Lower Thames Crossing

6.3 Environmental Statement Appendices Appendix 2.2 - Code of Construction Practice, First iteration of Environmental Management Plan - Annex B - Outline Materials Handling Plan (Clean version)

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Lower Thames Crossing

6.3 Environmental Statement Appendices Appendix 2.2 - Code of Construction Practice, First iteration of Environmental Management Plan - Annex B - Outline Materials Handling Plan

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1 Executive summary

1.1 Overview

1.1.1 This outline Materials Handling Plan (oMHP) is secured via Schedule 2 Requirements of the draft Development Consent Order (DCO) (Application Document 3.1). It sets out the approach and high-level principles for handling construction materials and waste on the A122 Lower Thames Crossing (the Project). This applies to handling operations both inside and outside the Order Limits. It is relevant to all construction works required for the Project.

1.1.2 A Materials Handling Plan (MHP) will be produced for each part of the authorised development by the Contractors during the construction phase of the Project, which would be required to be substantially in accordance with this oMHP. The MHP would set out a detailed approach for material movement and handling, taking into account the utility logistic hubs (ULHs) and compounds.

1.2 Excavated materials overview

1.2.1 An assessment of bulk earthwork quantities has been carried out to establish an illustrative approach to handling excavated material, including mass haul movements. This assessment has been used as a baseline position to support the traffic and environment assessments and assumes two tunnel boring machines being driven from the Northern tunnel entrance compound.

1.2.2 A key principle in the handling of excavated material is to maximise the transportation via offline haul routes to minimise the impact on the online road network, both strategic and local. Mass haul movements of excavated material within the Order Limits would predominately be offline via a constructed internal haul route network. Where this is not possible, the Contractors would use the road network adopting the principles set out in the oMHP.

1.2.3 Excavated materials volumes have been provided (Section 7.2), and movements of these materials will be subject to the requirements of this oMHP. The Project is anticipated to excavate 12,500,000m^3 of material of which 11,176,500m^3 would require onsite reuse. The volume of material requiring management offsite was initially estimated to be over 1,200,000 m3 at an earlier version of the DCO Application that was subsequently withdrawn, following recommendations from The Planning Inspectorate (PINS). As a result of design refinements and landscape mitigation proposals the estimated quantity of material requiring management offsite has reduced to 663,500m^3. For materials that cannot be reused, potential receiver sites and associated vehicle movements have been identified.

1.2.4 The CoCP (Application Document 6.3) includes mitigation measures to support the reuse and recovery of materials and minimise offsite waste management to reduce the associated number of vehicle movements.

1.3 Transport options

1.3.1 There are limited existing direct transport connections to the Order Limits which can be used for the transport of material. A review of the use of road, river and rail networks has been carried out with a focus on the final mile strategy (the road-based link between the multimodal point and the applicable construction worksite).

1.3.2 This has helped identify an approach to reduce and manage the impacts of construction vehicle movements on the wider transport network and onsite materials management, by getting materials as close to the construction worksites as possible before using the road network.

Rail

1.3.3 The review of potential local suppliers to support the delivery of the Project has identified several sites that utilise the existing rail paths to deliver material near to the Project. There are no existing direct rail connections to compounds within the Order Limits. Given the geographical and environmental constraints, combined with the associated planning and consenting challenges, it is not considered possible for the Project to construct a new railhead or any new rail lines to provide a direct rail connection.

1.3.4 For the movement of materials away from the Project, rail is not considered a viable transport option owing to geographical constraints and the lack of existing connections.

1.3.5 It would be possible to use rail as part of a multimodal approach to import materials to the Project via an existing rai l connection, with onward transport via the road network. However, Section 8 sets out detail on the limitations of providing a direct rail connection to the Project.

River

1.3.6 Port of Tilbury London Limited (PoTLL) and port of Tilbury2 (Tilbury2) are well located for material movements for the Project via the river. They are located close to the Order Limits at the North Portal (Northern tunnel entrance compound), where bulk material supplies including aggregates and oversize equipment such as the tunnel boring machinery (TBM) can be delivered to support construction operations on the TBM north side of the River Thames. These facilities will also be suitable for transporting tunnel spoil material if needed.

1.3.7 It would be possible to import materials to the Project via existing ports on the north side of the River Thames (e.g. PoTLL and Tilbury2), with onward transport via the road network. As such, the Project shall utilise port facilities for at least 80% by weight of bulk aggregates imported to the North Portal construction area ('the Baseline Commitment'). This commitment translates into 35% of the total bulk aggregates across the Project being transported via port facilities. In addition, and subject to the exceptions set out in Section 6, the Contractor would engage with aggregate and material suppliers collaboratively, to proactively maximise utilisation of river transport for the import of bulk aggregates for the north portal construction area beyond the Baseline Commitment so far as is reasonably practicable (the Better than Baseline Commitment).

1.3.8 To import materials to the construction compounds south of the River Thames via existing river infrastructure facilities south of the river may not always be appropriate, due to the reliance of the local road network and no direct access to construction compounds. The construction of direct access between the river to construction compounds is constrained by the Thames Estuary and Marshes Ramsar.

Conveyors

1.3.9 The use of conveyors can optimise material movements, through speed and volume, and reduce vehicle movements.

1.3.10 It is considered feasible for a Contractor to use conveyors to transport materials within the Order Limits on the north and south sides of the River Thames.

Multimodal

1.3.11 In order to reduce Heavy Goods Vehicle (HGV) movements on the strategic road network (SRN) and local road network, the Contractor would consider the use of multimodal transport of materials. This would require combining the material transport options identified above to identify the most efficient method, to optimise movements and reduce impacts. The following conclusions have been drawn:

a. It would be possible to use rail as part of a multimodal approach to import materials to the Project via an existing rail connection, with onward transport via the road network.

b. It would be possible to use existing ports on the north side of the River Thames (e.g. PoTLL and Tilbury2) as part of a multimodal approach to material transport, with onward transport via the road network.

c. It is considered feasible for a Contractor to use conveyors to transport materials within the Order Limits on the northern and southern sides of the River Thames as part of a multimodal approach to material transport.

Final mile strategy

1.3.12 A final mile strategy would be developed as part of the MHP and implemented by the Contractors in conjunction with the outline Traffic Management Plan for Construction (oTMPfC) (Application Document 7.14), making full consideration of required mileage and mileage reduction, peak traffic hours conflicts and associated impacts.

1.3.13 The focus of the final mile strategy is that delivery and construction vehicles would join the Project's internal haul route as quickly as possible from the SRN (where practicable) to reduce the Project's dependency and impact on the local road network.

1.3.14 The Project would require the Contractors to consult with the highway authority/authorities and adhere to freight and construction traffic routes (outlined in the oTMPfC). This would include a clear understanding of those routes which are not permitted, including any considerations around traffic-sensitive routes/roads and receptors.

1.3.15 The final mile strategy should be applied in combination with the full consideration of transport options and a multimodal approach to material movements.

2 Introduction

2.1 Purpose of this document

2.1.1 This oMHP sets out the approach and high-level principles for handling construction materials and waste for the Project, both inside and outside the Order Limits. It will not be applicable to the operational phase of the Project. Securing mechanisms are covered in Section 3 and forms part of the development phase of the DCO.

2.1.2 This oMHP considers the handling of excavated materials for reuse as well as excavated waste materials, and the delivery of large and/or frequent materials defined as 'bulk deliveries', which are considered to be the most logistically challenging types of deliveries and therefore potentially of most impact. Optimisation of deliveries and load capacities to minimise vehicle movements are key considerations.

2.1.3 Smaller, less-frequent deliveries, although not specifically addressed in this document, would also be required to meet the principles set out in this document (Section 3.4) to optimise deliveries and minimise vehicle movements.

2.1.4 This oMHP is relevant to all construction works required for the Project. Construction traffic movements are considered in the oTMPfC (Application Document 7.14).

2.1.5 This document describes methods of transportation for bulk materials, taking into consideration the use and upgrading of existing infrastructure. Consideration of multimodal transport options includes the use of rail and river to minimise road miles, where reasonably practicable, and the use of internal haul routes.

2.1.6 The Outline Site Waste Management Plan (oSWMP) (Application Document 6.3) sets out the overarching principles and procedures that would be applied for the management of waste during the construction of the Project.

2.1.7 This oMHP forms part of the DCO Application. An earlier version of the DCO Application was submitted and then withdrawn based on recommendation by PINS, that version did not contain an oMHP. Feedback was provided by PINS and it highlighted inconsistencies related to material movement principles and commitments. The Project realised the need to collate all principles and commitments related to the handling of bulk materials and to address concerns raised by PINS the oMHP has been developed.

2.1.8 An early iteration of this oMHP formed part of the community impact consultation; comments from local authorities as well as wider stakeholders have been considered and this document has been updated. The Consultation Report (Application Document 5.1) sets out in detail how responses to consultation have been considered. As per Requirement 11 (Part 1 of Schedule 2) of the draft DCO (Application Document 3.1) no part of the authorised development can commence until a Material Handling Plan (MHP) for that part has been submitted to, and approved in writing by, the Secretary of State.6.3

2.2 The Project

2.2.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent and the M25 south of junction 29, crossing under the River Thames through a tunnel. The Project route is presented in Plate 2.1.

2.2.2 The A122 would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13, M25 junction 29 and the M25 south of junction 29. The tunnel entrances would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.

2.2.3 Junctions are proposed at the following locations:

a. New junction with the A2 to the south-east of Gravesend

b. Modified junction with the A13/A1089 in Thurrock

c. New junction with the M25 between junctions 29 and 30

2.2.4 To align with National Policy Statement for National Networks (Department for Transport, 2014) policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied in line with the Dartford Crossing. Vehicles would be charged for using the new tunnel.

2.2.5 The Project route would be three lanes in both directions, except for:

a. link roads

b. stretches of the carriageway through junctions

c. the southbound carriageway from the M25 to the junction with the A13/A1089, which would be two lanes

2.2.6 In common with most A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. The A122 design outside the tunnel would include emergency areas. The tunnel would include a range of enhanced systems and response measures instead of emergency areas.

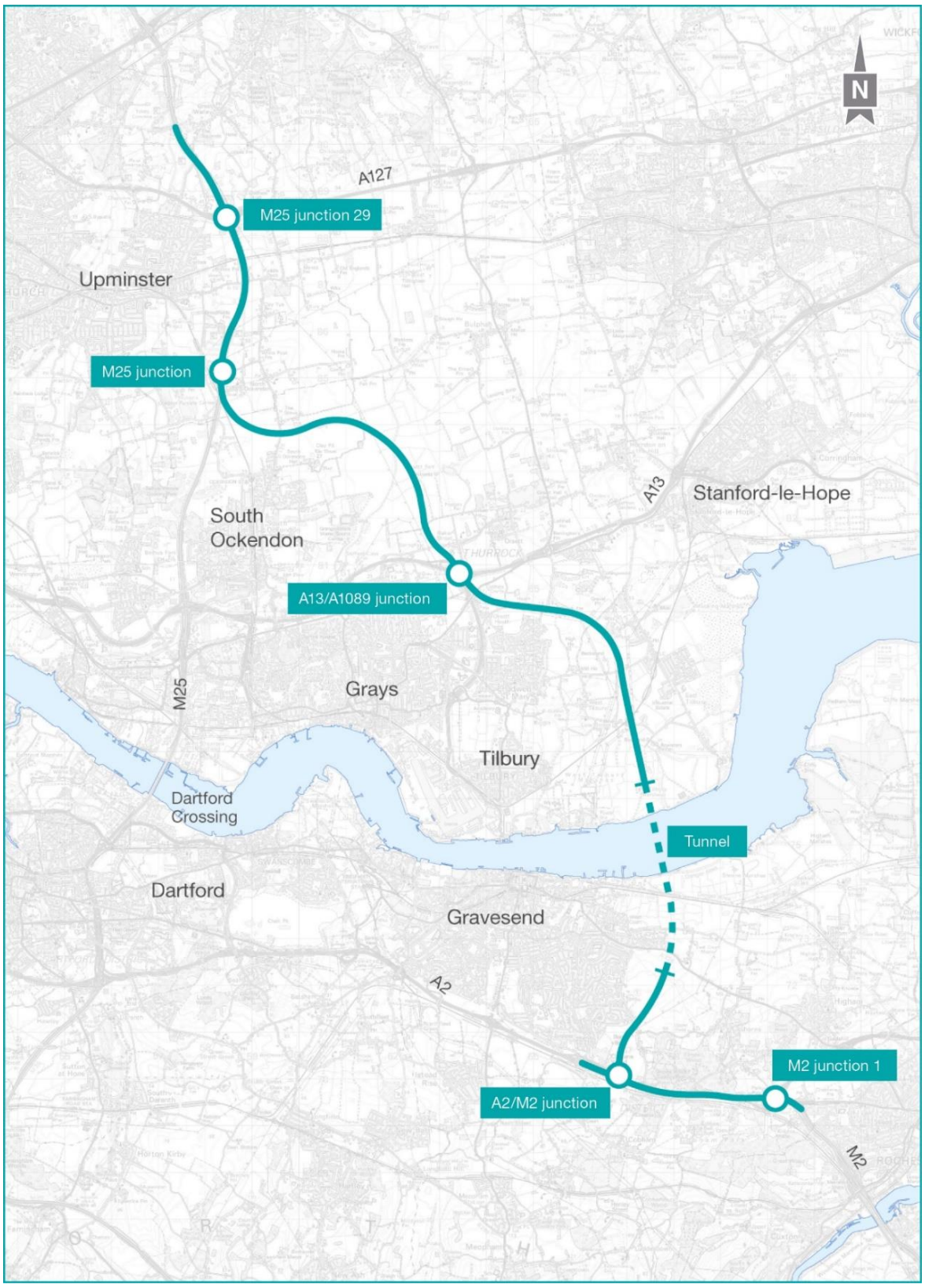
2.2.7 The A122 would be classified as an ‘all-purpose trunk road’ with green signs. For safety reasons, walkers, cyclists, horse riders and slow-moving vehicles would be prohibited from using it.

2.2.8 The Project would include adjustment to a number of local roads. There would also be changes to a number of Public Rights of Way, used by walkers, cyclists and horse riders. Construction of the Project would also require the installation and diversion of a number of utilities, including gas mains, overhead electricity

powerlines and underground electricity cables, as well as water supplies and telecommunications assets and associated infrastructure.

2.2.9 The Project has been developed to avoid or minimise significant effects on the environment. The measures adopted include landscaping, noise mitigation, green bridges, floodplain compensation, new areas of ecological habitat and two new parks.

Plate 2.1 Lower Thames Crossing Route



Related Project documents

2.2.10 The DCO application will include the following documents that should be read alongside this oMHP:

a. The Code of Construction Practice (CoCP), which includes the Register of Environmental Actions and Commitments (REAC) (Application Document 6.3)

b. Transport Assessment (Application Document 7.9)

c. Assessments supporting the Environmental Statement (Application Documents 6.1 to 6.3), including:

   i. Environmental Statement Chapter 5: Air Quality

   ii. Environmental Statement Appendix 11.1: Excavated Materials Assessment

   iii. Environmental Statement Chapter 11: Material Assets and Waste

   iv. Environmental Statement Chapter 12: Noise and Vibration

d. oSWMP (Application Document 6.3)

e. oTMPfC (Application Document 7.14)

f. Preliminary Navigational Risk Assessment (Application Document 7.15)

g. Framework Construction Travel Plan (Application Document 7.13)

2.3 Assumptions and limitations

2.3.1 This oMHP has been developed having regard to the following assumptions and limitations, which are discussed throughout the document:

a. The geographical context and footprint of the Project, including practicalities and constraints of the road and tunnel alignment (geographical and environmental constraints) (Section 4), would not change.

b. Quantities of construction materials and waste are indicative (Section 6).

c. Transport and logistics constraints and opportunities would not change significantly. For example, train routes remain open (Section 6).

d. The condition of existing infrastructure to be used for material movement is adequate and appropriate. Condition surveys would be undertaken before works start.

e. There would be sufficient industry capacity in terms of materials and plant to supply the Project demands. Discussions with suppliers indicate that capacity does exist.

f. Transportation of excavated material is not planned between construction sites on opposite sides of the River Thames via the existing road network, to reduce vehicle movements through the existing Dartford Crossing.

g. Material movement or transfer between two different construction compounds or construction worksites (within the Order Limits) would be optimised and managed in accordance with the appropriate regulatory consents to be obtained by the appointed Contractor.

3 Planning requirements and Project commitments

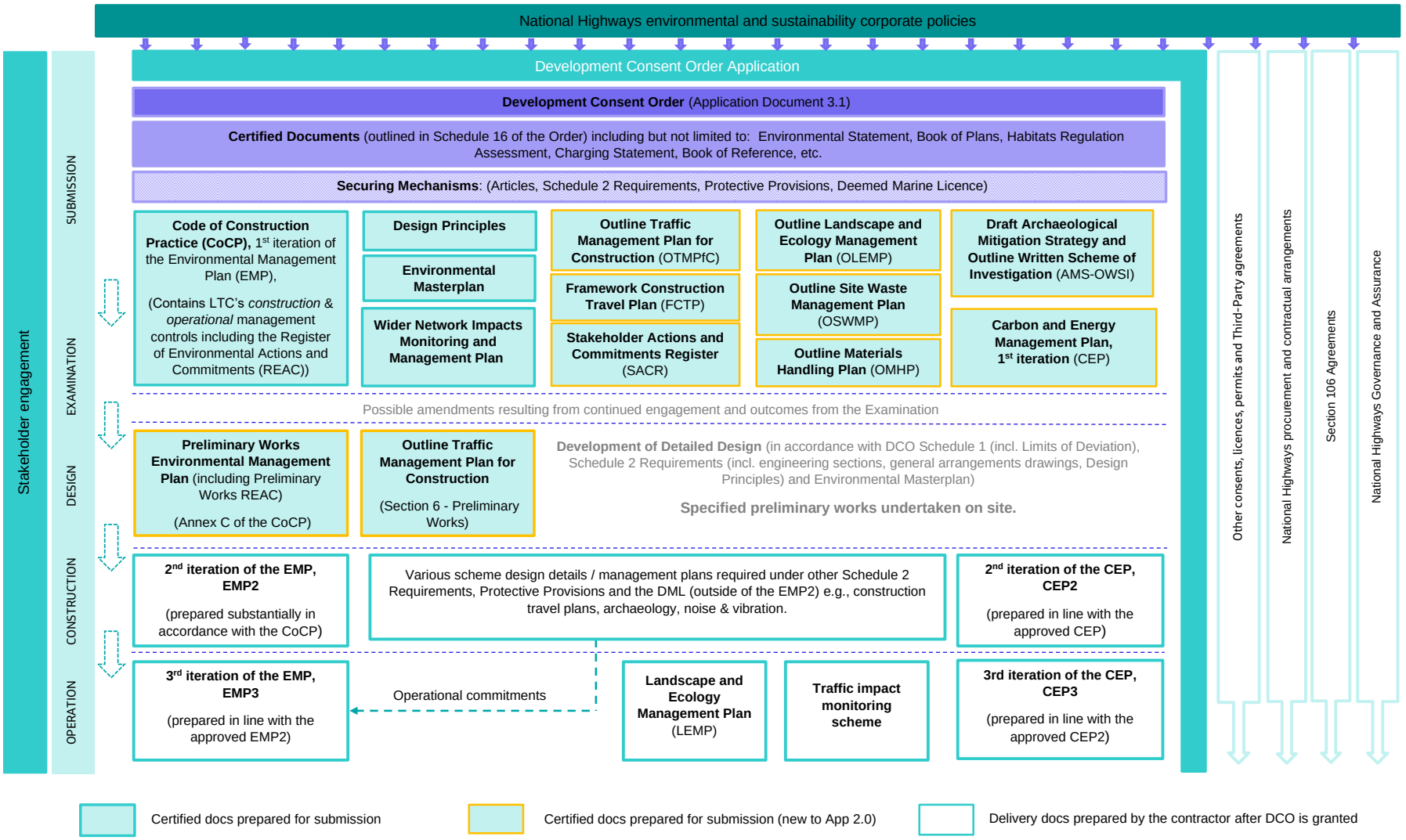
3.1 Planning requirements and the Development Consent Order

This oMHP should be read alongside Requirement 4 of the Schedule 2 Requirements to the draft DCO (Application Document 3.1), which requires plans for the management of materials to be in place before construction starts. Plate 3.1 provides an extract from the Project Control Plan, which illustrates the securing mechanisms.

