Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Examining Authority's Second Written Round of Questions and Requests for Information

Supporting Appendices

Lorry Movement Capacity at River Sites

Doc Ref: **APP61.13.02**

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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APP61.13.02: Lorry movement capacity at river sites

A.1 Introduction

A.1.1 This appendix reviews the arrangements for sites and materials which are planned to be taken by river but are required to be transported by road, as part of an 'all by road' operational derogation. This only considers the need to transport materials in the peak month(s) of construction.

A.2 Capacity of river sites

A.2.1 The capacity of a site for throughput of heavy goods vehicles depends on:

a. the construction phase on the site

b. the site layout and constraints

c. the lorry type and material

d. material handling equipment for loading and unloading

e. the hours of operation, including loading and vehicle access.

A.2.2 The construction phase drawings included in the *Book of Plans* (Doc refs: 2.05 to 2.29), submitted as part of the application for development consent, have layouts which include separate areas for receiving deliveries and for loading and despatching excavated materials. These areas allow sufficient room to load vehicles, process vehicles as they arrive on site, and also process vehicles for despatch.

A.2.3 Table A.1 summarises the key materials required during the peak month of construction at the river sites, and provides details of the processes and estimated timeframes to load and unload these materials.

Table A.1 Loading or unloading time for construction activities

Peak construction activity	Details
Excavated material	For excavated material removal by standard rigid tipper on a tunnel drive site, the typical cycle is lorry checking and clearance on entering site, lorry holding, lorry loading, load securing including sheeting, wheel cleaning and issue of duty of care documentation. The critical activity depends on the loading arrangements, including ability to load more than one lorry at a time, and this is dependent on the site size and layout. There are a number of methods to load, including excavators or wheeled loaders, both with or without a raised platform, loading conveyors or an overhead hopper system. If the site was to be used continuously for road transport, the site facilities would be designed for this and could use

Peak construction activity	Details
	a hopper system. However, as the site would normally be used for river transport facilities, it is considered not practical in terms of site layout and cost to have systems designed for high-capacity road loading, such as a hopper system. For loading without a hopper system, a loading time of five minutes per lorry can be readily achieved.
Other materials associated with main tunnel construction	For all tunnelling sites, other vehicle movements would also be required, including delivery of precast concrete tunnel lining segments, grout constitutes and tunnel boring machine supplies, such as temporary track and pipework. These vehicles would be required at the same time as those for excavated material removal, and could be processed and unloaded in parallel. The rate for loading and unloading these materials is typically 15 to 30 minutes, depending on the unloading equipment. On a large site, more than one load type could be unloaded at the same time; for example, cement being pumped to a silo, segments being unloaded and deliveries to storage.
Excavated material at other foreshore and river access sites	For excavated material removal at other foreshore and river access sites by road, it would depend on the construction phase and whether there is sufficient space to load a vehicle and have another vehicle waiting. At large sites during shaft construction and cofferdam fill removal, there would be sufficient space for a five-minute loading cycle to be achieved. At more restricted sites, such as Putney and Heathwall, where there is only space for a single excavated material vehicle on site at a time, the cycle time would be ten minutes per lorry.
Bulk material delivery	For the delivery of bulk materials including cofferdam fill, rigid tipper vehicles could tip their load in approximately four minutes. A number of vehicles could be on site, tipping at the same time. Therefore, a vehicle every four minutes would be manageable unless there are restrictions on access.
Other delivery vehicles (non-drive sites)	In addition, other delivery vehicles would be on site in parallel to the main activities at the non-drive sites and a 30-minute unloading cycle could reasonably be achieved.

A.2.4 Table A.2 provides a breakdown of the peak construction activity at each site, the capacity of each site to load and unload lorries, and the rate of loading/unloading that could be achieved. It also summarises the total capacity of each site for the assumed peak month of construction.

A.2.5 It is assumed that the capacity figures provided in Table A.2 represent the maximum vehicle movements that could be accommodated at each site, assuming all materials would be transported by road.

Table A.2 River site capacity for the assumed peak month of construction

River usage sites	Peak construction activity	Capacity of site/time taken to load or unload	Breakdown of site capacity	Site capacity (HGV movements /workday)
Putney Bridge Foreshore	Cofferdam removal	For excavated material removal. At more restricted sites such as Putney, where there would be only space for a single excavated material vehicle on site at a time, the cycle time would be 10 minutes per lorry. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 excavated material vehicle every 10 mins + 2 'other' vehicles per hour; 10-hour operation	160
Carnwath Road Riverside	Tunnelling	For loading without a hopper system, a loading time of 5 minutes per lorry could be readily achieved. Based on loading one vehicle at a time, this gives potential for 240 movements per workday at Carnwath Road Riverside. Vehicles for other movements, such as precast tunnel lining segments, grout constitutes and tunnel boring machine supplies (such as temporary track and pipework) would be required at the same time as those for excavated material removal. These could be processed and unloaded in parallel at Carnwath Road Riverside, with one lorry arrival/departure every 10 minutes being manageable.	1 excavated material vehicle every 5 mins + 6 'other' vehicles per hour; 10-hour operation	360
Cremorne Wharf Depot Site	Connection tunnel (SCL)	For excavated material removal at large sites during shaft construction and cofferdam fill removal, there would be sufficient space for a	1 excavated material vehicle every 5 mins + 2 'other' vehicles per hour;	280

