

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix Q

APFP Regulations 2009: Regulation **5(2)(q)**

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January 2013

**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement

Appendix Q: Blackfriars Bridge Foreshore

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Appendix Q: Blackfriars Bridge Foreshore

Q.1 Introduction

- Q.1.1 Catchment modelling¹ indicates that, in an average year, the Fleet Main combined sewer overflow (CSO) discharges 521,000m³ of untreated sewage into the tidal Thames beneath Blackfriars Bridge in the City of London. A worksite is required to intercept the Fleet Main CSO and the northern Low Level Sewer No.1 (the 'LLS (N)') and connect them to the main tunnel. The proposed development site is known as Blackfriars Bridge Foreshore.
- Q.1.2 In addition, ten other CSOs along the northern bank from Chelsea (Church Street CSO) to the City of Westminster (Essex Street CSO) would be controlled by the works in this location and at Chelsea Embankment Foreshore and Victoria Embankment Foreshore. In a typical year, these ten CSOs together discharge 2,138,000m³ of untreated sewage into the tidal Thames. This would avoid the need for additional sites at or near these ten CSOs.
- Q.1.3 The CSO was identified by the Environment Agency as a CSO that needs to be controlled. The CSO discharges have multiple impacts on water quality in this location, including a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants and the discharge of sewage derived litter and effluent.
- Q.1.4 The Blackfriars Bridge Foreshore site was selected as a suitable site to intercept the CSO, transfer flows into the main tunnel and enclose the required permanent structures.
- Q.1.5 The extent of the project site is shown on the Location plan in Annex Q and in the *Book of Plans*, which accompanies the application.
- Q.1.6 This section is structured as follows:
- a. Section Q.2 provides a brief description of the Blackfriars Bridge Foreshore site.
 - b. Section Q.3 sets out the planning context for works in this location.
 - c. Section Q.4 describes the site-specific development for which consent is sought and how the proposals evolved through consultation.
 - d. Section Q.5 analyses the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
 - e. Section Q.6 provides an overall conclusion of the site-specific assessment for the proposed works at this site.

¹ The assessment of the beneficial effect of a reduction in sewage derived litter discharged to the tidal Thames was inferred from catchment modelling results of the reduction in discharge volume, frequency and duration and was not directly modelled. For further details on catchment modelling refer to *Environmental Statement* Vol 3, Section 11.

Q.2 Site description

Q.2.1 The site comprises two sections of the foreshore of the River Thames: the main site extends from Temple Stairs to Blackfriars Rail Bridge and the secondary site lies between Blackfriars Rail Bridge and the City of London School. The site also includes sections of the Blackfriars Bridge westbound off-ramp and areas of the pavement along Victoria Embankment and Paul's Walk.

Figure Q.1 Aerial photograph of Blackfriars Bridge Foreshore



- Q.2.2 The section of river wall within the site forms part of the original Grade II listed embankment wall designed by Sir Joseph Bazalgette, which includes cast iron lamp standards, a granite retaining wall, various steamer piers, stairs and Blackfriars Bridge.
- Q.2.3 The site is bounded to the north by Victoria Embankment/Blackfriars Underpass/Upper Thames Street and to the east, south and west by the River Thames.
- Q.2.4 Within the site boundary are several existing structures and land uses of note. The footings of Chrysanthemum Pier lie immediately to the south of Inner Temple and to the east is the President, a permanently moored vessel used for hospitality. Blackfriars Millennium Pier lies further east and acts as a 'river bus' stop for the Thames Clipper passenger vessels and private tours by Crown River Cruises, which is based in a 1940s former London Fire Brigade pump house beside the pier.
- Q.2.5 Crossing over the site is Grade II* listed Blackfriars Bridge (A201), which carries vehicle and pedestrian traffic across the River Thames between

the City of London on the north bank and Southwark on the south bank. The northern footings of Blackfriars Bridge contain a sports club and toilets, which are not currently open to the public.

- Q.2.6 Parallel and to the east of Blackfriars Bridge is Blackfriars Rail Bridge, which separates the two parts of the site. The rail bridge is nearing the end of extensive renovation to enable Blackfriars Station to span the River Thames with a contemporary design that incorporates London's largest solar array on its roof.
- Q.2.7 To the north of the main site lie Grade II listed multi-storey buildings that are in predominantly business use. The buildings front Victoria Embankment and are characterised by a varied roof line and frontages in different architectural styles, notably the imposing neo-classical Unilever Building, the Tudor Gothic Sion College and 9 Carmelite Street, and the High Victorian Hamilton House.
- Q.2.8 To the north of the secondary site, the area is characterised by late 20th century development including the Mermaid Theatre, Baynard House, the recently rebuilt Blackfriars mainline rail station, and the Flemish influenced City of London School.
- Q.2.9 The Millennium footbridge crosses the River Thames approximately 100m to the east of the site.
- Q.2.10 To the south of the secondary site, on the opposite side of the River Thames, lie the Tate Modern art gallery and other contemporary residential and office developments within the London Borough of Southwark.
- Q.2.11 The area opposite the main site to the south is characterised by cultural uses such as Gabriel's Wharf, the London Television Centre and the National Theatre.
- Q.2.12 To the northwest of the main site lies Middle Temple including Temple Gardens, which is listed on English Heritage's Register of Historic Parks and Gardens.
- Q.2.13 The key features of the project site are identified in the Existing site features plan in Annex Q and in the *Book of Plans*.

Q.3 Planning context

- Q.3.1 In developing the proposals and mitigation measures for the development at Blackfriars Bridge Foreshore, Thames Water² had regard to the policies set out in the National Policy Statement for Waste Water (March 2012) (the 'NPS'), and to local plan designations where relevant to the application.
- Q.3.2 The local plan comprises the *London Plan* (2011) and the City of London's *Core Strategy* (September 2011).

² Thames Water Utilities Ltd (TWUL). The Draft Development Consent Order (DCO) contains an ability for TWUL to transfer powers to an Infrastructure Provider (as defined in article 2(1) of the DCO) and/or, with the consent of the Secretary of State, another body.

- Q.3.3 The site lies mainly within the River Thames, which is designated as part of the strategic Thames Policy Area and Blue Ribbon Network in the *London Plan*.
- Q.3.4 The *Core Strategy* policy designations applied to the site are:
- a. River Thames and Tidal Tributaries Site of Metropolitan Importance for Nature Conservation (CS9)
 - b. Temples Conservation Area (CS12 & 14, UDP ENV11 & 13)
 - c. Whitefriars Conservation Area (CS12 & 14, UDP ENV11 & 13)
 - d. St Paul's Heights Policy Area (CS13 & 14)
 - e. Monument Views Setting (CS13 & 14)
 - f. Protected Vistas – King Henry VIII's Mound, Westminster Pier (CS13 & 14)
 - g. Thames Policy Area (CS9)
 - h. Riverside Walk (CS9).
- Q.3.5 The only relevant extant planning permission within the site boundary was granted by the City of London for "*alterations to the existing landing stage pontoon, installation of a new access bridge and ramps up to and over the embankment wall*" at Chrysanthemum Pier (reference 11/00484/FUL). These works have not yet been undertaken.

Q.4 Description of development

Overview

- Q.4.1 The proposed development at Blackfriars Bridge Foreshore would intercept the Fleet Main CSO and connect to the LLS (N). The works would convey the flows from the CSO, which discharges through the existing river wall beneath the road bridge, and from the LLS (N), which runs beneath Victoria Embankment (A3211) highway and the Blackfriars Bridge westbound off-ramp, to the main tunnel.
- Q.4.2 By employing this approach at this site, Chelsea Embankment Foreshore and Victoria Embankment Foreshore, the flows from ten other CSOs along the north bank of the river would be controlled. This avoids the need for additional sites at or near the ten CSOs from Church Street in Chelsea to Essex Street in the City of Westminster. This is shown in the Northern Low Level Sewer No.1 plan in the Meeting the need subsection.

Application for development consent

- Q.4.3 The geographic extent of the proposals for which development consent is sought is defined by the limits of land to be acquired or used, which is illustrated in the *Book of Plans*. Table Q.1 lists the application drawings of relevance to this site and their status.

Table Q.1 Blackfriars Bridge Foreshore: Drawings that define the proposed development

Drawing title	Status	Location
Location plan	For information	<i>Book of Plans, Section 19</i>
As existing site features plan (various)	For information	<i>Book of Plans, Section 19</i>
Access plan	For approval	<i>Book of Plans, Section 19</i>
Demolition and site clearance plans (various)	For approval	<i>Book of Plans, Section 19</i>
Site works parameter plan	For approval	<i>Book of Plans, Section 19</i>
Site works parameter key plan	For information	<i>Book of Plans, Section 19</i>
Permanent works layout (various)	Illustrative	<i>Book of Plans, Section 19</i>
Proposed site features plan	Illustrative	<i>Book of Plans, Section 19</i>
Proposed site features plan	Indicative save for the layout of above-ground structures, which is illustrative	<i>Book of Plans, Section 19</i>
Proposed site features plan	Illustrative	<i>Book of Plans, Section 19</i>
Proposed landscape plan	Indicative save for the layout of above-ground structures, which is illustrative	<i>Book of Plans, Section 19</i>
Proposed landscape plan	Indicative save for the layout of above-ground structures, which is illustrative	<i>Book of Plans, Section 19</i>
Extent of loss of listed river wall	For approval	<i>Book of Plans, Section 19</i>
Existing and proposed sections (various)	Illustrative	<i>Book of Plans, Section 19</i>
As existing and proposed elevations (various)	Illustrative	<i>Book of Plans, Section 19</i>
Kiosk and undercroft area design intent	Indicative	<i>Book of Plans, Section 19</i>
Amenity kiosk design intent	Indicative	<i>Book of Plans, Section 19</i>
Typical river wall design intent	Indicative	<i>Book of Plans, Section 19</i>
As existing listed structure interface: River wall	For information	<i>Book of Plans, Section 19</i>
Proposed listed structure interface: River wall	Indicative	<i>Book of Plans, Section 19</i>
As existing listed structure interface: Bridge stairs (west)	For information save for the maximum extent of loss of listed structures, which is for approval	<i>Book of Plans, Section 19</i>

Drawing title	Status	Location
Proposed listed structure interface: Bridge stairs (west)	Indicative	<i>Book of Plans, Section 19</i>
As existing listed structure interface: Bridge stairs (east)	For information save for the maximum extent of loss of listed structures, which is for approval	<i>Book of Plans, Section 19</i>
Proposed listed structure interface:-Bridge stairs (east)	Indicative	<i>Book of Plans, Section 19</i>
Permanent President mooring access and plan elevation	Illustrative save for the detail of spanning the listed wall, which is for approval	<i>Book of Plans, Section 19</i>
Proposed relocated Blackfriars Pier	Illustrative	<i>Book of Plans, Section 19</i>
Construction phases plans (various)	Illustrative	<i>Book of Plans, Section 19</i>
Existing utilities plans	For information	<i>Utilities Statement</i>
River foreshore zones of working plan	For information	<i>Navigational Issues and Preliminary Risk Assessment</i>
Barge tracking past proposed structures	For information	<i>Navigational Issues and Preliminary Risk Assessment</i>
Existing highway layout	For information	<i>Transport Assessment</i>
Highway layout during construction plans (various)	Illustrative	<i>Transport Assessment</i>
Permanent highway layout	Illustrative	<i>Transport Assessment</i>

Q.4.4 The proposed Nationally Significant Infrastructure Project (NSIP) works at Blackfriars Bridge Foreshore comprise Work No. 17a the Blackfriars Bridge Foreshore CSO drop shaft, which would have an internal diameter of 24m and a depth (to invert level) of 53m.

Q.4.5 The associated development comprises Work No. 17b, which includes the works to intercept and divert flow from the Fleet Main CSO and connect the LLS (N) to the Blackfriars Bridge Foreshore CSO drop shaft (Work No.17a) and into the main tunnel (east central) (Work No. 1c). These works include construction of an interception chamber, CSO overflow structures, hydraulic structures, chambers with access covers, structures for air management plant and equipment, and other structures to manage and intercept flow. In addition, the works require the relocation of Blackfriars Millennium Pier. The full description of the proposed development can be found in Schedule 1 to the *Draft DCO*, and further details of the temporary construction works and permanent operational structures are set out below.

Q.4.6 All works would be contained within the relevant zones indicated on the Site works parameter plan.

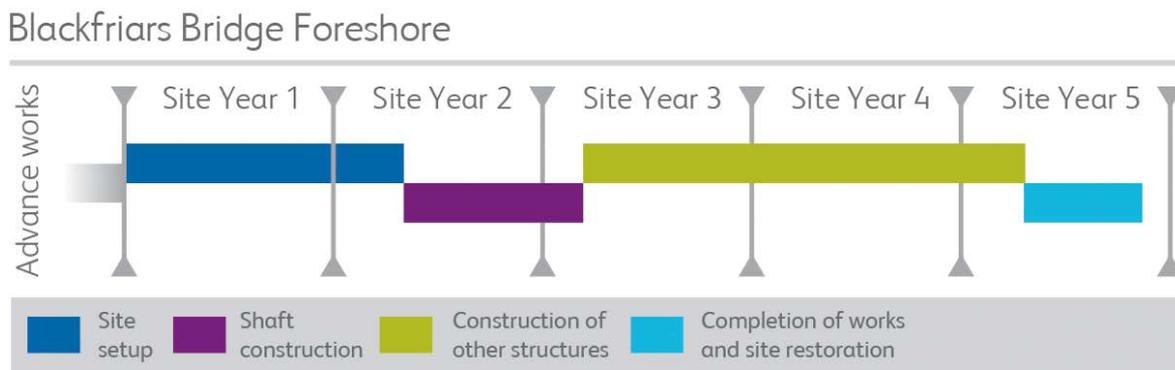
Construction

Q.4.7 Construction is programmed to take approximately five years and would involve the following main works:

- a. cofferdam construction and site set-up (approximately 16 months)
- b. shaft construction (approximately ten months)
- c. construction of other structures (approximately 26 months)
- d. completion of works and site restoration (approximately seven months).

