Gatwick Airport Northern Runway Project

Environmental Statement
Appendix 5.3.1: Buildability Report - Part B - Part 1

Book 5

VERSION: 1.0

DATE: JULY 2023

Application Document Ref: 5.3

PINS Reference Number: TR020005

APFP Regulations 5(2)(a) **Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009**

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 Executive Summary

1.1.1 The Gatwick Northern Runway Project (NRP) will enable increased passenger numbers and aircraft operations. The Project proposes alterations to the existing northern runway and enhances the taxiway systems and parking stands to accommodate increased aircraft movements. Other elements of the Project would enable the increased airfield capacity to be accessed by passengers through additional processing capability and improved airport access. It also offers flood compensation, habitat creation and provision of recreational routes and public open spaces.

1.1.2 An indicative construction methodology for the successful execution of NRP is described in ES Appendix 5.3.1 Buildability Report Part A (Doc Ref 5.3).

1.1.3 The NRP Buildability Report Part B details the construction and delivery programme for the Surface Access Works of the Project, spanning from Junction 9 of the M23 to Longbridge Roundabout on the A23. This report provides an indicative approach to the construction for the planned improvements, including upgrades to South Terminal, North Terminal and Longbridge roundabouts, and the M23 spur.

1.1.4 The report details the scope, methodology, and sequence of the logistic and construction works required for the Surface Access Works. The information helps to identify the necessary work packages, construction activities, and equipment requirements. It also outlines the logistics and enabling works for the construction, including surveys, the establishment of contractor compounds, demolition, temporary installations, and permanent works.

1.1.5 The construction methodology detailed in the report includes enhancements to the Longbridge Roundabout for increased capacity and safety, the reconfiguration of the North Terminal Roundabout, a new signalised junction at the North Terminal, and an upgrade of the South Terminal Roundabout. The indicative traffic management arrangements are described for each area (Longbridge Roundabout, North Terminal Roundabout and South Terminal Roundabout, during each stage of the construction)

1.1.6 The Report also includes scaled 3D visualisations of each structure's construction stages to help explain the proposed methodology.

1.1.7 It should be noted that the construction methods and sequence detailed in this report are indicative and subject to change and further refinement during the detailed design stage, following the appointment of a main contractor.

2 Introduction

2.1.1 The Buildability Report Part B focuses on the buildability and programme for delivery of the highway improvements required for the Project from Junction 9 of the M23 to Longbridge Roundabout on the A23 (the 'Surface Access Works'). The report describes an indicative approach for the construction of the Surface Access Works based on the preliminary highway designs set out in the application for development consent for the Project, and it does not intend to define a specific method. Information in this report has been used to inform the Environmental Impact Assessment process, which is reported in the Environmental Statement (ES). This report has also been used to determine the extent of temporary construction working space required for the Surface Access Works.

2.1.2 This report describes the scope, methodology and sequence of the logistics, construction and enabling works required to deliver the permanent Northern Runway Project (NRP) Surface Access Improvement Works. It identifies all of the work packages likely to be required to complete the Surface Access Works and, for each, sets out the most likely sequence of construction activities, together with the types of equipment needed.

2.1.3 The activities for the construction include surveys, the establishment of contractor compounds, demolition, temporary installations, permanent works and the removal of waste generated. The construction methods detailed in this report are based on the available information at the preliminary design stage for the application for development consent. They may be refined, changed, and improved, where appropriate, during the detailed design stage and following the appointment of a main contractor.

2.1.4 This report should be read in conjunction with **ES Appendix 5.3.1: Buildability Report – Part A** (Doc Ref 5.3), **ES Appendix 5.3.2: Code of Construction Practice** (Doc Ref 5.3) and **ES Appendix 5.3.2 CoCP Annex 3 – Outline Construction Traffic Management Plan** (Doc Ref 5.3).

3 Overview of Surface Access Works

3.1.1 Improvements at the South Terminal, North Terminal, and Longbridge roundabouts are required to accommodate the proposed increase in passenger numbers accessing the highway and add capacity. The location of these improvements can be seen in Figure 1 (shaded orange). The following surface access works form part of the Project:

- Enhancement of Longbridge Roundabout to increase capacity and improve safety.
- A re-configured junction at North Terminal to reduce traffic conflicts and increase capacity by replacing the existing roundabout with a signalised intersection and a flyover for northbound A23 traffic to minimise traffic conflicts and increase capacity.
- A new signalised junction connecting North Terminal to the A23 London Road to improve capacity and traffic flow, mitigating the existing need for southbound traffic to U-turn at Longbridge Roundabout.
- Grade separation of South Terminal Roundabout to increase capacity.
- Upgrade of the Eastbound M23 Spur Road from two to three running lanes.

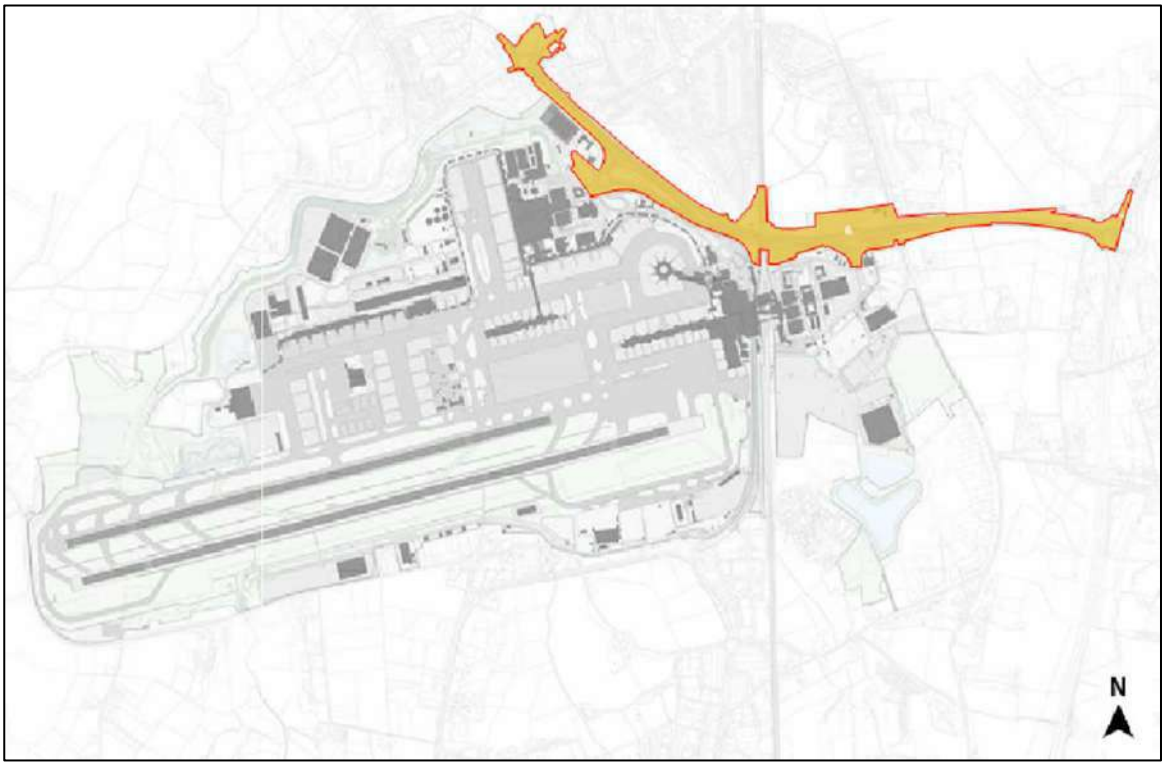


Figure 1: Location of Surface Access Works

3.1.2 The following description describes the proposals by section, starting at the eastern end close to the M23 Junction 9 and finishing at Longbridge Roundabout on the A23.

3.2. Surface Access Works Scope

3.2.1 This section details the elements of surface access works. This report considers the Project in the sections described below. A detailed description of the Project can be found in the **ES Chapter 5: Project Description** (Doc Ref 5.1).

3.2.2 The proposed surface access works comprise the below elements and they are illustrated in Figure 2:

1. A23 Brighton Road, including the bridge over the River Mole
2. Longbridge Roundabout, including the segregated left turn from A23 Brighton Road into A23 London Road.
3. North Terminal Roundabout, including a new flyover and connection to the A23 London Road.
4. A23 London Road.
5. Airport Way.
6. South Terminal Roundabout, including a new flyover and adjoining slip roads.
7. M23 Spur, east of Balcombe Road.

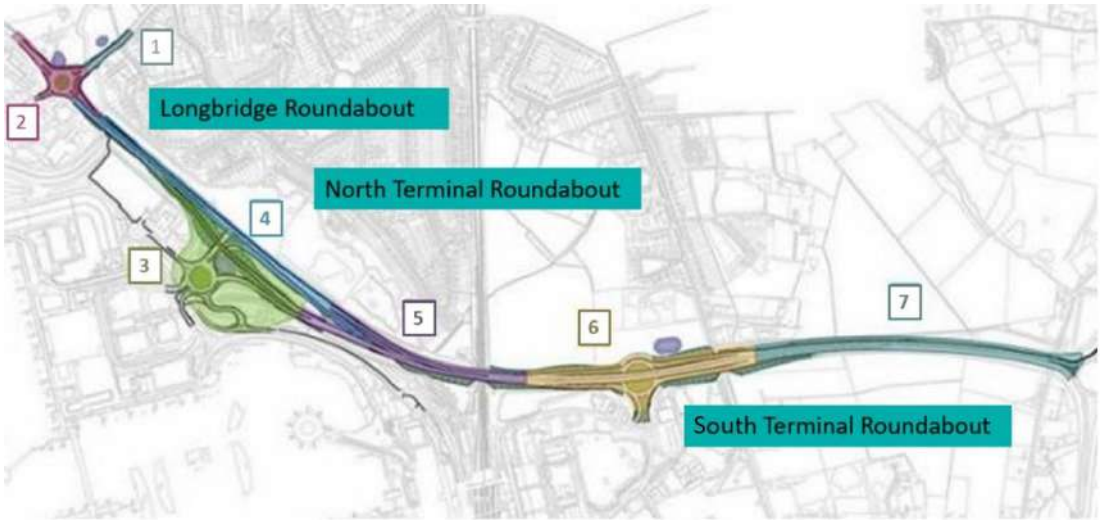


Figure 2: The proposed surface access works

3.3. A23 Brighton Road

3.3.1 The changes to the short section of A23 Brighton Road are required over the River Mole and as far as the junction with Woodroyd Avenue, resulting in the replacement of the bridge structure over the River Mole. The new bridge structure would need to accommodate the new carriageway, footways, and utilities illustrated in Figure 3.

3.4. Longbridge Roundabout

3.4.1 The new roundabout would have a slightly larger diameter. It would extend west and north to accommodate wider circulating lanes, additional pedestrian crossing facilities and improve capacity on exit and entry lanes for the A23 arm to and from Horley. A short retaining wall will be required at the corner of the petrol station, on the west side of the roundabout. The stilt structure for the segregated left turn lane from A23 Brighton Road to A23 London Road will be widened and extended. The Longbridge Roundabout works are illustrated in Figure 3.

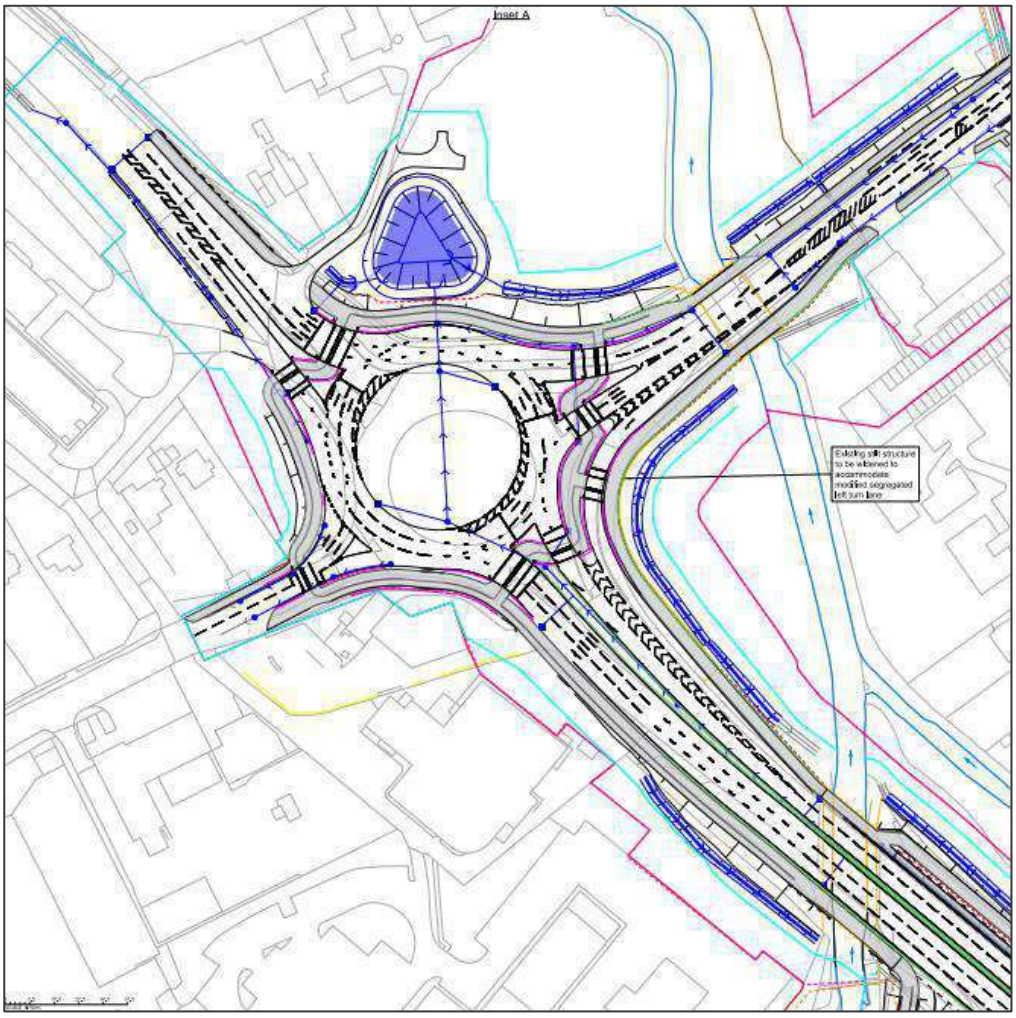


Figure 3: Longbridge Roundabout Improvements

3.5. A23 London Road

3.5.1 The changes to the layout of the North Terminal Roundabout impact the A23 with the location and design of the new signalised junction allowing traffic exiting the terminal to turn right and left onto A23 London Road. A23 westbound capacity is increased by adding a third lane from where the new flyover meets the A23 as far as the Longbridge roundabout. This would involve widening the carriageway to three lanes westbound over the River Mole. Alterations to the bridge deck or

total replacement of the structure will be required to accommodate the westbound A23 London Road widening over the River Mole. This report considers the implications of replacing the existing structure regarding the construction methodology and the sequencing with other highway works.

3.6. North Terminal Roundabout

3.6.1 The North Terminal roundabout is the entry point to the North Terminal and local access roads, including the northern and eastern perimeter roads. The modified roundabout would have a slightly larger diameter to increase its capacity. The new flyover will cross the new link between North Terminal Roundabout and the A23, passing north of the Premier Inn and petrol station located on Longbridge Way. The existing eastbound Airport Way exit has been replaced with a connection via a new signalised junction with the A23 London Road. A direct route from North Terminal to Crawley would be added, which removes the need for u-turning at Longbridge Roundabout. An additional drainage pond would be provided alongside the revised layout to take surface water runoff from the highways. The highway works at the North Terminal Roundabout are illustrated in Figure 4.

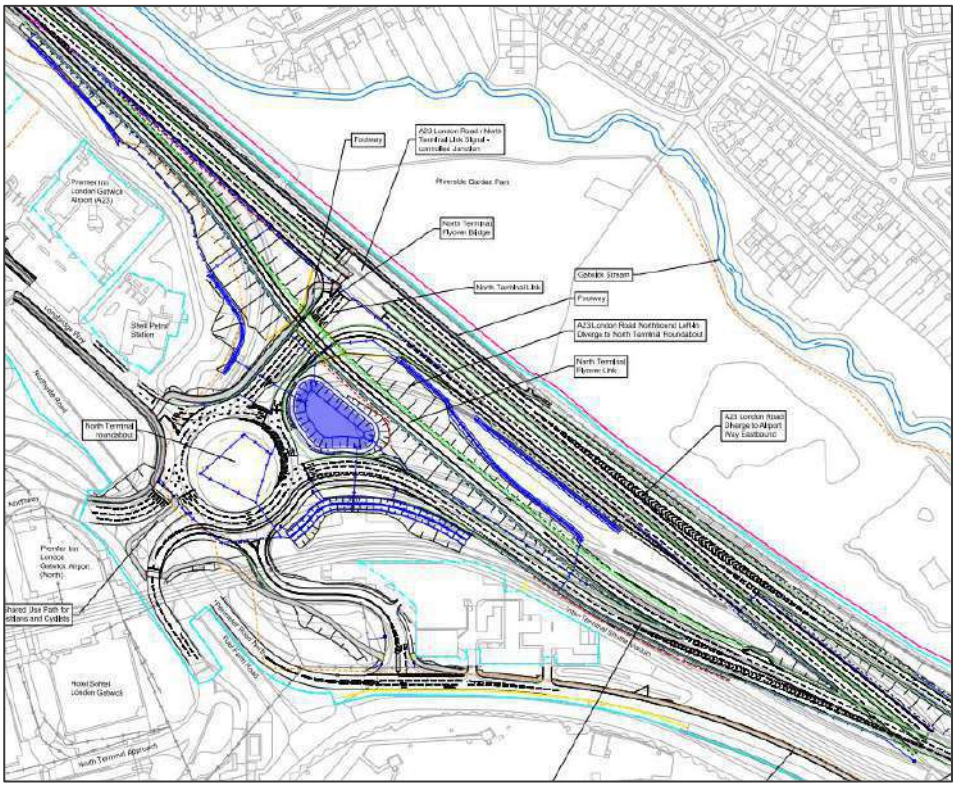


Figure 4: North Terminal Roundabout Improvements

3.7. Airport Way

3.7.1 A new third lane, westbound over the railway, is required to provide a lane gain for westbound traffic joining from South Terminal Roundabout. The third lane would involve widening the existing

bridge deck over the Brighton Main Line railway and widening the embankment on the south side of Airport Way. This is illustrated in Figure 5.

3.7.2 Construction of this new carriageway over the railway will require careful planning due to changes to the embankment immediately to the east and west of the railway. It would temporarily affect pedestrian and cycle routes. For the safety of users of the National Cycle Route 21, which passes underneath Airport Way, it will be necessary to close this route while construction is taking place on the nearby embankment, during which a suitable diversion will be provided.

Figure 5: Airport Way Westbound new third lane

3.8. South Terminal Roundabout

3.8.1 The South Terminal Roundabout (also known as the Welcome Roundabout) is the sole entry point into the South Terminal area and for local access roads, including the terminal forecourt, long-stay car parks and commercial premises. It is served by the M23 Gatwick Spur to the east (leading from M23 Junction 9) and Airport Way from the west (leading from the North Terminal roundabout).

3.8.2 The M23 Gatwick Spur/Airport Way carriageway will be raised, creating a flyover above the existing roundabout. The flyover is shown in Figure 6. The length of the flyover structure will be approximately 130 metres. The new slip roads connecting the east of the roundabout and extending over Balcombe Road will raise the existing route over the bridge approximately 2.2 metres. This would require replacing the existing bridge structure with a new structure to accommodate the proposed M23 spur and slip roads at this location.

3.8.3 The works at the South Terminal Roundabout would include the provision of a noise barrier. The barrier (approximately 600 meters in length and up to 1 meter in height) would be located along

the elevated section of the highway. Further details of the improvements to the South Terminal Roundabout are described in the **ES Chapter 5: Project Description** (Doc Ref 5.1).

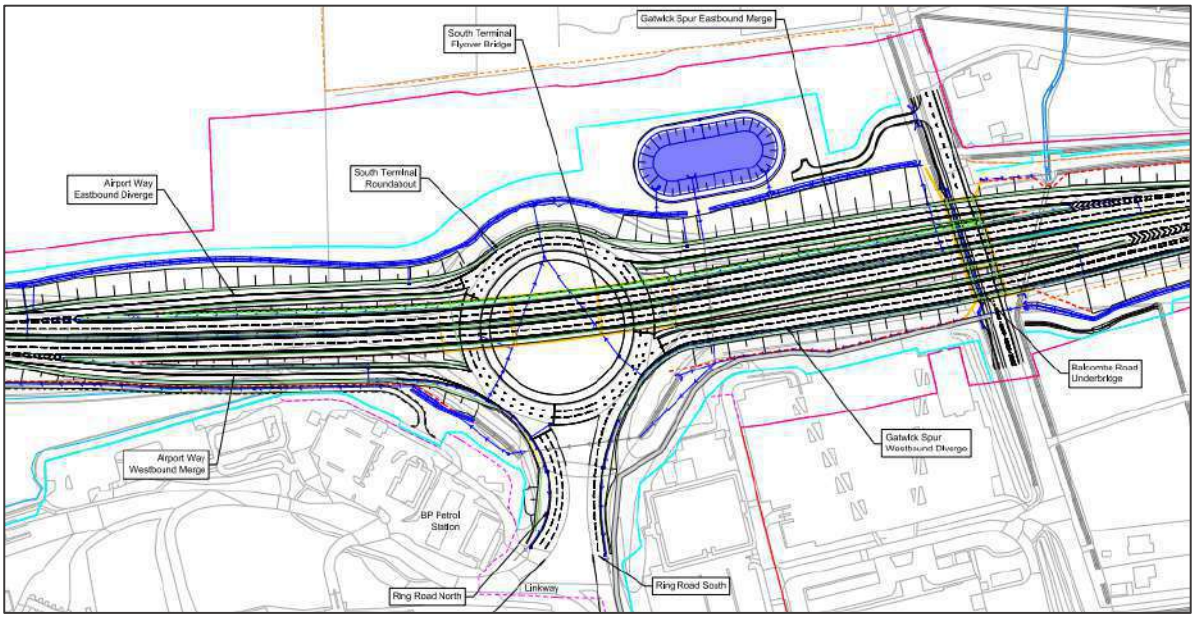


Figure 6: South Terminal Roundabout

3.9. M23 Spur

3.9.1 The eastbound M23 Spur will be widened to provide a three-lane eastbound carriageway (Figure 7) similar to the recently completed westbound carriageway,, and lane widths would be modified. The M23 Spur would be re-classified as an A-road, which would change its name to the 'Gatwick Spur'. Further details of the improvements to the M23 Spur are described in the **ES Chapter 5: Project Description** (Doc Ref 5.1).

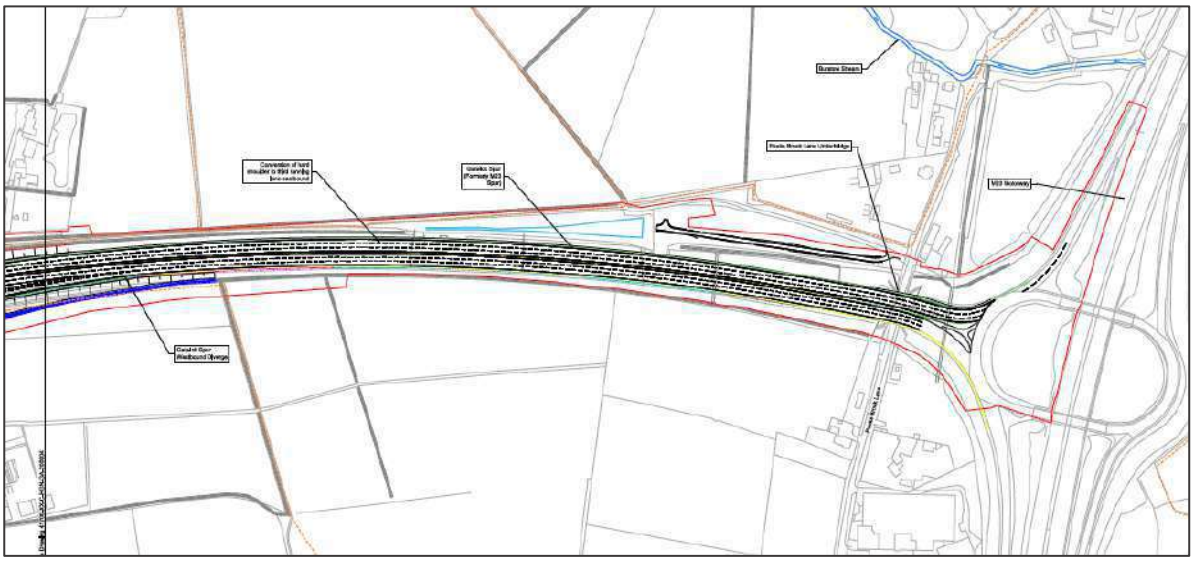


Figure 7: M23 Spur Improvements

4 Indicative Construction Programme

4.1.1 An indicative construction programme for the Surface Access Works has been used for this Buildability Report.

4.1.2 The main work elements outlined in above sections have been considered in producing the integrated programme. Utility services for diversions have been considered, traffic management requirements assessed, and stage drawings produced.

4.1.3 The programme shows early construction activities starting in 2027. The main construction activities begin in early 2028 at Longbridge Roundabout and early 2029 for the remainder of the Surface Access Works, and it proposes the completion of the works in late Spring 2032. The summary of the key dates for the proposed approach for the construction, utility diversions, site access and project completion are tabulated in Table 1 below.

Table 1: Key Dates Summary

Key Date	Component of the Project
2027	Pre-construction activities (including surveys for any unexploded ordnance and any necessary pre-construction surveys)
2028	Early works, including the establishment of compounds, fencing, early clearance, and diversion works and re-provision of essential replacement services.
2028-2031	Works to Longbridge Roundabout improvements
2029-2031	North Terminal Roundabout improvements
2029-2031	South Terminal Roundabout improvements
2032	Completion of Surface Improvements

4.1.4 The timing of the Surface Access works would depend on securing development consent and the discharge of the associated requirements. **ES Appendix 5.3.1: Buildability Report – Part A** (Doc Ref 5.3) includes an indicative construction programme for the airfield works.

4.1.5 The surface access improvements project, including improvements to Longbridge, North Terminal and South Terminal roundabouts, spans from 2027 to 2032.

4.1.6 The works to Longbridge Roundabout would take approximately three and a half years. The works are shown with an early commencement in early 2028 and would then be complete in spring 2031.

4.1.7 The works to the North and South Terminal Roundabouts would take approximately three years each to complete. The works on all three roundabouts will be completed at the end of 2031.

4.1.8 The extent of the works completed each year is detailed below.

4.1.9 In 2028, during the first year of surface access works, early works at Longbridge Roundabout would be undertaken. The works would include:

- Diversion of Utilities in Brighton Road
- Construction of the southern half of the Brighton Road River Mole Bridge
- Minor elements of works to Longbridge Roundabout

4.1.10 In 2029, the second year of construction would be the busiest of the four years and would seeee the below sections of the works completed:

- Construction of the northern half of the Brighton Road River Mole Bridge
- Major elements of works to Longbridge Roundabout
- Construction of the new flyover bridge for the North Terminal link
- Southern Half of new London Road River Mole Bridge
- Widening of Airport Way Network Rail Bridge
- Widening of London Road northbound verge
- Construction of the new link roads between the roundabout and London Road
- Widening of Airport Way Westbound
- Widening of the M23 Spur Eastbound
- Construction of the new slip road Balcombe Road Bridges
- Construction of the South Terminal Roundabout new slip roads

4.1.11 In 2030, the third year of the construction, the below works will be completed:

- Completion of the new Brighton Road River Mole Bridge
- Extension of the Stilt Structure
- Majority of the remaining elements of works to Longbridge Roundabout

- Widening, lowering and realignment of the London Road southbound to Airport Way eastbound link
- Works to the London Road southbound verge, including noise barrier and drainage culvert
- Highway modifications to North Terminal Roundabout and approaches
- Highway modifications to the Gatwick Way / Perimeter Road North junction
- Completion of the new South Terminal Flyover Bridge
- Completion of the mainline Balcombe Road Bridge.

4.1.12 In 2031, the fourth year of the construction would see the major switch to the new link roads of eastbound traffic leaving the North Terminal Roundabout, and hence the closure of the old eastbound Airport Way. All remaining tasks are scheduled to be completed during this year:

- Completion of works at Longbridge Roundabout, including new traffic signals and highway finishes
- Construction of North Terminal Flyover link embankments and highway works
- Modifications to Airport Way westbound approaching the roundabout
- Construction of Airport Way westbound connection to the new flyover link
- Construction of embankments and highway works to South Terminal Flyover
- Completion of works to South Terminal Roundabout highways

5 Key Delivery Interfaces and Stakeholders Strategy

5.1.1 The key interfaces identified for each of the main stakeholders potentially affected by the Surface Access Works and the strategy for managing those interfaces are set out in Table 2 below.

Table 2: Key Delivery Interfaces and Stakeholders Strategy

Stakeholder	Key Interfaces	Strategy
National Highways	Traffic Management on M23 Spur, Airport Way, A23	Liaising with National Highways throughout the delivery of the Project, e.g. traffic liaison meetings, informing them of the works programme, planned overnight works, traffic management and maintenance, and aligning requirements to minimise interruption to the existing road network and agreeing maintenance provisions.
Local Highway Authorities: Surrey County Council West Sussex County Council	Construction in Local Highway Authority areas	Work closely with West Sussex and Surrey County Councils to carry out the construction works with regard to traffic management and diversion routes.
M23 Spur - Gatwick Airport Users	Traffic management for the construction of North and South Terminal Roundabout	Sequencing of works that maintains the existing traffic movements and lanes during construction. Minimising necessary overnight and inter-peak M23, Airport Way, and A23 road/lane closures with suitable diversion routes. Providing clear and safe roadworks according to legal requirements and best practices.
Other Road Users	Works over A23 London Road, Brighton Road, Longbridge Roundabout and Balcombe Road. Impact on surrounding road network due to construction works on Surface Access Works.	Reduced lanes in each direction for the construction of structures along the scheme. Maintaining the Airport Way and A23 London Road existing traffic flow to minimise additional users on the other roads. Minimise the construction traffic on public roads.

Stakeholder	Key Interfaces	Strategy
Walkers and Cyclists	Works over A23 London Road, Brighton Road, Longbridge Roundabout and Balcombe Road.	Diversion routes for the walking and cycling routes. Sequenced construction to keep the alternative routes open during construction.
Residents within the vicinity of the Surface Access Works	Works close to residential properties, Fuel Stations, Hotels	Develop a site-specific Section 61 consent for mitigating the impact on residents with regard to noise, vibration and air quality Implement appropriate restrictions on works that may affect residents, for example, noise and vibration limits on piling works.
Emergency Services	Emergency arrangements for traffic management and construction	Work closely with emergency services; traffic liaison meetings to facilitate emergency access and diversions throughout traffic management arrangements and plan emergency measures for the actual construction works.
Statutory Undertakers	Work in proximity to existing services	Service diversions ranging from small, localised re-routing to major service diversions requiring individual solutions. Typical constraints for constructing service routes include traffic management, reduced workspace, and land take.
Statutory Regulators	Protecting species and sensitive habitats (including watercourses)	Ensure that all licenses and consents are in place before construction commences and comply with the requirements of any method statements therein. These are listed in the **List of Other Consents and Licences** (Doc Ref 7.5)

6 Construction Activities

6.1.1 The general sequence of works during the construction of the new highway sections would depend on the location and engineering needs. However, the regular activities would include:

- Pre-construction surveys and enabling works, including but not limited to pre-construction ecological mitigation, pre-construction archaeological investigation, provision of access points, temporary fencing and fencing to protect sensitive sites, construction site installations, diversion/protection of utilities.
- remediation of contaminated land or groundwater where required
- construction of access points
- site clearance and water management works
- demolition works where required
- temporary highway diversions and traffic management
- earthworks
- structures and drainage
- pavement, road works and surfacing
- street furniture, including lighting columns, road signs and safety barrier
- noise barriers
- accommodation works
- environmental mitigation works and landscaping

6.2. Working Hours

6.2.1 Work on the NRP Surface Access Works will include various working hours per shift. Operational requirements and traffic management will dictate some of the working hours. Some working hours will be implemented as mitigation measures to minimise the impact on the areas surrounding Gatwick Airport. The details of the proposed working hours are provided in **ES Appendix 5.3.2: Code of Construction Practice** (Doc Ref 5.3).

6.3. Obtaining Relevant Consent, Permits and Licenses

6.3.1 All necessary third party permissions and approvals would be obtained before commencing any site works. These include (but are not necessarily limited to):

- protected species licenses
- mobile plant licenses

- abstraction licenses
- water discharge permit
- flood defence consent
- land drainage consent
- notification of demolition works

6.3.2 A list of 3rd party permissions and approvals can be seen in List of Other Consents and Licences (Doc Ref 7.5)

6.4. Environmental Controls

6.4.1 The Works will be carried out in accordance with the environmental controls and measures set out in **ES Appendix 5.3.2: Code of Construction Practice (CoCP)** (Doc Ref 5.3).

6.5. Waste Management

6.5.1 A Waste Strategy, (**ES Appendix 5.3.2: CoCP Annex 5 - Construction Resources and Waste Management Plan** (Doc Ref 5.3), has been prepared to outline the steps that will be taken to design out and minimise waste going to landfill or incineration. The overall aim will be to carry out the design by applying the waste hierarchy principles, encourage operational recycling and use prefabricated materials to reduce waste production. Where waste is likely to be generated, this will be categorised in terms of waste type and quantity, opportunities for recycling and re-use, disposal routes, and licensing. Further details are provided in the CoCP.

6.5.2 Construction waste skips will be available in the site compound(s). The segregation will be undertaken wherever space allows. Waste transfer notes will be collated and reported monthly. Tickets for any waste removed by subcontractors will also be collected and reported.

6.6. Ecology

6.6.1 The Surface Access Works areas generally include low-value habitats, but smaller areas of higher-value habitat, including Riverside Garden Park, are present. Removing habitats in the initial construction stage would have a temporary effect until new trees, grassland, and shrub planting had been established.

6.6.2 Effects would be controlled to ensure that ecological constraints are considered in agreeing on the locations and methodologies for the pre-construction works. The details of the ecological measures during construction are given in the CoCP.

6.7. Logistics – Surface Access Works

Construction Traffic Access

6.7.1 An outline traffic management plan for materials (CTMP), **ES Appendix 5.3.2 CoCP Annex 3 - Outline Construction Traffic Management Plan (Doc Ref 5.3)** is prepared to show the approach to reduce any impact of construction vehicles on airport traffic and road network users. Information on the construction traffic access points to the construction compounds can be seen in the CTMP.

6.7.2 Most earthwork operations will require an access road at the bottom of the embankment. The earthwork access roads would have a running surface of approximately 8 to 10 metres in width to allow the safe passing of earthwork plants and vehicles.

6.7.3 The access roads for structures would be used for delivering materials and plants for constructing the structures. They would be approximately 8 metres wide and could be from the road surface or at the bottom of the embankments.

6.7.4 There would be instances where this is unavoidable for the existing bridge widening and replacements, construction of the new flyovers, extending the highway embankments and pavement laying operations.

6.7.5 Approval of the construction vehicle routing as set out in the **ES Appendix 5.3.2: Code of Construction Practice** (Doc Ref 5.3) will be sought from Local Highway Authorities.

Equipment Delivery/Access Points

6.7.6 Some deliveries would be categorised as abnormal loads. These are major earth-moving plants, cranes, piling rigs, concrete mixers, and pumps. The steel and precast concrete structural elements will also fall into abnormal load categories. Temporary holding areas would be required to control the deliveries of abnormal loads to the work areas. The proposed holding areas for the construction works are located at the compounds: South Terminal Roundabout, the North Terminal Roundabout, and the Longbridge Roundabout and the site compound areas at Reigate Field, Car Park Y, Car Park B, Longbridge Compound and Stilt structure area as described in section 6.9.

6.7.7 The structure elements will be delivered from M23 Junction 9 using Airport Way and A23 London Road.

6.7.8 Where plant and equipment cannot be delivered directly to the point of use, the main earthwork and piling plant would be delivered to site compounds. The equipment for the embankment and Airport Way Rail Bridge will be delivered to Car Park B. The only access to Car Park B compound is from under Inter Terminal Transport System (ITTS), and the height restriction will be considered during the construction equipment delivery.

6.7.9 Site equipment would also be delivered to other work areas via dedicated work access points. These access points will be agreed upon with highway authorities and airport operations while preparing traffic management plans.

6.7.10 Where necessary, wheel wash facilities would be provided at the main egress points from the works area(s) onto the existing road network. These would be self-contained facilities using a

water recycling system. The units would be regularly cleaned and maintained, and sediment would be separated and removed.

Temporary Bridges

6.7.11 A three-lane temporary bridge would be needed on A23 London Road Bridge southbound to facilitate replacing A23 London Road Bridge over the River Mole. The temporary bridge would remain in position until the southern part of the structure is installed, and traffic is shifted to the new bridge. Some overnight lane closures may be required during the removal of the temporary bridges.

Temporary Pedestrian Crossings

6.7.12 Temporary pedestrian crossings through the work areas would be avoided where practical, and a temporary diversion would be provided where practical. Where diversion routes are not practical, gated and clearly defined routes would be provided across the site. Signage would be provided for both pedestrians and plant operators. These pedestrian routes would be regularly monitored and checked throughout each shift.

