Traffic Management Plan
M25 Junction 28 Improvement

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Reviewer List

Name	Role
[redacted]	MP Customer Service Division
	OD Senior User
	Service Delivery Operations Manager (SDOM)
	NTOC Technology and Information Services Manager
	Maintenance Service provider (DBFO)
	Transport for London
	National Intelligence Unit

Approvals

Name	Signature	Title	Date of Issue	Version
		Programme Delivery Director		

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PROJECT CONTACT DETAILS

In this section, provide the details of the key personnel on this project, including those that are responsible for, or contributed to, the development of this product.

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CHECKLIST

TABLE 1-1 CHECKLIST

(PLEASE TICK EACH ITEM ONCE COMPLETED)

Items	Highways England Project Manager	Major Projects Customer Services Division
Have you completed all the sections relevant to the stage of the project?		
Have you completed the Options table in Appendix A?		
Have you completed the table in Appendix B in accordance with Roadworks a Customer View and the Dynamic Roadworks Vision?		
Have you completed the table in Appendix C in accordance with Roadworks a Customer View?		
Have you completed the table in Appendix D in accordance with Dynamic Road Works Benchmarking Template v2.0?		
Have you completed the table in Appendix E in accordance with implementing the highest safe speed within roadworks guidance?		
Have you provided details and justification of the TM proposals proportionate to the project stage?		
Have you completed suitable traffic modelling of the TM proposals to understand the impact on the customer?		
Have you identified the diversion route using the customer service standard for diversion routes for planned works and activities?		
Have you provided details of the other TM options considered and the reasons for discounting these?		
Have you included relevant references within the TM Plan, e.g. Communications Plan, Detailed Local Operating Agreement, Combined Operations PCF Product, Incident Management Plan?		

1. INTRODUCTION

PURPOSE AND OBJECTIVES

This Traffic Management Plan is for the construction phase of the project associated with SGAR 5 permanent works.

This TM plan refers to the Traffic Management Layout which is included in Appendix F.

The purpose of this Traffic management (TM) Plan is to set out the traffic management measures which will help deliver:

- **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.

The TM Plan will support good customer service and will consider the five key areas outlined in the Major Projects Dynamic Road Works Vision Statement and set out how the project can align to it. The five key areas are:

- Varying the speed limits so they are appropriate for the work taking place
- Shortening the length of road works
- Appropriate use of full road closures and associated diversions
- Delivering road works quicker
- Explaining clearly what activities are, or are not, taking place

The Traffic Management Strategy and design will be built around Highways England Major Projects Dynamic Road works – A Vision for the Future and Road works – A Customer's View as far as reasonably practicable.

Road Works – A Customers View

- Better integration with other road users
- Find other ways to deliver projects quicker
- Shorten the length of 'live' road works
- Widen 'narrow lanes'
- Vary speed limits
- Improve line demarcation
- Improve temporary VRS visibility
- Explore options for temporary lighting

This PCF Stage 5 plan identifies how the Delivery Integration Partner plans to deliver the works based on the construction buildability advice provided in stage 3 and further development by GRAHAM during due diligence that was carried out prior to Contract award. and detailed design stage. The plan will be refined during PCF Stage 6 (construction, commissioning and handover).

Whilst compiling this document and gathering the data required, a number of technical documents and standards were referred to. The primary documents, versions current at November 2021 were:

- Managing network occupancy requirements
- Traffic Signs Manual – Chapter 8: Roadworks and temporary situations
- Traffic Signs Manual – Chapter 8 (Part 2): Roadworks and temporary situations (Operations)
- Traffic Signs Manual – Chapter 8 (Part 3): Roadworks and temporary situations (Update)
- GG 115 - Requirements for works on the hard shoulder and roadside verges on high-speed dual carriageways
- Relaxation Works on Dual Carriageways
- MPI - 48-042016 National Rollout of scheme Billboards
- MPI - 54-062016 Improving Customer Experience Through Roadworks
- MPI - 55-082016 Improving the customer experience through roadworks - updates to
- Traffic England
- Raising the Bar 27: Managing temporary traffic management incursions
- Highways England Customer Group Definitions
- Major Projects - Dynamic Road Works Benchmarking Template
- GG 104 Standard for Safety Risk Assessment on the Strategic Road Network Design Rationale Documents
- CD 109 Highway link design,
- CD 122 Geometric design of grade separated junctions,
- CD 127 Cross-sections and headrooms
- CD 146 Positioning of signalling and advance direction signs
- Highways England – Health and Safety Five Year Plan, May 2017
- Highways England - Raising the bar (Highways England Index 1-33)
- Transport for London - Direct Vision Standard
- Transport for London - HGV Safety Permit
- Fleet Operator Recognition Scheme (www.fors-online.org.uk)

DETAILS OF THE SCHEME

Summary description of the scheme

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.

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.

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.

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.

An Outline version of the Traffic Management Plan was submitted during the DCO examination period.

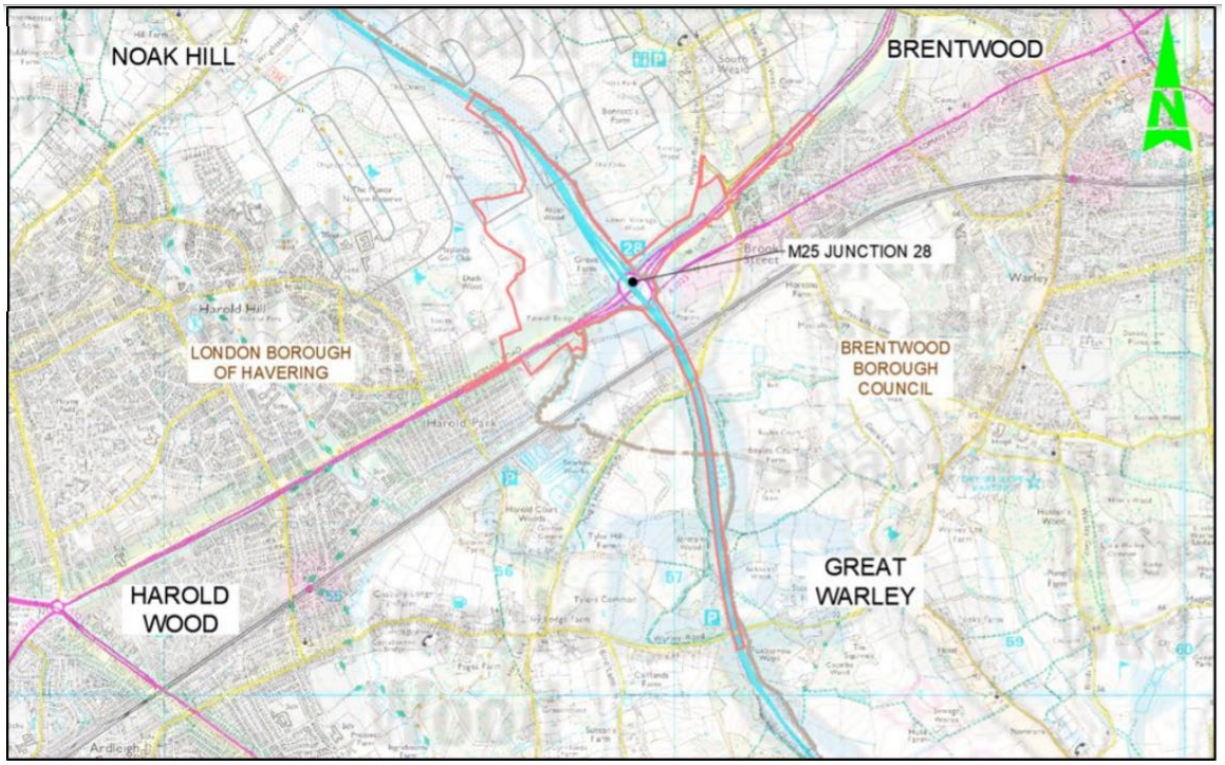


Figure 1.1: Location of M25 junction 28 improvement scheme

The following improvements are proposed:

- A new two-lane loop road with hard shoulder, for traffic travelling from the M25 anticlockwise onto the A12 eastbound, including a merge into a single lane prior to joining the A12
- The realignment of the A12 eastbound exit slip road and M25 anti-clockwise entry slip road to accommodate the proposed loop road
- An overbridge at A12 eastbound exit road to allow the proposed loop road to join the A12 eastbound carriageway below
- A bridge over the M25 anti-clockwise entry road to facilitate the proposed loop road above
- Widening of the M25 anti-clockwise carriageway to provide proposed exit road
- Construction of a bridge to the north and south of the loop road to allow it to pass over Weald Brook water course
- Construction of 3no. attenuation ponds, two within the loop road and one to the western side of the loop
- Creation of new access track leading to new attenuation pond from A12 eastbound
- Creation of new access track to new attenuation pond from M25 anti-clockwise on-slip
- Re-alignment of Weald Brook and Ingrebourne River water courses to facilitate construction of re-aligned slip roads
- Creation of grass land to the north of the loop road to provide for environmental mitigation and biodiversity improvements

- Erection of necessary highways supporting infrastructure including gantries and directional signage
- Diversion of existing high pressure gas main
- Associated landscape mitigation works

Challenges and considerations

Traffic flows

- 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.

ACCIDENT STATISTICS

Collision data for the scheme was taken over the following lengths:

M25 from the pedestrian bridge (E:557255, N:190979) to the Essex Boundary at the Curtis Plantion (E:554010, N:194863).

A12 from its junction with Maylands Way (E:556013, N:191929) to the Wigley Bush Lane flyover (E:557327, N:192921).

A1023 from Junction 28 M25 Junction 28 gyratory to Nags Head Road junction.

During the five-year period to the end of December 2019, there were a total of 127 PICs resulting in 173 casualties within the scheme area. These collisions comprised of:

- 3 Slight injury collisions
- 20 Serious injury collisions
- 3 Fatal collisions

No pedal cycle casualties were recorded within the study area.

Only one pedestrian casualty was recorded within the study are.

Thirteen motorcycles collisions were recorded at the following locations:

- A1023 single carriageway 4 no.
- M25 Junction 28 gyratory 3 no.
- A12 dual carriageway 2 no.
- M25 dual carriageway 4 no.

Forty-Three Heavy goods vehicles (greater than 7.5t maximum gross weight) were involved in injury collisions. 30 of which were on the M25 dual carriageway, 5 on the A12 dual carriageway and 8 on the M25 Junction 28 gyratory.

The most common manoeuvre being carried out by the heavy goods vehicles involved in collisions was changing lanes (18) followed by going ahead other (17).

The FWI rate along the M25 within the scheme extents is less than the comparable SRN figure. However, the FWI rate along the A12 is significantly higher than the comparable SRN dual carriageway figure. This is likely to be due to the short link length and the presence of a major interchange within the study area.

Further detail is provided in the technical note, M25 junction 28 improvements, Collision Analysis.

Table 1:2 - A summary of the scheme PICs – Five years (to end of 2019)

Project	Link	Length (KM)*	Length (Miles)	AADT** (direction 1)	AADT 2** (direction 2)	Vehicle kilometres	Personal Injury Accidents - 5-year period (2015 to 2019)														
							Collisions (not including slip roads)							Casualties (not including slip roads)							
							All	Slight	Serious	Fatal	Rate	FWI	FWI Rate	All	Slight	Serious	Fatal	Rate	FWI	FWI Rate
M25 J28	M25 South	0.5	0.3	126342		1.169x10^8	5	5	0	0	4.28	0.050	0.043	6	6	0	0	5.13	0.060	0.051
	M25 North	3.9	2.4	143936		1.025x10^8	52	43	9	0	5.07	1.330	0.130	82	73	9	0	8.00	1.630	0.159
	M25 Total	**4.4**	**2.7**			**1.142x10^8**	**57**	**48**	**9**	**0**	**4.99**	**1.380**	**0.121**	**88**	**79**	**9**	**0**	**7.71**	**1.690**	**0.148**
	A12 West	1.0	0.6	46782		8.542 x10^7	13	9	3	1	15.22	1.390	1.627	18	14	3	1	21.07	1.440	1.686
	A12 East	0.7	0.4	72779		8.423x10^7	19	15	3	1	22.56	1.450	1.721	27	23	3	1	32.054	1.530	1.816
	A12 Total	**1.7**	**1.0**			**1.697x10^8**	**32**	**24**	**6**	**2**	**18.86**	**2.840**	**1.674**	**45**	**37**	**6**	**2**	**26.52**	**2.970**	**1.751**
	A1023	**0.5**	**0.3**				**4**	**2**	**1**	**1**		**0.112**		**4**	**2**	**1**	**1**		**1.120**	
	M25 Junction 28 gyratory	**N/A**	**N/A**	**N/A-**	**N/A**	**N/A**	**22**	**21**	**1**	**0**	**N/A**	**0.310**	**N/A**	**23**	**22**	**1**	**0**	**N/A**	**0.320**	**N/A**
	London	N/A	N/A	N/A	N/A-	N/A	90	75	14	1	N/A	3.150	N/A	126	111	14	1	N/A	3.510	N/A
	Essex	N/A	N/A	N/A	N/A	N/A	33	26	5	2	N/A	2.870	N/A	45	37	6	2	N/A	2.970	N/A
	Totals	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**127**	**104**	**20**	**3**	**N/A**	**6.040**	**N/A**	**173**	**150**	**20**	**3**	**N/A**	**6.500**	**N/A**

Project	Link	Length (KM)*	Length (Miles)	AADT** (direction 1)	AADT 2** (direction 2)	Vehicle kilometres	Personal Injury Accidents - 3-year period (2017 to 2019)														
							Collisions (not including slip roads)							Casualties (not including slip roads)							
							All	Slight	Serious	Fatal	Rate	FWI	FWI Rate	All	Slight	Serious	Fatal	Rate	FWI	FWI Rate
M25 J28	M25 South	0.5	0.3	124741		6.830x10^7	4	4	0	0	5.86	0.040	0.059	5	5	0	0	7.32	0.050	0.073
	M25 North	3.9	2.4	141619		6.048x10^8	33	25	8	0	5.46	1.050	0.174	54	46	8	0	8.93	1.260	0.159
	M25 Total	**4.4**	**2.7**			**4.132x10^8**	**37**	**29**	**8**	**0**	**5.50**	**1.090**	**0.162**	**59**	**51**	**8**	**0**	**8.77**	**1.31**	**0.195**
	A12 West	1.0	0.6	46887		5.134 x10^7	8	5	2	1	15.58	1.250	2.435	10	7	2	1	19.48	1.270	2.474
	A12 East	0.7	0.4	67911		5.205x10^7	11	7	3	1	21.13	1.370	2.635	19	15	3	1	36.55	1.450	2.786
	A12 Total	**1.7**	**1.0**			**1.034x10^8**	**19**	**12**	**5**	**2**	**18.39**	**2.62**	**2.536**	**29**	**22**	**5**	**2**	**28.07**	**2.72**	**2.632**
	A1023	0.5	0.3				3	1	1	1		1.110		3	1	1	1		1.110	
	M25 Junction 28 gyratory	N/A	N/A	N/A-	N/A	N/A	16	15	1	0	N/A	0.250	N/A	17	16	1	0	N/A	0.260	N/A
	London	N/A	N/A	N/A	N/A-	N/A	60	47	12	1	N/A	2.670	N/A	84	71	12	1	N/A	2.910	N/A
	Essex	N/A	N/A	N/A	N/A	N/A	23	16	5	2	N/A	2.660	N/A	33	26	5	2	N/A	2.760	N/A
	Totals	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**99**	**78**	**18**	**3**	**N/A**	**5.580**	**N/A**	**134**	**113**	**18**	**3**	**N/A**	**5.930**	**1.977**

A12 West DfT Counter 46211
A12 East DfT Counter 16196
M25 South DfT Counter 73496
M25 North DfT Counter 73494
All rates given as per Hundred Million Vehicle Kilometres.

INCIDENT MANAGEMENT (RESILIENCE)

The Detailed Local Operating Agreement (DLOA) (HE551519-SWE-MAN-ZZ-CN-PC-50001) will be agreed with the core responders once the operating regime has been finalised.

2. TRAFFIC MANAGEMENT PLAN – DETAILED DESCRIPTION

CUSTOMER REQUIREMENTS

Key customers and stakeholder include the following:

- National Highways Area 5 Operations Directorate.
- Connect Plus Services (CPS)
- National Highways Area 6 Operations Directorate
- Transport for London (TfL)
- London Brough of Havering
- Essex County Council
- Maylands Golf Club
- Glebelands
- Grove Farm
- Aggregate suppliers
- Gardens of Peace Muslim Cemetery
- Road users
- NMUs
- Other businesses
- Woodstock Avenue residents
- Other Local residents
- Emergency services

The customer requirements log is detailed in Table 2-1, in addition to this the M25 J28 scheme team have further considered traffic management arrangements in line with the Highways England 20 Customer principles. These Customer Principles are based upon extensive qualitative research and engagements undertaken by Highways England with regular users of major schemes.

All customers will expect the works to be undertaken safely and efficiently, with effective communication taking place between all customer groups, throughout the scheme development and construction, utilising the integrated traffic management meetings. The customer requirements log expands on each individual group requirements.

- **Customer principle 1 - Other roadworks and improvements**
  - Liaison with HE Area 5, Area 6 & TfL for clash analysis with other local schemes
  - 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.
  - Attendance at the weekly collaborative planning workshop held at Area 5 will be maintained
  - Monthly TM meeting with emergency services and Local Authorities

- **Customer principle 2. Speed of delivery**
  - Efficient works strategies are being formulated however, elements of the design have been simplified to help facilitate construction.
  - Off-site fabrication (steel bridges & gantries & pre-cast beam)

- **Customer principle 3. Length of roadworks**
  - Opportunities for a sectional approach to the works being investigated as the construction strategy develops to minimise the length and durations of carriageway occupancy as far as practicable.

- **Customer principle 4. Lane width**
  - To be in accordance with Chapter 8
  - The A12 is heavily constrained and there is limited opportunity to widen lanes due to cross-section constraints
  - The narrow lanes will be advised to roadworks in advance and in accordance with Chapter 8

- **Customer principle 5. 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.

- **Customer principle 6. Line demarcation**
  - The use of Hydro blasting will be the preferred method of removal of lane lines where asphalt is due to be replaced to create the narrow lane scheme noting that the narrow lane areas will be resurfaced in these areas

- **Customer principle 7. Visibility of temporary barrier**
  - White lines and reflectors to be used to delineate barriers with high frequency maintenance.

