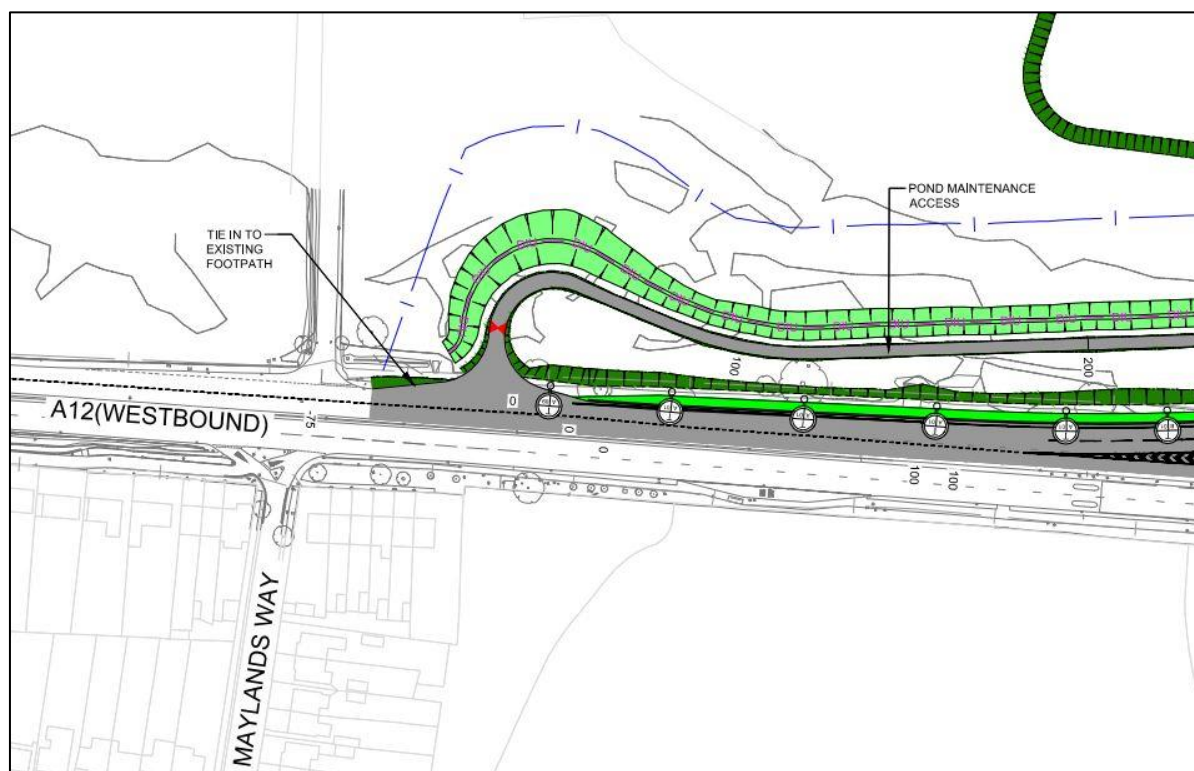
Work access

2.3.2 Access to the main site compound is via the proposed maintenance access adjacent to the Golf Club turn in and will be accessible throughout the entirety of the construction phase. The location is shown below in Figure 2-1. The detailed arrangements for the site access will be considered during the detailed traffic management design.

2.3.3 Access to the main site compound located north of the A12 and to the east of the access to Maylands Golf Club access road will be left in/left out only from the A12 eastbound carriageway, i.e. no right turns to or from the A12. The satellite compound to the north of Grove Farm will be connected to the main site compound via a temporary haul road. However, the satellite compound will also have a temporary entrance off the M25 junction 28 northbound on-slip to allow for some deliveries to be made directly to it. The satellite compound will have minimal storage space and, consequently, the entrance off the northbound on-slip will only be used by a limited number of 'just in time' deliveries of construction materials and equipment.

2.3.4 All construction traffic for the Scheme will use the M25, A12 and A127 to access the main and satellite compounds. Construction traffic arrivals to the main compound from the M25 north and A12 east will need to make a U-turn at the A12 junction with Gallows Corner to access the site. Arrivals from the M25 south will use Junction 29 and the A127 westbound to access the site via Gallows Corner.

Figure 2.1: Site compound access



- 2.3.5 Vehicle swept path analysis showing HGVs making the U-turn at the Petersfield Avenue junction with the A12 is provided in Appendix E. This demonstrates that the existing junction at Petersfield Avenue is not wide enough to allow articulated HGVs to make a U-turn.
- 2.3.6 Deliveries to the satellite compound will be from the A12 and M25 via junction 28 and the northbound on-slip. These vehicles will not need to U-turn along the A12 or use the A127 westbound and Gallows Corner.
- 2.3.7 All construction traffic departures will be via the main compound and use the A12 eastbound, with traffic heading for the M25 and A12 west using the A12 eastbound off-slip and junction 28 to reach their destinations.
- 2.3.8 All suppliers of construction materials and equipment will be notified of the construction lorry routes to be used when orders are placed, explaining that no other routes are to be used by construction delivery vehicles. They will also be issued with identification cards or stickers that will have to be displayed in vehicle windscreens, enabling them to be clearly identified as being associated with construction of the junction 28 scheme. Temporary signage on the road network will be installed directing construction delivery vehicles along the designated lorry routes. Arrangements for the temporary signage will be set out in the final TMP to be submitted to the Secretary of State for approval under Requirement 10 of the dDCO.
- 2.3.9 Should local residents or the local authorities become aware of construction traffic associated with the Scheme not following the designated construction lorry routes, then they will be able to raise the issue with Highways England's appointed Principal Contractor and appropriate action will be taken to prevent further instances.

- 2.3.10 To ensure that construction vehicles use the correct compound entrance, suppliers will be given the appropriate compound gate number for either the main or satellite compound when materials are ordered. This will be displayed in the vehicle windscreen. Repeatedly turning up at the wrong gate would result in enforcement action being taken by the Principal Contractor to ensure suppliers adhere to delivery instructions.
- 2.3.11 The number of deliveries estimated to be generated by construction of the Scheme over the construction programme is provided in Appendix F. It is estimated that up to around 190 construction vehicle movements per day (95 arrivals and 95 departures per day) will be generated during the busiest period of activity over the construction programme. As delivery estimates are refined, stake holders will be updated during stakeholder engagement meetings.

Restrictions

- 2.3.12 At this stage of the Scheme's development, the following key restrictions have been identified:
- Weekday peak traffic flows occur between 5am and 8pm. Night closures will need to be removed prior to this period
 - ECC has a traffic management embargo from the week prior to Black Friday (mid-November) until the first week in January. This covers main roads within the network and any routes which include Christmas events such as grottos. Given the works impact on ECC routes, this will need to be considered in discussion with ECC
 - Full road closures will need to be restricted to weekends or overnight.

Status: At this stage detailed traffic management proposals are not known. Once these are further developed, further liaison is required with key stakeholders to agree specific restrictions.

Operating lanes

- 2.3.13 Lane closures and narrow lane running will include but not be limited to:
- Narrow lane running on the M25 anticlockwise, and A12 eastbound for tie in works and verge works
 - Lane 1 and 2 closures on the M25 clockwise, anticlockwise and slip roads to allow for retaining wall piling mobilisation and de-mobilisation, tie in and surfacing works and for removal of existing gantry foundations. Removal of the bases under lane closures reduces the time needed for full closures
 - Hard shoulder closures on the M25 clockwise and anticlockwise to allow for the removal of existing gantry foundations
 - Lane closures on the A12 eastbound and the eastbound exit slip to enable tie in works, surfacing and line markings to be carried out
 - Lane 2 closure on the new M25 anticlockwise on-slip to allow for retaining wall piling mobilisation and de-mobilisation on offside verge.
- 2.3.14 Short-term road closures will include the following:

- Overnight closures of the A12 eastbound off-slip
- Overnight closures of the A12 eastbound on-slip
- Overnight closures of the M25 clockwise and anticlockwise between junction 27 and 28
- Overnight closures of the M25 clockwise and anticlockwise between junction 28 and 29

Speed limits

- 2.3.15 Whilst full consideration will be given to maintaining existing traffic speeds during the roadworks, it may be necessary to implement the following restrictions. See Appendix G for the “Implementing the highest safe speed within road works checklist” and Appendix H for the high-level risk assessment.
- 2.3.16 A 40mph restriction may be implemented on the A12 eastbound mainline and the off-slip to the circulatory. Due to the lack of existing hard shoulder and hard strips on the A12, a reduction of speed to 40mph will allow for a minimum safety zone of 0.5m, maximising the available works area. After completion of the Scheme the permanent speed limit on the A12 west of the M25 and the off-slip will be reduced to 50mph as part of the safety measures to accommodate the new loop road merge.
- 2.3.17 Both carriageways of the A12 do not fully comply with current highway standards (no hard strip) and consequently, narrow lanes will be required during some periods of construction. Off-peak closures of the nearside lane on the A12 eastbound may also be required for some construction activities, particularly for statutory utility diversion works.
- 2.3.18 On the M25, a 50mph speed limit will be required whilst the narrow lanes are in place and during overnight lane closures to minimise the risk of road traffic accidents through the works. Temporary vehicle barriers will also be installed. Once detailed plans are in place, consideration will be given to varying speed limits whilst works are not being undertaken. When the working areas are established, the narrow lanes requirements will be reconsidered and a more detailed risk assessment undertaken, particularly when mobilising/demobilising heavy plant. Retaining permanent speed limits may be possible if temporary lane closures are implemented, however the benefit will need to be weighed against the requirements for more traffic operations and the disbenefit of restricting working hours.

Length and duration of traffic management

- 2.3.19 Anticipated lengths and durations of traffic management systems are described in Table 2.4. The impacts of these measures have been assessed in the Dynamic roadworks benchmarking template (see Appendix D). Based on a site length of 8.2km and a contract duration of 671 days the total road-space availability is approximately 5,555 Km/days (approx. 8.2x671). The total occupancy from Table 2.4 (length multiplied by duration with a 50% reduction of duration for night only works) is 2,657 km/days.
- 2.3.20 Permanent speed limits will be in force at locations where there is no traffic management such that the permanent speed limit is in place for approximately 52% of the distance and time duration of the project. If after more detailed design

and risk analysis the narrow lane only running sections can be increased to permanent speed limits using the measures described in Table A1.8 of Chapter 8 part 3 – this percentage would reduce to 8%.

2.3.21 The dates shown above have been taken from the outline programme that shows the anticipated timing and sequencing of the proposed temporary traffic management measures. An outline programme is provided in Appendix I.

Table 2-4: Length and duration of traffic management

| Activity | Location of TM | Length (m) | Duration (days/nights) |
|--|--|------------|------------------------------------|
| A12 Traffic Management | | | |
| Set up barrier & narrow lanes and remove street lighting columns | A12 eastbound off-slip full overnight closure | 367 | Up to 2 days (Jul 22 to Oct 22) |
| Removal of barriers and narrow lanes | A12 eastbound off-slip full overnight closure | 367 | Up to 2 days (Jul 22 to Oct 22) |
| Mobilisation of piling pig/demobilisation of piling rig (Twice – installing sheet piles and removing them) | A12 eastbound off-slip full overnight closure | 367 | Up to 4 days (Aug 22 to Oct 22) |
| Mob/demob of crane for installing precast culvert units | A12 eastbound off-slip full overnight closure | 367 | Up to 2 days (Aug 22 to Oct 22) |
| Tie into western end of A12 | A12 eastbound off-slip full overnight closure | 367 | Up to 3 days (Sep 23 to Sep 23) |
| Tie in A12 to roundabout | A12 eastbound off-slip full closure | 367 | Up to 3 days (Sep 23 to Sep 23) |
| Services diversions (Planning in progress and may be reduced) | A12 eastbound off-slip full overnight closure | 367 | Up to 5 days (Apr 23 to Apr 23) |
| Statutory Undertakers Diversions | Narrow lane and off-peak lane 1 closure on the eastbound A12 | 1775 | Up to 30 days (April 23 to May 23) |