6.8. Delivery of Materials

Precast concrete and bridge beams

6.8.1 Precast concrete, reinforcement steel and steel structure elements would be constructed off-site and delivered to the required work areas by articulated road wagons. These would be delivered to the work areas on a just in time basis.

6.8.2 Bridge beams required for the new flyovers, replacement and widening of the bridges would be either pre-stressed concrete beams or manufactured steel plate girders. These would be manufactured off-site and delivered to the site on a just-in-time basis.

6.8.3 All beam deliveries would be made, where practical, during off-peak hours or during the lane closure. Localised temporary works may be required to the roundabouts for bridge beams being delivered to South Terminal, North Terminal, and Longbridge Roundabouts. The traffic management teams, such as escorts and rolling blocks, would control load movements along this route. This would be undertaken off-peak where practical and coordinated with the highway authorities.

Drainage Materials

6.8.4 All precast manhole and drainage components would be delivered to the site on a just-in-time basis on articulated road wagons. Pipes required on the Project are likely to be either precast concrete or twin-wall plastic pipe.

6.9. Temporary Construction Compounds

6.9.1 Four temporary construction compounds are required to support the construction of the Surface Access Works. These are:

- Long Bridge Roundabout Compound: Contractor's site welfare compound that will support the Longbridge Roundabout Works for Surface Access Works. The Compound will have minimum services in line with CDM 2015 regulations: site containers, a short-term material laydown area and a pick-up point for workforce vans.
- Car Park Y Compound: This Compound will be used for reprocessing the hard-excavated material from the core 'airside' runway works. The area will also be used to set up a contractor's welfare for the North Terminal Roundabout surface access works.
- South Terminal Roundabout Compound: The main site compound for Surface Access Works will be established at Reigate Field at north of the South Terminal Roundabout.
- Car Park B Compound: Contractor's site welfare compound for the widening works of Airport Way bridge over London Brighton Railway for surface access. The Compound will have minimum services in line with CDM 2015 regulations: site containers, a short-term material laydown area and a pick-up point for workforce minibuses.

6.9.2 The details of all the site compounds required for the Surface Access Works are provided in Buildability Report A and those sections describing the construction of the Longbridge, North Terminal and South Terminal Roundabouts.

6.10. Site Clearance

6.10.1 The site clearance operation would vary throughout using bespoke plant, such as stump grinders. Clearance operations would be adapted to suit the specific site conditions, and appropriate protection measures would be implemented.

6.10.2 The works would be supervised by the Ecological Clerk of Works (ECoW) in ecologically sensitive areas, where awareness of the environmental impacts of their operations would be the key consideration. The site clearance activities would be carried out in accordance with **ES Appendix 5.3.2 Code of Construction Practice** (Doc Ref. 5.3) .

6.11. Demolition

6.11.1 The proposed surface access works would require the demolition of existing structures. A specialist demolition contractor would undertake the demolition works.

6.11.2 The structures requiring demolition during the construction include:

- A23 Brighton Road Bridge over River Mole
- Longbridge Roundabout Segregated Left Turn Lane Stilt Structure
- A23 London Road Bridge over River Mole
- Airport Way Rail Bridge wing walls
- Balcombe Road Underbridge

6.11.3 The following measures will be taken into consideration to minimise the impacts of demolition:

- water spraying of structures/use of water as a dust suppressant before and during demolition.
- protection measures for water courses during the demolition of structures adjacent to and over River Mole.
- Re-use of materials.

6.12. Utilities

6.12.1 The construction of the Surface Access Works would involve a number of utility diversions.

6.12.2 Service diversions would range from small, localised re-routing to major underground service diversions requiring individual solutions. Typical constraints for constructing service routes include traffic management, reduced working space, land take and height restrictions.

6.12.3 Discussions are ongoing with the Statutory Undertakers to understand the existing service routes and requirements, which will inform the detail of service diversions.

6.12.4 Throughout the construction, there would be a risk that unchartered services may be encountered. This would be dealt with through a series of mitigation measures, including site surveys with cable-detecting equipment and trial holes.

6.12.5 The strategy is to avoid service routes, where practical, protect existing services if they cannot be avoided and, if neither option is achievable, then divert the services as a last resort.

6.13. Network Rail Interface

6.13.1 As part of the Surface Access Works, Airport Way Rail Bridge will be widened to be able to accommodate an additional lane at Airport Way westbound. These works will be coordinated with Network Rail, and necessary agreements and processes will be followed during the design, preconstruction and construction.

6.14. Earthworks

6.14.1 The main earthwork activities will include the following:

- pre-earthworks drainage and stripping
- bulk earthworks
- haulage of excavated materials; temporary storage of excavated materials
- placing and compacting excavating material.

6.14.2 These operations may be supplemented with additional works at some locations depending on conditions encountered, such as reprocessing excavated material and installing additional drainage.

Pre-Earthworks Drainage and Topsoil Stripping

6.14.3 Wherever practical, topsoil would be left in place to minimise the amount of unprotected ground exposed to runoff. Where topsoil is required to be removed, the removal will occur as late as possible before other works in the area.

6.14.4 Topsoil and subsoil would be stripped from the North and South Terminal roundabouts in accordance with **ES Appendix 5.3.2 Code of Construction Practice (Doc Ref. 5.3.2)**. The materials will be stored separately in designated storage areas where they will be maintained appropriately to avoid losses as reasonably as practical. The storage areas would be located close to where the material was removed. The materials that cannot be stored will be sent off-site to be used elsewhere.

6.14.5 Pre-earthworks drainage would be installed to divert surface water runoff from earthworks areas before works to remove topsoil begins.

Bulk Earthworks

6.14.6 The bulk earthworks would primarily be at M23 Spur, Airport Way, and A23 London Road, where the embankment widening and A23 Northbound Off Slip diversion are required.

6.14.7 The topsoil would be stripped with tracked excavators and dozers and transported to temporary stockpile deposition areas.

Plant and Machinery

6.14.8 The selection of plant and machinery for earthworks activities would consider noise levels, fuel consumption, CO2 emissions, safety, and suitability to undertake the task.

6.14.9 A summary of typical plant and machinery that would be required to undertake the earthworks operations is provided in Table 3 below.

Table 3: Typical Earthworks Plant and Machinery

Plant	Typical Work Activities
Tracked Excavators ranging from 3T to 30T	Excavation of material, trenches, surcharge material and loading haulage.
25-, 35- and 40-tons articulated dump trucks	Transport of excavated material from area to area on site haul roads.
Compaction Plant	Compaction of material placed in accordance with the Specification for Highways Works.
Small Bulldozers	Stripping topsoil, placing excavated material, and importing material for earthworks widenings.
6 or 8-wheeled tipper lorries	Transport of excavated material and imported material on the public highway.
Pneumatic or hydraulic breakers	Breaking redundant concrete or road construction.
Crushers and screeners	Reprocessing of materials generated within the site.
Water Bowsers	Dust suppression in dry conditions.
Road Brushes	Ensuring construction plant crossings are kept clean and free of debris.
Fuel bowsers	Re-fueling of small plant/equipment, e.g. generators and large slow-moving excavators.

6.15. Roadworks and Surfacing

Permanent Drainage

6.15.1 The drainage network will be upgraded based on the proposed highway alignment, including slip roads and a flyover. New carrier pipes are proposed at the pavement edge on both sides of A23 London Road and on the lower pavement edge of the North Terminal Flyover and slip roads where the existing drainage cannot be retained. Existing gullies are proposed to be re-aligned to the proposed pavement edge if possible or replaced with new gullies. Swales are proposed along the southern edge of the Airport Way immediately east of North Terminal Roundabout. Ditches and filter drains are proposed to drain the earthworks and vegetated land in-between junctions' roads.

Road Pavements

Sub-base

6.15.2 Sub-base construction would consist of the placement and compaction of bound and unbound material in accordance with the design. The material would be tipped at the desired location, spread in layers to the specified thickness and compacted. Samples would be taken to ensure the desired compaction is achieved.

Road Pavements Bituminous Bound Materials

6.15.3 Flexible pavement would be laid in three layers – base, binder, and surface course. Where practical, the bituminous material required for these layers would be supplied by mixing plants local to the construction works for direct delivery to the site location.

6.15.4 Dump trucks or trailers would be used to deliver the hot-mix material from the plant to the site location. These trucks would need to be previously cleaned and insulated against excessive heat loss during transportation and would be covered with a canvas to protect the material from the weather.

6.15.5 Placement of a bituminous mixture would be done only when the underlying layer is dry, and weather conditions permit. The bituminous mix is placed by an asphalt paver that spreads the mixture in a uniform layer of the required thickness, elevation and cross-section ready for compaction. The asphalt pavers are fitted with electronic screed control.

6.15.6 The compaction of the bituminous layer would start immediately after the spreading and finishing operations have been completed. Rolling would be carried out by steel wheel rollers.

6.15.7 The typical plant required for pavement construction operations is detailed in Table 4 below.

Table 4: Typical Plant for Paving Construction

Plant	Typical Work Activities
Asphalt paver	Placing bound and unbound materials
20T tipper lorries	Transporting material to paving machine from batching plant
Compaction plant of various sizes with edge cutter.	Compacting material place in accordance with specifications
Asphalt planner	Removing redundant road construction
Pneumatic or hydraulic breakers	Breaking out and cutting back joints in the surfacing
Bond coat lorry	Apply bond coat between surfacing layers

6.16. Water Management and Drainage

6.16.1 The water management during construction will follow the best practices to minimise the risk of water pollution, flooding, and damage to the ecological features of watercourses.

6.16.2 The water management strategy and measures that will be used to mitigate any potential adverse effects on the water environment during the construction of the Surface Access Works are outlined in **ES Appendix 5.3.2: CoCP Annex 1 - Water Management Plan** (Doc ref 5.3) and the **ES Appendix 5.3.2: Code of Construction Practice** (Doc Ref 5.3).

6.16.3 The water management strategy aims to prevent pollution and contamination of groundwater and surface waters while preserving the ecological elements of watercourses and resources. Water drainage will be managed during construction, and actions will be taken to mitigate the risk of flooding. The scheme would also identify measures for sustainable water use to minimise adverse environmental impacts.

Flood Risk

6.16.4 Activities within areas of flood risk would be managed by limiting or scheduling them during periods of low flood risk to minimise the impact. Temporary land required for construction would be located outside the floodplain where practical. In cases where construction must occur in flood-prone areas, allowances would be made for floodplain control measures and contingency actions.

6.16.5 Temporary mitigation measures would be implemented to prevent increased flood risk resulting from floodwaters displaced by construction activities. Examples of such measures include raised storage areas, haul roads, and cabins. These measures aim to ensure that the construction works do not significantly increase the risk of flooding and that any potential impacts are minimised.

Managing surface water during construction

6.16.6 The following principles for water management would be used to manage surface water during construction:

- The existing land drainage systems would be intercepted, and water would be diverted from the working area using pre-construction drainage whenever feasible.
- Early construction of permanent works attenuation ponds would be prioritised, but some additional temporary ones may be required in specific areas.
- To treat site runoff water before discharge, filtration and attenuation areas would be utilised. This would help to reduce water pollution and improve water quality by allowing sediments to settle and contaminants to be removed.
- Soil compaction and associated surface water runoff would be minimised by restricting vehicle traffic to designated haul roads, thus preserving soil structure and reducing erosion risk.
- Sustainable Drainage Systems (SuDS) would be employed, where practical, to manage surface water flood risk and prevent an increase in runoff rates or volumes from construction sites and compound areas.

- Runoff from the construction site would not be allowed into any natural pond. Construction runoff would be discharged into a watercourse under a permit/ consent from the relevant authority (where required) and following treatment and attenuation where necessary. This would ensure that sediment and pollutants carried in suspension in the surface water runoff from the site would have settled out before discharge to receiving watercourses.

Attenuation Ponds

6.16.7 Attenuation ponds would be excavated by traditional means using a medium-sized tracked excavator. Spoil arising is unlikely to be used within the works and hence would be removed off-site by road-going tipper trucks to other parts of the overall Project or used elsewhere. Wheel cleaning facilities would be required for vehicles leaving the site. It is assumed that the outfall headwall is situated above the river level and, as such, can be installed without significant river works or dewatering.

Culverts

6.16.8 The surface access elements of the Project do not impact the culverts of Main Rivers. There are three proposed culverts for ordinary watercourses:

- The existing bridge at Balcombe Road is a two-span bridge. An existing ditch adjacent to Balcombe Road is going through one span on the western side of the bridge. The bridge is proposed to be converted into a single-span bridge. Therefore, the ditch will be culverted.
- Immediately east of Balcombe Road, the existing culvert will be extended by approximately 4m on the southern side.
- The existing culvert on the northern side of A23 Brighton Road will be extended by 6m.

6.16.9 The culverts would be constructed in the applicable verges and need excavations approximately 3m wide by 3m deep. Ground support would be required using trench sheeting and props. Precast units would be delivered by road and placed by an attendant excavator or visiting crane.

Land Drainage

6.16.10 The surface access elements of the proposed improvements are not expected to affect land drainage apart from a small watercourse (ditch) on the southern side of Gatwick Spur. The proposed plan is to divert this ditch and maintain the same cross-section as the existing one.

7 Work and Traffic Management Areas

7.1.1 For simplicity of the Buildability Report, the works and traffic management arrangements required to undertake the Surface Access Works are split into three areas as below:

- Longbridge Roundabout Area (L)
- North Terminal Junction Area (W)
- South Terminal Junction Area (E)

7.1.2 The interface between the works/traffic management areas is approximate, and interim traffic management stages would need to be between the main stages. These will be developed in detail in liaison with the relevant highway authorities.

7.1.3 The interface points are indicated in Figure 8 below.

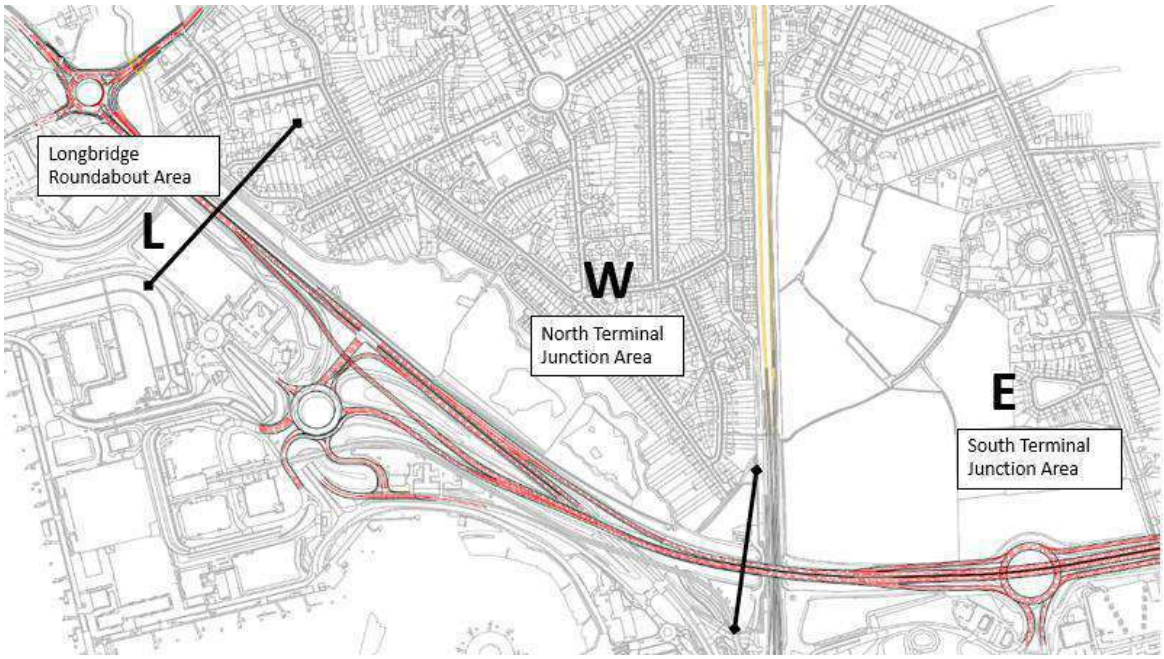


Figure 8: Works / Traffic Management Areas

7.1.4 A set of traffic management stages has been developed within each area, and these are described in more detail in the following sections.

7.2. Longbridge Roundabout Area (L)

7.2.1 The proposed arrangement for the new Longbridge Roundabout provides a larger partially signal-controlled roundabout replacing the partially signal-controlled existing roundabout.

7.2.2 Significant utility diversions would be required both in advance and during the works. Services passing through the A23 Brighton Road bridge would need to be diverted onto temporary services bridges and then onto the new bridge once completed.

7.2.3 Reconstruction of the A23 Brighton Road bridge over the River Mole is the most complex aspect of the works. It is considered feasible to construct a new bridge with abutments behind the existing one and a new deck replacing the existing deck, leaving the existing abutments and training walls in place.

7.2.4 The southern half would be constructed first, with traffic using the existing bridge's northern side. Traffic would then be routed over the completed southern half allowing the new northern half to be constructed.

7.2.5 Temporary diversion of pedestrians onto a combined pedestrian/utility bridge would be necessary to maintain access to/from A23 Brighton Road.

Advanced Works

7.2.6 Advanced works should be carried out and completed before the main junction construction works. These include vegetation clearance, utility location verification, diversion, and protection work. Installation of the temporary site compound has also been included.

7.2.7 Utility diversions would likely be required in most areas around the outside edges of the existing roundabout where the highways are being widened. The most significant diversions would be in the northern edges, where the most widening is to occur, and in the southern area outside the petrol station, where the new retaining wall is required.

7.2.8 Advanced works would include:

- Utility location verification, diversion and protection works. This would also include new temporary utility connections to any temporary construction compound. Utility diversion works will be required outside the permanent highway boundaries, within the existing highway verges and underneath the carriageway. Any work within existing carriageways would take place under temporary lane closures.
- Installation of the site compound. A small temporary construction compound would be required to support the construction works at the Longbridge roundabout. The compound will have welfare facilities, site containers, short-term material laydown areas and pick-up points for workforce vans.
- Ecological works. The Longbridge Roundabout area has limited ecological value except for the River Mole and environs to the east of the works. Some tree and shrub clearance would be required within the existing roundabout central island, and as such, there would be a small risk of nesting birds. Early clearance works outside the bird nesting season would negate this risk.

7.2.9 There will be temporary and permanent loss of existing habitats. Any other trees, scrubs and hedgerows proposed to be retained would be protected during construction. Measures will be implemented to ensure that bat foraging/commuting habitat and areas of trees, hedges, or scrubs to be retained are adequately protected from damage or destruction during the construction phase. Protective fencing would be erected around these features to prevent people, materials and machinery access.

Utility Works

7.2.10 Longbridge Roundabout is very congested in terms of existing utility services. Most utilities will be diverted in advance of the main works. Some enabling vegetation clearance and earthworks are likely necessary prior to the start of the main construction works.

7.2.11 Temporary diversion of those services passing over the existing A23 Brighton Road bridge would be required, and it is proposed that two temporary service bridges over the River Mole south and north of the planned new bridge be installed for this purpose.

7.2.12 A combined pedestrian/utility footbridge over the River Mole is proposed north of the new bridge. The existing water main would be temporarily diverted onto the footbridge. Once parts of the new A23 Brighton Road bridge are complete, these services will be diverted again into their final positions on the new bridge.

7.2.13 Utilities that support the highway, such as street lighting, traffic signals, and surface water drainage, need to be locally adjusted as the works progress.

Site Welfare - Longbridge Roundabout

7.2.14 The proposed compound at the Longbridge Roundabout would be located on the north side of the roundabout between the A217 and the A23 Brighton Road (Figure 9) adjacent to the River Mole. This would be a secure compound surfaced with crushed concrete or similar and securely fenced and accessed off the existing or new access off the A217, cabins and storage units for staff and labour use. Permanent power, communications, water connections and temporary foul drainage will be required. The site compound would be situated outside the River Mole Flood Zone.

Figure 9: Location of Longbridge Roundabout Site Welfare

Construction Stages and Traffic Management (L)

7.2.15 The stages have been developed to describe the general flow of the works. Works would start as soon as the working areas are available, consistent with maintaining the continuity of work packages.

7.2.16 The works in the Longbridge Roundabout area are planned to be undertaken in 5 principal stages L1 to L5, from 2028 to 2031.

7.2.17 The sequence of works through these stages is:

- Stage L1 – Removal of existing traffic islands. Diversion of utilities off A23 Brighton Road River Mole Bridge. Installation of traffic signals to temporary moveable bases. Widening of the north section of the roundabout.
- Stage L2 – Construction of the southern half of the new A23 Brighton Road River Mole Bridge. Modification to the south side of the A23 Brighton Road.
- Stage L3 – Construction of the northern half of the new A23 Brighton Road River Mole Bridge. Modification to the north side of the A23 Brighton Road. Widening of the south section of the roundabout.
- Stage L4 – Extension of the Stilt Structure on the A23 single left turn lane. Widening of the west section of the roundabout.
- Stage L5 – Modify Central Island. Return utilities to the new A23 Brighton Road River Mole Bridge. Works to verges of new A23 Brighton Road River Mole Bridge. New Traffic Islands. Resurface, road markings, and signals.

7.2.18 Several utility services would need diversion at the Longbridge Roundabout Area to facilitate the permanent works. Most of these would be carried out in advance with utilities lowered, protected, or moved to areas outside the works. It might be necessary to fill new levels in the north section of the roundabout before the utilities are diverted. Some utilities would require to be diverted during the works.

7.2.19 The construction and traffic management stages are described in more detail below.

Construction Stage L1

7.2.20 A small satellite compound with a small number of welfare, office and storage units would be installed in the field north of the roundabout accessed via the existing property access. The compound would be sited over the footprint of the new attenuation pond outside the floodplain area.

7.2.21 The existing splitter islands in the roundabout approach roads would be removed and surfaced over, including the island for the Segregated Left Turn Lane (SLTL). This would provide flexibility for the future routing of vehicles to suit the works. Access to the various works areas would be directly off the live highways.

7.2.22 Temporary bridges would be installed north and south of the existing A23 Brighton Road for utilities. The northern bridge would double as a pedestrian bridge. Access to the north side would be via the land to the North of the roundabout and North of A23 Brighton Road. The crane to lift the north utility bridge would likely be sited in this location.

7.2.23 Access to the south side east of the river would be challenging and would best be via the existing garage access off Woodroyd Avenue behind the filling station. The crane to lift the utility bridge would be sited in this location. Access to the south side west of the river would also be challenging and would likely be off the highway and down the bank to the flood plain. Utility services crossing both sides of the A23 Brighton Road River Mole Bridge would then be diverted onto the temporary utility bridges.

Traffic Management Stage L1

7.2.24 A summary of the key elements of the Traffic Management Stage L1 are illustrated in **Appendix A – Surface Access Construction Stage Sketches**.

7.2.25 Traffic would be maintained on the roundabout as per the existing arrangement but with fewer lanes. The speed limit would be restricted to 30mph through the works.

7.2.26 Traffic would be maintained against the central island of the roundabout and against the verges of the approach roads. During off-peak hours the cones/ barriers would be extended to allow extra working space for existing splitter islands to be removed and surfaced. The existing traffic signals would be adjusted with trailing leads and columns in moveable bases allowing them to be moved around to suit the works. After the works, the splitter islands would be reinstated with cones or interlocking barriers/blocks as required. Minor modifications to the traffic management would be required to remove the existing island for the SLTL from A23 Brighton Road into A23 London Road.

7.2.27 Traffic crossing the A23 Brighton Road River Mole Bridge would be maintained as existing, with one narrow lane in each direction. Off-peak modifications to move traffic to one side or the other or the centre may be required as the works dictate. An off-peak partial or total closure of A23 Brighton Road might be needed to site a mobile crane to lift the temporary bridges. However, it is anticipated that crane access will be available away from the highway.

7.2.28 Pedestrian routes would be maintained around the north perimeter of the roundabout throughout the works. Pedestrian access would not be maintained around the south side. Pedestrians would use the temporary utility/pedestrian bridge to cross the River Mole.

Construction Stage L2

7.2.29 The principal work activity within this stage would be to construct the southern half of the new A23 Brighton Road River Mole Bridge. Access to the south side east of the river will be via the existing garage access off Woodroyd Avenue behind the filling station. However, this would be impaired by the utility bridge when it is installed.

7.2.30 Alternative access would be off the highway, which may require an off-peak lane closure and traffic signals. Some work close to the live traffic may also need off-peak lane closures with traffic signals. Access to the south side west of the river would similarly be challenging and would likely be off the highway and down the bank to the flood plain. A detailed illustration of the indicative works to construct the southern half of A23 Brighton Road Bridge is provided in **Appendix A – Surface Access Construction Stage Sketches.**

7.2.31 Other works during this stage would include works to the southbound verge of A23 Brighton Road, which would be carried out after the new bridge's southern half abutments have been backfilled.

Traffic Management Stage L2

7.2.32 Traffic would be maintained on the roundabout as per the existing arrangement but with fewer lanes. The speed limit would be restricted to 30mph through the works. Traffic would be maintained against the central island of the roundabout. Traffic signal operation for vehicles would be maintained as in the previous L1 stage. The segregated left turn lane would remain open from A23 Brighton Road southbound onto A23 London Road southbound.

7.2.33 On London Road, traffic will be maintained on the existing carriageways until such time as the North Terminal Junction Area (W) stage W1 works commence described in section 7.3.11. Access to the filling station off the northbound carriageway would be maintained.

7.2.34 On Povey Cross Road, a single narrow lane of traffic in each direction would be maintained against the northside verge. The splitter island would be adjusted to suit. It would likely be necessary to temporarily relocate the pedestrian crossing further down Povey Cross Road – further away from the roundabout. This would provide working space on the south side of Povey Cross Road and around the south outside the 'quadrant' of the roundabout outside the filling station.

7.2.35 On A217, a single narrow lane of traffic northbound would be maintained against the existing northbound kerb-line with two lanes provided at the exit of the roundabout. Two narrow lanes would be provided on the southbound against the single northbound lane. The splitter island would be adjusted to suit. Combined with the arrangement in the A23 Brighton Road, this would provide working space on the southbound verge of the A217 and around the north 'quadrant' of the roundabout.

7.2.36 On A23 Brighton Road, a single narrow lane of traffic would be maintained in each direction against the northbound kerb-line across the River Mole Bridge. The splitter island would be adjusted to suit. The segregated left turn lane would be maintained from A23 Brighton Road into London Road southbound. Occasional off-peak closure of one southbound lane, or the segregated left turn lane, may be required for works close to the highway. Interaction with the roundabout traffic signals would be considered.

7.2.37 Pedestrian routes would be maintained around the north perimeter of the roundabout throughout the works. Pedestrian access would be maintained from Povey Cross Road across A23 London Road to maintain pedestrian access into Riverside Garden Park. Pedestrians would use the temporary utility/pedestrian bridge to cross the River Mole on A23 Brighton Road. A summary of the key elements of Traffic Management Stage L2 is illustrated in **Appendix A – Surface Access Construction Stage Sketches**

Construction Stage L3

7.2.38 The principal work activity within this stage is to construct the northern half of the new A23 Brighton Road River Mole Bridge and the verge highway realignment works. Access to the works would be both off the highway and at a low level via the fields on both sides of the river, noting that both areas are flood plains. The utility/bridge would impede access, meaning a small plant would be needed, and maintenance of pedestrian routes would require careful consideration. A detailed sequence of indicative construction illustrations of the southern half of A23 Brighton Road Bridge is provided in **Appendix B – Method Visual: A23 Brighton Road Bridge over River Mole Widening.**

7.2.39 Other works during this stage would include works to the south quadrant of the roundabout, including the surface water culvert alongside London Road northbound and the new retaining wall and highway alignment outside the Esso Filling Station. Access would mostly be off the highway through the cones/ barriers. These works would be undertaken concurrently with constructing the southern half of the new London Road River Mole Bridge in North Terminal Roundabout Stage W2.

Traffic Management Stage L3

7.2.40 Traffic would be maintained on the roundabout as per the existing arrangement but with fewer lanes. The speed limit would be restricted to 30mph through the works. Two lanes would be maintained on the roundabout for the right turn movement from London Road northbound to A23 Brighton Road northbound.

7.2.41 Traffic would be maintained against the central island of the roundabout. Traffic signal operation for vehicles would be maintained as previously.

7.2.42 On London Road, the traffic arrangement will vary to suit the requirements of adjacent North Terminal Junction Area (W) Stages W1 and W2. In Stage W1, a single narrow lane will be maintained in contraflow on the existing A23 London Road northbound carriageway whilst a temporary highway bridge is installed on the southbound carriageway. In the following Stage W2, a single narrow lane will be maintained southbound over the temporary bridge, with two narrow lanes maintained northbound also over the temporary bridge. The temporary splitter island at the roundabout would be adjusted to suit each stage. Access to the filling station off the northbound carriageway would be maintained.

7.2.43 On Povey Cross Road, a single narrow lane of traffic in each direction would be maintained against the north side verge. The splitter island would be adjusted to suit. The pedestrian crossing would be maintained further down Povey Cross Road. This would provide working space on the south side of Povey Cross Road and around the south outside of the roundabout outside the filling station.

7.2.44 On the A217, a single narrow lane of traffic northbound would be maintained against the existing northbound kerbline with two lanes provided at the exit of the roundabout. Two narrow lanes would be provided on the southbound against the single northbound lane. The splitter island would be adjusted to suit. Combined with the arrangement in A23 Brighton Road, this would provide working space on the southbound verge of the A217 and around the North of the roundabout.

7.2.45 On A23 Brighton Road, a single narrow lane of traffic would be maintained in each direction over the newly constructed southern half of the new A23 Brighton Road River Mole Bridge. The splitter island would be adjusted to suit. The segregated left turn lane would be maintained from A23 Brighton Road into London Road southbound. Off-peak closure of the southbound lane would likely be needed on occasion for works close to the highway, and traffic signals for the one-way operation would be required. Interaction with the roundabout traffic signals would need to be considered. Occasional off-peak closure of the segregated left turn lane may be required to suit the works.

7.2.46 Pedestrian routes would be maintained around the northern perimeter of the roundabout throughout the works. Pedestrian access would be maintained from Povey Cross Road across A23 London Road to maintain pedestrian access into Riverside Garden Park. Pedestrians would use the temporary utility/pedestrian bridge to cross the River Mole on A23 Brighton Road. The location of the key elements of Traffic Management Stage L3 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage L4

7.2.47 The main works in this stage are the extension of the existing Stilt Structure in the East Quadrant. The works are assumed to be an extension of the existing structure rather than the demolition and construction of a new larger structure. These works would be undertaken concurrently with the works in the adjacent North Terminal Junction Area (W) Stage W4 to reconstruct the northern half of the London Road River Mole Bridge.

7.2.48 Most of the work would be undertaken from the lower level with the construction plant lifted down by a mobile crane or a temporary ramp. It would be necessary to close one lane on the roundabout / London Road southbound off-peak / night-time to provide space for a crane. Working space would be tight but adequate for the equipment used to install the new lengths of the retaining wall. For safety, it may be necessary to close one lane of the London Road off-peak to undertake this work. A detailed sequence of illustrations of works to extend the Stilt Structure is provided **in Appendix C- Method Visual: Longbridge Roundabout SLTL Stilt Structure.**

7.2.49 Other works during this stage would include those to the west quadrant of the roundabout, including the surface water culvert and highway alignment outside the Hilton Hotel. These works may result in removing the pedestrian signals control box; hence, temporary pedestrian crossing signals may be required.

Traffic Management Stage L4

7.2.50 Traffic would be maintained on the roundabout as per the existing arrangement but with fewer lanes. The speed limit would be restricted to 30mph through the works. Two lanes would be maintained on the roundabout for the right turn movement from London Road northbound to A23 Brighton Road northbound.

7.2.51 Traffic would be maintained against the central island of the roundabout. Traffic signal operation for vehicles would be maintained as previously.

7.2.52 On London Road, traffic lanes would be introduced to suit the works being carried out in the adjacent North Terminal Junction Area (W) Stage W3 described in section 7.3.33. For most of this stage, two narrow lanes of traffic in each direction would continue to be maintained tight against the new nearside kerbline of the northbound over the newly constructed southern half of the London Road River Mole Bridge. The splitter island would be adjusted to suit. This would provide working space on the nearside of the southbound to construct the extension to the Stilt Structure concurrent with the northern half of the London Road River Mole Bridge.

7.2.53 On Povey Cross Road, a single narrow lane of traffic in each direction would be maintained to suit the completed verge works. The splitter island would be adjusted to suit. The new pedestrian crossing would be installed in its permanent location, albeit not fully commissioned.

7.2.54 On A217, a single narrow lane of traffic northbound and two narrow lanes southbound would be maintained against the newly widened southbound verge kerbline. Two lanes would be provided at the entry and exit to the roundabout. The splitter island would be adjusted to suit.

7.2.55 On A23 Brighton Road, the traffic would be switched to a single narrow lane of traffic in each direction maintained against the new northbound kerbline over the structurally complete new A23 Brighton Road River Mole Bridge. The splitter island would be adjusted to suit. A segregated left turn lane would be maintained from A23 Brighton Road into London Road southbound during peak hours. Off-peak closure of the northbound lane would likely be needed on occasion for works close to the highway, and traffic signals for the one-way operation would be required. Interaction with the roundabout traffic signals would need to be considered.

7.2.56 Pedestrian routes would be maintained around the northern perimeter of the roundabout throughout the works. Pedestrian access would be maintained from Povey Cross Road across A23 London Road to maintain pedestrian access into Riverside Garden Park via a temporary pedestrian/utility bridge over the River Mole. Pedestrians would use the temporary utility/pedestrian bridge to cross the River Mole on A23 Brighton Road.

7.2.57 The locations of the key elements of Traffic Management Stage L4 are provided in **Appendix A – Surface Access Construction Stage Sketches.**

Construction Stage L5

7.2.58 Initial works during this stage would include those to the central island of the roundabout. Two lanes will generally be maintained on the roundabout during Stage L5 except between the A217 and A23 Brighton Road, where only a single lane will be maintained.

7.2.59 The permanent splitter islands on the approaches to the roundabout would then be constructed. To provide access and working space, it may be necessary to reduce one lane passing each island off-peak locally.

7.2.60 On the south side of the A23 Brighton Road River Mole Bridge, works would be undertaken to divert the utilities off the temporary bridge and onto the new bridge. After this, the temporary utility bridge on the south side would be removed. Once the utility diversions are complete, the south pavement and remaining works will be completed.

7.2.61 On the north side of the A23 Brighton Road River Mole Bridge, works would be undertaken to divert the utilities off the temporary bridge and onto the new bridge. After this, the temporary utility bridge on the north side would be removed.

7.2.62 Once all the permanent splitter islands are complete, the final finishing works will be carried out. The new traffic signals would be installed and commissioned, the surface course asphalt planed out and played (if required), and anti-skid coatings and road markings installed.

7.2.63 At the end of this stage, the satellite compound would be demobilised, and the second attenuation pond constructed along with the associated pipework, headwalls, and finishes.

7.2.64 Once all works are complete, the new roundabout will be fully brought into service, all traffic management removed, and all permanent pedestrian routes fully opened.

Traffic Management Stage L5

7.2.65 At the start of Stage L5, the roundabout is effectively operating in its new arrangement but with fewer lanes. The speed limit would be restricted to 30mph through the works. Works to both River Mole Bridges and the stilt structure would be complete, and most of the roundabout works would be complete.

7.2.66 Two lanes would generally be in operation on the roundabout, and on all approaches, traffic lanes would be against the nearside edges. This would provide working space to install the permanent splitter islands. The cones/barriers would need to be locally modified to construct the segregated left turn lane island.

7.2.67 A single narrow lane in each direction in the centre of the road would be maintained across the A23 Brighton Road River Mole Bridge, providing working space on both verges.

7.2.68 Pedestrian routes would be maintained around the northern perimeter of the roundabout throughout the works. Pedestrian access would not be maintained around the south side. Pedestrians would continue to use the temporary utility/pedestrian bridge to cross the River Mole until the works are complete enough to return the utilities to the new bridge. Pedestrians would then be routed over the new bridge. An off-peak partial or total closure of A23 Brighton Road would likely be needed to lift out the temporary bridges to site the crane.

7.2.69 The locations of the key elements of Traffic Management Stage L5 are shown in **Appendix A – Surface Access Construction Stage Sketches**.

A23 Brighton Road Bridge over River Mole

7.2.70 The proposed new alignment of A23 Brighton Road requires a wider bridge than currently exists over the River Mole (Figure 10).

Figure 10: A23 Brighton Road River Mole Bridge Location

7.2.71 It is proposed to widen the highway on the south side to accommodate the extended segregated left turn lane. The edge of the carriageway is to be moved by approximately 4m, and the total width of the bridge on this side would need to be increased by approximately 3.5m to 4m.

7.2.72 In addition, the highway is to be widened on the north side to accommodate two lanes merging into 1. The edge of the carriageway would be moved by approximately 3m, and the total width of the bridge on this side would need to be increased by up to approximately 3m.

Existing Bridge A23 Brighton Road Bridge

7.2.73 The structure was built in 1932 and underwent strengthening works in 1991. A view from the north side is included in Figure 11.