3.1.1 Requirement 4 of the DCO Schedule 2 Requirements states that no part of the authorised development is to start until an Environmental Management Plan (Second Iteration), substantially in accordance with the CoCP, has been submitted to and approved in writing by the Secretary of State, following consultation with the stakeholders identified in Table 2.1 of the CoCP. Under Requirement 4(3), the Environmental Management Plan (Second Iteration) must include a plan for the management of materials, which must be in accordance with this document.

3.1.2 This oMHP provides the framework and principles that the Contractor must adhere to when developing the Materials Handling Plan (Second Iteration) for their part of the works, which would be required as part of the Environmental Management Plan (Second Iteration).

Plate 3.1 the Project Control Plan



3.2 Material Handling Plan

This oMHP sets out the principles for material movements and handling during the construction phase of the Project, providing the framework for a specific MHP for each part of the works, to be produced for the construction phase of the Project (see Control Plan flow diagram in Plate 3.1

3.2.1 The MHP will set out a detailed approach for material movement and handling, aligning to the principles set out in this oMHP. It will require information from a number of Project elements developed during the delivery phase, including the following:

a. Detailed design

b. Detailed construction programme

c. Detailed ground investigation

d. Detailed Written Scheme of Investigation

e. Excavated material mass haul strategy

f. Traffic Management Plan (TMP)

g. Environmental Management Plan and Site Waste Management Plan

3.2.2 Information which will be required to form part of the construction phase MHP is shown in Table 3.1.

Table 3.1 Detail required in the construction phase MHP

Information topic	Details
Project information	• Roles and responsibilities of involved parties in the transportation and handling of material • Location of compounds, ULH and construction worksites
Construction details	• Summary of the appointed Contractors' construction programme • Modularisation and offsite manufactured plan • Excavated Materials Plan (also referred to as mass haul plan), including tracking record of when and where material is excavated and placed for use within the Order Limits or management offsite.
Site layout plans	• Welfare and office space plan • Parking, loading and unloading and laydown area plan • Plant and materials storage • Excavated and demolition material storage and processing plan • Vehicle and pedestrian routes • Haul route crossings • Emergency and first aid points • Waste management areas • Wheel wash facilities

Information topic	Details
	• Equipment charging and fuelling areas
Traffic management (in accordance with the oTMPfC)	• Access plans to each construction compound • Parking arrangements for delivery vehicles • Pedestrian, cyclist, bus and general traffic considerations • Vehicle swept path analysis modelling.
Delivery and transport management	• Details of how the Contractor implements a delivery management system • Trip demand forecasting • Proposed timing windows for vehicle movements to and from site, taking local conditions into consideration • Details of abnormal load requirements, including appropriate planning and notification to relevant stakeholders, e.g. local authorities and emergency services

3.3 Commitments to secure mitigation of impacts

3.3.1 As part of the planning process and in line with industry best practice, the Project has made commitments to secure mitigation of its construction materials handling operations. These are secured in the draft DCO (Application Document 3.1) through Schedule 2 Requirements via the CoCP and REAC. This oMHP reflects those commitments.

3.4 Principles to optimise materials logistics

3.4.1 A number of principles will be applied to reduce material movements for construction, including the following, which are explained in greater detail below:

a. Design for manufacture and assembly, build offsite, and modular construction

b. Consolidation of deliveries

c. Maximising load density (removing unused space on vehicles)

d. Retention and reuse of site-generated materials such as excavated soils, vegetation, and demolition waste where possible

e. The proximity principle (of sourcing materials as close to the Project as possible)

f. Use of multimodal transport

Design for manufacture and assembly

3.4.2 Design for manufacture and assembly, is the prefabrication of all or part of an item offsite, for delivery then assembly and installation to form a completed asset, such as a piece of equipment or structure, with minimal onsite works.

3.4.3 Modular construction reduces vehicle trips and associated emissions, and can reduce overall construction times by improving the efficiency of delivery and assembly on site. It can also reduce construction activity risks.

3.4.4 The Contractor will be required to review the design to investigate the use of prefabricated structures and components and encourage a process of assembly rather than construction onsite, where economically and technically feasible.

Consolidation

3.4.5 Consolidation is the grouping of materials from multiple deliveries onto fewer vehicles to minimise the overall number of deliveries.

3.4.6 Provision has been made within compounds and ULH's for mass storage of materials and equipment and to manage delivery flows to individual construction worksites.

3.4.7 The Contractors will also be required to detail their performance in terms of reducing site traffic through consolidation.

Load density maximisation

3.4.8 The Project will require Contractors to plan and detail how they will maximise load density for all vehicle trips (the amount of weight that can be safely loaded per unit volume). This will reduce road miles travelled, emissions and road risks.

The proximity principle

3.4.9 Priority would be given to sourcing primary, secondary and recycled aggregates from Kent, Medway, Thurrock, Essex and Greater London whenever the design specification permits and supply is available, to embody the proximity principle of sourcing materials as close to the Project as possible.

3.4.10 The Contractor will use the Building Research Establishment (BRE) Framework Standard for Responsible Sourcing of Construction Products (BES 6001) (BRE, 2008), to verify imported materials are sustainably sourced and managed, to reduce impacts throughout the supply chain.

3.4.11 Similarly, in dealing with waste (including hazardous waste) and/or general excavated material that requires offsite management, the Contractors would adopt the proximity principle as part of the selection criteria of suitable receiver sites.

Multimodal transport

3.4.12 Multimodal transport refers to the use of road, water and rail in combination to optimise material transport and delivery.

3.4.13 The Project would seek to reduce road vehicle miles travelled using a combination of modes of transport, using a 'final mile' strategy to transport the materials efficiently to site from the main delivery terminal or depot. (See Section 8 for the final mile approach).

3.4.14 The locations of the main construction compounds of the Project provide for access to ports, rail in limited locations and the SRN (Section 8).

3.5 Managing construction delivery movements

3.5.1 The following measures will manage unavoidable construction vehicle movements, which are explained in greater detail in the sections below:

a. TMPs (in accordance with the oTMPfC (Application Document 7.14))

b. Queuing and holding points at site entrances within the Order Limits

c. Supply chain data analysis (information to provide an understanding of vehicle movements associated with deliveries, so that improvements and efficiencies can be implemented)

d. Materials distribution management (planning the flow and movement of materials to optimise movements and avoid stockpiling)

e. Delivery booking system

f. Movement of Abnormal Indivisible Loads

g. Mitigating measures for vulnerable road users

h. Construction site good housekeeping and safety

Traffic Management Plans

3.5.2 The preparation of TMPs for construction is a requirement of the draft DCO (Schedule 2 Requirement 10) and would be prepared by the Contractors to optimise vehicle movements with the aim of reducing impacts and improving safety.

3.5.3 The oTMPfC provides an overview of the approach that will be followed and will inform the preparation of a TMP for construction by the Contractors. This will require approval by the Secretary of State following consultation with the relevant highway authority/authorities.

Vehicle holding points

3.5.4 To manage the arrival of vehicles to the site compounds and ULH's, vehicle holding points would be provided, with reception and booking-in areas, located inside the Order Limits and close to agreed worksite entrances.

3.5.5 These areas will receive and process vehicles making deliveries on a scheduled basis, to minimise the risk of queuing on the highway (in accordance with the oTMPfC).

Supply chain data analysis

3.5.6 Supply chain data analysis would provide an understanding of vehicle movements associated with deliveries, so that improvements and efficiencies can be implemented.

3.5.7 Construction sites would be fitted with technology such as Automatic Number Plate Recognition, to enable the Contractors to track and analyse data relating to vehicle movements for the Project. This would help to drive conformity with agreed delivery hours, delivery routes, delivery of pre-booked materials, idling times, near misses and any non-conformity. This would enable Main Works Contractors to review, assess and improve performance where necessary.

3.5.8 The use and management of couriers would also form part of the data analysis to understand and help maximise load capacity.

Materials distribution management

3.5.9 The Project would implement a systematic approach to logistics management to drive efficiencies. A delivery management system would coordinate materials distribution to compounds to optimise movements and avoid stockpiling.

3.5.10 The Contractors would monitor material quantity requirements to avoid over-ordering, reducing risk of oversupply and damage on site, which could lead to waste materials being generated.

Delivery booking system

3.5.11 The Contractors would implement a delivery booking system for all construction deliveries associated with their site. A delivery booking system would enable forward planning and coordination of delivery vehicle movements, including management of non-conformances to delivery slots and proactive resolution of peaks in demand.

3.5.12 The delivery booking system would also allow driver details, registration numbers and arrival and departure times to be recorded.

Movement of Abnormal Indivisible Loads

3.5.13 The TBM bridge structures and associated specialist equipment, including tower cranes, mobile cranes and plant, would be delivered as Abnormal Indivisible Loads. This would also include wide loads and long loads (loads of exceptional length) for items such as bridge spans, crawler crane assemblies, and self-propelled modular transporters (used for manoeuvring heavy and large loads).

3.5.14 The CoCP (Application Document 6.3) confirms that Contractors must follow relevant legal requirements and planning processes for the transportation of Abnormal Indivisible Loads, including the assessment of structures, junctions and routes for the movement of these loads. This may require modification of junctions or temporary removal of street furniture and lighting, for example to enable a load to pass. All such movements would be carefully planned in consultation with the relevant highway authorities and the police (and detailed in the TMP).

Mitigating measures for vulnerable road users

3.5.15 To mitigate the impact of HGVs and other construction vehicles on vulnerable road users, the Project would apply the Fleet Operator Recognition Scheme and Construction Logistics and Community Safety Scheme, which demand collaborative action and reporting to prevent fatal, serious and near-miss collisions between vehicles servicing construction projects and vulnerable road users, including pedestrians, cyclists and motorcyclists. This is a requirement of the CoCP.

Construction site good housekeeping and safety

3.5.16 All vehicle movements on the Project construction sites would be managed in accordance with the requirements set out in the CoCP. This also includes good housekeeping and site security.

4 Environmental setting and existing infrastructure – considerations and constraints

4.1 Context

4.1.1 The geographical context and extent of the Project means that there are a number of constraints, including environmental and physical infrastructure, to consider in the planning of material movement for the Project. These are detailed below, and the relevant locations are indicated Plate 4.1, Plate 4.2 and Plate 4.3.

4.2 South of the River Thames

Use of the strategic and local road network

4.2.1 There are a limited number of SRN routes near the Order Limits.

4.2.2 The Project would primarily use direct access from the A2, A289 and A226 to compounds south of the River Thames for construction traffic movements. However, this is not possible in all locations, so the local road network will need to be used where required. The forecast impact to the road network is described in the Transport Assessment (Application Document 7.9).

4.2.3 Where construction traffic would use local roads, it would be via a limited number of routes across the geography of the Project (refer to the CoCP (Application Document 6.3) for detail on mitigation and limitations for vehicle routes). Additional measures to ensure safe use of the road network for construction traffic will be developed in consultation with the relevant local authorities and secured in the TMP developed prior to construction using the principles set out in the oTMPfC.

Environmental sensitive areas

Thames Estuary and Marshes Ramsar

4.2.4 The Thames Estuary and Marshes Ramsar is a designated site of international importance located on the southern side of the River Thames, near Gravesend. In order to reduce harm to the Ramsar and its functionally linked habitat, the Project is not seeking to create a new jetty (deep or shallow water) on the south side of the River Thames within the Project's Order Limits. This forms a constraint on river transport of materials into or out of construction compounds on the south side of the River Thames.

Rail infrastructure

4.2.5 Hoo Junction is an operational rail yard 4km away by road. However, it is primarily used by track maintenance fleets and is sited on the busy North Kent railway line, with frequent commuter services which would impact the availability of this rail route (in terms of the timing and ability to dispatch a train). Because works south of the River Thames (specifically the South Portal site

and associated compound) are not physically adjacent to Hoo Junction, it is not considered viable option for use by the Project.

Existing amenities

4.2.6 The Milton Rifle Range (a police training site) is located within the Thames Estuary and Marshes Ramsar. This creates a physical barrier to access to the River Thames from southern construction worksites within the Order Limits. This forms a further constraint on river transport of materials into or out of sites via the river on the southern side of the River Thames.

Plate 4.1 Geographical features and existing infrastructure south of the River Thames

4.3 North of the River Thames

Use of the strategic and local road network

4.3.1 There are a limited number of SRN routes near the Order Limits.

4.3.2 The Project would primarily use direct access from the A13, A1089, A127 and the M25 to compounds north of the River Thames for construction traffic movements. However, this is not possible in all locations, so the local road network will need be used where required. The forecasted impact to the road network is described in the Transport Assessment (Application Document 7.9).

4.3.3 Where construction traffic would use local roads, it would be via a limited number of routes across the geography of the Project (refer to the CoCP (Application Document 6.3) for detail on mitigation and limitations for vehicle routes). Additional measures to ensure safe use of the road network for construction traffic will be developed in consultation with the relevant local authorities and secured in the TMP developed prior to construction using the principles set out in the oTMPfC.

River infrastructure and water transport

4.3.4 On the north bank of the River Thames, there are two operational jetties close to the Order Limits (the North Portal area). However, both jetties are fully utilised by existing landowners and business owners and do not have additional capacity to import materials for the construction of the Project.

4.3.5 The busy navigational channel of the River Thames precludes the potential for the creation of a new jetty (deep or shallow water) on the north side of the river within the Order Limits.

Rail infrastructure

4.3.6 Three of the construction compounds north of the River Thames are located within 1km of existing rail connections: the Northern tunnel entrance, M25 and Ockendon Road compounds.

4.3.7 All other construction compounds north of the River Thames are not considered viable for a rail connection, due to the extensive road transportation on the SRN or local roads (online) that would be required to move materials and supplies to a rail connection.

4.3.8 The Tilbury2 development has an area of land committed to environmental mitigation as part of its DCO. This area would be the only practicable location to site a direct rail connection to the construction compound at the North Portal (Northern tunnel entrance and Station Road compounds). In light of the alternative existing rail facilities available in the immediate vicinity of the North Portal, it is considered disproportionate to construct a new temporary rail spur, which would have the effect of dislodging the Port of Tilbury's environmental mitigation. As a result, a direct rail connection is not considered appropriate for material movement on the north side of the River Thames.

4.3.9 Due to a combination of the physical spatial requirements and train path availability, a direct rail connection to compound M25 and Ockendon Road is not considered appropriate for material movement. Section 8 summarises the Projects material transport options.

Local features and infrastructure

4.3.10 The Tilbury Loop railway line forms a physical barrier to the continuation of offline access (construction traffic access via the haul routes inside the Order Limits) between the north bank of the River Thames and the intersection of the Order Limits with the M25.

4.3.11 Substation Road (located between the North Portal and the Tilbury Loop railway line) is a private road owned by Port of Tilbury London Limited (PoTLL). This road would be used to access compounds at the North Portal (the Northern tunnel entrance and Station Road compounds), but the use would be coordinated with the road owner's, operational requirements, as works associated with the now completed Tilbury2 project also require the use of this road, see paragraph 4.3.21 onwards for further details.

4.3.12 Parts of Medebridge Road in South Ockendon form a private road owned and maintained by Veolia UK. This road has been identified as a key access route to worksites north of the A13, to minimise the use of the local road network in this area. This road would be used to access compounds north of the A13 (the Mardyke and Medebridge compounds), but the use would be balanced with the road owner's operational requirements.

Proposed developments

4.3.13 There are several interfacing projects that will have physical interfaces during the delivery of LTC. The Interrelationship Document (Application Document 7.17) describes how National Highways has worked with third-party project promoters and stakeholders to design out and control project interfaces, where necessary, to avoid prejudicing the successful delivery of other projects. For interfaces specific to the oMHP such as access routes to compounds are detailed below. For interfaces that are nonspecific to the oMHP refer to the Interrelationship Document. The interfaces represent a snapshot of known interfaces at the time of DCO submission, new projects and interfaces may arise at the point of construction delivery.

4.3.14 The Traffic Management Forum detailed in the oTMPfC will be used to facilitate the management of interfaces that relate to construction logistics and temporary traffic management. Refer to the oTMPfC for further detail on the TMF.

Thurrock Flexible Generation Plant

4.3.15 The Thurrock Flexible Generation Plant is a project proposed by Thurrock Power Limited which has been granted consent. It is situated to the west of the North Portal compound. The Order Limits of Thurrock Power's DCO overlap with those of the Project.

4.3.16 The construction period for some elements of the Thurrock Flexible Generation Plant is anticipated to overlap with construction activities associated with the Northern Tunnel Entrance and Station Road compounds. Thurrock Power and the Project propose to use a shared access point off Substation Road for Abnormal Indivisible Loads and HGV movements.

4.3.17 The Project is working with Thurrock Power Limited to ensure neither project impedes the delivery of the other, while ensuring impacts on the local road network are minimised.

Brentwood Enterprise Park

4.3.18 BEP (Brentwood Enterprise Park) is a proposed mixed-use commercial development immediately east of M25 junction 29 which overlaps with the Project order limits south of the A127 east of M25 junction 29 adjacent to the Warley Street Compound.

4.3.19 Works are anticipated to start in July 2024 and end in March 2026 with the proposal raising levels on land overlapping with the Warley Street compound as well as land required by the Project for multi utility works. Completed works would not constrain construction activities in the area. However, the works would need to be coordinated and sequenced in a way that suits both projects.

4.3.20 The two schemes would have shared access routes if works overlapped and a contingency for joint access is the subject of ongoing engagement with the landowner and developer with the Planning Statement submitted in support of the BEP planning application confirming "...*there has been extensive liaison with the Lower Thames Crossing project team and it is confirmed that both proposals can co-exist*".

Tilbury2

4.3.21 Tilbury2 is a new terminal at the Port of Tilbury (PoT) in Thurrock, Essex. The development consists of a Roll-on, Roll-off (RoRO) terminal, Construction Materials and Aggregates terminal (CMAT) and associated infrastructure including rail and road facilities and revisions to the existing marine infrastructure. Construction started in March 2019 and it is now fully operational.

4.3.22 It is located to the west of the Project's north portal on the north side of the River Thames, east of the existing PoT. The Tilbury2 order limits overlap with the Project order limits to the south of the Tilbury Loop railway and the Project seeks to use the infrastructure corridor owned by PoTLL for access to the Northern Tunnel Entrance and Station Road Compounds.

4.3.23 The Project and the PoTLL have concluded on the terms of an 'Access Agreement' (third-party agreement) which allows the Project to use Tilbury2's infrastructure corridor for construction access but has not yet been signed as the PoTLL are waiting to review the DCO in conjunction with the agreement once the DCO has been submitted.

4.3.24 The Project recognises Tilbury2 is well located for material movements via river for the Project. It's located close to the order limits at the Northern Tunnel Entrance Compound. The Project will engage with aggregate suppliers and the PoTLL collaboratively, to proactively seek opportunities to use the Port and develop a strategy to reduce material movement by road. Refer to Section 6.2 for further detail on river use for material importation.