| Activity | Location of TM | Length (m) | Duration (days/nights) |
|--|---|------------|------------------------------------|
| | Narrow lane and off-peak lane 1 closure on the eastbound A12 | 1775 | Up to 20 days (July 23 to Aug 23) |
| A12 off-slip tie in works | Narrow lanes on the eastbound A12 | 1775 | Up to 25 days (Mar 24 to Sep 24) |
| A12 off-slip, bottom of slip road tie in works | Narrow lanes on the eastbound A12 | 1775 | Up to 55 days (Oct 23 to Jan 24) |
| A12 off-slip, top of slip road tie in works | Nearside left turn lane closed at A12 off-slip approach to J28 | 40 | Up to 85 days (Oct 23 to Mar 24) |
| A12 off-slip, bottom of slip road tie in works | Lane 1 closure on the eastbound A12 | 1090 | Up to 20 days (Jan 24 to Feb 24) |
| A12 on-slip, bottom of slip road tie in works | Narrow lanes on the eastbound A12 | 1775 | Up to 130 days (Mar 24 to Sep 24) |
| A12 eastbound on-slip road markings | A12 eastbound on-slip full overnight closure | 335 | Up to 5 days (Jul 24 to Jul 24) |
| A12 off-slip, bottom of slip road tie in works | Lane 1 closure on the eastbound A12 | 1090 | Up to 15 days (Jul 24 to Jul 24) |
| M25 Traffic Management | | | |
| M25 anticlockwise on-slip offside verge works | Narrow lane on-slip at M25 | 6185 | Up to 100 days (Dec 23 to May 24) |
| M25 anticlockwise on-slip offside verge works | Narrow lane on-slip and Lane 2 closure on the M25 anticlockwise | 6185 | Up to 140 days (Jan 24 to Aug 24) |
| M25 anticlockwise offside verge works | M25 anticlockwise on-slip Lane 2 closure at J28 | 320 | Up to 35 days (Mar 24 to May 24) |
| M25 anticlockwise on-slip - Bottom of slip road tie in works | Offside lane closures of M25 anticlockwise | 6185 | Up to 80 nights (Jan 24 to May 24) |

| Activity | Location of TM | Length (m) | Duration (days/nights) |
|---|--|------------|-----------------------------------|
| Roundabout, top of slip road tie in works | Roundabout nearside lane closures | - | Up to 30 days (Feb 24 to Mar 24) |
| Loop road tie in | M25 anticlockwise on-slip full overnight closure | 295 | Up to 20 days (Dec 23 to Jan 24) |
| M25 CW off-slip road markings | M25 clockwise on-slip full overnight closure | 378 | Up to 5 days (July 24 to July 24) |
| Gantry Traffic Management | | | |
| Gantry foundation installation | M25 clockwise off-slip full overnight closure | 320 | 45 days (Mar 24 to May 24) |
| Proposed gantry (Ch530) installation works | M25 anticlockwise full overnight closure | 5770 | Up to 2 nights (Apr 24 to Apr 24) |
| Proposed gantry (Ch740) installation works | Full overnight closure of M25 at J28 | 1531 | Up to 5 nights (May 24 to Jun 24) |
| Existing gantry (Ch710) removal works | Full overnight closure of M25 at J28 | 1531 | Up to 2 nights (Jul 24 to Jul 24) |
| Proposed gantry (Ch1800) installation works | M25 anticlockwise and clockwise full overnight closure | 29500 | Up to 5 nights (Jul 24 to Aug 24) |
| Gantry (S1) modifications | M25 anticlockwise full overnight closure | 10200 | Up to 5 nights (Aug 24 to Aug 24) |
| Gantry (S1) modifications | M25 CW full overnight closure | 10200 | Up to 5 nights (Aug 24 to Aug 24) |
| Gantry (Ch1530) removal works | M25 anticlockwise and clockwise full closure | 29500 | Up to 2 nights (Sep 24 to Sep 24) |
| Gantry removal (Ch1010) removal works | M25 anticlockwise full overnight closure | 10200 | Up to 5 nights (Sep 24 to Sep 24) |

Carriageway and slip road closures

2.3.22 The proposed carriageway and slip road closures primarily required for gantry works are listed in Table 2-5.

Table 2-5: Carriageway and slip road closures

| Type of closure (slip road / full carriageway) | Location (Start to end with respect to nearest junction or marker posts, if known) | Time of day (Start to end) / Stage in programme | Closure details | Drawing reference |
|--|--|---|---|-----------------------------------|
| Full carriageway | M25 clockwise and anticlockwise between J27 and J28 | 22:00-05:30 – Gantry removal/installation | M25 clockwise and anticlockwise carriageways to be closed between J27 and J28. Traffic to be diverted via Redbridge along the A12, A406 and M11. | HE551519-ATK-TTM-J28-DR-CH-000013 |
| Full carriageway | M25 anticlockwise between J29 and J28 | 22:00-05:30 – Gantry Modification | M25 anticlockwise carriageway to be closed between J29 exit slip and J28 entry slip. Traffic to be diverted via Gallows Corner junction along the A127 and A12. | HE551519-ATK-TTM-J28-DR-CH-000027 |
| Full carriageway | M25 clockwise between J28 and J29 | 22:00-05:30 – Gantry Modification | M25 clockwise carriageway to be closed between J28 exit slip and J29 entry slip. Traffic to be diverted via Gallows Corner junction along the A127 and A12. | HE551519-ATK-TTM-J28-DR-CH-000028 |
| Full carriageway | M25 clockwise and anticlockwise within J28 | 22:00-05:30 – Removal of existing gantry | M25 clockwise and anticlockwise to be | HE551519-ATK-TTM-J28-DR-CH-000011 |

| Type of closure (slip road / full carriageway) | Location (Start to end with respect to nearest junction or marker posts, if known) | Time of day (Start to end) / Stage in programme | Closure details | Drawing reference |
|--|--|---|--|-----------------------------------|
| | | | closed between extent of junction slip roads. Traffic to be diverted along slip roads via the circulatory. | |
| Slip road | J28 M25 anticlockwise on-slip full length of slip road. | 22:00-05:30 – Gantry foundation removal | M25 anticlockwise on-slip full closure. M25 anticlockwise bound traffic to be diverted via junction 29 to enter the M25 anticlockwise carriageway. | HE551519-ATK-TTM-J28-DR-CH-000008 |
| Slip road | J28 M25 clockwise off-slip full length of slip road | 22:00-05:30 – Gantry foundation removal | M25 clockwise off-slip full closure. M25 clockwise traffic to be diverted via junction 29 back to J28 anticlockwise on-slip. | HE551519-ATK-TTM-J28-DR-CH-000010 |
| Slip road | A12 eastbound on-slip from J28 roundabout to end of slip | 22:00-05:30 – Road Markings | A12 eastbound on-slip full closure. Traffic diverted via Gallows Corner Roundabout along the A12. | HE551519-ATK-TTM-J28-DR-CH-000009 |
| Slip road | A12 eastbound off-slip full length of slip road | 22:00-05:30 – Statutory diversions and Tie ins | A12 eastbound off-slip full closure. Traffic diverted via Marylands Interchange to the east on the A12 | HE551519-ATK-TTM-J28-DR-CH-000029 |

Hard shoulder running

- 2.3.23 There are no plans at this stage to run traffic temporarily on the hard shoulder.

Adjacent roadworks and other traffic management

- 2.3.24 The only planned major project in the vicinity currently identified as potentially likely to be under construction at the same time as construction of the Scheme is the Lower Thames Crossing (LTC).
- 2.3.25 If both projects are granted development consent, then the two project delivery teams will collaborate to ensure planned temporary traffic management measures are coordinated throughout the overlapping construction period of the projects to minimise traffic impacts and disruption as far as practicable.
- 2.3.26 Consultation with Highway England Operations Directorate (OD) will need to be continued prior to, and after start of works, regarding overlap of works, as their planned closures and works have shorter lead in times than major projects.
- 2.3.27 Regular liaison will also be required with HE, TfL and ECC who maintain the adjacent road network to avoid conflict with routine and winter maintenance.

Status: Liaison with the HE OD, TfL and ECC will be required to confirm adjacent schemes. Local projects are likely to have reduced lead-in times so will need to be confirmed during detailed design and prior to construction commencement.

2.3.28 Non-motorised user diversions

- 2.3.29 Where the temporary traffic management diversion affects the existing non-motorised user (NMU) route on the eastbound A12 off-slip, the shortest practicable route that is compatible with construction phasing and safety requirements will be implemented.
- 2.3.30 Temporary arrangements required during construction will remain in place until the public right of way is either re-established or a permanent diversion or realignment is constructed.

Bank holidays and embargos

2.3.31 Constraints on traffic management operations are listed in Table 2.6.

Table 2-6: Bank holiday and embargos

| Holiday | Year 2021 | Year 2022 | Year 2023 | Year 2024 |
|-------------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|
| New Year's Day* | Friday 1 st January | Saturday 1 st January | Sunday 1 st January | Monday 1 st January |
| Substitute day for New Year's Day* | N/A | Monday 3 rd January | Monday 2 nd January | N/A |
| Good Friday* | Friday 2 nd April | Friday 15 th April | Friday 7 th April | Friday 29 th March |
| Easter Monday* | Monday 5 th April | Monday 18 th April | Monday 10 th April | Monday 1 st April |
| Early May Holiday | Monday 3 rd May | Monday 2 nd May | Monday 1 st May | Monday 6 th May |
| Spring Bank Holiday* | Monday 31 st May | Monday 30 th May | Monday 29 th May | Monday 27 th May |
| Summer Bank Holiday | Monday 30 th August | Monday 29 th August | Monday 28 th August | Monday 26 th August |
| Black Friday & Cyber Monday weekend | TBC Late November/early December | TBC Late November/early December | TBC Late November/early December | TBC Late November/early December |
| Christmas Day* | Saturday 25 th December | Sunday 25 th December | Monday 25 th December | Wednesday 25 th December |
| Substitute day for Christmas Day* | Monday 27 th December | Tuesday 27 th December | N/A | N/A |
| Boxing Day* | Sunday 26 th December | Monday 26 th December | Tuesday 26 th December | Thursday 26 th December |
| Substitute day for Boxing Day* | Tuesday 28 th December | N/A | N/A | N/A |

*Note extended HE traffic management embargo to be considered.

2.3.32 Due to the extent and nature of the temporary traffic management for the Scheme, it is envisaged that on both safety and economical grounds it would not be practical to remove the traffic management arrangements for the bank holiday periods.

Significant events and seasonal traffic

2.3.33 No significant events have been identified at this stage.

Status: Further details regarding significant events and seasonal traffic will be confirmed by the Delivery Partner during detailed design.

Incident management

2.3.34 Breakdown recovery and associated safe drop off areas will be provided with durations and locations to be identified as the traffic management proposals and works scheduling are refined during detailed design. Incident Management Plans (IMP) will be developed in conjunction with the maintaining organisations on the M25 (Connect Plus Services) A12 East (HE service provider) A12 West (TfL); Traffic Safety Officers and the emergency services.

Status: An IMP, based upon the industry best practice will be developed.
 The IMP will be tested through desktop exercises with all parties present as appropriate. This will facilitate training of the IMP to all parties. The IMP will also specify any associated data that will be recorded and include consideration of the full range of incident scenarios that may occur in and around the works and associated areas

Incursion risk management

2.3.35 Risks associated with incursion into the traffic management systems with proposed mitigation measures are identified in Table 2.7.

Table 2-7: Incursion risk management

| Incursion risk | Proposed control / Mitigation measures |
|---|--|
| Public vehicles enter the site via works accesses as a result of follow-in or accidental breach | <p style="text-align: center;">Works accesses to be located along sections of the road with clear visibility and signage</p> <p style="text-align: center;">Suitable approach temporary signage and modifications to existing signage where a long-term slip closure is in place</p> <p style="text-align: center;">Site induction to include procedure for follow ins</p> <p style="text-align: center;">In the event of incursion, members of the public will be asked to remain in their vehicle and wait for an escort out</p> |
| Deliberate breaches of road closures | <p style="text-align: center;">Design traffic management as per guidance in Raising the Bar document 27: managing temporary traffic management incursions</p> <p style="text-align: center;">Alert/alarm systems at closures to warn the workforce of incursions</p> <p style="text-align: center;">Provide warning signs that CCTV is in operation</p> <p style="text-align: center;">Provide advance warning of closures to stakeholders</p> <p style="text-align: center;">Report incursions to police and record on AirsWeb</p> <p style="text-align: center;">The incident report will identify measures to prevent re-occurrence</p> |

Driver compliance

- 2.3.36 Subject to the review of speed limit requirements identified in section 2.3.4 above, a 40 mph speed limit may be in place for all traffic management on the A12. A 50mph speed limit may be in place for traffic management on the M25 due to narrow lane running and the nature of the operations. Enforcement through police operated safety cameras will be considered as part of the detailed traffic management design in Detailed design.

Status: Reference should be made to the Combined Operations Product Section 7 Compliance Strategy which will be developed further during detailed design stage.

Communication plan

- 2.3.37 A scheme communications plan has been developed and, along with the stakeholder database, this identifies key stakeholders and engagement strategies. This document will continue to be developed and will incorporate key communication requirements for the traffic management proposals as set out within this document.
- 2.3.38 A briefing note will be developed for the scheme and traffic management proposals agreed with the communications team. This will be provided to HE's customer contact centre and the Operational Planning team.

Status: The detailed traffic management proposals and associated communication plan proposals will not be known until the detailed design has been completed and the construction Delivery Partner is available to input into the process.