- **Customer principle 8. Night time visibility**
  - The M25, A12 and roundabout circulatory have permanent street lighting. During the phasing of works, including switching off existing lighting or lighting phases will be reviewed. Temporary lighting to maintain existing lighting levels will be

considered once safety risk assessment has been completed. Dark patches in lit areas will be avoided.

- **Customer principle 9. 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.]

- **Customer principle 10. Scheme information at the roadside**
  - Billboards will be provided in accordance with customer service standard.
  - Advance warning signage for slip closures

- **Customer principle 11. Electronic signage**
  - Use of VMS will considered 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
  - Use of existing gantry signals to be considered to communicate with the public, particularity around communicating details of full closure location and dates

- **Customer principle 12. Travel Time VMS (TTVMS)**
  - Use of travel time VMS will be considered in accordance with MPI 54.

- **Customer principle 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 and photographs will be published on the project website as required.
  - Temporary traffic management will be implemented on a just in time basis, once established, traffic management will be utilised and removed once works are

completed. In any downtime scheme information will be displayed as per Customer principle 10.

- **Customer principle 14. Local communications and outreach**
  - Detailed within the scheme's Communication Plan (HE551519-JGC-GEN-ZZ-PL-PC-50001).

- **Customer principle 15: Use multiple media channels, regularly**
  - Refer to customer plan and Communication Plan (HE551519-JGC-GEN-ZZ-PL-PC-50001).

- **Customer principle 16: Impactful Messages**
  - Impactful messaging has been a feature of the communication strategy to date

- **Customer principle 17. Explain no activity**
  - Identification of activities which may not be clearly visible but necessitating TM will be carefully considered.
  - Consideration of signing to explain will be developed and linked to the electronic signing strategy.

- **Customer principle 18. Seek customer feedback on new Traffic Management**
  - We will organise customer drive throughs of new traffic management to spot issues, improvements, behaviours and any unintended consequences.
  - We will engage with the relevant stakeholders with a view to seeking feedback on traffic management layouts
  - Use of diversions routes during overnight closure will take into consideration the requirements of GG 903.

- **Customer principle 19. Understanding customer experience**
  - We will engage regularly with customers of the scheme to secure timely feedback on the impact of the works (overlap with actions in Customer principle 18), but also to scope and evaluate changes to traffic management.

- **Customer principle 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.

Table 2-1 Customer Requirements Log

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the TM Plan taken these requirements into account and proposed mitigations using the customer principles?
Customer	*Road User*	• Journey time reliability. • Advanced warning of closures and/or diversions. • Appropriate diversion routes. • Maximise lane availability during peak periods.	• 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
	HGV user	• Journey time reliability. • Advanced warning of closures and/or diversions. • Appropriate diversion routes. • Maximise lane widths where possible.	• Minimising road space occupancy • Diversion routes agreed with local authority • 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
	Disabled Road user	• Method of recovery that is suitable for people with restricted mobility and their vehicles • Suitable roadside facilities for disabled users (toileting and medication stops)	• Recovery vehicles are wheelchair accessible • Customer care points with disabled access and welfare
	NMU	• Connectivity maintained during works • Temporary safe routes provided through works • (including provision for users with reduced mobility, visibility or other disability) • Diversion routes minimised	• Safety features such as temporary signalized pedestrian crossings • Suitable surface material for temporary footways
Stakeholder	*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

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the TM Plan taken these requirements into account and proposed mitigations using the customer principles?
	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
Partner	*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
	Transport for London (TfL) Essex County Council (ECC) and	• Minimise closures/diversions that may impact on network highway maintenance activities • Avoid clash of road space Seasonal traffic management embargoes • Meet TfL's Vision Zero ambitions. • Manage Work Related Road Risk.	• ECC & TfL representative to be invited to TM meetings • Advance notice of closures/diversions • Consider TM requirements during public holiday periods • In line with TfL's Vision Zero ambitions, the Mayor's Direct Vision Standard Scheme will be complied with, with permits required for all HGVs over 12t weight delivering to the scheme. • To manage Work Related Road Risk, the requirements for Fleet Operator Recognition Scheme Silver Level will be a requirement for operators of delivery vehicles to the scheme.

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the TM Plan 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 • Access for emergency services throughout construction.	• 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 • Arrangements will be put in place to ensure emergency services on blue lights, would be able attend any emergencies and in particular the properties on Woodstock Avenue.
Community	*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 • Access for all residents throughout construction. • Parking restrictions	• 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. • During construction, measures will be put in place to ensure that traffic will be managed appropriately in order to avoid, as far as practicable, adverse effects to users of the road network. • The construction workforce will be instructed not to park their cars anywhere except within the site compound. • Affected residents will be given a dedicate contact details in construction stage to report any issues.

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the TM Plan taken these requirements into account and proposed mitigations using the customer principles?
	Residents of Woodstock Avenue	• Notify the residents as far as possible in advance of the works and road closures, with the aim of allowing people to make appropriate alternative arrangements. • Access for emergency services on blue lights and all residents will be maintained throughout construction. • The construction workforce will be instructed not to park their cars anywhere except within the site compound. • Minimise disruption due to works including environmental factors (e.g., noise, dust, lighting) and diversion routes • Appropriate and regular communication on scheme development.	• Implementation of Communication Plan to ensure notification and liaison with individuals and/or local group representatives. • Affected residents will be given a dedicate contact details in construction stage should they observe construction workers parking their cars in local streets or to report any other issues. • 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. • During construction, measures will be put in place to ensure that traffic will be managed appropriately in order to avoid, as far as practicable, adverse effects to residents of Woodstock Avenue. • Arrangements will be put in place by to ensure emergency services on blue lights, would be able attend any emergencies in respect of properties on Woodstock Avenue. • The construction workforce will be instructed not to park their cars anywhere except within the site compound.
	Regional events	• Advanced warning of closures. • Efficient access for visitors.	• Implementation of Communication Plan to ensure notification and liaison with individuals and/or local group representatives. • Minimal disruption on busier days.
Client	*None identified*	*N/A*	*N/A*

NATURE OF THE WORKS

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 and in the drawings included in Appendix F. 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.

Type of construction works	Temporary traffic management (TM) requirements		Reference to proposed traffic management and diversion plans
A12 eastboundoff-slip and statutory undertakers work	Setup and removal of narrow lanes. Removal of street lightingcolumns Mobilisation ofPiling rig. Mobilisation ofcrane for installation of precast culvert units. Tie in works. Statutory undertakers diversions.	Work undertaken during full overnightclosures of the A12 eastbound off-slip.	Appendix F – HE551519-ATK- TTM-J28-DR-CH-000029
Statutory undertakers work	For statutory undertakers diversions work	A12 eastbound Lane 1 closure and narrow lanes	Appendix F – 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 F – 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 F – 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 F – HE551519-ATK- TTM-J28-DR-CH-000011
	Removal of existing gantry foundation (CH 1010)	Carried out with full road closures between J28 and J29	Appendix F – HE551519-ATK- TTM-J28-DR-CH-000013
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- 000010
	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 F – 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 F – 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 F – 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 F – 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 F – 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 F – HE551519-ATK- TTM-J28-DR-CH-000001 Layout 2
		A12 eastbound lane 1 closure	Appendix F – 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 F – HE551519-ATK- TTM-J28-DR-CH-000001 Layout 3
	Tie in of new A12 eastbound on-slip road	A12 eastbound narrow lane running	Appendix F – HE551519-ATK- TTM-J28-DR-CH-000001 Layout 4
	M25 anticlockwise on-slip earthworks	Narrow lanes on the M25 anticlockwise	Appendix F – 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 F – HE551519-ATK- TTM-J28-DR-CH-000002 Layout 5
	M25 anticlockwise tie in to bottom of new on-slip	Carried out with full road closures between J28 and J29	Appendix F – HE551519-ATK- TTM-J28-DR-CH-000013
	M25 anticlockwise tie in to top of new on-slip	Offside lane closures on the slip road and lane closures on the roundabout	Appendix F – HE551519-ATK- TTM-J28-DR-CH-000002 Layout 5
	M25 anticlockwise tie in to new off-slip	Narrow lanes on the mainline carriageway	Appendix F – 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 F – 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 F – HE551519-ATK- TTM-J28-DR-CH-000008

PROPOSED TRAFFIC MANAGEMENT MEASURES

The proposed measures have been detailed in section 3.1 in line with the Highways England 20 Customer principles.

Please refer to appendix D which shows a RAG status showing the status of the project against the Dynamic Roadworks Vision (Dynamic Road Works Benchmarking tool).

Work access

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 1.2.

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.

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.

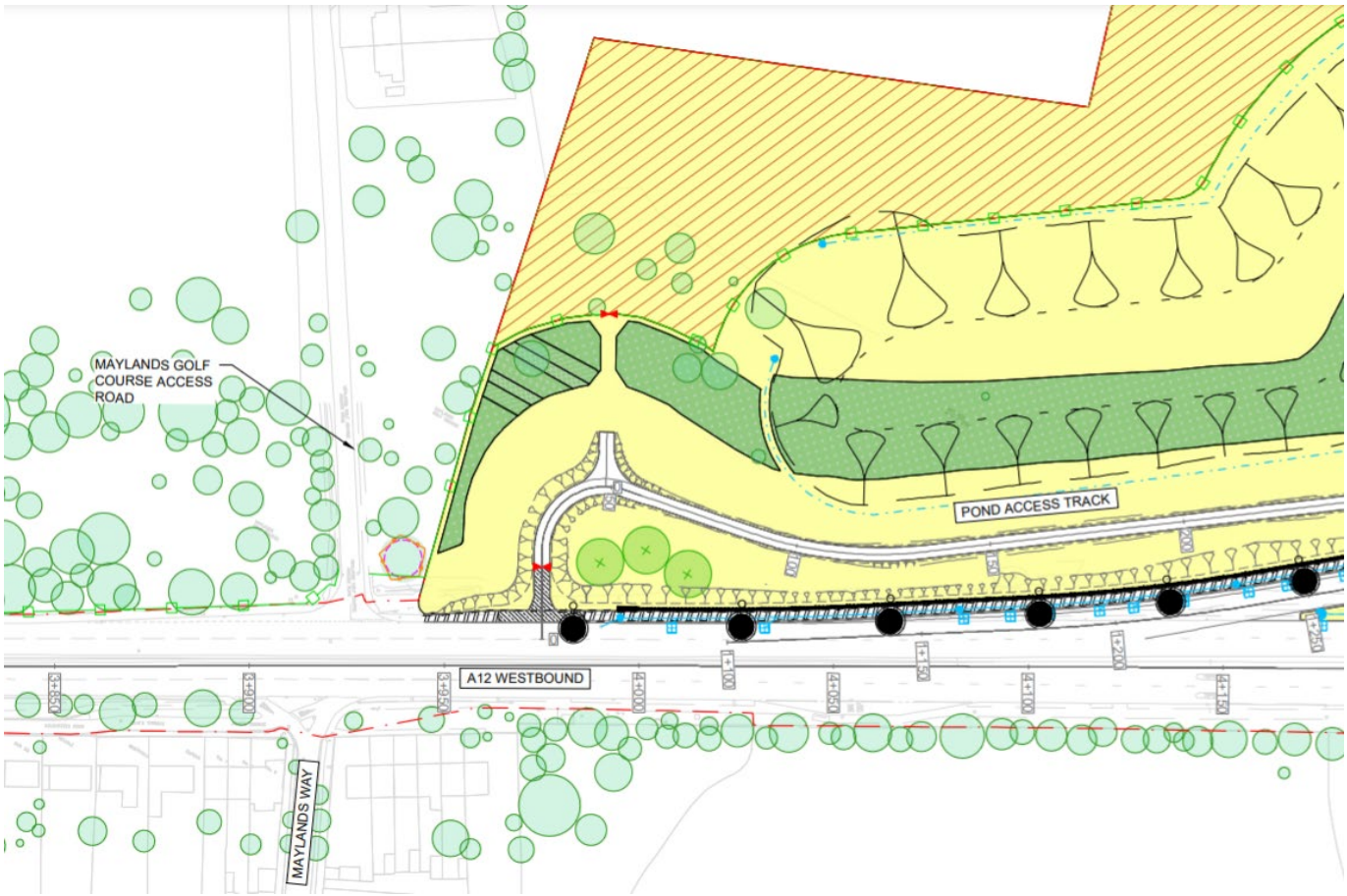


Figure 1.2: Site compound access

Vehicle swept path analysis showing HGVs making the U-turn at the Petersfield Avenue junction with the A12 is provided in Appendix I. This demonstrates that the existing junction at Petersfield Avenue is not wide enough to allow articulated HGVs to make a U-turn.

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.

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.

To manage Work Related Road Risk, the requirements for Fleet Operator Recognition Scheme Silver Level will be a requirement for operators of delivery vehicles to the scheme. In line with TfL's Vision Zero ambitions, the Mayor's Direct Vision Standard Scheme will also be complied with, with safety permits required for all HGVs over 12t weight delivering to the scheme. This will be primarily enforced by the current TfL restrictions reinforced by their ANPR cameras and PCNs. All suppliers of construction materials and equipment and haulage companies will be notified of the need to comply with these requirements when orders are placed. Vehicle compliance training would be implemented for gate staff to support monitoring with refusal of entry to non-compliant vehicles. Records would then be kept for review and audit as required.

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. Proposed arrangements for the temporary signage have been included in Appendix K.

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 the Principal Contractor via a dedicate contact details (will be provided in construction stage) as well as via CCC details and appropriate action will be taken to prevent further instances.

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.

The number of deliveries estimated to be generated by construction of the Scheme over the construction programme is provided in Appendix J. 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, stakeholders will be updated during stakeholder engagement meetings.

Restrictions

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.

Slip road closures and full closures of a main carriageway will only be implemented overnight with agreement from, and at times acceptable to Area 5, Area 6, TfL, ECC and emergency services. The form and timing of advance notifications shall be as agreed with these stakeholders and with Highways England.

Planned inspection and maintenance works by the network maintainer will include activities on the M25 Junction 28 and A12. Date of these works will be obtained from the maintainers and used to coordinate activities and phasing of temporary traffic management throughout delivery of the scheme.

Table 2-2 Restrictions

Restriction to be Implemented	Time of Day *(Start to End)*	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*
2 lanes running to be maintained in each direction on the A12	06:00 – 20:00	Petersfield avenue to Wigley bush lane overbridge
All lanes to be maintained in each direction on the M25	05:00 – 22:00	169/8 to 172/8 (extent of the standard works)

Operating lanes

During each of the phases, desirable minimum lane will be provided with temporary vehicle traffic barriers providing segregation from the work force. A combination of varioguard and concrete barriers is assumed to be used similar to those below (proposed barriers will require a temporary works design in accordance with BS5975). 375mm relaxed setbacks may be implemented to the carriageway side of both barriers.

Figure 2.1: Varioguard

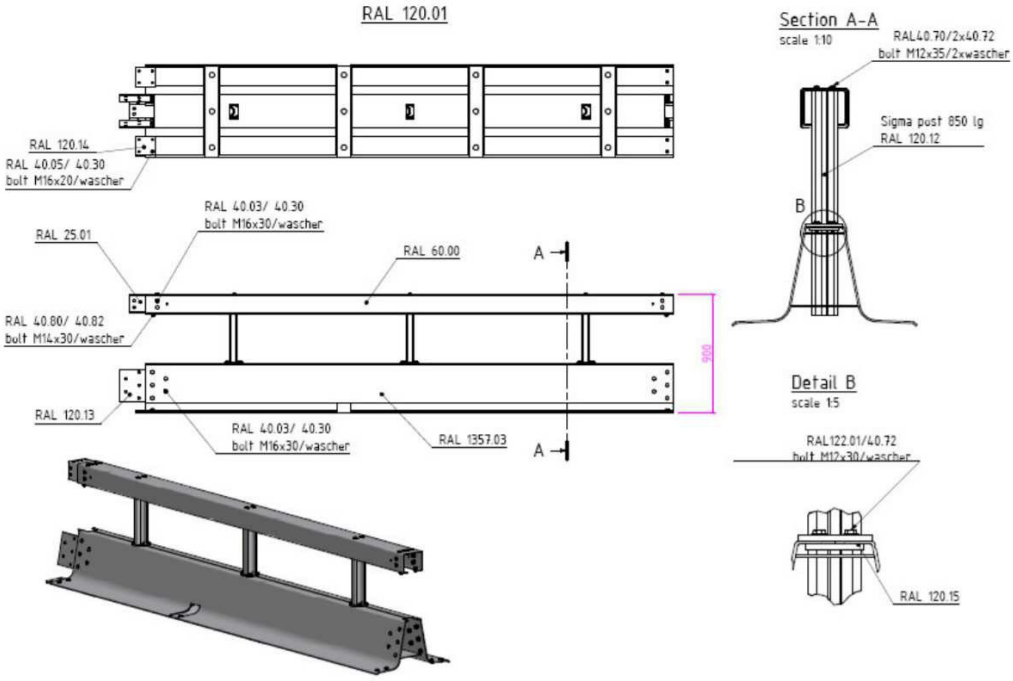
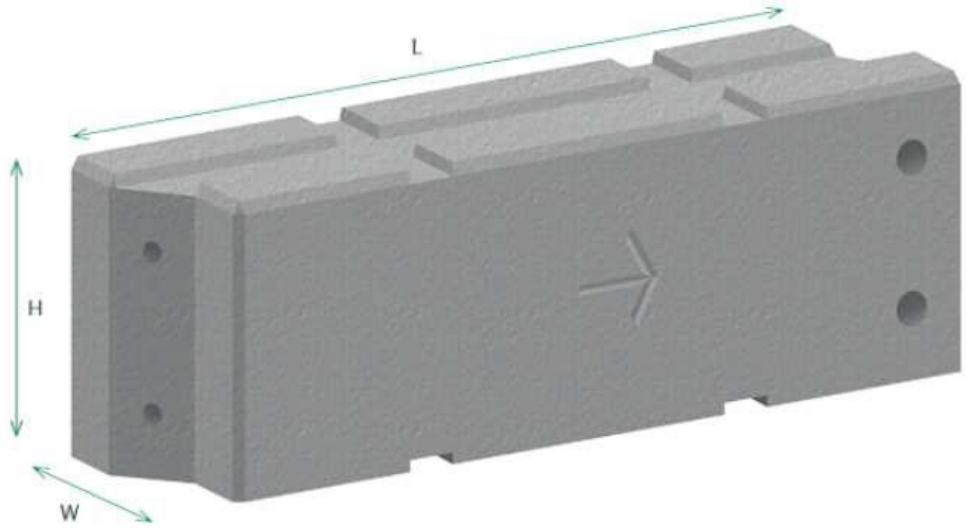


Figure 3.2: Temporary vertical concrete

TCVB Block Code	Product Drawing	Overall length (mm)	Modular length (mm)	W x H (mm)	Weight
V28	VIEW PDF	3150	3000	450 x 800	2500kg



barriers

During overnight road closures of the A12 and M25 / slip roads, works will use traffic cones only.