Q.4.8 The approximate construction programme is represented graphically below. The Construction phases plans are provided in Annex Q.

Figure Q.2 Construction timeline



Q.4.9 Connection and diversion of major utilities may be conducted in advance of the main activities listed above.

Q.4.10 The majority of construction would take place during standard working hours from 8am to 6pm Monday to Friday and 8am to 1pm Saturdays. Construction activities may occasionally be required outside of these hours during key activities subject to agreement with the local authority.

Q.4.11 For practicality and safety reasons, tunnel construction needs to take place over extended periods of time, including working on a 24-hour, seven days a week basis. A short period (approximately six months) of below-ground 24-hour working would be required at this site. During this period, the working would mainly take place below ground but artificial lighting would be required for the supporting activity at ground level for extended periods during the tunnel construction and secondary lining phases. Measures are included within the *Code of Construction Practice (CoCP)*, which accompanies the application, to ensure that all reasonable steps would be taken to minimise any detrimental impact on amenity from artificial light. For example, site lighting during construction would be capped and directional to ensure minimal light spill and lighting would only be used when necessary. Therefore, there would be no unreasonable effects on residential properties during construction.

- Q.4.12 Heavy goods vehicle (HGV) movements would be limited to standard working hours. In exceptional circumstances, HGV and abnormal load movements could occur up to 10pm on weekdays for large concrete pours and later at night in agreement with the local authority.
- Q.4.13 Loading of barges and barge movements would take place on a continuous 24-hour, seven days a week basis as the movements are linked to high tides. 350 tonnes barges would operate at a peak monthly average of three per day (a total of six barge movements) to transport excavated material and imported cofferdam fill by river rather than road.
- Q.4.14 Further information regarding working hours and site-specific restrictions is provided in the *CoCP* Parts A and B.
- Q.4.15 During construction phases 1 and 2, construction vehicles would access the site via the Blackfriars Bridge westbound off-ramp and Victoria Embankment, turning left into the site. During construction phase 3, construction vehicles would access the site via Blackfriars Underpass and Victoria Embankment, turning left into the site. For all phases, construction vehicles would leave the site onto Victoria Embankment, turning left out of the site.
- Q.4.16 It is anticipated that there would be an average of approximately 92 HGV movements per day (46 vehicle trips) for the majority of the construction period. There may be additional periods during key construction activities when these numbers would be exceeded. Further details regarding the number and breakdown of HGVs expected to access the site are set out in the *Transport Assessment*, which accompanies the application.
- Q.4.17 Potential layouts of the construction site are shown on the Construction phases plans in the *Book of Plans*. It should be noted that these layouts are illustrative only. The contractor(s) may arrange the site in a different way, depending on the chosen construction method, provided that any environmental effects are appropriately managed and that the cofferdam and piled deck do not exceed the maximum extent of temporary works platform shown on the Site works parameter plan.

Site set-up

- Q.4.18 Prior to commencing the main works, the President would be moved upstream to its temporary location at Chrysanthemum Pier and Blackfriars Millennium Pier would be moved permanently downstream of Blackfriars Bridge. The foreshore would be dredged in order to construct the replacement pier.
- Q.4.19 The site boundary would be established and one tree on Victoria Embankment in the western part of the site would be removed in advance of the works.
- Q.4.20 Part of the site is currently occupied by a specialist sports club, which would be closed for the duration of the works.
- Q.4.21 Other site works include setting up the required site access from Victoria Embankment, diverting the Thames Path and introducing the required traffic management activities, temporary services and utility diversions (including numerous telecommunications cables, gas pipes, water supply

pipes and electricity cables that would require diversion or protection prior to construction).

- Q.4.22 The temporary cofferdam would extend out from the existing river wall to create a working platform during construction. The piles used to form the cofferdam would be driven into the impermeable clays from a jack-up barge. The top level of the outer wall of the cofferdam would be set to existing flood defence level to maintain the level of defence during construction.
- Q.4.23 In order to create additional site area, a piled deck would be constructed along the southwestern face of the cofferdam by installing driven tubular piles and decking with steel and timber.
- Q.4.24 It is assumed that the piles would be driven using vibration piling techniques although the contractor(s) should seek to maximise the use of silent piling techniques where reasonably practicable.
- Q.4.25 Following removal and replacement of any soft material within the cofferdam, fill material would be placed onto the foreshore on top of a geotextile layer.
- Q.4.26 Potential scour would be monitored during the construction works. Any need for scour protection to the cofferdam would be identified using the approach set out in the scour and accretion monitoring and mitigation strategy plan for temporary works in the foreshore.
- Q.4.27 Internal site roads, plant and material storage areas, offices, welfare and workshops would be established on the cofferdam.

Shaft construction

- Q.4.28 The shaft would be constructed with a diaphragm wall primary lining and have a cast *in situ* secondary lining.
- Q.4.29 The first stage in the construction of each section of diaphragm wall would be the excavation and setting of inner and outer guide walls. These guide walls would retain the ground and allow excavation for the diaphragm walls between them. During diaphragm wall excavation, the trench would be filled with bentonite for ground support; on completion of excavation of each wall panel, steel bar reinforcement cages would be lowered in and concrete pumped into the trench to displace the bentonite and form a solid wall panel.
- Q.4.30 This process would be repeated for each diaphragm wall panel in order to create the full circle of the shaft.
- Q.4.31 The size of the diaphragm wall panels would require an extended working day to complete the concrete pour for each panel.
- Q.4.32 The diaphragm wall would be taken to a suitable depth to reduce the flow of water into the shaft. Grouting at the toe of the diaphragm wall and base would also be required to reduce the inflow of water. Dewatering would need to be undertaken as described below.
- Q.4.33 The shaft excavation would commence once the diaphragm walls are complete. The guide walls would be broken out and the soil within the diaphragm walls excavated to expose the walls. The excavator within the

shaft would load shaft skips hoisted by crawler crane and deposit the spoil within the excavated material handling area. After any required treatment, the material would be loaded onto barges for transport off-site. Once the excavation is complete, a steel reinforced concrete base plug would be formed at the base of the shaft.

- Q.4.34 It is anticipated that dewatering would be required. Dewatering wells would be drilled from the surface (external to the shaft). These pumps would be operational during shaft construction. It is assumed that extracted groundwater would be discharged directly into the tidal Thames following treatment through a settlement system. Extracted water would be sampled on a regular basis to check its quality.
- Q.4.35 Grouting would be required either side of the shaft to facilitate tunnel boring machine break in/break out. This would consist of a block of treated ground, external to the shaft.
- Q.4.36 Ground treatment may also be required during the interception and CSO works and to the base of the existing river wall.

Tunnel construction

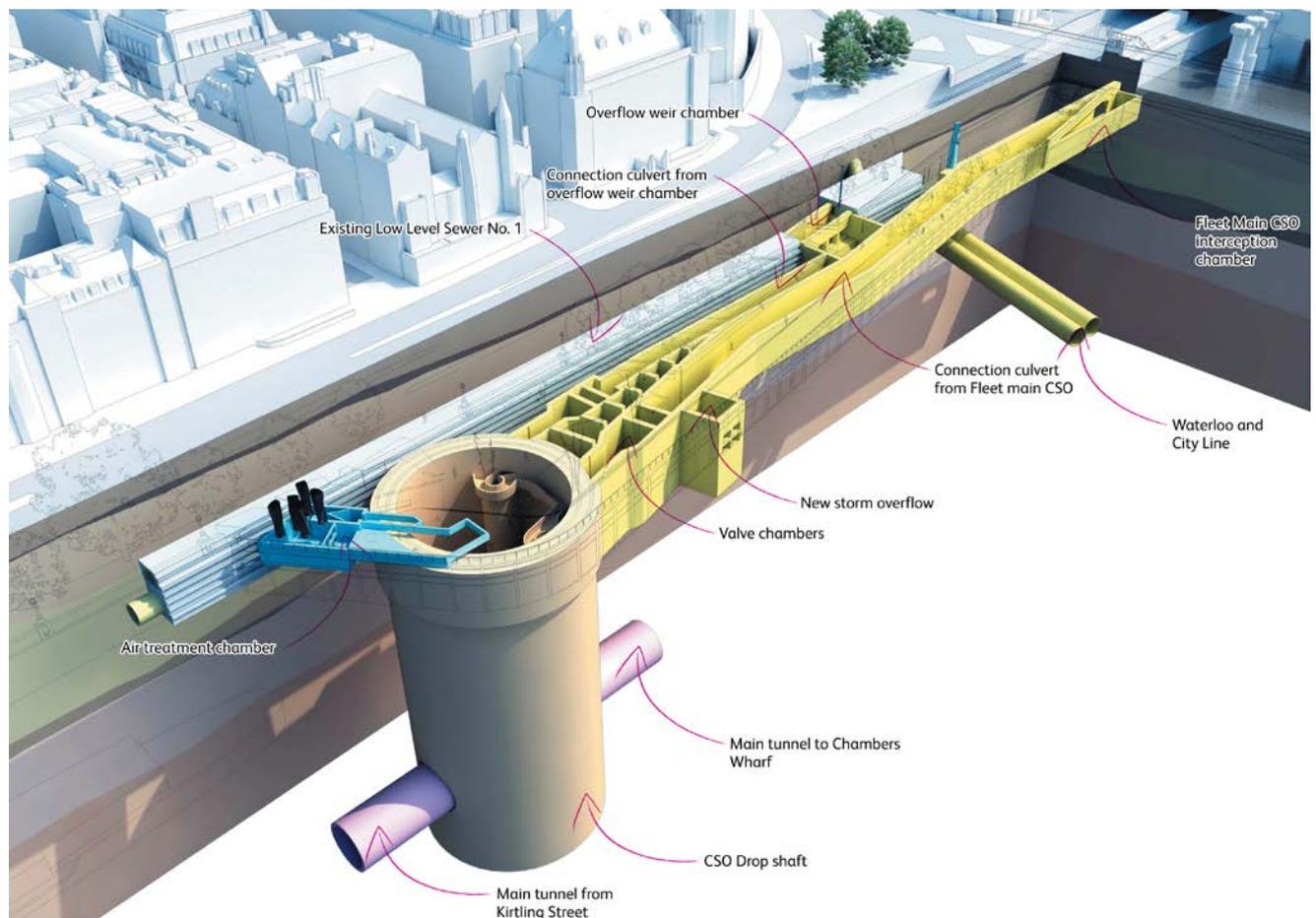
- Q.4.37 As the CSO drop shaft would be online of the main tunnel drive, no connection tunnel is required. However, a temporary cradle would be constructed to receive the tunnel boring machine from Kirtling Street and re-launch it to Chambers Wharf.
- Q.4.38 Tunnel portals with launch and reception seals would be formed in the shaft lining. The portals would consist of cast *in situ* concrete portal, with sealing arrangement as required, tied to the shaft lining.

Secondary lining of shaft

- Q.4.39 Secondary lining is an additional layer of concrete placed against the inside of a tunnel's primary concrete segmental lining for watertightness and to improve the overall structural durability.
- Q.4.40 It is assumed that the lining of the CSO shaft would be made of reinforced concrete placed inside the shaft's primary support. It would be formed with a continuous slip form formwork system or fixed shutters. The shutter would be assembled at the bottom of the shaft, slowly and continuously winched up the shaft while setting steel reinforcement from a working platform and continuously pumping concrete.
- Q.4.41 When the secondary lining is complete the internal structures including the vortexes and drop tubes would be shuttered and concreted.
- Q.4.42 The existing CSO that discharges to the River Thames under Blackfriars Bridge would be maintained during the works.
- Q.4.43 An overflow weir chamber, connection culvert and valve chamber would connect the existing LLS (N) to the CSO drop shaft.
- Q.4.44 To construct the overflow weir chamber on the LLS (N), the services above the sewer would be diverted or supported and protected where possible. It is anticipated that traffic management would be required for both the utility diversions and the overflow weir chamber construction.

- Q.4.45 The LLS (N) would be lined before the overflow weir chamber is constructed. The overflow weir chamber would be constructed using secant or sheet piles and excavated exposing the LLS (N). The base slab and internal walls would then be constructed. Flow would be temporarily diverted from the LLS (N) to allow the existing sewer to be broken out on completion of the weir chamber.
- Q.4.46 Sheet pile walls would be used to provide ground support within which the overflow weir chamber walls would be constructed. The walls would be constructed to a depth to minimise ground water ingress into the excavation, but small pumps would be utilised to manage any ground water that does seep through. The pumps would discharge water to the River Thames after being treated through a settlement system.
- Q.4.47 In order to enable this to be constructed, the Blackfriars Bridge westbound off-ramp would be closed, partially removed and reinstated on completion.
- Q.4.48 The walls of the overflow weir chamber would be formed by *in situ* reinforced concrete techniques. Concrete would be delivered to site and either pumped or skipped to the chamber. The piled walls would be extended to the CSO drop shaft to allow the connection culvert to be constructed in a similar manner to the chambers.
- Q.4.49 It is assumed that piles would be used to support the underground chambers, and would be bored reinforced concrete piles. The diameter, depth and spacing would depend on the structure design and ground conditions.
- Q.4.50 The existing Fleet CSO outfall to the River Thames would be intercepted within the new foreshore structure and flow through a valve chamber before entering the CSO drop shaft. These chambers would be constructed using similar methods to the overflow weir chamber. A new outfall would be constructed on the front of the new river wall to cater for the event that the main tunnel cannot accept any more flow. Flap valves would be fitted to prevent tidal flow entering the system.
- Q.4.51 Air management structures comprising a below-ground passive filter chamber and associated ducts and ventilation columns and the electrical and control kiosks would also be built and commissioned.
- Q.4.52 The functional components diagram below provides a graphic illustration of the proposed infrastructure to be concealed within the new landscaped foreshore structure.