Diversion route selection

- 2.3.39 The main temporary closures relate to the M25 mainline between J27 and J28 and between J28 and 29 and the M25 anticlockwise entry and exit slips. Mainline diversion routes will be the same as the routes already agreed by Connect Plus Services for emergency closures of those sections of the M25 and assessed against CHE memorandum 449.
- 2.3.40 Initial discussions have taken place with HE OD to determine suitable diversion routes during the M25 mainline overnight closures. Appendix J contains tactical diversion routes that have already been agreed between HE, the Police and local authorities for use during emergencies.
- 2.3.41 The M25 MS3 motorway signs will need to provide information of the closures in advance of the works to advise clockwise motorists to use the M11(N) and anticlockwise motorists to use A13(E) or A127(E).
- 2.3.42 Portable VMS signs will direct traffic travelling on the eastbound A406 approach to M11 junction 4 towards the A12 during the full closure between M25 junctions 27 and 28.
- 2.3.43 Similarly, portable VMS signs will direct traffic travelling on the northbound A406 approach to the A12 to take the A12 for destinations in the east.

2.3.44 Suitable signposted temporary diversions will be put in place when short-term temporary road closures are required. Table 2.8 shows the proposed temporary closure locations and a description of the associated diversion routes.

Table 2-8: Diversion routes

| Location of closure (Start to end with respect to nearest junction or marker posts, if known) | Diversion route description (Start to end with respect to nearest junction or marker posts, if known) | Length of diversion | Duration of the diversion | Additional journey time for the customer due to diversion route | No. of closures required | Drawing reference |
|--|--|--|---------------------------|---|--------------------------|-----------------------------------|
| Mainline Diversions | | | | | | |
| M25 clockwise between J27 and J28 DBFO emergency diversion route 47 | M25 A carriageway traffic will be diverted on to the M11 southbound to M11 J4, eastbound onto the A406 to Redbridge Roundabout, 2 nd exit onto the A12 eastbound to Gants Hill Roundabout, 3 rd exit onto A12 eastbound to M25 J28 and continue journey. Traffic on the M11 B carriageway to M25 A carriageway at J27 will continue on to the M11 B to M11 J4 and continue with diversion as above. | 18 miles 18 miles 26 miles | 2200-0530 | 30 mins 30 mins 30 mins | 3 | HE551519-ATK-TTM-J28-DR-CH-000013 |

| Location of closure (Start to end with respect to nearest junction or marker posts, if known) | Diversion route description (Start to end with respect to nearest junction or marker posts, if known) | Length of diversion | Duration of the diversion | Additional journey time for the customer due to diversion route | No. of closures required | Drawing reference |
|--|---|---------------------|---------------------------|---|--------------------------|-----------------------------------|
| | M11 A traffic will be diverted onto to M25 B carriageway at J27, exit at J26 and turnaround to M25 A carriageway, exit at J27 onto M11 B to M11 J4 and continue with diversion as above | | | | | |
| M25 anticlockwise between J28 and J27 DBFO emergency diversion route 48 | M25 B carriageway traffic will be diverted at J28 on to the A12 westbound to Gallows Corner junction, 3 rd exit onto A12 westbound to Redbridge junction, 3 rd exit onto A406 northbound to M11 J4, northbound onto M11 to J27. | 18 miles | 2200-0530 | 32 mins | 3 | HE551519-ATK-TTM-J28-DR-CH-000013 |
| M25 anticlockwise between J29 and J28 | Traffic to be diverted at J29 westbound onto the A127 to Gallows Corner | 6.3 miles | 2200-0530 | 10 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000027 |

| Location of closure (Start to end with respect to nearest junction or marker posts, if known) | Diversion route description (Start to end with respect to nearest junction or marker posts, if known) | Length of diversion | Duration of the diversion | Additional journey time for the customer due to diversion route | No. of closures required | Drawing reference |
|--|---|---------------------|---------------------------|---|--------------------------|-----------------------------------|
| CPS Emergency diversion 50 | junction, 4 th exit onto the eastbound A12 back to M25 J28. | | | | | |
| M25 clockwise between J28 and J29 CPS Emergency diversion 50 | Traffic to be diverted at J28 eastbound onto the A12 to Gallows Corner junction, 1st exit onto the eastbound A127 back to M25 J29. | 6.3 miles | 2200-0530 | 10 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000028 |
| M25 clockwise between J28 exit slip and J28 entry slip | Traffic to be diverted onto the exit slip around the junction and back onto the M25 clockwise | 0.5 miles | 2200-0530 | 2 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000011 |
| M25 anti clockwise between J28 exit slip and J28 entry slip | M25 clockwise carriageway to be closed between J28 exit slip and J28 entry slip. Traffic to be diverted onto the exit slip around the junction and back onto the M25 clockwise. | 0.5 miles | 2200-0530 | 2 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000011 |

| Location of closure (Start to end with respect to nearest junction or marker posts, if known) | Diversion route description (Start to end with respect to nearest junction or marker posts, if known) | Length of diversion | Duration of the diversion | Additional journey time for the customer due to diversion route | No. of closures required | Drawing reference |
|--|---|---------------------|---------------------------|---|--------------------------|-----------------------------------|
| Slip road Diversions | | | | | | |
| J28 M25 anticlockwise entry slip for full length of slip road | Traffic diverted onto M25 clockwise at J28, exit at J29, turn at junction and back onto M25 anticlockwise to continue journey. | 6 miles | 2200-0530 | 6 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000008 |
| J28 M25 clockwise exit slip for full length of slip road | Traffic diverted along the M25 clockwise towards J29, where the diverted traffic will return back along the M25 anticlockwise and exit at J28 | 6 miles | 2200-0530 | 6 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000010 |
| A12 eastbound entry slip from J28 roundabout to end of slip | Divert traffic onto the A12 westbound to Gallows Corner junction, 5 th exit onto A12 eastbound and continue journey. | 5 miles | 2200-0530 | 10 mins | 1 | HE551519-ATK-TTM-J28-DR-CH-000009 |

| Location of closure (Start to end with respect to nearest junction or marker posts, if known) | Diversion route description (Start to end with respect to nearest junction or marker posts, if known) | Length of diversion | Duration of the diversion | Additional journey time for the customer due to diversion route | No. of closures required | Drawing reference |
|--|---|---------------------|---------------------------|---|--------------------------|-----------------------------------|
| A12 eastbound exit slip for full length of slip road | Traffic diverted along the A12 eastbound to A12/junction 12, where the diverted traffic will return back along the A12 westbound and exit at J28. | 9 miles | 2200-0530 | 15 mins | 7 | HE551519-ATK-TTM-J28-DR-CH-000029 |

Safety and environmental control measures

2.3.45 Under paragraph (2) of Requirement 10, the final TMP must be substantially in accordance with the Outline Traffic Management Plan (TR010029/EXAM/9.52) and reflect the relevant mitigation measures set out in the REAC (TR010029/APP/7.3), which will be a certified document under Schedule 10 of the DCO. Measures to mitigate the risks to customer groups impacted by the scheme are identified in Table 2.9.

Table 2-9: Safety risk mitigation measures

| Customer group | Safety measures |
|-----------------------------|--|
| Customer | Free recovery through narrow lanes on the M25 Reduced speed limits through traffic management as appropriate Barrier to separate the works from travelling public Maintain safe NMU access Vehicle washdown and wheel wash provide at site exits to prevent transfer of mud and debris onto the road network Open payloads on construction vehicles to be covered to prevent release of dust and debris Spot checks undertaken to ensure construction vehicles are being properly maintained and comply with vehicle safety regulations. Construction vehicle drivers to be given refresher road safety and awareness training. |
| Stakeholder | Clear, well signed diversion routes, risk assessed to ensure suitability for vehicles Barrier to separate the works from travelling public Closures during lifting operations Integrated traffic management plans with stakeholders |
| Partner including workforce | Airlock systems used for closure entry points to prevent unauthorised access Suitable and sufficient temporary barrier Temporary speed limits through the works Closures during TM switches |
| Community | Risk assessment of diversion routes to identify local hazards such as bus stops and on-road parking Noise assessments and monitoring for construction works Signing to prevent/reduce re-routing onto unsuitable roads No idling of vehicles waiting to enter or leave sites |

2.3.46 The Principal Contractor will provide advanced notice to the emergency services of proposed road closures. Should the emergency services require access through the road closure/works because of the nature of the emergency and the need for a quick response time, then the emergency services would report to the traffic management vehicle stationed at the road closure. The construction supervisor would then authorise access, notify the workforce and the emergency services vehicle would be escorted through the road closure and works site by the traffic management vehicle.

- 2.3.47 A key component of the Traffic Management Plan will be the construction workforce Travel Plan that will be prepared by the appointed Principal Contractor prior to commencement of construction. This Travel Plan will set out the measures that will be adopted by the Principal Contractor to encourage the construction workforce to commute by modes of transport other than sole occupancy private car, including public transport. The Travel Plan measures considered are likely to include: Contractor operated shuttle bus service between Brentwood Station and main works site; incentives for car sharing; and incentives for using public transport.
- 2.3.48 Measures within the construction workforce travel plan will enable many construction workers to commute to site by modes of transport other than the private car. Nonetheless, adequate car parking will be provided within the site compound to accommodate those workers who are unable to use alternative means of transport. The construction workforce will also be instructed not to park their cars anywhere except within the site compound. Consequently, it is not anticipated that any of the construction workforce will park their cars anywhere other than within the site compound. Should local residents observe construction workers parking their cars in local streets, then they will be able to raise the issue with Highways England's appointed Principal Contractor and appropriate action will be taken to prevent further instances.

Human factors

Status: During detailed design, human factors will be considered in developing detailed TM layouts, a signing strategy and staff inductions.

2.4 Proposals for management of network occupancy

- 2.4.1 Road space has not yet been booked with Network Occupancy Management System planner.

Status: Details for the management of network occupancy will be developed in liaison with HE OD and their suppliers during detailed design alongside the agreement of the Detailed Local Operating Agreement (DLOA). Reference shall be made to the guidance for project managers within the document *Accurately Updating NOMS and our Digital Channels*.

2.5 Implications of traffic management measures

Intelligent transport services

Status: Detailed impacts of existing equipment during the works will be confirmed during the detailed design. Once detailed TM phasing and drawings are available, the Regional Intelligence Unit will need to undertake a traffic impact assessment to determine the level of delay the TM will cause.

Operations

- 2.5.1 The Scheme has been designed to minimise the impact on the M25 and the A12.
- 2.5.2 M25 work elements will be restricted to the slip road tie in, verge retaining walls and new/altered gantries. An incident management plan will be developed during detailed design 5 and operational maintenance protocols for winter maintenance will be agreed before works commence.
- 2.5.3 The new loop road has been designed to minimise impacting the A12 and work is restricted to tie ins and a new maintenance access off the A12.
- 2.5.4 Re-aligned slip roads have been designed to be constructed with minimum impact on the operation of the existing slip roads by providing sufficient clearance from the existing slip roads.

Maintenance activities

Status: Detailed impacts on maintenance activities will be confirmed during the agreement of the DLOA .

Other services providers

Status: Detailed impacts on other service providers, such as OD, DfT Statistics, NRTS contractor etc. will be assessed during detailed design and a strategy to mitigate will be produced.

Appendices

Appendix A: Roadworks principles

Roadworks principles

The table below details the proposed project approach to addressing the principles identified within Roadworks a Customer View (RACV) and the Roadworks a Customer View Implementation Toolkit. Within the table, the 'proposed approach' is the preferred option which has been selected and the project team is required to communicate the status of the project and activities completed at the current stage. The colour-coded text in the table is an indicator of the level of activities anticipated to have been completed during preliminary design and detailed design and should be used as guidance for completing this table. This text is based on best practice within the RACV Implementation Toolkit but should not be considered exhaustive. Within 'Other options considered', project teams should record any discounted options. The RACV Implementation Toolkit should be utilised to provide further guidance regarding best practice for achieving success with regards to each Customer Principle.