During the final phases of traffic management, when TVRS has been removed, traffic cones will be used to demarcate the work areas.

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.

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

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 E for the “Implementing the highest safe speed within road works checklist” and Appendix E for the high-level risk assessment.

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.

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.

On the M25, a 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.

Table 2-3 Speed Limits

The junction is one of the top 50 national casualty locations on England's major 'A' roads and motorways. Note: the A12 is not part of the Highways England Network.

Speed Limit	**Location** *(Start to End with respect to nearest junction or Marker Posts, if known)*	**Justification for Speed Limit** *(Suitable for external communications)*
50mph	Junction 28 Sip roads	Safe access/egress for work force, approach to junction
50mph/60mph	M25	Narrowed running lanes with TVRS and works traffic movements
50mph	A12	Safe access/egress for work force, approach to junction.
50mph	On junction	Safe access/egress for work force

Length of the Traffic Management

Anticipated lengths and durations of traffic management systems are described in Table 2.3. 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.

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%.

The dates shown below have been take from the outline programme that shows the anticipated timing and sequencing of the proposed temporary traffic management measures.

Table 2-4 Length of Traffic Management

Activity	TM Length (m)	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	Duration (days/nights)
A12 Traffic Management			
Set up barrier & narrow lanes andremove street lighting columns	367	A12 eastbound off-slip fullovernight closure	Up to 2 days (Jul 22 to Oct22)
Removal of barriers and narrow lanes	367	A12 eastbound off-slip fullovernight closure	Up to 2 days (Jul 22 to Oct22)
Mobilisation of piling pig/demobilisationof piling rig (Twice – installing sheet piles ad removingthem)	367	A12 eastbound off-slip fullovernight closure	Up to 4 days (Aug 22 to Oct22)
Mob/demob of crane for installingprecast culvert units	367	A12 eastbound off-slip fullovernight closure	Up to 2 days (Aug 22 to Oct22)
Tie into westernend of A12	367	A12 eastbound off-slip fullovernight closure	Up to 3 days (Sep 23 to Sep23)
Tie in A12 to roundabout	367	A12 eastbound off-slip fullclosure	Up to 3 days (Sep 23 to Sep23)
Services diversions (Planning in progress and maybe reduced)	367	A12 eastbound off-slip fullovernight closure	Up to 5 days (Apr 23 to Apr23)

Statutory Undertakers Diversions	1775	Narrow lane and off-peaklane 1 closure on the eastbound A12	Up to 30 days(April 23 to May 23)
	1775	Narrow lane and off-peaklane 1 closure on the eastbound A12	Up to 20 days (July 23 to Aug 23)
A12 off-slip tie inworks	1775	Narrow lanes on the eastbound A12	Up to 25 days (Mar 24 to Sep24)
A12 off-slip, bottom of slip roadtie in works	1775	Narrow lanes on the eastbound A12	Up to 55 days(Oct 23 to Jan 24)
A12 off-slip, top ofslip road tie in works	40	Nearside left turn lane closed at A12 off-slip approach to J28	Up to 85 days (Oct 23 to Mar 24)
A12 off-slip, bottom of slip roadtie in works	1090	Lane 1 closure on the eastbound A12	Up to 20 days (Jan 24 to Feb 24)
A12 on-slip, bottom of slip roadtie in works	1775	Narrow lanes on the eastbound A12	Up to 130 days(Mar 24 to Sep 24)
A12 eastboundon-slip road markings	335	A12 eastbound on-slip fullovernight closure	Up to 5 days(Jul 24 to Jul24)
A12 off-slip, bottom of slip roadtie in works	1090	Lane 1 closure on the eastbound A12	Up to 15 days(Jul 24 to Jul 24)
M25 Traffic Management			
M25 anticlockwiseon-slip offside verge works	6185	Narrow lane on-slip at M25	Up to 100 days(Dec 23 to May 24)
M25 anticlockwiseon-slip offside verge works	6185	Narrow lane on-slip and Lane 2 closure on the M25anticlockwise	Up to 140 days(Jan 24 to Aug 24)
M25 anticlockwise offside verge works	320	M25 anticlockwise on-slipLane 2 closure at J28	Up to 35 days (Mar 24 to May 24)
M25 anticlockwiseon-slip - Bottom ofslip road tie in works	6185	Offside lane closures of M25anticlockwise	Up to 80 nights(Jan 24 to May 24)
Roundabout, topof slip road tie inworks	-	Roundabout nearside laneclosures	Up to 30 days (Feb 24 to Mar 24)
Loop road tie in	295	M25 anticlockwise on-slipfull overnight closure	Up to 20 days (Dec 23 to Jan24)
M25 CW off-sliproad markings	378	M25 clockwise on-slip fullovernight closure	Up to 5 days (July 24 to July24)
Gantry Traffic Management			
Gantry foundation installation	320	M25 clockwise off-slip fullovernight closure	45 days (Mar 24 to May 24)
Proposed gantry (Ch530) installation works	5770	M25 anticlockwise full overnight closure	Up to 2 nights (Apr 24 to Apr24)
Proposed gantry (Ch740) installation works	1531	Full overnight closure ofM25 at J28	Up to 5 nights (May 24 to Jun24)

Existing gantry (Ch710) removalworks	1531	Full overnight closure ofM25 at J28	Up to 2 nights (Jul 24 to Jul24)
Proposed gantry (Ch1800) installation works	29500	M25 anticlockwise and clockwise full overnight closure	Up to 5 nights (Jul 24 to Aug24)
Gantry(S1) modifications	10200	M25 anticlockwise full overnight closure	Up to 5 nights (Aug 24 to Aug24)
Gantry(S1) modifications	10200	M25 CW full overnight closure	Up to 5 nights (Aug 24 to Aug24)
Gantry (Ch1530) removal works	29500	M25 anticlockwise and clockwise full closure	Up to 2 nights (Sep 24 to Sep24)
Gantry removal (Ch1010) removal works	10200	M25 anticlockwise full overnight closure	Up to 5 nights (Sep 24 to Sep24)

Carriageway and slip road closures

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 divertedvia 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 theA127 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 closedbetween J28 exit slip andJ29 entry slip. Traffic to be diverted via Gallows Corner junction along theA127 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 closed between extent of junction slip roads. Traffic to be	HE551519-ATK-TTM-J28-DR-CH-000011

			diverted along slip roads via the circulatory	
Slip road	J28 M25 anticlockwise on-slip full length of sliproad.	22:00-05:30 – Gantry foundation removal	M25 anticlockwise on-slipfull 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 fullclosure. 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 toend of slip	22:00-05:30 – Road Markings	A12 eastbound on-slip fullclosure. 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 fullclosure. Traffic diverted via Marylands Interchange to the east on the A12	HE551519-ATK-TTM-J28-DR-CH-000029

Hard shoulder running

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

Table 2-6 Hard Shoulder Running

There will be no hard shoulder running

Hard Shoulder Running Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	**Time of Day** *(Start to End)* **/ Stage in Programme**	**Hard Shoulder Running Details**	**Justification**
Not applicable			

Adjacent roadworks and other traffic management

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).

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.

Consultation with Highway England Operations Directorate (OD) will 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.

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.

Table 2-7 Adjacent Roadworks and Other Traffic Management

Nearby Traffic Management Location	Distance from Project	Interaction with Diversion Route(s)	Duration	Contact Details	Road Spacing Compliant?
M25 Junction 25 Improvements	17.5miles	None	2020 to 2023	[redacted]@highwaysengland.co.uk	Yes

Non-motorised user diversions

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.

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

Traffic management schemes will remain in place and maintained during Public and Bank Holidays except for full road closures which will not be permitted at such times.

Embargo dates for full closures and lane closures for the M25 Junction 28 Improvement scheme are noted below:

Table 2-8 Bank Holidays and Embargos

Bank Holidays	Dates	TM removed by:	TM Embargo to:
Easter	Good Friday Easter Monday	06:00 Thursday before Good Friday	00:01 Tuesday after Easter Monday
Early May Bank Holiday	Monday	Low key – no specific request for TM to be removed	
Spring Bank Holiday/Platinum Jubilee	Thursday 2 June to Monday 6 June	06:00 Wednesday	00:01 Monday
Summer Bank Holiday	Monday	06:00 Friday	00:01 Tuesday
Christmas/ New Year	25 December 26 December 01 January	06:00 20 December*	00:01 3 January*
Black Friday &**Cyber Monday Weekend	Friday after the fourth Thursday in November to following Friday	Highways England will confirm embargo arrangements for this period in advance	

*The Christmas embargo dates will be published annually by Highways England having been determined by the day of the week on which the bank holidays fall.

**This is not a bank holiday, but specific embargo arrangements are applied.

Significant events and seasonal traffic

This section has been updated with details of all significant events and seasonal traffic during the works associated with the junction improvements, together with mitigation measures to reduce the impact on travel due to the works.

Traffic safety and management requirements and constraints shall be specified in Appendix 1/17.

Table 2-9 Significant Events and Seasonal Traffic

Event	Implications with TM	Proposed Mitigation Measures
London Stadium / West Ham Urd football fixtures	Increased traffic during events	Communication plan with event organisers. Consider providing additional signage if required.
We Are FSTVL	Increased traffic during events	Communication plan with event organisers. Consider providing additional signage if required.
Creamfields Chelmsford	Increased traffic during events	Communication plan with event organisers. Consider providing additional signage if required.

Incident management

Regular patrols will be carried out within the traffic management by GRAHAM to prevent, identify and help manage incidents. All the workforce will be provided with a contact number that will be managed 24hrs so that incidents can be reported and managed.

A vehicle recovery service will be deployed that will cater for light and heavy recovery; this will initially be supported by an IPV. 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.

Welfare facilities will be provided at the site compound.

Incursion risk management

Highways England is committed to reducing all types of incursion on the network. Vehicle incursions in to work areas are recognised as one of the highest risks to road workers safety. 250 incursions per month are regularly reported between operations and major projects on the strategic road network, the true figure could be much higher as there is a perception that incursions are normal and accepted as part of the job. An incursion is defined as ‘an intentional or unintentional unauthorised entry into temporary traffic

management, by all or part of a vehicle being driven by members of the public or emergency services'.

Industry best practice and emerging initiatives to eliminate, reduce and manage risks caused by traffic management incursions will be incorporated in to agreed safe systems of work. Existing best practice includes:

- "Raising the Bar 2: Traffic management entry and exit "
- "Raising the Bar 27: Managing temporary traffic management incursions"

Traffic management layouts will reflect the approach to be adopted.

The guidance and recommendations from the Highways Safety Hub will be adopted and current best practice will be used. Consideration should be given to agreeing enhanced signing, educational information issued to road users in advance of the start of works, and targeted and continual instruction provided to the work force and supply chain.
Data relating to TM incursions will be collected based both on events occurring on site and from information gathered from other schemes to respond to trends and share best practice in mitigation and prevention measures.

Table 2-10 Incursion Risk Management

Incursion Risk	Proposed Control / Mitigation Measures
Incursions via Works Access Points as a result of follow-in	• Works Access Points to be clearly identified as being for works vehicles only. • Majority of works to be behind vehicle barrier; reducing access points • Site inductions will include a TM induction in which details of the procedure for follow ins will be provided. • In the event of a follow in, members of the public will be advised to remain in their vehicle and await escort out of the TM. Report all incursions to HE, for reporting via Airsweb.
Deliberate Incursions	• Design TM as per 'Raising the Bar: Document 27; • Managing temporary traffic management incursions'. Provide airlock systems on M25 carriageway closures. Provide local organisations with TM details to inform staff. • Members of the public will be advised to remain in their vehicle and await escort out of the TM. Where confrontation develops active plant should be stood down. Report all incursions to HE (for reporting via • Airsweb), and the Police if criminal.
Incursions from NMUs	• Clearly signed diverted routes. • TSCO to be informed of breeches.

	• Active plant to be stood down should incursion occur.

Driver compliance

Due to the localised nature of the traffic management, temporary speed restriction enforcement will be limited to routine police enforcement with no additional measures.

Communication plan

A Stakeholder and communications Plan has been developed by the contractor which describes the process by which communication will be managed between themselves, stakeholders and all other interested parties. This is contained within document reference HE551519-JGC-GEN-ZZ-PL-WM-50007.

Monthly TM liaison meetings will be held with Area 5 &6, TfL and ECC through the Area 5 Collaborative Planning Forum. The purpose of the meeting is to communicate planned works to allow for coordination and management of activities to reduce impact on the delivery and disruption to customers. Roadspace bookings will be through the Connect Plus Roadspace team.

A protocol for external communication to customers will be agreed with Highways England and will be incorporated within the scheme Stakeholder Management Plan. The plan will identify all those who need to be informed about the works and the level of engagement with them.

The Stakeholder Management plan will detail response times for queries from the public. It will also show the process for issuing press statements and publicity around major events (i.e. road closures or significant temporary alignment changes.

Roadside signage will be used to provide advance notice of intended works. This may be in the form of a static sin or mobile variable message sign.

Engagement with the local and wider community, including businesses, where it is possible to listen to their views/concerns and formulate solutions on an on-going basis will form an integral part of the traffic management.

Diversion route selection

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.

Discussions have taken place with HE OD to determine suitable diversion routes during the M25 mainline overnight closures. Appendix F contains tactical diversion routes that have already been agreed between HE, the Police and local authorities for use during emergencies.

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).

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.

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.

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 2-11 Diversion Routes

Diversion Route Description	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	Signs to be Implemented	Length of Diversion	Travel Time of the Diversion	Additional Journey Time for the Customer due to Diversion Route	No. of Closures required	Drawing reference
Mainline Diversions							
M25 A carriageway traffic will be diverted on to the M11 southbound to M11 J4, eastbound onto the A406 to Redbridge Roundabout, 2nd exit onto the A12 eastbound to Gants Hill Roundabout, 3rd exit onto A12 eastbound to M25 J28 and continue journey.	M25 clockwise between J27 and J28 DBFO emergency diversion route 47	Chapter 8	18 miles	22:00 – 05:30	30 mins	3	HE551519-ATK-TTM-J28-DR-CH-000013
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		30 mins		
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			26 miles		30 mins		

M25 B carriageway traffic will be diverted at J28 on to the A12 westbound to Gallows Corner junction, 3rd exit onto A12 westbound to Redbridge junction, 3rd exit onto A406 northbound to M11 J4, northbound onto M11 to J27.	M25 anticlockwise between J28 and J27 DBFO emergency diversion route 48	Chapter 8	18 miles	22:00 – 05:30	32 mins	3	HE551519-ATK-TTM-J28- DR-CH-000013
Traffic to be diverted at J29 westbound onto the A127 to Gallows Corner junction, 4th exit onto the eastbound A12 back to M25 J28.	M25 anticlockwise between J29 and J28 CPS Emergency diversion 50	Chapter 8	6.3 miles	22:00 – 05:30	10 mins	1	HE551519-ATK-TTM-J28- DR-CH-000027
Traffic to be diverted at J28 westbound onto the A12 to Gallows Corner junction, 1st exit onto the eastbound A127 back to M25 J29.	M25 clockwise between J28 and J29 CPS Emergency diversion 50	Chapter 8	6.3 miles	22:00 – 05:30	10 mins	1	HE551519-ATK-TTM-J28- DR-CH-000028
Traffic to be diverted onto the exit slip around the junction and back onto the M25 clockwise	M25 clockwise between J28 exit slip and J28 entry slip	Chapter 8	0.5 miles	22:00 – 05:30	2 mins	1	HE551519-ATK-TTM-J28- DR-CH-000011
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.	M25 anti clockwise between J28 exit slip and J28 entry slip	Chapter 8	0.5 miles	22:00 – 05:30	2 mins	1	HE551519-ATK-TTM-J28- DR-CH-000011
Slip road Diversions							
Traffic diverted onto M25 clockwise at J28, exit at J29, turn at junction	J28 M25 anticlockwise entry	Chapter 8	6 miles	22:00 – 05:30	6 mins	1	HE551519-ATK-TTM-J28- DR-CH-000008

and back onto M25 anticlockwise to continue journey.	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	J28 M25 clockwise exit slip for full length of slip road	Chapter 8	6 miles	22:00 – 05:30	6 mins	1	HE551519-ATK-TTM-J28- DR-CH-000010
Divert traffic onto the A12 westbound to Gallows Corner junction, 5th exit onto A12 eastbound and continue journey.	A12 eastbound entry slip from J28 roundabout to end of slip	Chapter 8	5 miles	22:00 – 05:30	10 mins	1	HE551519-ATK-TTM-J28- DR-CH-000009
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.	A12 eastbound exit slip for full length of slip road	Chapter 8	9 miles	22:00 – 05:30	15 mins	7	HE551519-ATK-TTM-J28- DR-CH-000029

Safety measures

Measures in place to ensure the safety of customer groups, including road users and the work force are detailed throughout this document. Further reference should be made to the PCF Product "*Combined Safety and Hazard Log Report*".

Table 2-12 Safety Measures

Customer Group	Safety Measure
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	• 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 • In line with TfL's Vision Zero ambitions, the Mayor's Direct Vision Standard Scheme will be complied with, with permits required for all HGVs over 12t weight delivering to the

	scheme. • To manage Work Related Road Risk, the requirements for Fleet Operator Recognition Scheme Silver Level will be a requirement for operators of delivery vehicles to the scheme.
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
Client	N/A

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.

A key component of the Traffic Management Plan will be the construction workforce Travel Plan that will be prepared by the 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.

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 the Principal Contractor via a dedicate contact details (will be provided in construction stage) as well as via CCC details and appropriate action will be taken to prevent further instances.