Figure Q.3 Functional components diagram



Completion of works and site restoration

- Q.4.53 On completion of the main construction (outlined above) the new river wall would be finished prior to removal of the temporary cofferdam to ensure flood protection.
- Q.4.54 Once the cofferdam fill is removed, the geotextile layer would be removed and permanent scour protection would be placed around the structure.
- Q.4.55 Once the main elements of construction are completed, the final landscaping works would be undertaken including final treatments and surfaces, planting and installation of street furniture.

Operation

CSO drop shaft

- Q.4.56 The drop shaft would have an approximate internal diameter of 24m and combined sewage flows diverted from the LLS (N) would be conveyed to the drop shaft via an overflow weir chamber and an underground connection culvert into the main tunnel via a connection tunnel.
- Q.4.57 Ground level access covers would be incorporated on the top of the shaft for inspection and maintenance purposes.

Overflow weir chamber and culvert

- Q.4.58 The overflow weir chamber and valve chambers would sit below ground, around the existing LLS (N) and within a new extension to the embankment. Covers on top of the chambers would enable access and inspection.

River wall

- Q.4.59 River wall parapets would be provided around the foreshore structure where required to meet current flood defence levels elsewhere the new public space on top of the structure would be at the same height as the flood defences.

Ventilation structures

- Q.4.60 Above the drop shaft five ventilation columns would be finished in a 'signature' project style, measuring 1.2m in diameter and between 4m and 8m in height.

- Q.4.61 It is also proposed to include one 4m to 8m high column that would be 0.7m internal diameter to serve the CSO interception chamber and connection culvert. This column would be incorporated into the wall adjacent to the Blackfriars Bridge westbound off-ramp.

A further column to serve the overflow weir chamber would stand 6m high and sit on the pavement adjacent to the off-ramp. It would be similar in scale to a lamppost and finished to blend in with the surroundings.

Electrical and control kiosk

- Q.4.62 Where possible, mechanical, electrical and control equipment would be incorporated in the kiosk in the undercroft area adjacent to the overflow weir chamber in order to minimise the visual impact. However, some equipment must be located closer to the valve chambers and CSO drop shaft. This equipment would be accommodated in an additional kiosk on the western end of the foreshore structure.

Amenity kiosk

- Q.4.63 An amenity kiosk would be constructed at the western end of the viewing platform as a means to activate the large space being created. It could provide an amenity to users of the new public realm and the Thames Path as one could house a small café or similar use. The kiosk would be operated by a third party and would require further consents to be obtained beyond the development consent order (DCO).

Other works

- Q.4.64 Areas of hardstanding would be included to facilitate maintenance vehicle access and incorporate ground-level access covers to the below-ground infrastructure.
- Q.4.65 It is proposed to incorporate a lift on the eastern side of Blackfriars Bridge to provide step-free access to Paul's Walk and the relocated Blackfriars Pier. The existing stairs in this location would be reconfigured to accommodate the lift.

Permanent restoration and landscaping

- Q.4.66 Following close engagement with stakeholders including the City of London, English Heritage and the Design Council CABE throughout the pre-application engagement, a design was developed that is supported to an indicative level of detail at this site. Final details would be agreed at a later stage through the proposed requirements, in compliance with the design principles and indicative Landscape plan agreed for this site.
- Q.4.67 The foreshore structure would be surrounded by a new section of river wall to protect most sections of the new paved surface, which would form new public realm and an extension to the Thames Path.
- Q.4.68 Parts of the CSO drop shaft would be raised approximately to flood defence level in order to create a viewing platform looking west towards the Houses of Parliament.
- Q.4.69 The viewing platform would also occasionally enable operational access for cranes and maintenance vehicles.
- Q.4.70 The President would be reinstated to a mooring west of the proposed foreshore structure, potentially with pedestrian access directly from the structure instead of the Thames Path.

Typical maintenance regime

- Q.4.71 Once the proposed development is operational, Thames Water would occasionally need to access the site for inspection and maintenance purposes. Personnel would visit the site approximately every three to six months to inspect and carry out maintenance of the ventilation and below-ground equipment. This would likely require a small van and may take several hours.
- Q.4.72 Once every ten years, a major internal inspection of the tunnel and underground structures would be carried out. This would likely involve a small team of inspection staff and support crew and two mobile cranes to lower the team into the shaft. This would likely take several days and require temporary fencing around the shaft to ensure safety and security.
- Q.4.73 Thames Water may also need to visit the site for unplanned maintenance or repairs, for example, in the event of a blockage or equipment failure. This may require the use of mobile cranes and vans.
- Q.4.74 Access for maintenance vehicles would be via a new mountable kerb on Victoria Embankment. The detailed design of this access point may necessitate strengthening the utilities subway beneath the Thames Path, which the crossover would bridge in order to reach the site.

Scheme development

- Q.4.75 Identifying a range of potentially suitable sites to intercept the Fleet Main CSO and connect to the LLS (N) was difficult due to the constrained urban nature of the area, limitations imposed by the surrounding heritage assets and existing underground tunnels. Originally four sites were investigated, but at an early stage of assessment three of these sites were ruled out as they were judged to be very constrained with restricted working areas and two of these sites could not be used to connect to the LLS (N). Therefore

Blackfriars Bridge Foreshore was the only shortlisted site to emerge from the assessment process and was the preferred site at all phases of consultation. The City of London stated its agreement to the location in its response to Section 48 publicity. Further details can be found in the *Final Report on-site Selection Process*, which accompanies the application.

- Q.4.76 The proposed infrastructure at Blackfriars Bridge Foreshore was designed to intercept the substantial flows of waste water in the Fleet Main CSO and LLS (N). As the majority of the infrastructure for the proposed development would be an in river structure connecting to the Thames Path, a key design objective for the permanent above-ground works was to integrate the functional components into the surrounding townscape. Specifically, to protect the setting of nearby listed buildings and views of St Paul's Cathedral from the river, and minimise any effects on river navigation.
- Q.4.77 The design was strongly influenced by an extensive process of stakeholder engagement. In order to ensure design quality, two rounds of review by the Design Council CABE panel were undertaken. Various pre-application meetings were held with the City of London and other strategic stakeholders. The public were consulted and full details of the feedback and our responses are contained in the *Consultation Report*, which accompanies the application. Consultation comprised three stages:
- a. phase one consultation
 - b. phase two consultation
 - c. Section 48 publicity.
- Q.4.78 The principal issues that arose from pre-application consultation and Section 48 publicity for Blackfriars Bridge Foreshore are given below and subsequently addressed in the planning assessment in Section Q.5 which follows:
- a. Effects on river navigation are discussed within the Land use subsection below.
 - b. Temporary and permanent relocations of existing land uses including the President and Blackfriars Millennium Pier are discussed in the Land use subsection below.
 - c. The effect on the historic setting of the site including views along the River Thames towards St Paul's Cathedral is assessed in the Historic environment and Good design subsections.
 - d. Possible effect of construction vehicles on the volume of traffic on Victoria Embankment is addressed in the Traffic and transport subsection.
 - e. Temporary diversion of the Thames Path during construction is also addressed in the Traffic and transport and Good design subsections.
 - f. Possible effects on local air quality arising from odour in neighbouring areas are discussed in the Air quality, emissions, dust and odour subsection.

- g. Arrangements for maintenance of the completed public realm are discussed in the Good design subsection.

Q.5 Site-specific planning considerations

Q.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at Blackfriars Bridge Foreshore. It considers the assessment criteria identified in the NPS and other issues relevant to the site. The design response of the proposed development to each of these issues was informed by extensive consultation with stakeholders, as set out in the *Consultation Report*, and is detailed below.

Meeting the need

Q.5.2 The proposed works at Blackfriars Bridge Foreshore would successfully meet the need to intercept the Fleet Main CSO and the LLS (N), and would make an important contribution to meeting the wider need for the project identified in Section A1.3 of the NPS.

Q.5.3 Currently, in an average year, the Fleet Main CSO discharges 21 times per year, releasing a total of approximately 521,000m³ of untreated sewage into the River Thames beneath Blackfriars Bridge in the City of London.

Q.5.4 The CSO was identified by the Environment Agency as a CSO that needs to be controlled. The CSO discharges have multiple impacts on water quality in this location, including a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants and the discharge of sewage derived litter and effluent.

Q.5.5 It is assumed that the CSO discharges will continue to worsen both in terms of volume, frequency and content. By the time the proposed works at Blackfriars Bridge Foreshore are ready to become operational the CSO is assumed to discharge, in an average year, approximately 571,000 m³ of untreated sewage, discharging approximately 23 times a year.

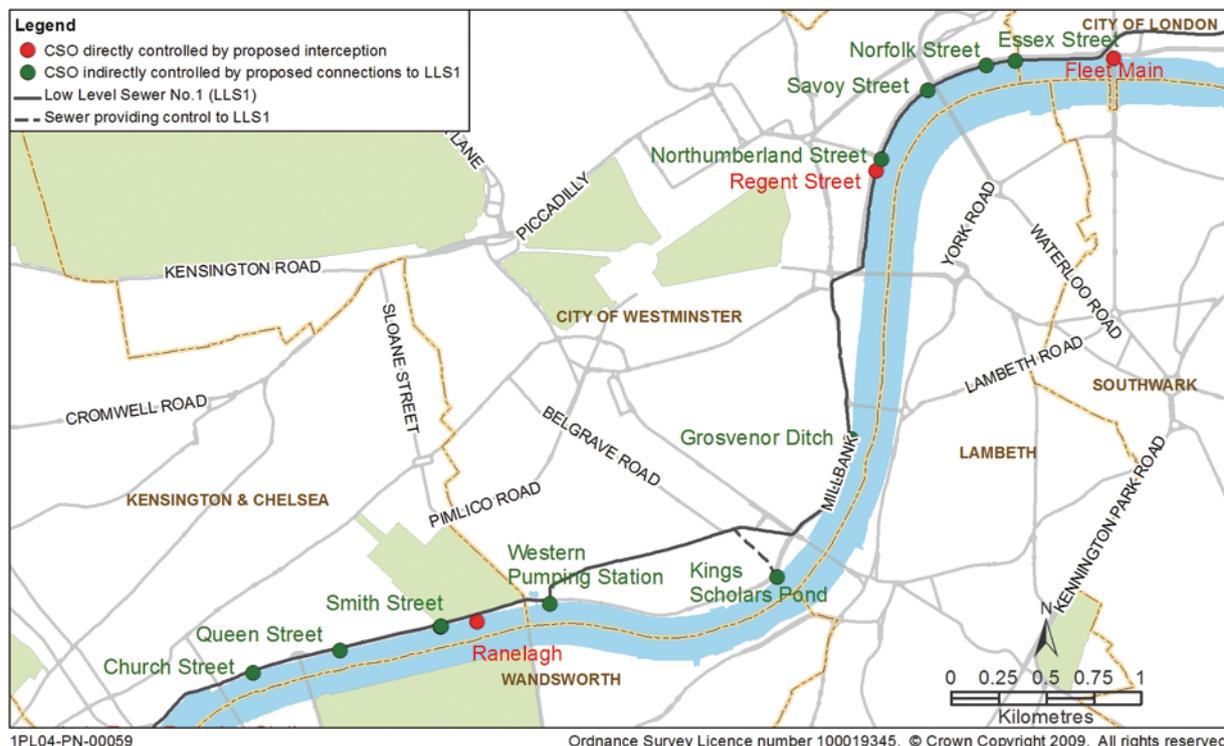
Q.5.6 Modelling suggests with the project in operation the discharges of untreated sewage in an average year would be reduced to 37,000m³, to an assumed level of four spills per year. This reduction would have a beneficial effect on river water quality.

Q.5.7 In addition, the ten other CSOs along the northern embankment from Chelsea (Church Street CSO) to the City of Westminster (Essex Street CSO) would be controlled by the development of overflow weirs along the LLS (N) at this location and at Chelsea Embankment Foreshore and Victoria Embankment Foreshore. In a typical year, these ten CSOs together discharge 2,138,000m³ of untreated sewage into the River Thames in the Royal Borough of Kensington and Chelsea and the City of Westminster. Modelling suggests that with the three connections to the LLS (N) annual discharges would reduce by 88 per cent from current levels to 249,700m³.

Q.5.8 As shown below, some of these ten existing CSOs are located in densely populated areas with residential neighbourhoods, major institutions and businesses; plus areas of significant built heritage interest. The avoidance

of additional construction and permanent development sites at some or all of these locations was welcomed by English Heritage and the three local planning authorities. Figure Q.4 below shows the location of these ten existing CSOs and the LLS (N).

Figure Q.4 The northern Low Level Sewer No.1



Q.5.9 For the above reasons, and taking into account the design and environmental mitigation outcomes described throughout this document, the Blackfriars Bridge Foreshore is considered the most suitable site to meet the need to control the Fleet Main CSO through connecting the LLS (N) to the main tunnel.