Plate 4.2 Geographical features and existing infrastructure north of the River Thames and up to the A13 junction

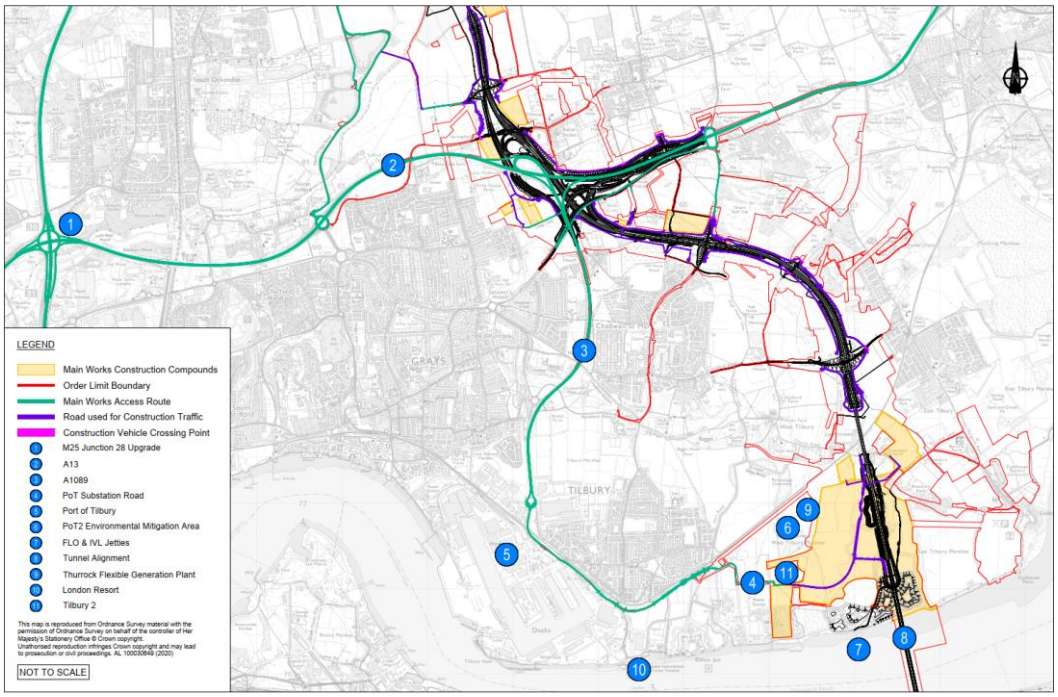
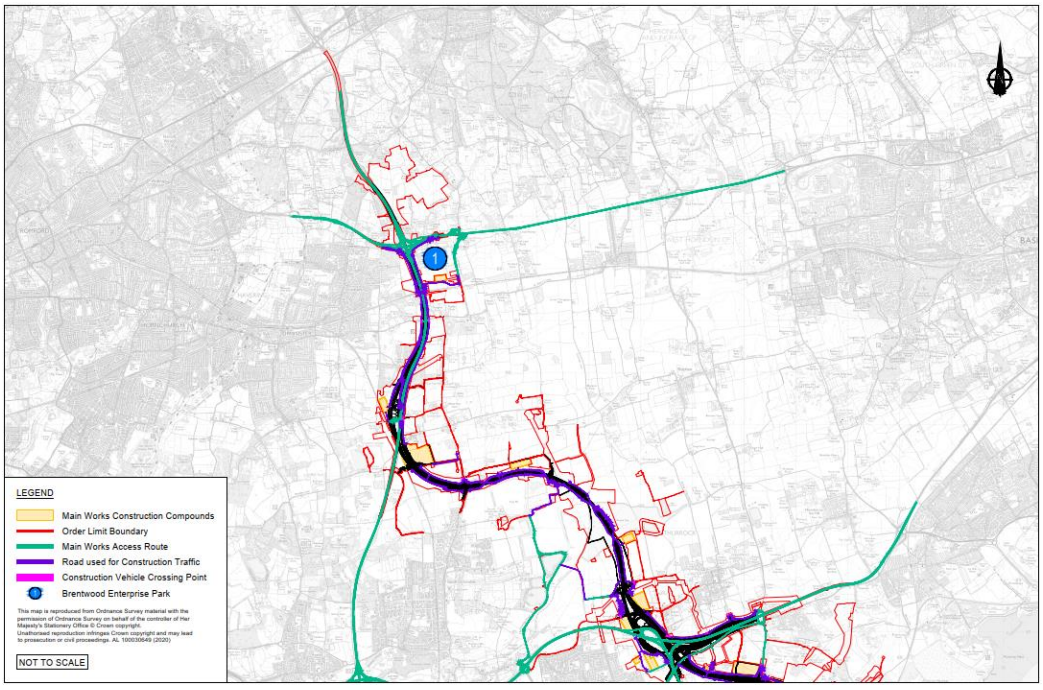


Plate 4.3 Geographical features and existing infrastructure north of the A13 junction



5 Construction logistics on large-scale projects

5.1 The need for construction compounds

5.1.1 To optimise the management of construction logistics on large-scale (major) projects, construction compounds are needed to provide appropriately located areas for specific activities, such as storing, managing and maintaining plant; storage and use of materials; operational activities such as concrete batching; and for workers' welfare and office facilities. Refer to CoCP (Application Document 6.3) for more information.

5.1.2 This is relevant to this oMHP because the use of compounds will optimise vehicle movement for material movements, storage and use. The Project has defined two types of compounds – construction compounds and ULHs (for works that are utility specific).

5.2 Construction compounds

5.2.1 Construction compound locations have been identified based on the following requirements:

a. To support the type, scale and complexity of works such as the tunnel portal sites

b. To facilitate material deliveries and storage (of both imported and excavated materials) in key locations

c. To be in suitable proximity to construction worksites and existing transport infrastructure, such as the SRN, rail and river access, to optimise vehicle movements and minimise impact on the environment and community

d. To provide the necessary facilities and operations capability to the Project construction workforce (including offices, welfare, catering, storage and materials processing)

e. To be close to existing transport networks to enable the Project workforce to commute to their place of work (compounds often provide a base location for the start and end of the working day)

f. To respond to feedback from stakeholders

5.2.2 Based on the above criteria, it has been identified that 18 construction compounds are required for the construction phase.

5.3 Utility logistic hubs

5.3.1 In addition to the 18 construction compounds, there would be 15 Utility Logistic Hubs (ULH) to facilitate the delivery of specific utility works. The ULHs would be required for receiving, storing and distributing the plant and materials needed to complete specific utility works. Their establishment, use and demobilisation would be aligned with the construction programme.

5.3.2 The ULHs would include facilities such as office space, welfare, refuelling, security, vehicle and wheel-wash and parking. In addition the ULHs would include materials laydown area appropriate to the size and quantity of the materials that would need to be stored. The ULHs would be in operation to facilitate specific utilities works, and once completed, the ULHs would be demobilised.

5.4 Access routes to construction compounds and ULHs

5.4.1 Access routes to each of the 18 construction compounds from the public highway have been developed in consultation with stakeholders, including local authorities and regulatory bodies, and through development of the Project design. The oTMPfC (Application Document 7.14) provides an overview of the approach proposed by the Project.

5.4.2 Of the 15 ULHs 9 will be jointly located with construction compounds. 6 ULHs require separate access to construction compounds due to requiring a separate working area within the Order Limits to which the construction compounds do not provide access for. For the 6 ULHs where access routes differ, levels of construction traffic movements will be low (further information is provided in the oTMPfC (Application Document 7.14)).

5.4.3 To minimise the use of the existing road network, haul routes have been proposed within the Order Limits. While these will be established early in the construction programme, some Project-related construction traffic would still need to access compounds via the local road network. The Transport Assessment (Application Document 7.9) sets out the forecast impacts on traffic as a result of the construction of the Project. The use of the haul routes as part of the final mile approach is described in Section 8.

5.4.4 Plate 5.1 to Plate 5.4 show compounds and ULH locations as well as illustrative construction access routes which would facilitate main works and utilities. Note these figures are illustrative and a snapshot in time during the works. Refer to the Temporary Work Plans TR010032/APP/2.17 for drawings which show the full extents of the scheme.

5.4.5 Plate 5.1 shows the following construction compounds and ULH:

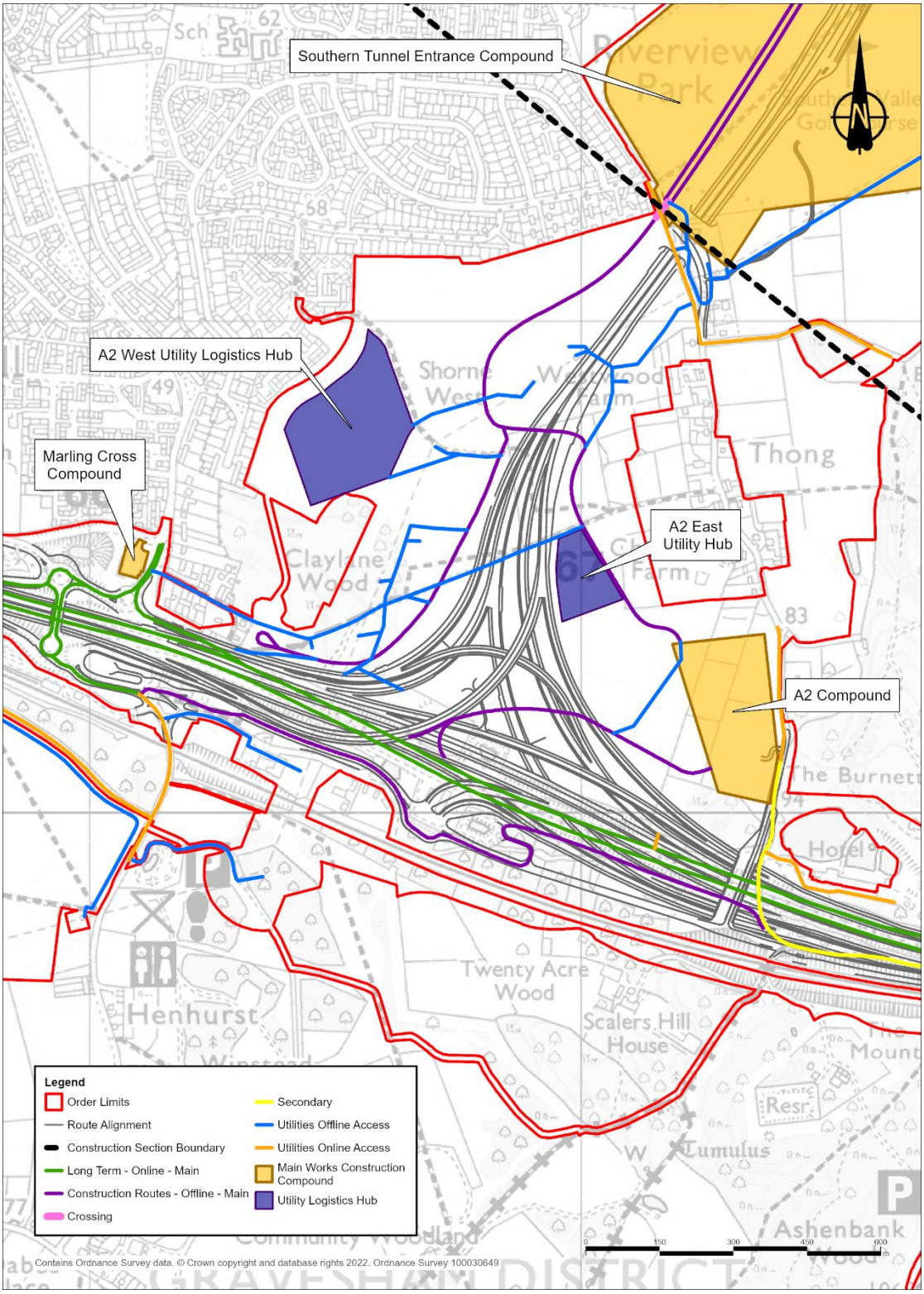
a. Marling Cross compound – near Gravesend East junction

b. A2 compound – near the A2 and Thong Lane

c. A2 East Utility Hub - near the A2 and Thong Lane

d. A2 West Utility Hub - near Gravesend East junction west of alignment

Plate 5.1 Compounds, ULH and construction access routes including utilities (A2 to Thong Lane over the A122)



5.4.6 Plate 5.2 shows the following construction compounds and ULH:

a. Park Pale Lane Utility Hub – north of the junction between A2 and M2

b. Shorne Ifield Road Utility Hub – south-east of proposed South Portal

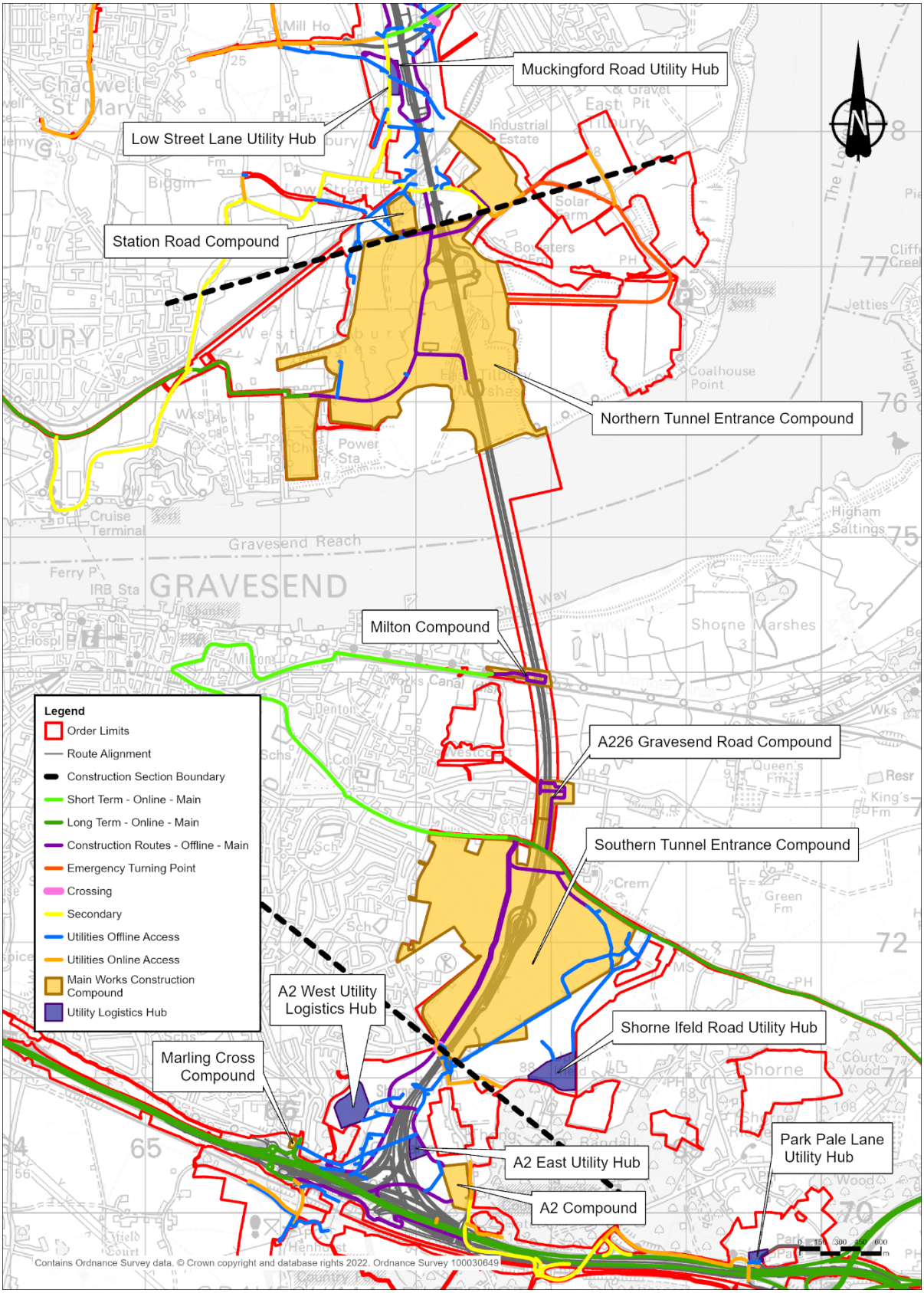
c. Southern tunnel entrance compound – around proposed South Portal

d. A226 Gravesend Road compound – around proposed ground protection tunnelling and strengthening works.

e. Milton Compound – south of the river and west of proposed alignment.

f. Northern tunnel entrance compound – around the proposed North Portal (including the section between the dashed line and Tilbury Loop railway line, east of the Project alignment)

Plate 5.2 Compounds, ULH and construction access routes including utilities (South Portal to North Portal)



5.4.7 Plate 5.3 shows the following construction compounds and ULH:

a. Station Road compound – between dashed line and Tilbury Loop railway line (west of the Project alignment)

b. Low Street Lane Utility Hub – north of the Tilbury Loop railway line and west of the Project alignment.

c. Muckingford Road Utility Hub - north of the Tilbury Loop railway line and west of the Project alignment.

d. Brentwood Road Utility Hub - south of the A13 and east of the A1089 near Brentwood Road

e. Brentwood Road compound – south of the A13 and east of the A1089 near Brentwood Road

f. Hornsby Lane Utility Hub - south of the A13, east of the A1089 and south of the Project alignment

g. Stanford Road compound – south of the A13 and east of the A1089 near the A1013

h. Stanford Road Utility Hub - south of the A13, east of the A1089 and north of the A1013

i. Long Lane compound (A and B) – south of the A13 and west of the A1089

j. Long Lane Utility Hub - south of the A13 and west of the A1089

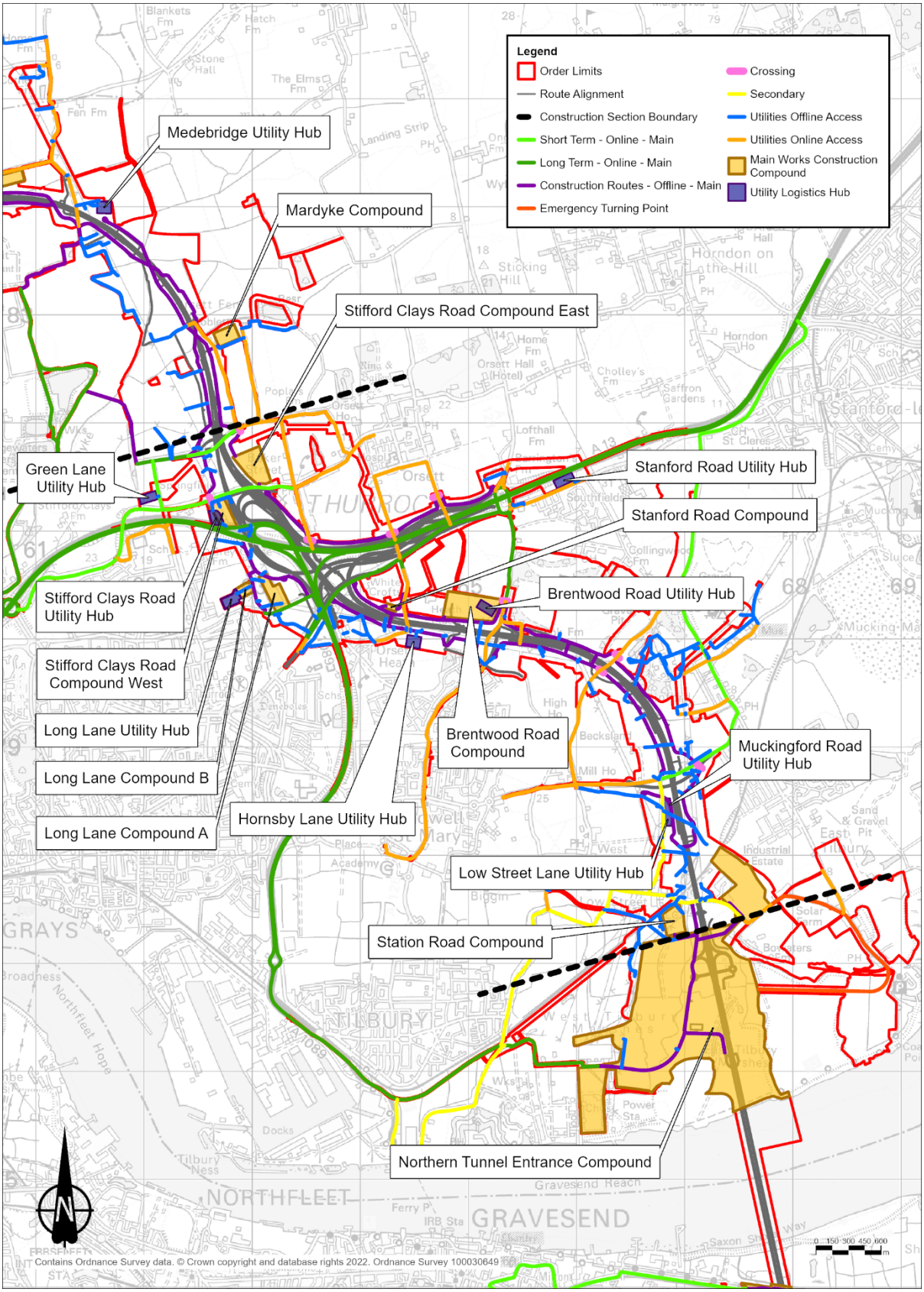
k. Stifford Clays Road compound West – north of the A13 and west of the Project alignment

l. Stifford Clays Road compound East – north of the A13 and east of the Project alignment

m. Stifford Clays Road Utility Hub - north of the A13 and west of the Project alignment

n. Green Lane Utility Hub - north of the A13 and west of the Project alignment

Plate 5.3 Compounds, ULH and construction access routes including utilities (North Portal to A13)