Human Factors

We define the customer as; *anyone we interact with throughout the lifecycle of the project and is any organisation that uses or is affected by the SRN.* According to the Highways England Customer Group Definitions, this could include (but is not limited to) the following:

- Road users
- Communities and community groups

- Emergency services
- Communities and pressure groups
- Tenants and persons and organisations that lease from the client
- The public who use the SRN

The preparation of the Traffic Management Plan, prior to implementation, we will use our design approach to review proposals to ensure we have identified and considered the needs of all the customer groups and addressed these in our Traffic Management Plan, where pragmatic and efficient to do so. This behavioural-led approach is also aligned to the guidance http://www.hse.gov.uk/humanfactors and therefore also considers the needs of the workforce in terms of safety and wellbeing.

PROPOSALS FOR MANAGEMENT OF NETWORK OCCUPANCY

The proposed works will have an impact on the operation of the M25 and A12. Road space will require booking and traffic management events such as carriageway closures will need advance planning. The road space requirements will have to be agreed with HE Area 5, Area 6, TfL and ECC. Formal and informal day to day communications will be required to ensure compliance with the network management and operation's obligations of their contract with Highways England. There is a monthly area traffic management co-ordination meeting to which all relevant stakeholders will be invited, potential clashes will be identified and discussed at these meetings prior to road space bookings being made.

Requirements will include, but not be exclusive to:

- Occupancy planning and consultation with the area maintenance provider.
- Management of Network Occupancy Planning within the Major Projects Contractor organisation.
- Management and contact protocol with the area maintenance provider during times of occupancy.
- Communication of high impacting works as defined in the operational requirements, for high impacting works, bookings are to be confirmed and not amended after:
    - 13.00 hrs on the day of the closure for closures between 19.00hrs and 24.00hrs and
    - 13.00 hrs on the day preceding the closure for closures between 00.01hrs and 19.00hrs

  unless, in exceptional circumstances, the amendment is due to safety, an incident or weather conditions which could not have been reasonably foreseen. This requirement applies to start times, changes to traffic management layout and end/stop times except for early finishes to end/stop times.

- GRAHAM will achieve 95% 7day accuracy. Failure to meet these requirements may result in withdrawal of road space until assurance that these targets will not be breached.

IMPLICATIONS OF TRAFFIC MANAGEMENT MEASURES

Intelligent Transport Service

During the works, the following mitigation measures will be implemented:

- Provision of a temporary breakdown recovery support function for motorists during the works to allow their recovery to safe locations, and reminders of the telephone numbers available to them in the event of a breakdown.

- Provision of Temporary CCTV system to cover the extent of the works for the entire time period that the scheme is within TM, in accordance with SHW.

Table 2-13 Intelligent Transport Service Infrastructure Impacts

Infrastructure	Impact on Infrastructure	Duration
MIDAS Loops	The ability to detect incidents and set signals within the scheme limits will not exist.	Removed permanently and replaced with radar, cctv will be used to monitor during construction
CCTV cameras	Five CCTV cameras (two gantry mounted and three mast mounted) will be provided	Nov 2023 – Dec 2024
Emergency Roadside Telephones (ERTs)	Three ERTs will be provded	Nov 2023 – Dec 2024
Removal of gantries	Two new portal gantries populated with VMSL, VNS, MS4 and ALM will be provided	Nov 2023 – Dec 2024

Operations

A Detailed Local Operating Agreement (DLOA) will be produced and agreed with all relevant parties to define what each party is responsible for. The DLOA will describe how each party co-ordinates their works to ensure there is minimal effect on each other's operations. The Agreement will include:

- A strategy to mitigate any risks on operations – Consideration will be given to the implications on day-to-day operations (such as incident management).
- If any roadside infrastructure that impacts the operation of ROC(s) (e.g. traffic loops) will be removed during construction
- Suitable measures/strategies that are to be proposed to the ROC(s) to mitigate the disruption and impact.

Maintenance activities

Pre-existing defects or known maintenance issues will be identified and recorded in a suitable register prior to the commencement of construction works. The Detailed Local Operating Agreement will define and clarify the obligations of the parties involved during the delivery of the scheme.

Other service providers

Connect Plus Services abnormal loads team will inform the project of the passage of abnormal loads through the traffic management. As there are no new over structures, it is envisaged that these assessments will be limited to highway widths only.

TM PLAN MANAGEMENT

This traffic management plan should be used as a live document that is updated regularly and reviewed in line with changes to the works on site. The contractors Traffic Management Manager will be responsible for updating the plan.

Throughout the implementation of the traffic management, the following data will be collected which will be used to assess the adequacy of the traffic management. The data will also be used to substantiate any arising incidents as part of the Incident Management Plan.

- Accidents/incidents quantities
- Timings of accident/incident and subsequent response
- Carriageway/lane locations
- Services attended
- Recovery type and vehicle type
- Congestion caused
- Weather and road conditions

The cause of any traffic related incident will be investigated, and any resulting mitigation shall be incorporated into the Traffic Management Plan.

3. APPENDICES

APPENDIX A – TM OPTIONS SELECTION

Table 3-1 TM Options Selection

TM Option	Details of TM Option	Advantages *(including time, cost, customer impact, safety implications, operational impact)*	Disadvantages *(including time, cost, customer impact, safety implications, operational impact)*	Are their further implications or additional TM requirements if this option is selected?	Option Selected or Rejected? *(if selected, colour cell green and if rejected, colour cell red)*
1	*Reduce A12 to a single lane*	• Increased productivity for the construction • Construction duration reduced	• Increased impact to customer • Increased impact to community • Increased operational impact		Rejected
2	*Complete all works under night closures*	• Decreased impact to all customer groups during the day.	• Increased environmental impact • Construction duration increased significantly • Increased risk of incidents • Increased risk of quality issues	Yes. Traffic management would need to be installed at the start of every shift and then removed again.	Rejected
3	*Phased approach to maintain the existing configuration of 2 lanes on the A12 and 3 lanes on M25. Build new link and slip roads under narrow lane running then switch to new configuration*	• Junction remains fully open • Minimal impact to customer	• Narrowed lanes will have some impact on customer • Increased construction duration	Yes – coordination with adjacent local highway authorities, key businesses and stakeholders to identify further measures to manage travel demand	Accepted

APPENDIX B – ROADWORKS PRINCIPLES

Table 3-2 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 **PCF Stage 3** and **PCF Stage 5**, 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 PCF Stage 3 in anticipation of further detailed works to be undertaken within PCF Stage 5. These activities should also be refined within PCF Stage 5.
Blue activities – Activities to be completed during PCF Stage 5.

Table 3-2 Roadworks Principles

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
Planning and Design of Traffic Management	1	Other roadworks and improvements	• *TM planned in co-ordination with other projects and areas across the region (Highways England and non-Highways England)* • *Consideration of diversion routes in co-ordination with other projects and areas across the region (Highways England and non-Highways England)* • *Identify local regular forums prepared to review plans for TM* • *Liaison with NOMS representative for works within the area.* • *Co-ordination of diversion routes at key decision points and publication once approved.* • *Identify and mitigate the impact of major events* • *Produce schedule for local regular forums prepared to review plans for TM* • *Signing on local roads to inform of incidents or roadworks on the Strategic Road Network*	• Current major schemes identified. local schemes to be identified through the Area 5 co-ordination workshop • Significant and seasonal traffic reviewed in PCF5 • Locations for early warning signage to be identified
	2	Speed of delivery	• *Review proposed key design decisions to ensure these can be constructed without significant impact on customers* • *Increasing workforce/shift patterns/productivity to maximise utilisation of the restricted road space* • *Use available technology to minimise impact and maximise productivity* • *Manufacturing components off-site*	• Concrete vehicle barrier to be used where possible. • Reinforced walls and bridge options considered off site manufacture • Intelligent temporary traffic lights to control traffic during different phases of construction where possible
	3	Length of roadworks	• *Phasing of road works delivery* • *Length of road works in accordance with Traffic Signs Manual, Chapter 8, Part 3* • *Suitable traffic modelling of the TM proposals to understand the impact on the customer* • *Formal agreements for road works not in accordance with Traffic Signs Manual, Chapter 8, Part 3 requirements*	• TM phasing to maximise capacity during construction.
	4	Lane width	• *Consider alternative layout options, including widening non-standard/temporary 'narrow' lanes within roadworks, in design and communication of reasoning to customers* • *Consider contraflow* • *Alternate widths to facilitate traffic flows* • *Smooth road surfaces and clear demarcation during works and after TM has been removed, and ensure sufficient budget is available to maintain this*	
	5	Speed Limit	• *Options considered to maintain the permanent speed limit and why a lower speed limit is required, where applicable* • *Suitable traffic modelling of the TM proposals to understand the impact on the customer* • *Road works designed to be safe for permanent speed limit in accordance with Traffic Signs Manual, Chapter 8, Part 3*	
	6	Line demarcation	• *Removal of white line set within contracts as a standard requirement* • *Use of permanent standard white lines* • *Demarcation for night time/rain/bright sunlight conditions*	• Narrow lanes will require temporary white lines

			• *Night time lighting requirements* • *Regular checking and maintenance*	
	7	Visibility of temporary barrier	• *Good visibility of temporary vehicle barrier* • *Visibility in narrow lanes* • *Improving visibility of temporary vehicle barrier* • *Maintenance of vehicle barrier reflectors*	• Temporary vehicle barrier to have reflectors • The junction and approach will be lit
	8	Night time visibility	• *Risks and requirements of temporary lighting* • *Improving night time visibility of lanes/temporary vehicle barrier in road works using temporary lighting or through the retention of existing lighting* • *Alternative solutions to using temporary lighting*	
Information Provision	9	Advance notice of works	• *Providing advanced notice, i.e. a minimum of 4 weeks prior to project commencing* • *Use of billboards and VMS at roadside prior to start of roadworks* • *Information communicated through various networks/media* • *Planning for advanced notice of changes to TM provided throughout delivery*	
	10	Scheme information at the roadside	• *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* • *Number and locations of billboards or temporary signage within main works and along diversion routes in respect to TM* • *Size and appearance of temporary signage/billboards across the scheme* • *Planning for updates to billboards or temporary signage*	
	11	Electronic signage	• *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)* • *Use and location of portable VMS for travel time and project specific messaging* • *Consideration of signing strategy with respect to information overload* • *Consistency in language across projects for VMS messages*	
	12	Travel Time VMS (TTVMS)	• *Use and location of TTVMS through project TM for main works and diversion routes in accordance with MPI 54-062016 (reissued 15/08/2018)* • *Accuracy of travel time including travel time for alternative routes (diversion routes)*	
	13	Visible progress	• *Providing updates to customers about overall progress via signage within roadworks* • *Use of alternative media to provider customer updates* • *Accuracy of information in line with key milestones and completed works*	
Engaging and Communicating with Customers	14	Local communications and outreach	• *Approach/strategy for delivering good communications at the right time* • *Stakeholder mapping for project/area* • *Use of public exhibitions* • *Use of various media for communications, e.g. newsletters, radio, etc.* • *Understanding of public requirements and key events for TM* • *Diversion route engagement (pre- and post-works) to understand access requirements* • *Progress updates* • *Communications plan*	
	15	Use multiple media channels, regularly	• *Identify provision/frequency of information and media methods to be used (make proportional to project)* • *Use of NOMS to ensure accuracy of traffic data* • *Engagement with appropriate organisations to raise awareness/advertise through their sites*	
	16	Impactful messages	• *Information to be communicated – programme/community/customer benefit messages* • *Identify media to be used* • *Follow the Construction and Roadworks Communication Toolkit as appropriate*	
	17	Explain no activity	• *Strategy to provide explanation of no activity and manage customer perception of project* • *On-road/off-road communications approaches*	

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

APPENDIX C – CUSTOMER IMPACT ASSESSMENT TOOL

The Customer Impact Assessment Tool in Appendix C is taken from the Roadworks a Customer View (RACV) Implementation Toolkit. This should be completed prior to Section 2.1 to provide an indicator of the level of impact anticipated by the project on each customer group at the current PCF stage. Following completion of Appendix C, populate Section 2.1 and Table 2-1 focusing on how the TM Plan takes account for the requirements of the customer groups rated as red and amber within this appendix, high and medium impact respectively. The requirements of the Customer Impact Mitigation Tool from the RACV Implementation Toolkit have been included within Table 2-1.

1. 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 3-3 Impact of roadworks and associated construction traffic on different types of road users and level of impact

	Road user type (e.g. commuters, leisure drivers, freight, etc.)	**Level of impact**		
		High	**Medium**	**Low**
1.	Commuter	x		
2.	HGV/Freight	x		
3.	Leisure		x	
4.	Disabled user		x	
5.	Buses		x	
6.	NMU			x
7.				

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

Table 3-4 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.	NMU			x
2.	Local residents	x		
3.	Local freight/HGV	x		
4.	Disabled road user		x	
5.	Local commuter	x		
6.				
7.				

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

Table 3-5 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			X
2.	Leisure			X
3.	Freight	X		
4.	Industrial Estate		X	
5.	Residents	X		
6.	Local stakeholder		X	
7.				

APPENDIX D – DYNAMIC ROADWORKS BENCHMARKING TEMPLATE

Table 3-6 below defines the Dynamic Road Works Benchmarking RAG rating descriptions for the 5 Visions in accordance with the Dynamic Road Works Benchmarking Template v2.0, which should be used to complete the following Dynamic Road Works Benchmarking Scores in Table 3-7. Appendix D should be populated once Section 2.3 Proposed traffic management measures is completed to provide a summary of the current state of the project. RAG rate the project against the Dynamic Roadworks Vision to record the status of the project at the current PCF stage.

Table 3-6 RAG Descriptions for Visions

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.

	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	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. 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. 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. AND the average journey time created by the road works is not more than an additional seven minutes thirty seconds.	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. AND the average journey time created by the road works is not more than an additional seven minutes thirty seconds.	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. AND/OR the average journey time created by the road works is more than an additional seven minutes thirty seconds.
Closures & diversions	No more than 1 full closure (including slip road closures) every 3 months And / or the diversion route has a comparable journey time, and impact on communities along the diversion route are minimal	No more than 1 full closure (including slip road closures) every month	More than 1 full closure (including slip road closures) every month
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	Benefits are delivered to the customer before full opening (NA if offline project) OR construction is undertaken at least 6 days a week	No benefits are delivered to the customer before full opening (NA if offline project)

	AND restrictions are lifted during embargo periods (unless full productivity is maintained)	OR restrictions are lifted during embargo periods (unless full productivity is maintained)	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.

Dynamic Road Works Benchmarking Scores

Table 3-7 Dynamic Roadworks Benchmarking Template

Vision	Green/ Amber/ Red/ NA/ Not yet known	Project Evidence for RAG Rating
1. **Speeds** *Varying the speed limits so they are appropriate for the work taking place*	Green	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.
2. **Length** *Shortening the length of roadworks*	Green	TM is mostly localised to tie in works and short length/duration gantry works
3. **Closures and diversions** *Appropriate use of full road closures (including slip road closures) and associated diversions*	Amber	Simple diversion routes with low impact on journey time
4. **Delivering quicker** *Delivering road works quicker*	Amber	Construction is undertaken at least 6 days a week
5. **Explaining activity** *Explaining clearly what activities are, or are not, taking place*	Green	Use of variable message signs, website and social media updates and regular update meetings with major stakeholders

APPENDIX E – 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 3-8 Checklist for implementing the highest safe speed within road works

	Checklist items	Reasoning
Development of design brief	Incorporate requirements outlined in *Chief Highways Engineer Memorandum 446/19*	The requirements of CHE Memorandum 446/19 have been considered. 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. The Traffic Management proposals to date reflect the current understanding of the programme, site constraints and methods of construction to be adopted.
Safety risk assessment	Where 60mph speed restrictions are to be used, set a safety objective to ensure the safety baseline can be maintained	Safety Risk Assessment has been undertaken to ascertain appropriate safe speeds within the roadworks. Please see below.
	Review appropriate evidence to inform the analysis of risk	
	Ensure your scheme specific risk assessment captures all foreseeable hazards	
Work programme and traffic	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

management proposal	Where the same speed restriction cannot be used across the entirety of the scheme, consider use of varying restrictions, where suitable	being undertaken and at different location. This will be refined during the construction stage with paticular attention paid to elimination of speed limits when the only restriction is narrow lane working.
Implementation	Consider undertaking additional safety audits to ensure that the required mitigations outlined within your safety risk assessment are implemented correctly	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	Road space is booked, TTROs have been programmed
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 construction stage.
	Update your safety risk assessment and introduce new mitigations to maintain safety baseline if required	

Risk Assessment

Low	1-5
Medium	6-14
High	15-25

A12

Grouping	Identified hazardous event	Population at risk	Likelihood	Severity	Risk	Control measures	Likelihood	Severity	Risk	Comments
Collision between vehicles	Collision between road users vehicles	Vehicular road users	4	4	16	D1, D2, D6, D7, D9, D13, O2, O3, O4, O5, O6, O8, O11, C2, C3, C5	2	4	8	Safety concerns over construction traffic exiting into high-speed traffic and high-speed traffic entering temporary traffic management. Works exits, whenever possible to be positioned at the end of traffic management and suitable briefings to be delivered on entering and leaving site
	Collision including works vehicles	Vehicular road users and road workers	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8, O9, O10, O11, C1, C2, C3, C5	2	4	8	
	Collision between moving and stationary vehicles	Vehicular road users and road workers	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D13, O1, O2, O3, O4, O5, O6, O7, O8, O11, C2, C3, C5	1	4	4	
Collisions between vehicles and pedestrians	Collision between road users and road worker	Vehicular road users and road workers	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12, O1, O2, O3, O5, O6, O8, O10, O11, C1, C2, C3, C5	1	4	4	Vehicle barrier to protect customer from works, also offering protection

	Collision between road users and pedestrian road user	Road users (vehicular and pedestrian)	3	4	12	D1, D2, D5, D6, D7, D9, D11, D12 D13, O2, O3, O4, O5, O6, O8, O11, C1, C2, C3, C5	1	4	4	to workers. Plant exclusion zones to be implemented. Suitable barriers/fencing to exclude pedestrians from works area
	Collision between works vehicle and road worker	Road workers	3	4	12	D1, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8, O10, O11, C1, C2, C3, C5	1	4	4	
Collisions with temporary traffic management and roadside furniture		Vehicular road users	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D12 D13, O1, O2, O3, O6, O7, O8, O10, O11, C1, C2, C3	2	3	6	