River usage sites	Peak construction activity	Capacity of site/time taken to load or unload	Breakdown of site capacity	Site capacity (HGV movements /workday)
		5-minute loading cycle. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	10-hour operation	
Chelsea Embankment Foreshore	Cofferdam removal	For excavated material removal at large sites during shaft construction and cofferdam fill removal, there would be sufficient space for a 5-minute loading cycle. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 excavated material vehicle every 5 mins + 2 'other' vehicles per hour; 10-hour operation	280
Kirtling Street	Tunnelling	For loading without a hopper system, a loading time of 5 minutes per lorry could be readily achieved. For Kirtling Street, the site size and layout means that loading of more than one vehicle could be carried out at a time. Based on the same loading times as stated above but loading two vehicles concurrently, this gives potential for 480 movements per workday at Kirtling Street. Vehicles for other movements, such as precast tunnel lining segments, grout constitutes and tunnel boring machine supplies (such as temporary track and pipework) would be required at the same time as those for excavated material removal. These could be processed and unloaded in parallel at Kirtling Street, with one lorry every 5 minutes being manageable.	1 excavated material vehicle every 2.5 mins + 12 'other' vehicles per hour; 10-hour operation	720

River usage sites	Peak construction activity	Capacity of site/time taken to load or unload	Breakdown of site capacity	Site capacity (HGV movements /workday)
Heathwall Pumping Station	Cofferdam construction	For the delivery of bulk materials, including cofferdam fill, rigid tipper vehicles could tip their load in approximately 4 minutes. However, due to the restricted site, a vehicle every 8 minutes would be manageable. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 imported fill delivery every 8 mins + 2 'other' vehicles per hour; 10-hour operation	190
Albert Embankment Foreshore	Cofferdam construction	For the delivery of bulk materials, including cofferdam fill, rigid tipper vehicles could tip their load in approximately 4 minutes. A number of vehicles could be on site, tipping at the same time. Therefore, a vehicle every 4 minutes would be manageable. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 imported fill delivery every 4 mins + 2 'other' vehicles per hour; 10-hour operation	340
Victoria Embankment Foreshore	Cofferdam construction	For the delivery of bulk materials, including cofferdam fill, rigid tipper vehicles could tip their load in approximately 4 minutes. A number of vehicles could be on site, tipping at the same time. Therefore, a vehicle every 4 minutes would be manageable. In addition, other delivery vehicles will be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 imported fill delivery every 4 mins + 2 'other' vehicles per hour; 10-hour operation	340
Blackfriars	Cofferdam removal	For excavated material removal at large sites	1 excavated material	280

River usage sites	Peak construction activity	Capacity of site/time taken to load or unload	Breakdown of site capacity	Site capacity (HGV movements /workday)
Bridge Foreshore		during shaft construction and cofferdam fill removal, there would be sufficient space for a 5-minute loading cycle. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	vehicle every 5 mins + 2 'other' vehicles per hour; 10-hour operation	
Chambers Wharf	Cofferdam removal	For excavated material removal at large sites during shaft construction and cofferdam fill removal, there would be sufficient space for a 5-minute loading cycle. In addition, other delivery vehicles would be on site at the same time during cofferdam construction as there are large areas to unload. Although a large number could be on site at the same time, it is reasonable to assume 6 other vehicles an hour could be managed. . It should be noted that the assumed programme rates for both bringing in and removing cofferdam fill is based on barge deliveries and it would be difficult to maintain the programmed rate at Chambers Wharf using only the road.	1 excavated material vehicle every 5 mins + 6 'other' vehicles per hour; 8.5-hour operation	306
	Tunnelling	For loading without a hopper system, a loading time of 5 minutes per lorry could be readily achieved. Based on loading one vehicle at a time, this gives potential for 204 movements per workday at Chambers Wharf, where HGV movements would be constrained by restricted weekday hours (8.5	1 excavated material vehicle every 5 mins + 6 'other' vehicles per hour; 8.5-hour operation	306

River usage sites	Peak construction activity	Capacity of site/time taken to load or unload	Breakdown of site capacity	Site capacity (HGV movements /workday)
		hours per day). Vehicles for other movements, such as precast tunnel lining segments, grout constitutes and tunnel boring machine supplies (such as temporary track and pipework) would be required at the same time as those for excavated material removal. These could be processed and unloaded in parallel at Chambers Wharf, with one lorry every 10 minutes being manageable.		
King Edward Memorial Park Foreshore	Cofferdam construction	For the delivery of bulk materials, including cofferdam fill, rigid tipper vehicles could tip their load in approximately 4 minutes. However, due to the restricted site, a vehicle every 8 minutes would be manageable. It should be noted that the assumed programme rates for both bringing in and removing cofferdam fill is based on barge deliveries and it would be difficult to maintain the programmed rate at King Edward Memorial Park using only the road. In addition, other delivery vehicles would be on site at the same time and a 30-minute unloading cycle could reasonably be achieved.	1 imported fill delivery every 8 mins + 2 'other' vehicles per hour; 10-hour operation	190

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