5.4.8 Plate 5.4 shows the following construction compounds and ULH:

a. Mardyke compound – north of the A13, east of the Project alignment near Fen Lane

b. Medebridge Utility Hub - north of the Project alignment

c. Medebridge compound – north of the Project alignment in an open field

d. M25 compound – just east of the M25 and near Ockendon Road

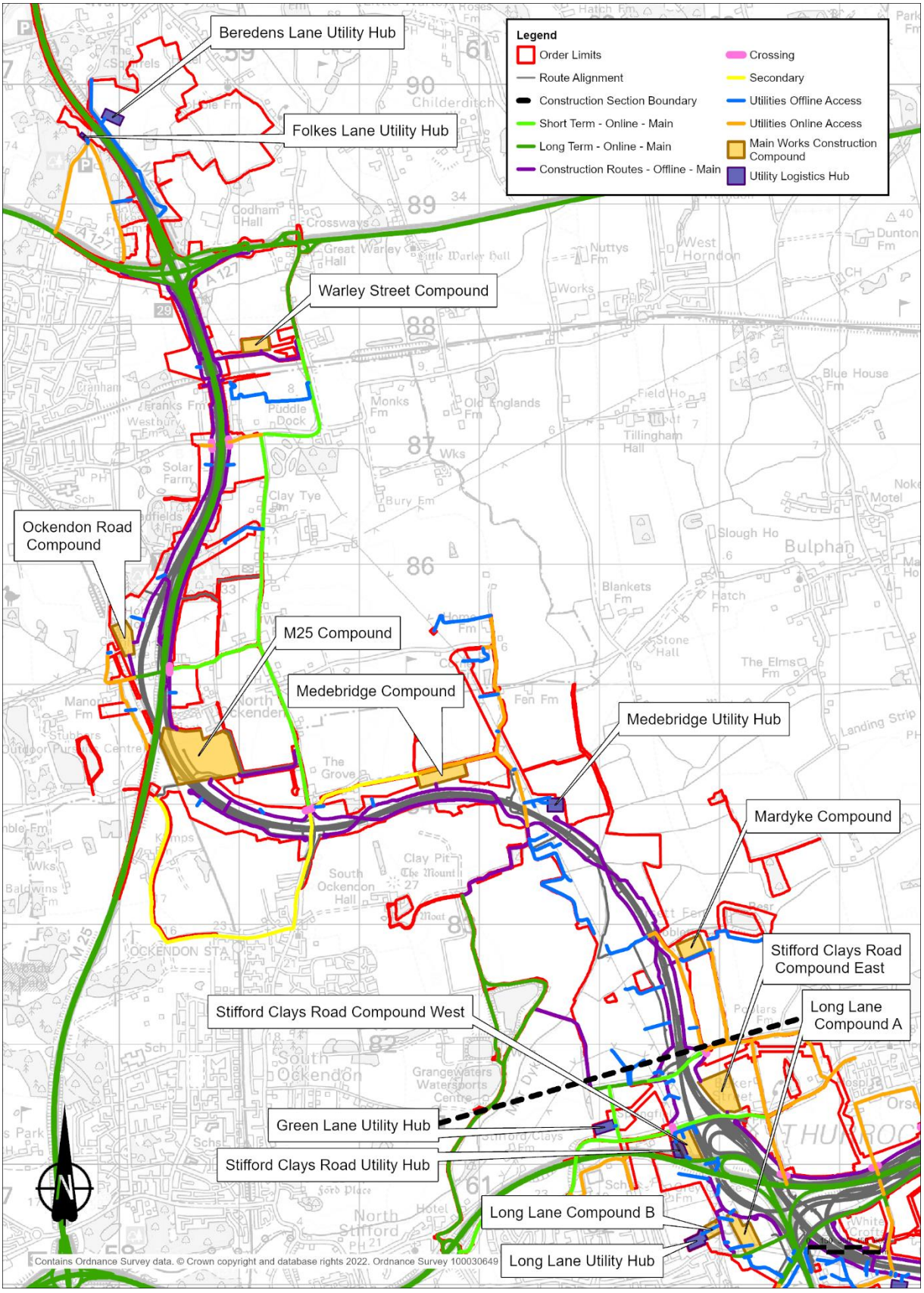
e. Ockendon Road compound – just west of the M25 and near Ockendon Road

f. Warley Street compound – just east of the M25 and near the A127

g. Folkes Lane Utility Hub – north of the A127 and west of the M25

h. Beredens Lane Utility Hub – north of the A127 and north-east of the M25

Plate 5.4 Compounds, ULH and construction access routes including utilities (A13 to M25)



6 Materials movements

6.1 Material supply

6.1.1 To assess the capability and capacity of suppliers to support the construction of the Project, potential local suppliers were identified and engaged. The purpose of the engagement was to understand the infrastructure in place to deliver the required materials and equipment via river, rail or local road; production capabilities; and experience of supplying a major project.

6.1.2 The assessment has focused on material supplies that form the majority of Project demand in terms of quantity and frequency of construction deliveries. This included ready-mixed concrete, aggregates (sand, gravel, rock and recycled), cement and asphalt.

6.1.3 Kent County Council and Essex County Council have produced aggregate assessments for local supply opportunities.

6.1.4 Targeted engagement was also undertaken with suppliers that have numerous sites local to the Order Limits and experience of supplying major projects to better understand availability of supply within the 20km catchment area.

6.1.5 The assessment focused on a 20km catchment area, considered to equate to a road journey of up to one hour, which is considered to embody the proximity principle and focus on supply sites and depots most likely to be used in the Project's construction.

6.1.6 Table B.1.1 and Table B.1.2 in Annex B.1 represent sites categorised by their multi-modal delivery capabilities and proximity to the project. The scenario developed, for modelling purposes, is a researched, deliverable scenario. It should be noted that contractors will develop their own supply chains and delivery modes, within the framework provided by the control documents.

6.2 Material transportation to the Project sites

Aggregate transportation via rail

6.2.1 The majority of rail-borne aggregates used by the construction sector in London and the surrounding area are sourced from one of three areas: the Mendip Hills in Somerset, Leicestershire, or the Peak District.

6.2.2 Traffic from the Mendip Hills dominates, travelling along the Great Western route into Greater London at Acton. From this central facility (Acton), trains are forwarded or divided to carry large or smaller loads to their respective destinations.

6.2.3 By contrast, traffic from Leicestershire and the Peak District tends to run directly to terminals via the Midland Main Line.

6.2.4 The review of potential local suppliers to support the delivery of the Project has identified several sites that utilise the existing rail paths to deliver material near to the Project. It would be possible to use rail as part of a multimodal approach to import materials to the Project via an existing rail connection, with onward transport via the road network. However, Section 8 sets out detail on the limitations of providing a direct rail connection to the Project.

Aggregate transportation via river

6.2.5 As explained in Section 4, the Project is situated close to the Port of Tilbury. National Highways has been working closely with the PoTLL, the Port of London Authority (PLA) and DP World (London Gateway Port), and has taken into consideration the opportunity of utilising port facilities, particularly in connection with the construction of the tunnels and the northern portal. The use of port facilities would not always be appropriate (e.g., in connection with works south of the River Thames) but the sections below set out how the Main Works Contractors would maximise the use of port facilities.

6.2.6 The purpose of the commitments set out below is as follows:

a. Minimise the number and length of construction-related transport movements

b. Minimise the potential social and environmental impacts arising from construction-related import of materials associated with the Project

Existing situation

6.2.7 There are several suppliers with river access and port operators including both PoTLL and Tilbury2 who are closest to the Project's Order Limits. Tilbury2 has a Construction Materials Aggregate Terminal within it, which receives aggregates by river and distribute onwards via road or rail into London and Essex. The proximity and road connectivity of the Port of Tilbury facilities to the north portal construction area provides a potentially advantageous supply connection.

6.2.8 There are two operational jetties on the north bank of the River Thames close to the Order Limits: East Tilbury jetty and Ingrebourne Valley Limited jetty. However, both jetties are fully utilised by existing landowners and business owners and do not have additional capacity to import materials for the construction of the Project. Further detail is provided in Section 8.

Measures to be secured in Environmental Management Plan2 (EMP2) in connection with use of port facilities

6.2.9 The Project recognises the opportunity that the use of the river for material transportation presents for reducing impacts of vehicle movements. As such, subject to the exceptions below, the Project shall utilise port facilities for at least 80% by weight of bulk aggregates imported to the north portal construction area ('the Baseline Commitment'). This commitment translates into 35% of the total bulk aggregates across the project being transported via port facilities.

6.2.10 This amount is consistent with the construction traffic inputs into the Transport Assessment (Application Document 7.9), and has been used for the purposes of a reasonable worst-case scenario in the environmental assessments.

6.2.11 In addition, and subject to the exceptions set out below, the Contractor would engage with aggregate and material suppliers collaboratively, to proactively maximise utilisation of river transport for the import of bulk aggregates for the north portal construction area beyond the Baseline Commitment so far as is reasonably practicable **(**the Better than Baseline Commitment).

6.2.12 In realising this commitment, consideration should be given to:

a. Suitability and operational capacity of existing river infrastructure to facilitate unloading of construction materials within the programme for the delivery of the Project and within its working hours

b. Where onward distribution by road is required, road connectivity between the river supply site and Project construction sites

c. The potential of adverse impact on the road network, particularly the A1089 and Asda roundabout as compared to the traffic and environmental assessments, and should also consider the related principles of the 'final mile' strategy (Section 8.4)

d. National Highways' obligations to consider Value for Money as a public sector body

6.2.13 The following definitions shall apply to paragraph 6.2.9 to 6.2.12:

a. 'Bulk aggregates'.

   i. Includes sand and aggregates for the manufacturing of concrete, aggregates for the construction of permanent and temporary infrastructure such as roads, haul routes and working platforms.

   ii. Excludes cement for the construction of permanent and temporary infrastructure including for the manufacturing of concrete, the use of aggregates for bituminous bound materials and site won excavated material.

b. 'North portal construction area' means Northern tunnel entrance compound shown in Plate 5.2 and which is proposed to be used for works associated with the construction of permanent and temporary infrastructure south of the Tilbury viaduct and up to where the tunnels connect with the South Portal (but excluding the South Portal itself).

c. 'Port facilities' means facilities within, or next to, the Port of Tilbury or facilities along the River Thames which do not require the use of the road network next to the Thames Freeport.

6.2.14 The Contractor for the temporary and permanent infrastructure at the north portal construction area must explain in the EMP2 submitted for approval by the Secretary of State for that part of the Project how the Baseline Commitment and the Better than Baseline Commitment are addressed.

Exemptions

6.2.15 Neither the Baseline Commitment nor the Better than Baseline Commitment applies to the import of materials where:

a. Circumstances outside of the Contractor's control mean that another mode of transport should be utilised. Examples of such circumstances include where river use is unavailable due to circumstances such as poor weather or damage to the river transport system (conveyors/barges), or where the Port's operations are suspended. Or

b. Where delay is likely to give rise to danger to persons or property, and the Secretary of State agrees, following consultation with the PLA and Port of Tilbury by National Highways, that the commitment should not apply.

6.2.16 Where these exemptions apply, any materials imported are to be excluded from determination of compliance with the Baseline Commitment and the Better than Baseline Commitment.

6.2.17 The Better than Baseline Commitment does not require the Contractor to utilise river transport where there is likely, as a result of meeting the Commitment, to be:

a. A material worsening of traffic conditions on the A1089 or the Asda roundabout, or

b. Materially new or materially different adverse environmental effects as compared to the environmental assessments (but this shall not prevent an environmentally better solution).

6.3 Waste movement

Each construction compound and ULH would have a defined waste management area. Main Works Contractors would be required to define an area in which wastes can be separated to increase recovery. The oSWMP (Application Document 6.3) provides high-level principles for the management of waste during construction of the Project. Using the principles set in the oSWMP, a construction phase Site Waste Management Plan will be developed by the appointed Contractors during construction (refer to the Control Plan extract in Plate 3.1.

6.3.1 The oSWMP also includes detail on the types and quantities of waste forecasted to be generated that will require management. The location of any offsite management of waste (including hazardous) will take into consideration the proximity of the receiver site from the Project, as part of the criteria selection of a suitable receiver site for excavated waste.

6.3.2 The CoCP (Application Document 6.3) includes mitigation measures to support the reuse and recovery of materials and minimise offsite waste management to reduce the associated number of vehicle movements. Where excavated materials (and all waste) are to be reused, recycled and/or recovered within the Order Limits this would be subject to the relevant regulatory controls, such as the Development Industry Code of Practice (CL: AIRE, 2011). Additional specific waste commitments are made in the REAC and detailed in the oSWMP

6.4 Excavated material receiver sites

6.4.1 It is important to understand the anticipated volumes of excavated material which will need to be taken offsite, to validate available offsite capacity at third-party receiver sites (Section 7.2 provides further detail on anticipated volumes).

6.4.2 A detailed description of the approach and identified receiver sites is provided in the Excavated Materials Assessment (Application Document 6.3 – Appendix 11.1) which is provided in the DCO application. The Excavated Materials Assessment will provide a framework to allow the Contractor to identify and assess new or alternative receiver sites which were not previously assessed, or which were previously excluded as potential receiver sites. This would be subject to the sites meeting the criteria established in the Excavated Materials Assessment.

6.4.3 By identifying potential receiver sites and demonstrating capacity, the Excavated Materials Assessment has helped develop assumptions for the management of excavated material, to inform the construction traffic impact assessments.

6.4.4 Appendix 11.3 in Chapter 11 of the ES (Application Document 6.3) provides an overview of the third-party offsite waste facility sites identified to date.

7 Movements of excavated material

7.1 Introduction

7.1.1 An assessment of bulk earthwork quantities has been carried out to establish an illustrative approach to handling excavated material. This includes mass haul movements, i.e., how is the transportation of excavated material handled between point of excavation to destination for placement, stockpiling and/or management offsite. This assessment has been used as a baseline position to support the traffic and environment assessments.

7.1.2 The earthwork assessment includes the following:

a. Quantification of excavated material defined as surplus to the needs of the Project

b. Indicative illustration of mass haul movements using the temporary haul routes defined as ‘offline’, and movements using the road network defined as ‘online’

c. A Project-wide view to the management and handling of excavated material

7.1.3 The ground investigation works have provided information on the physical (geotechnical) and chemical properties of excavated material. It is important to understand the anticipated quantities and geology of the excavated materials to establish appropriate handling and use onsite, or management offsite if surplus to requirements and if hazardous materials are encountered.

7.1.4 The mass haul movements shown in the assessment are indicative and may be subject to change as the Project is developed through detailed design, and as the nature of the ground is fully understood during excavation activities.

7.1.5 Detail has been provided within Section 7.5 regarding the duration of excavated material mass movements where vehicles need to move via an online route and the process may be obstructive, e.g., a planned road closure is required to facilitate the movement safely and mitigate the impact on the road network. Mass haul movements that are offline along the internal haul routes are generally unconstrained and will be carried out in line with the appointed Contractor phasing and programme of works.

7.1.6 For the purposes of the earthworks assessment construction worksites have been grouped into the following areas:

a. Section A – includes worksites on and around the A2 up to Thong Lane.

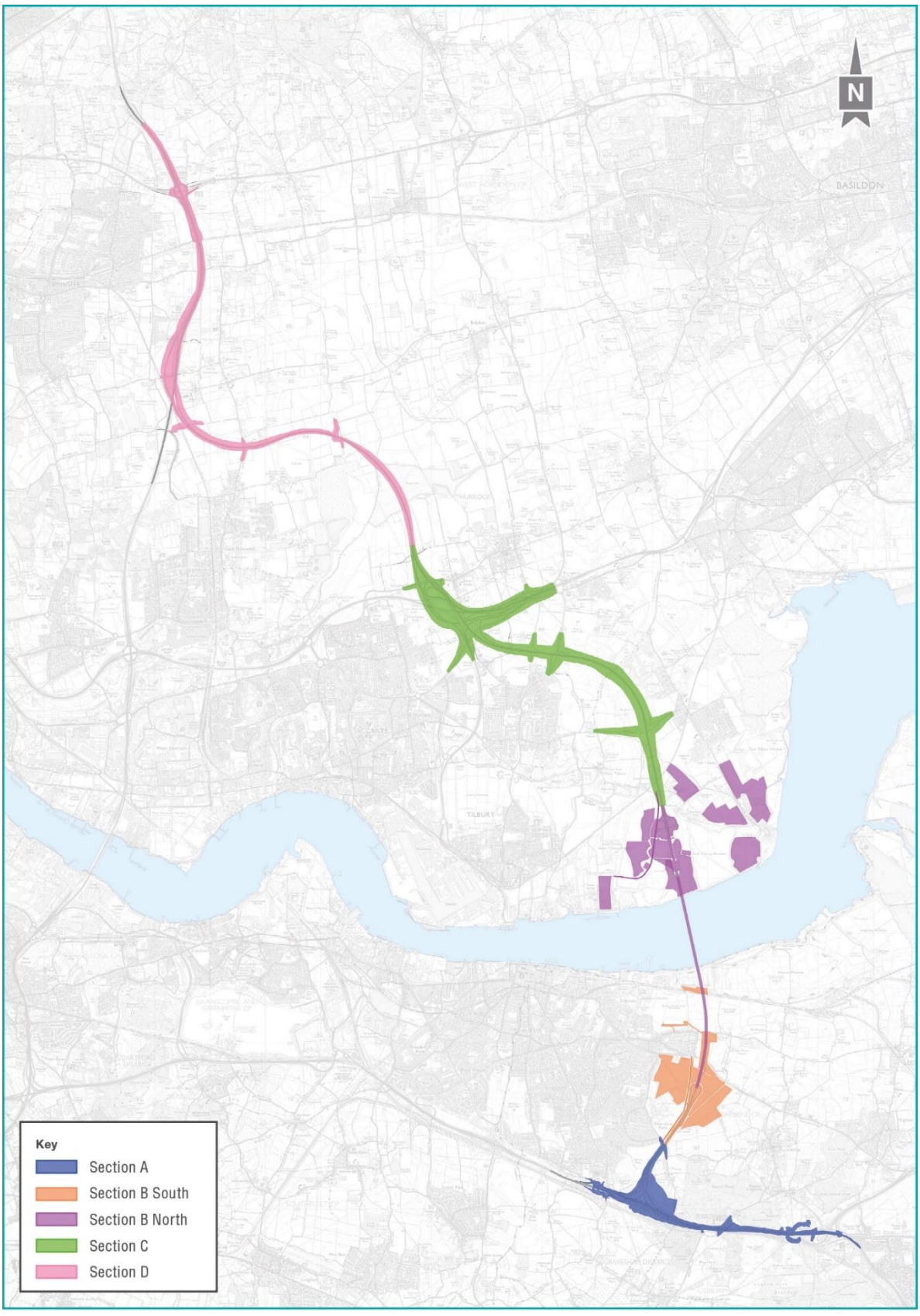
b. Section B south – includes worksites from Thong Lane to the south of the River Thames.

c. Section B north – includes worksites from north of the River Thames up to south of Tilbury Loop railway.

d. Section C – includes worksites from south of the Tilbury Loop railway up to Green Lane located north of the A13.

e. Section D – includes worksites from Green Lane to north of junction 29 of the M25 and up to the Project extents.