Colour coding key

- **Green** activities – Activities for planning, identifying and set up within preliminary design in anticipation of further detailed works to be undertaken within detailed design. These activities should also be refined within detailed design.
- **Blue** activities – Activities to be completed during detailed design.

| | Key principles | Proposed approach |
|---|----------------------------------|---|
| 1 | Other roadworks and improvements | <p>TM planned in co-ordination with other projects and areas across the region (Highways England and non-Highways England)</p> <p>Consideration of diversion routes in co-ordination with other projects and areas across the region (Highways England and non-Highways England)</p> <p>Identify local regular forums prepared to review plans for TM Liaison with NOMS representative for works within the area.</p> <p>Co-ordination of diversion routes at key decision points and publication once approved.</p> <p>Identify and mitigate the impact of major events</p> <p>Produce schedule for local regular forums prepared to review plans for TM</p> <p>Signing on local roads to inform of incidents or roadworks on the Strategic Road Network</p> |
| 2 | Speed of delivery | <p>Review proposed key design decisions to ensure these can be constructed without significant impact on customers</p> <p>Increasing workforce/shift patterns/productivity to maximise utilisation of the restricted road space</p> <p>Use available technology to minimise impact and maximise productivity</p> <p>Manufacturing components off-site</p> |
| 3 | Length of roadworks | <p>Phasing of road works delivery</p> <p>Length of road works in accordance with Traffic Signs Manual, Chapter 8, Part 3</p> |

| | Key principles | Proposed approach |
|----|------------------------------------|---|
| | | <p>Suitable traffic modelling of the TM proposals to understand the impact on the customer</p> <p>Formal agreements for road works not in accordance with Traffic Signs Manual, Chapter 8, Part 3 requirements</p> |
| 4 | Lane width | <p>Consider alternative layout options, including widening non-standard/temporary 'narrow' lanes within roadworks, in design and communication of reasoning to customers</p> <p>Consider contraflow</p> <p>Alternate widths to facilitate traffic flows</p> <p>Smooth road surfaces and clear demarcation during works and after TM has been removed, and ensure sufficient budget is available to maintain this</p> |
| 5 | Speed Limit | <p>Options considered to maintain the permanent speed limit and why a lower speed limit is required, where applicable</p> <p>Suitable traffic modelling of the TM proposals to understand the impact on the customer</p> <p>Road works designed to be safe for permanent speed limit in accordance with Traffic Signs Manual, Chapter 8, Part 3</p> |
| 6 | Line demarcation | <p>Removal of white line set within contracts as a standard requirement</p> <p>Use of permanent standard white lines</p> <p>Demarcation for night time/rain/bright sunlight conditions</p> <p>Night time lighting requirements</p> <p>Regular checking and maintenance</p> |
| 7 | Visibility of temporary barrier | <p>Good visibility of temporary vehicle barrier</p> <p>Visibility in narrow lanes</p> <p>Improving visibility of temporary vehicle barrier</p> <p>Maintenance of vehicle barrier reflectors</p> |
| 8 | Night time visibility | <p>Risks and requirements of temporary lighting</p> <p>Improving night time visibility of lanes/temporary vehicle barrier in road works using temporary lighting or through the retention of existing lighting</p> <p>Alternative solutions to using temporary lighting</p> |
| 9 | Advance notice of works | <p>Providing advanced notice, i.e. a minimum of 4 weeks prior to project commencing</p> <p>Use of billboards and VMS at roadside prior to start of roadworks</p> <p>Information communicated through various networks/media</p> <p>Planning for advanced notice of changes to TM provided throughout delivery</p> |
| 10 | Scheme information at the roadside | <p>Dependent upon the scale of the project use of either billboards or temporary signage to display reasons and timescales for the work, including signage along diversion routes, in accordance with MPI 48-042016</p> <p>Number and locations of billboards or temporary signage within main works and along diversion routes in respect to TM</p> <p>Size and appearance of temporary signage/billboards across the scheme</p> |

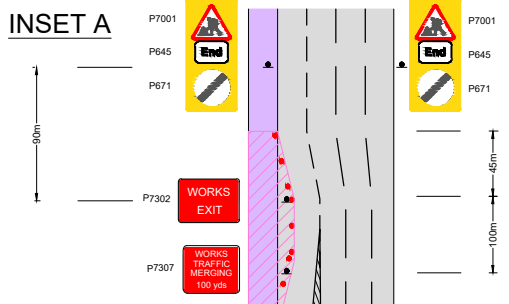
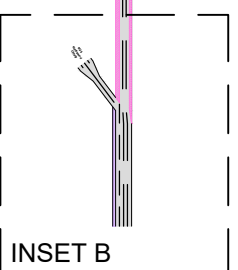
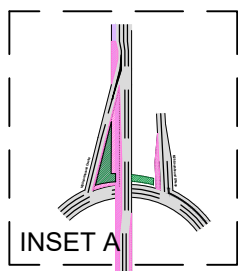
| | Key principles | Proposed approach |
|----|--|---|
| | | Planning for updates to billboards or temporary signage |
| 11 | Electronic signage | <p>Use of standard approach in accordance with the Variable Signs and Signals Policy for flexible project specific messaging and in accordance with MPI 54-062016 (reissued 15/08/2018)</p> <p>Use and location of portable VMS for travel time and project specific messaging</p> <p>Consideration of signing strategy with respect to information overload</p> <p>Consistency in language across projects for VMS messages</p> <p>Consider use of electronic billboards</p> |
| 12 | Travel Time VMS (TTVMS) | <p>Use and location of TTVMS through project TM for main works and diversion routes in accordance with MPI 54-062016 (reissued 15/08/2018)</p> <p>Accuracy of travel time including travel time for alternative routes (diversion routes)</p> |
| 13 | Visible progress | <p>Providing updates to customers about overall progress via signage within roadworks</p> <p>Use of alternative media to provide customer updates</p> <p>Accuracy of information in line with key milestones and completed works</p> |
| 14 | Local communications and outreach | <p>Approach/strategy for delivering good communications at the right time</p> <p>Stakeholder mapping for project/area</p> <p>Use of public exhibitions</p> <p>Use of various media for communications, e.g. newsletters, radio, etc.</p> <p>Understanding of public requirements and key events for TM</p> <p>Diversion route engagement (pre- and post-works) to understand access requirements</p> <p>Progress updates</p> <p>Communications plan</p> |
| 15 | Use multiple media channels, regularly | <p>Identify provision/frequency of information and media methods to be used (make proportional to project)</p> <p>Use of NOMS to ensure accuracy of traffic data</p> <p>Engagement with appropriate organisations to raise awareness/advertise through their sites</p> |
| 16 | Impactful messages | <p>Information to be communicated – programme/community/customer benefit messages</p> <p>Identify media to be used</p> <p>Follow the Construction and Roadworks Communication Toolkit as appropriate</p> |
| 17 | Explain no activity | <p>Strategy to provide explanation of no activity and manage customer perception of project</p> <p>On-road/off-road communications approaches</p> |

| | Key principles | Proposed approach |
|----|--|--|
| 18 | Seek customer feedback on new Traffic Management | <p>Planning for early customer drive through of new traffic management to spot issues, improvements, etc.</p> <p>Agree standard approach to seek feedback from traffic officers, customers and/or customer managers</p> |
| 19 | Understand customer experience | <p>Agree approach to collecting customer feedback</p> <p>Agree mechanisms to engage with various customers</p> <p>Identify process for analysis of correspondence and feedback</p> <p>Planning for use of analysis outcomes to influence future communications</p> |
| 20 | Complete the feedback loop | <p>Identify strategy to communicate how customer input has influenced delivery and project management</p> <p>Agree approach for communicating customer benefits when realised</p> <p>Plan customer specific POPE type assessments – during and after project to share learning</p> <p>Agree consultation strategy to collate customer views/feedback, e.g. pre-project, during construction, during operations, post-project</p> <p>Agree use of social media to share good news stories</p> <p>Identify strategy for sharing best practice, both internally and externally with customers</p> |

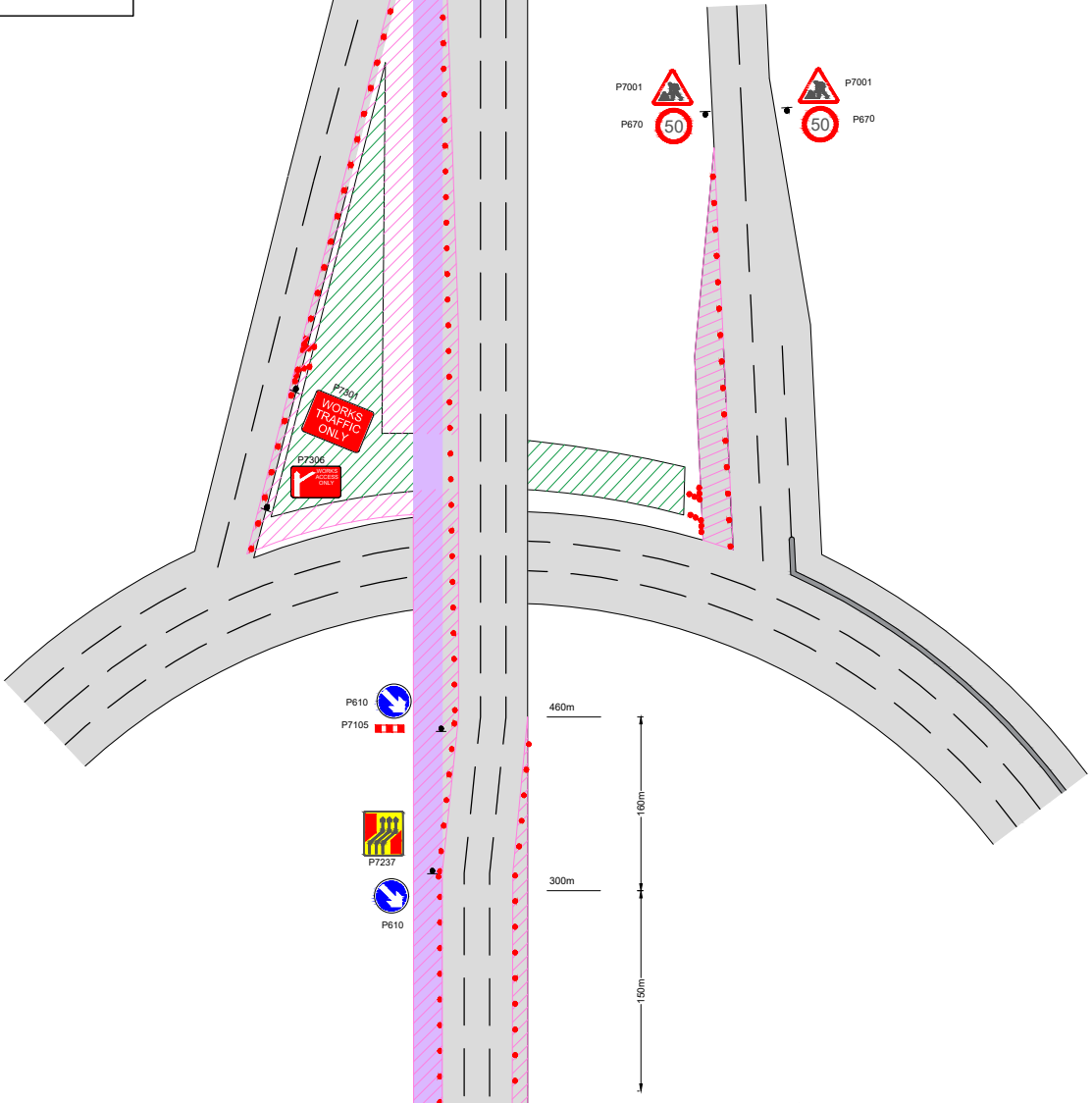
Appendix B: Proposed traffic management layouts and diversion routes

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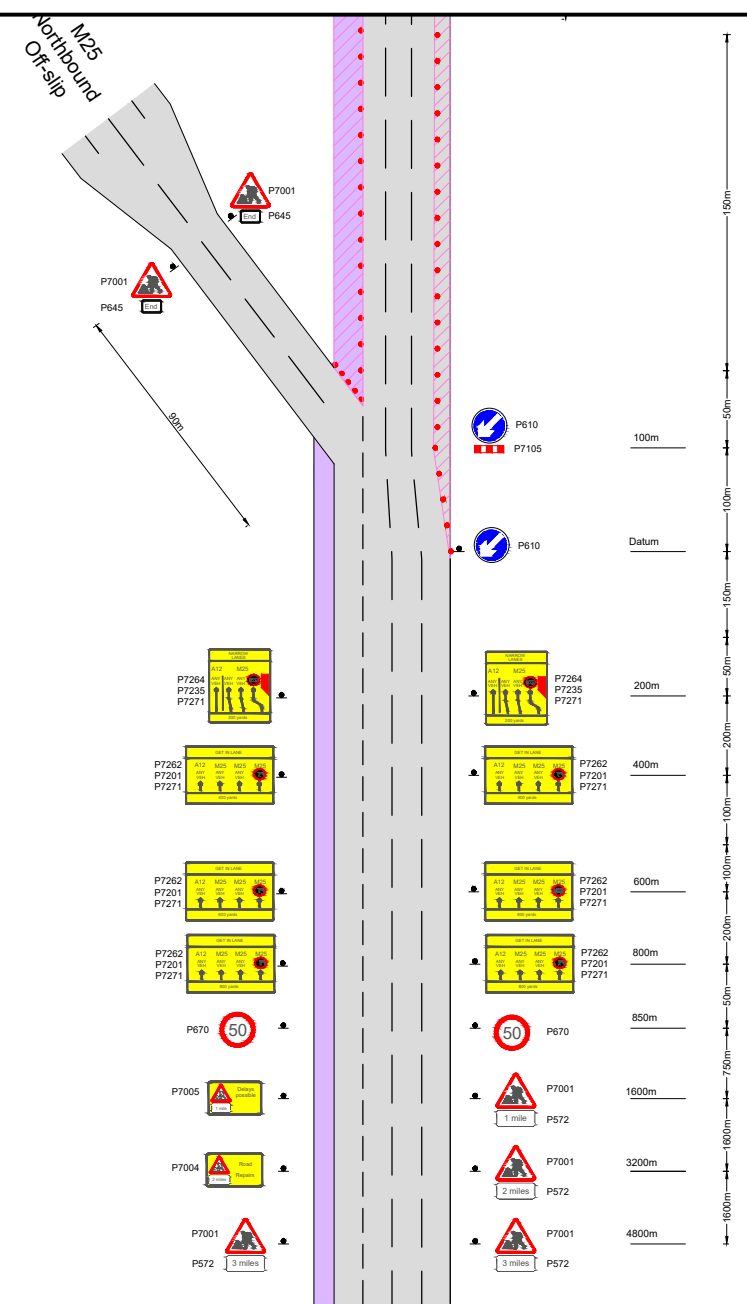
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- M25 Anti-clockwise On slip offside verge works
- M25 Anti-clockwise On Slip tie-in works
- M25 Anti-clockwise Off slip tie-in works