7.2.74 The bridge deck comprises a simply supported reinforced concrete beam and slab with reinforced concrete utility troughs on each side. The bridge deck is skewed at 0° 25' with a clear skew span of 7.6m and an overall deck width of 19.21m. The abutments are of mass concrete construction with spread footings, approximately 2.28m wide and around 3.5m below road level.

7.2.75 The existing bridge has brick parapets on both edges. However, these do not meet current standards as a vehicle barrier is present behind the highway kerb on both sides. Concrete bagwork[1] river training/erosion protection walls exist on both sides of the bridge.

7.2.76 There are multiple drainage ditches and pipes in close vicinity to the bridge. Surface water ditch outlets are visible through the bag work walls on the bridge's upstream and downstream sides.

[1] The concrete bagwork is pre-filled bags with concrete for placement below water level for watercourse scour protection.

Further investigation and survey are required to confirm details of existing drainage and any unidentified pipes.

7.2.77 The existing bridge accommodates utilities on both sides within services zones within/between beams or a trough formed within the deck. The services drawings indicate electric, telecoms, and gas services on the south side and telecoms and water services on the north side. Ducts for telecoms (assumed) are visible and attached to the outside of the bridge deck on the south side, and water service is attached to the outside of the bridge deck on the north side.

Figure 11: View of the A23 Brighton Road bridge over the River Mole from the North

New A23 Brighton Road Bridge

7.2.78 The preferred option is to retain the majority of the existing structure and construct a new section to support the wider carriageways; however, the replacement of the existing structure will be considered for the construction methodology and programming purposes.

7.2.79 The proposed arrangement assumes that the new substructure and foundations are installed behind the existing ones and found at approximately the same level. It would be necessary to carry out investigative surveys to prove the detailed location of the existing structure, and it may be that a slight increase in the span of the bridge is required to ensure the new foundations do not clash with the existing ones.

7.2.80 An illustration of the assumed arrangement can be seen Figure 12. The designers have confirmed that this accords with the preliminary design considerations for the new bridge.

7.2.81 It is assumed that the new foundations would need to include piles of a medium diameter – around 600-750mm diameter. Ground investigation surveys would need to be carried out in advance to inform the foundation design.

7.2.82 The new substructure and foundations would need to extend past the ends of the existing foundations and be constructed behind the existing bagwork walls. The extent of the foundation for the existing wing walls is unknown and depending on how the foundations extend from the main foundations, it may be necessary to remove some foundations along with the wing walls. The programme assumes that the wing wall foundations do not impede the new foundations.

7.2.83 The proposed arrangement requires the deck of the existing bridge to be removed to install the new deck at similar levels. The new deck will consist of precast concrete beams cast integrally with the substructure. The existing substructure (abutments) would be reduced in height to permit the construction of the new deck, and the tops would be made good.

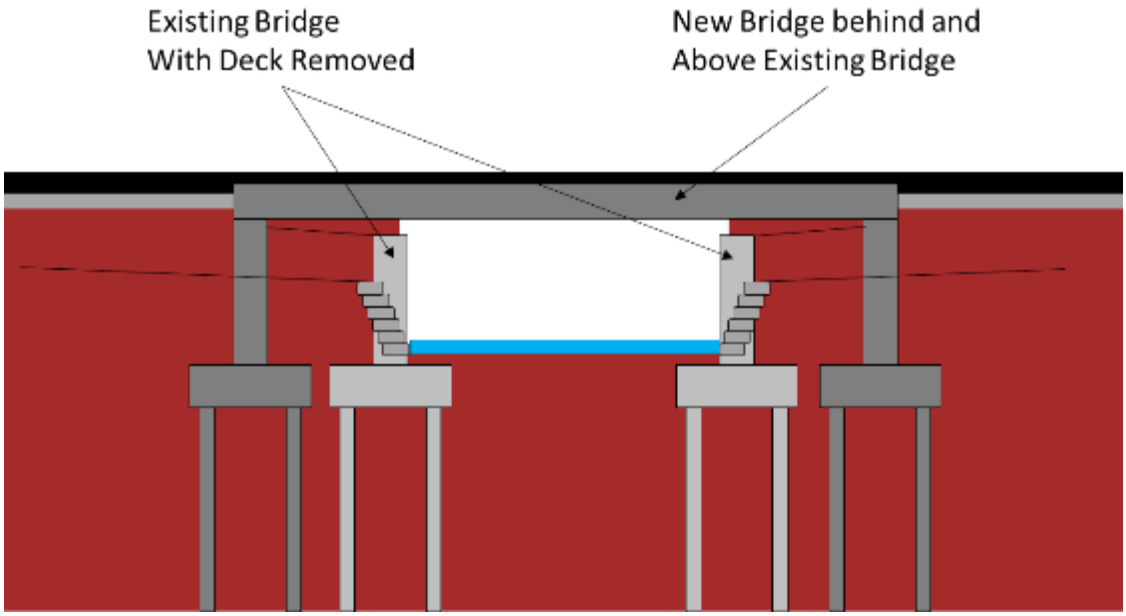


Figure 12: Illustration of assumed new A23 Brighton Road Bridge

Construction Sequence

7.2.84 Consideration of the existing highway width, minimum lane widths, highway geometry, and reconstruction methodology suggests that it would be feasible to maintain a single narrow-width traffic lane in each direction during the main stages of the works. It will be necessary to have temporary vehicle barriers and their respective safety zones to protect both the works/existing bridge and the travelling public. Further surveys and detailed consideration would be needed to validate this during the detailed design stage.

7.2.85 The anticipated typical construction sequence and methodology for the replacement of the A23 Brighton Road Bridge (first, the southern half and then the northern half of the bridge) is as follows:

- Install a temporary service bridge on the south side and divert utilities.
- Install temporary service and the pedestrian bridge on the north side and divert utilities.
- Construct the new bridge on the south side.
- Establish traffic management and secure the working area.
- Remove the existing street furniture and highway surfacing.
- Install sheet-piled retaining walls and excavate the embankment.
- Install cofferdams for the foundations of the main wall and wing walls.

- Infill cofferdams where their extend past the existing bridge to form a piling platform.
- Install foundation piles from road level, most likely using a small continuous flight auger (CFA) type rig.
- Excavate, install props, and dewater cofferdams.
- Break down piles, and construct foundations.
- Construct substructure – main walls and wing walls.
- Backfill to working level for deck and partially remove cofferdam.
- A crash deck would be required beneath to protect the River Mole, most likely spanning the river above flood level supported off the existing abutment walls.
- Remove the existing deck, if practical, by sawing it into sections and lifting it out. Some traditional breakouts with crusher jaws or impact hammers may be required.
- Lower tops of existing abutments – if practical, by sawing– and make good.
- Install precast concrete deck beams and permanent formwork and construct the deck.
- Complete backfill and substructure work.
- Complete highway surfacing and pavements.
- Construct the northern half of the bridge by repeating the same sequence.
- Divert Utilities onto the new bridge. Complete and open footway and remove temp footbridge.

7.2.86 A 3D visualisation of the construction sequence is provided in **Appendix B: Method Visual - A23 Brighton Road Bridge over River Mole Widening.**

Stilt Structure Widening and Extension

7.2.87 The proposed new arrangement of the A23 Brighton Road / A23 London Road Segregated Left Turn Lane (SLTL) requires a wider and greater extent of stilt structure than currently exists.

Existing Structure

7.2.88 The deck of the existing stilt structure is a solid concrete slab approximately 600mm deep. It is unclear how the western edge is supported; however, the assumption is that there is a line of contiguous concrete piles forming both a retaining wall and the support to the deck. These piles appear to have been coated with sprayed concrete to protect and prevent backfill material loss.

7.2.89 The eastern edge of the deck is supported on a line of concrete columns (Figure 13) approximately 500mm in diameter, approximately 2m high, at approximately 4.5m between centres. An intermediate line of columns is also included over the widest central section of the structure. The concrete columns are each supported by a single concrete foundation on concrete piles. The retaining wall extends past the ends of the stilt structure to support the highway before switching to an earth embankment.

Figure 13: View from the stilt structure supporting Longbridge SLTL

New Structure

7.2.90 Extension of the structure would rely on the design and condition of the existing structure being suitable, which would be subject to survey and design checks. An extension would benefit from providing a larger work area at the road level. An illustrative plan of an extended structure is shown in Figure 14.

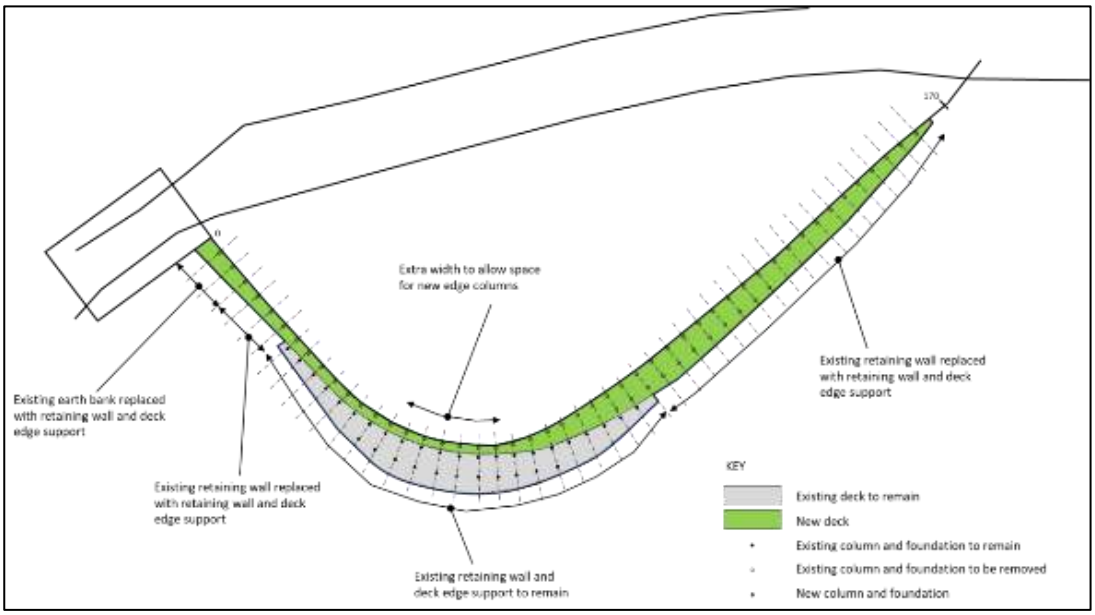


Figure 14: Illustration of extension to stilt structure supporting the Longbridge SLTL

7.2.91 It is assumed that the existing structure would be partially demolished, a new one constructed and the existing retaining wall, which currently supports the deck, could be retained and used to support the western edge of the new structure. The retaining wall on either side of the existing deck would be replaced. The existing deck and columns would be removed. New piled foundations would be constructed between the existing foundations and columns, and a new in-situ concrete deck would be constructed above. An illustrative plan of the assumed new structure is indicated in Figure 15.

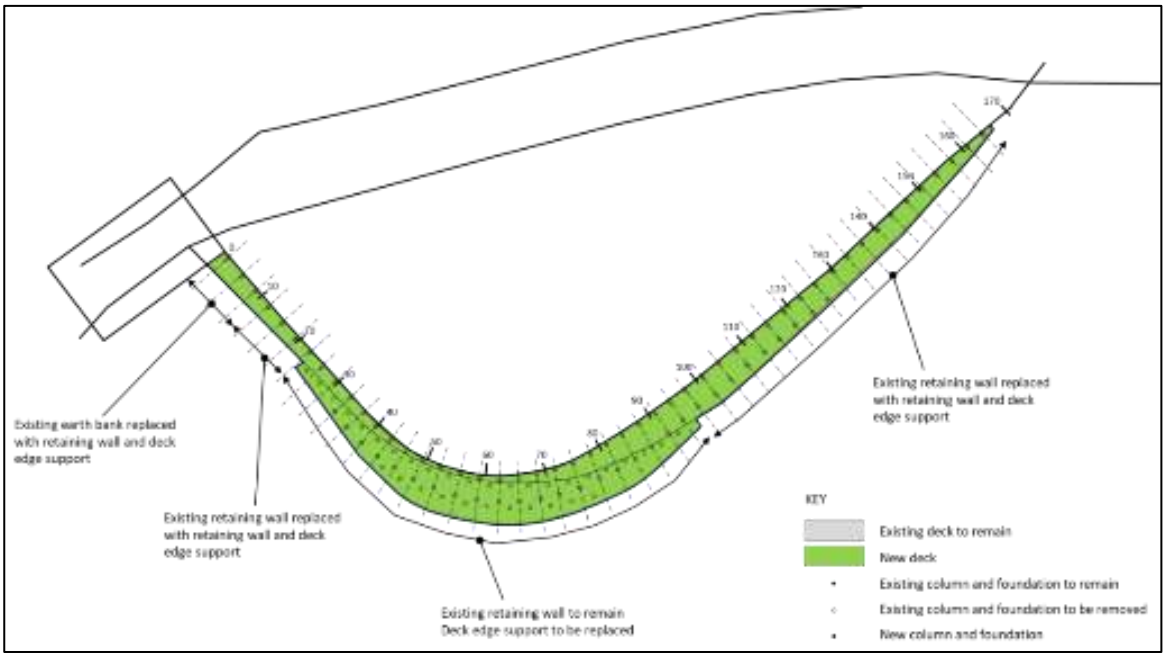


Figure 15: Illustration of proposed stilt structure supporting the Longbridge SLTL.

Construction Sequence / Methodology

7.2.92 Reconstruction would require a significant period when the SLTL is out of use to provide working space for the works. The existing traffic island would be removed first, followed by the main works carried out concurrently with reconstructing the southern half of the A23 Brighton Road bridge.

7.2.93 The works would mostly be serviced by crane from road level, with only the piling and foundations requiring access to the lower level. Access to a large piling rig would be difficult, so it is expected that piling would be carried out using a restricted access machine such as a Klemm 708. Pile diameter and length would be restricted to 600mm in diameter and 20m in depth for this machine.

7.2.94 The anticipated construction sequence and methodology for the structure, following any utility diversions, are as follows:

- Establish traffic management and secure the working area.
- Remove the existing SLTL traffic island and highway surfacing above the existing structure.
- Install an access ramp to the lower level from A23 London Road (subject to EA approval). Ideally, a mass-fill ramp of crushed stone would be used. Alternatively, an open steel bridge ramp structure could be used if a mass fill ramp in the flood zone were unacceptable.
- Demolish existing deck and columns, if practical, by sawing into sections and lifting out. Some traditional breakouts with crusher jaws or impact hammers may be required.
- Install foundation piles from the lower level, most likely using a small CFA-type rig. It will be necessary to move the access ramp to install all piles. Concrete will be supplied from road level.
- Install new retaining wall piles on either side of the existing structure from road level.
- Commence constructing foundations, columns and deck working from A23 Brighton Road to A23 London Road. Falsework will be required for the construction of the deck.
- Once piles and foundations are complete, remove the access ramp and construct the remaining works from the road level.
- Complete construction of foundations, columns and deck to the south extent in A23 London Road.
- Waterproof deck and complete highway, pavement, and parapet works.

7.2.95 A 3D scaled visualisation of the construction sequence is provided in **Appendix C: Method Visual: Longbridge Roundabout (STLT) Stilt Structure**.

Modifications to Existing Roundabout

7.2.96 Local lane restrictions would be required on the roundabout and approaches in order to carry out near carriageway and tie-in works.

7.2.97 Modifications to the existing roundabout would include:

- Relocation of any drainage systems and electrical cabling affected by the modifications.
- Removal of kerbs and excavation and reinstatement of unbound pavement layers to create a suitable foundation.
- New kerbs, where required, followed by bound bitumen-based pavement layers to finished road level, road markings and other finishes as required before opening to traffic.

7.3. North Terminal Junction Area (W)

7.3.1 In overview, the required works at the North Terminal Roundabout are:

- The existing at-grade North Terminal Roundabout is to be upgraded with the introduction of a new flyover for westbound traffic heading onto A23 London Road, roundabout signalisation upgrades, and various geometry modifications to the roundabout and the approach link roads.
- Airport Way eastbound link was removed along with other merges and diverges.
- A new signal-controlled junction will be introduced on A23 London Road with a link road connecting to North Terminal Roundabout.
- A23 London Road diverges onto Airport Way eastbound to be upgraded to provide greater traffic capacity.
- Airport Way westbound flyover merge onto A23 London Road northbound to introduce a third lane continuing to Longbridge roundabout. River mole bridge to be widened.

Advanced Works

7.3.2 Advanced works would be those that should be carried out and completed prior to the main roundabout construction works.

7.3.3 Advanced works would include:

- Utility location verification, diversion and/or protection works. Several utility services would need diversions in the area to facilitate the permanent works. The utility works will involve the protection or relocating of these services and will be agreed upon with the Utility Providers before the start of the permanent works.
- Installation of the site compound. A significant temporary construction compound will be required to support the works. The compound will provide management offices and parking for staff, welfare and parking for operatives and logistics areas to store temporary and permanent materials.
- Ecological works. The environmental and ecological impacts and risks associated with the upgrade of the North Terminal Roundabout are considered low.

7.3.4 Vegetation and tree clearance of the existing embankments is required. The access to work areas will be through the Lower Forecourt and west of Pond D, southeast of the existing bridge. The access will be supplied through Car Park B at the southwest of the bridge abutment.

7.3.5 There will be temporary and permanent loss of existing habitats. Any other trees, scrubs and hedgerows proposed to be retained would be protected during construction. Measures will be implemented to ensure that bat foraging/commuting habitat and areas of trees, hedges, or scrubs to be retained are adequately protected from damage or destruction during the construction phase. Protective fencing would be erected around these features to prevent people, materials and machinery access.

Temporary Site Compound

7.3.6 The main compound for the works will be South Terminal Roundabout Compound, as shown in Figure 16. Site welfare for the workforce will be located at the Car Park Y compound adjacent to the material reprocessing area.

Figure 16: Illustrative layout of the Car Park Y compound

7.3.7 The principal components of the Car Park Y compound comprise:

- Secure fenced area with access-controlled entrance and exit off the Perimeter Road North to the north of the compound.
- Limited areas for material laydown.
- Provision for contractor, project manager and supply chain vehicles.
- Welfare provisions such as restrooms, drying rooms, changing and locker rooms, toilet and shower facilities, prayer rooms, canteen and other welfare facilities.

Construction Stages and Traffic Management (W)

7.3.8 The works in the North Terminal Roundabout area have been planned to be undertaken in 6 principal stages, W1 to W6. Some sub-stages may be required.

7.3.9 The sequence of works through these stages is:

- Stage W1 – Removal of central reserve of A23 London Road. Installation of temporary highway bridge London Road River Mole Bridge.
- Stage W2 – Widening of A23 London Road Northbound Verge, including installation of the new London Road River Mole Bridge southern half. Widening of the Airport Way Railway Bridge.
- Stage W3 – Installation of the new London Road River Mole Bridge northern half. Reconstruction of the offside of A23 London Road Southbound to Airport Way Eastbound Link.
- Stage W4 – Reconstruction of the nearside of A23 London Road Southbound to Airport Way Eastbound Link.
- Stage W5 – Opening the new Roundabout / A23 London Road Links to traffic. Closure of the old Airport Way Westbound. Realigning of the Airport Way Westbound Approach to Roundabout.
- Stage W6 – Completion of the new Flyover Link.

7.3.10 The sequencing of the main works and traffic management in each stage are described in more detail below.

Construction Stage W1

7.3.11 London Road between Airport Way Bridge and Longbridge Roundabout requires the removal and hardening of the existing central reserve to be suitable for traffic running. Night-time access off the northbound highway would be via closed lane 2. The northern length of the central reserve appears to already be hardened and may only require the removal of the vehicle barrier to bring it into use.

7.3.12 It should be noted that in the middle and southern areas, taking out and hardening the central reserve for running on may not be necessary. Most of the verge widening may be undertaken offline, with two narrow lanes of traffic northbound maintained against the current central reserve for most of the time. Final surfacing tie-ins would require the nearside lane to be closed off-peak. For the scheduling, it is assumed that the central reserve is hardened and trafficked throughout its length.

7.3.13 Installation of a temporary carriageway for slip road diversion on London Road Northbound Off Slip to North Terminal Roundabout will be done during this stage. Access will be from off-highway areas.

7.3.14 Preparation works for the reconstruction and widening of the London Road River Mole Bridge will be undertaken. A three-lane temporary highway bridge would be installed to span the northern half of the existing bridge, as its integrity will be compromised once work to the south side

commences. Localised widening of the low embankment on the southbound verge will be required, which will necessitate some temporary work. Temporary foundations would be installed at highway level, and the panel bridge would be assembled on the road and jacked up into position on its supports. Approach ramps would then be installed, most likely as a combination of bridging units and fill material.

7.3.15 A temporary pedestrian footbridge crossing the River Mole will also be installed to the north of the highway. Works will be carried out from the low level on either side of the river with temporary foundations installed and bridge units craned into place.

7.3.16 A temporary utility bridge crossing the River Mole will also be installed to the south of the highway. Works will be carried out from the low level on either side of the river with temporary foundations installed and bridge units craned into place. A 3-D visualisation of the construction sequence is provided in **Appendix D – Method Visual: A23 London Road Bridge over River Mole.**

Traffic Management Stage W1

7.3.17 Traffic between London Road Bridge and Airport Way Rail Bridge would use the existing highways without traffic management except at the following locations:

- London Road northbound between Airport Way Bridge and Longbridge Roundabout – two narrow lanes against verge peak hours. Single lane against verge off-peak / night hours. Cones only would be used for traffic management allowing adjustment to single lane working in off-peak hours.
- London Road southbound between Airport Way Bridge and Longbridge Roundabout – two narrow lanes against the verge generally.
- Traffic crossing the A23 London Road River Mole Bridge would be reduced to a single narrow lane in contraflow on the existing northbound carriageway to facilitate works on the southbound carriageway.
- London Road northbound off slip to North Terminal Roundabout – one narrow lane against offside off-peak hours.

7.3.18 Traffic speed would be limited to 40mph throughout the works. The locations of the key elements of the Traffic Management Stage are provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage W2

7.3.19 A number of significant works would be undertaken in Stage W2.

7.3.20 At the North Terminal Roundabout, the new Airport Way Westbound Link Flyover bridge would be constructed, and following the completion of the abutments, the new link roads between the roundabout and the London Road would be constructed. Access would be off the existing slip roads into the working area.

7.3.21 At the River Mole, the southern half of the existing highway bridge would be demolished, and the new enlarged southern half would be constructed. A temporary retaining wall would be required to retain the adjacent carriageway installed from the highway level. The remainder of the works would be carried out from the intermediate level, either accessing off the closed northbound carriageway or from Car Park Y. A crash deck would be installed before removing the existing bridge deck and reducing the level of the existing abutments. Piling and abutment construction would be from the intermediate level, with new abutments being situated behind the existing ones. Once complete, the abutments would be filled, and the embankments widened on either side. Bridge beams would be installed using cranes sited on the widened embankments, and the deck subsequently be completed. A 3-D visualisation of the construction sequence is provided in **Appendix E – Method Visual: North Terminal Flyover.**

7.3.22 One element of work that would be carried out in this stage is the widening of the northbound London Road. Access would generally be from the highway through the traffic management but would also be from the off-highway areas. These works would need to coordinate with the widening of the A23 Brighton Road River Mole Bridge being carried out in Longbridge Roundabout starting in stage L2.

7.3.23 Another element of work is the widening of the Airport Way Railway Bridge and the subsequent widening of the embankment and highway on Airport Way westbound. Most of the works to widen the Airport Way Rail Bridge would be carried out from the lower level; however, certain activities would be carried out from Airport Way lane 1, which would require periods of closure. This would include installing retaining walls behind each abutment (assuming they were steel sheet piles or similar) and works to modify the edge of the existing bridge and to join the extended deck to the existing deck. Installation of the bridge beams might require the closure of Airport Way westbound. Installation of the beams would need to be coordinated with applicable railway closures, which would most likely be at night and weekends.

7.3.24 Extension of the existing pedestrian underpass and Gatwick Stream Culvert would be undertaken concurrently with the works to Airport Way Railway Bridge. This work would be undertaken from the lower level and would not generally affect Airport Way westbound traffic.

7.3.25 Widening of the embankment would be carried out from off-highway areas at the toe of the existing embankments once the underpass, culverts and Airport Way Rail Bridge widening have progressed sufficiently. Short-term and/or off-peak lane one closure would likely be required for some activities. Once the embankment widening is complete, the highway widening works will be carried out with access off the highway through traffic management.

7.3.26 Enlargement of the North Terminal Roundabout would be carried out in stages during this overall traffic management stage.

7.3.27 In addition to the above works that affect the highways, a number of other elements would be undertaken during this stage. They include:

- The new Airport Way Westbound Link Flyover bridge would be constructed, and following the completion of the abutments, the new link roads between the roundabout and the London Road would be constructed.
- At some point, a crossover would be constructed on Airport Way over the London Way Bridge in readiness for traffic use in the next stage. Elements of the new Airport Way westbound tie - into the widened roundabout would also be constructed.
- Installation of the Geocell attenuation tank in Car Park Y and the associated pipework and outfalls would also be carried out in this stage.

Traffic Management Stage W2

7.3.28 Traffic between A23 London Road Bridge and Airport Way Railway Bridge would use existing highways without traffic management except at the following locations:

- London Road southbound between Airport Way Bridge and Longbridge Roundabout – two narrow lanes against the verge except over River Mole temporary bridge where one narrow lane only would be maintained.
- London Road northbound between Airport Way Bridge and Longbridge Roundabout – 2 narrow lanes against southbound, including over the River Mole temporary bridge. Traffic is running over the infilled existing central reserve. This provides working space to widen the northbound verge. The position of the off-slip diverge and on-slip merge would be modified to suit the widening northbound widening works.
- Periods of single lane working on London Road northbound might be necessary to undertake elements of the widening of the River Mole Bridge. These include early activities associated with retaining walls to support the highway edge. These works are programmed to be undertaken in spring 2029 when single lane running should be acceptable. These works also include demolishing and reconstructing the existing lane 1 deck and constructing the new deck section. These works are programmed to be undertaken in late 2029 when single lane running should be acceptable.
- London Road northbound Off Slip to North Terminal Roundabout: two narrow lanes against the nearside using the diverted section on the temporary carriageway.
- Airport Way is westbound – two narrow lanes maintained against the central reserve. Single narrow lane for periods for certain activities on Network Rail Bridge and embankment and highway widening. A high containment temporary vehicle barrier would be required over the Network Rail Bridge when the permanent parapet and safety barriers and not in place. Relocation of the high containment barrier for off-peak extra working space would be awkward, and hence it would be necessary to have longer periods with only a single westbound lane in place.

7.3.29 These works include early activities associated with retaining walls to support the highway edge. These works are programmed to be undertaken in spring 2029. These works also include

modifications to the existing deck and construction of the new deck section. These works are programmed to be undertaken between autumn 2029 and early 2030.

7.3.30 Local traffic management would be in place on the North Terminal Roundabout during this stage and would need to be modified in stages to suit the works.

7.3.31 Traffic speed is limited to 40mph throughout the works.

7.3.32 The locations of the key elements of Traffic Management Stage W2 are provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage W3

7.3.33 The main element of work that would be carried out in this stage is the widening / modification / lowering of the southbound A23 London Road / Airport Way link road on the offside. Traffic will be running on the existing link nearside. This work would include the modification of the London Road southbound verge after the modified diverge. Most of the work requires full-depth reconstruction as the new highway levels are expected to be lower than the existing ones. Access to undertake the work would be off the highway into the work areas. Working space will be minimal at the narrowest point, and the work will be slow. The modified merge tie-in to Airport Way eastbound will require a full-depth reconstruction of Airport Way. Sufficient work would be carried out to enable traffic use in the next stage.

7.3.34 The other main element of work is the demolition of the northern half of the old London Road River Mole Bridge. The works will be undertaken in the same manner as that of the southern half. The temporary retaining wall would be reused to retain the adjacent carriageway. The remainder of the works would be carried out from the intermediate level accessing off the closed southbound carriageway. A crash deck would be installed prior to removing the existing bridge deck and reducing the level of the existing abutments. Piling and abutment construction would be from the intermediate level, with new abutments being situated behind the existing ones. Once complete, the abutments would be filled, and the embankments widened on either side. Bridge beams would be installed using cranes sited on the widened embankments, and the deck subsequently be completed. A 3-D visualisation of the construction sequence is provided in **Appendix D – Method Visual: A23 London Road Bridge over River Mole.**

7.3.35 Other secondary works undertaken during this stage include modifying Gatwick Way and the Perimeter Road North / Northgate Road Junction. Local traffic management would be introduced and modified to suit the works being carried out in stages.

Traffic Management Stage W3

7.3.36 London Road southbound between Airport Way Bridge and Longbridge Roundabout would require two narrow lanes against the northbound lanes on the newly constructed southern half of River Mole Bridge. This provides working space for works to demolish and reconstruct the northern half of the new River Mole Bridge.

7.3.37 London Road southbound to Airport Way eastbound link road requires one narrow lane against the verge. London Road northbound Off Slip to North Terminal Roundabout requires two narrow lanes against the nearside and using the diverted section on the temporary carriageway continues.

7.3.38 Airport Way is westbound and requires two narrow lanes maintained against the newly widened kerbline and over the newly widened Airport Way Railway Bridge.

7.3.39 Airport Way eastbound requires one narrow lane that crosses to the westbound carriageway via the central reserve crossover on London Road Bridge (installed in the previous stage) and crosses the railway in contraflow before crossing back to the eastbound carriageway. One lane remains on the existing eastbound against the existing central reserve. Off-peak/night-time closures of one lane may be required when constructing the merge. This allows sufficient working space for part of the link road merge to be constructed as shown in Figure 17 below.

Figure 17: Detail at Airport Way Eastbound Contraflow in Stage W3

7.3.40 Local traffic management would be in place on the North Terminal Roundabout during this stage and would need to be modified in stages to suit the works. Traffic speed is limited to 40mph throughout the works.

7.3.41 The location of the key elements of Traffic Management Stage W3 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage W4

7.3.42 The main element of work that would be carried out in this stage is the completion of the widening / modification / lowering of the southbound A23 London Road / Airport Way link road on the near side. Traffic will be running on the new link carriageway offside. Most of the work requires full-depth reconstruction as the new highway levels are expected to be lower than the existing ones. Access to undertake the work would be off the highway into the work areas. Working space will be minimal at the narrowest point, and the works will likely be slow.

7.3.43 Works will also be carried out alongside the London Road southbound to include new drainage pipework and attenuation culvert at the embankment toe discharging into Gatwick Stream, with access off the highway. Installation of a noise barrier from the River Mole Bridge to the Airport

Way Rail Bridge would be carried out along with any associated embankment widening to facilitate.

7.3.44 Works to the north parapet of the Airport Way Rail Bridge would also be carried out in this stage.

Traffic Management Stage W4

7.3.45 Traffic Management Stage W4 requires the following measures at the locations stated:

- London Road northbound between Airport Way Bridge and Longbridge Roundabout – two narrow lanes against the new northbound verge kerbline.
- London Road southbound between Airport Way Bridge and Longbridge Roundabout – two narrow lanes against northbound lanes running over the infilled existing central reserve. This provides working space for works to the verge of the southbound London Road and to the London Road / Airport Way Link Road.
- London Road southbound to Airport Way eastbound link road – one narrow lane running on the newly constructed highway on the offside.
- London Road northbound Off Slip to North Terminal Roundabout – two narrow lanes against nearside and using the diverted section on temporary carriageway continues.
- Airport Way is westbound – two narrow lanes maintained against the newly widened kerbline and over the newly widened Airport Way Railway Bridge.
- Airport Way eastbound – one narrow lane crosses to the westbound carriageway via the central reserve crossover on London Road Bridge (installed in the previous stage) and crosses the railway in contraflow before crossing back to the eastbound carriageway. One lane remains on the existing eastbound against the existing central reserve. Off-peak closures of one lane would likely be required when constructing the merge. This allows sufficient working space for part of the link road merge to be constructed (see Figure 18 below).
- Traffic speed will be limited to 40mph throughout the works.

Figure 18: Detail at Airport Way Eastbound Contraflow in Stage W4

7.3.46 The location of the key elements of Traffic Management Stage W4 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage W5

7.3.47 The new central reserve to the London Road is constructed in Stage W5. Access would generally be from the northbound highway through traffic management. The permanent signal-controlled junction would be installed and commissioned.

7.3.48 Completion of the merge of the new Airport Way eastbound to the old alignment would be completed to tie in the remaining areas of full-depth reconstruction.

7.3.49 Works to widen and modify the alignment of Airport Way westbound between the London Road Bridge and the North Terminal Roundabout would be carried out to include widening of the low embankment with associated retaining walls and carriageway widening. Access would be a combination of access at a low level for embankment works and off the old westbound carriageway and live highway areas for carriageway level works.

7.3.50 Other works not directly affecting the highway network would also be undertaken, to include:

- Construction of the Airport Way Westbound Link west approach embankment and, once complete, new carriageway up to and over the new flyover and tie-in to the London Road northbound. Access would mostly be off the North Terminal Roundabout but also off the London Road northbound at the merge tie-in.
- Construction of the Airport Way Westbound Link east approach embankment would be undertaken as far as practical, and then, once complete, a new carriageway from the new flyover. Access would mostly be off the North Terminal Roundabout but also off the A23 London Road northbound at the old roundabout diverge.
- The attenuation ponds adjacent to the North Terminal Roundabout would also be constructed during this stage with access off the North Terminal Roundabout.

Traffic Management Stage W5

7.3.51 At the end of Stage W4, the London Road eastbound link to Airport Way eastbound is fully open and effectively becomes Airport Way eastbound. The new link roads between the North Terminal Roundabout and the London Road and the signal-controlled junction are opened to traffic. The existing eastbound Airport Way from the North Terminal Roundabout to the London Road Bridge is closed to traffic.

7.3.52 Traffic Management Stage W5 requires the following measures at the following locations:

- London Road is northbound – two narrow lanes are maintained against the nearside/verge kerbline.
- London Road is southbound – two narrow lanes are maintained against the nearside/verge kerbline.
- Airport Way eastbound (from London Road southbound diverge)- two narrow lanes are maintained against the nearside/verge kerbline.

- Airport Way westbound - two narrow lanes are maintained against the nearside/verge kerbline to the London Road Bridge, at which point traffic is diverted onto the old Airport Way eastbound carriageway connecting to the North Terminal Roundabout.

7.3.53 The location of the key elements of Traffic Management Stage W5 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage W6

7.3.54 The remaining works would be carried out in this stage. The remaining section of the westbound Airport Way link would be completed, and the tie-in made to the live carriageway. It would likely be necessary to reduce to one lane for a short period to make the final tie-ins. Any remaining areas of the existing highway would be taken up.

7.3.55 Any work needed to the deck/parapets of the London Road bridge would be undertaken. Any plane and inlay of existing surfacing areas would be undertaken.

7.3.56 Final reinstatement and landscaping would be completed in this stage.

Traffic Management Stage W6

7.3.57 Traffic Management Stage W6 requires the following measures at the following locations:

- London Road is northbound – two regular lanes are maintained against the nearside/verge kerbline. Off-peak lane closures would be required to plane and inlay the surface course if that work element was required and to apply final road markings and the like.
- London Road is southbound – two normal lanes are maintained against the nearside/verge kerbline. Off-peak lane closures would be required to plane and inlay the surface course if that work element was required and to apply final road markings.
- Airport Way eastbound (from London Road southbound diverge)- two narrow lanes are maintained against the offside/verge kerbline.
- Airport Way westbound – two narrow lanes are maintained against the new nearside verge.
- Airport Way westbound - two narrow lanes are maintained against the nearside/verge kerbline to the London Road Bridge, at this point, traffic is diverted onto the old Airport Way eastbound carriageway connecting to the North Terminal Roundabout.

7.3.58 The location of the key elements of Traffic Management Stage W6 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

A23 London Road Bridge over River Mole

7.3.59 The proposed works will add an additional lane to the northbound carriageway, a 3.5m wide shared-use path, and associated separation verges to the carriageway and parapet. Therefore, the bridge needs to be widened on the western side to accommodate this. The structure will be widened by up to approximately 9.65m. The location of the bridge is shown in Figure 19 below.

Figure 19: Location of A23 London Road River Mole Bridge

Existing Bridge

7.3.60 The existing bridge above the River Mole is a single-span structure consisting of pre-stressed post-tensioned beams, transversely post-tensioned within the deck slab supported on bearings on a mass concrete abutment. The structure includes a services trough on each side of the structure assumed to contain services. There have been subsequent works on the western side to cover the utility trough with a slab to support additional lanes over the bridge. Based on the available record drawings, this slab appears to be supported on steel beams within the utility trough.

7.3.61 The structure was built in the 1950s, the works to cover the utility trough may have occurred in the 1960s, and subsequent works to upgrade the edge beams and parapets were carried out in approximately 2016.

7.3.62 The original bridge spanned approximately 15m along the road alignment at a skew of approximately 40 degrees.

New A23 London Road River Mole Bridge

7.3.63 A complete replacement of A23 London Road River Mole bridge would be required if the existing bridge cannot be retained. The new bridge will likely be precast concrete beams with an in-situ deck.

Construction Sequencing/Methodology

7.3.64 A temporary bridge would need to be installed at A23 southbound to allow the demolition of the existing deck. This will keep the three-lane carriageway open for traffic while constructing the southern part of the bridge. Following the newly widened part's construction, the traffic will shift to the new section, and the northern part of the bridge will be constructed.