Slip Roads

Grouping	Identified hazardous event	Population at risk	Likelihood	Severity	Risk	Control measures	Likelihood	Severity	Risk	Comments
Collision between vehicles	Collision between road users vehicles	Vehicular road users	4	4	16	D1, D2, D6, D7, D9, D13, O2, O3, O4, O5, O6, O8, O11, C2, C3, C5	2	4	8	Safety concerns over construction traffic exiting into high-speed traffic and high-speed traffic entering temporary traffic management. Works exits, whenever possible
	Collision including works vehicles	Vehicular road users and road workers	4	4	16	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8, O9, O10, O11, C1, C2, C3, C5	2	4	8	

	Collision between moving and stationary vehicles	Vehicular road users and road workers	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D13, O1, O2, O3, O4, O5, O6, O7, O8, O11, C2, C3, C5	1	4	4	to be positioned at the end of traffic management and suitable briefings to be delivered on entering and leaving site
Collisions between vehicles and pedestrians	Collision between road users and road worker	Vehicular road users and road workers	4	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12, O1, O2, O3, O5, O6, O8, O10, O11, C1, C2, C3, C5	1	4	4	Vehicle barrier to protect customer from works, also offering protection to workers. Plant exclusion zones to be implemented. Suitable barriers/fencing to exclude pedestrians from works area
	Collision between road users and pedestrian road user	Road users (vehicular and pedestrian)	3	4	12	D1, D2, D5, D6, D7, D9, D11, D12 D13, O2, O3, O4, O5, O6, O8, O11, C1, C2, C3, C5	1	4	4	
	Collision between works vehicle and road worker	Road workers	3	4	12	D1, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8, O10, O11, C1, C2, C3, C5	1	4	4	
Collisions with temporary traffic management and roadside furniture		Vehicular road users	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D12 D13, O1, O2, O3, O6, O7, O8, O10, O11, C1, C2, C3	1	3	3	

M25 mainline

Grouping	Identified hazardous event	Population at risk	Likelihood	Severity	Risk	Control measures	Likelihood	Severity	Risk	Comments
Collision between vehicles	Collision between road users vehicles	Vehicular road users	4	4	16	D1, D2, D6, D7, D9, D13, O2, O3, O4, O5, O6, O8, O11, C2, C3, C5	2	4	8	Safety concerns over construction traffic exiting into high-speed traffic and high-speed traffic entering temporary traffic management. Works exits, whenever possible to be positioned at the end of traffic management and suitable briefings to be delivered on entering and leaving site
	Collision including works vehicles	Vehicular road users and road workers	4	4	16	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8, O9, O10, O11, C1, C2, C3, C5	2	4	8	
	Collision between moving and stationary vehicles	Vehicular road users and road workers	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D13, O1, O2, O3, O4, O5, O6, O7, O8, O11, C2, C3, C5	1	4	4	
Collisions between vehicles and pedestrians	Collision between road users and road worker	Vehicular road users and road workers	4	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D11, D12, O1, O2, O3, O5, O6, O8, O10, O11, C1, C2, C3, C5	1	4	4	Vehicle barrier to protect customer from works, also offering protection to workers. Plant exclusion zones to be implemented. Less likelihood of pedestrians entering site but briefings to cover pedestrians
	Collision between road users and pedestrian road user	Road users (vehicular and pedestrian)	3	4	12	D1, D2, D5, D6, D7, D9, D11, D12 D13, O2, O3, O4, O5, O6, O8, O11, C1, C2, C3, C5	1	4	4	
	Collision between works vehicle	Road workers	3	4	12	D1, D3, D4, D5, D6, D7, D9, D11, D12 D13, O1, O2, O3, O5, O6, O7, O8,	1	4	4	

	and road worker					O10, O11, C1, C2, C3, C5				seeking refuge from BDV
Collisions with temporary traffic management and roadside furniture		Vehicular road users	3	4	12	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D12 D13, O1, O2, O3, O6, O7, O8, O10, O11, C1, C2, C3	1	3	3	

Design control measures

D1. Implementation of appropriate lane widths, variable lane widths (demarcating a wider kerbside lane) may be appropriate in conjunction with restriction on lane usage to allow extra space for larger vehicles and encourage instinctive organisation of vehicle types.

D2. Clear and appropriate road marking.

D3. Appropriate setback between lanes and works demarcation.

D4. Understanding of the activities to ensure there is sufficient working area.

D5. Careful consideration to works access and exit points with suitable locations of access and egress points that ensure good sightlines. The use of appropriate merging lengths designed to correspond with the implemented temporary speed restriction.

D6. Optimising the length of roadworks to minimise disruptions to the road user and ensure the risk to all affected parties is ALARP.

D7. The use of a suitable signage strategy that is clear and coherent without causing road user confusion. The use of additional signage around any changes in speed restriction within the roadworks.

D8. Implement clear and sufficient contraflow guidance and signage.

D9. Careful consideration when designing works in close proximity to junctions with the use of suitable and clear signage.

D10. Inclusion of 'gates'/emergency access points within the safety barrier to allow stricken vehicles/debris to be removed from a live lane.

D11. Safety barrier specification, including appropriate impact attenuators (crash cushions) suitable for containing high speed errant vehicles. It may also be appropriate to consider the use of 'smart' barriers equipped with sensors to improve incident response times.

D12. Ensuring appropriate clearance to roadside furniture or traffic management devices in line with relevant regulations and appropriate for the implemented speed restriction. It is further advised that prior to the installation of temporary traffic management, a Road Restraints Risk Assessment Process (RRRAP) be undertaken to identify and mitigate the risk posed to road users by roadside furniture and unsafe roadsides.

D13. The use of traffic management devices that complies with visibility and conspicuity guidelines outlined in Chapter 8 Part 1 and 2 of the Traffic Signs Manual.

D14. In line with good practice, schemes may wish to conduct a road safety audit to help identify site-specific risks, and controls, and to inform the safety risk assessment process

Operational control measures

O1. Activities within the works zone to be carried out away from potential incursion locations (e.g. works access points). Logistics planning should look to ensure that the movement of vehicles and use of access egress points within the works reduce interactions with road users.

O2. Use of variable speed restrictions or communications via existing or portable signs to warn approaching road users of road workers in the carriageway or as a response to an incident.

O3. Use of signs and variable speed restrictions dependant on conditions.

O4. Implementation of measures to identify stricken/stranded vehicles such as the use of CCTV cameras and stopped vehicle detection systems supported by signing to provide advanced warning.

O5. Support by on-call incident support and impact protection vehicles (with suitable crash cushions) who are able to respond promptly to any requests from emergency services or vehicle recovery.

O6. Plans for checking to ensure resilience is incorporated into the use of remotely operated signs (e.g. batteries regularly checked, signs regularly checked, spare signs in the event of any fault/damage/theft). Specific methodology for placing and changing signs to be developed and documented in contractor's risk assessment and method statement (RAMS)

O7. The implementation specific documented methodology for placing and changing signs that is in line with the temporary speed restriction (e.g. RAMS).

O8. Implementation of appropriate checks when signs are displaying the correct speed restriction or to ensure all signs have been changed correctly. This should be considered regardless of the type of signs used.

O9. Implementation of a speed enforcement strategy to promote compliance with the speed restriction.

O10. Review of current working practices including the incident management plan to ensure it is safe as reasonably practicable to operate at the temporary speed restriction.

O11. All work undertaken by competent and appropriately trained road workers

Communications control measures

C1. Implementation of clear and secure speed restrictions signs to inform road users of temporary or variable speed restriction.

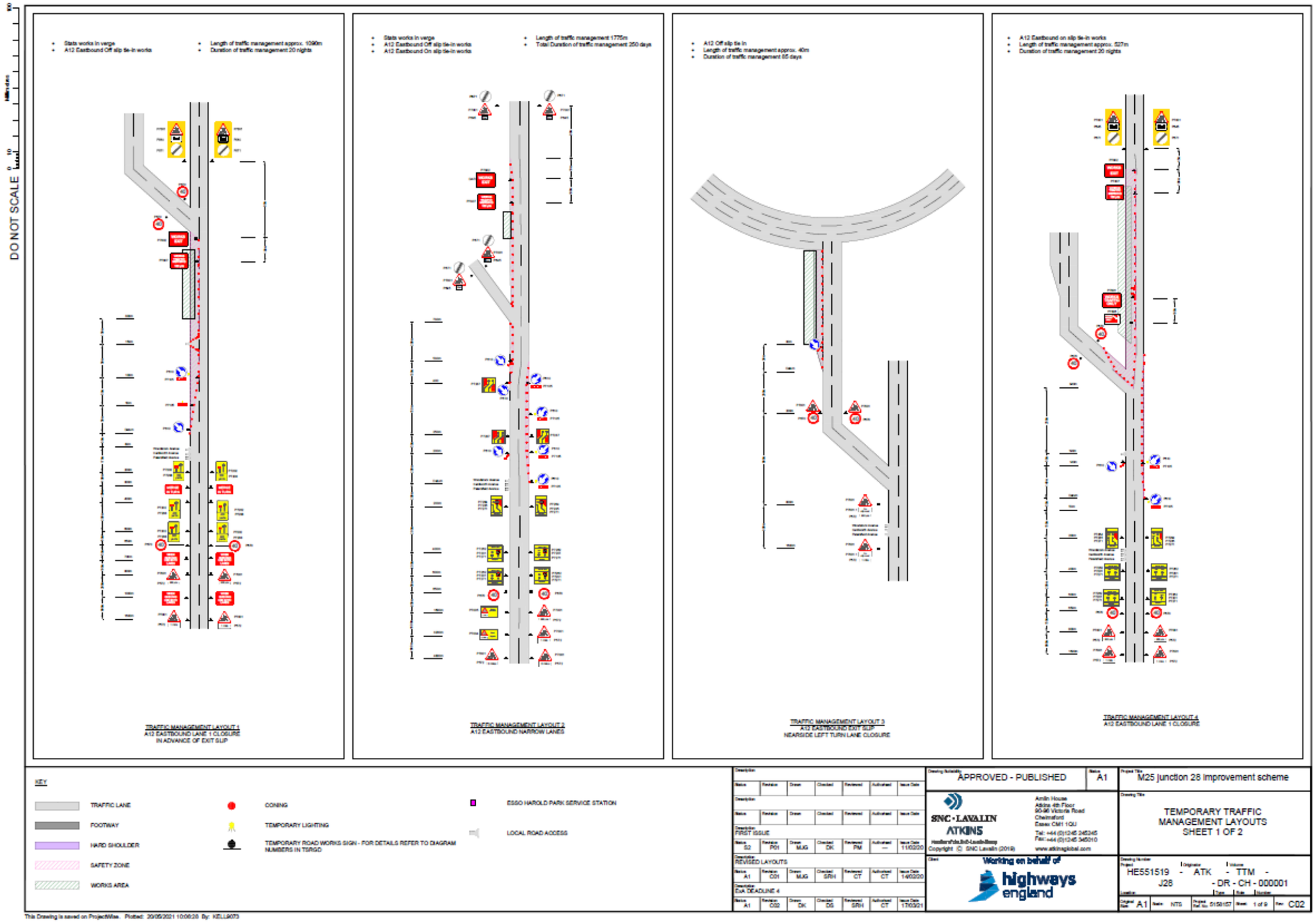
C2. The use of VMS and targeted communication strategies as communication tools to inform and warn road users of temporary or variable speed restrictions. This may include the use of online and offline media to inform road users about impending works on the network and implemented speed restrictions.

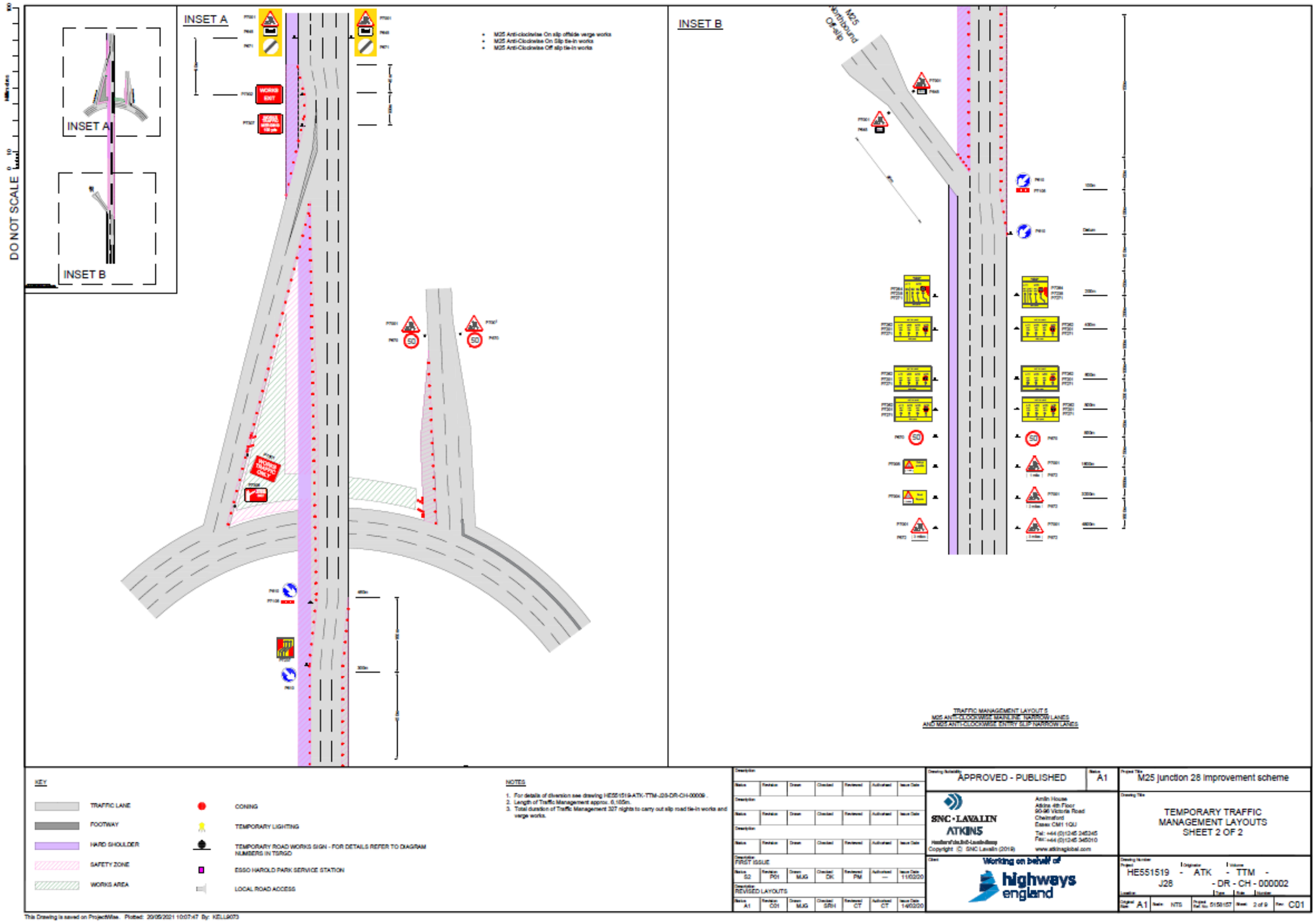
C3. Communication with Traffic Management Operatives, vehicle recovery operators, emergency services and Traffic Officers to trigger a review of working practices and method statements to ensure they are in line with the implemented temporary speed restriction and reflect the change in risks for live lane working.

C4. Communication of temporary speed restriction to road workers including any updates of relevant documentation and procedures.

C5. Identification of and engagement with all appropriate stakeholders.