INSET B



TRAFFIC MANAGEMENT LAYOUT 5
M25 ANTI-CLOCKWISE MAINLINE NARROW LANES
AND M25 ANTI-CLOCKWISE ENTRY SLIP NARROW LANES

| KEY | |
|-----|---|
| | TRAFFIC LANE |
| | FOOTWAY |
| | HARD SHOULDER |
| | SAFETY ZONE |
| | WORKS AREA |
| | CONING |
| | TEMPORARY LIGHTING |
| | TEMPORARY ROAD WORKS SIGN - FOR DETAILS REFER TO DIAGRAM NUMBERS IN TSRGD |
| | ESSO HAROLD PARK SERVICE STATION |
| | LOCAL ROAD ACCESS |

NOTES

1. For details of diversion see drawing HE551519-ATK-TTM-J28-DR-CH-00009 .
2. Length of Traffic Management approx. 6,185m.
3. Total duration of Traffic Management 327 nights to carry out slip road tie-in works and verge works.

| Description | | | | | | |
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| Status | Revision | Drawn | Checked | Reviewed | Authorised | Issue Date |
| Description | | | | | | |
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| Description | | | | | | |
| FIRST ISSUE | | | | | | |
| S2 | P01 | MJG | DK | PM | --- | 11/02/20 |
| Description | | | | | | |
| REVISED LAYOUTS | | | | | | |
| A1 | C01 | MJG | SRH | CT | CT | 14/02/20 |

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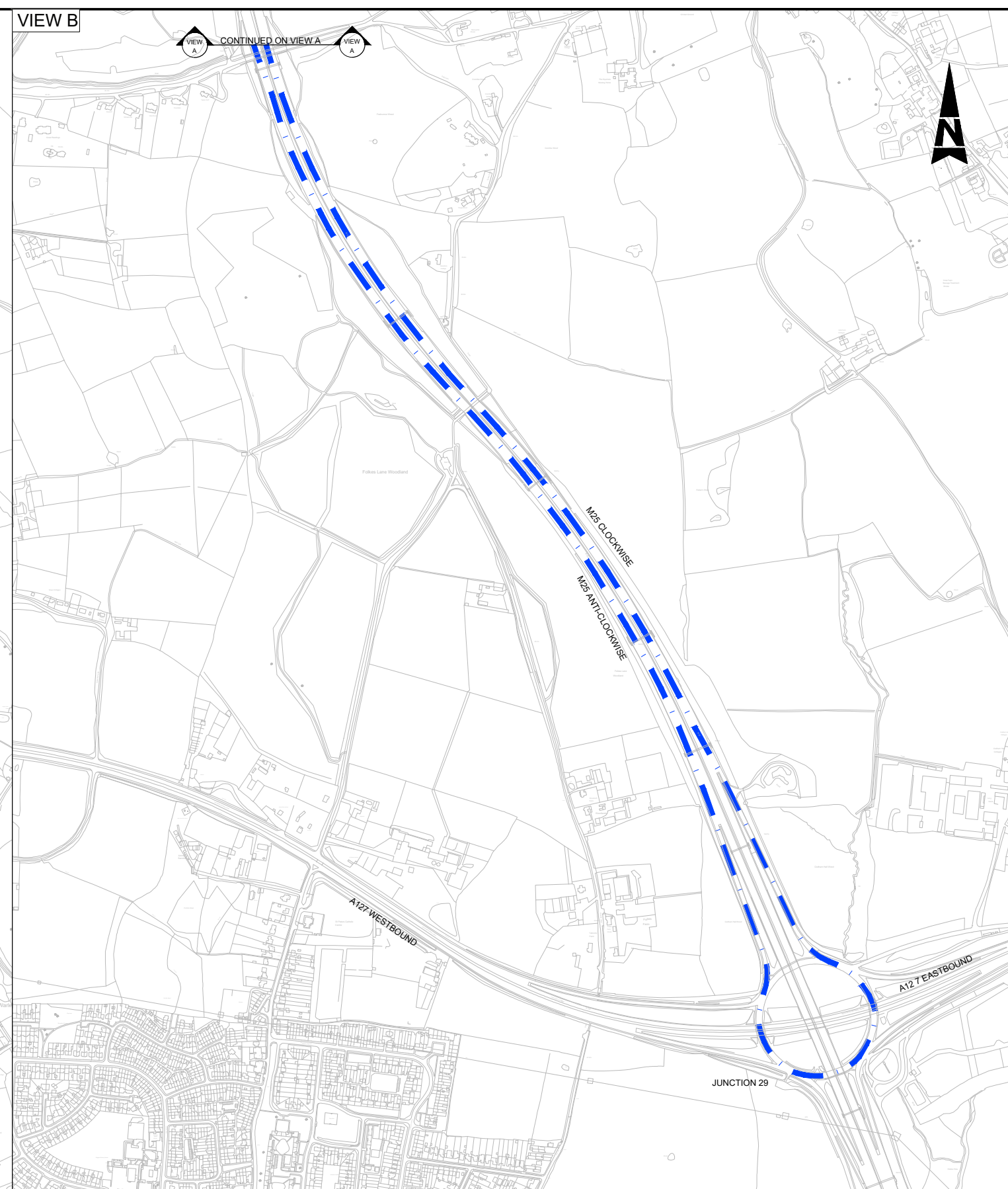
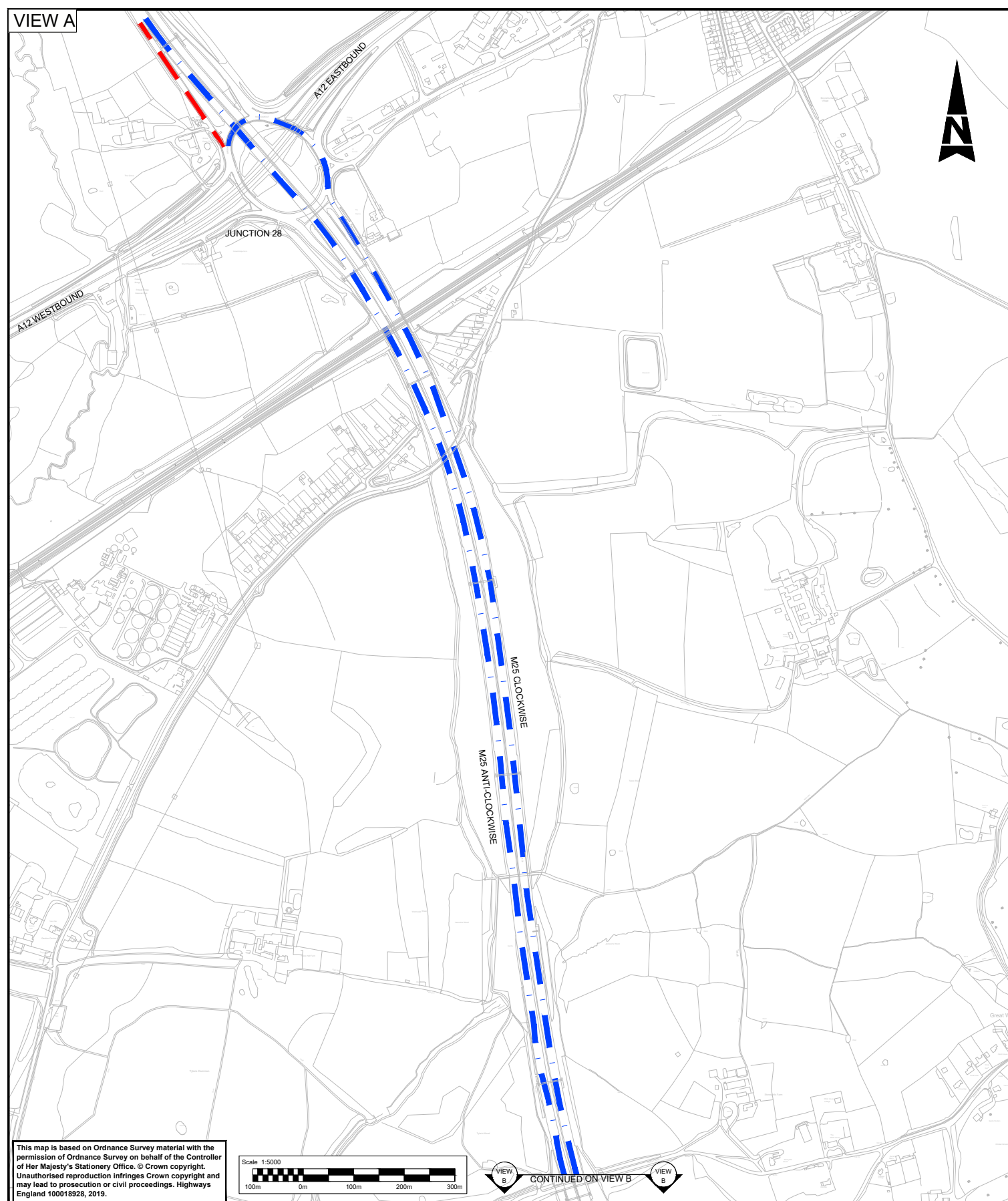
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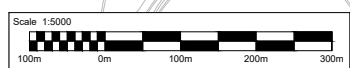
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| Project Title | | M25 junction 28 improvement scheme | | | |
| Drawing Title | | TEMPORARY TRAFFIC MANAGEMENT LAYOUTS SHEET 2 OF 2 | | | |
| Project | HE551519 | Originator | ATK | Volume | TTM |
| Location | J28 | Project Ref. No. | - DR - CH - 000002 | Sheet | 2 of 9 |
| Original Size | A1 | Scale | NTS | Project Ref. No. | 5158157 |
| | | Rev. | C01 | | |

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- KEY**
- M25 J28 ANTICLOCKWISE ON SLIP ROAD CLOSURE
 - - - DIVERSION ROUTE

- NOTES**
1. For details of slip road closure see drawing HE551519-ATK-TTM-J28-DR-CH-000005 Layout 8.
 2. Length of Closure approx. 295m.
 3. Length of Diversion approx 4800m.
 4. Duration of Traffic Management 20 nights to tie in bottom of new slip road.