7.3.65 The existing abutments could be reused subject to geotechnical assessment and extended to accommodate the additional width. However, inspections noted that the abutments' condition has deteriorated, including some significant cracks. The replacement of the abutment will be considered by constructing new abutments behind the existing ones.

7.3.66 The anticipated construction sequence would be as below:

- Install the temporary bridge and divert traffic.
- A three-lane temporary bridge needs to be installed to keep traffic live on A23 London Road Bridge and construct the southern part of the new bridge structure. Traffic management will be required on A23 London Road during the installation period.
- Demolish the southern half of the existing bridge deck and construct the new structure.
- Install temporary ground support for bridge replacement.
- Install piles from the road level.
- Install cofferdam and reduce the ground level and piles.
- Install crash deck and demolish existing deck.
- Install new foundations, abutment and wing walls and backfill abutment walls.
- Construct new deck and backfill approaches to road level.
- Shift traffic to the newly constructed section (two by two lanes). Remove the temporary bridge and reconstruct the northern half, repeating the same steps.

7.3.67 The 3D visualisation of the construction sequence can be seen in **Appendix D: Method Visual – A23 London Road Bridge over River Mole.**

North Terminal Flyover

7.3.68 The proposed highway arrangement and indicative location of the proposed North Terminal Flyover are illustrated in Figure 20.

Figure 20: North Terminal Junction Imprvoments Proposed Plan – New Flyover

Current Roundabout

7.3.69 The current North Terminal Roundabout connects the North Terminal accesses (including Gatwick Way to the southeast, Northway and North Terminal Approach to the southwest and Longbridge Way to the northwest) to the A23 London Road northbound to the North and Airport Way to the east.

7.3.70 The position of the proposed flyover and associated earthworks coincides with the existing slip road connections between the North Terminal Roundabout and A23 London Road northbound. As access to/ from A23 London Road will need to be retained for the duration of the works, temporary modification of the A23 London Road slip roads will likely be required as part of the construction sequence.

Proposed North Terminal Flyover

7.3.71 The proposed structure carries one lane, hard shoulder and offside hard strip for a total width between verges of 7.3m. Including an allowance for a western verge width of approximately 2m verges and an eastern verge width of approximately 4.6m (to accommodate visibility requirements and the proposed noise barrier), the total width between parapets would be a minimum of approximately 13.9m. The indicative location of the proposed flyover, North Terminal Link Road and A23 London Road slip road connection to North Terminal is given in Figure 21.

7.3.72 The main span of any option taken forward will need to be up to approximately 43.5m in length across the connection between the roundabout and A23 London Road.

7.3.73 It is assumed that the piers and abutments would have piled foundations; however, foundation design is subject to geotechnical design and ground investigation.

Figure 21: Proposed New Flyover, NT link road and A23 Slip Road connection

Construction Sequence/Methodology

7.3.74 The position of the proposed flyover and associated earthworks coincides with the existing slip road connections between North Terminal Roundabout, A23 London Road northbound and Airport Way. As access to/from A23 London Road and Airport Way will need to be retained for the works, the new A23 link road is required to be operational to complete the works in Airport Way westbound and the new flyover. The likely construction sequence is as follows:

- Construct Airport Way Link Bridge.
- Preparation of a piling platform for the piled foundations and construction of reinforced concrete pile caps for the foundations of the bridges. To provide a safe working area, lane closures on the existing A23 London Road Northbound exit and entry slip roads and Airport Way may be required for the duration of piling and foundation construction activities. Temporary ground support may be required whilst constructing the foundations.
- Abutment walls and wing walls are constructed in reinforced concrete.
- Assuming a steel and composite deck construction, lifting steel beams onto the abutments and piers as tied pairs will be delivered to the site on low loaders. Installation of formwork (both temporary and permanent), reinforcement fixing and casting of the deck and deck edge beams. Temporary working platforms and formwork would be required around and under the deck for deck construction, which can often be pre-installed before the lift.
- Construct the new A23 London Road Link and open it to traffic.
- Close existing Airport Way Eastbound from the roundabout and A23 London Road northbound diverge and merge.
- Complete the new flyover approach embankments.

- Construct the new Airport Way westbound roundabout approach.
- Complete highway works at the new flyover.

7.3.75 A 3D visualisation of the construction sequence is provided in **Appendix E: Method Visual – North Terminal Flyover.**

Airport Way Railway Bridge

7.3.76 The bridge is owned and maintained by National Highways and spans over the London to Brighton railway, which is maintained by Network Rail, and a private road belonging to Gatwick Airport Ltd. Two public footpaths also pass under the structure, one on each side of the railway.

7.3.77 The proposed highway design changes include the addition of an additional westbound lane on the south side of the bridge. The bridge would need to be widened by approximately 4.5m to accommodate the additional lane and associated verge provision. The location of the eastbound carriageway and central reserve is not changed (and is constrained by the location of the longitudinal joint between decks).

7.3.78 The proposed highway arrangement concept design is illustrated in Figure 22.

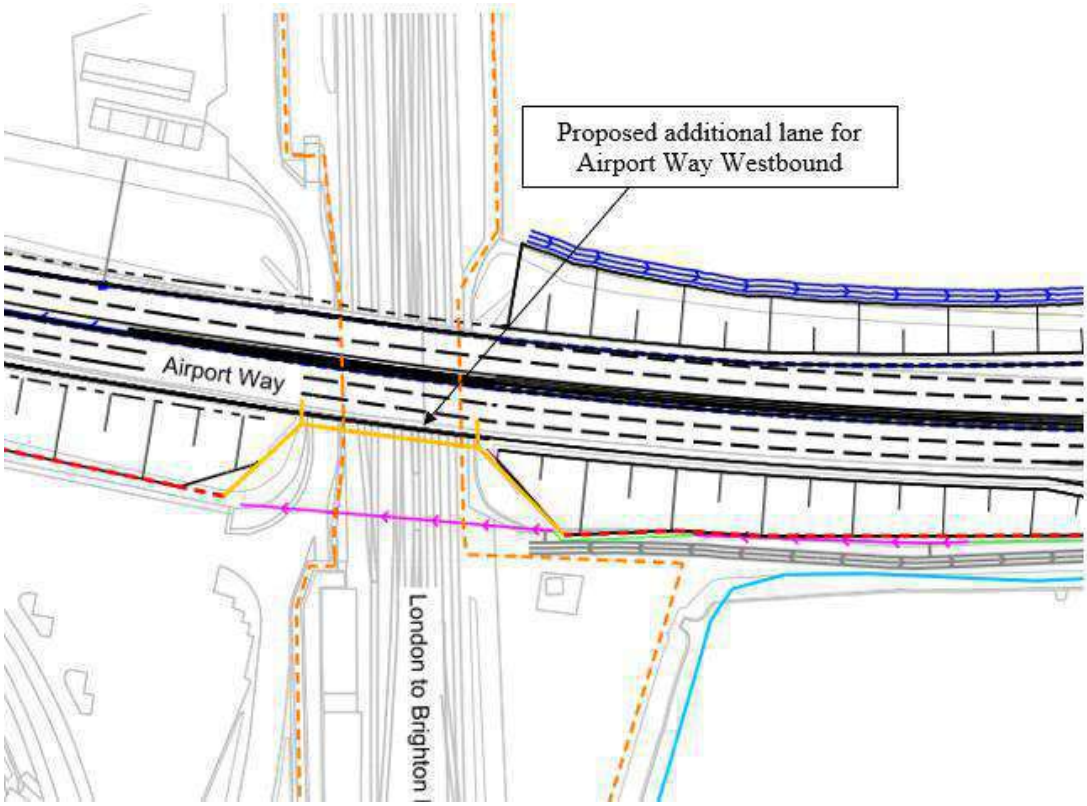


Figure 22: Airport Way Bridge Widening

Existing Bridge

7.3.79 The existing bridge (see Figure 23 below), constructed in 1974, consists of two separate steel composite deck structures with shared abutments. Each deck has a reinforced concrete slab supported on six steel beams. The two structures are separate and were designed with a three-quarter-inch gap filled with a foam strip at the joint between them. The structure underwent joint repairs in 2015.

7.3.80 The abutments are reinforced concrete construction with spread footings. The east abutment is of counterfort construction; the west abutment is of cantilever construction. The bridge spans approximately 38m with a skew of approximately 10 degrees. The bridge is simply supported and fixed at the western end and free at the eastern end.

7.3.81 Original drawings allowed for services to be carried in a narrow-raised strip on the edge of both sides of each deck. The quantity and type of services currently being carried by the bridge are unknown.

Figure 23: Existing Airport Way Bridge

Widening of the existing bridge

7.3.82 Widening the existing bridge would include introducing a new adjacent structure of the same form to make it continuous with the existing structure.

7.3.83 The abutments would be extended to support the new wider bridge deck, with new wing walls constructed to retain the embankment. The existing edge beam and parapet would be removed, and the edge of the deck broken back to enable a continuous deck beneath the running surface. Two new steel beams would be placed on the extended abutments, and a new slab would be cast continuously with the existing one.

7.3.84 A new parapet would be installed as part of this work to meet current containment standards. The new section of the deck would be designed accordingly.

7.3.85 The bridge is rising towards the side to be widened; therefore, by matching the current arrangement, there should not be any negative impact on clearance to the rail infrastructure below due to the works.

7.3.86 The articulation of the new bridge would be matched to the existing arrangement.

Construction sequencing/methodology

7.3.87 The anticpated construction sequence is as follows:

- A small welfare compound will be set up at Car Park B. The compound will include welfare and office containers, parking for vehicles and equipment, and laydown areas for the construction crews widening the bridge. The compound will be hoarded and separated from the public.
- Vegetation and tree clearance of the existing embankments. The access to work areas will be through the Lower Forecourt and west of Pond D, southeast of the existing bridge. The access will be supplied through Car Park B at the southwest of the bridge abutment.
- Temporary retaining walls will be installed to allow excavation around the existing wing walls. Installation of temporary vehicle barriers will be installed to separate the traffic and the worksite.
- Excavate the embankment and demolish/remove existing wing walls.
- Construction of extended abutment and new wing wall.
- The new deck beams will be placed using a mobile crane from Car Park B. The beams will be transported to Airport Way westbound. The Airport Way westbound will be closed during the operation. Several rail possessions will be required during the installation of the new beams.
- Permanent and temporary formwork will be installed to allow construction works to continue with the requirement of rail possessions.
- The existing edge beam will be demolished, and preparation for slab extension will be completed.
- The new in-situ concrete deck will be cast.
- New parapets will be constructed, and temporary formwork will be removed.
- Approach Embankments will be backfilled.
- Temporary retaining walls will be removed, and highway works will be completed.

7.3.88 A 3D visualisation of the construction sequence is provided **in Appendix F - Method Visual: Airport Way Railway Bridge.**

7.4. South Terminal Junction Area (E)

7.4.1 The proposed arrangement for the new Gatwick Airport South Terminal Roundabout provides a grade-separated roundabout junction connecting and providing traffic movements between the South Terminal, the M23 Spur Road, and Airport Way.

Advanced Works

7.4.2 Advanced works would be those that should be carried out and completed before the main roundabout construction works. These include utility location verification, diversion and protection works, including environmental protection works. Installation of the temporary site compound has also been included.

7.4.3 Advanced works would include:

- Utility location verification, diversion or protection works. Several utility services would need a diversion in the area to facilitate the permanent works. The utility works will involve the protection or relocating of these services and will be agreed upon with the Utility Providers before the start of the permanent works.
- Installation of the site compound. A significant temporary construction compound will be required to support the works. The compound will provide management offices and parking for staff, welfare and parking for operatives and logistics areas to store temporary and permanent materials.
- Ecological Works. General site clearance across all areas of the site is needed to enable subsequent activities. These works include vegetation clearance, primarily of trees and shrubs, which ideally need to be carried out outside of the bird nesting season.

7.4.4 There will be temporary and permanent loss of existing habitats. Any other trees, scrubs and hedgerows proposed to be retained would be protected during construction. Measures will be implemented to ensure that bat foraging/commuting habitat and areas of trees, hedges, or scrubs to be retained are adequately protected from damage or destruction during the construction phase. Protective fencing would be erected around these features to prevent people, materials and machinery access.

Site Compound – South Terminal Roundabout

7.4.5 The South Terminal Roundabout Compound will be the main temporary construction compound supporting all surface access works, including South Terminal Roundabout. The compound will include management offices, parking, welfare facilities for operatives, and logistics areas to store temporary and permanent materials. The provision of vehicle recovery and customer care facilities is also needed.

7.4.6 The management offices and parking would be located to the east to benefit from any service connections in Balcombe Road. Direct access to Balcombe Road for only workforce private cars will be provided. This access will also be used during the replacement of Balcombe Road Bridges that are part of the South Terminal Roundabout works. The access would also allow limited early

access to the land to commence construction of the compound prior to access off the South Terminal Roundabout.

7.4.7 Main traffic routes and parking areas would be surfaced with bituminous materials. Office accommodation would likely be single-story open-plan modular units.

7.4.8 An illustrative layout of the South Terminal Roundabout Compound is shown in Figure 24.

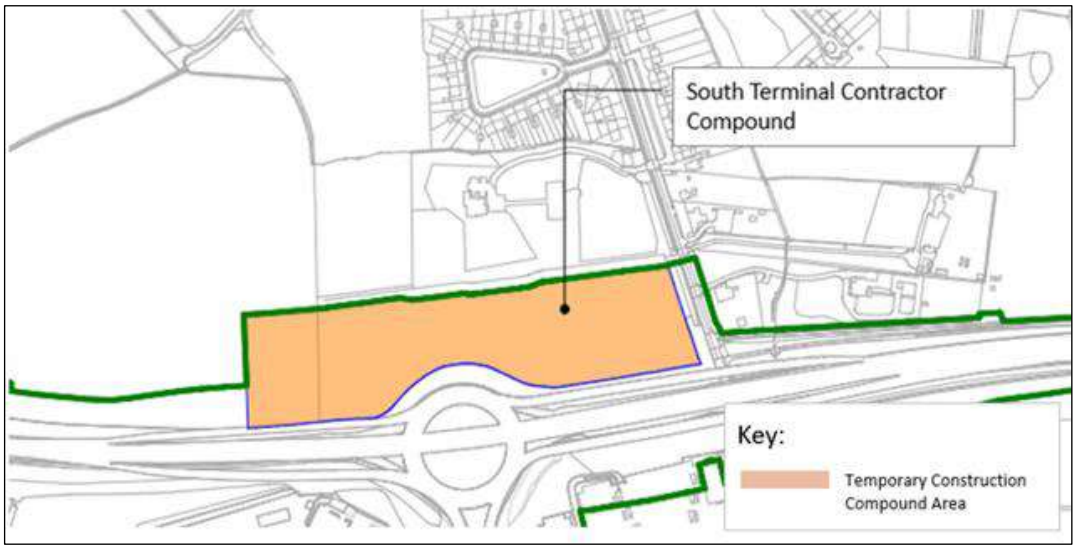


Figure 24: Illustrative layout of the South Terminal Roundabout Compound

Construction Stages and Traffic Management (E)

7.4.9 The works in the South Terminal Roundabout area have been planned to be undertaken in three principal stages, E1 to E3. Some sub-stages may be required.

7.4.10 The sequence of works through these stages is:

- Stage E1 – Construction of the new slip roads including Balcombe Road bridges and the M23 Eastbound Spur widening.
- Stage E2 – Construction of the new flyover bridge and mainline Balcombe Road Bridge.
- Stage E3 – Construction of the new flyover embankments and highways and modification of the roundabout and approaches.

7.4.11 Traffic management east of the Network Rail Bridge would need to be coordinated and tied into that to the west. This would result in further traffic management layouts depending on the timing of the two stages.

7.4.12 Several utility services would need a diversion in the area to facilitate the main works. Most of these could and would be carried out in advance with utilities lowered, protected, or moved to areas outside the works.

7.4.13 The traffic management and works in each stage are described below. The location of the key elements of the Traffic Management Stages is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage E1

7.4.14 Balcombe Road Slip Road bridges would be constructed during this stage. Works will mostly be accessed and carried out from the Balcombe Road level. It would be necessary to install ground support alongside the existing M23 Spur carriageway to excavate for the new bridge abutments. Steel sheet piles would need to be installed from the main carriageway level, which would likely require short-term off-peak reduction to one lane.

7.4.15 Embankment construction for all four new slip roads would be mostly carried out offline and working from the toe level up to the carriageway level. Where available, some access would be from the carriageway, especially once the widening has reached the carriageway level.

7.4.16 Carriageway construction would follow with access off the mainline highway through traffic management. It would most likely be necessary to reduce to a single lane on the main carriageways to do the final surfacing tie-ins. It would be essential to ensure sufficient carriageway is constructed at this stage to accommodate two lanes on the four slip roads. The permanent design currently only allows for a single lane and discontinuous hard shoulder, so an additional temporary carriageway may be required.

7.4.17 A temporary carriageway would be installed during this stage to allow for an elongated roundabout in the next stage to simplify viaduct construction.

Traffic Management Stage E1

7.4.18 Traffic management Stage E1 requires the following measures:

- M23 Spur eastbound and westbound – traffic in two narrow lanes against the central reserve in both directions.
- Airport Way eastbound and westbound - traffic in two narrow lanes against the central reserve in both directions. Traffic management would need to match that required to widen Airport Way Rail Bridge in Stage W2.
- Roundabout and approaches – traffic mainly uses the existing highway with two lanes against the central island to tie in with the traffic management on the main approaches.

7.4.19 Balcombe Road traffic management will depend on the form and arrangement of the new bridges to be constructed. For the current programme, it is assumed that the new abutments are behind the line of the existing ones, and hence the majority of the work will be away from the carriageway edge. As such, single-line traffic would most likely be able to remain for most of the work. Single line alternate way with traffic signals would be required off-peak when working adjacent to the carriageway, and closure would be required for installation of the deck beams. Details of the proposed traffic management arrangements during the South Terminal Roundabout Stage 1 are set out in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage E2

7.4.20 Balcombe Road mainline bridge would be constructed during this stage. Works would initially be accessed and carried out from Balcombe Road level. The existing bridge deck, piers and abutments would be demolished over one or a number of off-peak weekend closures of Balcombe Road. It shouldn't be necessary to close the M23 Spur during these works. Once demolished, the area would be excavated and ramps installed to the carriageway level. Piling and substructure work for the new abutments would be undertaken from Balcombe Road, and single alternate line working would likely be required for short periods to facilitate access.

7.4.21 Structural backfill to the abutments would be undertaken from the carriageway level, as access from Balcombe Road would be impossible. Closure of Balcombe Road would be required for the installation of new bridge beams, permanent formwork and the like.

7.4.22 The new South Terminal Flyover bridge would be constructed with traffic skirting the worksite using the temporary sections of the carriageway installed in the previous stage. Access and egress would be off the roundabout through the traffic management. Construction would be predominately independent of the adjacent traffic.

7.4.23 Works to the central reserve of Airport Way and preparatory works for the mainline carriageway would also be undertaken as necessary during this stage.

Traffic Management Stage E2

7.4.24 Traffic Management Stage E2 includes the following measures:

- Airport Way is westbound and eastbound – two narrow lanes of traffic maintained on the new slip roads and into the main carriageway against the new nearside/verge kerblines.
- M23 Spur is westbound and eastbound – two narrow lanes of traffic maintained on the new slip roads and into the main carriageway against the nearside/verge kerblines.
- Roundabout and approaches – traffic mostly uses two lanes against the outside kerbline to tie in with the traffic management on the slip roads. Roundabout temporarily expanded with traffic running on temporary surfacing outside the footprint of the new viaduct.
- Balcombe Road traffic management will depend on the form and arrangement of the new bridges to be constructed. For the current programme, it is assumed that the new abutments are behind the line of the existing, and hence the majority of the work will be away from the carriageway edge. As such, single-line traffic would most likely be able to remain for most of the work. Single line alternate way with traffic signals would be required off-peak when working adjacent to the carriageway, and closure would be required for installation of the deck beams.

7.4.25 Details of the proposed traffic management arrangements during the South Terminal Roundabout Stage 2 are set out in **Appendix A – Surface Access Construction Stage Sketches**.

Construction Stage E3

7.4.26 The primary works to be undertaken and completed in this stage are constructing the new viaduct bridge approach embankments and completing the carriageway and associated kerbs, drainage,

signage and lighting. It is assumed that the embankments would comprise reinforced earth with precast concrete facing panels attached by reinforcing straps. Embankment construction could commence in the previous stage; however, the temporary roundabout widening needs to be removed to complete the embankments. Tie-ins to Airport Way and M23 Spur mainline and the associated slip roads would likely require off-peak lane closures. Access and egress to carry out these works would be off the mainline carriageway or slip roads through the traffic management as appropriate.

7.4.27 Completion of works to the roundabout and South Terminal access roads would also happen during this stage.

Traffic Management Stage E3

7.4.28 Traffic Management Stage E3 requires the following measures:

- Airport Way westbound and eastbound – Existing (from Stage E2) two narrow lanes of traffic maintained on the new slip roads and into the main carriageway against the new nearside/verge kerblines.
- M23 Spur is westbound and eastbound – two narrow lanes of traffic maintained on the new slip roads and into the main carriageway against the nearside/verge kerblines.
- Roundabout and approaches – traffic mainly uses two lanes against the outside kerbline to tie in with the traffic management on the slip roads. Roundabout re-opened to use beneath new viaduct bridge.

7.4.29 Balcombe Road would remain free of traffic management as works should be completed in the previous stage.

7.4.30 The location of the key elements of the South Terminal Roundabout Traffic Management Stage E3 is provided in **Appendix A – Surface Access Construction Stage Sketches**.

Retaining Walls and Earthworks

7.4.31 There is a requirement for retaining walls supporting up to 4 to 5 meters of ground within the South Terminal Roundabout. These typically support the toe of embankments for the new slip roads, notably the Airport Way westbound merge slip road as it passes the current Kentucky Fried Chicken/ MacDonald's/ BP Filling Station and ponds and the M23 Spur Road eastbound merge where it passes close to the existing properties. For these retaining walls, driven steel sheet piles with steel or concrete capping would be most suitable. A boring concrete secant pile solution would be appropriate if the noise becomes an issue.

7.4.32 The retaining walls are required to support up to 8 meters of fill for the new flyover approach embankments. In this instance – and considering the apparent robust nature of the existing subsoil foundation – a viable alternative to in-situ concrete would be reinforced earth retaining systems such as those manufactured by Tenser or other manufacturers.

7.4.33 For the construction programme, we have assumed that the embankment retaining walls will be formed from concrete panel-faced reinforced earth walls (see Figure 25 and Figure 26).

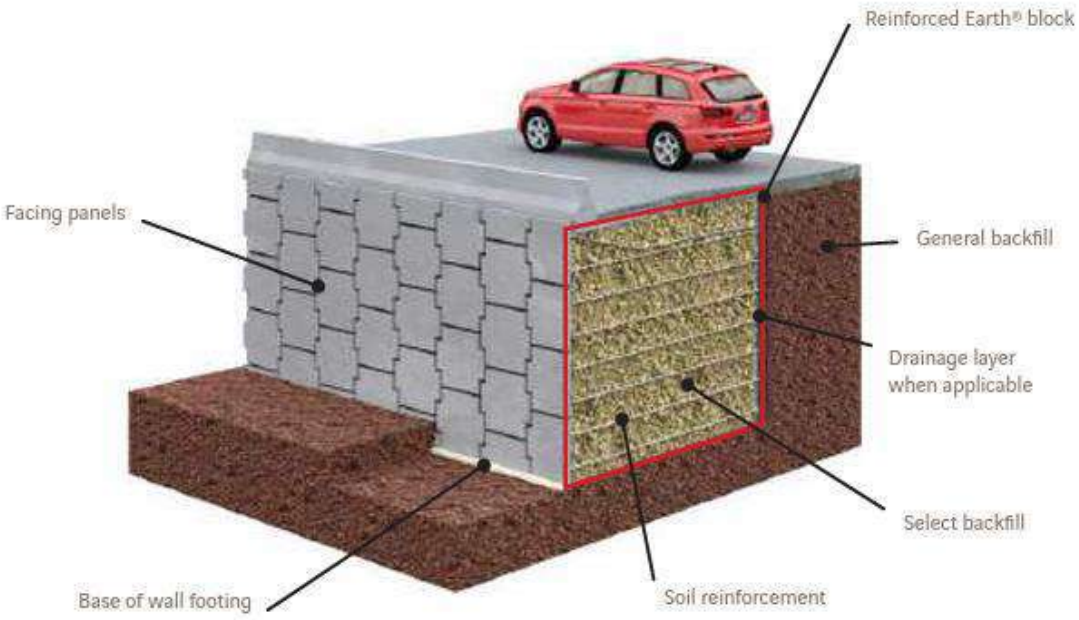


Figure 25: Typical reinforced earth-retaining structure[2]

[2] Freyssinet Mechanically Stabilised Earth (MSE) Wall: Reinforced Earth.

Figure 26: Typical concrete faced reinforced earth retaining wall (Example by RECo®)

7.4.34 Airport Way and M23 Spur Earthworks and Retaining Walls works would include:

- Breaking up the existing road pavement layers, removing services, infilling maintenance holes and redundant drainage systems, and removing soft spots within the existing embankments, if any.
- Earthworks in compacted layers in conjunction with reinforced earth concrete panel faced retaining walls running alongside the new alignment for M23 Spur / Airport Way to build up the road platform and include capping material.

7.4.35 Works would include the completion of retaining walls and earthworks in compacted layers to build up the road platform up to and including capping material. New earthworks layers would be benched into existing embankment side slopes where necessary. Much of the work would be undertaken without lane closures on the existing carriageways. However, localised short-term lane closures will be needed in the vicinity of the tapers and tie-ins.

7.4.36 Local embankment construction adjacent to the existing roundabout before the main works could be carried out early whilst the Balcombe Road slip road bridges are being constructed.

South Terminal Roundabout Flyover

7.4.37 A new four-span flyover is proposed for the M23 Spur / Airport Way mainline dual two-lane carriageway to provide unrestricted movement through traffic. The outline design proposes a composite steel beam / concrete deck structure supported on reinforced concrete abutments and piers. An overall deck thickness to a carriageway level of 1.63m has been assumed for vertical alignment purposes. The vertical alignment impacts other aspects of the project, most notably the crossing of Balcombe Road to the east.

7.4.38 Construction of the flyover piers within the roundabout central island is sequenced to commence early. The in-situ concrete foundations and walls would be constructed using standard plants and equipment accessing the work area off the roundabout. It is assumed that the foundations would be piled.

7.4.39 Temporary closures of the roundabout would be required to lift the steel deck beams into place over the carriageway. Permanent formwork and edge protection would be fixed, after which deck construction would continue above the live carriageway below.

South Terminal Flyover Construction Sequence

7.4.40 Access to the working area within the central island would be via a temporary, signal-controlled plant crossing the roundabout's northern segment. Traffic flows may be such that the plant crossing would have restricted hours when it could be operated, during the time of day when construction activities occur. Alternative access may be possible via the closure of the inside lane for use as a works access/ egress route.

7.4.41 Access to the working areas to construct the east and west abutments would be via the redundant mainline carriageway exits/entries from/to the roundabout.

7.4.42 Temporary widening of the roundabout outside the abutments will be implemented to bring the abutments into the central area. This would allow the deck to be constructed without a live carriageway beneath.

7.4.43 For the construction programme, it is assumed that the existing roundabout remains in its original arrangement.

7.4.44 Construction of the new flyover would include:

- Preparation of a piling platform for the piled foundations and reinforced concrete pile caps for the east and west abutments. Preparation of a piling platform for the piled foundations and reinforced concrete pile caps for some of the foundations to the bridges to support the M23 Spur / Airport Way flyover across the South Terminal Roundabout.
- Traffic on the roundabout entries and exits will prevent the completion of the abutment foundations, which would encroach onto the existing carriageways. These need to be completed at a later date.
- Piles would most likely be bored cast in situ to minimise noise impacts. Lane closures on the roundabout would likely be required to provide a safe working area for piling and foundation construction activities. If daytime closures are impractical due to traffic volumes, overnight

temporary closures could be used, with piling and construction work at night. This would, however, introduce a localised noise and lighting impact.

- Bridge deck construction assumes a concrete beam and composite deck construction. The beams will be delivered to the site on low loaders and lifted onto the abutments and piers. Parapets, vehicle restraint systems (if any), deck drainage systems, and deck waterproofing membrane will be installed.
- Completion of the carriageway on the bridge decks would be carried out with the mainline carriageway construction in a later stage.

7.4.45 An illustrative 3D visualisation of the construction sequence is provided in **Appendix G - Method Visual: South Terminal Flyover.**

Balcombe Road Bridges

7.4.46 The introduction of the M23 Spur eastbound merge slip road and the westbound diverge slip road requires the construction of two new bridges over the existing Balcombe Road.

7.4.47 The two bridges would need to be constructed adjacent to the existing M23 Spur bridge over Balcombe Road. The vertical alignment results in a deck level 2 metres above the existing carriageway. Once these bridges are constructed and traffic is switched to the new slip roads, the existing mainline bridge would need to be reconstructed to suit the higher carriageway level.

M23 Slip Roads, Construction Sequence

7.4.48 Access to carry out the construction of the new M23 Spur westbound diverge and eastbound merge under bridges would generally be from Balcombe Road, most likely accessed from the site compound. Some single-lane running on Balcombe Road with temporary traffic signals would be needed for certain activities.

7.4.49 Temporary closure of Balcombe Road would be required for the installation of deck beams and some follow-on activities. Traffic using the M23 Spur should be largely unaffected by the works; however, it would be prudent for dual narrow lanes running against the central reserve to be implemented.

7.4.50 The key stages in the construction sequence for the M23 slip-under bridges at Balcombe Road are described below:

- A temporary steel sheet pile retaining wall would be installed along the edge of the eastbound and westbound carriageway. This is needed primarily to support the carriageway when the embankment is excavated. The secondary purpose of the retaining wall would be to support the fill behind the new bridge abutments when filled higher than the adjacent mainline carriageway. A significant-sized 'leader' piling rig would install the sheet piles working from the mainline carriageway behind barriers. It may be necessary to introduce single-lane contraflow traffic management during these works.
- Once installed on the east side, the embankment behind would be excavated using appropriately sized equipment, e.g. a medium-sized (20t) excavator, with the material being disposed of off-site. The east abutment wing walls would be demolished back to the abutment. Access would be off Balcombe Road.
- The foundations for the new abutments would be formed. Demolition of parts of the wing wall foundations to the east abutment would be required. Surgical demolition using drills/saws and the like may be required in order not to affect the remaining abutment.
- Once complete, a suitable piling/work platform would be placed, and the foundation piles installed. Space would be limited, so a small, specialised piling rig would most likely be required. Foundations would be excavated, piles broken down, reinforcing steel fixed, and bases concreted. Ground support would be required due to the depth.
- Due to the confined working area, the new abutment walls and wing walls would be constructed using traditional formwork and small-scale equipment. Reinforcing steel and formwork would be fixed from appropriate access, and the walls would be concreted. Couplers

would be included on the inside ends to allow the abutment walls to be tied into the mainline bridge foundation later.

- The inside wing walls to the west abutments would be cast against the existing bridge wing walls. This would isolate the future fill behind the abutments from spilling out to the future construction area for the mainline bridge.
- Precast concrete beams would be placed using a suitably sized mobile crane working from Balcombe Road, which would be temporarily closed. Beams would be delivered to the M23 Spur Road. Alternatively, the beams could be installed by a crane located on the M23 Spur Road with a temporary carriageway closure.
- Permanent formwork and precast parapet edge units would be installed with Balcombe Road closed, after which the remaining deck work would be completed with traffic running. All remaining deck works would then be completed.
- The new bridges are backfilled behind the abutments up to the highway formation level, and any remaining deck construction activities are completed. On the west side, the existing wing walls would be permanently buried. Backfill with imported granular material would be carried out with small-scale plants. Earthworks would most likely be coordinated with general embankment widening for the slip roads.
- The new slip roads would be constructed up to and across the new bridges, ready to switch traffic. It may be necessary to install a temporary highway barrier on the inside edges of the new carriageway adjacent to the mainline carriageway, as the new carriageway will be 2 meters or higher in the temporary case.
- The bridges and carriageway will be completed and ready for traffic to be switched from the mainline to the slip roads to permit the reconstruction of the mainline Balcombe Road Bridge.

7.4.51 The 3D visualisation of the construction sequence can be seen in **Appendix H - Method Visual: Balcombe Road Under Bridges.**

M23 Mainline, Bridge Construction Sequence

7.4.52 The key stages in the bridge construction sequence for the M23 mainline at Balcombe Road are described below:

- At the commencement of the works, temporary steel sheet pile retaining walls are in place supporting the slip road embankments.
- The deck will be removed by providing temporary support, cutting it up into sections, and lifting or transporting these out using heavy lifting equipment. SPMT (Self-Propelled Mobile Transporters) could be engaged to support the deck panels whilst a diamond wire saw separates the east side spans. The SPMTs could raise the deck of its supports and drive it out under the higher north-side slip road bridge and into the site compound for later recycling.
- The slip road bridges being significantly higher than the old bridge, would allow the deck to pass beneath. Balcombe Road needs to be closed during demolishing of the deck.

- The fill behind the existing east abutment would be removed using a large excavator (40t) from the carriageway level. Excavated material would be removed off-site. The east abutment and any remaining sections of the wing wall would then be removed by traditional methods down to the foundation level.
- A suitable piling/work platform would be placed, and the foundation piles installed. A small piling rig would be required due to space limitations. Foundations would be excavated, piles broken down, reinforcing steel fixed and tied into couplers in the slip road bridge foundations, and bases concreted. Ground support would be required due to the depth.
- Due to the confined working area, the new abutment walls would be constructed using traditional formwork and small-scale equipment. Reinforcing steel and formwork would be fixed from appropriate access and tied into couplers in the slip road bridge foundations, and the walls concreted.
- The new decks would be constructed. Precast concrete beams would be placed using a large mobile crane, most likely working from the mainline carriageway level behind the existing west abutment. Temporary closure of at least one of the M23 Spur Road slip roads would be required during beam placing, along with a closure of Balcombe Road.
- Beams would be delivered to the M23 Spur Road carriageway level west side.
- Permanent formwork and precast parapet edge units would be installed with Balcombe Road closed, after which the remaining deck work would be completed with traffic running. All remaining deck works would then be completed.
- The new bridge is backfilled behind the abutments up to the highway formation level, and any remaining deck construction activities are completed.

7.4.53 On the west side, the granular backfill would fill the void between the existing and new abutments and then bury the existing abutment and broken-up carriageway. The backfill would fill the gap behind the new abutment and the broken-up existing carriageway on the east side. The new bridge would be structurally complete and ready for carriageway construction.

7.4.54 The 3D visualisation of the construction sequence can be seen in **Appendix H - Method Visual: Balcombe Road Under Bridges.**

Carriageway works to new Merge and Diverge slip roads

7.4.56 Most of the work will be carried out without affecting traffic using the existing mainline carriageway. However, dual narrow lanes running with lanes against the central reserve would be implemented to maximise the working space available.

7.4.57 The works would include the construction of the new carriageway over the new Balcombe Road slip road bridges, and hence the works would be timed to suit their completion.

7.4.58 Carriageway works to new Merge and Diverge slip roads would include:

- Drainage and any ducting for electrical cables within the verges, along with any large foundations for new traffic signs.
- Preparation of formation level, local detailing around the tie-ins to the existing carriageways and placing of sub-base. Localised short-term, temporary lane closures in the vicinity of the tapers and tie-ins to the existing carriageways.
- Kerb laying, if any, followed by road pavement construction in bitumen-bound materials laid by paving machine. Localised short-term, temporary lane closures in the vicinity of the tapers and tie-ins to the existing carriageways.
- Vehicle restraint systems, lighting columns (if any), road marking, verge completion and other activities to enable all four slip roads to be opened to traffic.

7.4.59 The completed merge and diverge slip roads would then be opened to traffic, and the mainline carriageways would be closed. This allows the remaining work to be carried out.

Modifications to Existing Roundabout

7.4.60 Local lane restrictions would be required on the roundabout and approaches in order to carry out near carriageway and tie-in works.

7.4.61 Modifications to the existing roundabout would include:

- Relocation of any drainage systems and electrical cabling affected by the modifications.
- Removal of kerbs and excavation and reinstatement of unbound pavement layers to create a suitable foundation.
- New kerbs, where required, followed by layers of bound bitumen-based road pavement layers to finished road level, road markings and other finishes as required before opening to traffic.

Carriageway construction works at Airport Way and M23 Spur

7.4.62 The carriageway construction works at Airport Way and the M23 spur would include the following:

- Drainage and any ducting for electrical cables within the verges.
- Preparation of formation level, local detailing around the tie-ins to the existing carriageways and placing of sub-base, which is likely to be a cement-stabilised material or 'lean mix' concrete laid by paving machine. Localised short-term, temporary lane closures in the vicinity of the tapers and tie-ins to the existing carriageways.
- Kerb laying, if any, followed by road pavement construction in bitumen-bound materials laid by paving machine. Localised short-term, temporary lane closures in the vicinity of the tapers and tie-ins to the existing carriageways.
- Vehicle restraint systems, lighting columns (if any), road marking, verge completion and other activities to enable the mainline Airport Way and M23 Spur to be opened to traffic.