Plate 7.1 Construction Sections



7.2 Overview of excavated material volumes

7.2.1 The Project would require onsite reuse of approximately 11,176,500m^3 of excavated materials. The volume of material considered to be unsuitable for reuse, or surplus and requiring management offsite is estimated to be approximately 663,500m^3.

7.2.2 Table 7.1 provides a further breakdown of the excavated material volumes including bulk movements of materials between sections within the Order Limits.

Table 7.1 Volume and type of excavated materials (bulked)

Location	**Section A – Kent Roads**		
South of the River Thames	Material type	Material is anticipated to be Chalk (as dug), with lesser contributions of made ground and Head deposits.	
	Excavated volume (m^3)	~1,400,000	
	Volume for reuse within Order Limits (m^3)	~1,396,500	
	Provision for external import of engineering fill (m^3)	~360,000(Note 1)	
	Imported from within Order Limits and reused (m^3)	~600,000(Note 2)	
	Volume for offsite management (m^3)	Inert/Non-hazardous	0
		Hazardous	~3,500
	Section B (South of River Thames) – tunnels & approaches		
South of the River Thames	Material type	Material is anticipated to be Chalk (as dug) with lesser contributions of made ground, Alluvium, River Terrace Deposits and Head deposits.	
	Excavated volume (m^3)	~2,600,000	
	Volume for reuse within Order Limits (m^3)	~2,000,000	
	Exported for reuse within Order Limits (m^3)	~600,000(Note 2)	
	Volume for offsite management (m^3)	Inert/Non-hazardous	0
		Hazardous	0

	Section B (North of River Thames) – tunnels & approaches		
North of the River Thames	Material type	Material is anticipated to be Chalk slurry (from TBM) with made ground (landfill), pulverised fuel ash, Peat and Alluvium from the launch ramp and North Portal area.	
	Excavated volume (m^3)	~2,700,000	
	Volume for reuse within Order Limits (m^3)	~1,886,000	
	Imported from within Order Limits and reused (m^3)	~314,000(Note 3)	
	Volume for offsite management (m^3)	Inert/Non-hazardous	~660,000* offline transportation to IVL receiver site located within the order limits
		Hazardous	~154,000 **offsite management (outside of Order Limits)*
	Section C – Roads North		
North of the River Thames	Material type	Material is anticipated to be made ground, Alluvium, River Terrace Deposits and Clay	
	Excavated volume (m^3)	~3,400,000	
	Volume for reuse within Order Limits (m^3)	~3,100,000	
	Export for reuse within Order Limits (m^3)	~50,000(Note 3)	
	Volume for offsite management (m^3)	Inert/Non-hazardous	~250,000
		Hazardous	0
	Section D – Roads North		
North of the River Thames	Material type	Material is anticipated to be made ground, Alluvium, River Terrace Deposits and Clay	
	Excavated volume (m^3)	~2,400,000	
	Volume for reuse within Order Limits (m^3)	~1,880,000	
	Export for reuse within Order Limits (m^3)	~264,000(Note 3)	
	Volume for offsite management (m^3)	Inert/Non-hazardous	~250,000
		Hazardous	~6,000

	Summary		
Project total	Excavated volume (m^3)	~12,500,000	
	Volume of external import of engineering fill (m^3)	~360,000	
	Volume for reuse within Order Limits (m^3)	~11,176,500	
	Volume for offsite management (m^3)	Inert/Non-hazardous (management outside of Order Limit	~500,000,
		Inert/Non-hazardous (management within the Order Limits)	~660,000
		Hazardous	~163,500

General note 1: Quantities are an approximation and have been expressed as a rounded number

General note 2: Volumes for retention within the Order Limits excludes quantity imported/exported

Note 1: The import of 360,000m3 is a safeguard position to construct the reinforced soil embankments at the A2, refer to paragraph 7.3.5

Note 2: Surplus from section B (south of River Thames) is to be exported to section A, refer to paragraph 7.4.18

Note 3: Surplus from sections C and D are to be exported to section B (north of River Thames), refer to paragraph 7.5.7

7.3 Provision for stockpiling

General approach

7.3.1 In accordance with the Design Manual for Roads and Bridges (DMRB) LA110 Material assets and waste (Highways England, 2019), consideration needs to be given to onsite stockpiling and segregation arrangements for waste and any supporting logistical arrangements.

7.3.2 It would be necessary to include provision for stockpiling of excavated materials during construction works, to aid the phasing of construction and the reuse of material across the Project. Where practicable, the phasing of the earthwork activities would promote minimising double handling (handling and placement of excavated material more times than necessary) and movement of material to its permanent destination.

7.3.3 Stockpiles will be managed relative to the site-specific activities. This includes stockpiles for topsoil, hazardous material (for later offsite management), materials to be reused, excess clean material and imported materials for construction.

7.3.4 This would enable the segregation of waste types, prevent the mixing of hazardous and non-hazardous wastes and enhance recovery rates.

7.3.5 The appointed contractor will identify stockpile areas based on the requirements of their mass haul plan. The stockpiling areas will consider sensitive receptors in the layout, along with managing the impact of the following:

a. Lighting

b. Access and egress

c. Loading/unloading areas (including hours of operation)

d. Dust

e. Noise

f. Visual impact

g. Rainwater runoff

h. Archaeological features, including working practices and appropriate safeguarding in line with the archaeological commitments in the COCP, REAC and the Cultural Heritage chapter (Application Document 6.1 - Chapter 6).

7.3.6 Where reasonably practicable, the stockpile locations within the compounds will be positioned to provide mitigation, such as sound or visual barriers, in line with the Environmental Impact Assessment (Application Documents 6.1 to 6.3). This mitigation is detailed in the REAC (REAC Ref's LV009, LV011, LV015, LV017, LV021, LV024 and LV026).

7.4 Offline transportation of excavated material

7.4.1 Mass haul movements of excavated material within the construction worksites would predominately be offline via a constructed internal haul route network.

7.4.2 A key principle in the handling of excavated material is to maximise the transportation via offline haul routes to minimise the impact on the online road network, both strategic and local.

7.4.3 There would be over 11,836,500m^3 of excavated material to be transported and retained within the Order Limits, with a further 663,500m^3 estimated for management offsite.

7.4.4 The following primary construction worksite locations have been identified where significant offline movements would occur. The locations are presented by each of the key construction areas in terms of the site geography: Roads North; Tunnels; and Kent Roads. For each construction worksite described, the associated compound has been referenced to provide context to location and access arrangements.

Kent Roads

Between Thong Lane and the A2

7.4.5 The construction of the Project route north of the A2 and south of Thong Lane (near the A2 compound) involves a series of deep cuttings and construction of embankments.

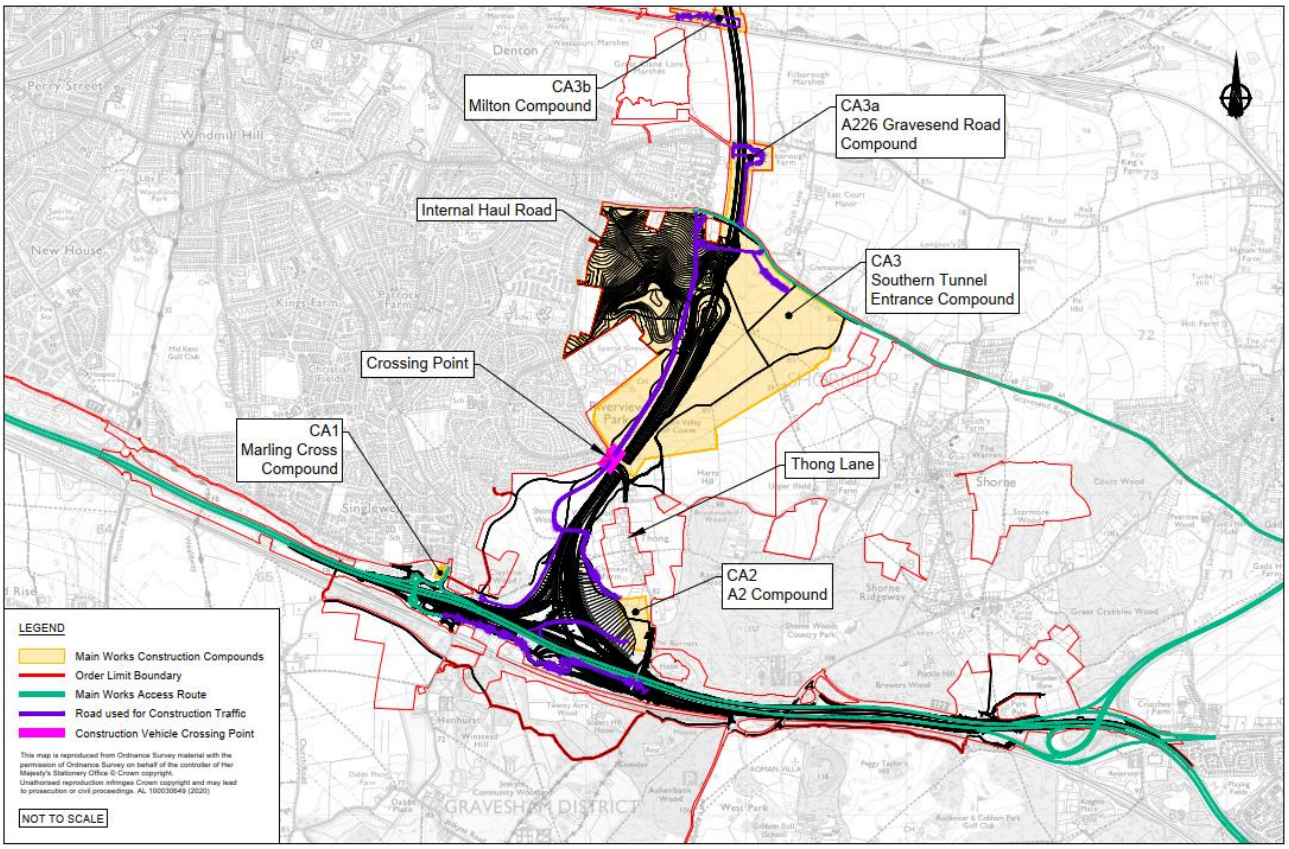
7.4.6 The earthwork operation would require approximately 2 million m^3 of excavated material to be handled and placed to form the deep cuttings, embankments and proposed Project landscape contours. The earthwork assessment has identified there is a deficit of 600,000m^3 of excavated material, which will be sourced from the South Portal site (Southern tunnel entrance compound), just north of Thong Lane.

7.4.7 The remaining 1.4 million m^3 will be sourced from the cutting operations between Thong Lane and the A2.

7.4.8 The transportation of the 600,000m^3 of excavated material from the South Portal construction worksite will be via the constructed haul routes using heavy duty construction vehicles. The haul route in this section follows the Project route and would be modified to suit the phasing of the works in this area.

7.4.9 It is anticipated there will be over 35,000 movements associated with transporting the excavated material from the South Portal construction worksite to south of Thong Lane. This material would be transported along the internal haul route but would need to cross Thong Lane, as shown in Plate 7.2. The road crossing would be managed under temporary traffic signals or a similar system to manage the traffic flows along Thong Lane. In addition, provision has been made within the Order Limits either side of the proposed Project route and associated compounds (A2 compound and Southern tunnel entrance compound) for stockpiling of material. Stockpiling would reduce the frequency of vehicle movements and mitigate against construction impacts associated with the construction vehicle movements at the crossing point.

Plate 7.2 Transportation route of excavated material between the South Portal site and south of Thong Lane



Tunnels

North Portal Site (Northern tunnel entrance compound)

7.4.10 The earthwork operation at the North Portal site would involve the handling of approximately 2.7 million m^3 of excavated material. This includes the material generated from the two TBMs.

7.4.11 The site is situated on and adjacent to Goshem's Farm, a historical landfill site located between the North Portal and the River Thames and includes a parcel of land called Shed Marsh. The site is currently managed by Ingrebourne Valley Limited (IVL) as part of a restoration project to raise the land using inert material and restore it back to high quality, arable farmland. IVL has been receiving excavated material from several major infrastructure projects in London.

7.4.12 Shed Marsh would be used to temporarily store and manage excavated material generated from the North Portal and tunnelling operations.

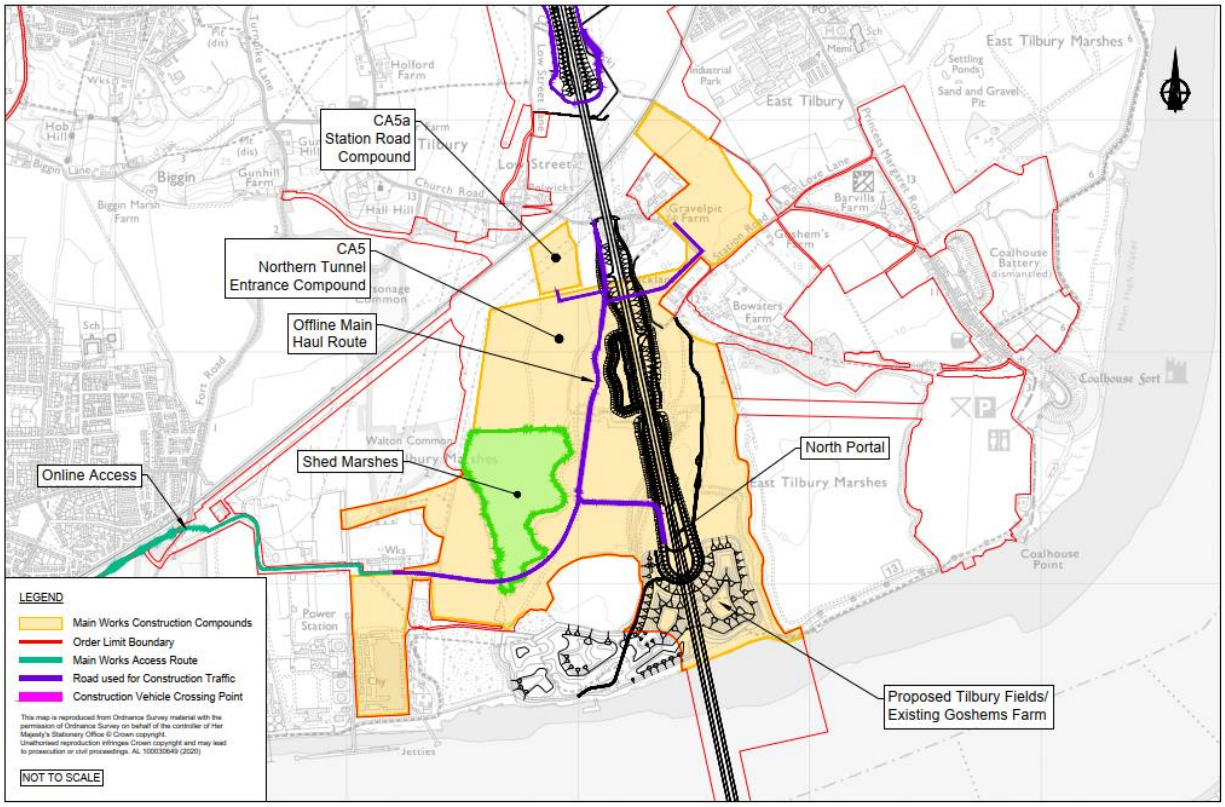
7.4.13 As part of the Project design, the Tilbury Fields landscape feature will be situated on the existing Goshem's Farm. The design of Tilbury Fields looks to utilise the excavated material generated from the construction of the tunnel and portal to create a multi-functional space located on the River Thames, and adjacent the North Portal. The various materials excavated from the tunnel can be used to create the substrate for the creation of an open mosaic habitat at Tilbury Fields, for the benefit of invertebrates and other fauna. The designation

of Tilbury Fields as a Park will help the regular disturbance of land that would benefit the open mosaic habitat.

7.4.14 Approximately 1.4 million m^3 of material arisings from the North Portal construction and tunnel boring will be used to develop the landscape feature. A further 800,000m^3 will be used to form the embankments and landscaping surrounding the North Portal, of which some will be imported from sites north of the Tilbury Loop rail line (*refer to section 7.5 'Roads North and Tunnels*'). It is anticipated the works will occur concurrently with the tunnelling and North Portal construction works as the excavated material becomes available for placement. The remaining surplus of approximately 660,000m^3 will be retained within the Order Limits and managed by IVL as part of their long-term restoration project and a further 154,000m^3 of hazardous material transported offsite.

7.4.15 The transportation of all the excavated material (excluding any hazardous material) from the North Portal construction and tunnelling operations will be offline, using heavy duty construction vehicles. Haul routes will be constructed to facilitate the movement of excavated material at the North Portal site.