Good design

Q.5.10 The amount, layout and scale of the proposed development are primarily dictated by the function it needs to perform in intercepting the Fleet Main CSO and the LLS (N) and connecting them to the main tunnel.

Q.5.11 Early site analysis and subsequent engagement identified that it was important for the design to respond to the following design opportunities and constraints at this site.

Q.5.12 The site-specific design opportunities included:

- a. Create a new area of public realm on top of the foreshore structure with views across the River Thames towards the South Bank and Waterloo Bridge.
- b. Provide a level route for the Thames Path.
- c. Enable future development of the area under Blackfriars Bridge and the westbound off-ramp by others.

- d. Increase the usability and attractiveness of the riverside for local residents, workers and tourists.
- e. Help to indirectly control flows from ten other CSOs along the northern bank of the River Thames.

Q.5.13 The site-specific design constraints included:

- a. the proximity of the authorised navigation channel of the River Thames and the need to ensure navigational safety
- b. the limited headroom available beneath Blackfriars Bridge, where the Fleet Main CSO outfall is located
- c. the London Underground Waterloo and City Line tunnels, which run parallel to the west of Blackfriars Bridge
- d. the London Underground District Line tunnels, which run beneath the embankment
- e. a UK Power Networks (formerly EDF) cable tunnel, which runs under the River Thames to the east of Blackfriars Bridge
- f. a service tunnel in the embankment wall, directly above the LLS (N)
- g. the proximity of Victoria Embankment and Blackfriars Underpass, which form part of the Transport for London Road Network
- h. the need to locate the shaft on the line of the main tunnel to facilitate safe construction of the connection in the local ground conditions
- i. the need for the main tunnel to pass beneath the Blackfriars road and rail bridges
- j. the separation required from Blackfriars Bridge to maintain safe navigation under Arch 2 (the northernmost full arch)
- k. the complexity of pedestrian flows through and around the site and the various steps, ramps and subways (mostly dating from the 1960s) that negotiate the level changes between Victoria Embankment, the Thames Path, the Blackfriars road and rail bridges and a pedestrian subway
- l. the 1960s Blackfriars Underpass and Blackfriars Bridge westbound off-ramp
- m. Environment Agency stated policy to minimise encroachment into the foreshore
- n. the need to protect the foreshore structure from vessel impacts
- o. the setting of the listed buildings fronting Victoria Embankment and Blackfriars Bridge itself
- p. the need to relocate Blackfriars Millennium Pier
- q. Whitefriars and Temple conservation areas and protected views along the riverside
- r. the depth and relatively fast flow of the river at this point.

- Q.5.14 The proposals for Blackfriars Bridge Foreshore were carefully developed through a collaborative process of design review and extensive consultations. A review based on an initial assessment and sketched ideas for the site was undertaken with the Design Council CABI in April 2011. A landscape scheme was proposed for the area of public realm on the foreshore structure, which included a series of three multi-level open spaces, each with a different character, linked by steps and ramps. The western section of the space was the highest level and afforded views of the river; the middle section was the lowest and was designed to be floodable; and the mid-level eastern section was intended to be a low key area in which to sit and enjoy the river.
- Q.5.15 The Design Council CABI panel provided the following feedback in response: *'While we recognise the current stage of design development we were disappointed that the proposals did not present a more convincing response to the challenges presented by this site. We think that use of a physical model would assist in developing a simpler, more legible design solution'* [Letter dated 13 April 2011].
- Q.5.16 In response to the Design Council CABI's comments on the proposals, the multi-level area of public realm was redesigned in a simpler fashion. The design comprised: a widened section of the Thames Path running through and around the site; a series of wide steps, to be used as an informal seating area, descending from the Blackfriars Bridge westbound off-ramp onto the foreshore structure; and a viewing platform at the western end of the foreshore structure. The revised design was then reviewed for a second time by the Design Council CABI.
- Q.5.17 Following a second review, the Design Council CABI panel provided feedback including the following in its letter dated 30 June 2011: *"The presentation highlighted the opportunity for the proposals to begin to address the complexity of levels and movement patterns on this site by unpicking and stitching this streetscape back together. We think the proposals represent a commendable response to this challenge [...]The designs appear to resolve a complex set of site conditions and engineering constraints to produce a public realm proposal that is simple, functional and elegant. The astute handling of the level of change from the highway down to the Thames Tunnel³ platform underpins an assured design solution"*.
- Q.5.18 The design presented at the second Design Council CABI review was presented at phase two consultation where the main objections, issues and concerns included:
- a. The foreshore structure is too large/there should be no structures in the river.
 - b. The potential effect on foreshore habitats is of concern.
 - c. The design should include landscaping, planting and other elements to enhance biodiversity.

³ The project changed its name from the Thames Tunnel project to the Thames Tideway Tunnel project in July 2012.

- d. The design should include seating, shelter and areas for play.
- e. The effect of the permanent design on nearby listed buildings and the conservation area is a concern.
- f. The improved Thames Path and imaginative public realm proposals are welcomed but more detailed proposals should be agreed with stakeholders.

Q.5.19 In response to the phase two consultation feedback, the landscape design for the foreshore structure was modified. More levels of planting and a water feature were included to provide opportunities for play a more informal arrangement for the street furniture was introduced. The rill proposed in earlier consultation was removed but retained the River Thames shape by engraving it into the paving. The engineering and architectural design of the foreshore structure was redesigned to reduce the projection into the authorised channel by approximately 4m. This involved softening the geometry of the structure and introducing curved corners (most notably on the south-western corner) and moving the CSO drop shaft closer to the existing river wall.

Q.5.20 Other key aspects that influenced the evolution of the design include:

- a. managing impacts on existing land uses
- b. maintenance of the completed public realm
- c. managing the impacts of construction.

Managing impacts on existing land uses

Q.5.21 In view of changes to the scale of the structure, it was not practical to return Blackfriars Millennium Pier to its original location. Instead, it was proposed to relocate the pier permanently to the east of Blackfriars Rail Bridge. The pump house used by Crown River Cruises would be removed and the occupiers moved off-site.

Q.5.22 The President is moored permanently on the site and used for hospitality. It would be moved temporarily to Chrysanthemum Pier west of the site. The existing footings of Chrysanthemum Pier would be rebuilt in accordance with planning permission 11/00484/FUL to accommodate the President.

Q.5.23 The access to the toilets (currently closed to the public) and sports club in the base of Blackfriars Bridge would be reinstated post construction if requested by the owner, City of London.

Maintenance of the completed public realm

Q.5.24 Thames Water developed the proposals through on-going consultation with the City of London and other stakeholders and is proposing an indicative level of design at this site as a result. In response to a draft consents pack containing the proposed planning requirements and design principles, the City of London said in its letter dated 18 October 2012:

“The future maintenance responsibility for the new permanent lift and replacement stairs needs to be discussed further.

“If it is envisaged that the City (i.e. as trustee of Bridge House estates) would be responsible for these we would need to ensure through the DCO process that the relevant Blackfriars Bridge Act/s apply to the new lift and stairs such that the City has powers to maintain them as part of the bridge. Plus the City will look to secure an appropriate commuted sum for this purpose. The lift would have to meet City specifications and we would want the benefit of manufacturers’ warranties.) We also need assurance that the landing point of the stairs is sufficiently wide so as not to hinder pedestrian flow....

“It has not been agreed who will be responsible for maintaining the proposed water feature and the City is unlikely to be willing to take this on (even if it could). Whether the City has maintenance powers may depend upon the status of the land in question. Likewise responsibility for maintenance of landscaping on the new foreshore structure may depend on whether the area is declared city walkway”.

- Q.5.25 Thames Water discussed the *Draft DCO* with City of London and will discuss mechanisms to enable the stairs and lift to be maintained by the City by amending the relevant Bridge Act. Furthermore Thames Water would agree a mechanism for the maintenance and management of the open space/landscaping through a Section 106 agreement with City of London, including standards of maintenance and responsibilities for funding. Thames Water would also agree with City of London a mechanism to ensure public access to the land and scope of legitimate restrictions to public access.

Managing the impacts of construction

- Q.5.26 The CoCP Part B contains a number of measures to limit the impact of construction on the Blackfriars area, namely:
- a. The hoardings would incorporate contextually appropriate art work and viewing windows.
 - b. Low level directional lighting would address potential impacts on aquatic ecology, while maintaining a safe working environment.
 - c. Recessed site access gates and traffic management would ensure construction vehicles do not queue on the road.
 - d. The extent of works within the highway would be minimised during the London marathon.
 - e. Construction of replacement Blackfriars Millennium Pier and rebuilding of Chrysanthemum Pier would ensure continuity of service for the President and other vessels currently using the site.
 - f. The use of protection barriers would minimise the risk of accidental collisions with Blackfriars Bridge.
 - g. A membrane between the river bed and temporary back-fill material would prevent contamination of juvenile fish habitat and preserve potential archaeology.
- Q.5.27 Engineering design initiatives also reduced the scale of the structure by 4m at its widest point, thereby limiting encroachment into the authorised

shipping channel. The use of river rather than road transport has also increased since phase two consultation to limit impacts on the surrounding road network.

- Q.5.28 Overall, considerable thought went into ensuring the design responds to consultation and provides an attractive area of public realm that responds to its local context. The design features responding to the unique attributes of the area include:
- a. Raised, westward oriented terraces above flood level would be provided with seating to take in long ranging views of the River Thames towards the Houses of Parliament (design principle BLABF.11)
 - b. The views from the river to the listed buildings along Victoria Embankment and St Paul's Cathedral beyond would be respected (design principle BLABF.17).
 - c. A water feature would be created to encourage education and play.
 - d. The floral motifs unique to Blackfriars Bridge may be used as the inspiration and pattern for stair balustrades and screens in the new public space.
 - e. The majority of the distinctive bronze head mooring rings on the existing river wall would be retained (design principle BLABF.19).
 - f. High quality natural stone paving would be used (design principle BLABF.24), which in the application is indicatively inscribed with informative dialogue on wastewater, the River Thames and the project.
 - g. Tree planting would create shaded passive recreation space and continue the landscaping along the Thames Path.
 - h. Amenity would be improved for pedestrians using the Blackfriars Underpass, with up-lighting and new architect designed screening to the northern façade, with adaptation of the space behind as active commercial space subject to approval by the local authority in due course. Voids below the ramp (both existing and proposed) would be enclosed with high quality screens designed to be in keeping with the overall architectural and landscape design. Entrances to the main electrical and control equipment kiosk, toilets and specialist sports facility would be integrated into this screen (design principle BLABF.08). Services would be provided to the undercroft areas to facilitate possible future commercial development (by others) (design principle BLABF.09).
 - i. The stairs to the east and west of Blackfriars Bridge would be replaced to achieve an improved quality of design, which seeks to enhance the setting of the Grade II listed Blackfriars Bridge, compared to the existing 1960s stairs.
 - j. A lift would be provided between the Thames Path and Blackfriars Bridge to facilitate step free access between Blackfriars Millennium Pier and Blackfriars Station (design principle BLABF.01).

- k. Fenders would be included on the structure as a result of consultation with Port of London Authority (design principle BLABF.25).
- l. An amenity building that could be used as visitor information or commercial kiosk in the western end of the site was added to form a focal point along the western edge of the space. Such a use would increase activity, natural surveillance and a sense of security within the area and add to the character of the space.
- m. The materials would be in a palette of colours that respect the surrounding built landscape.

Q.5.29 The small amount of functional infrastructure visible at ground level, such as the cast metal ventilation columns, was carefully designed to complement the setting of the site and be visually unobtrusive as set out below.

- a. The five (drop shaft) ventilation columns of up to 8m in height would feature the 'signature' design. They would be higher than the functional requirement in order to improve the columns' proportions and visual appearance. They would be finished in black cast iron (subject to detailed approval) to reference other historic cast and wrought iron features in the area, including on the Grade II listed Embankment wall.
- b. The Fleet ventilation column would be incorporated into a column on the wall adjacent to the Blackfriars Bridge westbound off-ramp. The overflow weir chamber ventilation column would be located in the pavement on the off-ramp. It would be similar to a lamppost in scale and finished to blend with the surroundings
- c. The majority of the electrical and control equipment is incorporated in a kiosk located in the undercroft area in order to minimise the visual impact. Some equipment must be closer to the valve chambers and drop shaft, which constrains the position. These would be located in a kiosk on line of the existing wall to mark the change from the listed wall to the new structure. Along with the remainder of the structure, electrical and control kiosks would be protected from climate related increases river levels by increasing the height of the parapet, the design having had regards to the Thames Estuary 2100 study (TE2100).

Figure Q.5 Aerial visualisation of the foreshore structure



- Q.5.30 The design life of the major civil engineering components of the project is 120 years, including buildings. The details of the external finishes of the ventilation columns and kiosks are not specified in the application, but are to be submitted for the subsequent approval of the local planning authorities. These details must be in accordance with the design principles, which require materials to be high quality and long lasting. The project was designed to be durable and resilient to change.
- Q.5.31 The Environment Agency established the TE2100 to develop a long-term flood risk management plan for London and the tidal Thames. The plan suggests that the height of the tidal Thames flood defences could be raised in the future. This was taken into account at all project sites and the ability to raise river walls at a later date was incorporated into the designs.
- Q.5.32 The design for Blackfriars Bridge Foreshore is therefore as visually attractive as possible taking account of both aesthetics and functionality. The proposals put forward are designed to be durable through appropriate siting and layout and adaptable through the flexibility provided by approval of the details of landscaping and materials by the City of London through the DCO requirements. The use of the design principles and the zones set out in the Site works parameter plan also provides flexibility to develop the detailed designs in the future within the parameters set.
- Q.5.33 Planning requirements were discussed and the principles in the *Design Principles* document, which accompanies the application, were agreed

with the City of London to guide the detailed design and implementation of the scheme.