7.4.63 With the completion of the works, the new highway arrangement would be fully open to traffic.

Glossary

Table 5: Glossary of Terms

Term	Description
BP	British Petrol
CDM	Construction Design and Management Regulations
CFA	Continuous flight auger
CO2	Carbon dioxide
CoCP	Code of Construction Practice
CTMP	Construction Traffic Management Plan for Materials
EA	Environment Agency
ECoW	Ecological Clerk of Works
ES	Environmental Statement
ITTS	Inter Terminal Transport System
NRP	Northern Runway Project
NT	North Terminal
RECo	Reinforced Earth Company
SLTL	Segregated Left Turn Lane
SPMT	Self-Propelled Mobile Transporters
SuDS	Sustainable Drainage System
WMP	Water Management Plan

Appendix A – Surface Access Construction Stage Sketches

Buildability Report Part B

Appendix A

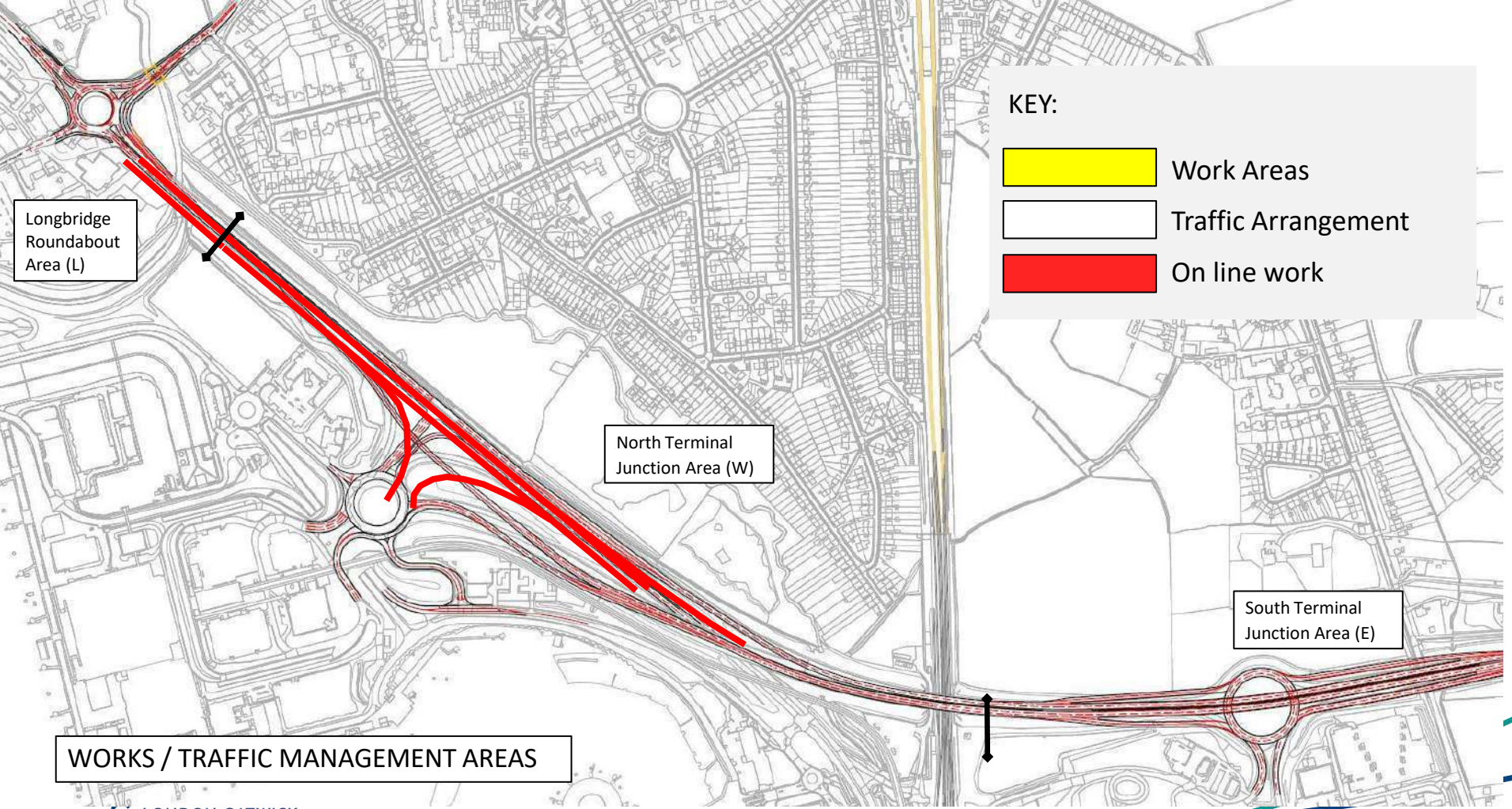
Gatwick Surface Access Construction Stages Sketches

LONDON GATWICK

POWERED BY VINCI AIRPORTS | GLOBAL INFRASTRUCTURE PARTNERS

WORKS AND TRAFFIC MANAGEMENT AREAS

Longbridge Roundabout Area (L)
North Terminal Roundabout Area (W)
South Terminal Roundabout Area (S)

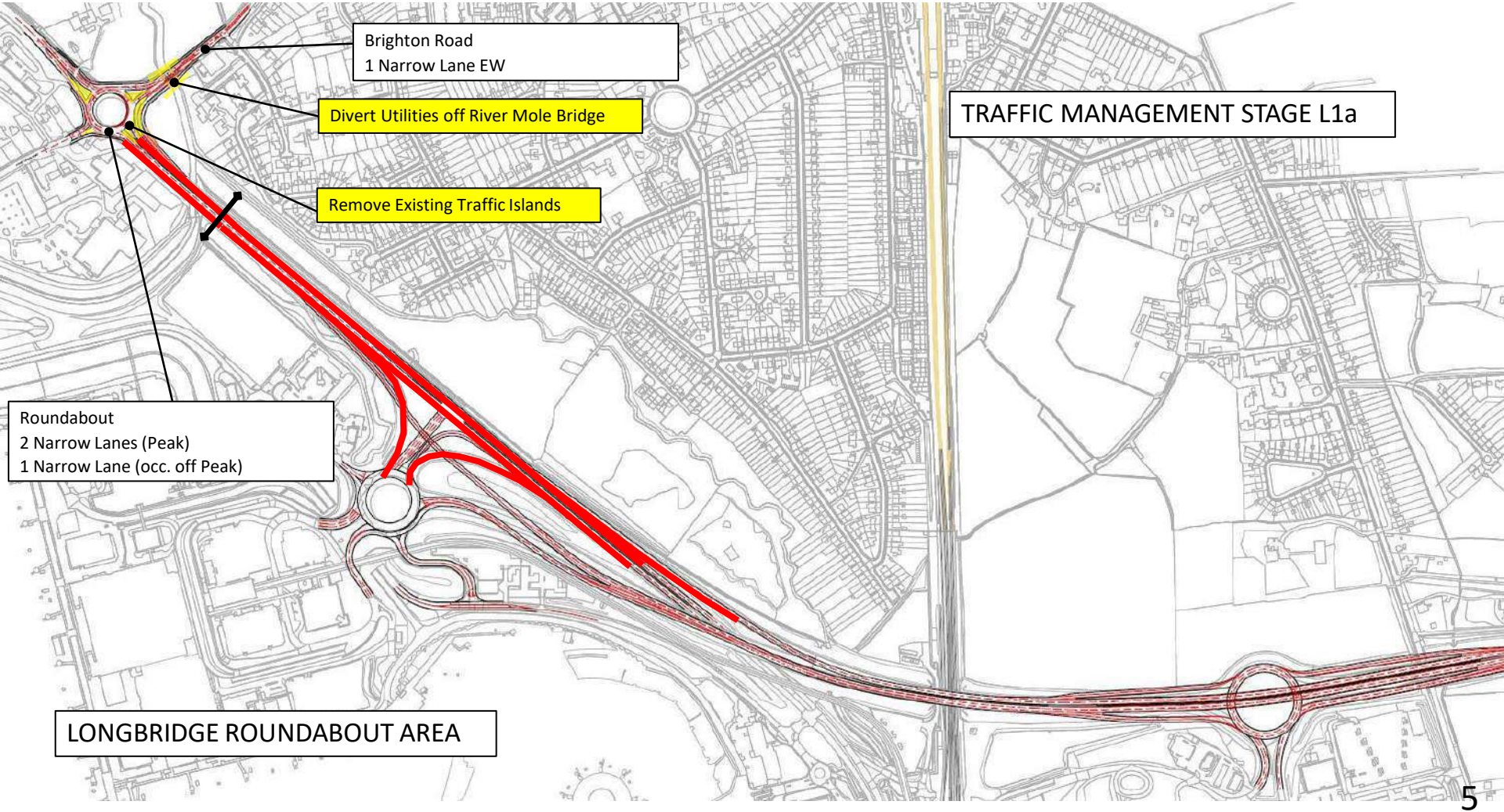


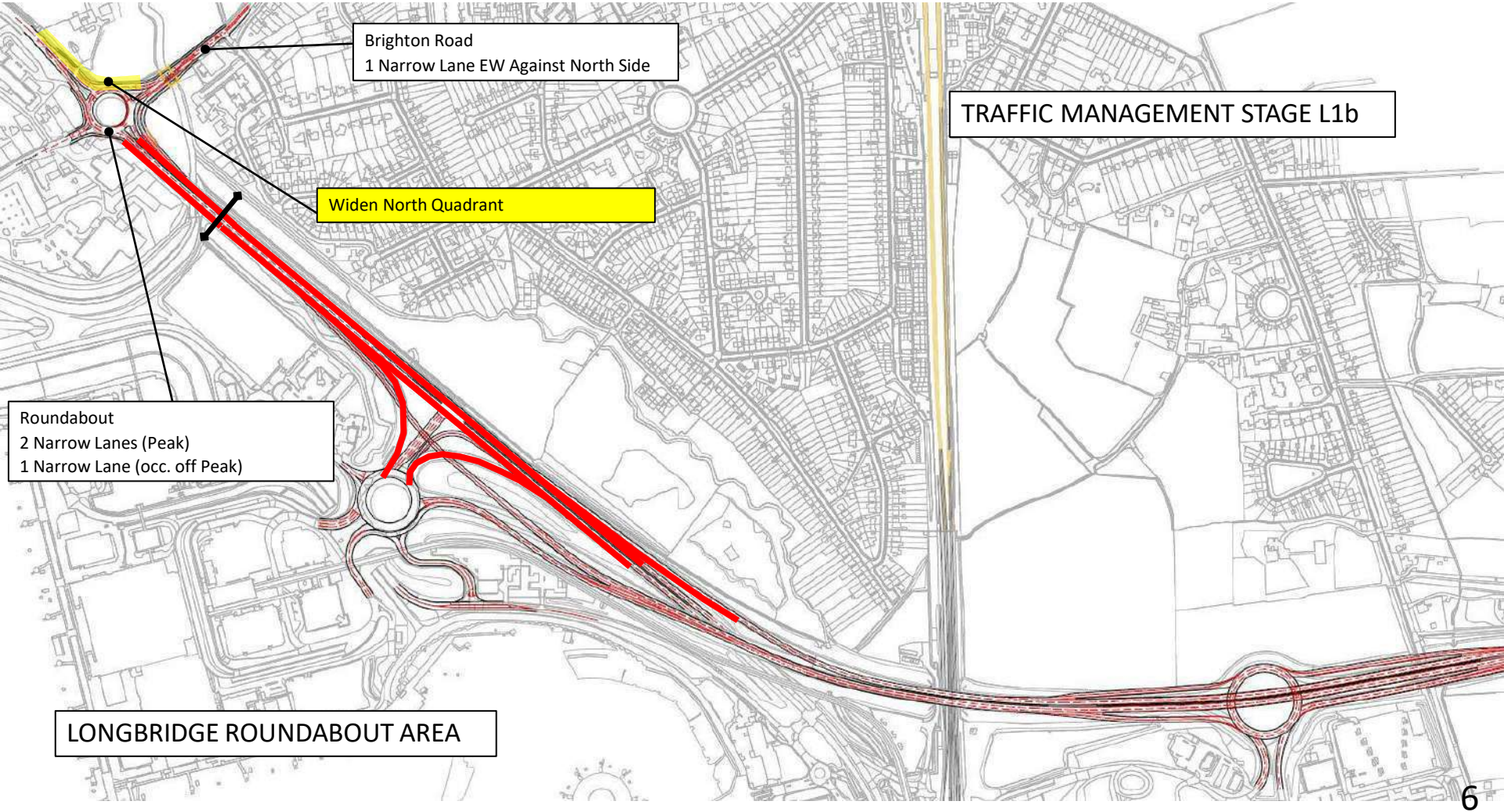
WORKS / TRAFFIC MANAGEMENT AREAS

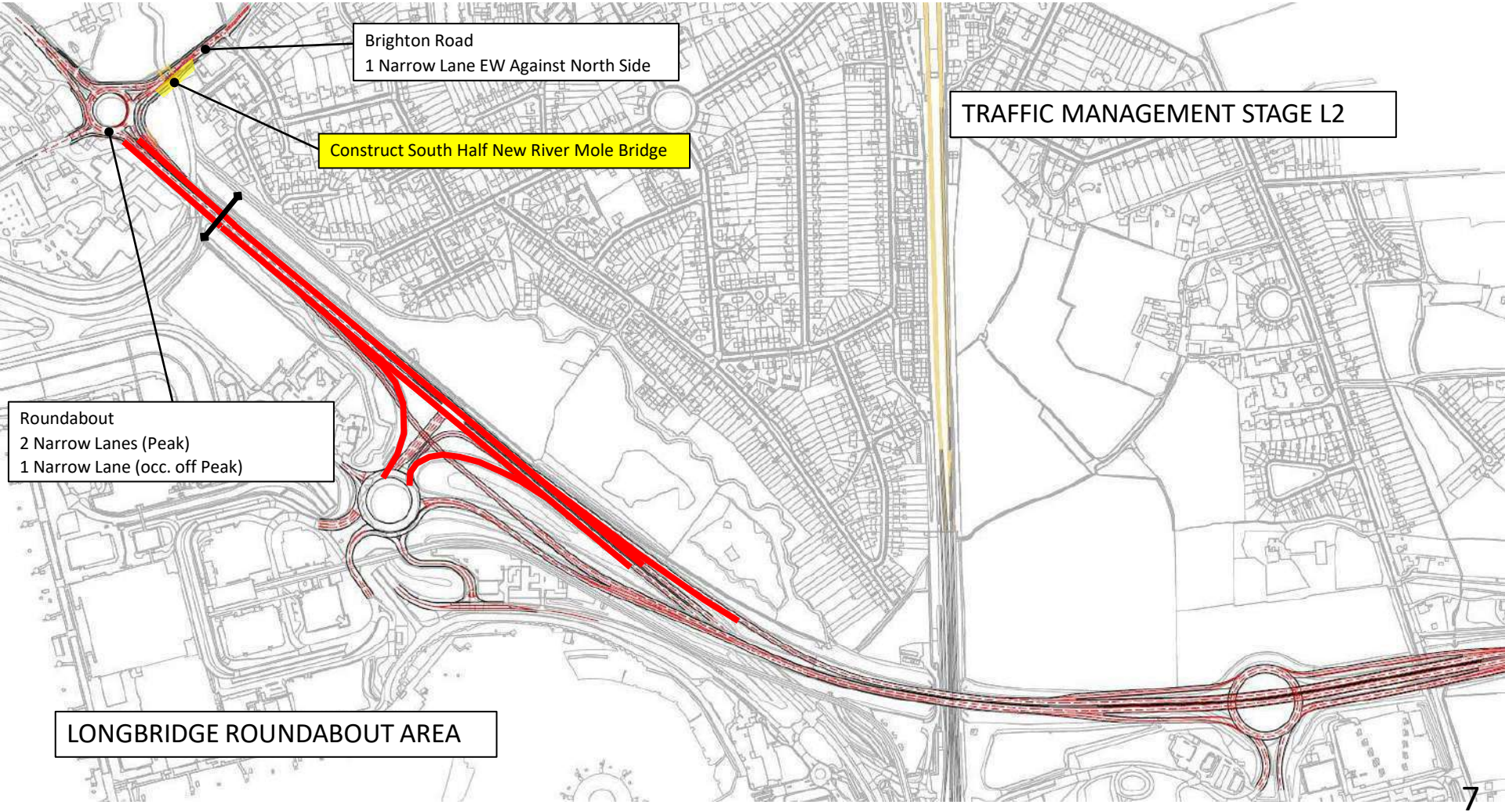
LONDON GATWICK

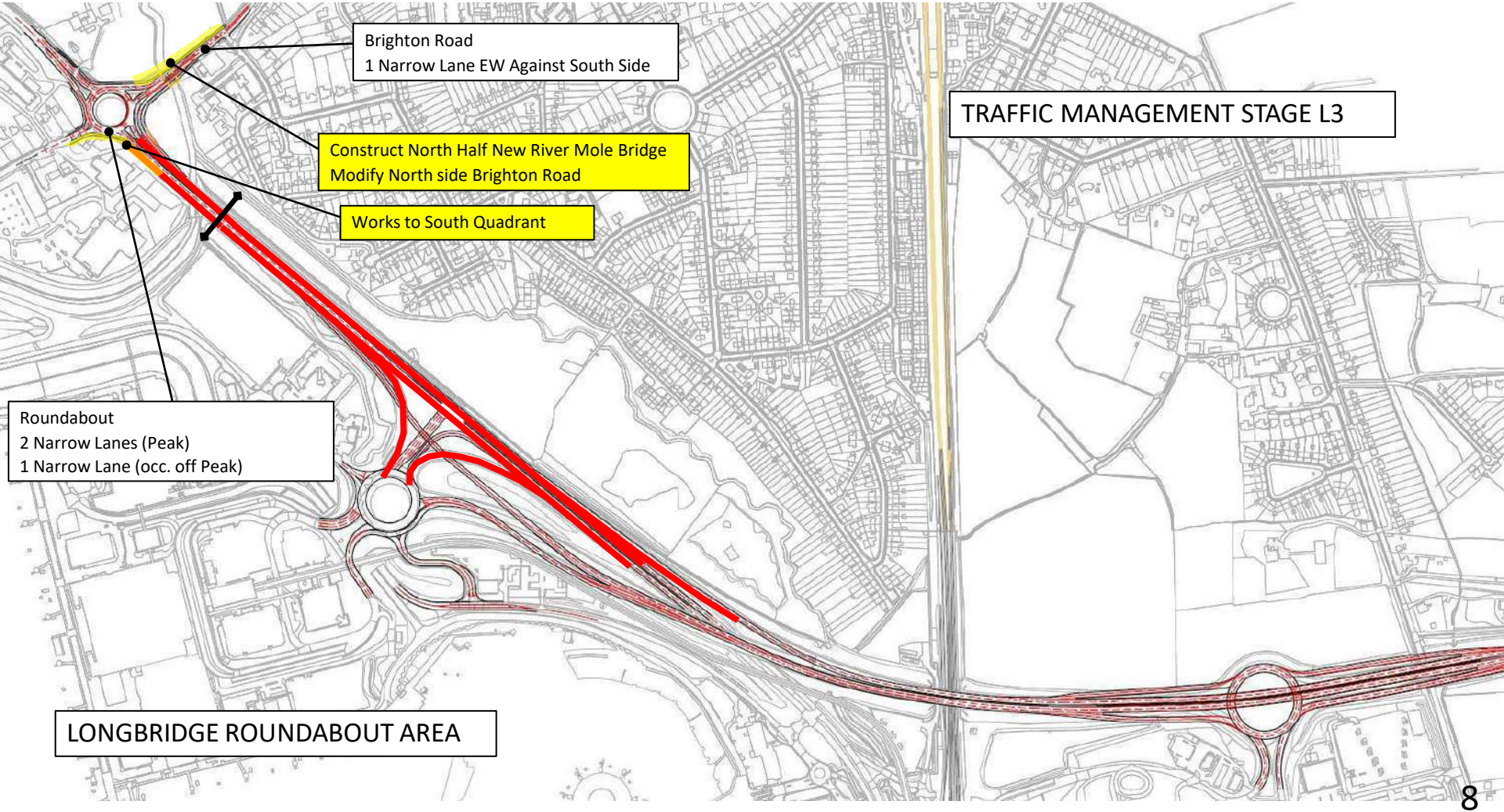
LONGBRIDGE ROUNDABOUT AREA CONSTRUCTION STAGES SKETCHES

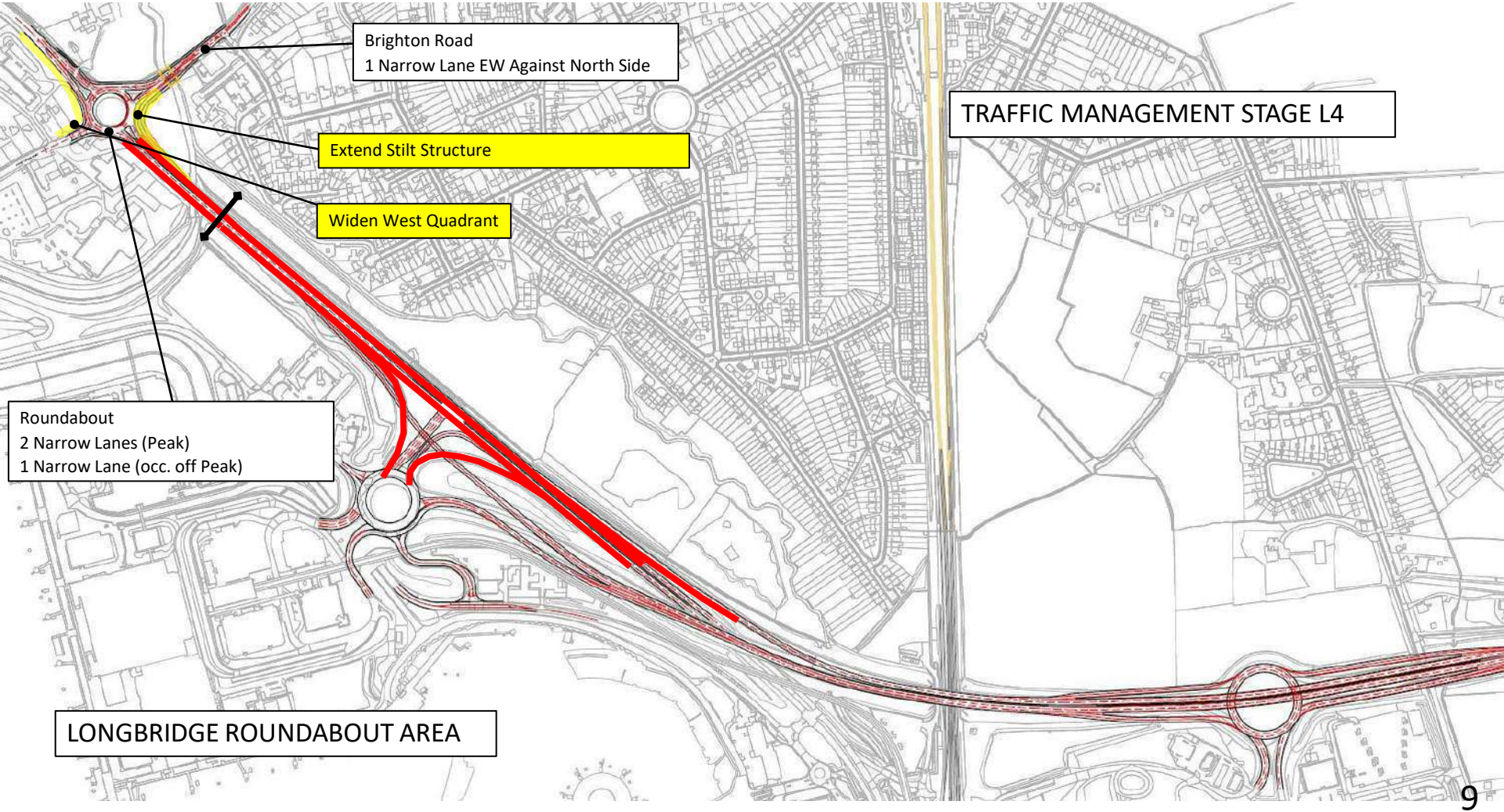
1. L1a
2. L1b
3. L2
4. L3
5. L4
6. L5a
7. L5b

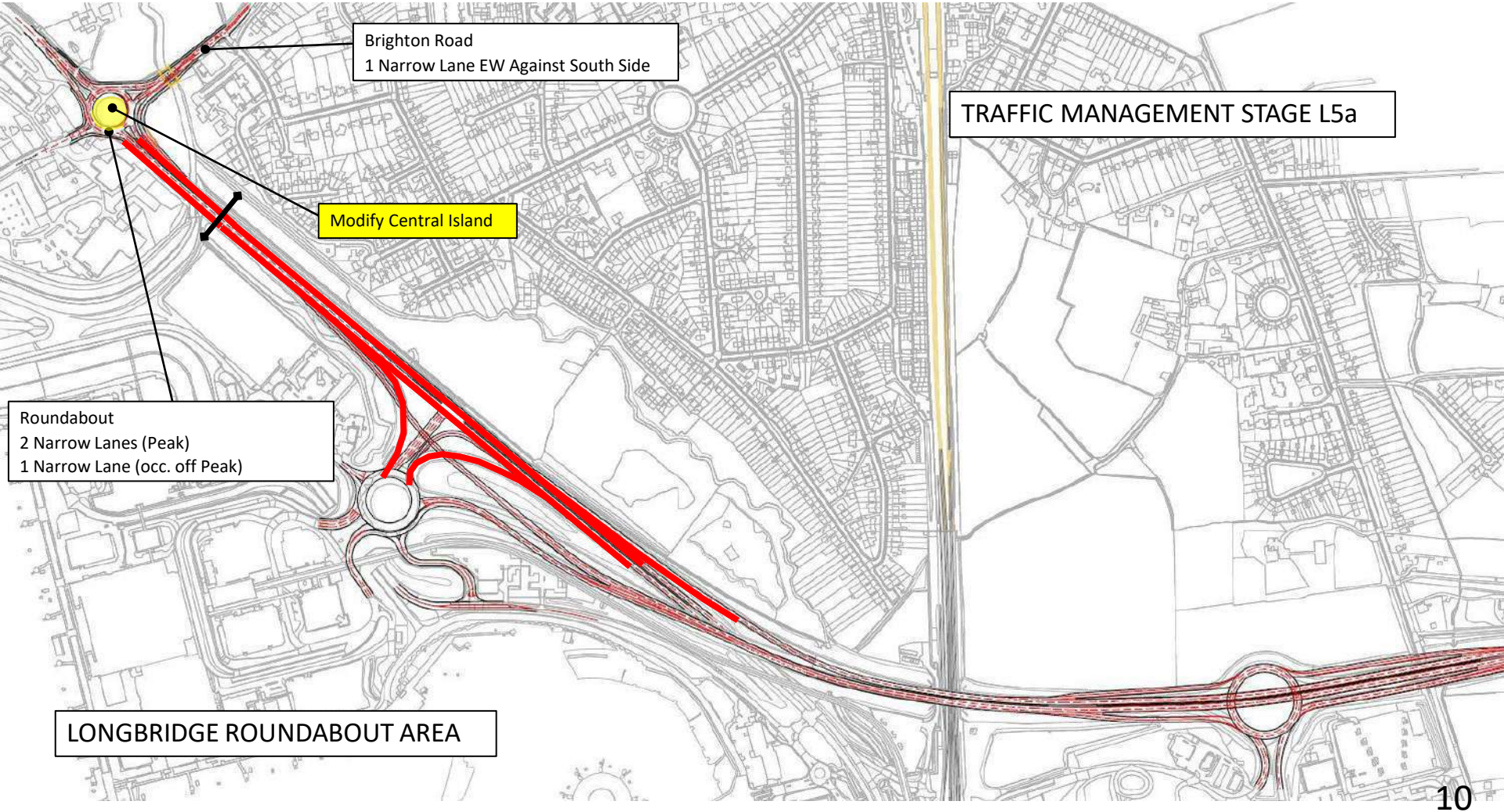

Brighton Road
1 Narrow Lane EW
Divert Utilities off River Mole Bridge
Remove Existing Traffic Islands
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
TRAFFIC MANAGEMENT STAGE L1a
LONGBRIDGE ROUNDABOUT AREA

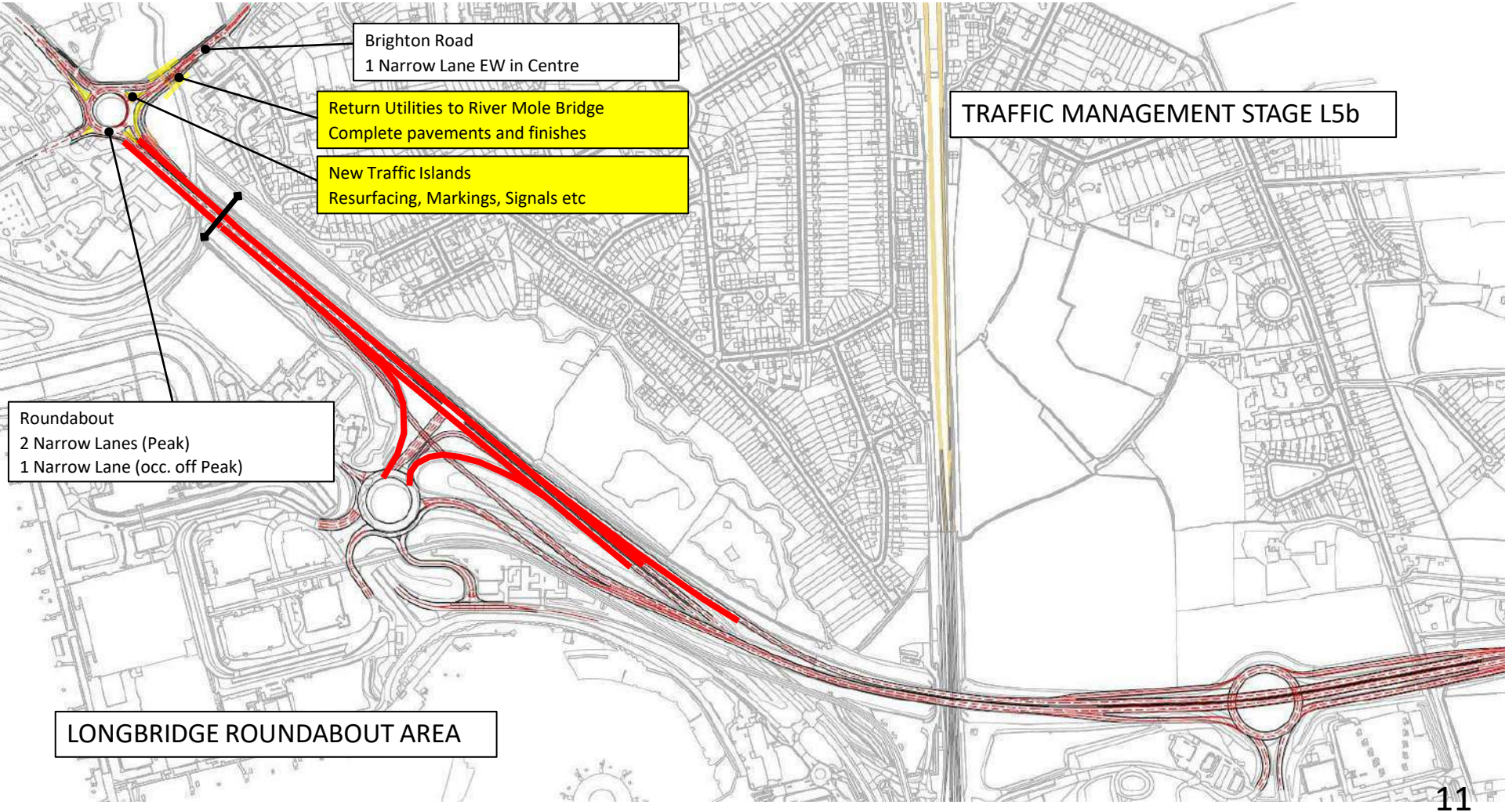

Brighton Road
1 Narrow Lane EW Against North Side
Widen North Quadrant
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
TRAFFIC MANAGEMENT STAGE L1b
LONGBRIDGE ROUNDABOUT AREA


Brighton Road
1 Narrow Lane EW Against North Side
Construct South Half New River Mole Bridge
TRAFFIC MANAGEMENT STAGE L2
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
LONGBRIDGE ROUNDABOUT AREA


Brighton Road
1 Narrow Lane EW Against South Side
Construct North Half New River Mole Bridge
Modify North side Brighton Road
Works to South Quadrant
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
TRAFFIC MANAGEMENT STAGE L3
LONGBRIDGE ROUNDABOUT AREA

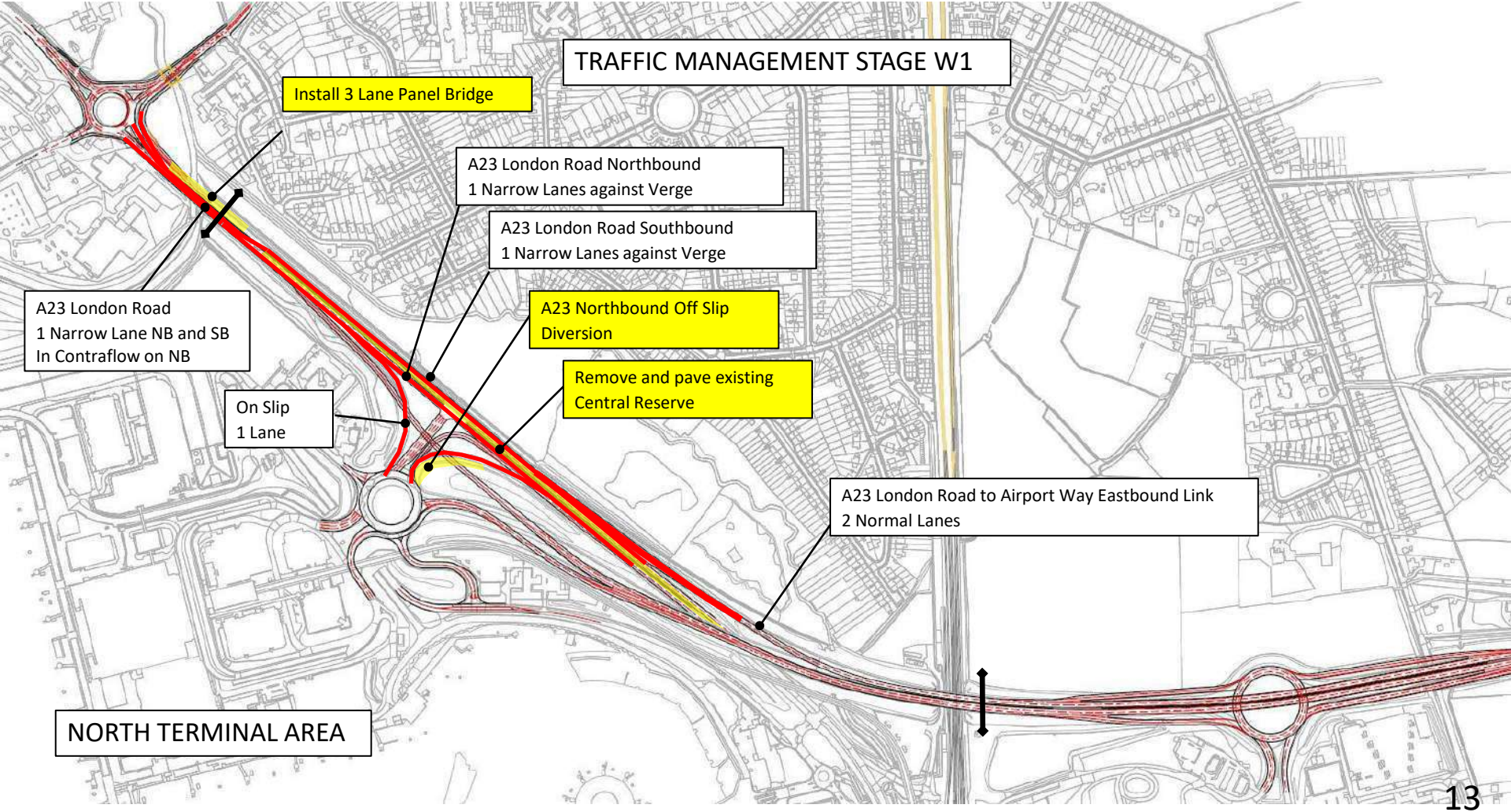

Brighton Road
1 Narrow Lane EW Against North Side
Extend Stilt Structure
Widen West Quadrant
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
TRAFFIC MANAGEMENT STAGE L4
LONGBRIDGE ROUNDABOUT AREA