APPENDIX F – PROPOSED TRAFFIC MANAGEMENT DRAWINGS AND DIVERSION ROUTES

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INSET A
INSET B
INSET A
INSET B
M25 Anti-clockwise On slip offside verge works
M25 Anti-Clockwise On Slip tie-in works
M25 Anti-Clockwise Off slip tie-in works
M25 Northbound Off-slip
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. 6,165m.
3. Total duration of Traffic Management 327 nights to carry out slip road tie-in works and verge works.
FIRST ISSUE
REVISED LAYOUTS
APPROVED - PUBLISHED
A1
M25 junction 28 Improvement scheme
TEMPORARY TRAFFIC MANAGEMENT LAYOUTS SHEET 2 OF 2
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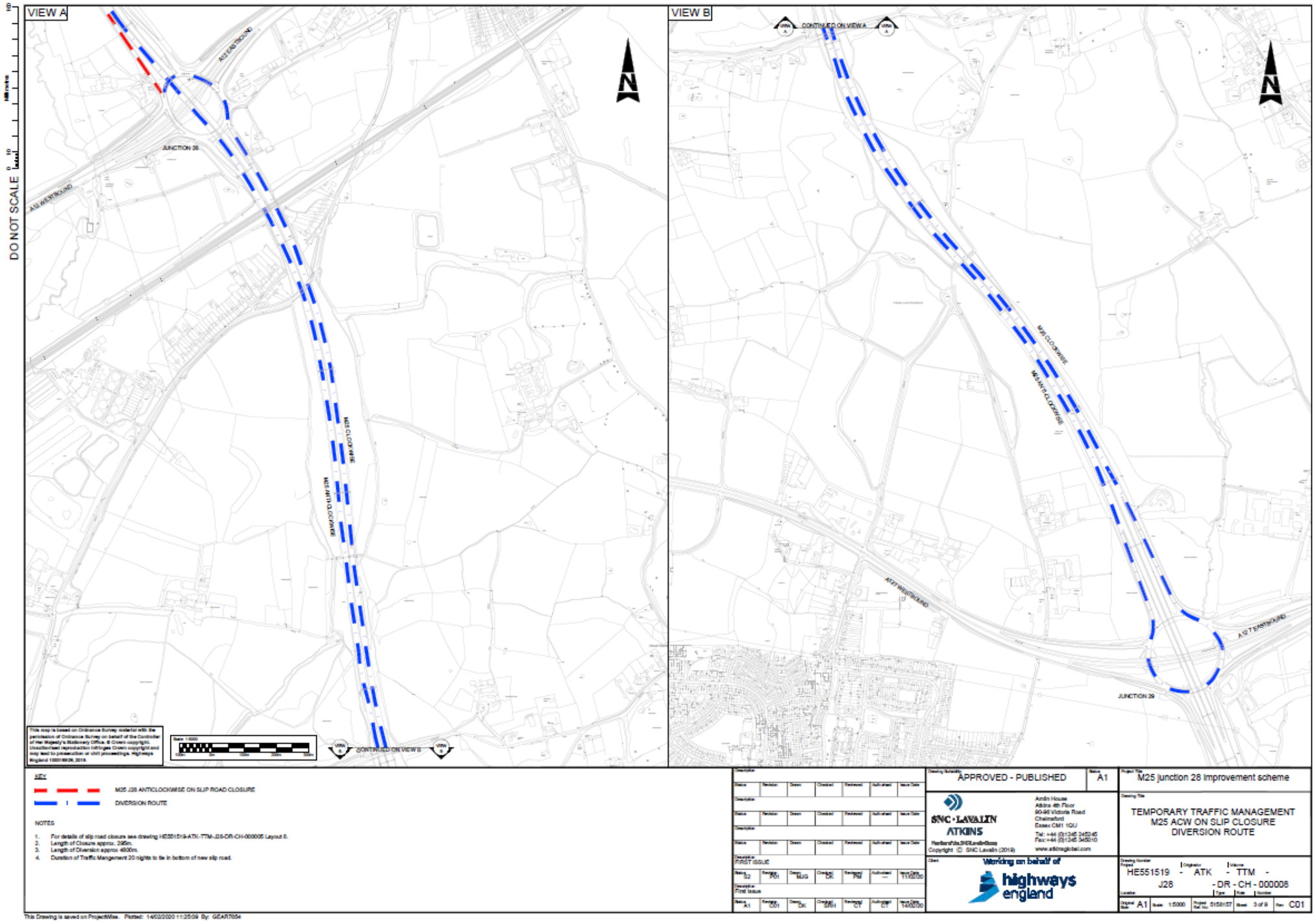
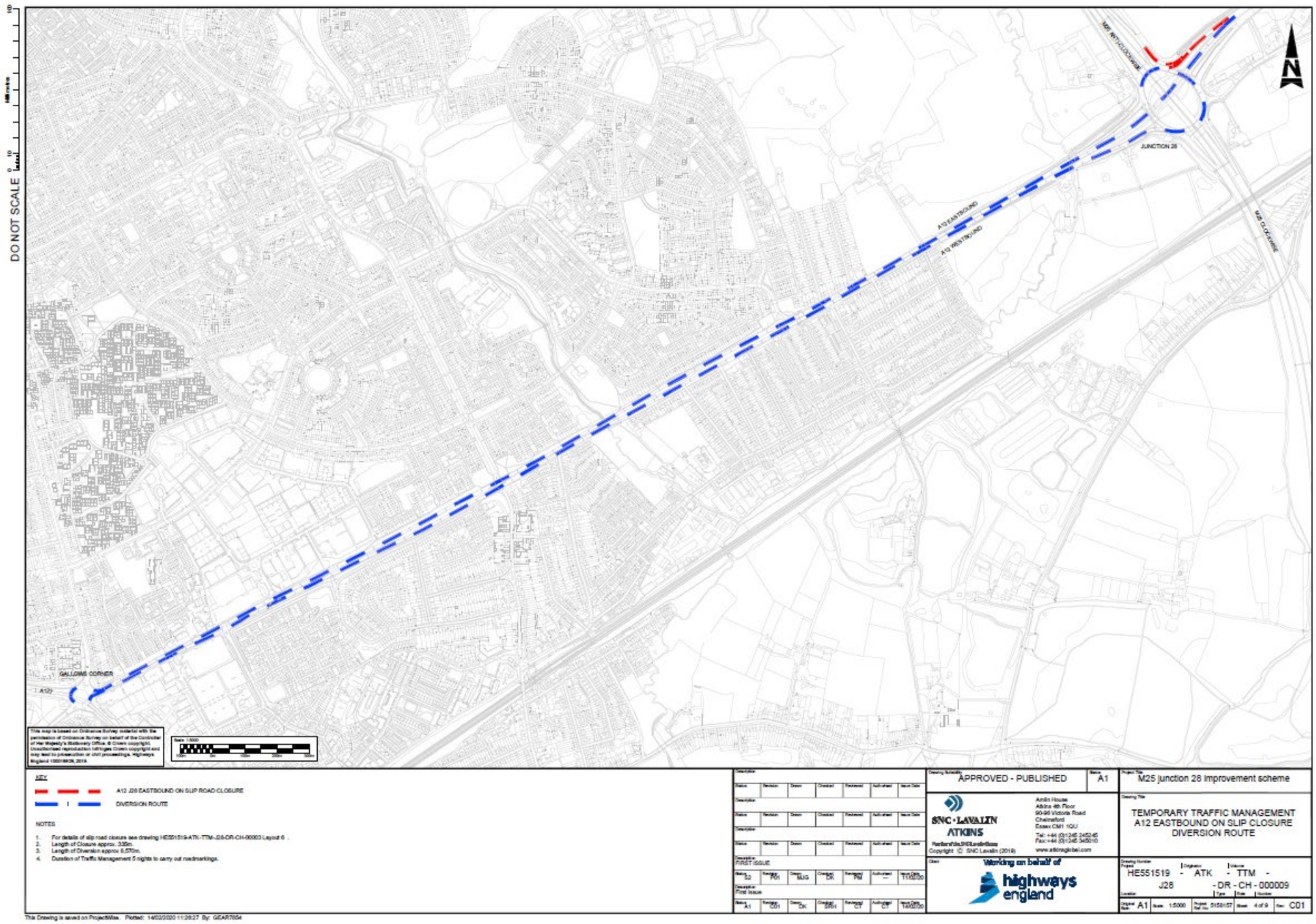

VIEW A
VIEW B
DO NOT SCALE
A12 EASTBOUND
A12 WESTBOUND
JUNCTION 28
M25 CLOCKWISE
M25 ANTI-CLOCKWISE
CONTINUED ON VIEW B
CONTINUED ON VIEW A
A127 WESTBOUND
A127 EASTBOUND
JUNCTION 29
KEY
M25 J28 ANTICLOCKWISE ON SLIP ROAD CLOSURE
DIVERSION ROUTE
NOTES
1. For details of slip road closure see drawing HE551519-ATK-TTM-J28-DR-CH-000005 Layout 8.
2. Length of Closure approx. 295m.
3. Length of Diversion approx. 4800m.
4. Duration of Traffic Mangement 20 nights to tie in bottom of new slip road.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
M25 ACW ON SLIP CLOSURE
DIVERSION ROUTE
SNC-LAVALIN ATKINS
Working on behalf of highways england
HE551519 - ATK - TTM - J28 - DR - CH - 000008
C01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Kilometres
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A12 EASTBOUND
A12 WESTBOUND
M25 ANTI-CLOCKWISE
M25 CLOCKWISE
JUNCTION 28
GALLOWS CORNER
A12
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Scale 1:5000
100m 0m 100m 200m 300m
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
FIRST ISSUE
Status S2 Revision P01 Drawn MJG Checked DK Reviewed PM Authorised — Issue Date 11/02/20
Description
First Issue
Status A1 Revision C01 Drawn DK Checked SMH Reviewed CT Authorised CT Issue Date 14/02/20
Drawing Suitability APPROVED - PUBLISHED
Status A1
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Client
Working on behalf of
highways england
Project Title
M25 junction 28 Improvement scheme
Drawing Title
TEMPORARY TRAFFIC MANAGEMENT
A12 EASTBOUND ON SLIP CLOSURE
DIVERSION ROUTE
Drawing Number
Project HE551519 - Originator ATK - Volume TTM -
Location J28 - Type DR - Role CH - Number 000009
Original Size A1 Scale 1:5000 Project Ref. No. 5158157 Sheet 4 of 9 Rev C01
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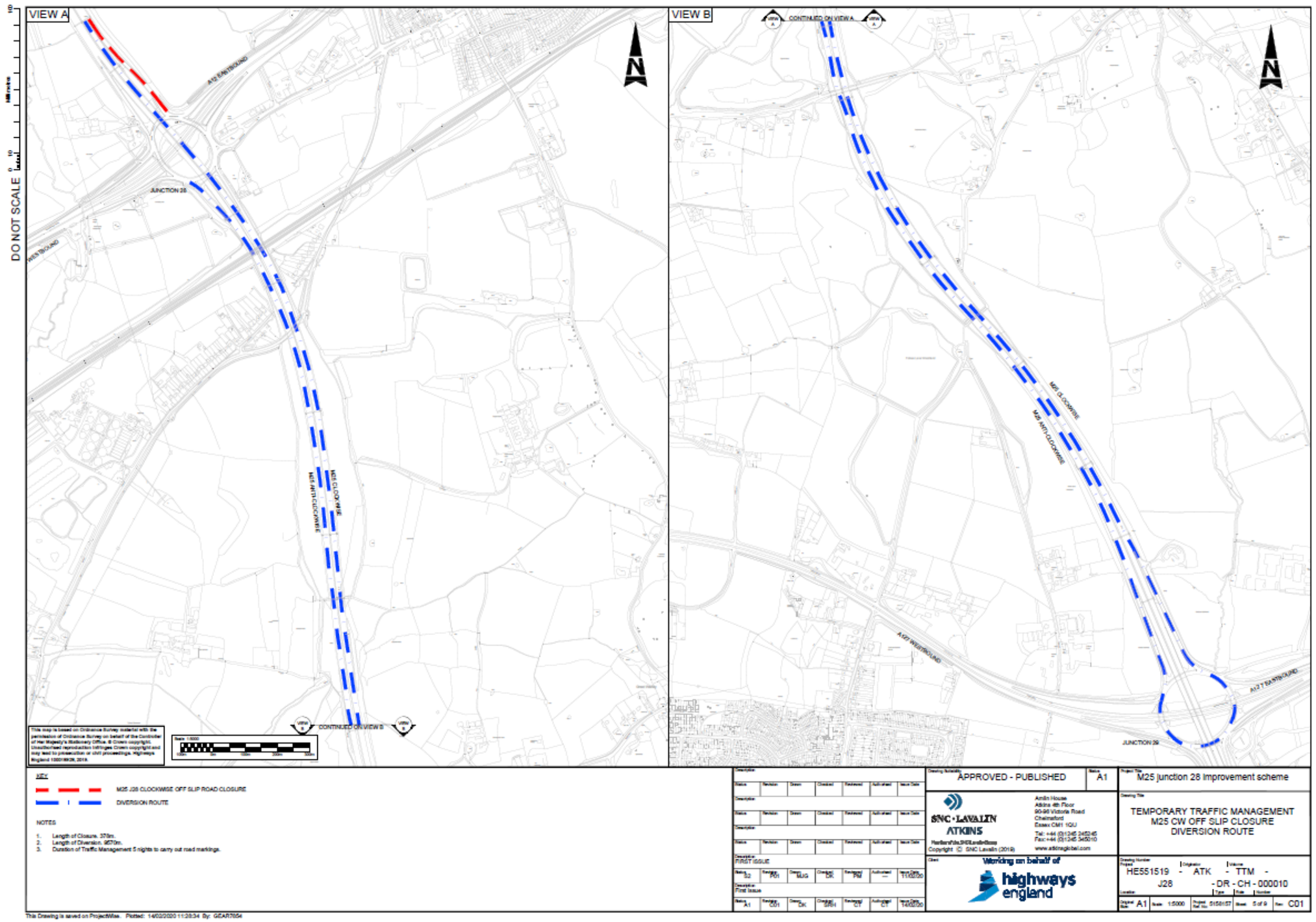
VIEW A
VIEW B
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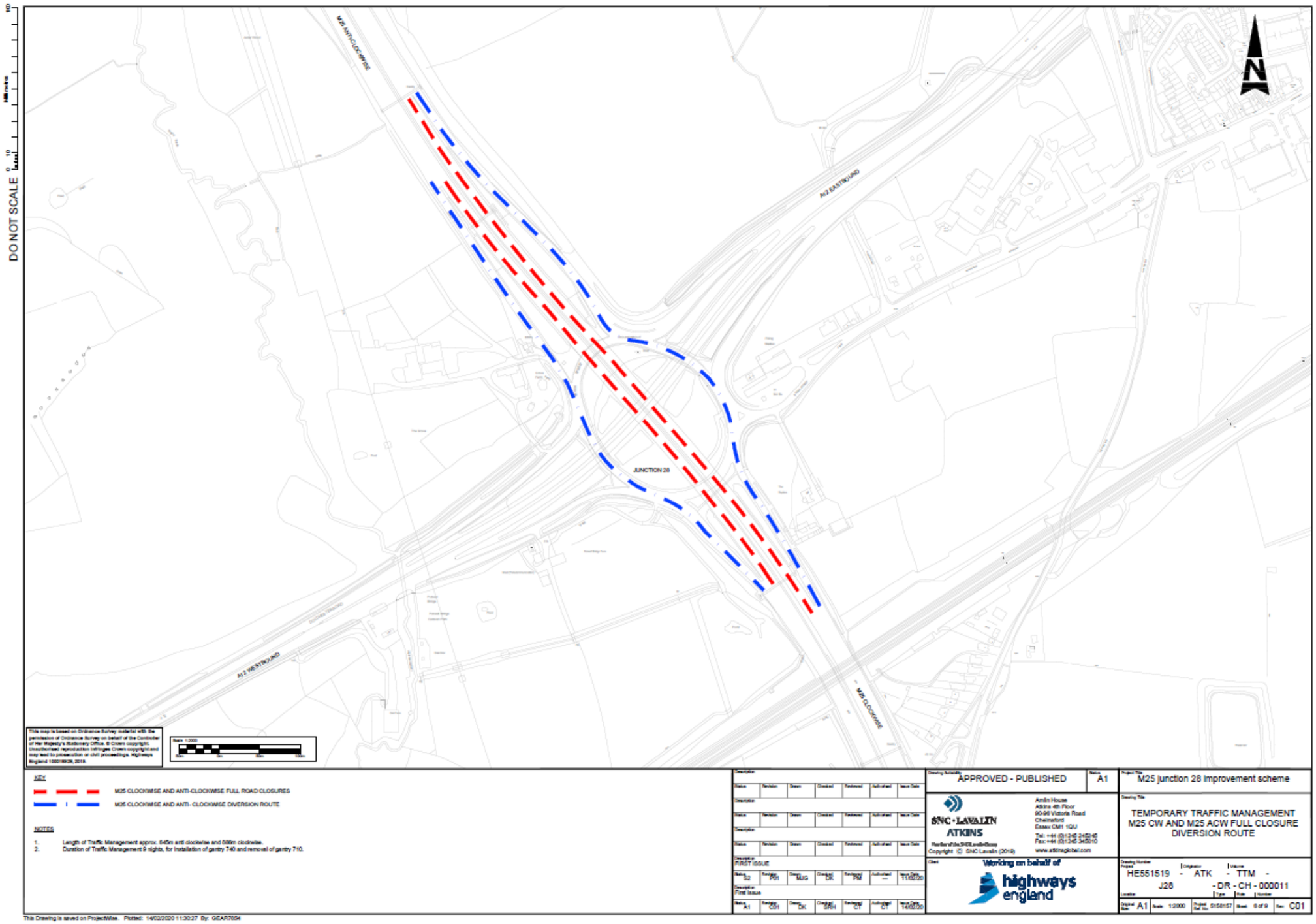
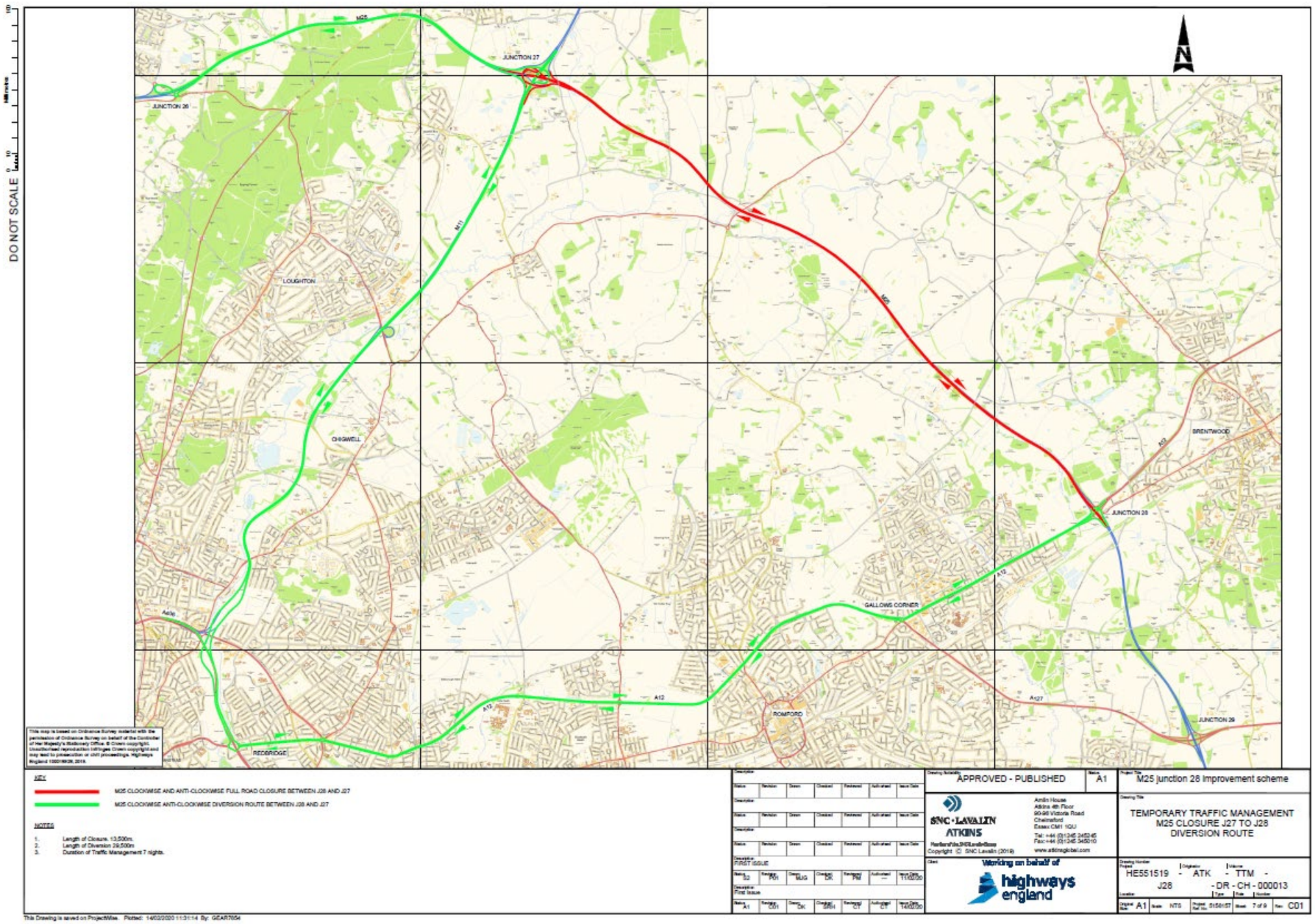
A12 EASTBOUND
JUNCTION 28
M25 CLOCKWISE
M25 ANTI-CLOCKWISE
CONTINUED ON VIEW B
CONTINUED ON VIEW A
A127 WESTBOUND
A127 EASTBOUND
KEY
M25 J28 CLOCKWISE OFF SLIP ROAD CLOSURE
DIVERSION ROUTE
NOTES
1. Length of Closure, 370m.
2. Length of Diversion, 4670m.
3. Duration of Traffic Management 5 nights to carry out road markings.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
M25 CW OFF SLIP CLOSURE
DIVERSION ROUTE
SNC-LAVALIN ATKINS
Working on behalf of highways england
HE551519 - ATK - TTM - J28 - DR - CH - 000010
CD1