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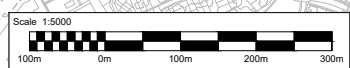
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| Drawing Number | Project | Originator | Volume |
| HE551519 | - ATK | - TTM | - |
| J28 | - DR - CH - 000008 | | |
| Location | Type | Role | Number |
| | | | |
| Original Scale: | A1 | Scale: 1:5000 | Project Ref. No.: 5158157 |
| | | | Sheet: 3 of 9 |
| | | | Rev: C01 |

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- KEY**
- A12 J28 EASTBOUND ON SLIP ROAD CLOSURE
 - - - DIVERSION ROUTE

- NOTES**
1. For details of slip road closure see drawing HE551519-ATK-TTM-J28-DR-CH-00003 Layout 6 .
 2. Length of Closure approx. 335m.
 3. Length of Diversion approx 8,570m.
 4. Duration of Traffic Management 5 nights to carry out roadmarkings.

| Description | | | | | | |
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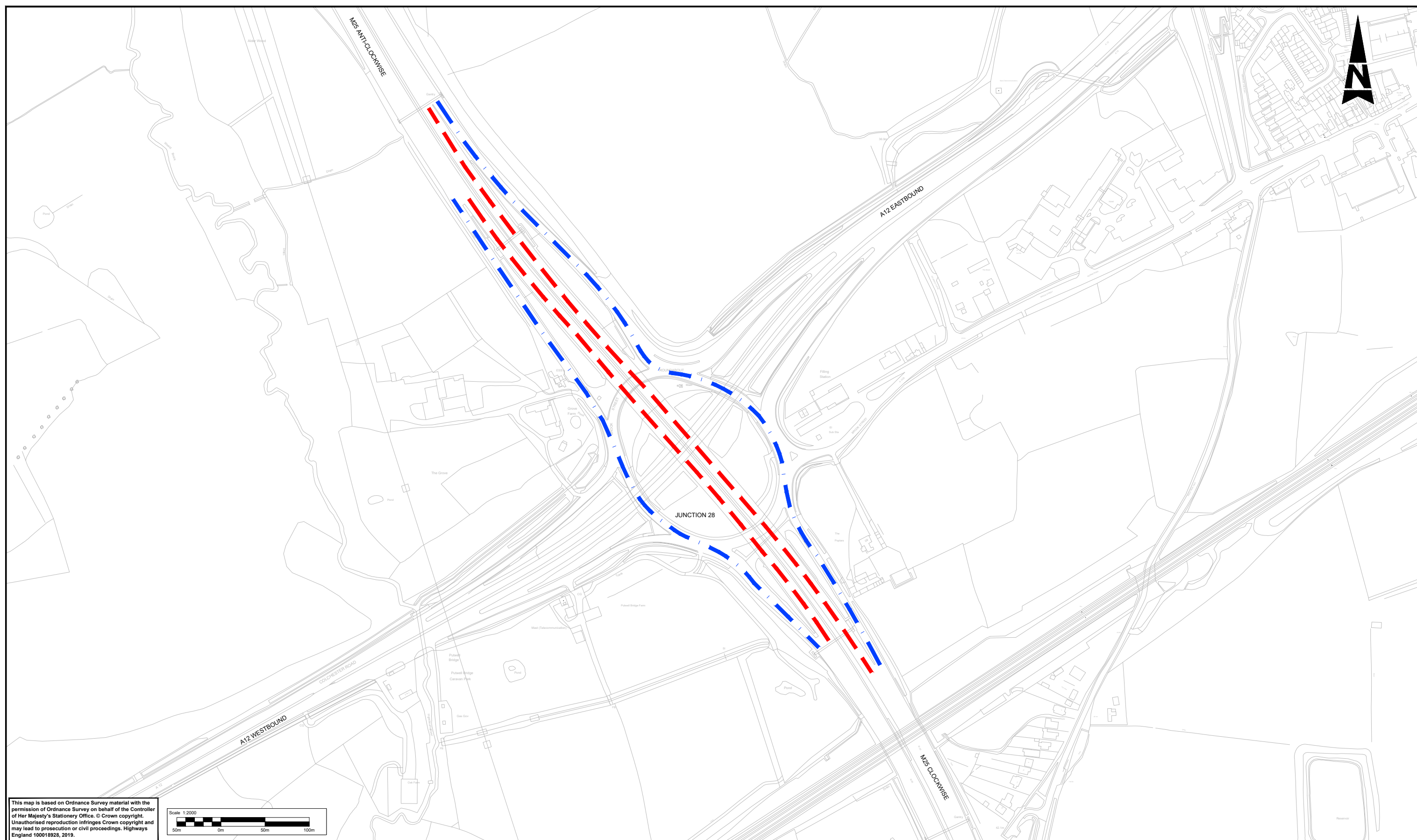
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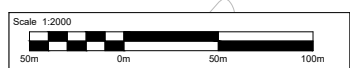
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| Project Title | | M25 junction 28 improvement scheme | |
| Drawing Title | | TEMPORARY TRAFFIC MANAGEMENT A12 EASTBOUND ON SLIP ROAD CLOSURE DIVERSION ROUTE | |
| Drawing Number | Project | Originator | Volume |
| HE551519 | - ATK | - TTM | - |
| J28 | | - DR - CH - 000009 | |
| Location | Type | Role | Number |
| Original Scale: A1 | Scale: 1:5000 | Project Ref. No.: 5158157 | Sheet: 4 of 9 Rev: C01 |

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- KEY**
- - - - - M25 CLOCKWISE AND ANTI-CLOCKWISE FULL ROAD CLOSURES
 - - - - - M25 CLOCKWISE AND ANTI- CLOCKWISE DIVERSION ROUTE

- NOTES**
1. Length of Traffic Management approx. 645m anti clockwise and 886m clockwise.
 2. Duration of Traffic Management 9 nights, for Installation of gantry 740 and removal of gantry 710.

| Description | Status | Revision | Drawn | Checked | Reviewed | Authorised | Issue Date |
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| First Issue | S2 | PO1 | MJG | DK | PM | --- | 11/02/20 |
| First Issue | A1 | CO1 | DK | SRH | CT | CT | 14/02/20 |

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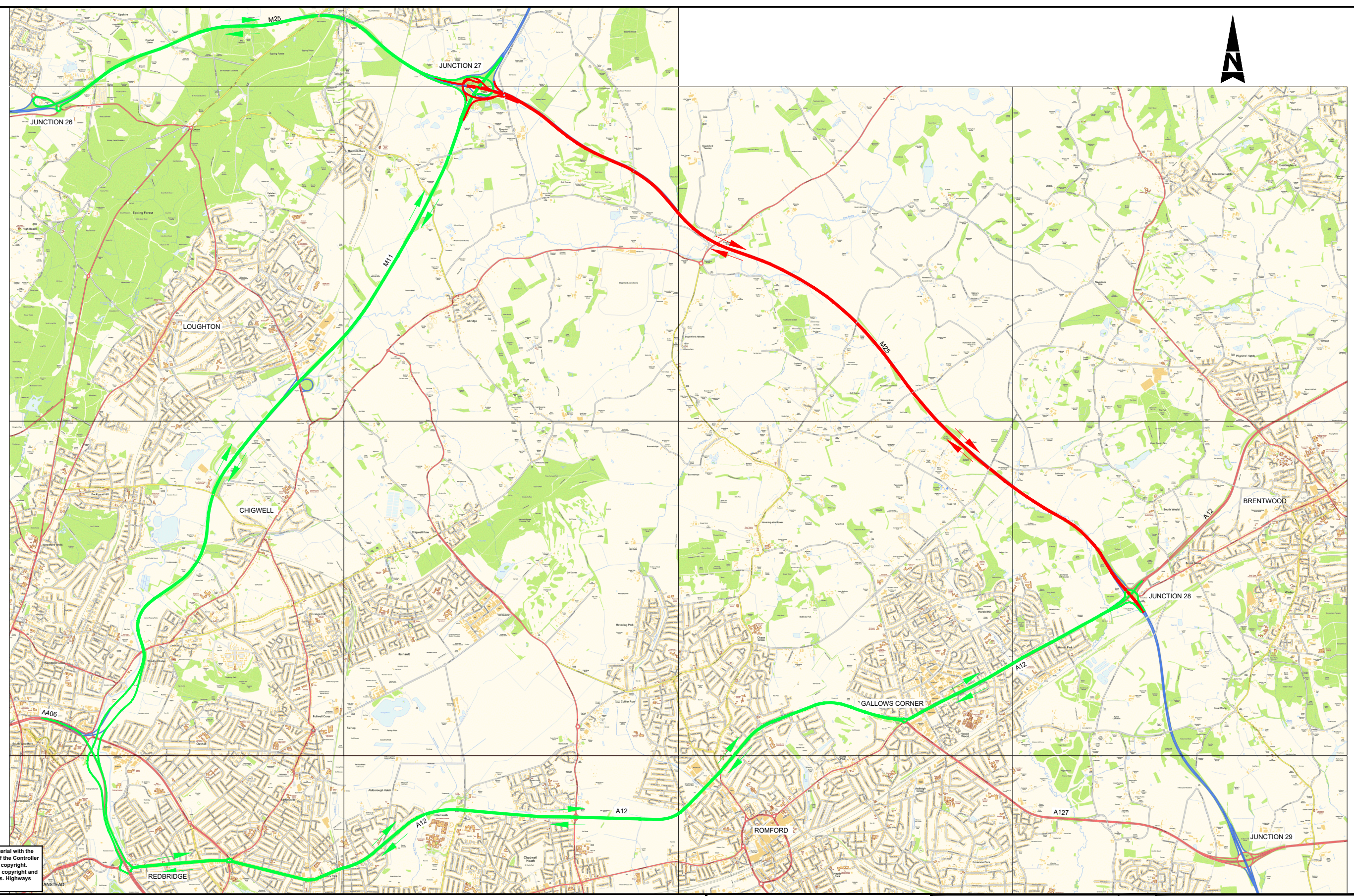
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| Project Title | M25 junction 28 improvement scheme | | |
| Drawing Title | TEMPORARY TRAFFIC MANAGEMENT M25 CW AND M25 ACW FULL CLOSURE DIVERSION ROUTE | | |
| Drawing Number | HE551519 | Originator | ATK |
| Project | J28 | Volume | TTM |
| Location | J28 | Type | DR - CH - 000011 |
| Original Scale | A1 | Scale | 1:2000 |
| Project Ref. No. | 5158157 | Sheet | 6 of 9 |
| Rev. | C01 | Rev. | C01 |



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KEY

| | |
|---|--|
|  | M25 CLOCKWISE AND ANTI-CLOCKWISE FULL ROAD CLOSURE BETWEEN J28 AND J27 |
|  | M25 CLOCKWISE ANTI-CLOCKWISE DIVERSION ROUTE BETWEEN J28 AND J27 |

- NOTES**
- Length of Closure, 13,500m.
 - Length of Diversion 29,500m
 - Duration of Traffic Management 7 nights.

| Description | | | | | | |
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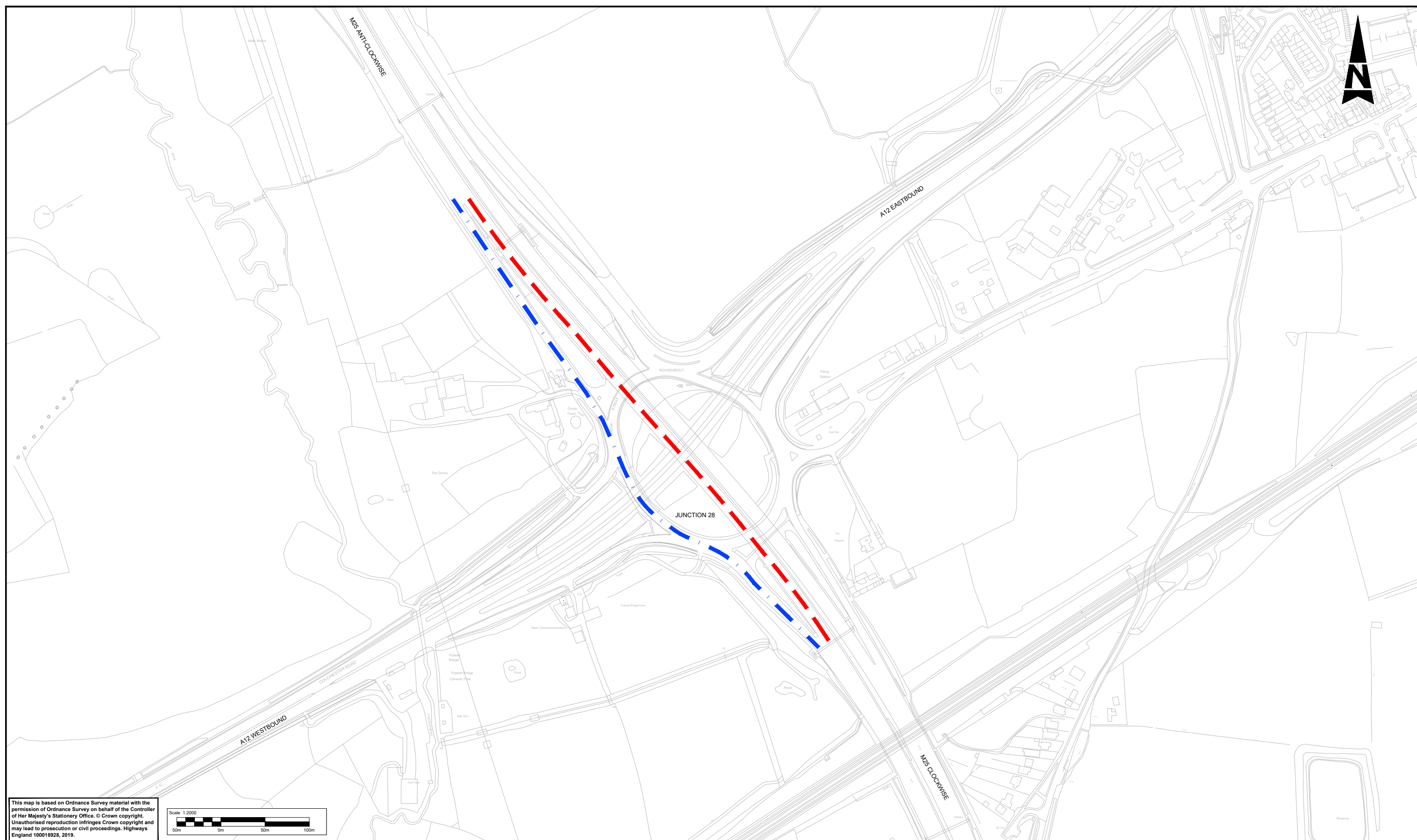
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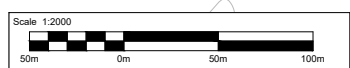
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| Drawing Title | TEMPORARY TRAFFIC MANAGEMENT M25 CLOSURE J27 TO J28 DIVERSION ROUTE | | |
| Drawing Number | Project | Originator | Volume |
| HE551519 | - ATK | - TTM | - |
| J28 | - DR - CH | - 000013 | |
| Location | Type | Role | Number |
| Original Scale: A1 | Scale: NTS | Project Ref. No.: 5158157 | Sheet: 7 of 9 |
| | | | Rev: C01 |