Plate 7.3 Overview of the North Portal site and Goshem's Farm



Roads North

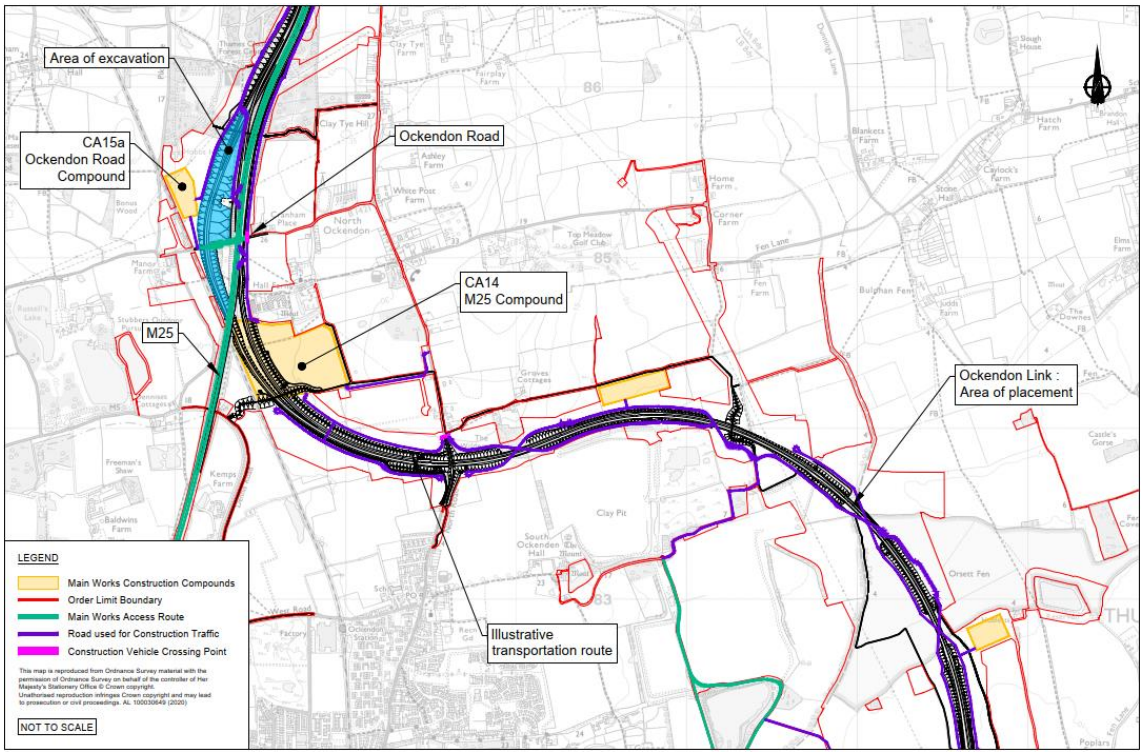
To construct the Ockendon Link

7.4.16 Several earthwork operations would be required to form the embankments for the proposed Ockendon link of the Project route (M25 compound, Medebridge compound and Mardyke compound). The location west of the M25 (Ockendon Road compound), where a deep cutting would be formed to connect the Project road to the M25, has been identified as a source for suitable material to form these embankments in addition to material sourced from the Ockendon Link.

7.4.17 The earthwork operation assessment has identified a deficit of approximately 165,000m^3 for suitable material within the Ockendon link location.

7.4.18 The construction worksites between the location of the material source west of the M25 (point of excavation) and placement will be constrained by the existing M25 alignment to maintain a direct offline route. Based on a standard HGV, It is anticipated that there will be over 19,000 construction vehicle movements to transport the excavated material using the road network. To mitigate this online movement, the transportation period will align with the closure of Ockendon Road over a period of up to 19 months. The material will then be transported using earthmoving construction vehicles along Ockendon Road during the closure period. This will provide direct offline access to the haul route for transportation to the worksites associated with the construction of the Ockendon link, while mitigating any associated construction traffic impacts associated with this mass haul movement on the online road network. An illustrative route is shown in Plate 7.4.

Plate 7.4 Ockendon Road offline haul route



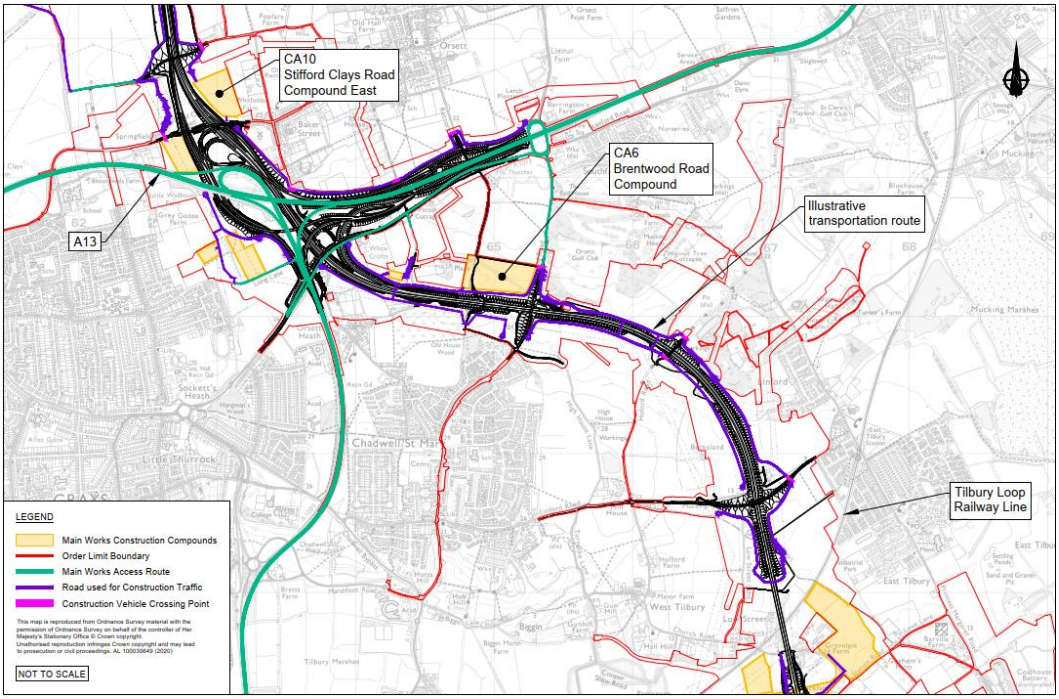
South of A13 up to the Tilbury Loop railway line

7.4.19 The construction of the 4km section of the Project route south of the A13 up to the Tilbury Loop railway line (Brentwood Road compound) will require a significant earthwork operation. This will involve the construction of a series of embankments and false cuttings, to form the Project route and associated crossings over the local road network.

7.4.20 The earthwork operation assessment has identified a requirement for approximately 950,000m^3 of excavated material to form the embankments and false cuttings, across the 4km section. It is anticipated that the primary source of material used would initially be from the cutting operations along the Project route within this section. Once a route is established under the A13 as part of the Project route, the remaining excavated material required will be sourced from the cutting operations north of the A13 (Stifford Clays Road compound East).

7.4.21 The transportation of the 950,000m^3 of excavated material will be via the constructed haul routes using heavy duty construction vehicles. The haul route in this section follows the Project route, including under the A13. Initial use of the road network will be required until access under the A13 is complete. The majority of material would be transported via the haul route under the A13, this lessens the need to use the road network to access north of the A13. The haul route in this section would require a series of road crossings at the point of interface with the local road network. The road crossings will be managed under temporary traffic signals or a similar system. The oTMPfC provides further details of temporary traffic management measures. This is illustrated in Plate 7.5.

Plate 7.5 Illustration of mass haul movements south of the A13 towards Tilbury Loop railway line



7.5 Online transportation of excavated material

7.5.1 There is a Project focus on maximising offline mass haul movements. In the circumstances described below, where online movements have been specified, this is due to physical constraints such as a railway line or crossing of the SRN. In the case for offsite management of excavated material, this is limited to a road-based approach due to the limitations with the use of rail and river described in Section 8.2.

7.5.2 The following locations have been identified where online movements would occur. The locations are presented by each of the key construction areas, i.e., Kent Roads, Tunnels and Roads North. For each construction worksite described, the associated compound has been referenced to provide context to location and access arrangements.

Kent Roads

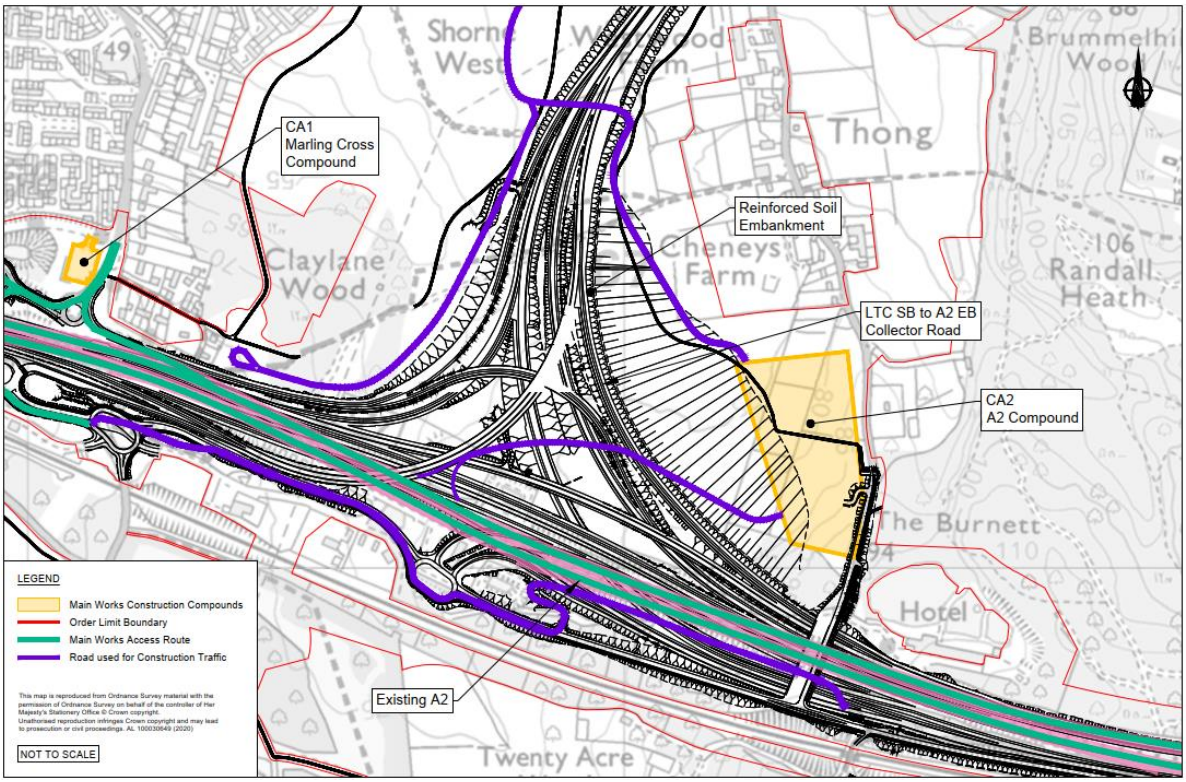
External importation of reinforced soil – A2 compound

7.5.3 The construction of the reinforced soil embankment to form the Project route southbound to A2 eastbound collector road would require reinforced soil to construct the embankments. The quantities demonstrated in Table 7.1 incorporate a safeguard position, for the provision to import 360,000m³ of material to form earthworks embarkments. This is in the event that material sourced on site (excavated materials) does not meet the engineering classification necessary to form earthworks embarkments. The vehicle movements associated with import are represented in the construction traffic modelling using the Project's transport model.

7.5.4 The appointed Contractor would be required to source suitable material and transport it in accordance with the MHP and the temporary Traffic Management Plan.

7.5.5 Due to the lack of suitable rail and river connectivity, the material would be transported using the earthmoving construction vehicles via the road network. The construction worksite would be located near the A2 compound, and the material would be transported via the A2 and onto the connecting haul route as shown in Plate 7.6 for placement and/or storing. The transportation of this material would require over 40,000 construction vehicle movements over a short period of time (anticipated to be less than one year).

Plate 7.6 Location of reinforced soil embankment



Roads North and Tunnels

7.5.6 Material excavated at worksites in the vicinity of the Brentwood Road compound, the Stifford Clays Road compound East and the M25 compound will be transferred to the Northern tunnel entrance and Station Road compounds.

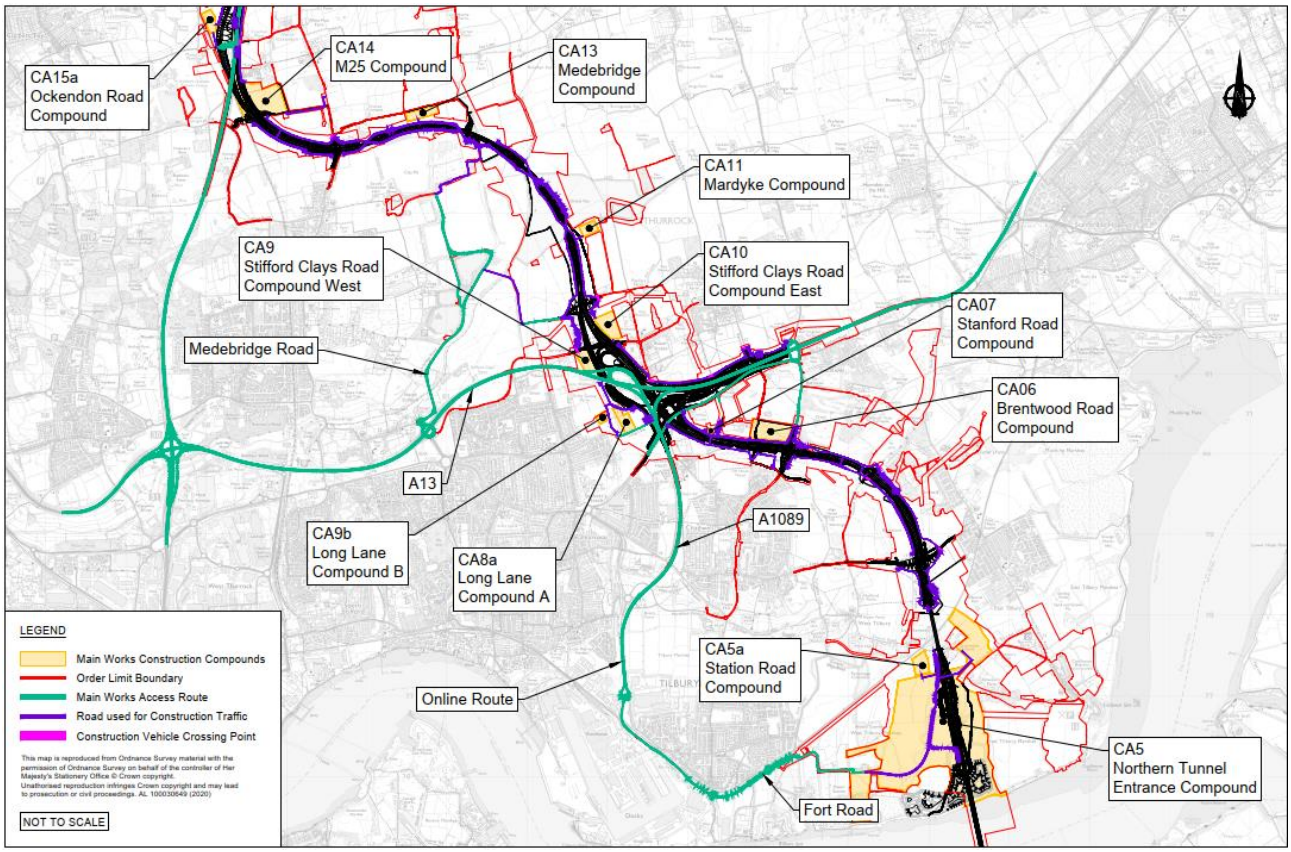
7.5.7 The construction of the Project route and connecting access road at the southern end of the Tilbury Viaduct (Station Road compound) and North Portal approach (Northern tunnel entrance compound) requires the construction of structural embankments. The initial ground investigation has indicated the material in this area is unlikely to be suitable to construct the structural embankments, resulting in a requirement to import 314,000m^3 of material.

7.5.8 The earthwork assessment has anticipated that this material would be imported from the construction worksites located north of the Tilbury Loop railway line (Brentwood Road compound) including the A13 (Stifford Clays Road compound East) and the M25, where there is a surplus requirement of excavated material.

7.5.9 The offline transportation of material between construction worksites situated further north at the A13 and M25 construction worksites (Brentwood Road compound, Stifford Clays Road compound East and M25 compound) is constrained by the location of the Tilbury Loop railway line. The level crossing at Station Road has limited periods for traffic to cross over the Tilbury Loop railway line. With over 35,000 construction vehicle movements to transport the imported material, the capacity for crossing at Station Road would not be feasible. As a result, the online route identified would be via the A13, A1089 and Fort Road providing access to the construction worksite, while avoiding the use of the Station Road level crossing, refer to Plate 7.7. It is anticipated that the material would be required towards the latter end of the programme.

Provision has been made within the associated compounds for stockpiling to enable the transportation of material over a longer period at a lower frequency of HGV movements.

Plate 7.7 Online route of transportation of excavated material between construction worksites north and south of the Tilbury Loop railway line



7.6 Management of material offsite to receiver sites

7.6.1 The earthwork assessment has identified the following quantities of excavated material as surplus to requirements, for management offsite:

a. North of the River Thames: 660,000m^3 (an additional 660,000m^3 is to be managed by IVL but retained within the Order Limits)

b. South of the River Thames: 3,500m^3 (of which all is hazardous material)

7.6.2 The above quantities include excavated hazardous material as well as inert/non-hazardous excavated material.

7.6.3 As detailed in Section 6.4, the Excavated Materials Assessment (Application Document 6.3- Appendix 11.1) will have a set of criteria to establish suitable receiver sites and waste facility sites. The appointed Contractor will identify suitable sites for transporting excavated material surplus to requirements.

7.6.4 The transportation of this material will be via the road network using earthmoving construction vehicles to suitable sites identified by the appointed Contractor. South of the River Thames there would be over 400 construction vehicle movements and, in the north, over 77,000 construction vehicle movements associated with the surplus of excavated material.

7.6.5 It is anticipated the offsite transportation of the excavated material will be spaced out over the duration of the earthworks programme (approximately three to four years). In addition, provision has been made within the Order Limits including compounds for stockpiling of material. Doing so would lessen the construction impacts associated with the construction vehicle movements.

8 Transport options for materials movement

8.1 Introduction

8.1.1 This section summarises the Project's material transport options and details the final mile approach.

8.1.2 There are limited existing direct connections to the Project's Order Limits which can be used for the transport of material. A review of the use of road, river and rail networks has been carried out with a focus on the final mile strategy (the road-based link between the multimodal point and the applicable construction worksite).

8.1.3 This has helped identify an approach to reduce and manage the impacts of construction vehicle movements as set out in the oTMPfC (Application Document 7.14) on the wider transport network and onsite materials management, by getting materials as close to the construction worksites as possible before using the road network.

8.1.4 Construction vehicle movements broadly cover the following:

a. Hard materials/assets deliveries such as drainage pipes and ducting

b. Aggregate materials such as sand, cement and ballast

c. Abnormal loads for bridge beams and plant

d. Utility plant and materials

e. Waste removal

f. Earthworks movements on site

8.2 Considerations of transport options for material movement

Rail

8.2.1 There are no existing railheads within the Order Limits. As such, the feasibility of implementing direct rail connections has been evaluated in terms of environmental impacts, available capacity, construction demand and operations, as detailed below.

Rail: south of the River Thames

8.2.2 The construction works required south of the River Thames (TBM reception site and A2/M2 connection sites) will produce significant volumes of excess ground materials. The majority of this material will be retained within Order Limits. The only exception would be hazardous material, which would need to be disposed of offsite in an appropriate facility.

8.2.3 Hoo Junction is an operational rail yard 4km away by road. However, it is primarily used by track maintenance fleets and is sited on the busy North Kent railway line, with frequent commuter services which would impact the availability of this rail route (in terms of the timing and ability to dispatch a train). Because works south of the River Thames (specifically the Southern tunnel entrance and A226 Gravesend Road compounds) are not physically adjacent to Hoo Junction, materials or arisings would need to be transported to the rail yard either by road or conveyor.