DO NOT SCALE
N
M25 ANTI-CLOCKWISE
A12 EASTBOUND
JUNCTION 28
A12 WESTBOUND
M25 CLOCKWISE
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 696m clockwise.
2. Duration of Traffic Management 9 nights, for installation of gantry 740 and removal of gantry 710.
APPROVED - PUBLISHED
A1
M25 junction 28 Improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
M25 CW AND M25 ACW FULL CLOSURE
DIVERSION ROUTE
SNC-LAVALIN
ATKINS
Working on behalf of
highways england
HE551519 - ATK - TTM -
J28 - DR - CH - 000011
C01


DO NOT SCALE
0 10 Kilometre
N
M25
JUNCTION 26
JUNCTION 27
JUNCTION 28
JUNCTION 29
A406
A12
A127
M11
LOUGHTON
CHIGWELL
REDBRIDGE
GALLOWS CORNER
ROMFORD
BRENTWOOD
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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
1. Length of Closure. 13,500m.
2. Length of Diversion 29,500m
3. Duration of Traffic Management 7 nights.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
SNC-LAVALIN ATKINS
Amlin House
Atkins 4th Floor
90-98 Victoria Road
Chelmsford
Essex CM1 1QU
Tel: +44 (0)1245 345345
Fax: +44 (0)1245 345010
www.atkinsglobal.com
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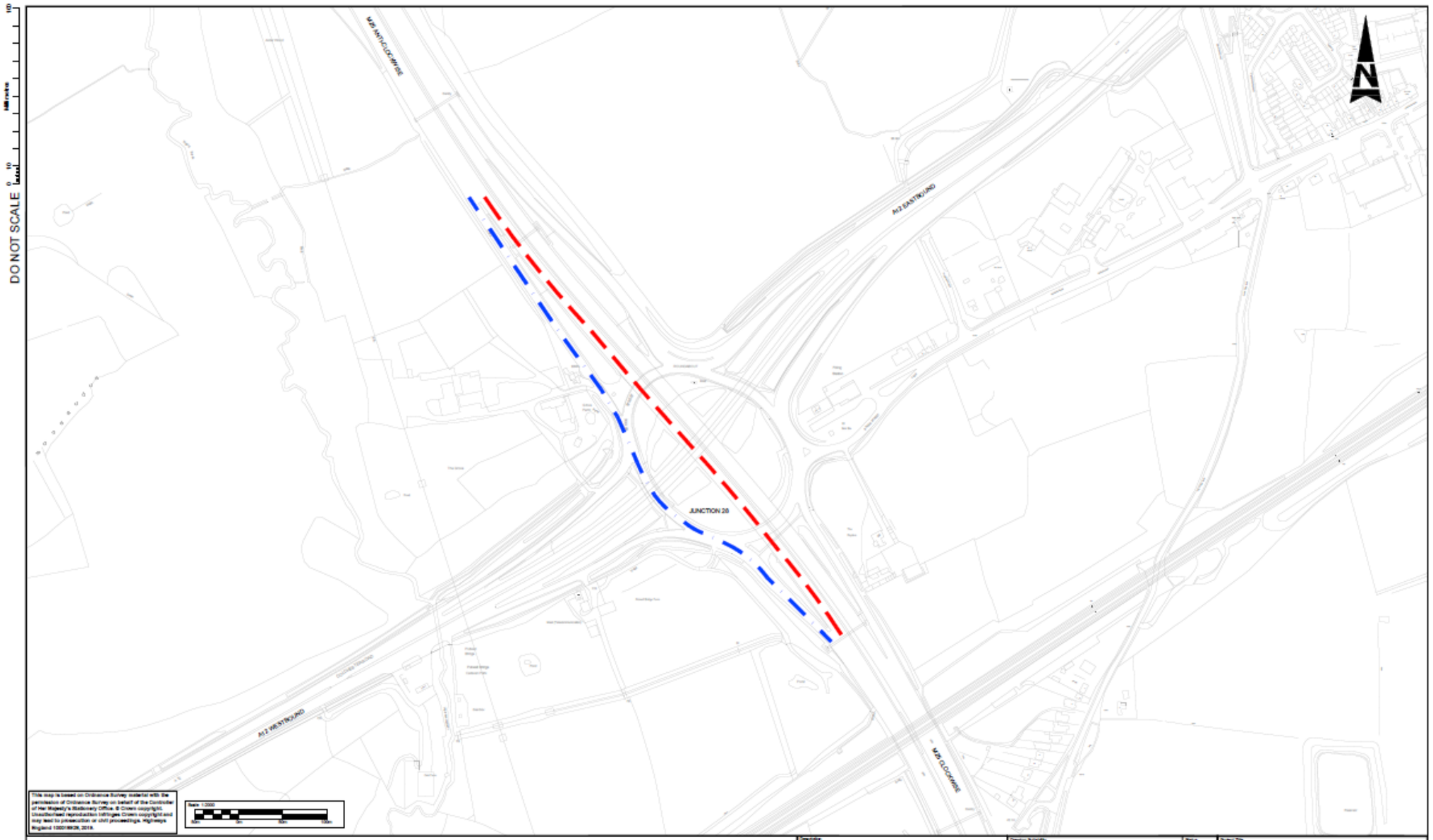
Working on behalf of
highways england
TEMPORARY TRAFFIC MANAGEMENT
M25 CLOSURE J27 TO J28
DIVERSION ROUTE
HE551519 - ATK - TTM - J28 - DR - CH - 000013
A1
NTS
7 of 9
C01
This Drawing is saved on ProjectWise. Plotted: 14/02/2020 11:31:14 By: GEAR7054


DO NOT SCALE
M25 ANTICLOCKWISE
A12 EASTBOUND
JUNCTION 28
A12 WESTBOUND
M25 CLOCKWISE
N
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KEY
SLIP ROAD CLOSURE
DIVERSION ROUTE
NOTES
1. Length of Traffic Management approx. 645m.
2. Duration of Traffic Management 5 nights for modifications to 3No. gantries.
FIRST ISSUE
First Issue
APPROVED - PUBLISHED
A1
M25 junction 28 Improvement scheme
SNC-LAVALIN ATKINS
Amlin House
Atkins 4th Floor
90-96 Victoria Road
Chelmsford
Essex CM1 1QU
Tel: +44 (0)1245 345345
Fax: +44 (0)1245 345010
www.atkinsglobal.com
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Working on behalf of
highways england
TEMPORARY TRAFFIC MANAGEMENT
M25 CW CLOSURE
DIVERSION ROUTE
HE551519 - ATK - TTM -
J28 - DR - CH - 000026
A1
1:2000
C01
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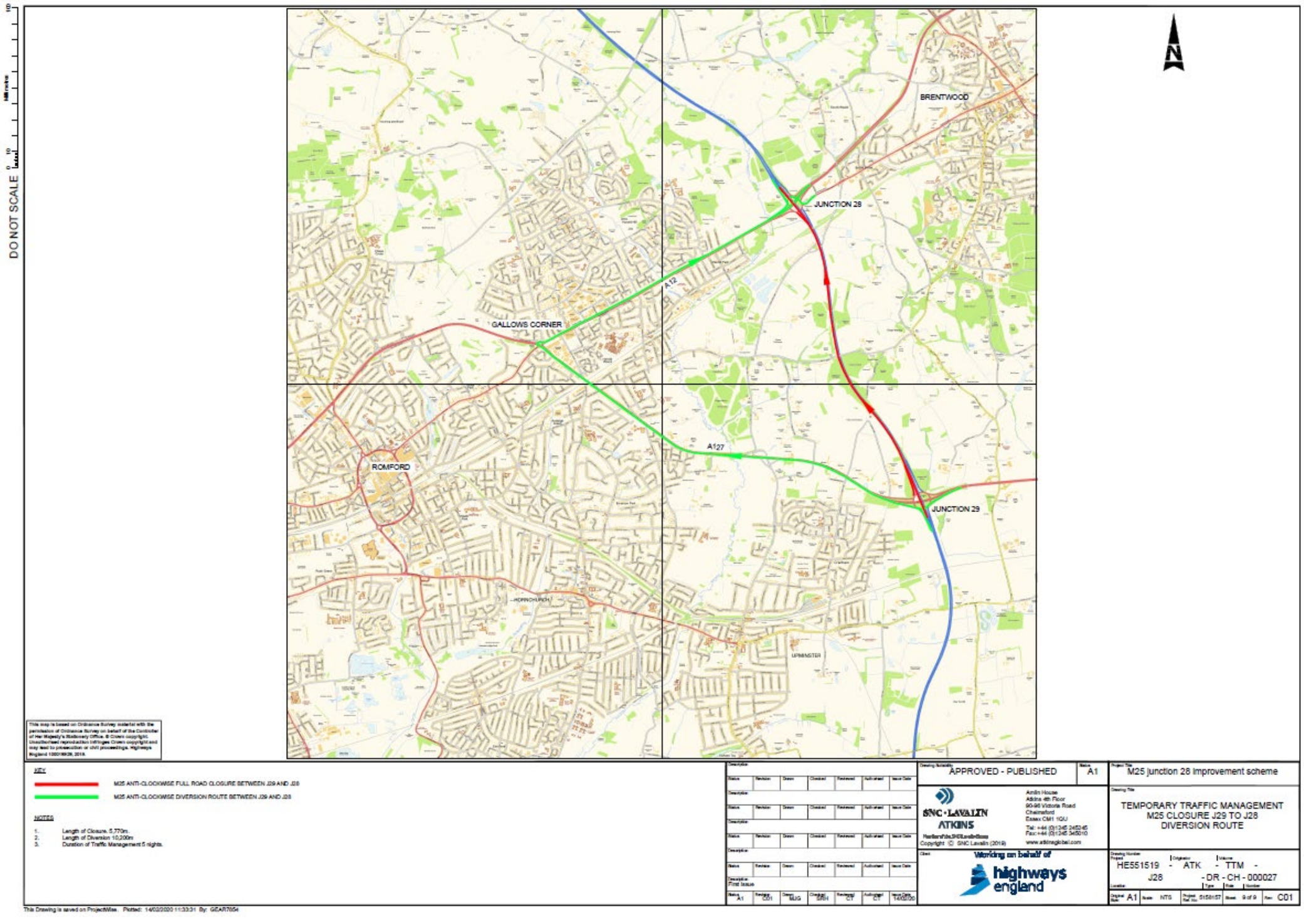
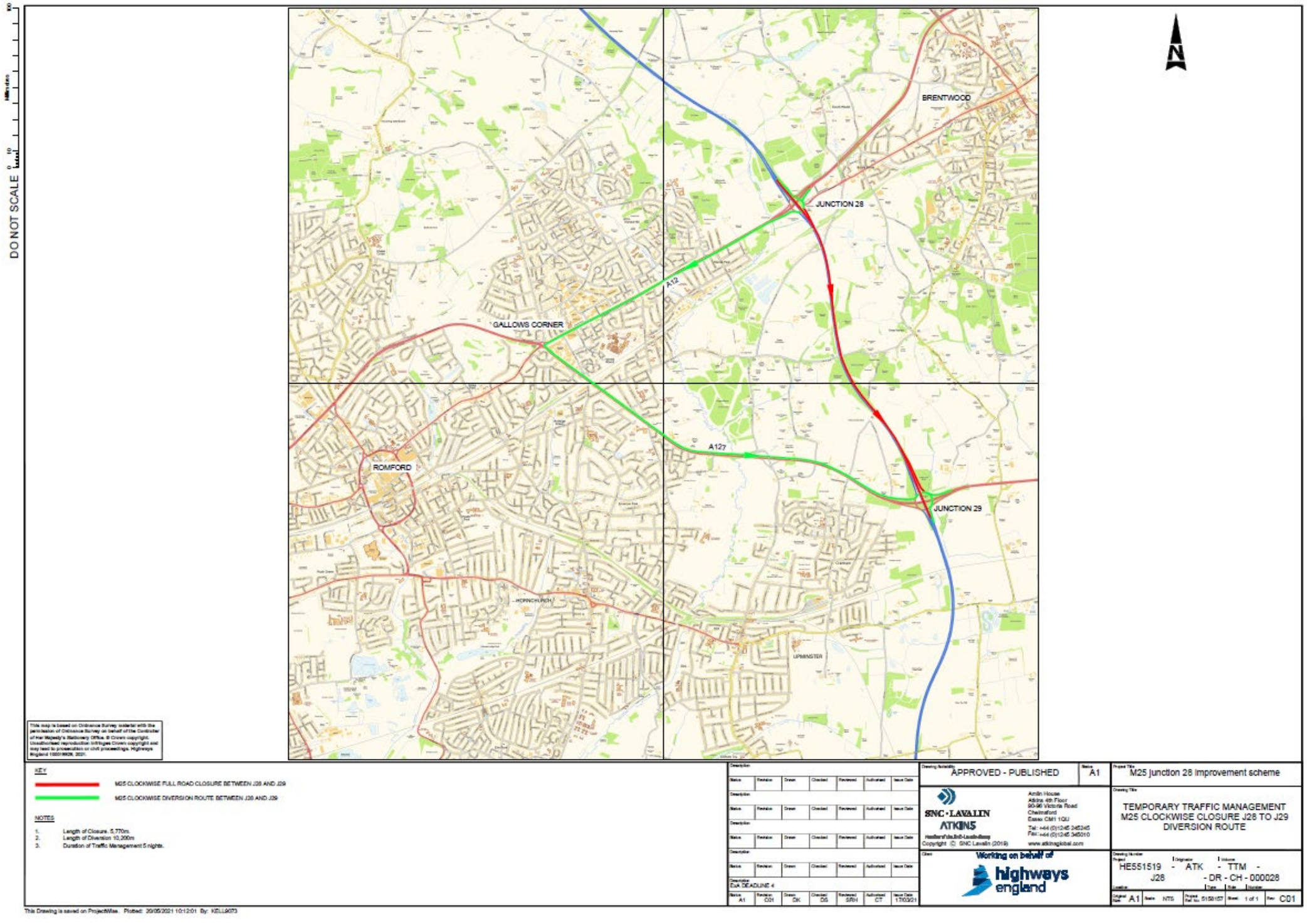
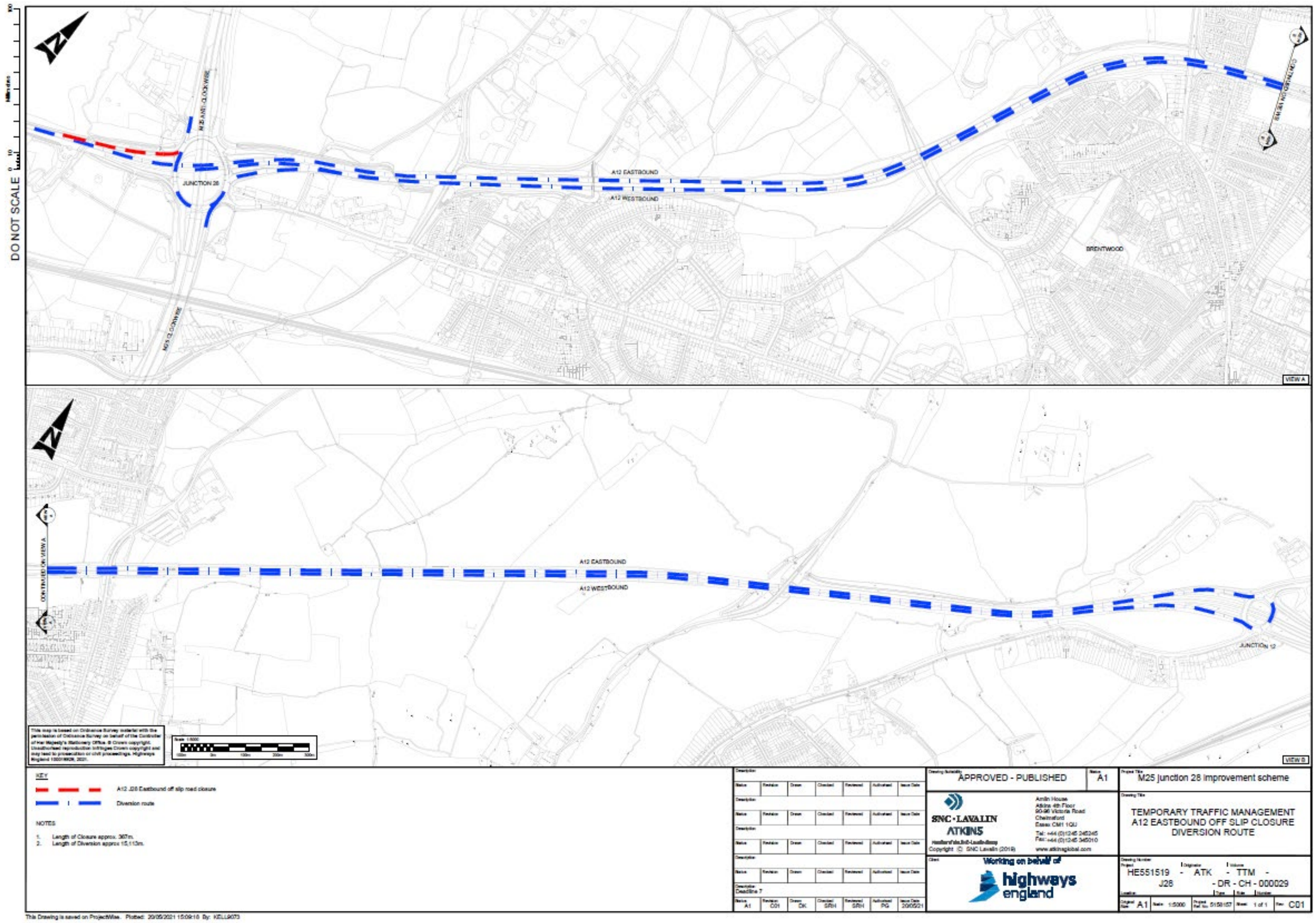