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KEY

| | |
|--|-------------------|
| | SLIP ROAD CLOSURE |
| | DIVERSION ROUTE |

- NOTES**
- Length of Traffic Management approx. 645m.
 - Duration of Traffic Management 5 nights for modifications to 3No. ganties.

| Description | | | | | | |
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|----------------|---------------|---|------------------------|
| Project Title | | M25 junction 28 improvement scheme | |
| Drawing Title | | TEMPORARY TRAFFIC MANAGEMENT M25 CW CLOSURE DIVERSION ROUTE | |
| Drawing Number | Project | Originator | Volume |
| HE551519 | - ATK | - TTM | - |
| J28 | | - DR - CH - 000026 | |
| Location | Type | Role | Number |
| A1 | Scale: 1:2000 | Project Ref. No.: 5158157 | Sheet: 8 of 9 Rev: C01 |

Appendix C: Customer impact assessment tool

Consider the impact of the roadworks (and the associated construction traffic) on the different types of road users and rate the level of impact:

Table C1: Intelligent transport service infrastructure impacts

| | Road user type (e.g. commuters, leisure drivers, freight, etc.) | Level of impact | | |
|---|--|-----------------|--------|-----|
| | | High | Medium | Low |
| 1 | Commuters | H | | |
| 2 | Freight | | M | |
| 3 | Leisure | | M | |

Consider the impact of the roadworks (and the associated construction traffic) on the communities and rate the level of impact:

Table C2: Impact of roadworks and associated construction traffic on communities and level of impact

| | Community (e.g. commuters, leisure drivers, freight, non-motorised user, etc.) | Level of impact | | |
|---|---|-----------------|--------|-----|
| | | High | Medium | Low |
| 1 | Commuters | H | | |
| 2 | Freight | H | | |
| 3 | Leisure | | M | |

Consider the impact of diversion routes on road users and communities and rate the level of impact:

Table C3: Impact of diversion routes on road users and communities and level of impact

| | Customer types (e.g. commuters, leisure drivers, freight, industrial estates, residents, local authorities, retail parks, schools, stadiums, local events, land owners, etc.) | Level of impact | | |
|---|--|-----------------|--------|-----|
| | | High | Medium | Low |
| 1 | Commuters | | | L |
| 2 | Leisure | | | L |
| 3 | Freight | H | | |
| 4 | Industrial Estate | | M | |
| 5 | Residents | H | | |
| 6 | Local stakeholder | | M | |

Appendix D: Dynamic roadworks benchmarking template

Table D1: RAG descriptions for visions

| | Green (aligned to vision) | Amber (just outside vision) | Red (well outside vision) |
|----------------------------------|--|---|--|
| Speeds | Over 50% of the project (in distance and time) is at the permanent speed limit | Less than 50% is at the permanent speed limit, but there is clear evidence showing what alternative methods of construction were used. | Less than 50% is at the permanent speed limit, and there is no evidence showing what alternative methods of construction were used. |
| Length | <p>The total length of TM on any one 'journey' (i.e. on 2 arms of a roundabout that could form a realistic journey) is shorter than 6km, or 1 link if on a motorway.</p> <p>Or, the total length of TM is more than 6km (or 1 link if a motorway) but there is evidence the increased length is proportional to a reduced delivery time.</p> <p>Or, the total length of TM is more than 6km (or 1 link if a motorway) but the additional length is operating at a minimum of 60mph.</p> <p>AND the average journey time created by the road works is not more than an additional seven minutes thirty seconds.</p> | <p>The total length of TM is more than 6km (or 1 link if a motorway) and there is evidence that the reduced delivery time is halfway proportional to the increased length. e.g. a fifty percent increase in length for a 25% reduction in the time taken to deliver the additional length.</p> <p>AND the average journey time created by the road works is not more than an additional seven minutes thirty seconds.</p> | <p>The total length of TM is more than 6km (or 1 link if a motorway) and there is no evidence of reduced delivery time even halfway proportional to the increased length, nor is the additional length a minimum of 60mph.</p> <p>AND/OR the average journey time created by the road works is more than an additional seven minutes thirty seconds.</p> |
| Closures & diversions | No more than 1 full closure (including slip road closures) every 3 months | No more than 1 full closure (including slip road closures) every month | More than 1 full closure (including slip road closures) every month |

| | Green (aligned to vision) | Amber (just outside vision) | Red (well outside vision) |
|----------------------------|--|--|---|
| | And / or the diversion route has a comparable journey time, and impact on communities along the diversion route are minimal | | |
| Delivering quicker | Benefits are delivered to the customer before full opening (NA if offline project) AND construction is undertaken at least 6 days a week AND restrictions are lifted during embargo periods (unless full productivity is maintained) | Benefits are delivered to the customer before full opening (NA if offline project) OR construction is undertaken at least 6 days a week OR restrictions are lifted during embargo periods (unless full productivity is maintained) | No benefits are delivered to the customer before full opening (NA if offline project) NOR is construction undertaken at least 6 days a week NOR are restrictions lifted during embargo periods (and full productivity isn't maintained) |
| Explaining activity | There is evidence of a comprehensive on-road/off-road communications approach, which updates customers as required of activities undertaken, works completed and progress made. | Evidence of an off-road only communications approach, which updates customers as required of activities undertaken, works completed and progress made. | No evidence of a communications approach which updates customers as required of activities undertaken, works completed and progress made. |

NA – This part of the vision is not applicable to this project e.g. the project may be a new road so there is no need to report on speeds/length etc.

Not yet known – The project cannot yet provide this information. If this option is chosen, the project must provide supporting evidence on a) why it is not yet known and b) when the information is expected to be available.

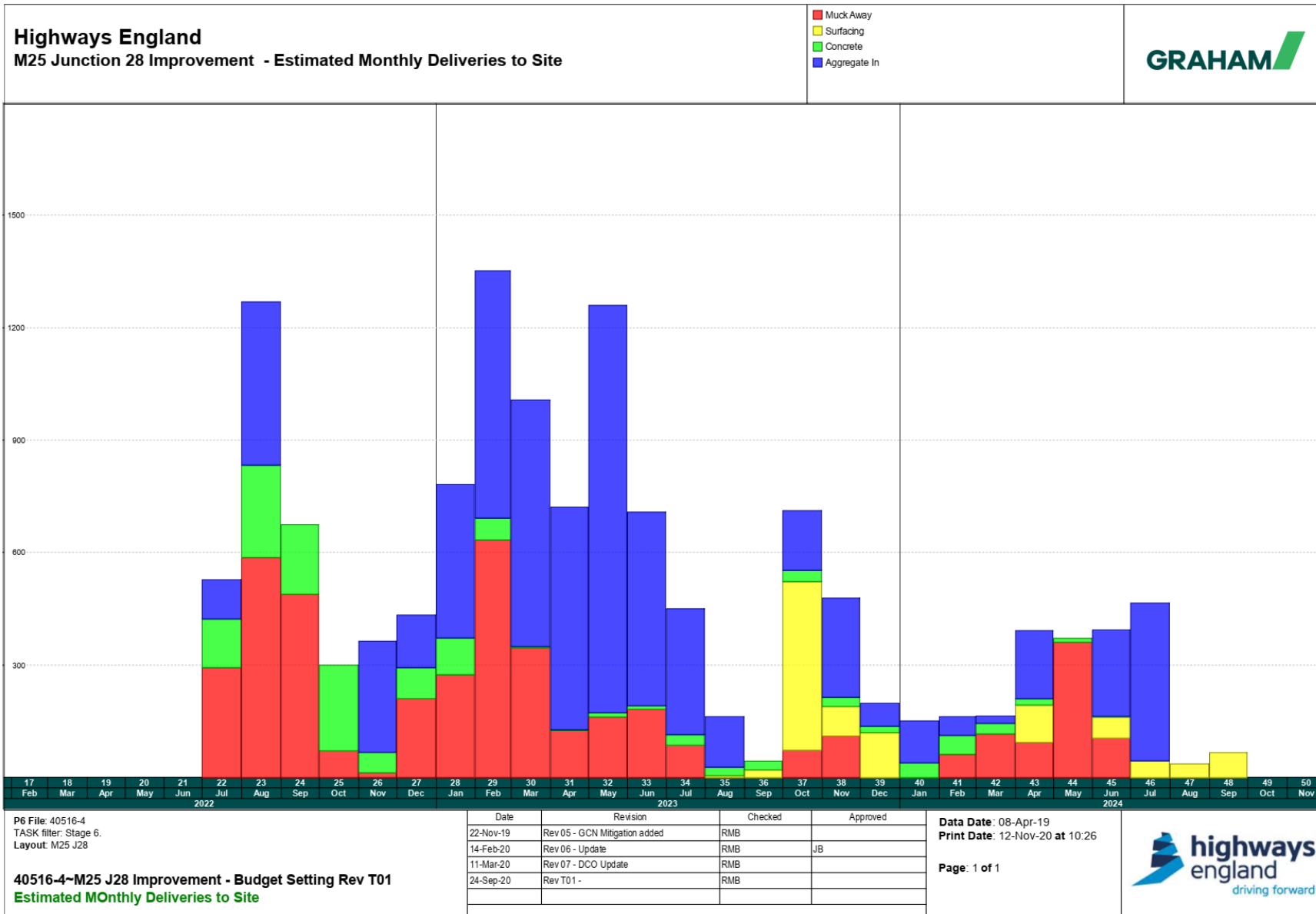
Dynamic road works benchmarking scores

Table D2: Dynamic roadworks benchmarking template

| Vision | Green/ Amber/ Red/ NA/ Not yet known | Project evidence for RAG rating |
|--|---|---|
| <p>1. Speeds Varying the speed limits so they are appropriate for the work taking place</p> | Green | <p>Based on a site length of 8.2km and a contract duration of 671 days the total road-space availability is approximately 5555 Km/days (approx. 8.2x671). The total occupancy from Table 2.4 (length multiplied by duration with a 50% reduction of duration for night only works) is 2657 km/days. Permanent speed limits will be in force at locations where there is no traffic management such that the permanent speed limit is in place for approximately 52% of the distance and time duration of the project. If after more detailed design and risk analysis the narrow lane only running sections can be increased to permanent speed limits using the measures described in Table A1.8 of Chapter 8 part 3 – this percentage would reduce to 8%.</p> |
| <p>2. Length Shortening the length of roadworks</p> | Green | <p>TM is mostly localised to tie in works and short length/duration gantry works</p> |
| <p>3. Closures and diversions Appropriate use of full overnight road closures (including slip road closures) and associated diversions</p> | Amber | <p>No more than an average of 1 full closure per month</p> |
| <p>4. Delivering quicker Delivering road works quicker</p> | Amber | <p>Construction is undertaken at least 6 days a week</p> |
| <p>5. Explaining activity Explaining clearly what activities are, or are not, taking place</p> | | <p>Communications plan will be developed during Stage 5</p> |

Appendix E: Petersfield Avenue vehicle swept path analysis

Appendix F: Estimated construction vehicle trip generation



Appendix G: Implementation the highest safe speed within road works checklist

Implementing the highest safe speed within road works – checklist

This checklist is from the ‘Implementing the highest safe speed within road works - guidance’. This checklist should be completed prior to Section 2.3.3 to provide further information to justify the speed restrictions chosen for the road works scheme. Following completion of this checklist, Section 2.3.3 and Table 2-3 should then be completed, to provide details on the reasoning for the planned speed restrictions, along with any implications.