8.2.4 Movements by road from the Southern tunnel entrance compound to Hoo Junction would create a significant impact on the village of Higham by generating additional traffic through use of HGVs. A conveyor to transport materials to Hoo Junction would have to pass through the Thames Estuary and Marshes Ramsar site. The Ramsar site is of significant ecological importance and, as such, the tunnel length was extended, and the South Portal relocated to avoid any construction works there. Therefore, construction of a conveyor through it is not considered an acceptable environmental impact (paragraph 8.2.36).

8.2.5 The impacts identified above mean that a direct rail connection south of the River Thames is considered unviable.

Rail: north of the River Thames

8.2.6 Three of the construction compounds north of the River Thames are located within 1km of existing rail connections: the Northern tunnel entrance, M25 and Ockendon Road compounds. The opportunity for a new rail connection is explored from paragraphs 8.2.9 to 8.2.15.

8.2.7 All other construction compounds north of the River Thames are not considered viable for a rail connection, due to the extensive road transportation on the SRN or local roads (online) that would be required to move materials and supplies to a rail connection.

The North Portal work (Northern tunnel entrance compound)

8.2.8 The North Portal construction area (Northern tunnel entrance compound), from where the two TBMs would be launched and driven, is bordered by the existing Tilbury Loop railway line, and the M25 compound and Ockendon Road compound construction areas, in Thurrock, border the London Tilbury Southend railway.

8.2.9 The Northern tunnel entrance compound construction area does not have direct rail access, even though it is bordered by a railway line. The majority of the Northern tunnel entrance compound comprises landfill (current commercial operational and historic) and floodplain. The only potential site where a railhead or branch line could be created for this compound would be within the Tilbury2 ecological mitigation area.

8.2.10 This is unsuitable given that it would cause Tilbury2 to be in breach of a requirement of its DCO. In light of the alternative existing rail facilities available in the immediate vicinity of the North Portal, it is considered disproportionate to construct a new temporary rail spur which would have the effect of dislodging the PoTLL's environmental mitigation. As a result, a direct rail connection is not considered appropriate for material movement on the north side of the River Thames

8.2.11 It is therefore not considered a viable option to construct a railhead at the North Portal site (Northern tunnel entrance compound).

Availability of existing rail paths and routes

8.2.12 The existing high volume of rail freight on lines north of the River Thames has limited the availability of train movements and routes for the movement of the Project's materials, arisings or equipment.

M25 compound and Ockendon Road compound construction areas

8.2.13 The M25 compound and Ockendon Road compound construction areas, while bordered by the London Tilbury Southend railway, cannot include a direct rail connection due to spatial constraints requirements. These requirements include the construction of 1,500m of temporary sidings and maintenance track, including an underpass to provide a route under the M25.

8.2.14 Further analysis has shown limited train path availability on the rail network in this region. There is currently an average of 12 free minutes per hour in which to start and complete a freight movement, which is insufficient for the Project demand.

8.2.15 Taking into consideration the combination of the physical spatial requirements and train path availability, a direct rail connection is not considered appropriate for material movement on the north side of the River Thames.

Rail summary

8.2.16 There are no existing direct rail connections to compounds within the Order Limits. Given the geographical and environmental constraints, combined with the associated planning and consenting challenges, it is not considered possible for the Project to construct a new railhead or any new rail lines to provide a direct rail connection.

8.2.17 Given the geographical constraints and lack of direct rail connections, rail is not considered a favourable transport option for the movement of materials away from the Project.

8.2.18 The review of potential local suppliers to support the delivery of the Project has identified several sites that utilise the existing rail paths to deliver material near to the Project. It would be possible to use rail as part of a multimodal approach to import materials to the Project via an existing rail connection, with onward transport via the road network. Refer to Annex B.1, which identifies potential suppliers, including multimodal transport options.

River

8.2.19 The Project Order Limits are directly adjacent to the River Thames. As such, existing river infrastructure close to the Order Limits has been considered.

Wharves

8.2.20 A number of wharves are close to the Order Limits. However, following engagement with relevant stakeholders, including the owners and operators, the Project has been advised that they are all fully utilised by existing landowners and commercial operations. Consequently, they cannot provide a river connection for the Project.

Jetties

8.2.21 Two jetties are located close to the Project's Order Limits on the north bank of the River Thames: the East Tilbury jetty at Goshem's Farm and the Ingrebourne Valley Limited jetty, which are considered below.

8.2.22 As outlined in Section 4, following stakeholder engagement, including with the jetties' owners and users, and full consideration of environmental and navigation constraints, it has been determined that it will not be feasible for the Project to construct a new jetty (deep or shallow water) in the River Thames.

East Tilbury jetty at Goshem's Farm

8.2.23 The East Tilbury jetty (also known as the Ferrovial Laing O'Rourke (FLO) jetty) comprises a pontoon approximately 98m long by 24m wide, connected to land by a double bridge approximately 95m in length with 4.2m wide carriageways. The jetty is tidally constrained, providing mooring facilities for bulk cargo loading and unloading, currently operating a maximum of three 1,500t barges at high tide (therefore six barges in total per day).

8.2.24 It would theoretically be possible to use the jetty to deliver bulk aggregates or pre-cast sections to the Project construction compound at the North Portal (Northern tunnel entrance compound) within the tidal window outline above. However, the jetty is currently owned by FLO and used by IVL. Its current and proposed future use is to receive waste from other local major projects (Tideway and Silvertown Tunnel in due course) and as such will be operating at full capacity. It would not be possible for the Project to use the East Tilbury jetty, as it would cause an unacceptable significant negative impact on existing project operations in the London area.

Ingrebourne Valley Limited jetty

8.2.25 This jetty comprises a pontoon approximately 70m long by 15m wide, connected to land by a single bridge approximately 35m in length with a 4.2m wide carriageway. The jetty provides mooring facilities for bulk cargo loading and unloading which is currently operating a maximum of two 1,500t barges at high tide (therefore four barges in total per day). It would be theoretically possible to use the jetty to deliver bulk aggregates or pre-cast sections to the Project construction compound at the North Portal (Northern tunnel entrance compound).

8.2.26 The IVL jetty is used and owned by IVL. There are also upcoming projects for which the jetty is earmarked to supply. As such, it is not proposed to use this jetty as it would cause an unacceptable negative impact on existing project operations in the London area.

Ports

8.2.27 In line with the Project approach of considering facilities located within a 20km catchment area (Section 6), approximating to a road journey of up to one hour, there are three ports close to the Project's Order Limits on the northern side of the River Thames: PoTLL and Tilbury2, both approximately 3.5km to the west, and DP World London Gateway approximately 6.5 km to the east.

8.2.28 Both PoTLL and Tilbury2 provide for aggregate supply and have already been used for the delivery of the TBM for other major projects in the London region, such as Thames Tideway. Currently, DP World London Gateway provides a logistics hub, but does not provide bulk aggregate facilities.

PoTLL and Tilbury2

8.2.29 The Port of Tilbury and Tilbury2 offer services including high-density container terminals, RoRo (roll-on/roll-off), Construction Materials Aggregate Terminal, bulk cargo and liquid bulk terminal facilities, deep water mooring quay walls and jetties, and warehouse storage.

8.2.30 These facilities are suitable for loading and unloading heavy cargo. An existing heavy lifting capacity of 140t exists with their available lifting equipment (undertaken by a third-party lifting contractor) for the loading and unloading of the largest TBM components and is therefore suitable in principle for use by the Project.

South of the River

8.2.31 There are numerous supply sites situated south of the River Thames with river infrastructure facilities who offer services in the supply of bulk aggregates. A non-exhaustive list of identified sites is listed in Annex B.1.

8.2.32 The connectivity of the sites to supply Project compounds located south of the River Thames is dependent on the use of the local road network. The construction of direct access to the compounds is constrained by the Thames Estuary and Marshes Ramsar.

River summary

8.2.33 Of existing river infrastructure facilities, PoTLL and Tilbury2 are well located for material movements for the Project via river. They are located close to the Order Limits at the North Portal (Northern tunnel entrance compound), where bulk material supplies including aggregates and oversize equipment such as the TBM can be delivered to support construction operations on the north side of the River Thames. These facilities would also be suitable for transporting tunnel spoil material if needed.

8.2.34 It would be feasible for the Project to import materials via existing ports on the north side of the River Thames (e.g. PoTLL and Tilbury2), with onward transport via the road network. Refer to Annex B.1 for references to using the multimodal transport options.

8.2.35 The proximity of the supply sites to the Project compounds, lack of connectivity and limitation to construct direct access due environmental constraints are factors that need to be taken into consideration in the use of these site. As a result In the use of these sites it may not always be appropriate.

Conveyors

8.2.36 Conveyors have the ability to transport materials between different locations without the use of equivalent vehicle trips. They can operate at higher speed and capacity, and over a greater distance than vehicles, per hour.

Conveyor usage south of the River Thames

8.2.37 A review was undertaken to assess the feasibility of the use of a conveyor system to transport arisings offsite from construction areas located south of the River Thames, e.g. from the Southern tunnel entrance and A2 compounds.

8.2.38 One potential conveyor route was identified for the Project construction sites south of the River Thames for the movement of material to and from site: Hoo Junction. This is a railyard approximately 4km away by road, with rail connectivity to the North Kent railway line (noting that this rail yard is primarily used by maintenance fleets).

8.2.39 The conveyor routes would need to cross the Thames Estuary and Marshes Ramsar (Section 4), and as such, engagement was undertaken with statutory environmental bodies, including the Environment Agency, Natural England and the Royal Society for the Protection of Birds (RSPB).

8.2.40 Following engagement, it was considered that the use of conveyors to transport materials across the southern construction areas to a railyard would cause a negative environmental impact on the Ramsar as a result of intrusive works required to install and operate the conveyor, and associated noise. It is therefore not considered feasible.

8.2.41 It remains possible to use conveyors to move material within the Order Limits between construction worksites south of the River Thames, and this will be explored as part of the preparation and submission of the MHP to the Secretary of State for approval.

Conveyor usage north of the River Thames

8.2.42 North of the River Thames, there is provision for conveyors to be used within the Order Limits to transport materials such as bulk aggregates and also to transfer tunnel arisings to Shed Marsh for IVL to process once they have reached the tunnel portal.

Conveyor summary

8.2.43 It is considered feasible for a Contractor to use conveyors to transport materials within the Order Limits on the north and south sides of the River Thames.

8.3 Multimodal transportation summary

8.3.1 In order to reduce HGV movements on the SRN and local road network, the Contractor would consider the use of multimodal transport of materials.

8.3.2 Transport of materials by rail, river and conveyor have been considered, with the following conclusions:

a. It would be possible to use rail as part of a multimodal approach. Local suppliers currently use existing rail infrastructure to import material to their facilities, where it is processed, stored and then transported by road.

b. It would be possible to use existing ports on the north side of the River Thames (e.g. PoTLL and Tilbury2) as part of a multimodal approach to material transport, subject to capacity, with onward transport via the road network.

c. It is considered feasible for a Contractor to use conveyors to transport materials within the Order Limits on the northern and southern sides of the River Thames as part of a multimodal approach to material transport.

8.3.3 The Project requires the Contractor to consider and implement a multimodal approach to material transport in order to minimise negative impacts and reduce safety risks. The MHP to be submitted to the Secretary of State for approval would include an explanation of how multimodal solutions have been included and implemented or discounted.

8.4 Final mile strategy

Final mile strategy overview

8.4.1 The ‘final mile’ logistics refer to the last part of the material logistics journey. It is a description of the logistics phase at its most local geographical point to the Project and is applied to materials movements as a best practice approach.

8.4.2 A final mile approach supports the use of multimodal transport systems to optimise transportation so that impacts are reduced as far as reasonably practicable and to control costs. This oMHP has identified suitable transport options, including by river, rail and road. The Contractors would complete further assessments, in accordance with the Control Plan (Section 3) to fully determine the optimum method of transporting materials from source to the Project construction sites.

8.4.3 The final mile strategy would be implemented by the Contractors in conjunction with the oTMPfC (Application Document 7.14), making full consideration of required mileage and mileage reduction, peak traffic hours conflicts and associated impacts.

8.4.4 Construction material suppliers identified within a 20km catchment area of the Project (Section 6) have been recognised as having used a final mile strategy that aligns with the Project. Contractors would be required to identify and appoint a supplier operating under these principles in order to optimise materials handling.

8.4.5 Delivery to the construction site directly by rail is not considered feasible, as the footprint needed for a railhead within the Order Limits that is clear of main lines is not available when taking into account the site construction requirements.

8.4.6 The final mile strategy would see delivery and construction vehicles join the Project alignment via the identified access routes, to then join the internal haul route. A focus has been made to establish connections directly from the SRN where reasonably practicable to lessen the Project's dependency on the local road network.

8.4.7 The closest parts of the SRN to the Project are:

a. M25

b. A13

c. A2/M2

d. A1089

8.4.8 The Project would require the Contractors to consult with the highway authority/authorities and adhere to freight and construction traffic routes (outlined in the oTMPfC (Application Document 7.14)). This would include a clear understanding of those routes which are not permitted, including any considerations around traffic-sensitive routes/roads and receptors. The oTMPfC contains the principles and mechanism which would be applied and reflected in the TMP.

References

BRE (2008). BRE Framework Standard for Responsible Sourcing of Construction Products (BES 6001).

Highways England (2019). Design Manual for Roads and Bridges, LA 110 Environmental assessment and monitoring Material assets and waste. Accessed July 2022. https://www.standardsforhighways.co.uk/dmrb/.

Glossary

Term	Acronym or abbreviation	Explanation
A122		The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1).
A122 Lower Thames Crossing	the Project	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
Abnormal Indivisible Load	AIL	A load that cannot be divided for the purpose of being carried on a road without undue expense or risk of damage.
Automatic Number Plate Recognition	ANPR	Automated Number Plate Recognition is a technology that reads vehicle registration plates to create vehicle location data.
Building Research Establishment	BRE	Provides research, advice, training, testing, certification and standards for both public and private sector organisations in the UK and abroad.
Code of Construction Practice	CoCP	Contains control measures and standards to be implemented by the Project, including those to avoid or reduce environmental effects.
Construction Logistics and Community Safety Scheme	CLOCS	A national Standard that requires all stakeholders in construction to take responsibility for health & safety beyond the hoardings. It demands collaborative action to prevent fatal or serious collisions between vehicles servicing construction projects and vulnerable road users: pedestrians, cyclists, and motorcyclists.
Construction worksite		Any location within the Order Limits where work related to the Project is carried out. This includes construction compounds and ULHs.
Contractor(s)		A Contractor whose bid is successful for any one of the packages of work being let as part of the Project. This could include Main Works Contractors, Utilities Contractors as well as sub-contractors.
Development Consent Order	DCO	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Design Manual for Roads and Bridges	DMRB	A series of documents which contains requirements and advice regarding works on motorway and all-purpose trunk roads
Environmental Impact Assessment	EIA	An assessment undertaken as part of the DCO to establish the environmental impact of the Project.
Excavated Materials Assessment	EMA	An assessment of the excavation activities required to construct the Project and which forms part of the DCO submission.

Term	Acronym or abbreviation	Explanation
Environmental Management Plan2	EMP2	For the Project, a plan setting out the conclusions and actions needed to manage environmental effects as defined by the Design Manual for Roads and Bridges standard LA 120. The CoCP is the equivalent of the first iteration of the EMP (EMP1). The contractor's EMP would be EMP2 and the end of construction EMP would be EMP3.
Ferrovial Laing O'Rourke	FLO	A joint venture between Ferrovial and Laing O'Rourke
Final Mile		The 'final mile' logistics refer to the last part of the material logistics journey. It is a description of the logistics phase at its most local geographical point to the Project.
Fleet Operators Recognition Scheme	FORS	A voluntary accreditation scheme for fleet operators which aims to raise the level of quality within fleet operations, and to demonstrate which operators are achieving exemplary levels of best practice in safety, efficiency, and environmental protection.
Framework Standard for Responsible Sourcing	BES 6001	Framework Standard for Responsible Sourcing of Construction Products (BES 6001)
Heavy Goods Vehicle	HGV	A large, heavy motor vehicle used for transporting cargo.
Ingrebourne Valley Limited	IVL	A leading land reclamation and restoration company in the south-east of England
Main Works Contractor	MWC	A Contractor whose bid is successful for any one of the packages of work being let as part of the Project.
Materials Handling Plan	MHP	A plan which sets out the strategy and measures to be adopted with respect to the handling of materials for the Project.
National policy statement for national networks	NPSNN	Sets out the need and government policies for nationally significant infrastructure rail and road projects for England.
Online movement		Transportation movement using the local and or strategic road network.
Offline movement		Transportation movement using the Project temporary haul routes.
Order Limits		The limits of deviation of land shown on the land plans and on the work plans within which the authorised development may be carried out
outline Materials Handling Plan	oMHP	A plan setting out the approach and high-level principles for handling excavated materials and the delivery of large and/or frequent materials defined as bulk deliveries. It is relevant to all construction works required for the Project.
outline Site Waste Management Plan	oSWMP	A document which sets out how resources will be managed, and waste controlled during the Project. Plans usually involve recording the amount of waste that will be produced and details the proposed methods of waste disposal.

Term	Acronym or abbreviation	Explanation
Outline Traffic Management Plan for Construction	oTMPfC	A plan setting out the strategy and measures to be adopted with respect to highway and transportation issues for the Project. The oTMPfC supports the DCO application and would be embedded within the eventual construction contractor documentation and will form an overarching and comprehensive management procedure for the contractor to adhere to.
Port of Tilbury London Limited	POTLL	A professional maritime transport facilities company. Possessing of container terminal facilities, bulk cargo and cement facilities.
Port of Tilbury 2	POT2	Port of Tilbury 2 is a DCO approved development currently under construction, located East of POTLL
Ramsar site		A wetland site designated as being of international importance according to the Ramsar Convention
Register of Environmental Actions and Commitments	REAC	The REAC identifies the environmental commitments that would be implemented during the construction and operational phases of the Project and would form part of the Code of Construction Practice if the Development Consent Order is granted.
Royal Society for the Protection of Birds	RSPB	A charitable organisation that works to promote conservation and protection of birds and the wider environment through public awareness campaigns, petitions and through the operation of nature reserves throughout the United Kingdom.
Self-propelled modular transporters	SPMT	Vehicles used for manoeuvring heavy and large loads often too large or awkward for large vehicles.
Strategic road network	SRN	The core road network in England managed by National Highways.
Traffic Management Plan	TMP	A plan setting out the strategy and measures to be adopted with respect to highway and transportation issues for the Project.
Tunnel boring machinery	TBM	Machinery used to excavate tunnels with a circular cross-section.
Utility logistic hub	ULH	A compound required for receiving, storing and distributing the plant and materials needed to complete specific utility works. They would include facilities such as office space, welfare, refuelling, security, vehicle and wheel-wash and parking.