Water quality, water resources and flood risk

Water quality and resources

- Q.5.34 There are four licensed groundwater abstractions from the Chalk (the lower aquifer) around the site and the external dewatering outside the diaphragm wall may potentially affect nearby abstraction sources. The dewatering of the lower aquifer at a nearby project CSO drop shaft sites may also influence these abstractions sources.
- Q.5.35 Measures to protect water quality and resources during construction are detailed in Section 8 of the *CoCP* Part A, and referred to in Sections 5 and 7 of the *Planning Statement*. The *CoCP* also covers activities that are subject to pollution control and makes reference to good practice.
- Q.5.36 After taking into account the measures incorporated into the design and *CoCP*, including adherence to good pollution prevention practice, there would be no adverse impacts on surface water resources, river flows and groundwater resources.
- Q.5.37 Once operational, the scheme would reduce the number of discharges significantly from 21 to four. Therefore the project would have a beneficial effect on water quality in the tidal Thames and contribute to the protection and enhancement of biodiversity of the Blue Ribbon Network.
- Q.5.38 The site therefore meets the decision making criteria set out in the NPS as no adverse effects are expected on water quality or resources and the Environment Agency has no outstanding concerns.

Flood risk

- Q.5.39 The main flood risk to the site during construction and operation is the tidal Thames. The majority of the site is situated within the foreshore, which is a functional floodplain and is classified as Flood Zone 3b (land where water flows or is stored during flooding). The inland section of the site falls within the 'high probability' flood zone (Flood Zone 3a). A Flood Risk Assessment undertaken in accordance with Section 4.4 of the NPS is included within the *Environmental Statement*.
- Q.5.40 Flood defence levels along the River Thames frontage would be maintained during the temporary works. This would be achieved by constructing a temporary works platform in the river (including cofferdam) to the same height as the existing flood defence level. This temporary structure would tie into the existing flood defences on either side of the site.
- Q.5.41 The permanent operational area would be protected from flooding through the provision of flood defences which would provide the same level of protection as existing defences. This would be secured via a project-wide riparian design principle (IRVR.02). In addition, to accommodate climate change the proposed new structure at Blackfriars Bridge Foreshore was designed so that the river walls can be raised to TE2100 levels in the future.

- Q.5.42 The new flood defences would be located along the periphery of the operational area and tie into existing flood defences, providing a continuous defence line along the embankment at all times. However, as at present, the site would be at residual risk of tidal flooding in the event of a breach in the new flood defence wall or overtopping of the defence wall as a result of a failure of the Thames Barrier. The consequence of a breach or failure of flood defences would not compromise the long term operational function of the tunnel and therefore no additional measures in addition to those outlined above are proposed.
- Q.5.43 Part B of the *CoCP* includes site-specific measures for temporary drainage of the construction access route and permeable surfacing of temporary areas of hardstanding.
- Q.5.44 Operational surface water drainage at this site is addressed in the design principles, which require on-site drainage to be designed in accordance with relevant National Standards and in accordance with the Water Management Act 2010. Site-specific design approaches and measures were developed to ensure surface water is positively drained once operational. In the event of a storm coinciding with a high tide event, surface water drainage from the site may be restricted by tide-locking of the surface water outfall, similar to existing riverside areas. Although water would potentially pool on the surface of the public realm, given the rare concurrence of such events, on-site storage at or below the surface would be provided in accordance with design principle SDRN.02.
- Q.5.45 The *Draft DCO* includes a requirement for the permanent drainage details to be submitted and approved in writing by the local authority in accordance with the design principles.
- Q.5.46 The Flood Risk Assessment shows that the proposed development would be appropriate for the area as flood risk to the development would remain unchanged and the development would not lead to an increase in flood risk in the surrounding area. The presence of permanent structures within the foreshore has the potential to reduce the availability of flood storage within the tidal foreshore of the River Thames. The effect of removal of flood storage on flood levels is propagated throughout the hydrological unit of the Thames reach and was considered on a cumulative basis. This is discussed further in the project-wide assessment.
- Q.5.47 The project would have a direct beneficial effect on water quality in the tidal Thames at this location and contribute to the protection and enhancement of biodiversity of the Blue Ribbon Network and the River Thames Site of Nature Conservation Importance.
- Q.5.48 Following the construction of the proposed development, the risk of flooding would remain unchanged. Therefore, the proposed development satisfies the decision making requirements of the NPS as set out in para. 4.4.10.
- Air quality, emissions, dust and odour**
- Q.5.49 Through the measures included in the *CoCP*, all reasonable steps would be taken to minimise detrimental impacts on air quality or amenity resulting from emissions and dust, as required by the NPS. With the

implementation of the *CoCP* measures, the overall effect on local air quality from construction (ie, effects from construction road traffic, tugs for river barges and construction plant), would not be adverse for any of the closest sensitive receptors.

- Q.5.50 The City of London Corporation has declared the whole Borough an Air Quality Management Area for NO₂ and PM₁₀. In addition, the site is in close proximity to the boundaries of the London Boroughs of Lambeth and Southwark. The latter has an Air Quality Management Area in place for the northern part of its Borough including the land directly opposite the site.
- Q.5.51 The closest sensitive receptors to the development are occupiers of nearby residential dwellings and the City of London School.
- Q.5.52 For the Blackfriars Bridge Foreshore site the majority of receptors would experience negligible effects in terms of PM₁₀ and NO₂ emissions. With respect to construction dust effects on air quality for receptors, these are either negligible or minor adverse. The use of river rather than road transport for the majority of the construction trips substantially decreased that amount of air pollution that would otherwise be expected from the site.
- Q.5.53 The *Air Management Plan*, which accompanies the application, is designed to ensure that odours do not arise from the operation of the scheme at any of the proposed site locations.
- Q.5.54 At this site, a passive ventilation system would be installed to allow air to move into and out of the tunnel system as wastewater flows enter and exit during storm events. During infrequent, extreme storm events, the air that would be pushed out of the system could exceed the capacity of the filters and would be released through the ventilation structures to prevent damage to the odour control equipment. In this case, the excess air would only be partially treated. At least 99 per cent of the time, all air released would be treated, which would avoid any effects on amenity from odour and meet the regulatory requirements.
- Q.5.55 The project-wide air management plan is designed to ensure that the air in the tunnels is kept fresh, that a low pressure is maintained within the tunnels to prevent unwanted releases and that when air is released it is treated. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, at all sites there are to be ventilation structures which would allow air to enter and leave the tunnel system.
- Q.5.56 When the tunnels are empty, clean air would be drawn into the tunnels at specific sites by the extraction of air at other specific sites so as to keep the air in the tunnels fresh. This means that odours would not build up while the tunnels are empty. As the tunnels fill, air displaced from the tunnels would initially be extracted and treated at the active ventilation sites before being released and later, depending of the level of filling, would pass through the passive carbon filters. These filters clean the air and remove any odours before it is released.
- Q.5.57 At passive ventilation sites such as Blackfriars Bridge Foreshore, a passive carbon filter would be installed within a below ground chamber. During a typical year this treats all the air displaced from the particular

shaft which would occur only when the shaft is drowned by the rising wastewater in the tunnel. During infrequent, extreme storm events (about once in 15 years), the air that is pushed out of the shaft could exceed the capacity of the passive filter and would be released untreated through a pressure relief structure to prevent damage to the passive filter. For 100 per cent of the time during a typical year, all air released would be treated, which means that all regulatory requirements would be met and there would be no nuisance odours or loss of amenity due to odours.

- Q.5.58 The City of London raised an issue with regards to existing odour concerns elsewhere in the City, and this requires some consideration. Although the proposed development would not address existing odour issues it would not make their impact any greater. The main tunnel would be isolated from the existing sewerage network serving the City of London by flap valves. Thus there would be no effect on the current air balance in the existing sewers.
- Q.5.59 When the tunnel is not capturing combined wastewater, the flap valves are closed and tunnel air cannot enter the existing sewers. Under this condition fresh air is drawn into the tunnel via one way dampers through the five ventilation columns at Blackfriars Bridge Foreshore by the action of extraction fans at other shafts in the western and eastern ends of the tunnel. This makes air pressure in the tunnel slightly lower than the atmospheric pressure, preventing any leaks of tunnel air.
- Q.5.60 When the tunnel is capturing combined wastewater, the flap valves would be forced open by the flow of wastewater. Some air may be dragged into the tunnel from the sewerage network along with the wastewater, but no air would escape from the tunnel into the sewerage network.
- Q.5.61 Air release from the tunnel occurs only when the shaft is drowned and air can no longer be drawn into the tunnel. At this time air expelled from the shaft passes through carbon filters where it is treated before being released through the same five ventilation columns which would be a minimum 4m high, which would ensure adequate dispersion.
- Q.5.62 The air movement in the tunnel was extensively modelled under different scenarios of tunnel operation for the typical year and for a year with high rainfall. The modelling confirms that the tunnel air would behave as explained above.
- Q.5.63 Appropriate measures are proposed to ensure that the proposals would not lead to any or substantial changes in, air quality, emissions, dust or odour or a significant loss of amenity during construction or operation.

Biodiversity and geological conservation

- Q.5.64 Terrestrial ecology at Blackfriars Bridge Foreshore is limited to the habitat provided by semi-mature London plane trees (*Acer platanus* x *acerifolia*). One of these trees would be removed. The semi-mature trees have low intrinsic biodiversity value and would support only small numbers of nesting common bird species. Trees planted on the Victoria Embankment would be semi-mature London Planes (design principle BLABF.15).

Q.5.65 The site is not designated for its geology or geomorphological importance, and there are no internationally (Special Protection Areas, Ramsar sites) or nationally designated ecological sites (Sites of Special Scientific Interest, Marine Conservation Zones) in the vicinity of the site. However, Blackfriars Bridge Foreshore falls within the non-statutory River Thames and Tidal Tributaries Site of Importance for Nature Conservation, which was designated by the Greater London Authority and adopted by all boroughs that border the River Thames.

Q.5.66 By intercepting the CSO, the proposed development would result in the reduction in the occurrence of dissolved oxygen related fish mortalities and would improve the quality of the foraging habitat for fish, constituting a beneficial effect.

Loss of foreshore habitat

Q.5.67 On 2 October 2012 the Environment Agency responded to the Section 48 publicity by saying: "*Permanent encroachment into the river should only be for essential tunnel infrastructure, or river dependent activities or where absolutely necessary for hydraulic smoothing and scour control. The public toilets and sports facility access do not fall into this category. If the physical footprint can be further reduced by locating these activities landside then this should be done [...] It is unlikely that any foreshore will remain at this site as a result of these works. This large encroachment creates a significant loss of this habitat in this area*".

Q.5.68 The scale of the proposed development is a result of the size and layout of the infrastructure, and modelling was undertaken to design the shape of the structure in a manner that would limit scour. With regards to the sports club and toilets, these are existing facilities located under the Blackfriars Bridge westbound off-ramp and at the request of City of London the access temporarily blocked by construction would be reinstated. Further details are provided on the Permanent works layout plan.

Q.5.69 During construction there would be a temporary land take (of which approximately 250m² would be from intertidal habitat close to Blackfriars Bridge, and the remainder from sub-tidal habitat) associated with the presence of the cofferdam.

Q.5.70 The Blackfriars Bridge Foreshore site is considered to be of low-medium (borough) value for fish due to the limited intertidal habitat. This valuation is supported by the limited assemblage of species recorded at the site during baseline survey gathering.

Q.5.71 Throughout design development, the functional design, footprint, and layout of the new infrastructure proposed were refined and optimised with the aim of minimising encroachment of permanent structures in the foreshore where possible and minimising harm to foreshore habitats.

Q.5.72 The *Environmental Statement* identifies that during construction there is likely to be direct effects on fish because of the loss of feeding, resting and nursery habitat due to temporary land take. Additionally, during piling there would be suspended sediment blanketing fish feeding areas and reducing the visibility of water.

- Q.5.73 The construction effects would be managed in accordance with the *CoCP* and the *CoCP* Part B, which identifies a site-specific requirement to install a membrane between the river bed and temporary back-fill material to prevent contamination of the juvenile fish habitat.
- Q.5.74 Once in operation, the permanent loss of designated inter-tidal habitat because of the new foreshore structure would have residual effects on designated sites and habitats and fish.
- Q.5.75 The extent of the physical works in the river was reduced as far as practicable for the construction and operational phases and there are no further on-site measures available to significantly reduce adverse effects of the land take. In this stretch of the river encroachment into the foreshore was minimised due to the interception of the LLS (N), which along with sites at Chelsea Embankment Foreshore and Victoria Embankment Foreshore avoids the needs for worksites to intercept up to ten other CSOs along the northern embankment in central London.
- Q.5.76 It is important to identify that although there would be residual effects on aquatic ecology due to land take. By intercepting the CSO, the project would result in the reduction in the occurrence of dissolved oxygen related fish mortalities and would improve the quality of the foraging habitat for fish, constituting a beneficial effect.
- Q.5.77 In accordance with NPS policy (para. 4.5.3), Thames Water assessed the impact and sought to take advantage of opportunities to conserve and enhance biodiversity as part of the proposals in this location. Any residual impacts are an unavoidable effect of the need to intercept the CSO in this location.