Table G1: Checklist for implementing the highest safe speed within road works

| | Checklist items | Reasoning |
|------------------------------------|---|---|
| Development of design brief | Incorporate requirements outlined in <i>Chief Highways Engineer Memorandum 446/19</i> | <p>The requirements of CHE Memorandum 446/19 have been considered in Preliminary design as far as possible. Requirements in the memorandum are now incorporated in Chapter 8 Part 3, including Table A1.8 Criteria for identification of design speed for standard schemes.</p> <p>The requirements of the Memorandum together with the preliminary traffic management design and this Traffic Management Plan will feed into the design brief for Detailed design, where more detailed traffic management proposals will be developed.</p> <p>The Traffic Management proposals to date reflect the current understanding of the programme, site constraints and methods of construction to be adopted.</p> |
| Safety risk assessment | <p>Where 60mph speed restrictions are to be used, set a safety objective to ensure the safety baseline can be maintained</p> <p>Review appropriate evidence to inform the analysis of risk</p> <p>Ensure your scheme specific risk assessment captures all reasonably foreseeable hazards</p> | <p>Safety Risk Assessment has been undertaken to ascertain appropriate safe speeds within the roadworks. Please refer to Appendix H</p> |

| | Checklist items | Reasoning |
|---|--|---|
| Work programme and traffic management proposal | Ensure design of temporary traffic management is suitable for road users travelling at the proposed speed restriction | Preliminary traffic management layouts have been developed to reflect possible speed restrictions which may be necessary for certain activities. Speed restrictions will vary depending on works being undertaken and at different location. This will be refined during the Traffic Management Design at Detailed design with particular attention paid to elimination of speed limits when the only restriction is narrow lane working. |
| | Where the same speed restriction cannot be used across the entirety of the scheme, consider use of varying restrictions, where suitable | |
| Implementation | Consider undertaking additional safety audits to ensure that the required mitigations outlined within your safety risk assessment are implemented correctly | This is to be revisited during the Traffic Management Design at Stage 5. Temporary Traffic restrictions which may be required during construction will be obtained, even if subsequent risk assessments enable their use to be substantially reduced or eliminated. A safety audit of the detailed traffic management proposals will be required |
| | Where enforcement is required as part of your safety risk assessment, engage with enforcement agencies early | |
| | Obtain the appropriate Temporary Traffic Restriction Orders required for your proposal | |
| Validation | Where assumptions in your safety risk assessment were informed by expert opinion or other sources of data, monitor suitable metrics to provide information on the performance of implemented mitigations | Metrics will be agreed and monitored during the Traffic Management Design at Stage 5 |
| | Update your safety risk assessment and introduce new mitigations to maintain safety baseline if required | |

Appendix H: High level risk assessment

High level risk assessment

| Location | Temporary Traffic Management Feature | Measure | Chapter 8 Requirement | The Risk Is | The Risk Is caused by | Mitigation | Other Measures possible | | Comments |
|--|--|---|--------------------------------------|--|--|--|-------------------------|-----------------------------|---|
| | | | | | | | Measure | Impact | |
| A12 (utility works and tie-in operations) | Safety Zone reduced 0.5m with or without narrow lane running | Temporary 40mph limit enforced when work is in progress | Mandatory under clause D3.2.12 | Barrier impacts and injury to motorists and workforce | Sub-standard cross section width of existing carriageway | Reduce speed limit whilst works are in place in accordance with C8 | Lane closures | Increase in user delays | Permanent speed limit on this section of road after the works are completed will be reduced to 50mph. The A12 is part of Transport for London's road network at this location |
| | | | | | | | Carriageway Widening | Significant additional cost | |
| M25 ACW (gantry foundation installation) | Hard shoulder closure | Maintain 70mph limit throughout Traffic Management | Chapter 8 Part 3 - Clause U2.10 | Barrier impacts and injury to motorists and workforce | Works distracting drivers (medium risk) | Produce a safe TM proposal, at a 70mph design speed in accordance with Chapter 8 Part 3 - Clause U2.10 | N/A | N/A | More detailed risk analysis of operations to be undertaken in Stage 5. If the safety criteria at this location cannot be met, the speed limit can be reduced down to a minimum of 50mph in the worst case scenario. |
| M25 ACW | Narrow lane running | Maintain 70mph limit throughout Traffic Management | Chapter 8 Part 3 - Clause U2.10 | Barrier impacts and injury to motorists and workforce | Works distracting drivers (low risk) | Produce a safe TM proposal, at a 70mph design speed in accordance with Chapter 8 Part 3 - Clause U2.10 | N/A | N/A | This is a lower risk work element, driver behaviour to be monitored and speed reductions introduced as appropriate |
| M25 ACW Lane Closures for piling rig mobilisation/demobilisation | Lane closures | Maintain 70mph limit throughout Traffic Management | Chapter 8 Part 1 - D3.7.26 Table 3.5 | Barrier impacts, side swipe collisions and injury to motorists and workforce | Lane changes, high traffic volumes and works distracting drivers (high risk) | Reduce speed limit to 50mph whilst works are in place in accordance with C8 part 1 | Full Closure | Disruption and user delays | It may be necessary to close 2 lanes plus hard shoulder for crane mobilisation demobilisation activities. The risks of distractions and impact with heavy plant during loading and unloading operations is high. Operation to be considered in more detail in PCF stage 5 when plant and pile driving characteristics are known |

- Recommended
- Further risk assess in PCF Stage 5
- Not recommended

Appendix I: Outline traffic management programme

| Highways England - Project No. MP0270 M25 Junction 28 Improvements | | | | | | | GRAHAM | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------|---|---------------------------|------------------------|-------------------------|---|--------|-----|-----|---|-----|-----|---|---|-----|---|---|------|---|-----|-----|---|------|-----|---|---|-----|---|---|-----|---|-----|
| # | Activity ID | Activity Name | Planned / Actual Duration | Planned / Actual Start | Planned / Actual Finish | 2023 | | | | | | | | | | | | 2024 | | | | | 2025 | | | | | | | | | |
| | | | | | | Jan | F | Mar | Apr | M | Jun | Jul | A | S | Oct | N | D | Jan | F | Mar | Apr | M | J | Jul | A | S | Oct | N | D | Jan | F | Mar |
| 1 | PCF Stage 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Construction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Traffic Regulation Order | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Traffic Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | JG-S6-TM-1000 | A12 EB Narrow Lane Running + off peak L1 Closure - SU works (Complete ZAV/Diversions at A12 tie in points) | 30 | 05-Apr-23 | 19-May-23 | A12 EB Narrow Lane Running + off peak L1 Closure - SU works (Complete ZAV/Diversions at A12 tie in points) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | JG-S6-TM-1310 | A12 EB Narrow Lane Running-off peak L1 Closure - SU works(Complete BT diversions at A12 tie in points -TOP OF OFF SLIP) | 20 | 14-Jul-23 | 10-Aug-23 | A12 EB Narrow Lane Running-off peak L1 Closure - SU works(Complete BT diversions at A12 tie in points -TOP OF OFF SLIP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | JG-S6-TM-1010 | A12 Eastbound narrow lane running - tie in works off slip | 55 | 30-Oct-23 | 25-Jan-24 | A12 Eastbound narrow lane running - tie in works off slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | JG-S6-TM-1020 | A12 Eastbound existing off slip - close nearside left turn lane | 85 | 30-Oct-23 | 08-Mar-24 | A12 Eastbound existing off slip - close nearside left turn lane | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | JG-S6-TM-1030 | M25 ACW - Narrow Lane running - On slip off side works | 100 | 07-Dec-23 | 13-May-24 | M25 ACW - Narrow Lane running - On slip off side works | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | JG-S6-TM-1040 | M25 On Slip ACW - Full closure nights - tie in to new slip road | 20 | 07-Dec-23 | 17-Jan-24 | M25 On Slip ACW - Full closure nights - tie in to new slip road | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | JG-S6-TM-1050 | A12 Eastbound - L1 Closure - Nights - Off slip tie in | 20 | 15-Jan-24 | 09-Feb-24 | A12 Eastbound - L1 Closure - Nights - Off slip tie in | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | JG-S6-TM-1060 | M25 ACW - Narrow Lane running - On Slip verge works | 140 | 18-Jan-24 | 06-Aug-24 | M25 ACW - Narrow Lane running - On Slip verge works | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | JG-S6-TM-1070 | M25 On Slip ACW - Offside lane closure - nights - tie in works | 80 | 18-Jan-24 | 13-May-24 | M25 On Slip ACW - Offside lane closure - nights - tie in works | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | JG-S6-TM-1080 | Switch Traffic on to new NB On slip | 1 | 18-Jan-24 | 18-Jan-24 | Switch Traffic on to new NB On slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | JG-S6-TM-1090 | Roundabout nearside lane closure - tie in A12 off slip | 30 | 12-Feb-24 | 23-Mar-24 | Roundabout nearside lane closure - tie in A12 off slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | JG-S6-TM-1100 | M25 CW - H/S & Off slip diverge closure - Gantry foundations | 45 | 07-Mar-24 | 13-May-24 | M25 CW - H/S & Off slip diverge closure - Gantry foundations | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | JG-S6-TM-1110 | M25 CW L1/L2 Closure Nights - Piling mobilisation | 10 | 07-Mar-24 | 20-Mar-24 | M25 CW L1/L2 Closure Nights - Piling mobilisation | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | JG-S6-TM-1120 | Switch traffic on to new A12 Eastbound off slip | 1 | 11-Mar-24 | 11-Mar-24 | Switch traffic on to new A12 Eastbound off slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | JG-S6-TM-1130 | A12 Eastbound narrow lane running - tie in works on slip | 130 | 11-Mar-24 | 13-Sep-24 | A12 Eastbound narrow lane running - tie in works on slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | JG-S6-TM-1140 | M25 CW Off Slip - L2 closure | 35 | 21-Mar-24 | 13-May-24 | M25 CW Off Slip - L2 closure | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | JG-S6-TM-1150 | M25 CW L1/L2 Closure Nights - Piling de-mobilisation | 1 | 05-Apr-24 | 05-Apr-24 | M25 CW L1/L2 Closure Nights - Piling de-mobilisation | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | JG-S6-TM-1160 | Full closure M25 ACW @ J25 - ADS CH 530 Install | 2 | 06-Apr-24 | 09-Apr-24 | Full closure M25 ACW @ J25 - ADS CH 530 Install | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | JG-S6-TM-1170 | Full closure M25 both directions - Gantry CH 740 Install | 5 | 29-May-24 | 04-Jun-24 | Full closure M25 both directions - Gantry CH 740 Install | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | JG-S6-TM-1180 | Full Closure M25 both directions - Existing Gantry Removal CH 710 | 2 | 03-Jul-24 | 04-Jul-24 | Full Closure M25 both directions - Existing Gantry Removal CH 710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | JG-S6-TM-1190 | A12 Eastbound On Slip - Full closure nights - Roadmarkings | 5 | 05-Jul-24 | 11-Jul-24 | A12 Eastbound On Slip - Full closure nights - Roadmarkings | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | JG-S6-TM-1200 | M25 CW Off slip - Closure - Nights - Roadmarkings on slip | 5 | 05-Jul-24 | 11-Jul-24 | M25 CW Off slip - Closure - Nights - Roadmarkings on slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | JG-S6-TM-1210 | M25 ACW - H/S & L1 closure - gantry foundation removal CH 710 | 5 | 12-Jul-24 | 18-Jul-24 | M25 ACW - H/S & L1 closure - gantry foundation removal CH 710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | JG-S6-TM-1220 | A12 Eastbound - L1 Closure - Nights - On slip tie in | 15 | 19-Jul-24 | 08-Aug-24 | A12 Eastbound - L1 Closure - Nights - On slip tie in | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | JG-S6-TM-1230 | Full closure M25 both directions - Gantry CH 1800 Install | 5 | 31-Jul-24 | 05-Aug-24 | Full closure M25 both directions - Gantry CH 1800 Install | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | JG-S6-TM-1240 | Full closure M25 ACW - Existing Gantry S21 Modifications | 5 | 14-Aug-24 | 20-Aug-24 | Full closure M25 ACW - Existing Gantry S21 Modifications | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | JG-S6-TM-1250 | Full closure M25 CW - Existing Gantry S21 Modifications | 5 | 21-Aug-24 | 28-Aug-24 | Full closure M25 CW - Existing Gantry S21 Modifications | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | JG-S6-TM-1260 | Full Closure M25 both directions - Existing Gantry Removal CH 1530 | 2 | 05-Sep-24 | 05-Sep-24 | Full Closure M25 both directions - Existing Gantry Removal CH 1530 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | JG-S6-TM-1270 | M25 ACW - Narrow lane running - tie in off slip | 20 | 16-Sep-24 | 11-Oct-24 | M25 ACW - Narrow lane running - tie in off slip | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | JG-S6-TM-1280 | M25 ACW - H/S & Off slip closure gantry foundation removal CH 1010 | 5 | 16-Sep-24 | 20-Sep-24 | M25 ACW - H/S & Off slip closure gantry foundation removal CH 1010 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | JG-S6-TM-1290 | M25 ACW - L1/L2 Night time closure - surfacing/road marking tie ins | 15 | 23-Sep-24 | 11-Oct-24 | M25 ACW - L1/L2 Night time closure - surfacing/road marking tie ins | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | JG-S6-TM-1300 | Switch Traffic on to new loop road | 1 | 14-Oct-24 | 14-Oct-24 | Switch Traffic on to new loop road | | | | | | | | | | | | | | | | | | | | | | | | | | |

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