DO NOT SCALE
BRENTWOOD
JUNCTION 28
A12
GALLOWS CORNER
A127
ROMFORD
HORNCHURCH
UPMINSTER
JUNCTION 29
N
KEY
M25 ANTI-CLOCKWISE FULL ROAD CLOSURE BETWEEN J29 AND J28
M25 ANTI-CLOCKWISE DIVERSION ROUTE BETWEEN J29 AND J28
NOTES
1. Length of Closure, 5,770m.
2. Length of Diversion 10,200m
3. Duration of Traffic Management 5 nights.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
M25 CLOSURE J29 TO J28
DIVERSION ROUTE
SNC-LAVALIN ATKINS
Working on behalf of highways england
HE551519 - ATK - TTM - J28 - DR - CH - 000027
C01


DO NOT SCALE
BRENTWOOD
JUNCTION 28
A12
GALLOWS CORNER
A127
ROMFORD
JUNCTION 29
HORNCHURCH
UPMINSTER
KEY
M25 CLOCKWISE FULL ROAD CLOSURE BETWEEN J28 AND J29
M25 CLOCKWISE DIVERSION ROUTE BETWEEN J28 AND J29
NOTES
1. Length of Closure, 5,770m.
2. Length of Diversion 10,200m
3. Duration of Traffic Management 5 nights.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
M25 CLOCKWISE CLOSURE J28 TO J29
DIVERSION ROUTE
SNC-LAVALIN
ATKINS
highways england
HE551519 - ATK - TTM - J28 - DR - CH - 000028
C01


DO NOT SCALE
M25 ANTI-CLOCKWISE
M25 CLOCKWISE
JUNCTION 28
A12 EASTBOUND
A12 WESTBOUND
BRENTWOOD
M25 ANTI-CLOCKWISE
VIEW A
CONTINUED ON VIEW A
A12 EASTBOUND
A12 WESTBOUND
JUNCTION 12
VIEW B
KEY
A12 J28 Eastbound off slip road closure
Diversion route
NOTES
1. Length of Closure approx. 307m.
2. Length of Diversion approx 15,113m.
APPROVED - PUBLISHED
A1
M25 junction 28 improvement scheme
TEMPORARY TRAFFIC MANAGEMENT
A12 EASTBOUND OFF SLIP CLOSURE
DIVERSION ROUTE
SNC-LAVALIN
ATKINS
Working on behalf of
highways england
HE551519 - ATK - TTM -
J28 - DR - CH - 000029
CD1

APPENDIX G. AFFECTED COMMUNICATIONS ASSETS MARKED UP DRAWINGS

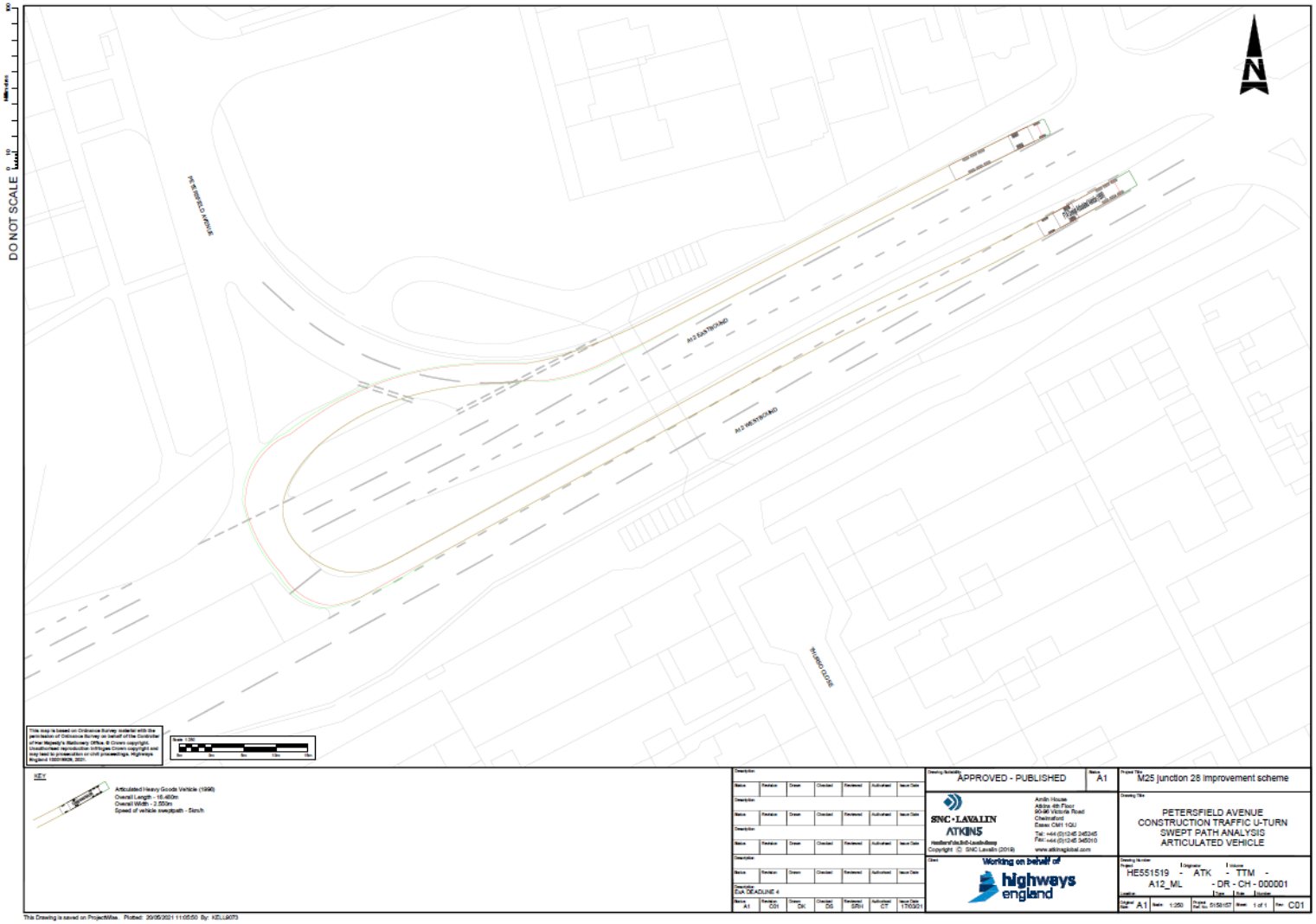
APPENDIX H. EMBARGO DATES

The embargo dates for 2021/2022 are set out in the tables below.

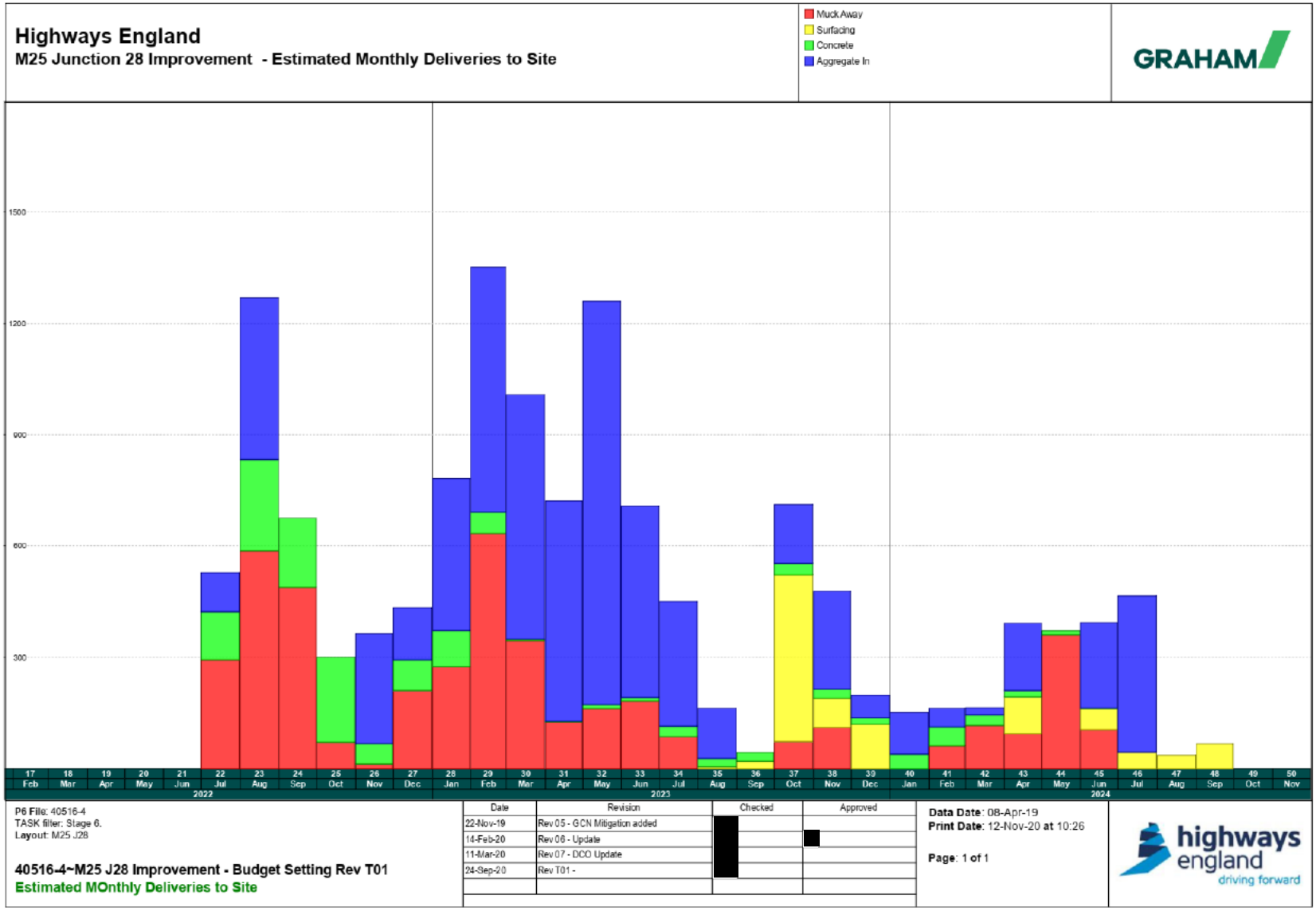
2021 Bank Holidays	Dates	TM Removed by	TM Embargo to
Easter	Good Friday 2 April Easter Monday 5 April	06:00 Thursday 1 April	00:01 Tuesday 6 April
Early May Bank Holiday	Monday 3 May	Low key – no specific request for TM to be removed (regions to assess the impact of off network events on the SRN)	
Spring Bank Holiday	Monday 31 May	06:00 Friday 28 May	00:01 Tuesday 1 June
Summer Bank Holiday	Monday 30 August	06:00 Friday 27 August	00:01 Tuesday 31 August
Black Friday/ Cyber Monday	Friday 26 November Monday 29 November	20:00 Sunday 28 November	06:00 Friday 3 December
Christmas/ New Year	Substitute Christmas Day - Monday 27 December Substitute Boxing Day - Tuesday 28 December Substitute New Year - Monday 3 January	06:00 Tuesday 21 December	00:01 Tuesday 4 January 2022

2022 Bank Holidays	Dates	TM Removed by	TM Embargo to
Easter	Good Friday 15 April Easter Monday 18 April	06:00 Thursday 14 April	00:01 Tuesday 19 April
Early May Bank Holiday	Monday 2 May	Low key – no specific request for TM to be removed (regions to assess the impact of off network events on the SRN)	
Spring Bank Holiday/ Platinum Jubilee	Thursday 2 June Friday 3 June	06:00 Wednesday 1 June	00:01 Monday 6 June
Summer Bank Holiday	Monday 29 August	06:00 Friday 26 August	00:01 Tuesday 30 August
Black Friday/ Cyber Monday	To be confirmed		
Christmas/ New Year	Substitute Christmas Day - Tuesday 27 December Boxing Day - Monday 26 December Substitute New Year - Monday 2 January	06:00 Tuesday 20 December	00:01 Tuesday 3 January

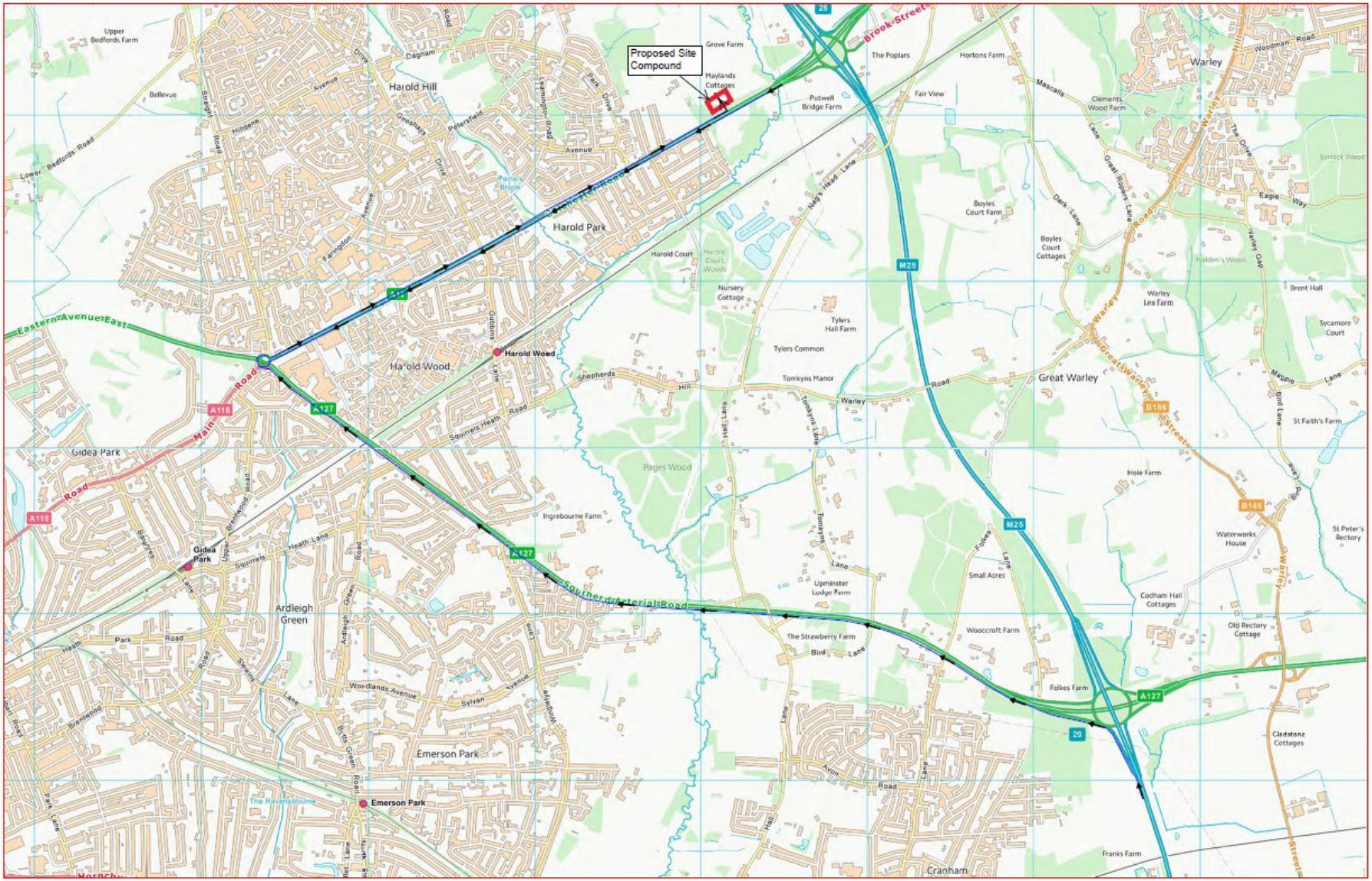
APPENDIX I. PETERSFIELD AVENUE VEHICLE SWEPT PATH ANALYSIS



APPENDIX J. ESTIMATED CONSTRUCTION VEHICLE TRIP GENERATION


Highways England
M25 Junction 28 Improvement - Estimated Monthly Deliveries to Site
Muck Away
Surfacing
Concrete
Aggregate In
GRAHAM
1500
1200
900
600
300
17 Feb
18 Mar
19 Apr
20 May
21 Jun
22 Jul
23 Aug
24 Sep
25 Oct
26 Nov
27 Dec
28 Jan
29 Feb
30 Mar
31 Apr
32 May
33 Jun
34 Jul
35 Aug
36 Sep
37 Oct
38 Nov
39 Dec
40 Jan
41 Feb
42 Mar
43 Apr
44 May
45 Jun
46 Jul
47 Aug
48 Sep
49 Oct
50 Nov
2022
2023
2024
P6 File: 40516-4
TASK filter: Stage 6.
Layout: M25 J28
40516-4~M25 J28 Improvement - Budget Setting Rev T01
Estimated MOnthly Deliveries to Site
Date
Revision
Checked
Approved
22-Nov-19
Rev 05 - GCN Mitigation added
14-Feb-20
Rev 06 - Update
11-Mar-20
Rev 07 - DCO Update
24-Sep-20
Rev T01 -
Data Date: 08-Apr-19
Print Date: 12-Nov-20 at 10:26
Page: 1 of 1
highways england
driving forward

APPENDIX K. PROPOSED TEMPORARY SIGNAGE ON THE ROAD NETWORK DIRECTING CONSTRUCTION DELIVERY VEHICLES


Proposed Site Compound
Harold Hill
Harold Park
Harold Wood
Gidea Park
Ardleigh Green
Emerson Park
Great Warley
Warley
Cranham
Eastern Avenue East
Main Road
Southend Arterial Road
Brook Street
Warley Street
M25
A127
A118
B186
28
29