Annexes

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Annex B.1 Identified suppliers and transportation options assessment

Table B.1.1 Potential supplier sites (aggregates and cement) identified and categorised by their multimodal delivery capabilities and proximity to the Project via the use of the road network

					Distance and average duration between supplier delivery sites and Project Compounds in Section A, B South, B North, C & D					
Ref	**Material**	**Supplier**	**Supplier's delivery site**	**Potential delivery site for LTC**	**A**	**B South**	**B North**	**C**	**D**	**Comments**
Combined rail and road transportation										
1AS	Limestone Aggregate	Hanson	Allington Depot	Hoo Junction	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Crossing of river required	Crossing of river required	Crossing of river required	Refer to Section 4.4 & 8.2 of the oMHP. Alternatively direct delivery from supplier site 'Allington Depot'.
					30min (14miles)	30min (14miles)	60min (34.5miles)	55min (30miles)	55min (28miles)	
2AS	Limestone Aggregate	Hanson	Dagenham	Port of Tilbury (Rail)	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (Direct from Dagenham)	Yes (Direct from Dagenham)	Situated north of the River Thames.
					45min (25miles)	35min (20miles)	25min (17miles)	15min (12miles)	15min (10miles)	
3AS	Cement	Tarmac	Northfleet	Hoo Junction	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Crossing of river required	Crossing of river required	Crossing of river required	Refer to Section 4.4 & 8.2 of the oMHP Alternatively direct delivery from supplier site 'Northfleet'.
					15min (6miles)	20min (11miles)	35min (19.5miles)	30min (16miles)	35min (20miles)	
4AS	Cement & Aggregates	Tarmac	West Thurrock	Port of Tilbury (Rail)	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (Direct from Thurrock)	Yes (Direct from Thurrock)	Situated north of the River Thames.
					25min (14miles)	35min(17miles)	25min (11miles)	12min (5miles)	10min (5miles)	
5AS	Cement	Tarmac	Greenwich Wharf	Hoo Junction	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Crossing of river required	Crossing of river required	Crossing of river required	Refer to Section 4.4 & 8.2 of the oMHP Alternatively direct delivery from supplier site 'Greenwich Wharf'.
					40min (25miles)	30min (19miles)	50min (27miles)	22min (40miles)	50min (26miles)	
6AS	Cement	AI	Greenwich (Angerstein) Wharf	Hoo Junction	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Crossing of river required	Crossing of river required	Crossing of river required	Refer to Section 4.4 & 8.2 of the oMHP Alternatively direct delivery from supplier site 'Greenwich (Angerstein) Wharf '.
					25min (19miles)	35min (24miles)	45min (26miles)	35min (22miles)	30min (19.5miles)	
7AS	Aggregates (Sand Gravel)	AI	Isle of Grain	Hoo Junction	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Crossing of river required	Crossing of river required	Crossing of river required	Refer to Section 4.4 & 8.2 of the oMHP Alternatively direct delivery from supplier site 'Isle of Grain'.
					30min (17miles)	25min (14miles)	65min (36miles)	60miles (32miles)	65min (36miles)	
10CP	Aggregates	AI	DP -London Gateway	Port of Tilbury (Rail)	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (Delivered to Tilbury)	Yes (Delivered to Tilbury)	Situated north of the River Thames.
					35min (22miles)	40min (26miles)	20min (10miles)	15min (6.5miles)	20min (12.5miles)	
18AS	Aggregates	Brett Aggregates	Cliffe	Direct to compound/Hoo Junction	Yes	Yes	Crossing of river required	Crossing of river required	Crossing of river required	Site situated south of the river. Brett Aggregates planning consent contains restriction on HGV movement using local roads. Rail connectivity via Hoo Junction would require use of local road network to A2 compound and Southern tunnel entrance compound.
					25min (10.5miles)	20min (8miles)	60min (30miles)	50min (26miles)	55min (30miles)	
Combined river and road transportation										
4AS	Aggregate	Tarmac	West Thurrock	Delivered to Port of Tilbury	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (Direct via road)	Supply site situated north of the River Thames. Potential river link to Port of Tilbury to reduce road distance for compounds in section B North, C & D. Compounds in
					25min (14miles)	35min (17miles)	25min (11miles)	12min (5miles)	10min (5miles)	

					Distance and average duration between supplier delivery sites and Project Compounds in Section A, B South, B North, C & D					
Ref	**Material**	**Supplier**	**Supplier's delivery site**	**Potential delivery site for LTC**	**A**	**B South**	**B North**	**C**	**D**	**Comments**
										section A & B South would require delivery via HGV using the local and strategic road networks.
5AS	Cement	Tarmac	Greenwich Wharf	Delivered to Port of Tilbury	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (via Road)	Supply site situated north of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North, C & D. Compounds in section A & B South would require delivery via the use of HGVs using the local and strategic road networks.
					40min (25miles)	30min (19miles)	50min (27miles)	22min (40miles)	50min (26miles)	
8AS	Aggregates	Tarmac	Erith	Delivered to Port of Tilbury	Yes (via road)	Yes (via road)	Yes (Delivered to Tilbury)	Yes (Delivered to Tilbury)	Yes (Delivered to Tilbury)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
					35min (15miles)	40min (20miles)	50min (18miles)	40min (14miles)	50min (18miles)	
3AS	Cement	Tarmac	Northfleet	Deliver to Port Tilbury & Hoo Junction via rail	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (via Road)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks. For use of Hoo Junction refer to Section 4.4 & 8.2 of the oMHP
					15min (6miles)	20min (11miles)	35min (19.5miles)	30min (16miles)	35min (20miles)	
3AS	Limestone Aggregate	Tarmac	Northfleet	Deliver to Port Tilbury & Hoo Junction via rail	Yes (Delivered to Hoo Junction)	Yes (Delivered to Hoo Junction)	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (via Road)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks. For use of Hoo Junction refer to Section 4.4 & 8.2 of the oMHP
					15min (6miles)	20min (11miles)	35min (19.5miles)	30min (16miles)	35min (20miles)	
22AS	Aggregates	Tarmac	Ridham	Deliver to Port of Tilbury	Yes (via road)	Yes (via road)	Yes (Delivered to Tilbury)	Yes (via Road)	Crossing of river required	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
					45min (23miles)	45min (24miles)	75min (44miles)	45min (60miles)	70min (43miles)	
2AS	Limestone Aggregate	Hanson	Dagenham Wharf	Delivered to Port of Tilbury	Crossing of river required	Crossing of river required	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (via Road)	Supply site situated north of the River Thames. Potential river link to Port of Tilbury to reduce road distance for deliveries to compounds in section B North. Compounds in section A & B South would require crossing over the river Thames via the local and strategic road networks . Compounds in section C & D located in closer proximity to supplier site,but would still require the use of local and strategic road network.
					45min (25miles)	35min (20miles)	25min (17miles)	15min (12miles)	15min (10miles)	
9AS	Aggregate (Sand/ Gravel)	Hanson	Frindsbury	Deliver to Port of Tilbury	Yes via Road	Yes via Road	Yes (Delivered to Tilbury)	Yes (via Road)	Yes (via Road)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
					20min (9miles)	15min (6miles)	55min (28miles)	50min (25miles)	50min (27miles)	

					Distance and average duration between supplier delivery sites and Project Compounds in Section A, B South, B North, C & D					
Ref	**Material**	**Supplier**	**Supplier's delivery site**	**Potential delivery site for LTC**	**A**	**B South**	**B North**	**C**	**D**	**Comments**
10AS	Cement	Hanson	Purfleet	Delivered to Port of Tilbury	Crossing of river required 25min (12.5miles)	Crossing of river required 25min (18miles)	Yes (Delivered to Tilbury) 20min (10.5miles)	Yes (via Road) 15min (7miles)	Yes (via Road) 20min (9miles)	Supply site situated north of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
6AS	Aggregates	AI	Greenwich (Angerstein) Wharf	Delivered to Port of Tilbury	Crossing of river required 25min (19miles)	Crossing of river required 35min (24miles)	Yes (Delivered to Tilbury) 45min (26miles)	Yes (Delivered to Tilbury) 35min (22miles)	Yes (via Road) 30min (19.5miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
6AS	Cement	AI	Greenwich Wharf	Delivered to Port of Tilbury	Crossing of river required 25min (19miles)	Crossing of river required 35min (24miles)	Yes (Delivered to Tilbury) 45min (26miles)	Yes (via Road) 35min (22miles)	Yes (via Road) 30min (19.5miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
11AS	Cement	AI	Chatham Docks	Delivered to Port of Tilbury	Yes via Road 25min (10miles)	Yes via Road 20min (7.5miles)	Yes (Delivered to Tilbury) 60min (30miles)	Crossing of river required 50min (26miles)	Crossing of river required 60min (33miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
12AS	Aggregates	Day Aggregates	Greenwich (Angerstein) Wharf	Delivered to Port of Tilbury	Yes via Road 25min (19miles)	Yes via Road 35min (24miles)	Yes (Delivered to Tilbury) 45min (26miles)	Crossing of river required 35min (22miles)	Crossing of river required 30min (19.5miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
7AS	Aggregates (Sand Gravel)	AI	Isle of Grain	Delivered to Port of Tilbury	Yes via Road 30min (17miles)	Yes via Road 25min (14miles)	Yes (Delivered to Tilbury) 65min (36miles)	Crossing of river required 60miles (32miles)	Crossing of river required 65min (36miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
13AS	Aggregates	CEMEX	Northfleet Wharf	Delivered to Port of Tilbury	Yes via Road 25min (8.5miles)	Yes via Road 30min (12miles)	Yes (Delivered to Tilbury) 35min (17miles)	Yes (Delivered to Tilbury) 30min (12miles)	Yes (Delivered to Tilbury) 25min (11miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
14AS	Aggregates	CEMEX	Angerstein Aggregates Wharf	Delivered to Port of Tilbury	Yes via Road 25min (19miles)	Yes via Road 35min (24miles)	Yes (Delivered to Tilbury) 45min (26miles)	Crossing of river required 35min (22miles)	Crossing of river required 35min (19.5miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.

					Distance and average duration between supplier delivery sites and Project Compounds in Section A, B South, B North, C & D					
Ref	**Material**	**Supplier**	**Supplier's delivery site**	**Potential delivery site for LTC**	**A**	**B South**	**B North**	**C**	**D**	**Comments**
15AS	Cement	CEMEX	Port of Tilbury	Port of Tilbury	Crossing of river required 35min (20miles)	Crossing of river required 40min (25miles)	Yes via Road 10min (2.5miles)	Yes via Road 10min (3.6miles)	Yes via Road 25min (15miles)	Supply site situated north of the River Thames. Port of Tilbury ideal location to minimise road distance for compound in section B North. Compounds in section A & B South would require crossing over the River Thames using the local and strategic road network.
16AS	Cement	CEMEX	Dagenham Cement and Ash Plant	Delivered to Port of Tilbury	Crossing of river required 45min (20miles)	Crossing of river required 50min (24miles)	Yes (Delivered to Tilbury) 35min (16miles)	Yes via Road 30min (12miles)	Yes via Road 30min (10miles)	Supply site situated north of the River Thames. Port of Tilbury ideal location to minimise road distance for compound in section B North. Compounds in section A & B South would require crossing of river using the local and strategic road network.
23AS	Aggregates	Brett Aggregates	Cliffe	Direct to compound/Hoo Junction	Yes 25min (10miles)	Yes 20min (7.7 miles)	Yes (Delivered to Tilbury) 55min (30miles)	Crossing of river required 50min (26miles)	Crossing of river required 50min (28miles)	Potential to use supplier jetty to provide river transportation to Port of Tilbury for compounds B North. For compounds located in section A & B South would require the use of local and strategic road network. Currently there are limitation on the number of HGV movements operating from this site within the operational permit
20AS	Aggregates	Gill Aggregates	Northfleet	Delivered to Port of Tilbury	Yes via Road 25min (8.5miles)	Yes via Road 30min (12miles)	Yes (Delivered to Tilbury) 35min (17miles)	Crossing of river required 30min (12miles)	Crossing of river required 25min (11miles)	Supply site situated south of the River Thames. Potential river link to Port of Tilbury to reduce distance of deliveries via road and crossing of the River Thames for compounds in section B North, C & D. Compounds in section A & B South would require HGVs using the local and strategic road networks.
24AS	Aggregates	CMAT	Tilbury 2	Tilbury 2	Yes via road 40min (21miles)	Yes via road 50min (27miles)	Yes via road Less than 3miles	Yes via road 15min (7.5miles)	Yes via road 25min(11.5miles)	Refer to the oMHP Section 4 for further detail on access to Tilbury 2.
Road only										
17AS	Aggregate (Sand/ Gravel)	Hanson	Bulls Lodge	Direct to compound	65min (45miles)	55min (40miles)	45min (30miles)	35min (25miles)	30min (23miles)	Road transportation via HGVs using the local and strategic road network.
18AS	Aggregate (Sand/ Gravel)	Hanson	Birch	Direct to compound	80min (60miles)	75min (55miles)	65min (45miles)	55min (40miles)	55min (39miles)	Road transportation via HGVs using the local and strategic road network.
19AS	Aggregates	CEMEX	Aylesford Quarry	Direct to compound	25min (12miles)	30min (12.5miles)	70min (32miles)	60min (28miles)	60min (29miles)	Road transportation via HGVs using the local and strategic road network.
21AS	Aggregate (Sand/ Gravel)	Tarmac	Kingsnorth	Direct to compound	25min (11.5miles)	20min (9miles)	65min (31miles)	60min (27miles)	60min (28miles)	Road transportation via HGVs using the local and strategic road network.

Key		**Notes**
Tier 1	Less than or equal to 30min	Duration and distance taken from Google Maps
Tier 2	Greater than 30min – but less than 45min	Temporary traffic management not taken into consideration
Tier 3	Greater than or equal to 45min but less than 60min	Durations stated based on weekday 8am departure, based on data from Google maps
Tier 4	Greater than or equal to 60min	Haul route not considered, distance and duration based on movement between supplier site to compound entrance
		Tier based on distance/duration to site not production capacity
		Refer to drawing: Annex B.2 of the oMHP for location of identified sites.
		Supplier sites are based on engagement with suppliers and desktop review. This does not represent an exhaustive of sites, but a representation of potential sites.

Table B.1.2 Potential supplier sites (ready mixed concrete and asphalt) identified and categorised by their multimodal delivery capabilities and proximity to the Project via the road network

			Distance and average duration between supplier delivery site and LTC (Section A ,B South, B North, C & D)										
Ref	**Supplier**	**Supplier's site**	**A**		**B South**		**B North**		**C**		**D**		**Comments**
Concrete			**Distance**	**Duration**	**Distance**	**Duration**	**Distance**	**Duration**	**Distance**	**Duration**	**Distance**	**Duration**	
1CP	Tarmac	West Thurrock (Euromix)	14miles	25min	17miles	35min	11 miles	25min	5miles	12min	5miles	10min	Batching plant located north of the River Thames
2CP	Tarmac	Belvedere (Mulberry)	18.5miles	35min	21 miles	40min	19 miles	45min	14 miles	35min	12miles	35min	Batching plant located south of the River Thames
3CP	Tarmac	Greenwich (Euromix)	25miles	40min	19miles	30min	27miles	50min	22miles	40min	26miles	50min	Batching plant located south of the River Thames
4CP	Hanson	Erith	15miles	35min	19miles	30min	18.5miles	45min	13.5miles	35min	12miles	30min	Batching plant located south of the River Thames
5CP	Hanson	Rochester	7miles	20min	6miles	15min	29miles	60min	24.4miles	50min	22miles	50min	Batching plant located south of the River Thames
6CP	Hanson	Dagenham	25miles	45min	20miles	35min	17miles	25min	12 miles	15min	10miles	15min	Batching plant located north of the River Thames
7CP	Hanson	Silvertown	22miles	45min	25.6miles	50min	23miles	35min	18miles	30min	16.5miles	25min	Batching plant located north of the River Thames
8CP	Hanson	Greenwich	26miles	40min	21miles	35min	23miles	40min	19miles	35min	17miles	35min	Batching plant located south of the River Thames
9CP	Hanson	Allington (Maidstone)	14miles	30min	15miles	30min	34.5miles	60min	30miles	55min	28miles	50min	Batching plant located south of the River Thames
10CP	AI	DP World	22miles	35min	26miles	40min	10miles	20min	6.5miles	15min	12.5miles	20min	Batching plant located north of the River Thames
11CP	AI	Greenwich	19miles	25min	24miles	35min	26niles	45min	22miles	35min	19.5miles	30min	Batching plant located south of the River Thames
12CP	AI	Stratford	26miles	45min	23miles	40min	24miles	40min	24miles	30min	17.5 miles	30min	Batching plant located north of the River Thames
13CP	CEMEX	Northfleet Wharf	8.5miles	25min	12miles	30min	17miles	35min	12miles	30min	11 miles	25min	Batching plant located south of the River Thames
14CP	CEMEX	Purfleet	18.5miles	35min	13miles	30min	10miles	20min	5.5miles	12min	5 miles	10min	Batching plant located north of the River Thames
15CP	CEMEX	Dagenham	20miles	45min	24miles	50min	16miles	35min	12miles	30min	10miles	30min	Batching plant located north of the River Thames
16CP	CEMEX	Blue Bell	10miles	20min	11miles	20min	30miles	45min	26miles	35min	25miles	35min	Batching plant located south of the River Thames
17CP	CEMEX	Brentwood	26.5 miles	50min	32miles	55min	16miles	35min	15miles	30min	11.5miles	20min	Batching plant located north of the River Thames
18CP	CEMEX	Angerstein	19miles	25min	24miles	35min	26miles	45min	22miles	35min	19.5miles	35min	Batching plant located south of the River Thames
19CP	Brett	Northfleet	8miles	25min	11.5miles	30min	16.5miles	40min	12miles	35min	10miles	30min	Batching plant located south of the River Thames
20CP	Tarmac	Kingsnorth	10miles	25min	9miles	25min	31miles	55min	26miles	45min	26miles	45min	Batching plant located south of the River Thames
Asphalt													
1AP	Tarmac	Mulberry Wharf	18.5miles	35min	15.5min	30min	19miles	45min	14miles	40min	14miles	40min	Batching plant located south of the River Thames
2AP	Tarmac	Snodland	10miles	20min	11miles	20min	32miles	55min	29miles	45min	28miles	45min	Batching plant located south of the River Thames
3AP	Tarmac	Harlow	36.5miles	45min	40miles	55min	33miles	50min	28miles	40min	21.5miles	30min	Batching plant located north of the River Thames
4AP	Tarmac	Hothfield	34miles	50min	33miles	50min	54miles	90min	49miles	80min	54miles	90min	Batching plant located south of the River Thames
5AP	Tarmac	Harper Lane	50miles	65min	55.5miles	70min	46.5miles	60min	42miles	55min	35 miles	50min	Batching plant located north of the River Thames
6AP	Hanson	Dagenham	20miles	35min	25miles	45min	17miles	25min	12.3 miles	15min	10miles	15min	Batching plant located north of the River Thames
7AP	Hanson	Allington (Maidstone)	15miles	30min	14miles	35min	34.5miles	60min	30miles	55min	28miles	50min	Batching plant located south of the River Thames
8AP	Hanson	Bulls Lodge (Chelmsford)	40miles	55min	45miles	60min	30miles	45min	25miles	40min	24miles	35min	Batching plant located north of the River Thames
9AP	AI	Robins Wharf	6miles	12min	11miles	20min	17miles	45min	13.5miles	35min	10.5miles	30min	Batching plant located south of the River Thames
10AP	AI	Jurgens Road	14miles	20min	19miles	30min	11miles	30min	6.5miles	20min	2.5miles	15min	Batching plant located north of the River Thames
11AP	AI	Angerstein Wharf	19miles	25min	24miles	35min	26miles	45min	22miles	35min	19.5miles	35min	Batching plant located south of the River Thames

Key	
Tier 1	Less than or equal to 30min
Tier 2	Greater than 30 min- but less than or equal to 45min
Tier 3	Greater than 45min

Notes
Duration and distance taken from Google Maps
Temporary traffic management not taken into consideration
Durations stated based on weekday 8am departure, based on data from Google maps
Haul route not considered, distance and duration based on movement between supplier site to compound entrance
Tier based on distance/duration to site not production capacity
Refer to drawing: Annex B.2 of the oMHP for location of identified sites.
Supplier sites are based on engagement with suppliers and desktop review. This does not represent an exhaustive of sites, but a representation of potential sites.

Annex B.2 Overview of identified suppliers (Drawing)

This page is intentionally left blank. Please see separate PDF file for this Annex.

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