Landscape and visual impacts

- Q.5.78 During construction, the scale and intensity of activity would result in temporary effects on the townscape and views, including those towards and within the Whitefriars and Temple Conservation Areas. The proposed development took into account local *Conservation Area Character Summaries* produced by the City of London for Whitefriars and the Temples Conservation Areas, in accordance with para. 4.7.2 of the NPS.
- Q.5.79 The proposed development involves the creation of an embankment extension of considerable scale. The design sought to limit the effect on views of the listed buildings along Victoria Embankment and create a new space where people can enjoy the river away from the busy road. It does not affect any designated views.
- Q.5.80 The design parameters and principles for the above-ground structures (ventilation columns, control kiosk and river wall) and landscaping were carefully chosen to ensure they are sensitive to the surrounding townscape and visually attractive. A full explanation of the design intent and interaction with the surrounding townscape is included in the *Design and Access Statement*, which accompanies the application.
- Q.5.81 The design principles and parameters are secured through a DCO Requirement. This requires the finishes, materials and external appearance of above-ground structures to accord with the committed

principles and to be submitted to the local authority for subsequent approval.

- Q.5.82 The construction works would be a prominent, albeit temporary, feature of the local townscape and views. Through considered construction layout and design and the *CoCP*, the effects of construction would be minimised. The *CoCP* identifies mitigation such as high specification hoardings around the worksite and other measures outlined in the Limiting impacts of construction subsection.
- Q.5.83 The NPS recognises that NSIPs are likely to take place in mature urban environments, with adverse construction effects on townscape and visual receptors likely to arise. The central London landscape is considered to have a high capacity to accommodate change; this is certainly the case at Blackfriars Bridge Foreshore where the adjoining Blackfriars Station redevelopment resulted in major construction works to create a new station that spans the Blackfriars Rail Bridge. The benefits of intercepting the CSO and the significant beneficial legacy of the permanent works in this location are considered to outweigh these temporary effects of construction.

Land use including open space, green infrastructure and green belt

- Q.5.84 The NPS requires the consideration of any conflicts between a proposal in a development plan and impacts on existing and proposed land uses near the development site. The NPS suggests the decision maker can attach greater weight to proposals within adopted development plans, but in reaching judgement, should consider if an adverse impact is temporary or capable of being reversed within a reasonable timescale.
- Q.5.85 The impact of the proposals on land uses and designations (as identified in the *Core Strategy* and retained policies) was a key consideration in the site selection process and on-going design development. However, given the location of the preferred site the principal effects would be on existing in river structures and river navigation.

Relocation of existing structures

- Q.5.86 In order to accommodate the cofferdam for construction and eventual development, it is proposed to temporarily relocate the President to Chrysanthemum Pier and to relocate Blackfriars Millennium Pier to the east of the main structure permanently. The access to the toilets (not currently open to the public) and sports club beneath Blackfriars Bridge would be closed during the works and would be reinstated following construction. The toilets below the ramp would be returned to use with new separate entrances (design principle BLABF.06) and the entrances, along with the one to the specialist sports club, would be integrated into the proposed high quality screen in accordance with design principle BLABF.08.
- Q.5.87 The premises lease of the specialist sports club will expire before the commencement of the proposed works. We understand there is no plan for the lease to be renewed; instead the club will move to an alternative

facility. As described later in the social economic section, if for some reason the sports club is still occupying the premises when the project starts compensation could be available to assist in its relocation.

- Q.5.88 With regards to reinstatement of the President, design principle BLABF.03 states that access ramps for the President moorings would be designed to current standards. They would bridge over the river wall with minimum physical or visual impact on the listed structure or span from the elevated platform at the western end of the new foreshore structure. The effects on the use of the President would be minimal as it would only be closed for a short period during relocation.

River navigation

- Q.5.89 The *Navigational Issues and Preliminary Risk Assessment*, which accompanies the application, discusses particular issues faced at potential project development sites in foreshore locations.
- Q.5.90 Correspondence from the Port of London Authority (PLA) dated 5 October 2012 makes the following comment in relation to the Blackfriars Bridge Foreshore site: *“Although acknowledging that considerable efforts have been made to reduce the impact of the permanent works on navigational safety, the PLA still has significant concerns in relation to the proposals within the Section 48 publicity for this site. In particular, the scale and extent of the LLAU [limits of land to be acquired or used] at this site is considered excessive – extending into the authorised channel and impacting on navigation through arch two of Blackfriars (Road) Bridge”*.
- Q.5.91 Near Blackfriars Bridge, the River Thames is narrow and fast-flowing. It is well used by both freight operators and passenger services. Only a small area of foreshore is exposed at the very lowest tides. It is a challenging environment in which to introduce a new foreshore structure. The current proposals were informed by extensive consultation with the Port of London Authority, barge operators and passenger services operators.
- Q.5.92 The main navigational issue would be the intrusion of the foreshore structure into the authorised channel. The extent of this projection was determined by the engineering requirements for the CSO drop shaft and the surrounding new section of river wall (refer to the *Engineering Design Statement*, which accompanies the application). GPS tracking information provided by barge operators showed that barges would pass close by the proposed structure.
- Q.5.93 Therefore, the main design aim was to ensure that Arch 2 of Blackfriars Bridge could continue to be used safely by all river traffic, of which barges are the least manoeuvrable. Following phase two consultation, the engineering and architectural design of the foreshore structure was developed further and the projection into the authorised channel was reduced by approximately 4m.
- Q.5.94 In the design submitted with the application, the foreshore structure projects approximately 3m into the authorised channel. In 2012, buoys were installed in the River Thames to mark the area of the structure and test its impact on passing vessels. This test demonstrated that it would be possible for barges to navigate through Arch 2 and past the structure.

Thames Water is confident that the area of the structure in the current design is the maximum required to accommodate the functional components; however, Thames Water will continue to develop the detailed engineering design in an attempt to reduce the projection and any possible impacts further. The contractor(s) would also be required to provide a detailed navigational risk assessment prior to undertaking works in the river. A preliminary navigational risk assessment is included in the application for development consent which includes 'zones of foreshore working drawings' to clarify the function of the temporary and permanent areas within the limits of land to be acquired or used.

Q.5.95 Blackfriars Bridge Foreshore is only visible during low tide. The space has some limited visual amenity and environmental value as part of the wider

Open space

Q.5.96 The permanent works on the foreshore represent a negative impact on open space. However, the extent of the physical works on the foreshore has been reduced as far as practicable, in order to reduce impacts on ecology and navigation. Once complete a new landscaped space of approximately 5,000m³ would be created, a significant contribution to addressing a deficiency in open space within the City of London, albeit of a different character from the foreshore. The space would create new opportunities for sitting out in an improved landscaped environment. The new area for sitting would provide direct views of the Southbank and the Thames. The new space would form part of the Thames Path, forming part of a wider regional network of open space. The *Open Space Assessment*, which accompanies the application, provides further information on the provision of existing and proposed open space.

Q.5.97 The footpath between the foreshore and Victoria Embankment road would be affected by the proposals and forms part of the Thames Path and therefore has a recreational role. The Thames Path would be diverted for the duration of the proposed works and a lift installed and retained for operational use to provide step free access from Thames Path to Blackfriars Bridge.

Q.5.98 The design of the area would comply with the Disability Discrimination Act. Materials of contrasting colours and textures would be selected to assist the visually impaired, while respecting the historic surroundings.

Q.5.99 The pedestrian access to both the relocated Blackfriars Millennium Pier and the reinstated President would be step-free over the river wall. The footpath around the access ramps to the relocated pier would be widened to maximise room for pedestrians. At present, the local authority is implementing a landscape scheme in this area. Widening the path would involve reconfiguring the raised planters and removing four trees. A new gated opening in the wall at the back of Paul's Walk would be created to facilitate emergency access to the pier from Upper Thames Street.

Q.5.100 The proposed lift to the east of Blackfriars Bridge would facilitate step-free access from the bridge to Paul's Walk and for people interchanging between Blackfriars Station and the pier. The lift and the replacement

stairs would be installed prior to the temporary closure of the Thames Path.

- Q.5.101 The President would need to be moved temporarily during construction; however, it would be reinstated in its current position with a new mooring arrangement.
- Q.5.102 It was not practical to return Blackfriars Millennium Pier to its original location. Instead, it is proposed to relocate the pier permanently to the east of Blackfriars Rail Bridge.
- Q.5.103 These various measures would minimise impacts on existing and adjacent land uses as far as practicable. The loss of foreshore represents a negative impact on open space, but once the works are complete a new high quality space would be created. It is not considered that the proposed works would prevent the beneficial, continued and proposed use of surrounding land uses, either during construction or operation. Similarly, it is not considered that any extant planning permissions, committed developments, or policy allocations for future development would be adversely impacted as a result of the works in this location.

Noise and vibration

- Q.5.104 The NPS recognises that NSIPs are likely to take place in mature urban environments, and in the short term, to lead to noise disturbance during construction.
- Q.5.105 The nearest residences located to the north of the site in the City of London are at 7 to 13 Kings Bench Walk (approximately 55m), and the nearest residences to the south of the site are at River Court on the opposite bank of the Thames in the London Borough of Southwark (approximately 200m). The non-residential noise sensitive receptors selected for assessment are the offices on Victoria Embankment, including Sion Hall, 40 to 50 Victoria Embankment, Unilever Building (including the Crown Plaza Hotel on New Bridge Street) and the Mermaid Conference Centre. The Noise and Vibration assessment undertaken in the *Environmental Statement* found impacts would not be significant for receptors near the site.
- Q.5.106 In accordance with NPS policy, a series of measures detailed in the *CoCP* are embedded within the project design. The *CoCP* Part B also contains site-specific measures which are embedded within the project design in this location including the provision of site hoarding at 2.4m high on the cofferdam sections perpendicular to the river wall, hoarding at 3.6m around the main shaft working site, and hoarding on the southern part of the access route.
- Q.5.107 The implementation of measures embedded in the *CoCP* such as selection of the most quiet, cost effective plant available, and optimising plant layout to minimise noise emissions would ensure that effects are minimised.
- Q.5.108 Given the nature of the works proposed, no further practicable noise mitigation within the construction site was identified beyond those methods identified in the *CoCP*.

- Q.5.109 Through the *CoCP* and project design, efforts were made to reduce noise and vibration impacts wherever possible, such that the project would not have a detrimental effect on the health and quality of life of the local community.

Historic environment

- Q.5.110 The NPS recognises that NSIPs are likely to take place in mature urban environments and to have adverse effects on archaeology and cultural heritage.

Archaeology

- Q.5.111 The entire City of London is within an Archaeological Priority Area. The site has low potential to contain palaeoenvironmental, prehistoric or medieval remains, but a moderate to high potential to contain Roman remains. There is also a high potential for the site to contain post-medieval remains that could be of medium or high significance. The *Heritage Statement*, which accompanies the application, explains the archaeological, heritage and conservation area attributes of the site more fully.
- Q.5.112 In the early 1960s a first century Roman ship was recovered from the then foreshore in the north-eastern part of the main site. The prow of the Blackfriars Roman ship is understood to be preserved *in situ* beneath the foreshore to the east of the proposed cofferdam. Past human activity and the scouring action of the river mean that the potential for evidence from the Roman to early modern periods surviving intact is relatively low.
- Q.5.113 Further evaluation and mitigation would be carried out in accordance with a scope of works in a *Site-specific Archaeological Written Scheme of Investigation*, which would be based on the principles in the *Overarching Archaeological Written Scheme of Investigation*, which accompanies the application. This would ensure that the scope and method of fieldwork are appropriate. The site-specific scheme would be submitted in accordance with the DCO Requirement.
- Q.5.114 It is necessary to construct the below and above-ground works in this location. The impact of the works would be minimised by careful design, archaeological recording and by the form and materials of the proposed elements, in accordance with Section 4.7 and para. 4.10.11 of the NPS.