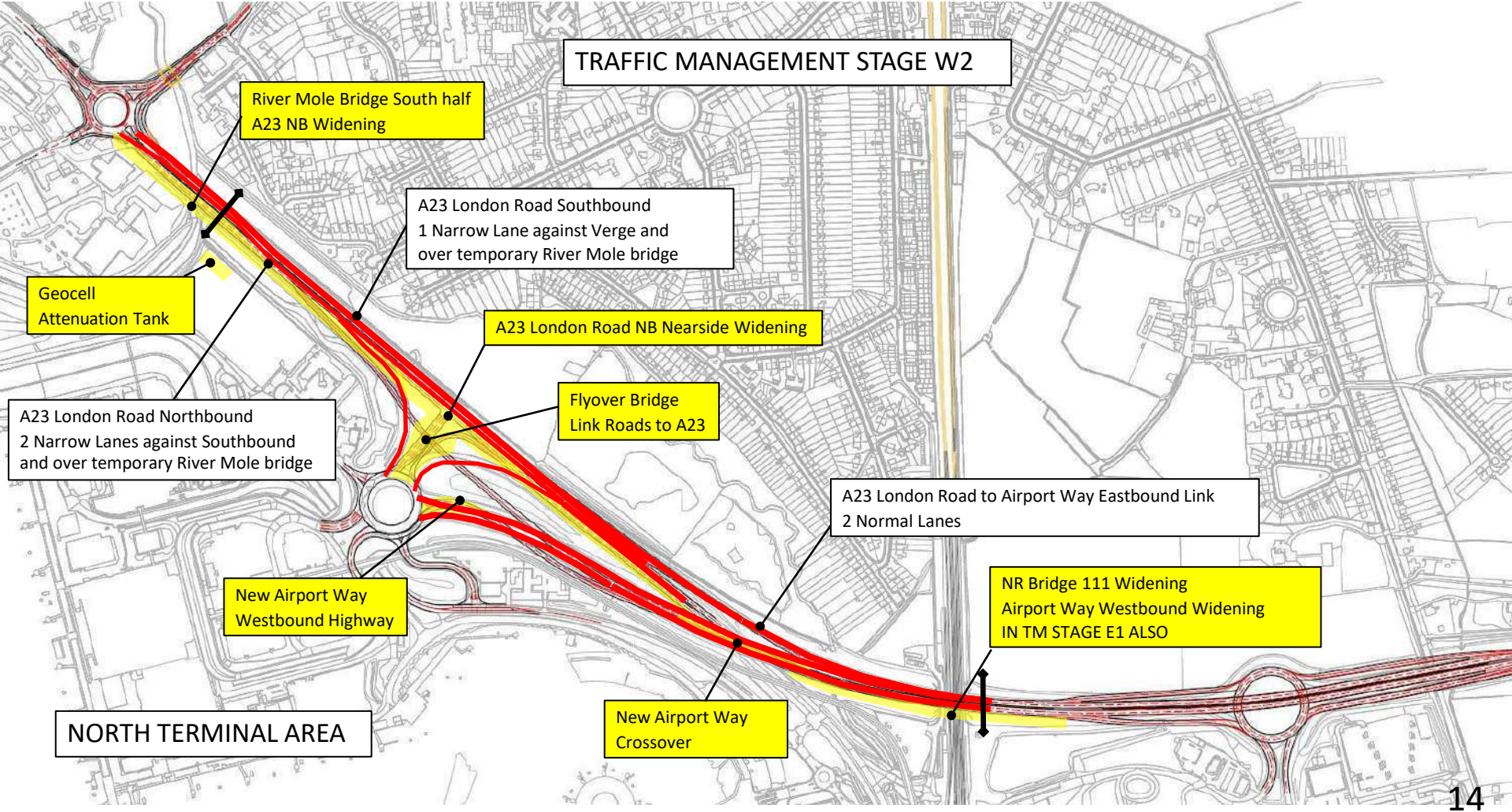

Brighton Road
1 Narrow Lane EW Against South Side
Modify Central Island
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
TRAFFIC MANAGEMENT STAGE L5a
LONGBRIDGE ROUNDABOUT AREA

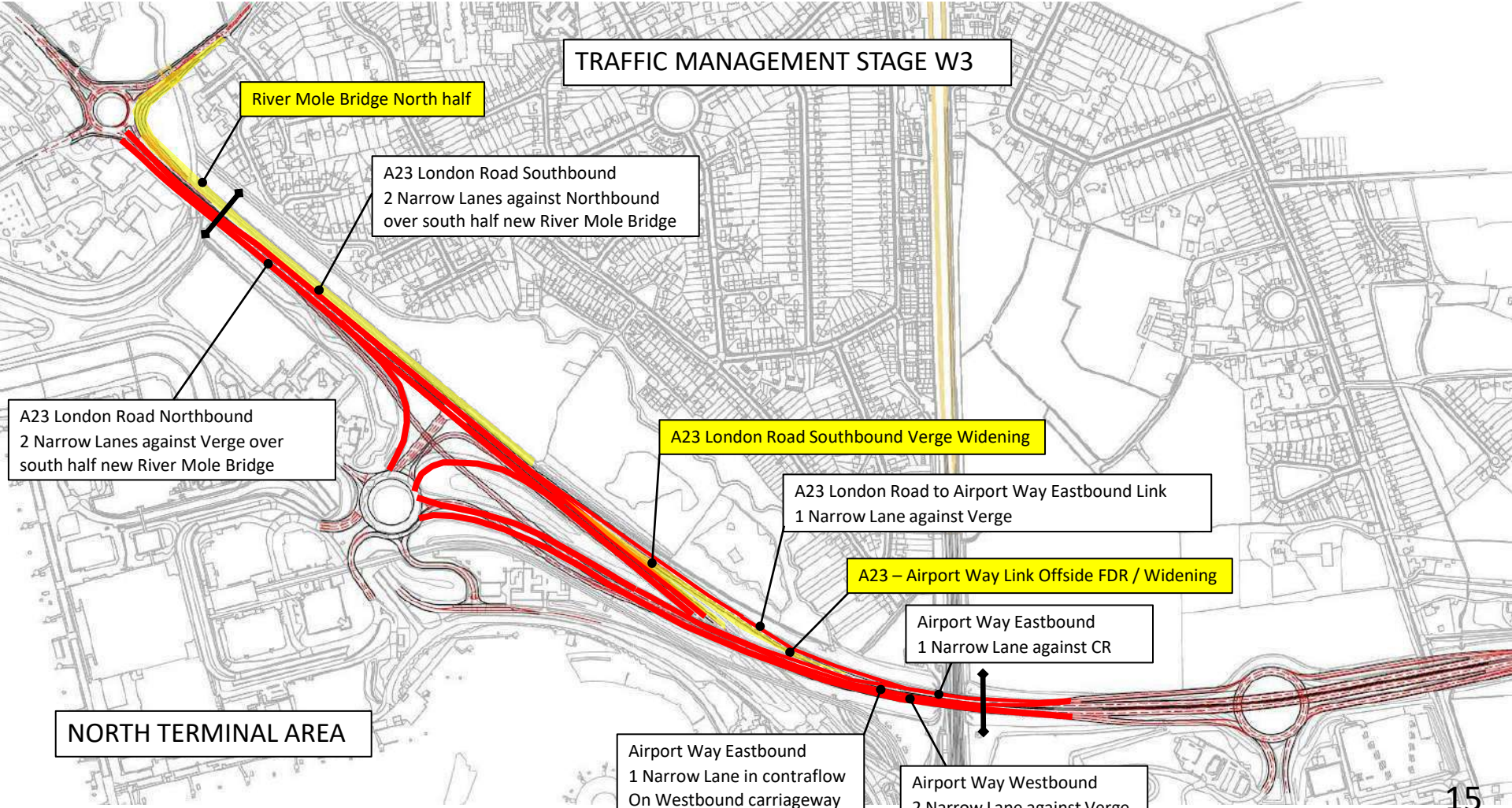

Brighton Road
1 Narrow Lane EW in Centre
Return Utilities to River Mole Bridge
Complete pavements and finishes
New Traffic Islands
Resurfacing, Markings, Signals etc
TRAFFIC MANAGEMENT STAGE L5b
Roundabout
2 Narrow Lanes (Peak)
1 Narrow Lane (occ. off Peak)
LONGBRIDGE ROUNDABOUT AREA

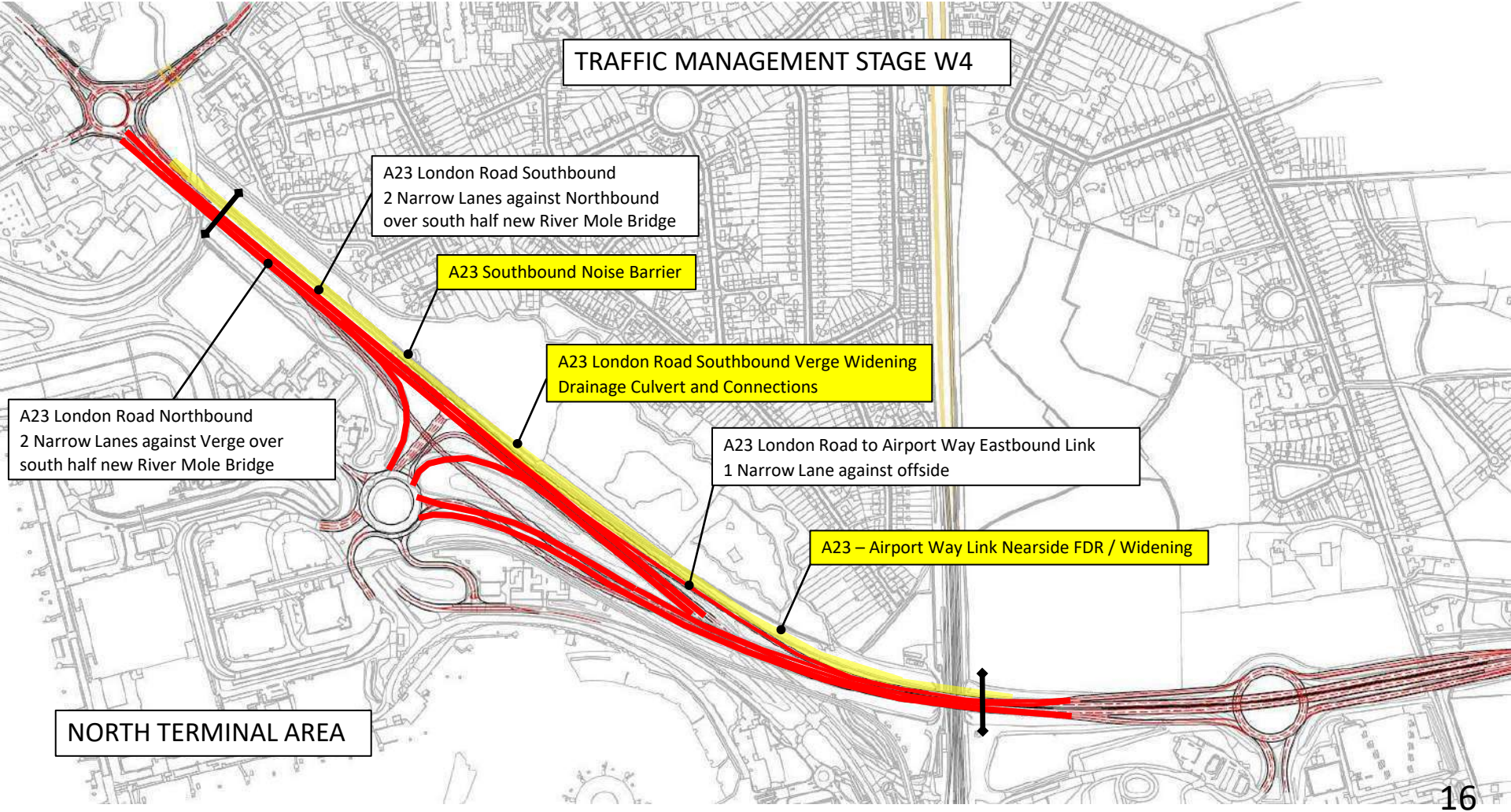
NOTRH TERMINAL ROUNDABOUT AREA

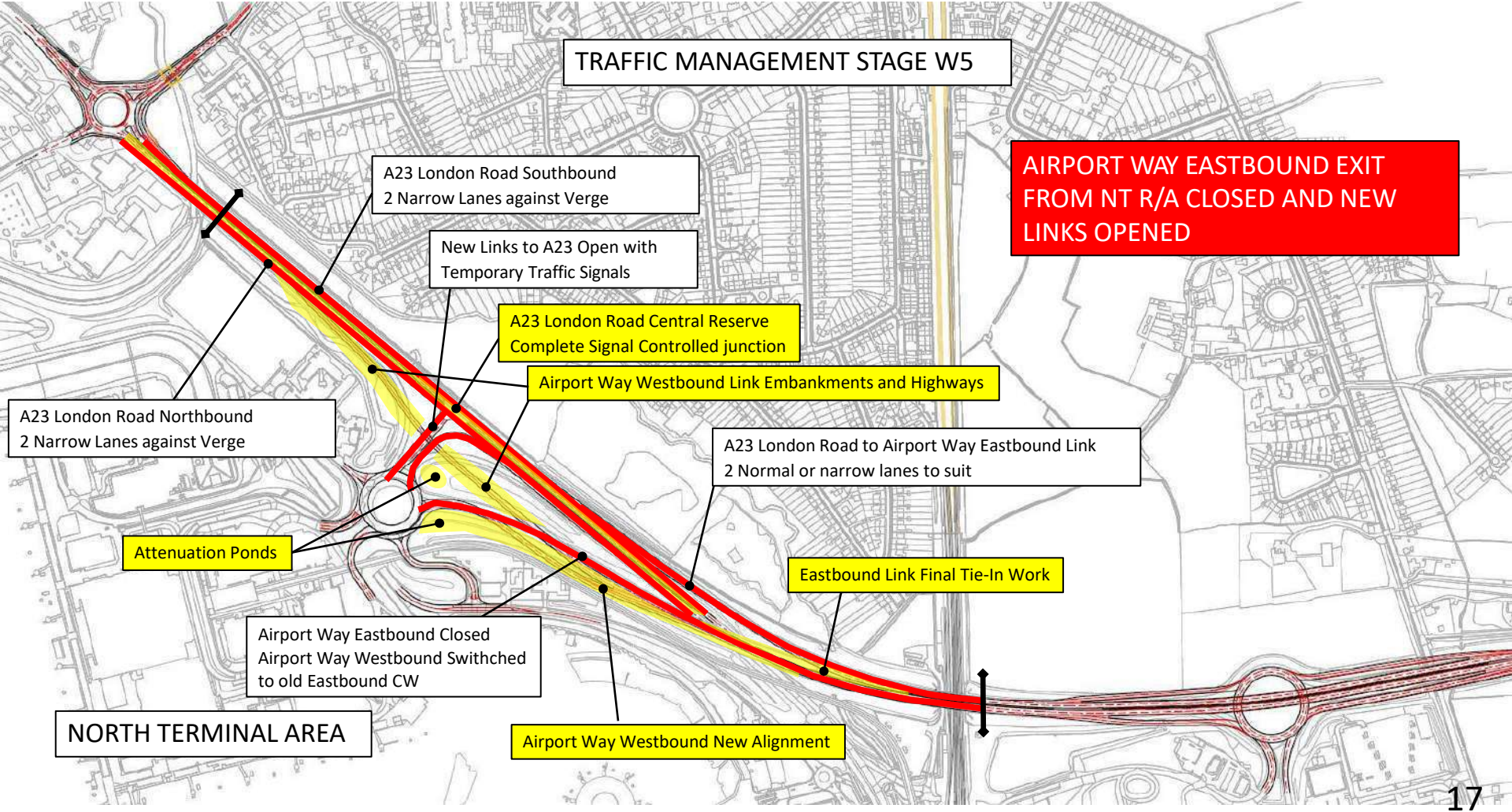
1. **W1**
2. **W2**
3. **W3**
4. **W4**
5. **W5**
6. **W6**

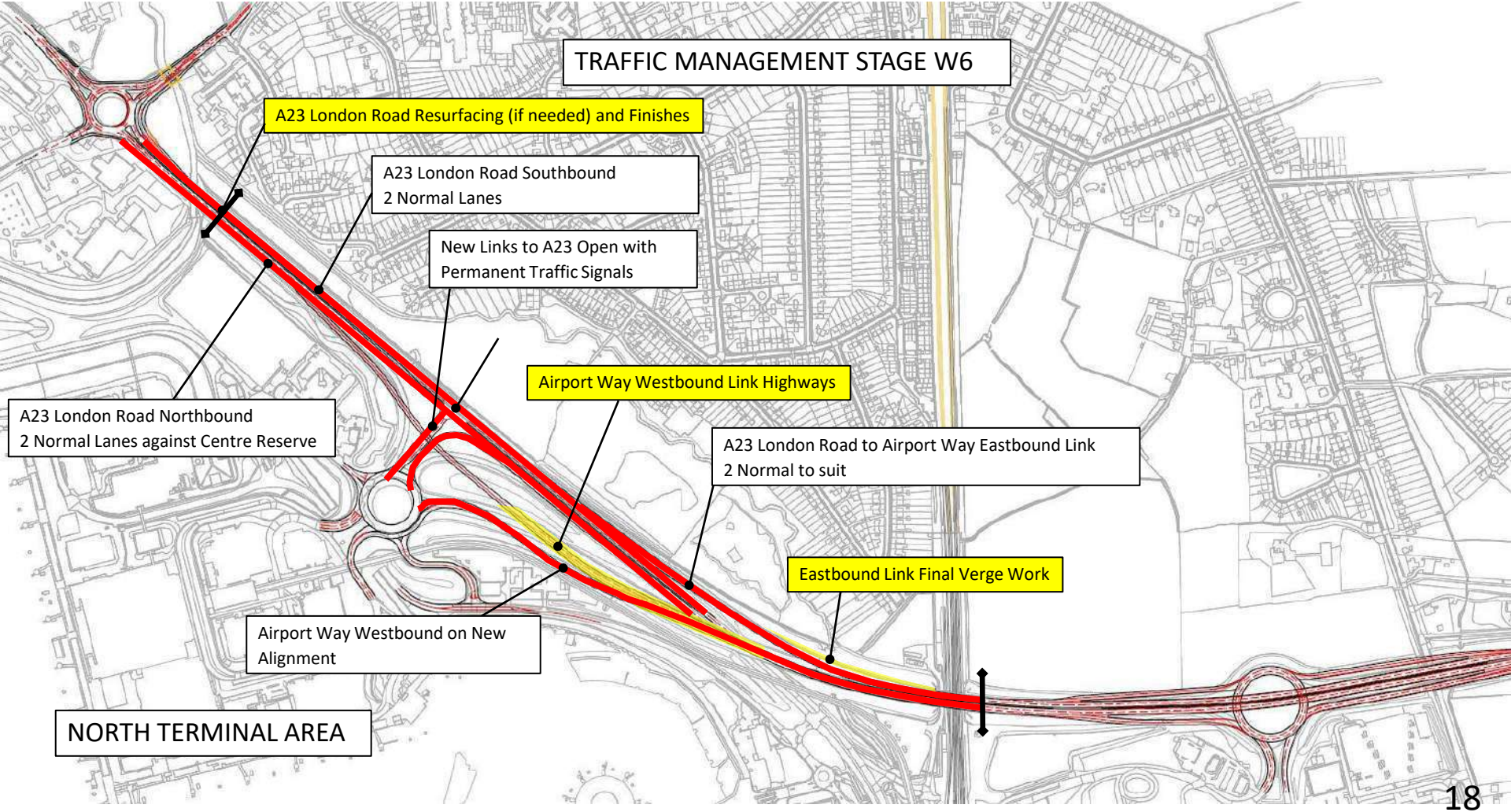

TRAFFIC MANAGEMENT STAGE W1
Install 3 Lane Panel Bridge
A23 London Road Northbound
1 Narrow Lanes against Verge
A23 London Road Southbound
1 Narrow Lanes against Verge
A23 London Road
1 Narrow Lane NB and SB
In Contraflow on NB
A23 Northbound Off Slip
Diversion
Remove and pave existing
Central Reserve
On Slip
1 Lane
A23 London Road to Airport Way Eastbound Link
2 Normal Lanes
NORTH TERMINAL AREA


TRAFFIC MANAGEMENT STAGE W2
River Mole Bridge South half
A23 NB Widening
A23 London Road Southbound
1 Narrow Lane against Verge and
over temporary River Mole bridge
Geocell
Attenuation Tank
A23 London Road NB Nearside Widening
A23 London Road Northbound
2 Narrow Lanes against Southbound
and over temporary River Mole bridge
Flyover Bridge
Link Roads to A23
A23 London Road to Airport Way Eastbound Link
2 Normal Lanes
New Airport Way
Westbound Highway
NR Bridge 111 Widening
Airport Way Westbound Widening
IN TM STAGE E1 ALSO
New Airport Way
Crossover
NORTH TERMINAL AREA


TRAFFIC MANAGEMENT STAGE W3
River Mole Bridge North half
A23 London Road Southbound
2 Narrow Lanes against Northbound
over south half new River Mole Bridge
A23 London Road Northbound
2 Narrow Lanes against Verge over
south half new River Mole Bridge
A23 London Road Southbound Verge Widening
A23 London Road to Airport Way Eastbound Link
1 Narrow Lane against Verge
A23 – Airport Way Link Offside FDR / Widening
Airport Way Eastbound
1 Narrow Lane against CR
NORTH TERMINAL AREA
Airport Way Eastbound
1 Narrow Lane in contraflow
On Westbound carriageway
Airport Way Westbound
2 Narrow Lane against Verge

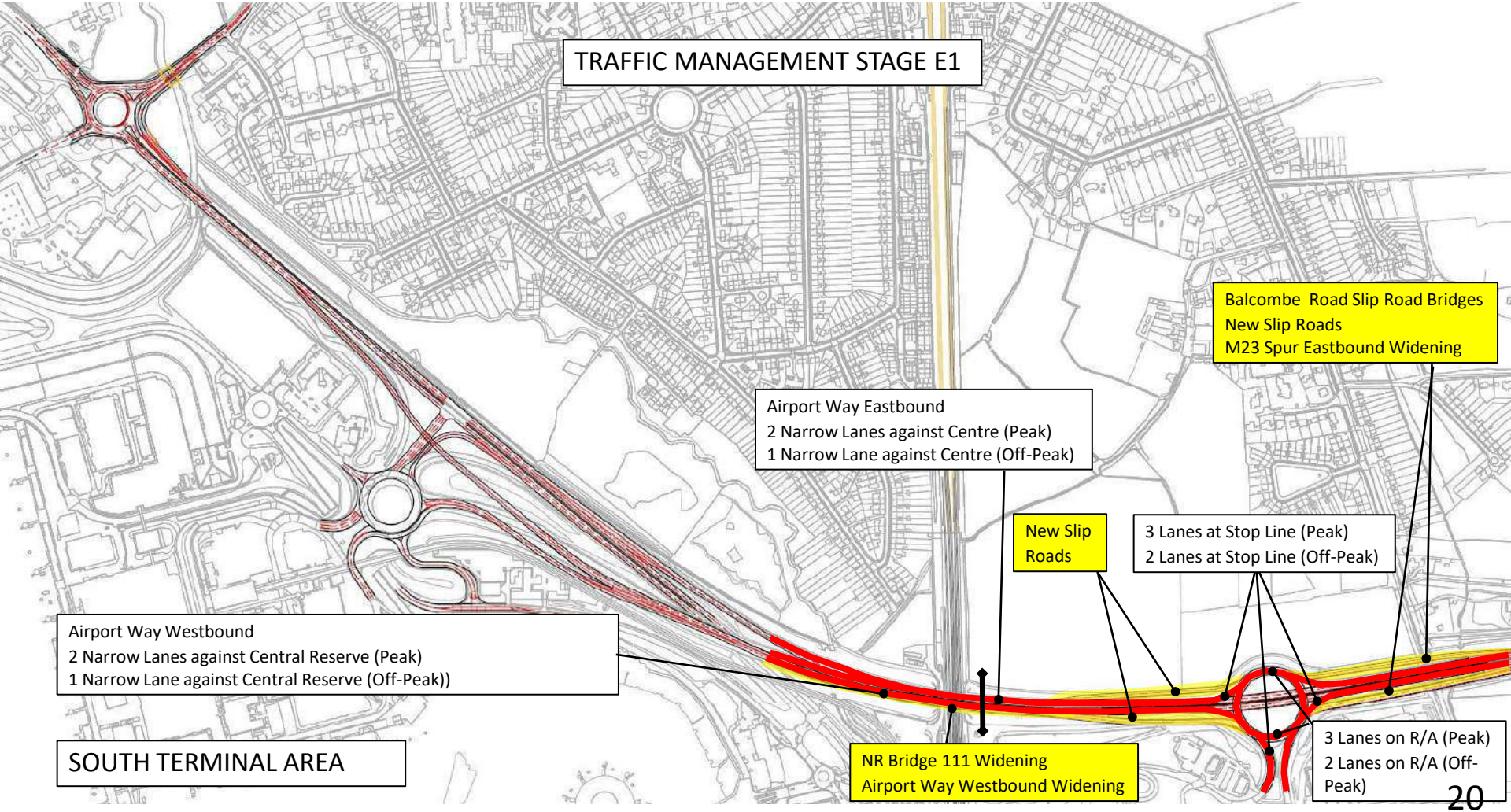

TRAFFIC MANAGEMENT STAGE W4
A23 London Road Southbound
2 Narrow Lanes against Northbound
over south half new River Mole Bridge
A23 Southbound Noise Barrier
A23 London Road Southbound Verge Widening
Drainage Culvert and Connections
A23 London Road Northbound
2 Narrow Lanes against Verge over
south half new River Mole Bridge
A23 London Road to Airport Way Eastbound Link
1 Narrow Lane against offside
A23 – Airport Way Link Nearside FDR / Widening
NORTH TERMINAL AREA

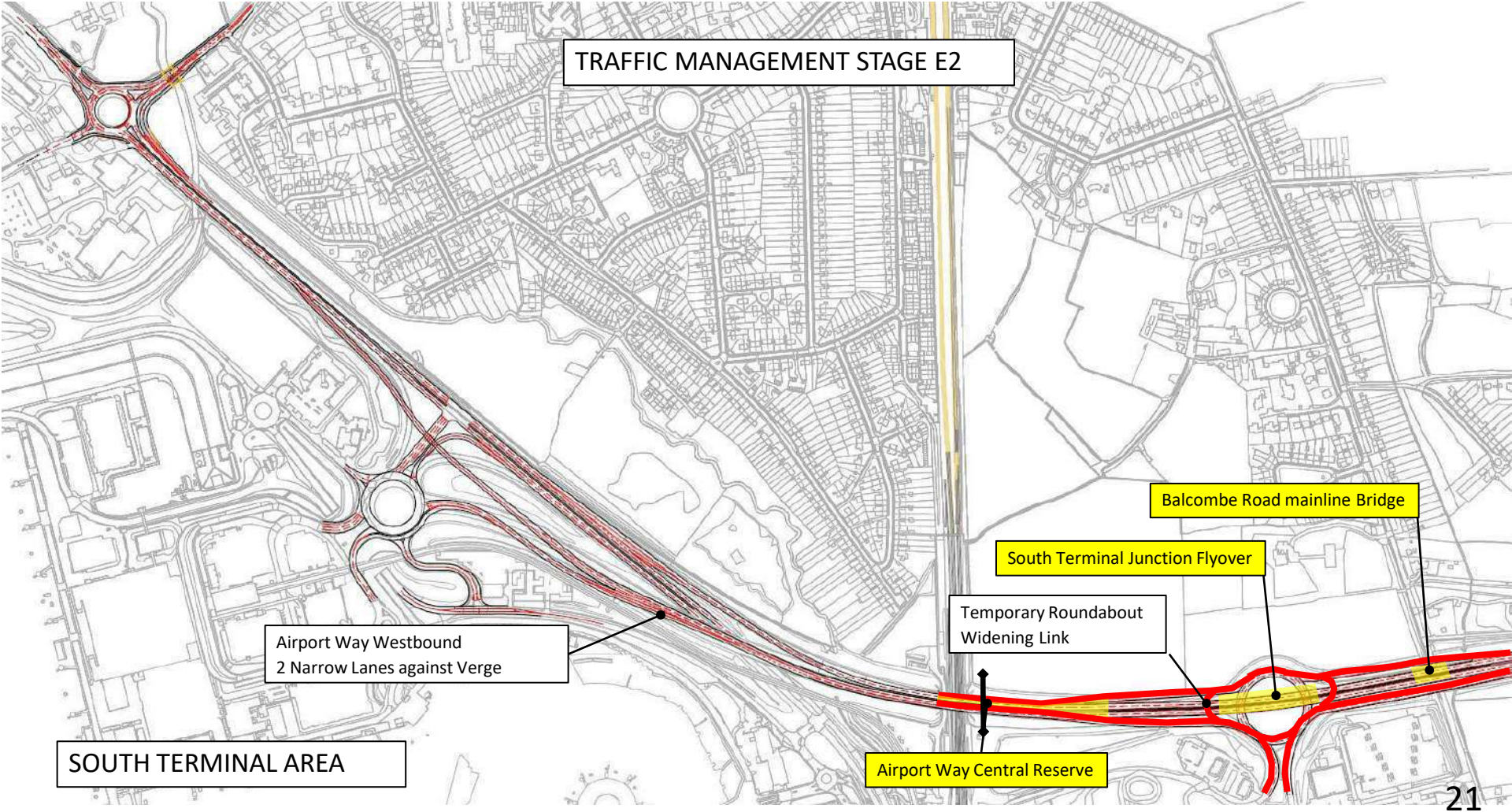

TRAFFIC MANAGEMENT STAGE W5
AIRPORT WAY EASTBOUND EXIT FROM NT R/A CLOSED AND NEW LINKS OPENED
A23 London Road Southbound
2 Narrow Lanes against Verge
New Links to A23 Open with
Temporary Traffic Signals
A23 London Road Central Reserve
Complete Signal Controlled junction
Airport Way Westbound Link Embankments and Highways
A23 London Road Northbound
2 Narrow Lanes against Verge
A23 London Road to Airport Way Eastbound Link
2 Normal or narrow lanes to suit
Attenuation Ponds
Eastbound Link Final Tie-In Work
Airport Way Eastbound Closed
Airport Way Westbound Swithched
to old Eastbound CW
NORTH TERMINAL AREA
Airport Way Westbound New Alignment

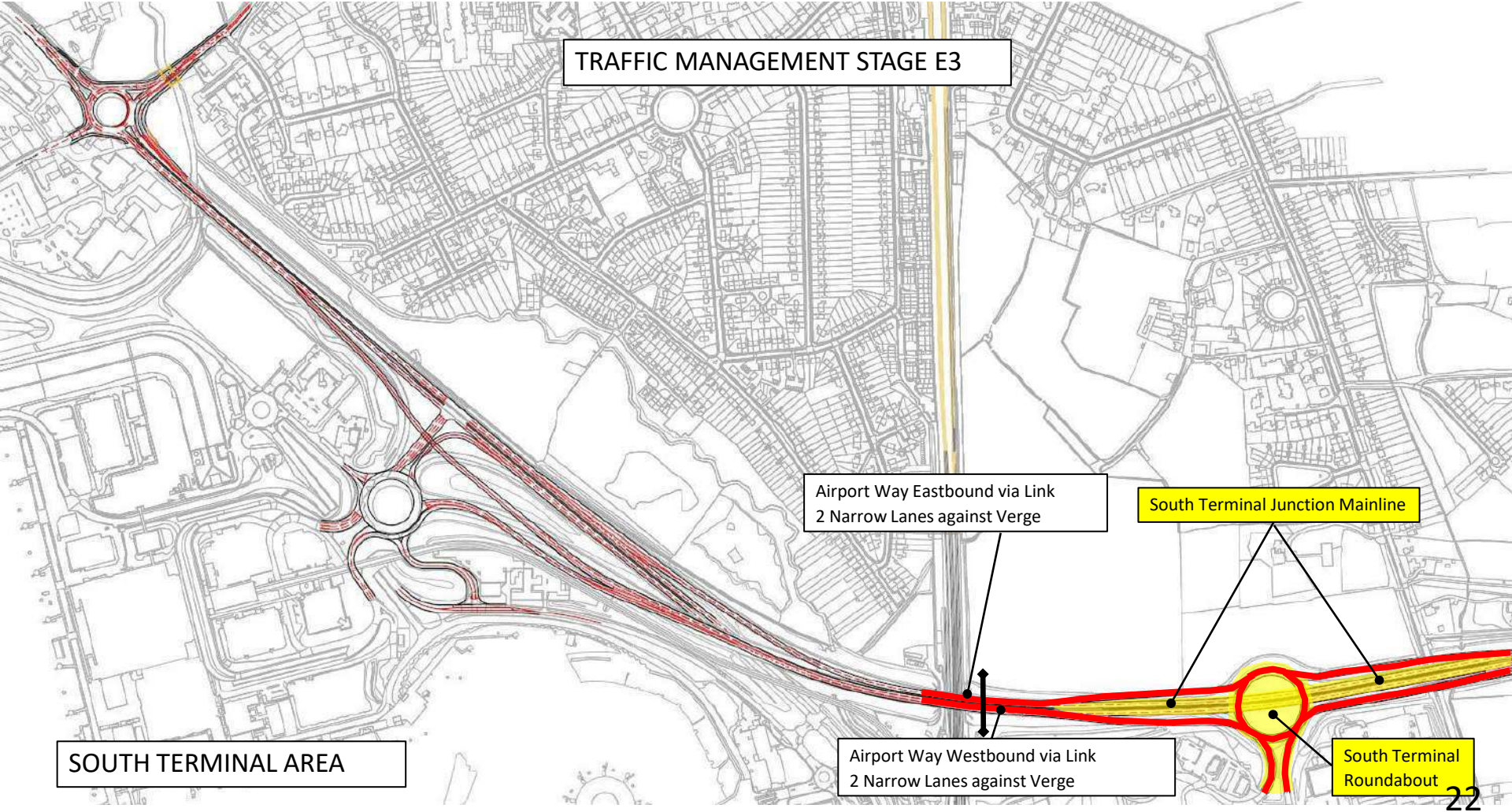

TRAFFIC MANAGEMENT STAGE W6
A23 London Road Resurfacing (if needed) and Finishes
A23 London Road Southbound
2 Normal Lanes
New Links to A23 Open with
Permanent Traffic Signals
A23 London Road Northbound
2 Normal Lanes against Centre Reserve
Airport Way Westbound Link Highways
A23 London Road to Airport Way Eastbound Link
2 Normal to suit
Eastbound Link Final Verge Work
Airport Way Westbound on New
Alignment
NORTH TERMINAL AREA

SOUTH TERMINAL ROUNDABOUT AREA

1. **E1**
2. **E2**
3. **E3**


TRAFFIC MANAGEMENT STAGE E1
Balcombe Road Slip Road Bridges
New Slip Roads
M23 Spur Eastbound Widening
Airport Way Eastbound
2 Narrow Lanes against Centre (Peak)
1 Narrow Lane against Centre (Off-Peak)
New Slip Roads
3 Lanes at Stop Line (Peak)
2 Lanes at Stop Line (Off-Peak)
Airport Way Westbound
2 Narrow Lanes against Central Reserve (Peak)
1 Narrow Lane against Central Reserve (Off-Peak))
SOUTH TERMINAL AREA
NR Bridge 111 Widening
Airport Way Westbound Widening
3 Lanes on R/A (Peak)
2 Lanes on R/A (Off-Peak)


TRAFFIC MANAGEMENT STAGE E2
Balcombe Road mainline Bridge
South Terminal Junction Flyover
Temporary Roundabout
Widening Link
Airport Way Westbound
2 Narrow Lanes against Verge
Airport Way Central Reserve
SOUTH TERMINAL AREA


TRAFFIC MANAGEMENT STAGE E3
Airport Way Eastbound via Link
2 Narrow Lanes against Verge
South Terminal Junction Mainline
SOUTH TERMINAL AREA
Airport Way Westbound via Link
2 Narrow Lanes against Verge
South Terminal
Roundabout

Appendix B - Method Visual: A23 Brighton Road Bridge over River Mole

Buildability Report - Part B
Method visuals - Structures

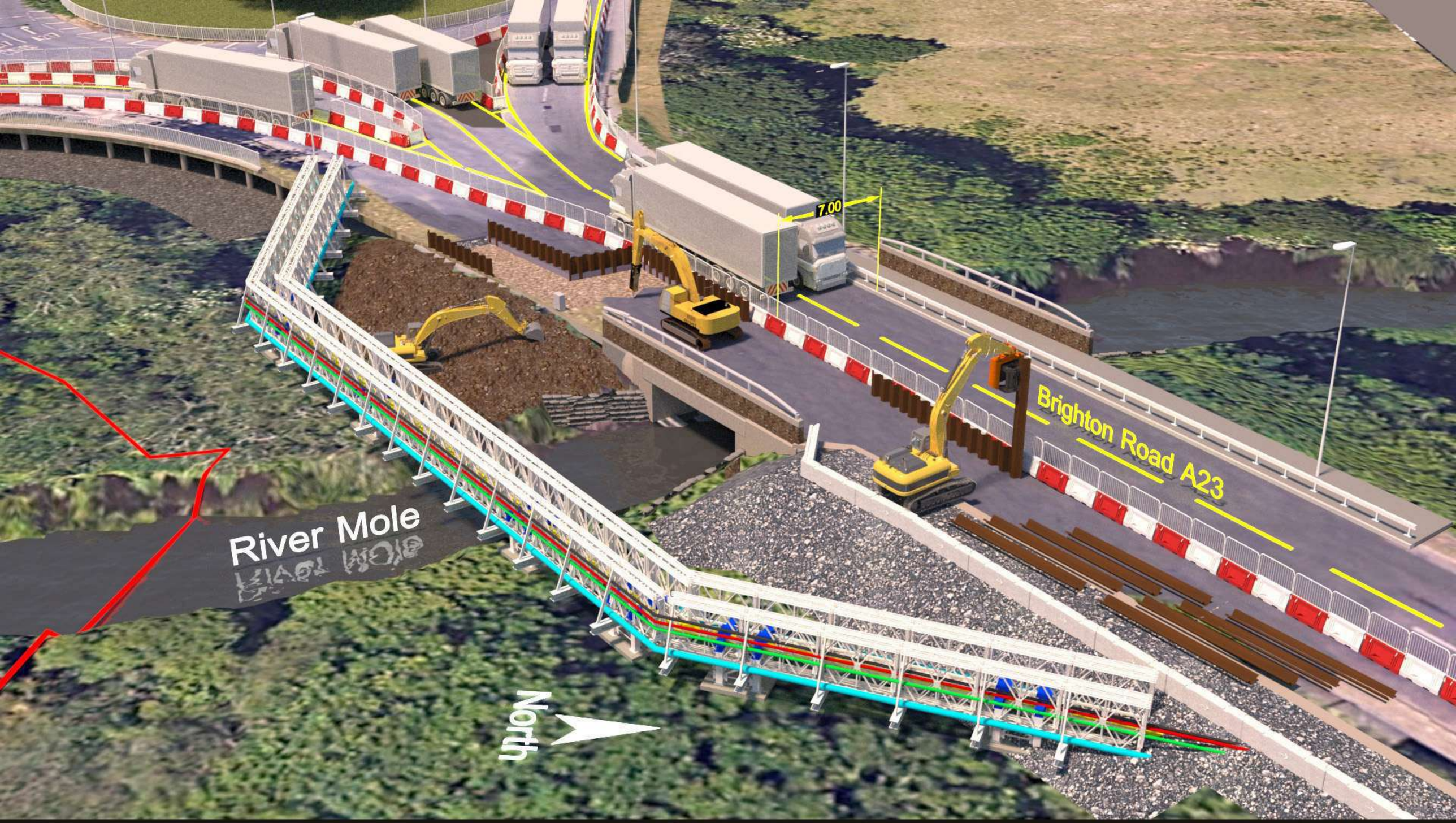
Appendix B

A23 Brighton Road Bridge over River Mole

LONDON GATWICK

POWERED BY VINCI AIRPORTS | GLOBAL INFRASTRUCTURE PARTNERS

A23 Brighton Road Bridge over River Mole **Stage 0: Existing**



A23 Brighton Road Bridge over River Mole

Stage 1: Install TM, divert services, site clearance & sheet piling

A23 Brighton Road Bridge over River Mole

Stage 2: Bulk excavate to reduced level, Piling new south abutments

A23 Brighton Road Bridge over River Mole

Stage 3: Demolish existing bridge, south side, to below new soffit level

A23 Brighton Road Bridge over River Mole

Stage 4: Night closure - Install south deck beams

A23 Brighton Road Bridge over River Mole

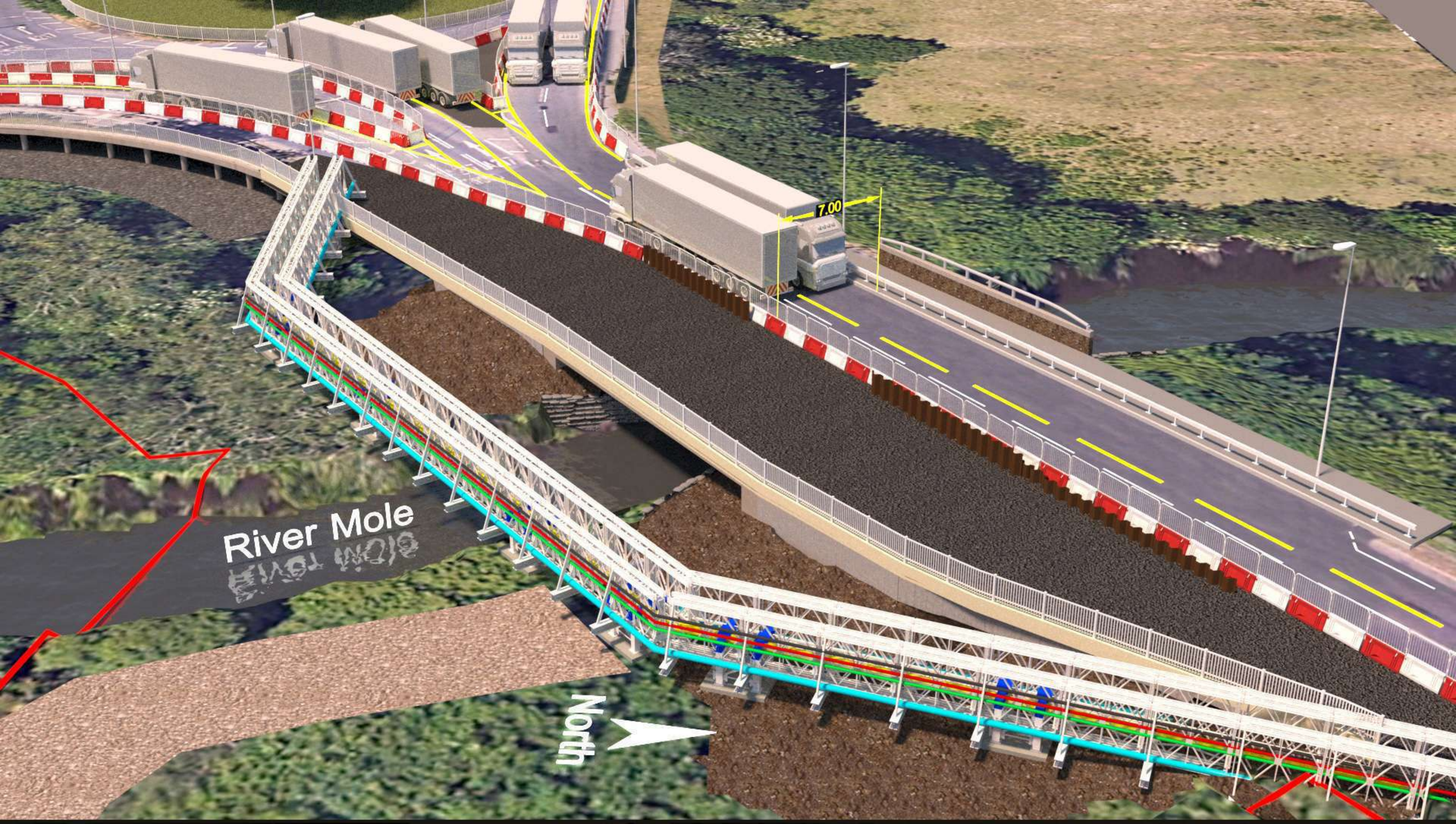
Stage 5: Concrete diaphragms, south side

River Mole

North

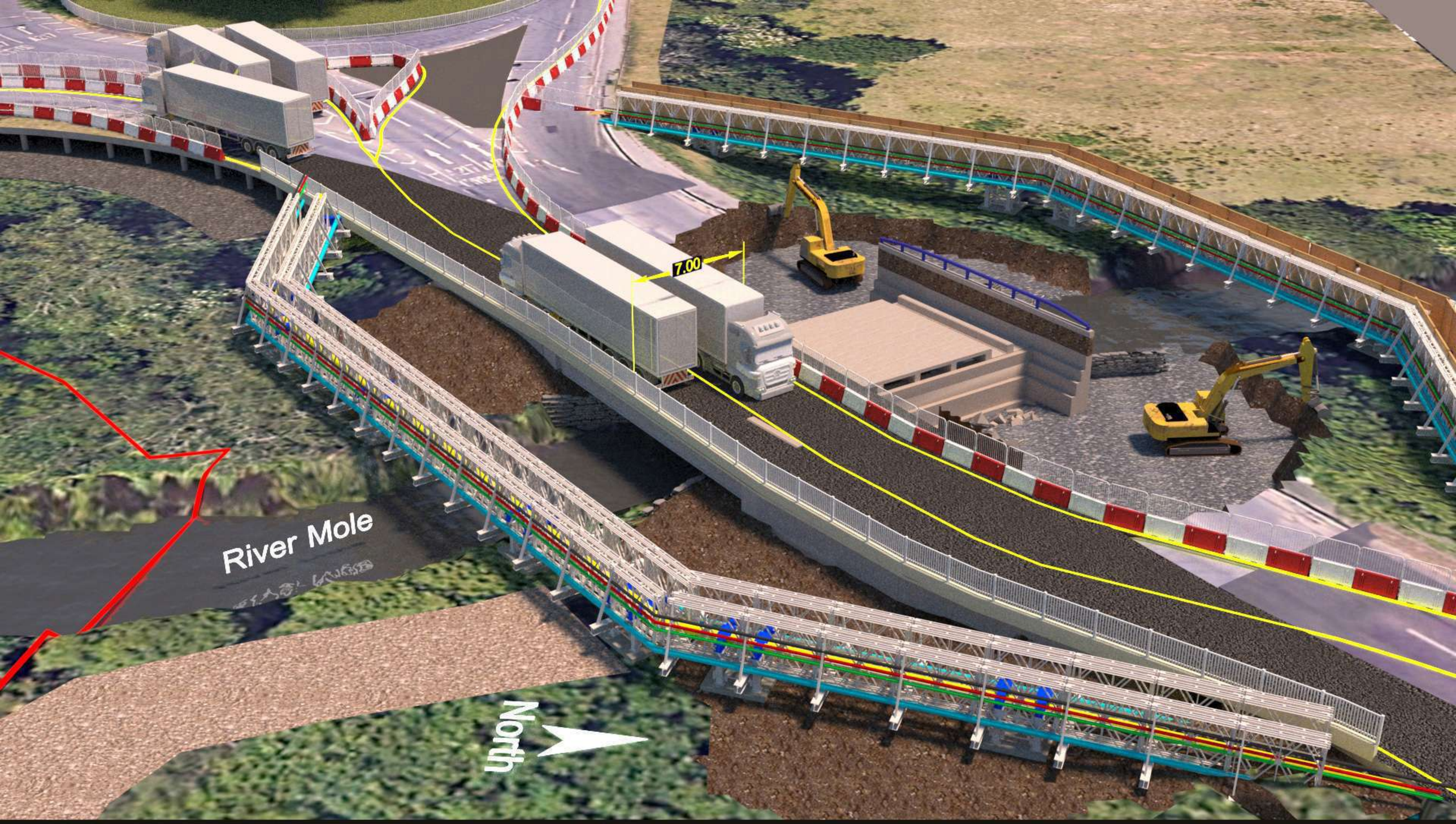
A23 Brighton Road Bridge over River Mole

Stage 6: Concrete deck & retaining walls place compacted fill to structure



A23 Brighton Road Bridge over River Mole

Stage 7: Asphalt finish to road widening, install parapets



A23 Brighton Road Bridge over River Mole

Stage 8: Switch traffic, divert services, excavate to reduced level, north

A23 Brighton Road Bridge over River Mole

Stage 9: Extract sheet piles, expose new south abutments

A23 Brighton Road Bridge over River Mole

Stage 10: Demolish existing bridge, north side, to below new soffit level

A23 Brighton Road Bridge over River Mole

Stage 11: Construct new abutments, place deck beams, north side

A23 Brighton Road Bridge over River Mole

Stage 12: Concrete new deck, north side

A23 Brighton Road Bridge over River Mole

Stage 13: Compacted backfill, lay asphalt for widening, open all lanes

A23 Brighton Road Bridge over River Mole

Stage 14: Re-connect services through new footpaths, landscaping

Appendix C - Method Visual: Longbridge Roundabout SLTL Stilt Structure

Buildability Report - Part B

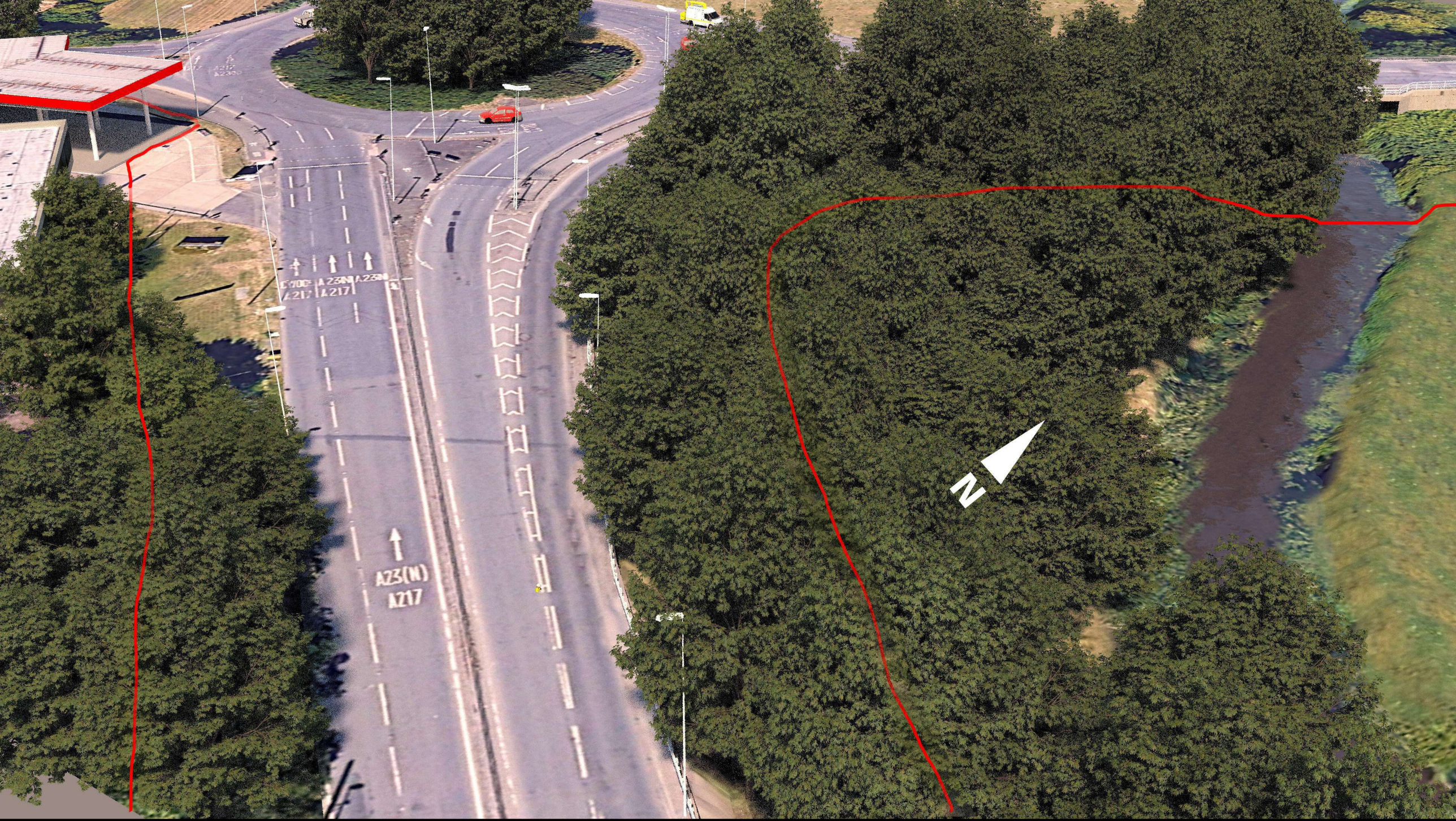
Method visuals - Structures

Appendix C:

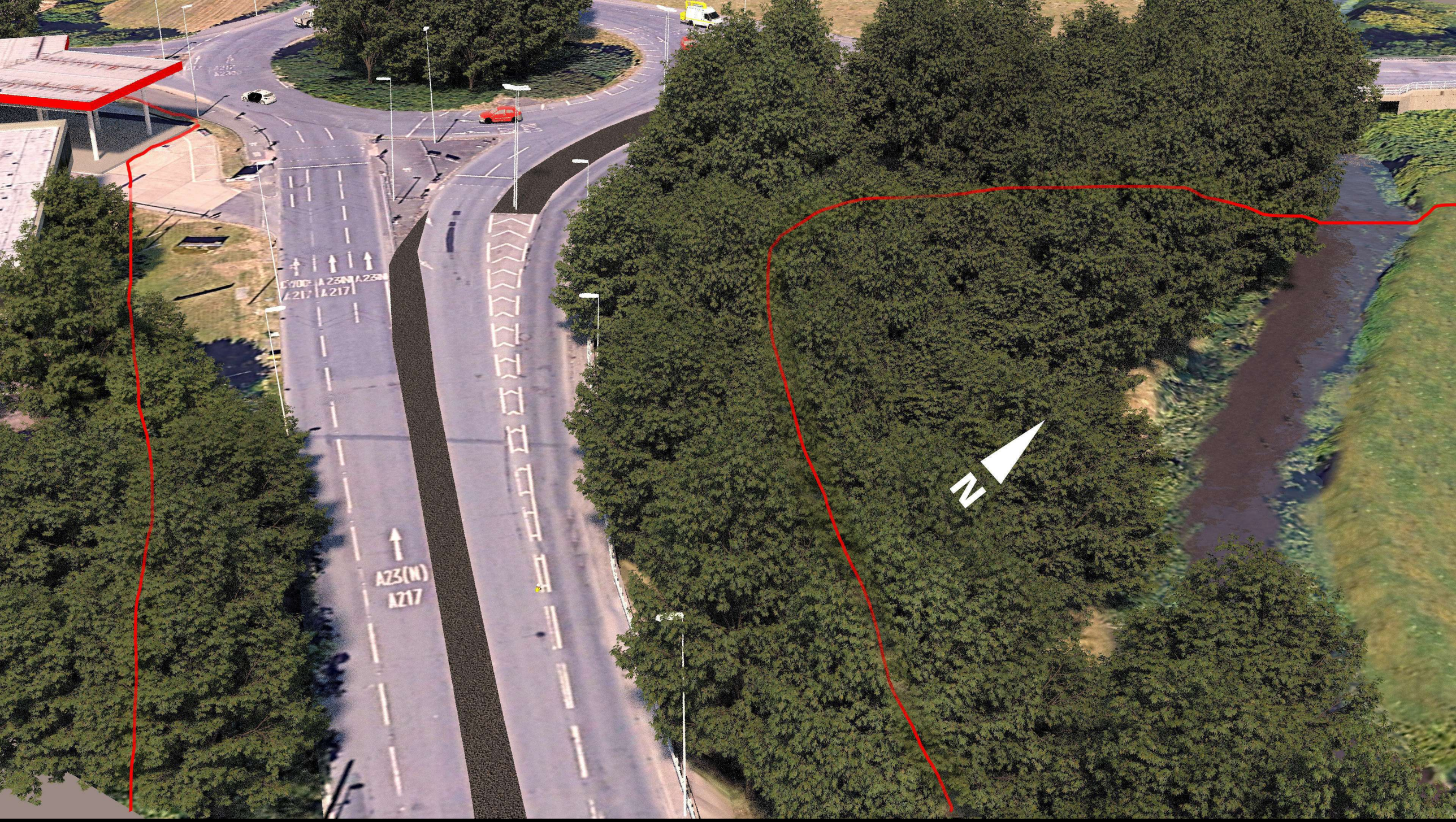
Longbridge roundabout segregated left turn lane stilt structure

LONDON GATWICK

POWERED BY VINCI AIRPORTS | GLOBAL INFRASTRUCTURE PARTNERS



Longbridge Roundabout segregated left turn lane stilt structure **Stage 0: Existing**



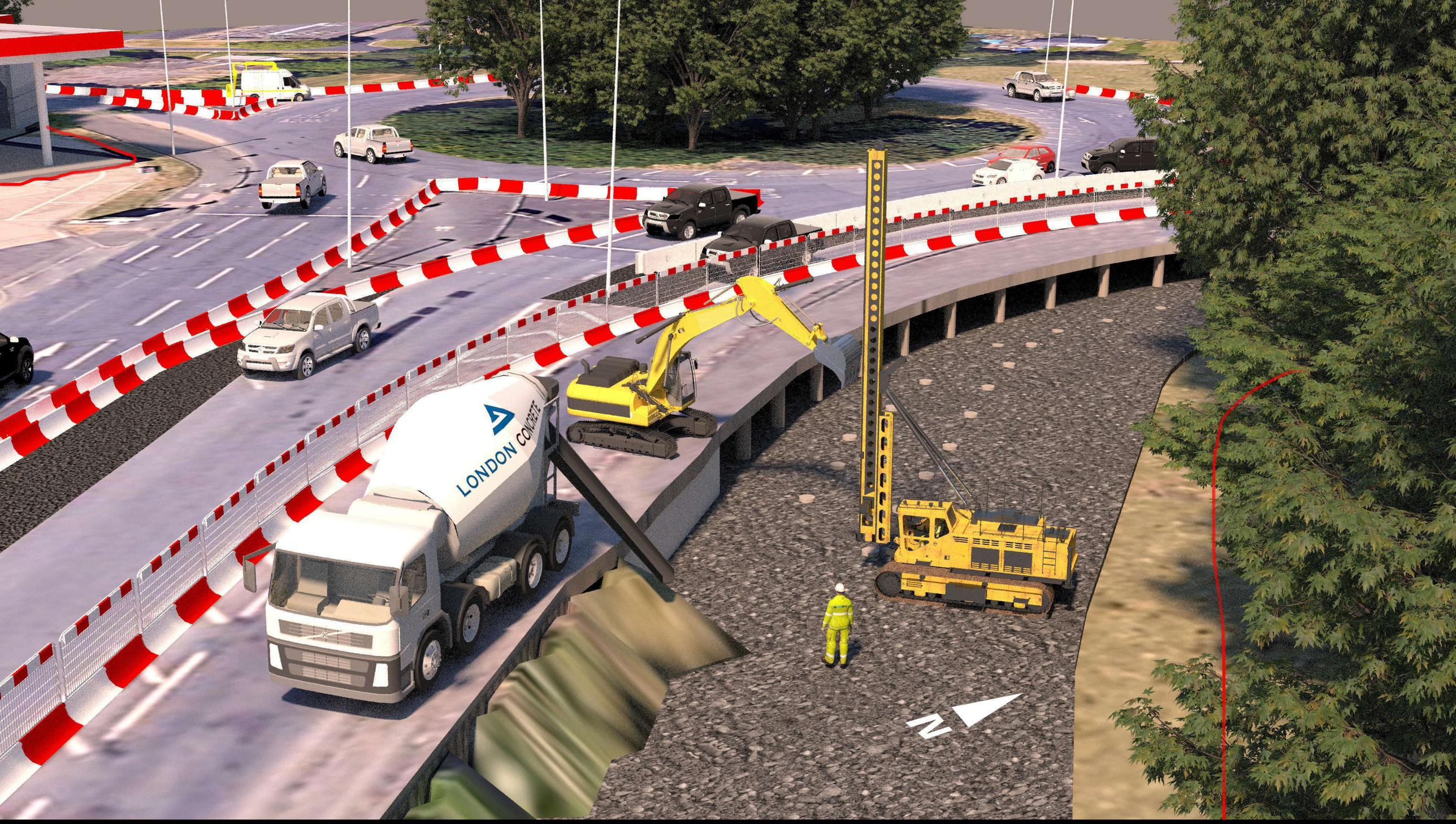
Longbridge Roundabout segregated left turn lane stilt structure

Stage 1: Black islands for traffic management installation

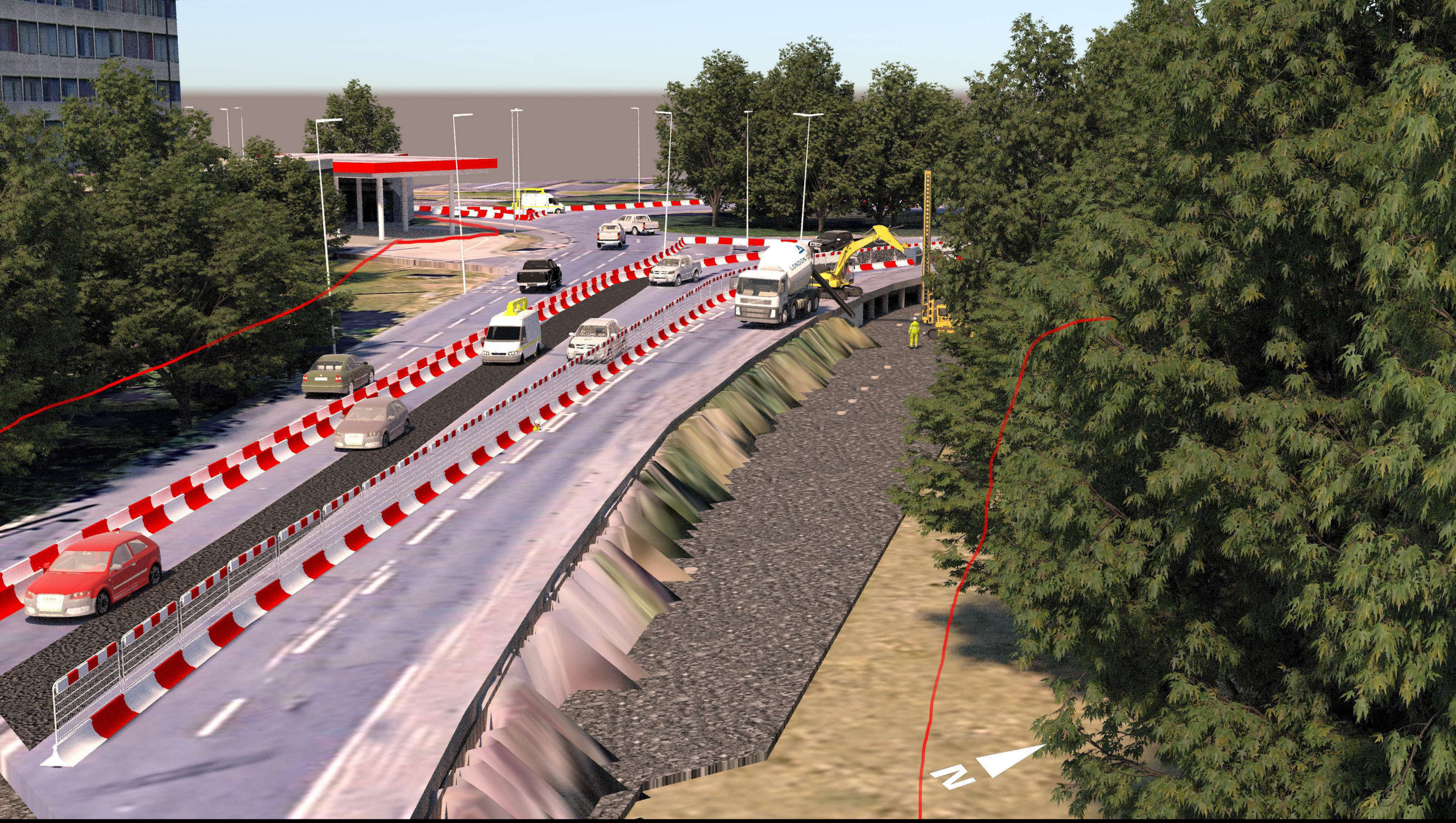
Longbridge Roundabout segregated left turn lane stilt structure

Stage 2: Site clearance, install traffic management, mobilise plant to site

Longbridge Roundabout segregated left turn lane stilt structure **Stage 2: (Zoomed in)**



Longbridge Roundabout segregated left turn lane stilt structure **Stage 3: Piling for column foundations**



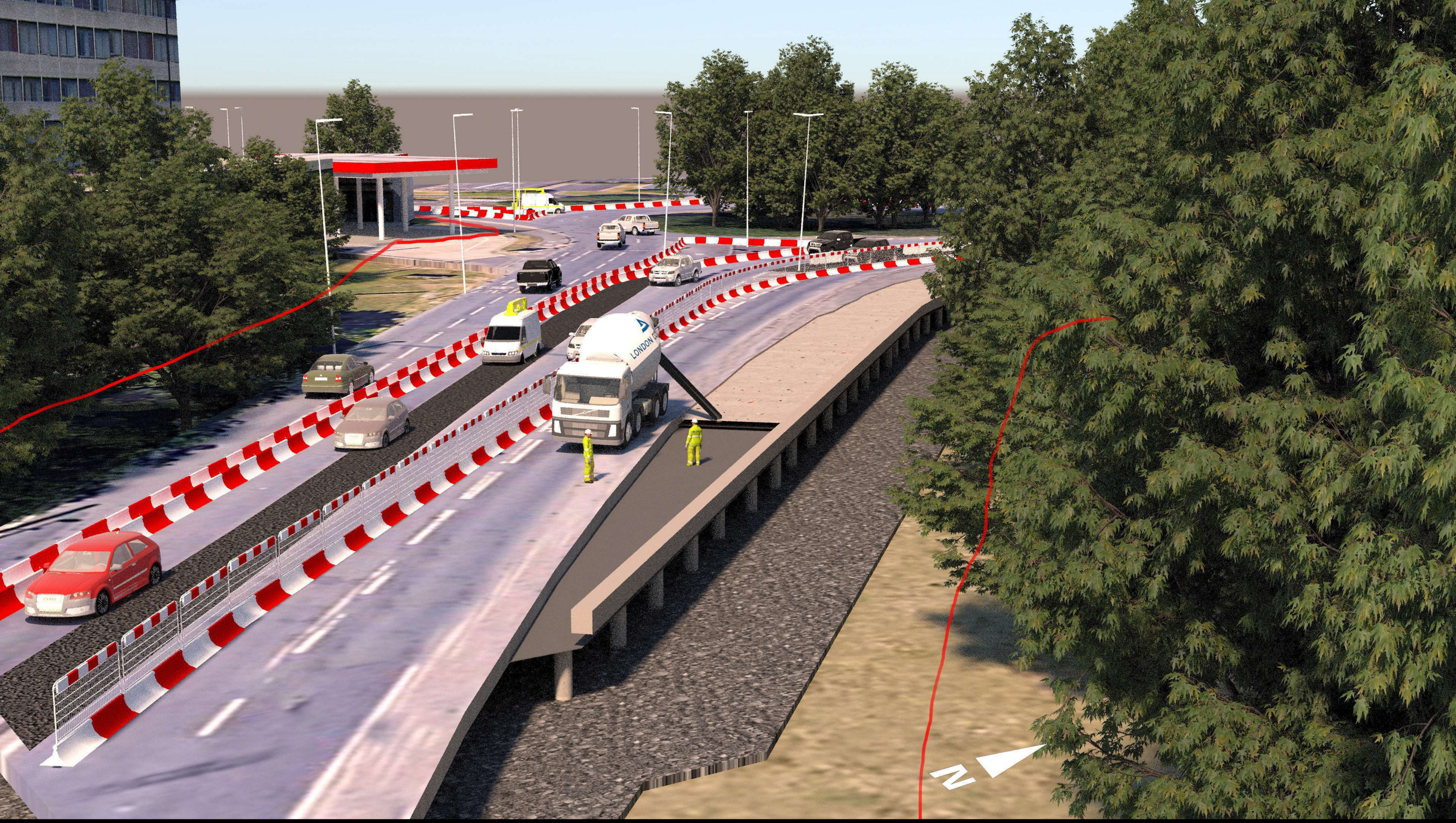
Longbridge Roundabout segregated left turn lane stilt structure **Stage 3: (Zoomed out)**

Longbridge Roundabout segregated left turn lane stilt structure

Stage 4: Install sheet piles, excavate embankment, cast columns (stilts) following up

Longbridge Roundabout segregated left turn lane stilt structure

Stage 5: Complete columns (stilts), prepare to concrete connecting beams.



Longbridge Roundabout segregated left turn lane stilt structure

Stage 6: Cast connecting beams and deck for road widening

Longbridge Roundabout segregated left turn lane stilt structure

Stage 7: Plane & lay asphalt - tie in

Longbridge Roundabout segregated left turn lane stilt structure

Stage 8: Install parapet railing / road furniture and landscaping

Appendix D - Method Visual: A23 London Road Bridge over River Mole

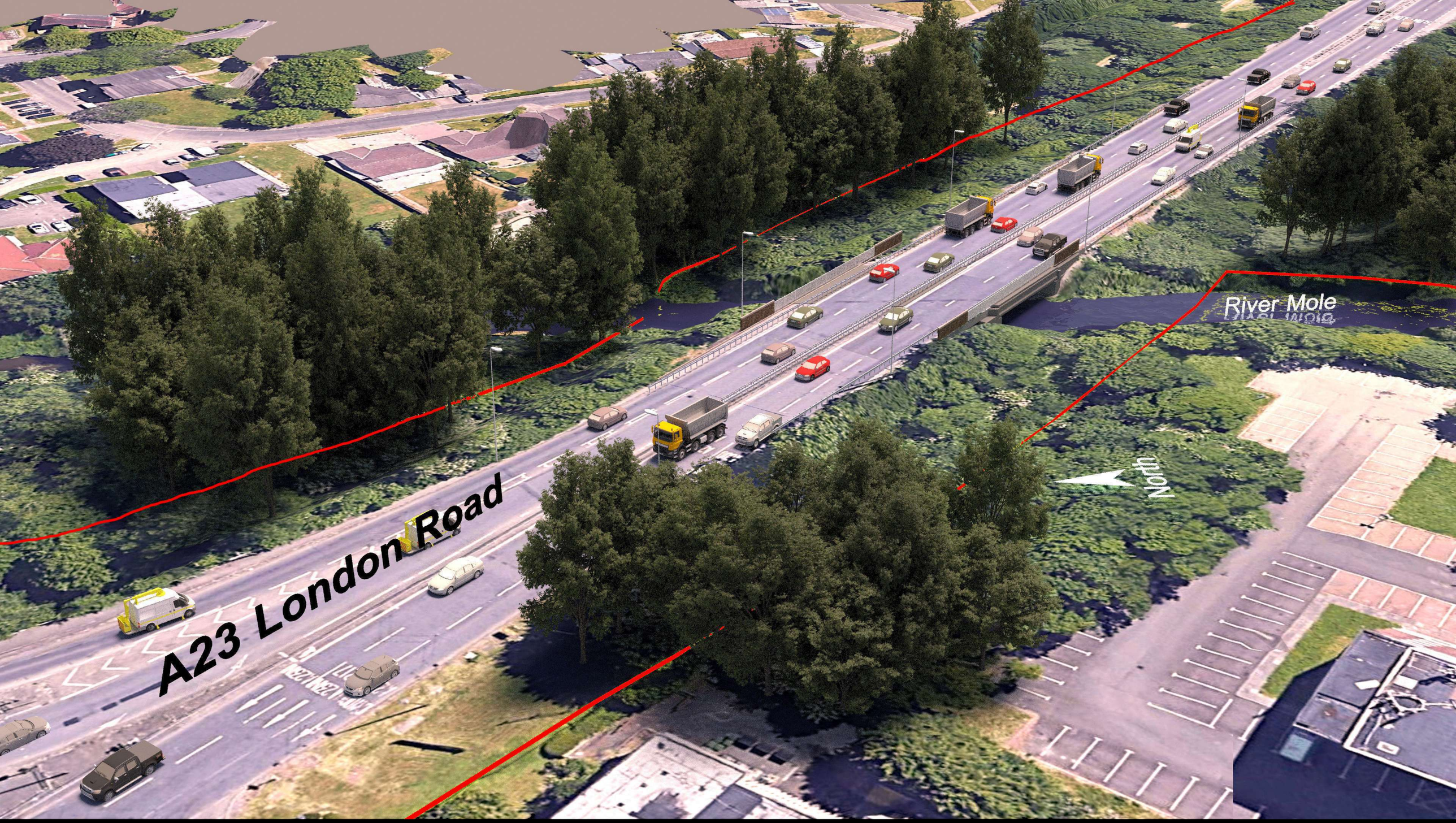
Buildability Report - Part B

Method visuals - Structures

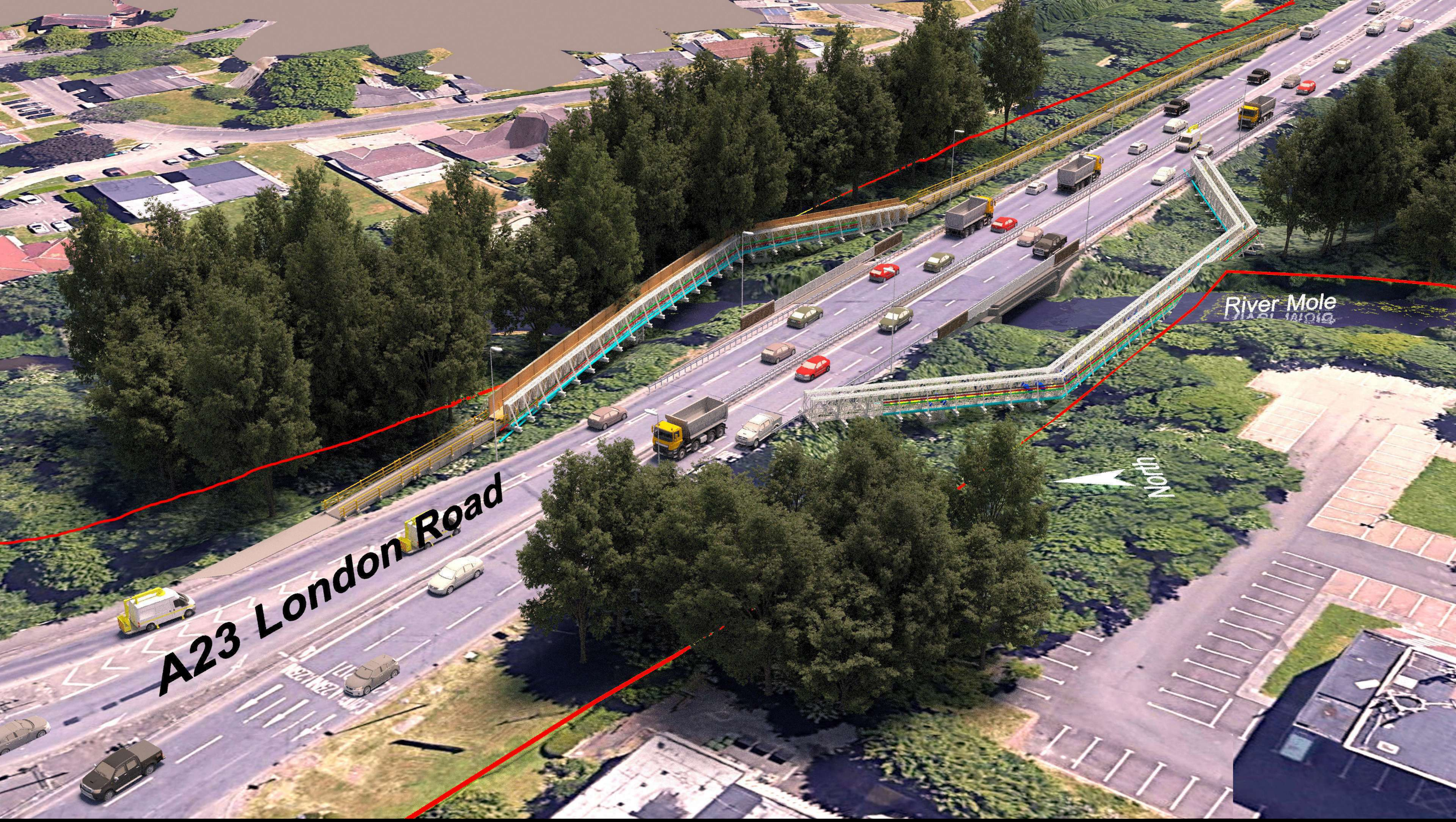
Appendix D:
A23 London Road Bridge over River Mole