Heritage assets

- Q.5.115 There are two nationally designated heritage assets within the site perimeter: Bazalgette's Victoria Embankment wall (including Grade II listed cast iron lamp standards, a granite retaining wall, benches, piers and stairs) and Blackfriars Bridge. The existing listed sturgeon lamp standards would be carefully removed, stored and reinstated in their current position as far as possible. The existing 'replica' lamp standards would be replaced with originals from elsewhere or with new castings from the original moulds if possible (design principle BLABF.14).
- Q.5.116 The existing river wall is in two sections, both granite faced mass-gravity retaining structures:

- a. The original listed 1868 (Bazalgette) wall from the west as far as the old London Fire Brigade pump house
 - b. The 1964 wall, built as part of the Blackfriars underpass scheme, from the pump house eastwards (not listed).
- Q.5.117 The 1868 wall contains the LLS (N), which turns to the north prior to the 1964 wall and a service subway which continues into the 1964 wall.
- Q.5.118 In order to connect to the LLS (N), modifications to the existing 1868 river wall, which contains the sewer, would also be required in order to construct the overflow weir chamber.
- Q.5.119 The proposed structure would connect to the existing Grade II listed river wall at the western end and to the 1964 wall at the eastern end. Sections of this existing river wall would be retained and raised slightly to separate the hectic Victoria Embankment from the intimate garden terraces proposed as a part of the new embankment structure. The transition between the original and new sections of wall would be negotiated with a treatment of high quality materials in a simple, functional and modern layout. The iconic river-facing features on the existing wall, such as the Lion's Heads, would be retained, which would make this one of the few places in London in which to appreciate these sculptural forms at close quarters.
- Q.5.120 The foreshore structure walls would be finished in natural stone (design principle BLABF.18).
- Q.5.121 The junction at the western end of the foreshore structure with the listed wall would be marked with a 'shadow gap' designed to limit the accumulation of litter (design principle BLABF.23).
- Q.5.122 The new lift and replacement stairs to Blackfriars Bridge would use existing breaks in the bridge parapet to minimise the loss of historic fabric. The existing break in the parapet wall of Blackfriars Road Bridge would be used to accommodate replacement stairs and a new lift to the eastern side of the bridge. The western replacement stairs would be positioned to end in the zone of modern additions to the bridge. Both would be designed to respect the historic character and fabric of the bridge (design principle BLABF.22). The amount of historic fabric to be removed would be kept to the minimum.
- Q.5.123 The handrail that runs from the western Blackfriars Bridge parapet to the off-ramp from Blackfriars Bridge to Victoria Embankment would be replaced to tie in with the new development. The fascia of the concrete edge beam would also be re-clad (design principle BLABF.10). The proposed railings to the western end of the foreshore area would be designed to be as visually unobtrusive as possible without compromising safety (design principle BLABF.12).
- Q.5.124 Grade II listed Blackfriars Bridge would be subject to ground movement effects, concentrated to its northern end where the bridge is within the site. The bridge is expected to experience total movements of up to 6.1mm, resulting in a risk of negligible damage, with a risk of cracks typically up to

- 0.1mm in width. This would represent a negligible magnitude of change to an asset of high significance, with a minor adverse effect.
- Q.5.125 Within the site perimeter there are also five Grade II listed lamp standards and five Grade II listed benches, all of high asset significance and to be temporarily removed as part of the proposals and reinstated following construction.
- Q.5.126 There are two non-statutory heritage assets on the site. The President is moored in the centre of the main site, and is listed on the National Register of Historic Vessels and is also a member of the National Historic Fleet (Cert No. 494). Secondly in the 1940s, a pier, pump house (the former London Fire Brigade pump house) (HEA 1G) and associated access ramps were built in the eastern part of the main site as emergency fire brigade measures during the Blitz.
- Q.5.127 As the President would be moved 100m west of its location for the duration of construction only, the impact of the proposed development on this non statutory asset is considered minimal.
- Q.5.128 Although unlisted, the 20th century former London Fire Brigade pump house to be demolished as part of the proposals (design principle BLABF.20) would be recorded to English Heritage Survey Level 3 standards prior to removal, in accordance with the *Overarching Archaeological Written Scheme of Investigation*.
- Q.5.129 There would be some minor harmful effects as a result of the permanent works at this site; however, none would amount to 'substantial harm'. They would also give rise to a range of benefits that would outweigh any harm done.
- Q.5.130 With regards to the impact of the scheme on built heritage beyond the site boundary, it is acknowledged there would be an impact on the Temples and Whitefriars Conservation Areas through introduction of a new element into an otherwise coherent heritage townscape. However, reinstatement of the lamp standards, the continued line of plane tree and other design measures would mitigate the effects of the scheme on the wider Conservation Areas and the setting of surrounding buildings such as the neo-classical Unilever Building and 9 Carmelite Street.
- Q.5.131 The foreshore structure would have a visual impact on the setting of the conservation areas and listed buildings. This impact would be minimised by its low profile, the unobtrusive design, and the carefully conceived interface with the historic river wall. It would make a positive contribution to the distinctive local character by enhancing the Thames Path and the appearance of the river frontage at Blackfriars Bridge and would not conflict with the important heritage views of the buildings along Victoria Embankment.
- Q.5.132 The high quality design of the foreshore structure would minimise any negative impacts on the fabric and setting of nearby heritage assets as far as possible. The proposals would not cause any substantial harm to the significance of the heritage assets on or around the site.

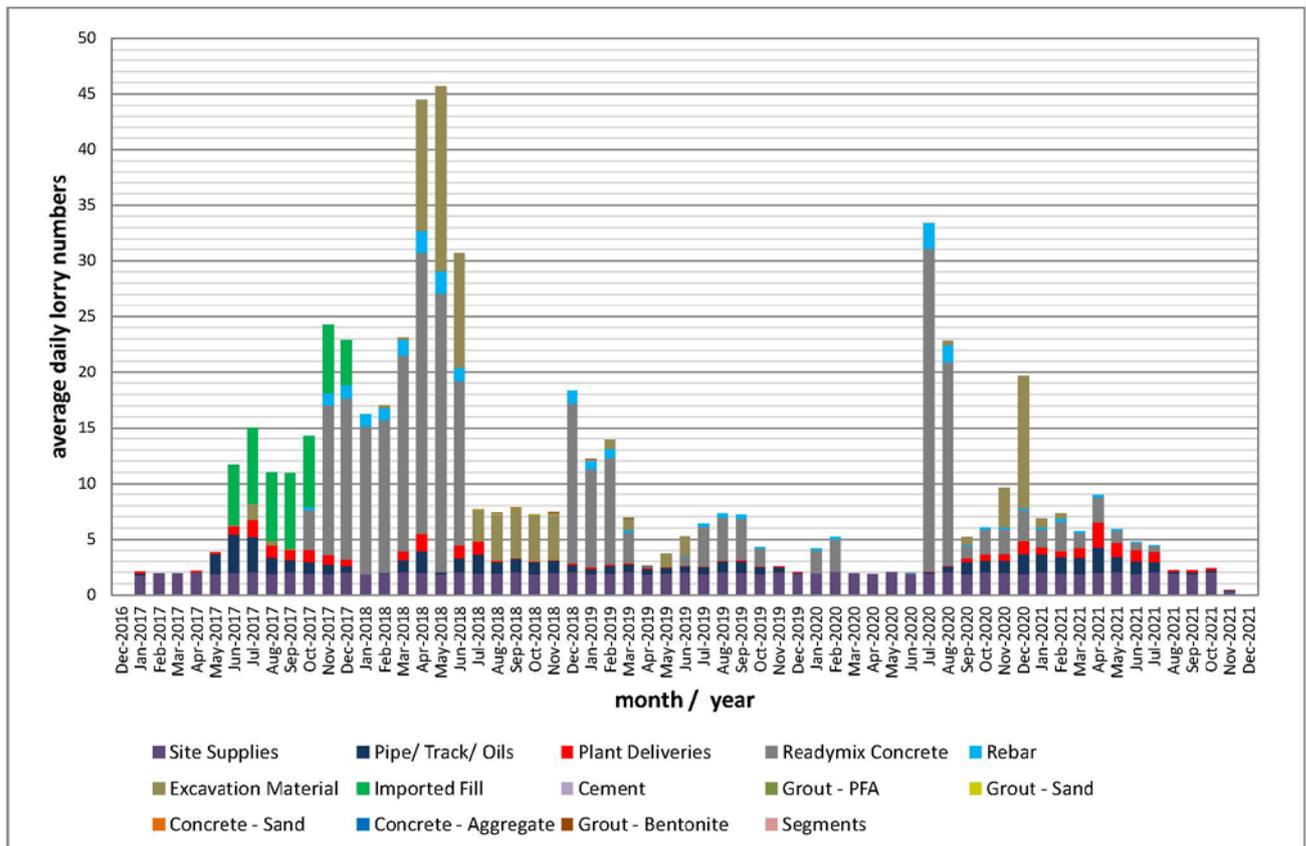
Light

- Q.5.133 The NPS requires the decision maker to be satisfied that all reasonable steps have been undertaken to minimise detrimental impact on amenity from artificial light. Additionally the *Daylight/Sunlight Assessment*, which accompanies the application, concluded that there would be no material impact on sunlight or daylight from construction or the permanent works.
- Q.5.134 During construction, the site would only be lit in the evenings in winter. Any site lighting during construction would have minimal spill into the wider area due to the measures set out in the *CoCP*. The surrounding area, being in central London, is lit by street lighting and by light spill from surrounding buildings, and visual receptors have limited sensitivity to additional lighting in the early evening.
- Q.5.135 Nonetheless during construction, the *CoCP* Part B identifies that a site-specific lighting plan is to be prepared, which would address the impact on terrestrial and aquatic ecology and include the use of low level directional lighting where possible, while meeting safe work requirements. This represents an appropriate level of protection to amenity.
- Q.5.136 Design principle BLABF.05 states that: *“The festoon lighting to Victoria Embankment shall be reinstated as far as possible”*. An illustrative lighting design for all lighting to the new foreshore structure was developed and is set out in the *Design and Access Statement*, which gave careful consideration to how the scheme may appear at night in its historic context, while being accessible and of visual interest to visitors. The illustrative lighting design was developed in line with the design objectives for the site and would be further guided by compliance with the scheme-wide design principles, all of which are considered applicable at this site.
- Q.5.137 In summary, and taking into account the central, predominantly non-residential nature of the site location, all reasonable steps were taken to minimise any detrimental effects arising from the use of artificial lighting at the site.

Traffic and transport

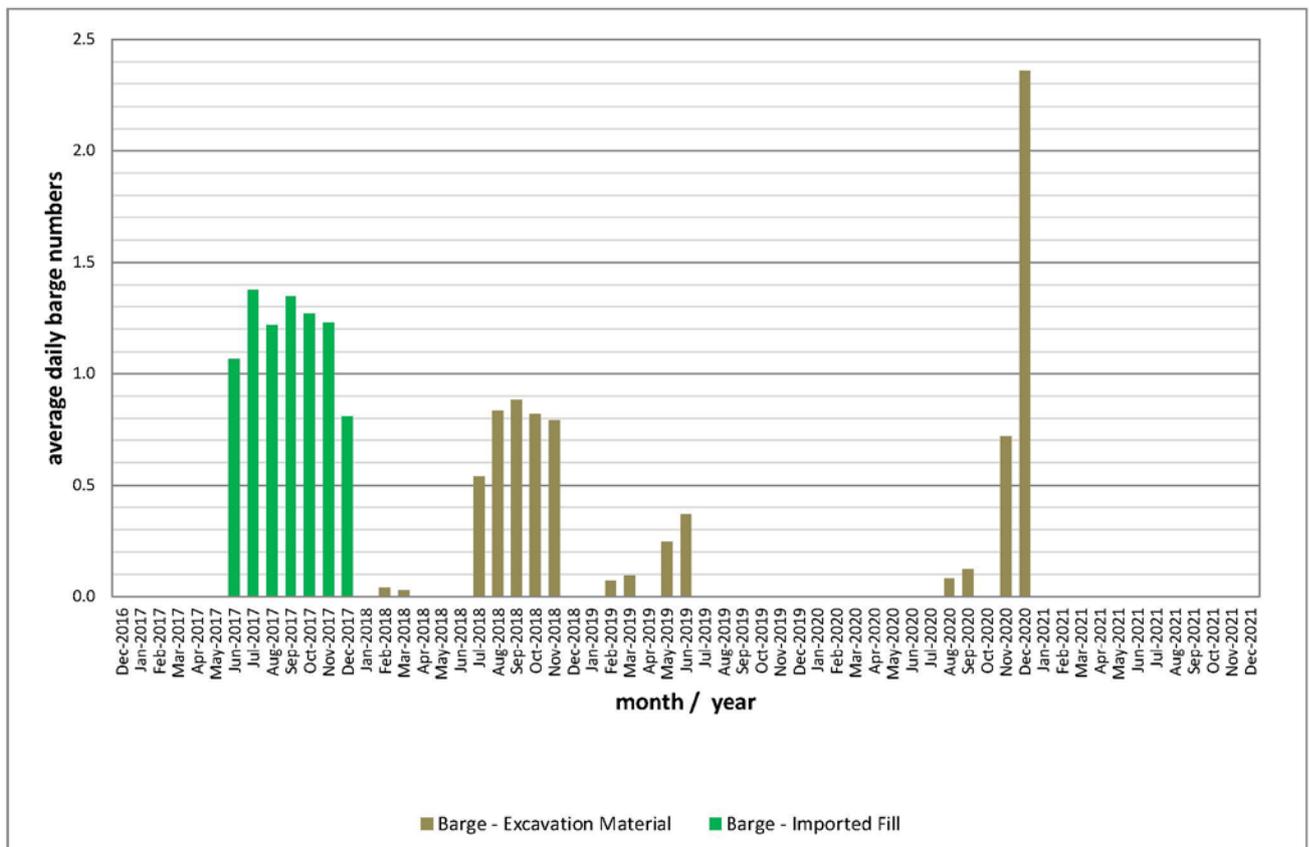
- Q.5.138 Victoria Embankment and Blackfriars Bridge are designated part of the Transport for London Road Network, which means that Transport for London (TfL) is the relevant highway authority.
- Q.5.139 During construction vehicle movements would take place on weekdays between 8am to 6pm and on Saturdays from 8am to 1pm. Up to one hour before and after these hours would be used for mobilisation and demobilisation. Mobilisation may include loading, unloading, and arrival and departure of staff and movement to and from the site. In exceptional circumstances HGV, on agreement with the local authority and abnormal load movements could occur up to 10pm or later for large concrete pours. Figure Q.6 below shows the Average daily lorry movements at Blackfriars Bridge Foreshore during construction.

Figure Q.6 Average daily lorry movements at Blackfriars Bridge Foreshore



- Q.5.140 Disruption to the local road network would be minimised through the site layout, design and phasing of our construction works. The effects of road transport would be managed through the traffic management plans, which would seek to limit the number of vehicle movements and hours of operation, identify the most suitable access points and any necessary highway management arrangements. Only Transport for London Road Network roads would be used for deliveries and access.
- Q.5.141 Consideration was given to alternative locations for the connection to the LLS (N), including on Victoria Embankment. While this would avoid closure of the ramp, it would require narrowing of Blackfriars Underpass/Victoria Embankment to a single lane. Traffic modelling demonstrated that closure of the ramp would cause significantly less disruption to traffic than narrowing of Victoria Embankment. The results of this modelling are summarised in an appendix of the *Transport Assessment*.
- Q.5.142 A significant proportion of the construction and excavated materials would be transported by barge. During construction it is proposed that a minimum of 90 per cent of the cofferdam fill and a minimum of 90 per cent of the excavated material from the shaft would be transported by barge. Each barge would save approximately 55 lorries from using the road network. Figure Q.7 below shows the average daily barge movements for the Blackfriars Bridge Foreshore site.