LONDON GATWICK

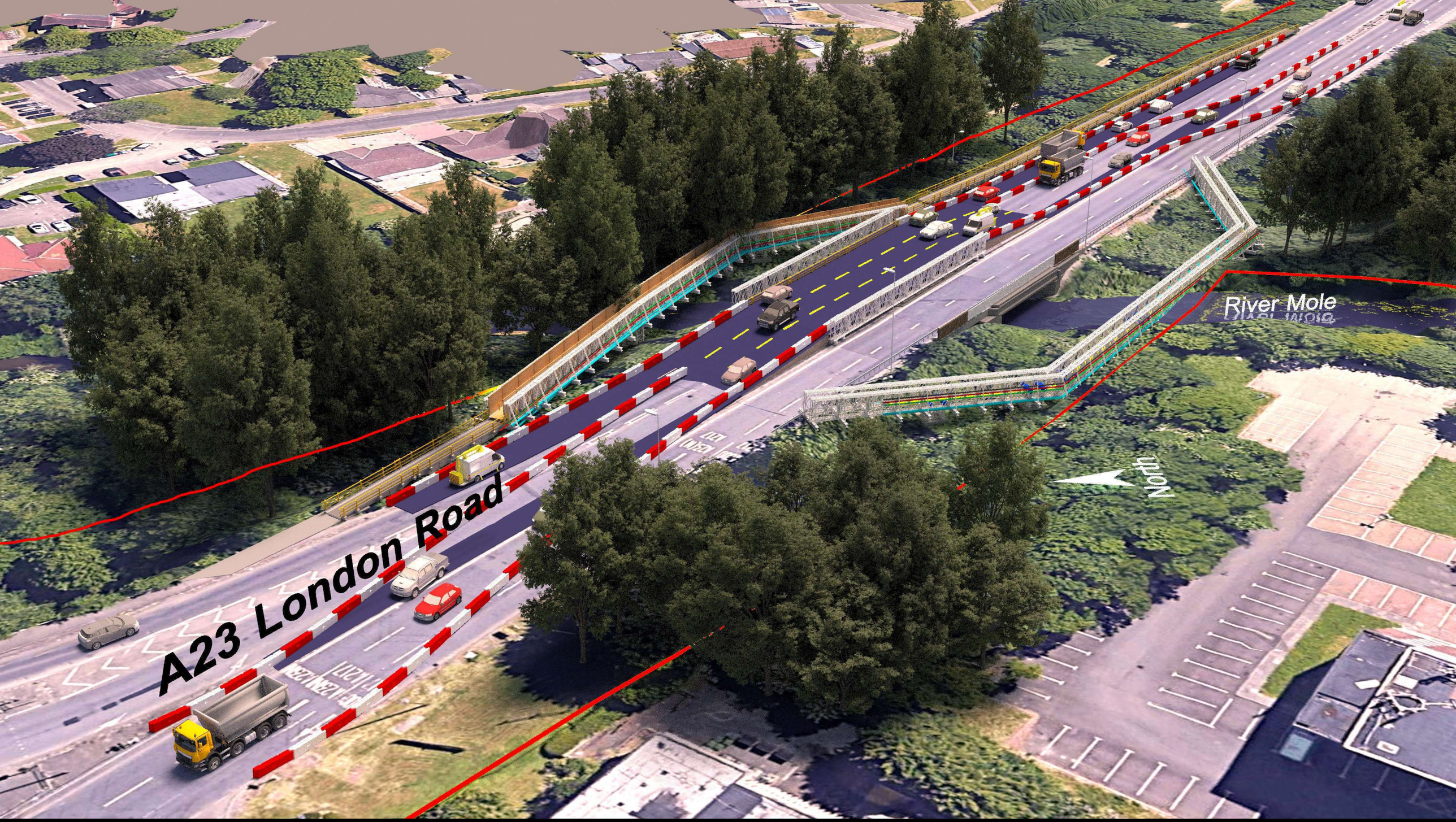
POWERED BY VINCI AIRPORTS | GLOBAL INFRASTRUCTURE PARTNERS



A23 London Road Bridge over River Mole **Stage 0: Existing**

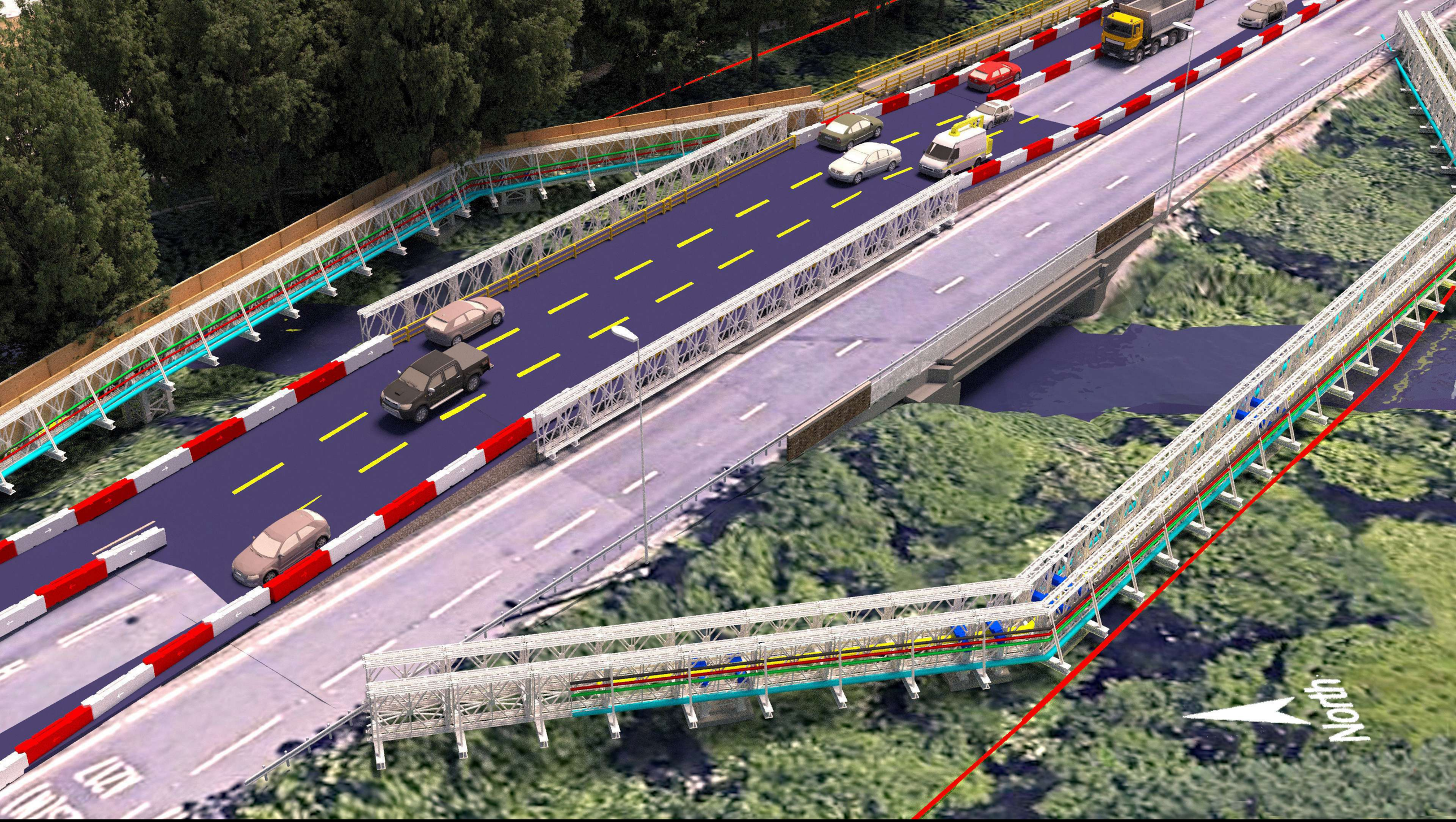


A23 London Road Bridge over River Mole **Stage 1: Install service bridges & divert Services, east bound &**

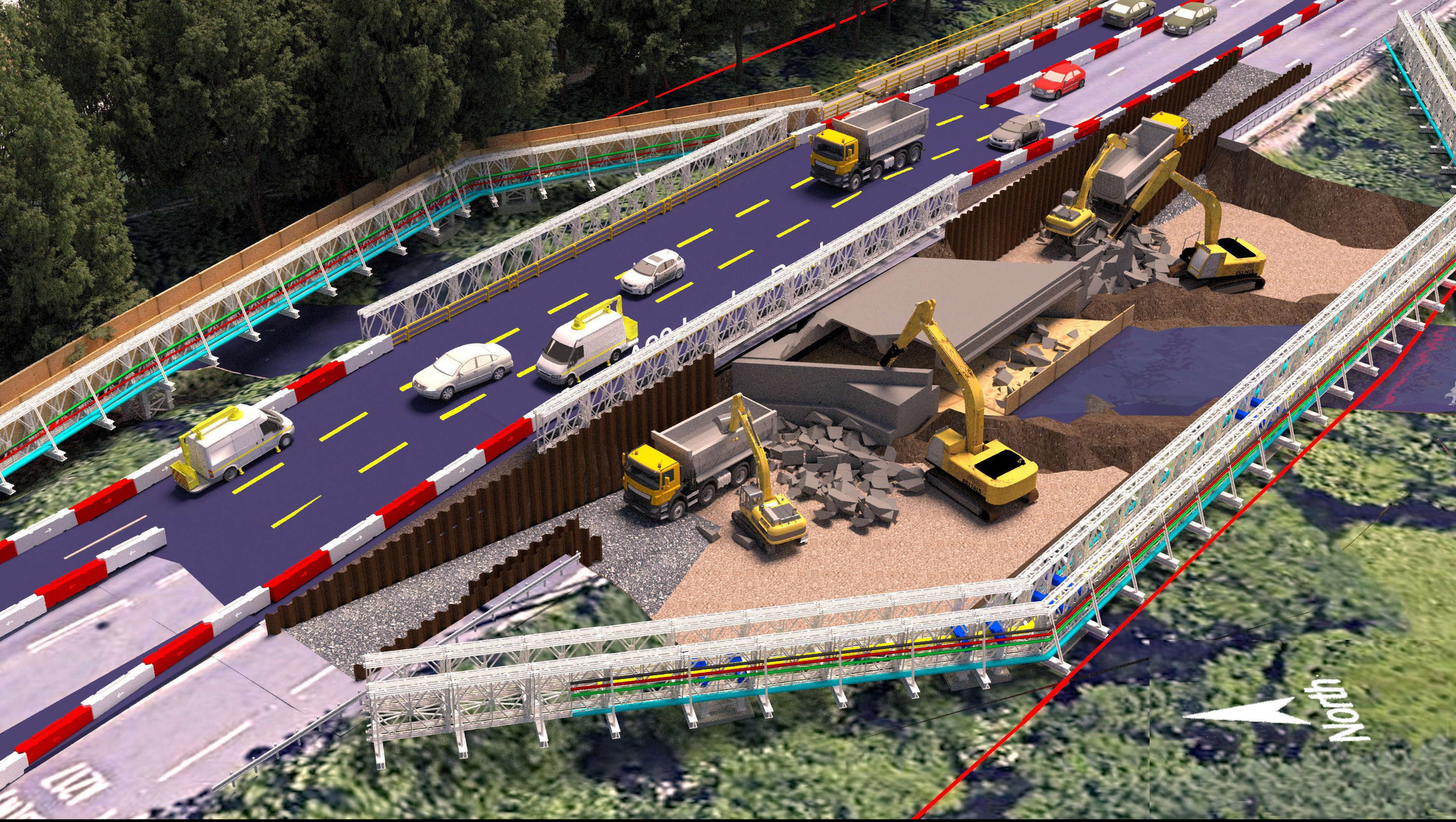


A23 London Road Bridge over River Mole

Stage 2: Install ramp over existing bridge, east bound



A23 London Road Bridge over River Mole **Stage 2: (Zoom view)**



A23 London Road Bridge over River Mole

Stage 3: Sheet piles, access ramps, reduce level, demolish existing bridge

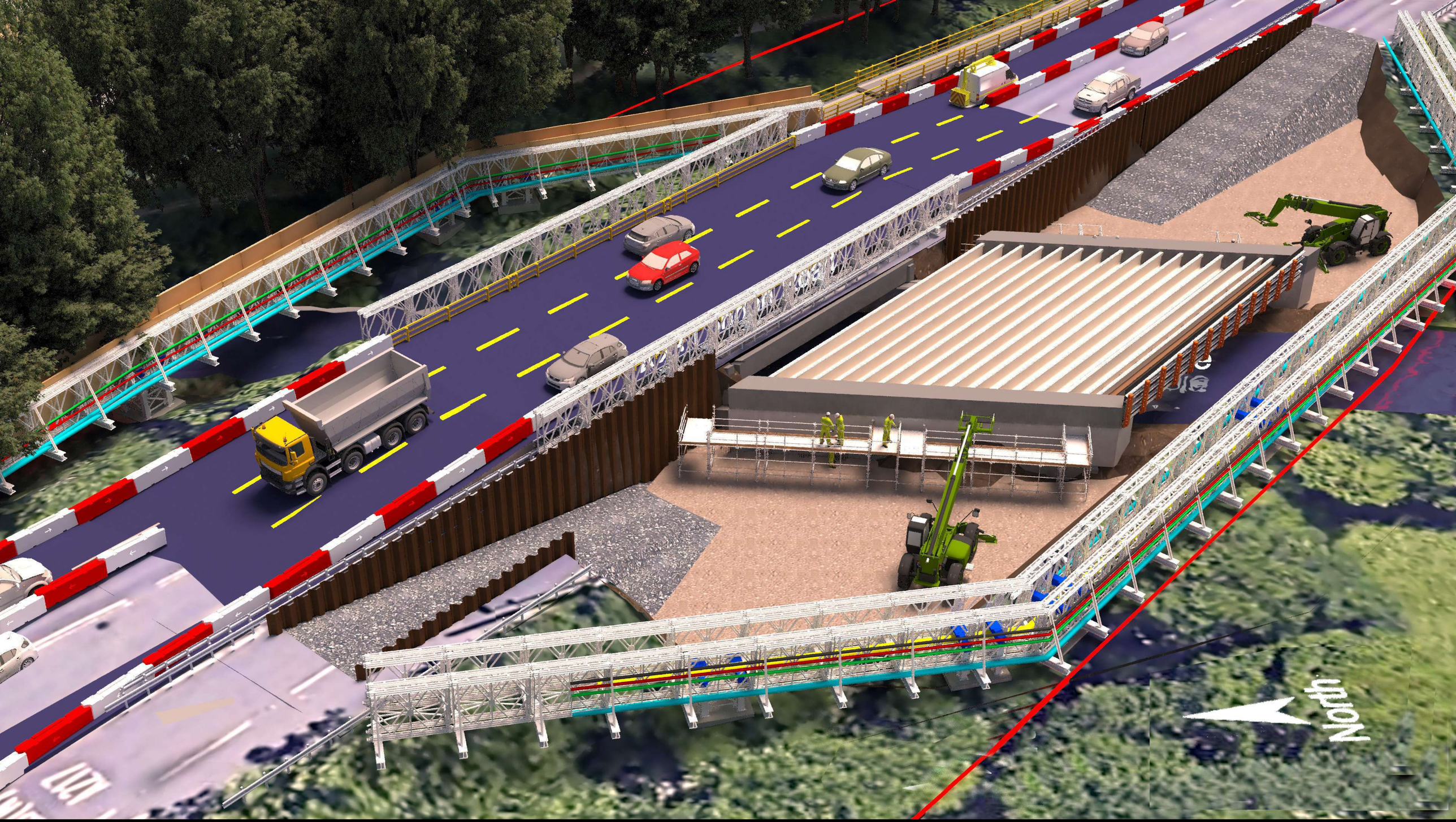
A23 London Road Bridge over River Mole **Stage 4: CFA piling for new abutment foundations, south side**

A23 London Road Bridge over River Mole

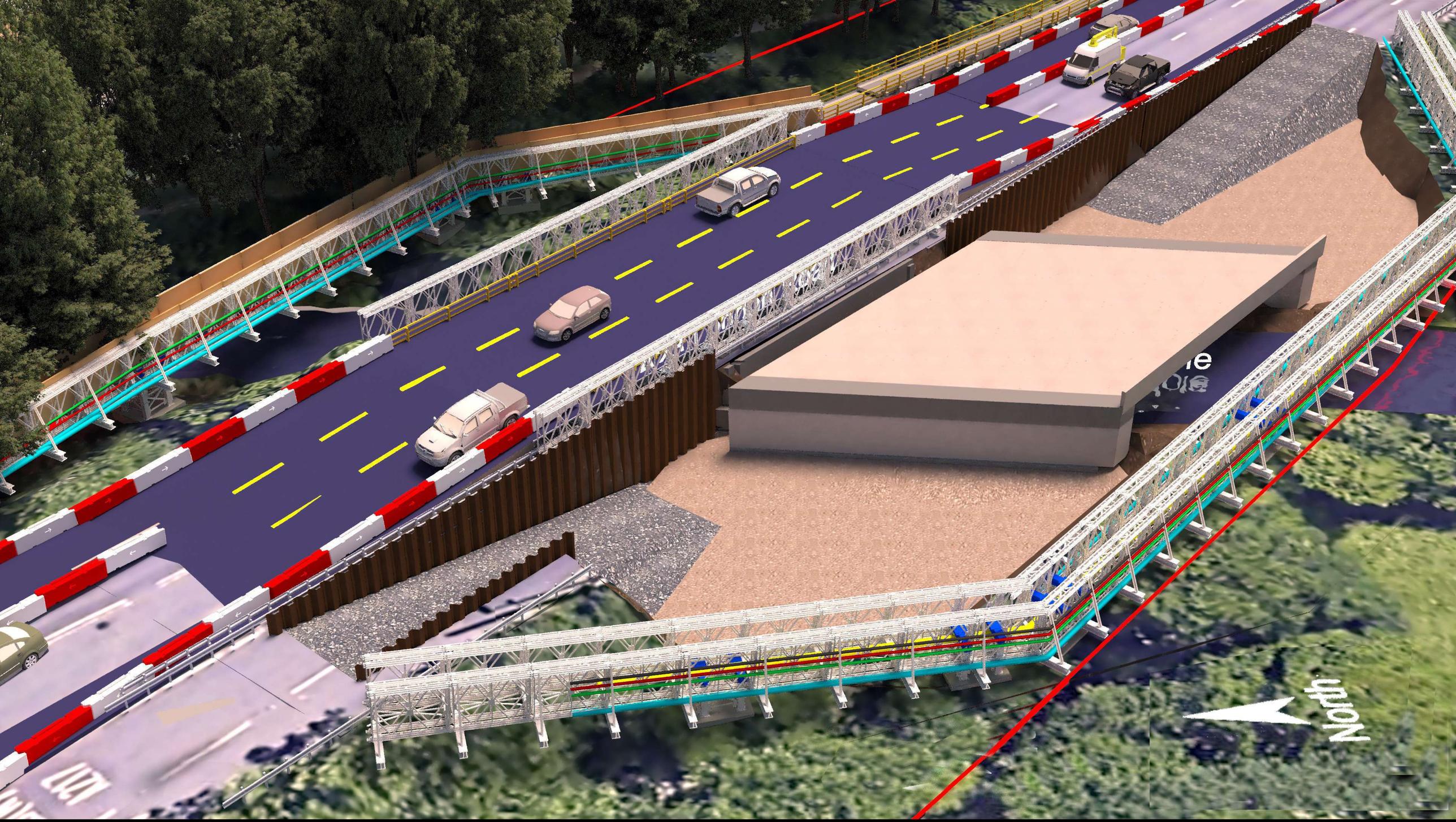
Stage 5: Construct new south side abutment walls

A23 London Road Bridge over River Mole

Stage 6: Switch west bound traffic to east bound carriageway, 2 way.

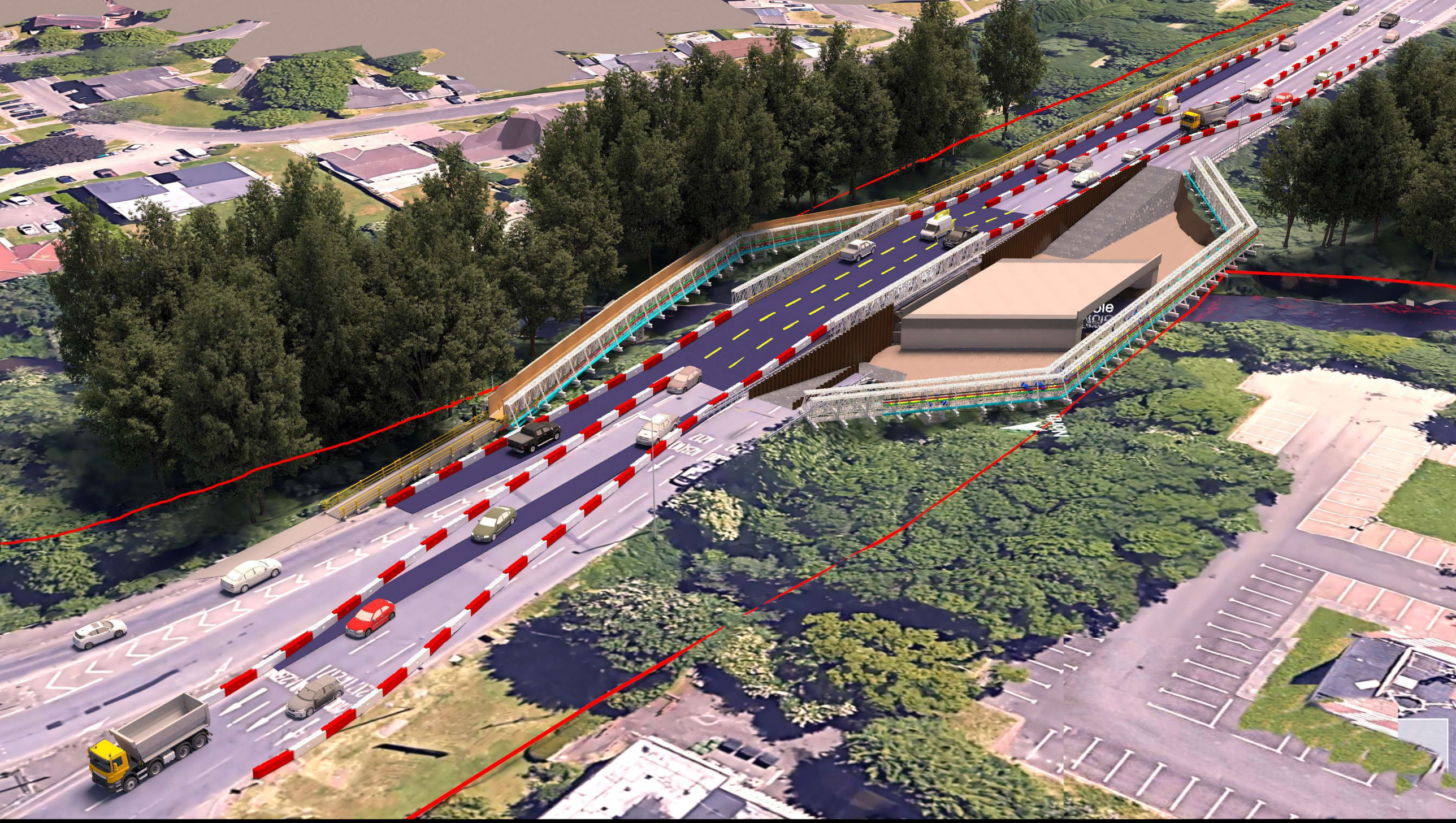


A23 London Road Bridge over River Mole **Stage 7: Concrete diaphragms and parapets**

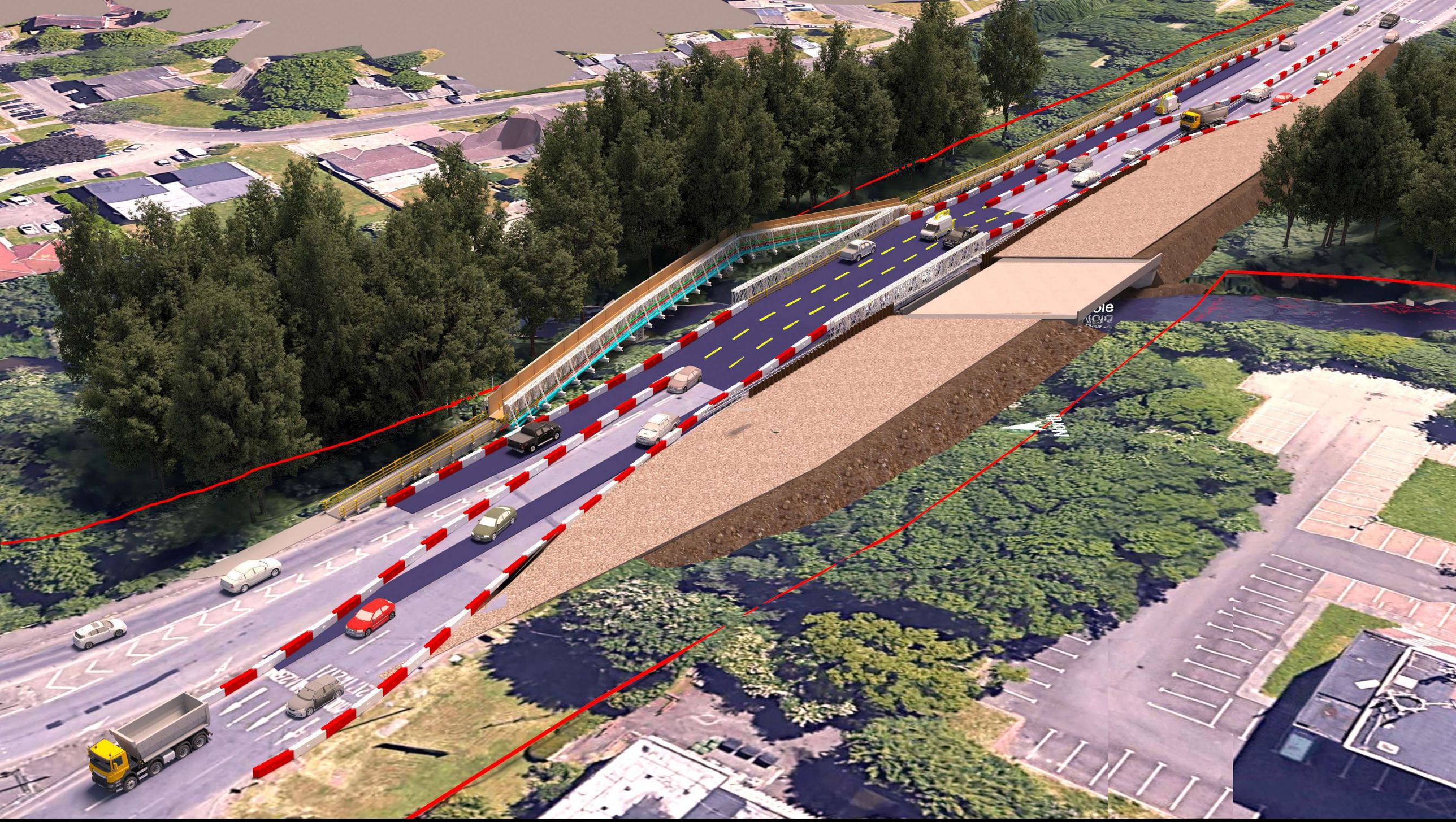


A23 London Road Bridge over River Mole

Stage 8: Form south side bridge deck



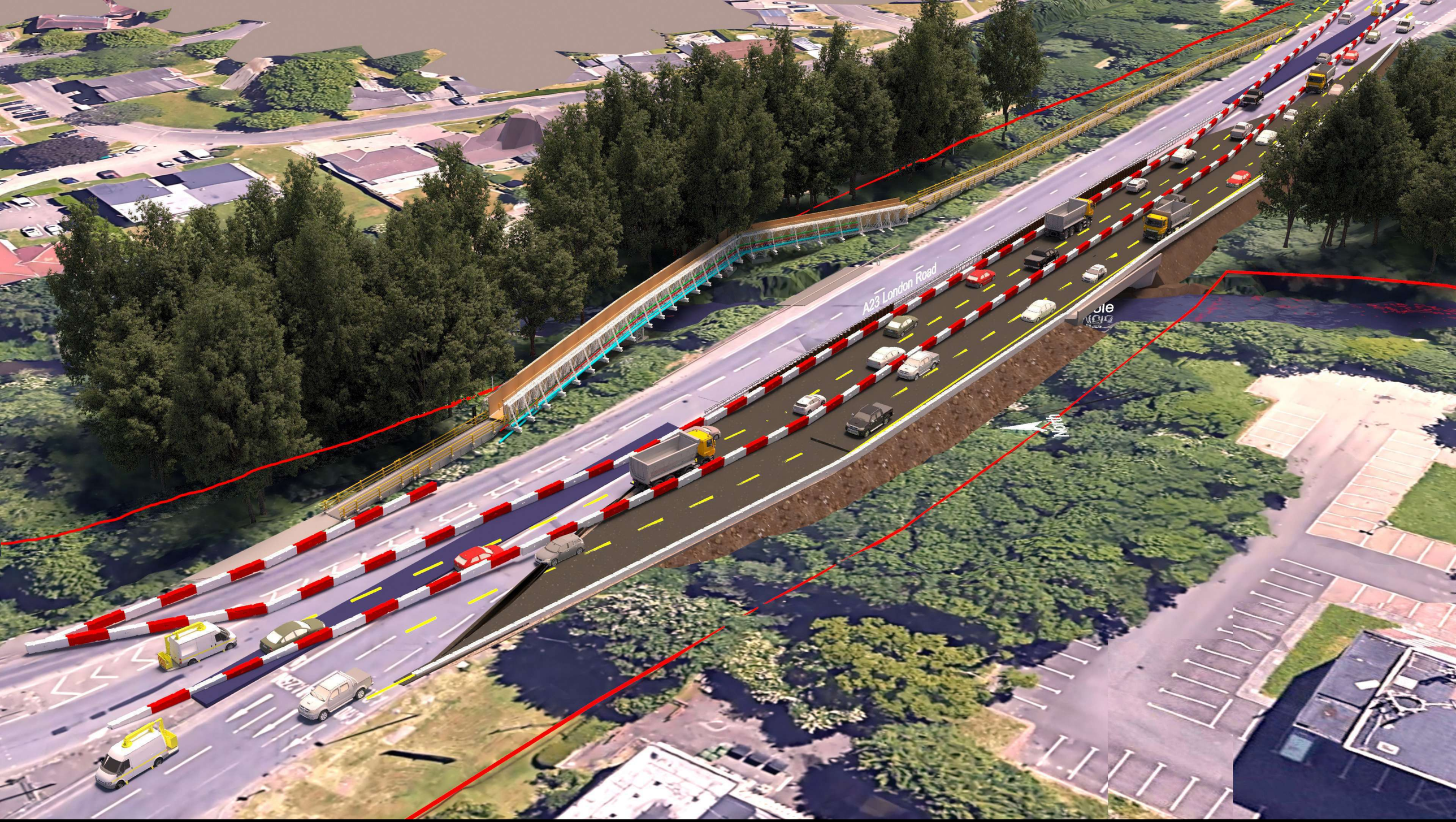
A23 London Road Bridge over River Mole **Stage 8: Zoom out**



A23 London Road Bridge over River Mole

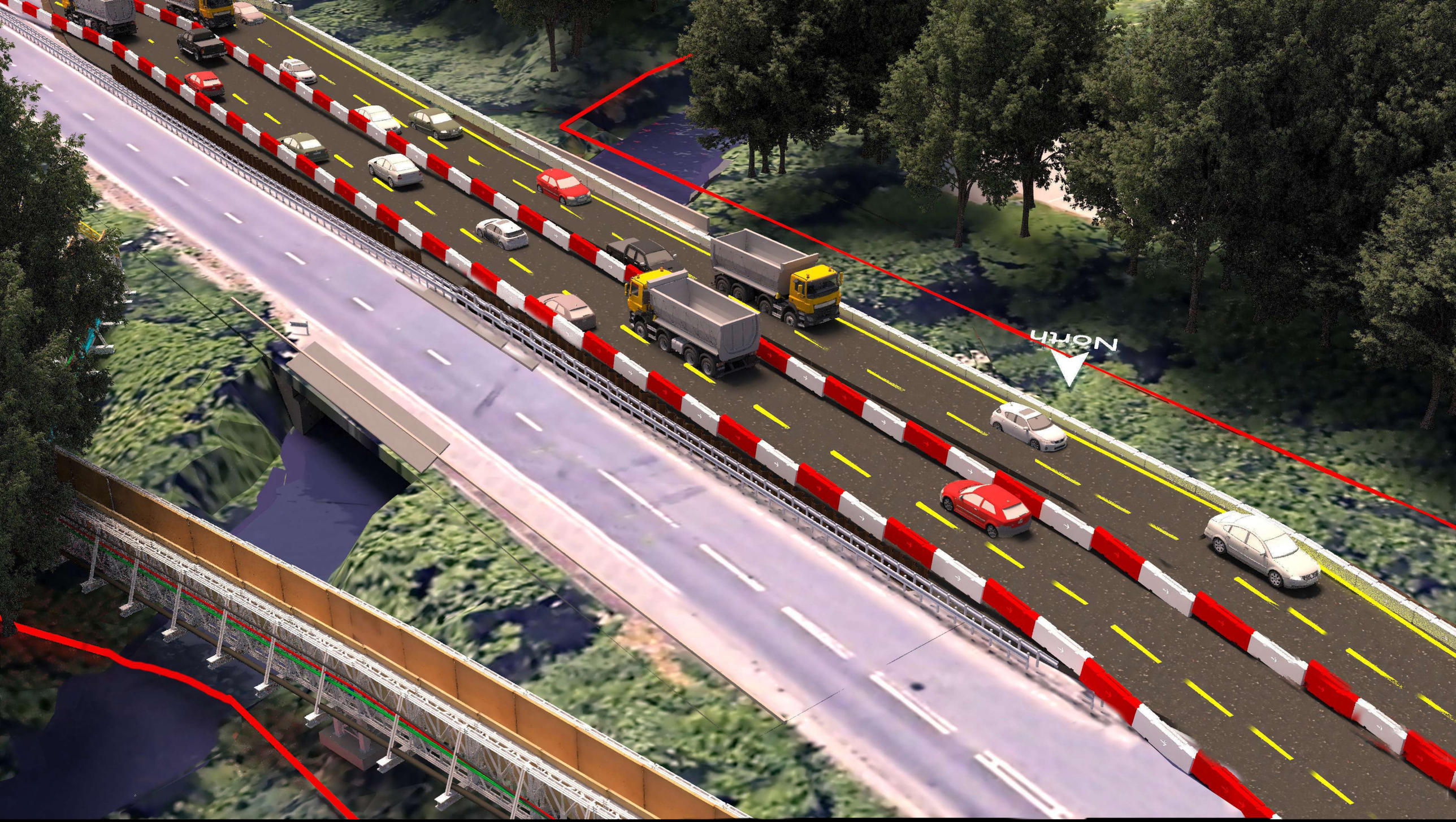
Stage 9: Bulk earthworks fill to new west bound embankment

A23 London Road Bridge over River Mole **Stage 10: Asphalt finish over new west bound carriageway**



A23 London Road Bridge over River Mole

Stage 11: Switch traffic from east bound to new west bound



A23 London Road Bridge over River Mole **Stage 11: Switch view north side**