Figure Q.7 Average daily barge movements at Blackfriars Bridge Foreshore



Q.5.143 As a part of the Greater London Authority response to Section 48 publicity dated 5 October 2012, TfL stated that: *“The site now has an additional access point. It is of considerable concern that the many significant issues raised by the Mayor at Phase 2 consultation have not been more fully resolved. For example, the phasing, general arrangements and design for the proposed relocation of the Blackfriars Millennium Pier still needs to be agreed with TfL”.*

Q.5.144 Appendix A of the same consultation response also asked that matters including the following be addressed within the DCO: *“Include a requirement that the works programme, site layout and traffic management plans will minimise the period of any temporary highway closures. Traffic Management Plan to be agreed with TfL”.*

Q.5.145 The impact of highway layout changes during construction would be reduced by appropriate traffic management, which would be agreed in consultation with TfL.

Thames Path temporary diversion

Q.5.146 To enable the construction works the location of Blackfriars Millennium Pier would be permanently moved approximately 230m eastwards, to opposite Puddle Dock. In addition the construction works would close the staircase to the west of Blackfriars Bridge and the staircase from Paul’s Walk to the footway on the Blackfriars Bridge off slip ramp. In order to maintain a suitable step free interchange route from Blackfriars Millennium Pier to Blackfriars Station Thames Water proposes to provide a lift to the

east of Blackfriars Bridge in order to ensure step-free access is maintained at a similar level of distance/journey time to the existing situation, to reduce potential disadvantages to disabled users and to promote as inclusive a level of provision as possible.

- Q.5.147 In its response to Section 48 publicity dated 4 October 2012, the City of London said in relation to access to the Riverside Walk: *“Although the finished proposal would provide additional facilities and improve access to the riverside, it is essential that access (including disabled access) to the riverside walk and Thames bridges is maintained throughout the construction phase and that every effort is made to improve access for the operational life of the development. Pedestrian and disabled access links with the Blackfriars Thameslink station, Blackfriars Bridge, St Paul’s Walk and Victoria Embankment should be maintained throughout the construction and operational phases of the development”*. The proposals at this site would comply with this.
- Q.5.148 As shown on the access plans the diversion of the Thames Path during construction would be via use existing footpaths and pedestrian crossings between Temple Avenue and Blackfriars Bridge where lift and stairs would enable access down to the Thames Path. Therefore, the access would be suitable for those with a disability.
- Q.5.149 Diversions would be clearly advertised in advance of the construction activities to inform users of changes to their journeys.
- Q.5.150 With regards to concerns by the City of London (above) that sections of Riverside Walk would become too narrow as a result of the works following construction the path would be widened. Design principle BLABF.02 was subsequently agreed with the City of London, namely: *“The Thames Path would be diverted over the new foreshore structure. It would be level and a minimum width of 4m. The Thames Path east of the Fleet Main CSO would be a minimum width of 3m”*.
- Q.5.151 With regards to construction vehicle traffic, in phase one and two the site access for construction vehicles would be from the Blackfriars Bridge westbound off-ramp. In Phase 3 the off-ramp would be closed and all construction vehicles would use the westbound carriageway of Blackfriars underpass to access the site.
- Q.5.152 Two coach parking spaces would need to be temporarily removed during the construction works in order to allow unimpeded access of HGVs and to avoid conflicts with existing road users in the surrounding area. Thames Water held discussions with TfL regarding replacement temporary coach parking near the site and design principle BLABF.04 states that the coach parking on Victoria Embankment would be reinstated where practicable.
- Q.5.153 The CoCP sets out traffic and vehicle control measures including:
- a. The temporary diversion of the Thames Path would be clearly signed, including notices, pamphlets, guides and signage to the public.
 - b. Lorry arrivals would be strictly controlled and coordinated to set times to ensure that no lorries queue outside of the site.

- Q.5.154 During the operational phase there would be occasional vehicle trips to and from the site for maintenance activities. These would have no effect on the surrounding transport networks.
- Q.5.155 The NPS recognises that new nationally significant infrastructure may give rise to substantial impacts on traffic and transport particularly during construction. The temporary closure of the slip road off Blackfriars Bridge would give rise to adverse effects on local traffic. However this is unavoidable and is a consequence of the highly constrained and complex series of level changes at this site. There are no alternative road access points which would have less impact and it is essential that Thames Water is able to get HGVs to the site as not all goods can be brought to the site by barge.

Waste management

- Q.5.156 The Waste Strategy was developed to provide a framework for the management of materials and waste that would be produced throughout the construction and operational phases of the project. This ensures that the requirements set out in para. 4.14.6 of the NPS would be satisfied, and the Waste Strategy would be secured via a requirement in accordance with para. 4.14.7 of the NPS.
- Q.5.157 No particular site-specific waste issues arise at this site.

Socio-economics

- Q.5.158 The site-specific socio-economic assessment, reported in the *Environmental Statement*, along with the outcomes of the *Equalities Impact Assessment*, which accompanies the application, and is partly summarised below.
- Q.5.159 During construction, nearby residents and users of the area surrounding the site would be impacted by diversion of the Thames Path, the relocation of Millennium Pier, changes to highway layout during construction and the movement of large construction vehicles. Where possible these impacts would be mitigated by means of the *CoCP*.
- Q.5.160 In the operational phase, the provision of a new public space would be beneficial to surrounding residents. If the kiosk on the western section of the site is used for commercial purposes this would create employment opportunities and a place for the local community to meet (design principle BLABF.13).
- Q.5.161 Access to the sports club located beneath Blackfriars Bridge westbound off-ramp would be closed during construction works, as it is located within the construction area. The lease for the sports club premises is expiring and the occupiers are planning to relocate to a new space in the London Bridge area. The access would be reinstated on completion of construction so the business could re-open, but this would be a matter for the property owners, the City of London Corporation.
- Q.5.162 With regards to the pump house, it is understood that the business does not need to be physically located on the river nor does it derive a particular commercial benefit from its current location on the pier (for instance the business does not conduct ticket sales from this location). Compensation

could therefore be paid and alternative premises found in the city for Crown River Cruises.

- Q.5.163 The President would be relocated temporarily, and close to its current location. There are unlikely to be any socio-economic effects associated with the relocation however financial compensation exists if a need is demonstrated.
- Q.5.164 The socio-economic assessment arrived at a preliminary conclusion that there is potential for only minor to moderate impacts on receptors, most of which are addressed through the *CoCP*.
- Q.5.165 Furthermore, the Blackfriars Bridge Foreshore site is expected to require a maximum workforce of 70 workers. These jobs and training opportunities would provide a stimulus to the local economy.

Q.6 Overall conclusions

- Q.6.1 The need for the project and the principle for this part of it is established at the national level in the NPS. In a typical year, the Fleet Storm Relief Sewer CSO discharges approximately 521,000m³ of untreated sewage into the River Thames at Blackfriars in the City of London. The capture of these CSO discharges within the main tunnel would substantially reduce the flows of untreated sewage into the tidal Thames in this location. The CSO was identified by the Environment Agency as a CSO that needs to be controlled.
- Q.6.2 Given the site's location in a restricted urban area, there would inevitably be some disturbance during the five year construction period. However, through sensitive design and the *CoCP*, Thames Water sought to minimise any disturbance that would be experienced in accordance with NPS policy requirements, and relevant local policy designations.
- Q.6.3 The operational benefits of the proposed works in this location are considered to outweigh any temporary effects of construction. The reduction of discharges from the Fleet Main CSO and ten others through interception of the LLS (N) would improve the water quality in the tidal Thames, with associated benefits to water quality, ecology, and amenity. This would also help reduce the health risks to river users and reduce sewage derived litter.
- Q.6.4 The design of the permanent works has in-principle support from the City of London subject to further details on maintenance arrangements. It has responded positively to the design and this is reflected in the agreement to submit an indicative level of detail for the development consent order. The design sought to provide an attractive new area of public realm with views across the Thames and a minimised effect on the Grade II* listed Blackfriars Bridge, and the Temples and Whitefriars Conservation Areas.
- Q.6.5 The proposed works at this site, and the mitigation measures developed and advanced as part of the application for development consent, directly accord with the approach required by the NPS. Adverse effects have been minimised as far as possible and opportunities have been taken to enhance the local environment and to leave a positive legacy.

- Q.6.6 Section 7 of the *Planning Statement* considers the implications of the local effects of the works at Blackfriars Bridge Foreshore and the other sites, and describes the overall balance between impacts and benefits associated with the project as a whole, against the guidance in the NPS. It concludes that the works at Blackfriars Bridge Foreshore, and the project as a whole, are compliant with the NPS and that development consent should be granted.

Annex Q: Drawings for Blackfriars Bridge Foreshore

List of drawings

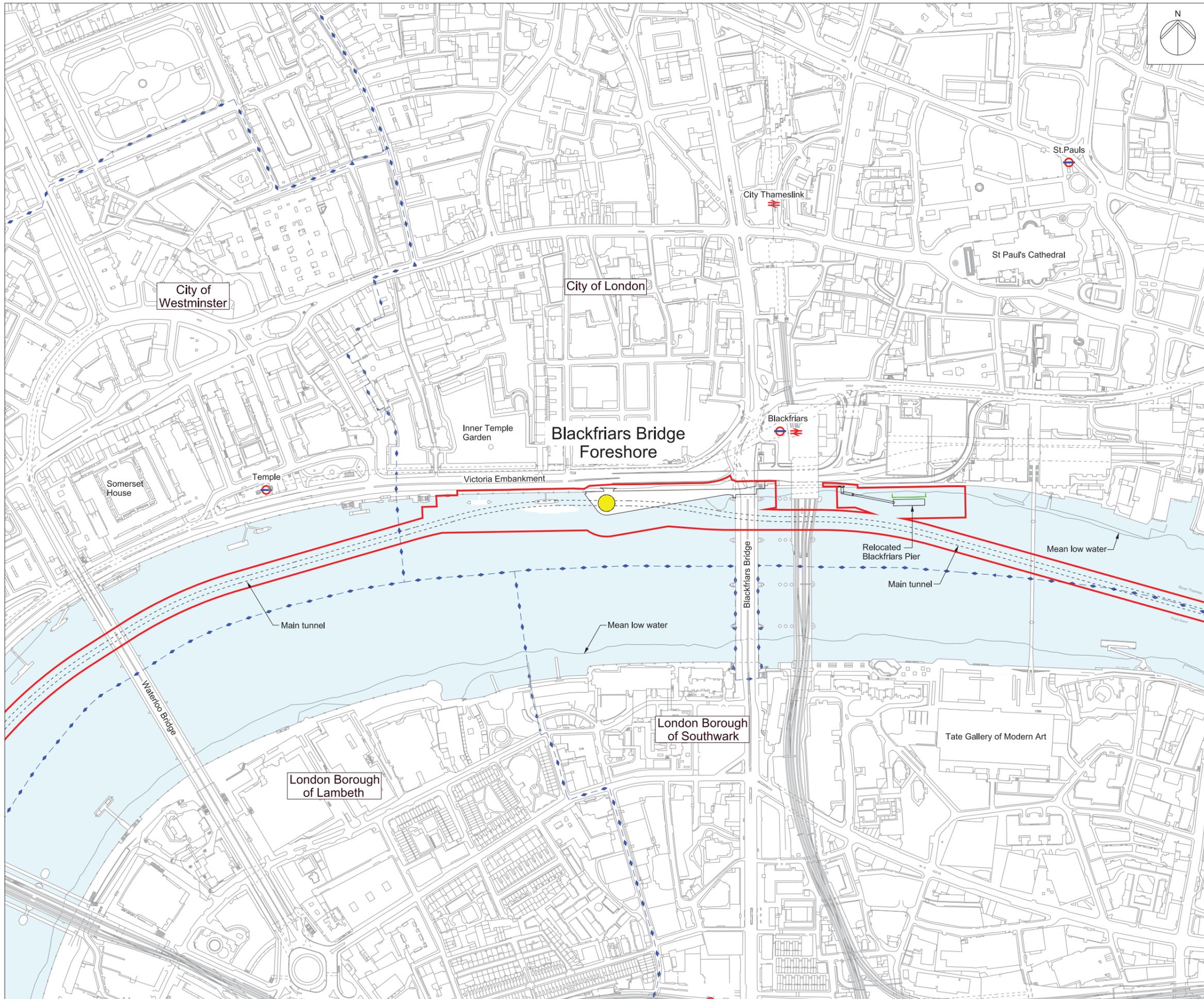
Blackfriars Bridge Foreshore: Location plan

Blackfriars Bridge Foreshore: As existing site features plan

Blackfriars Bridge Foreshore: Construction phases plans

Blackfriars Bridge Foreshore: Land use plan

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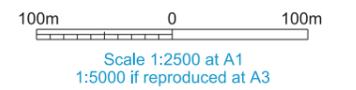
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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:
- Local authority boundary
 - Order limits
 - Tunnel
 - Shaft

- Notes:
1. The alignment of the tunnels are illustrative within limits of deviation.



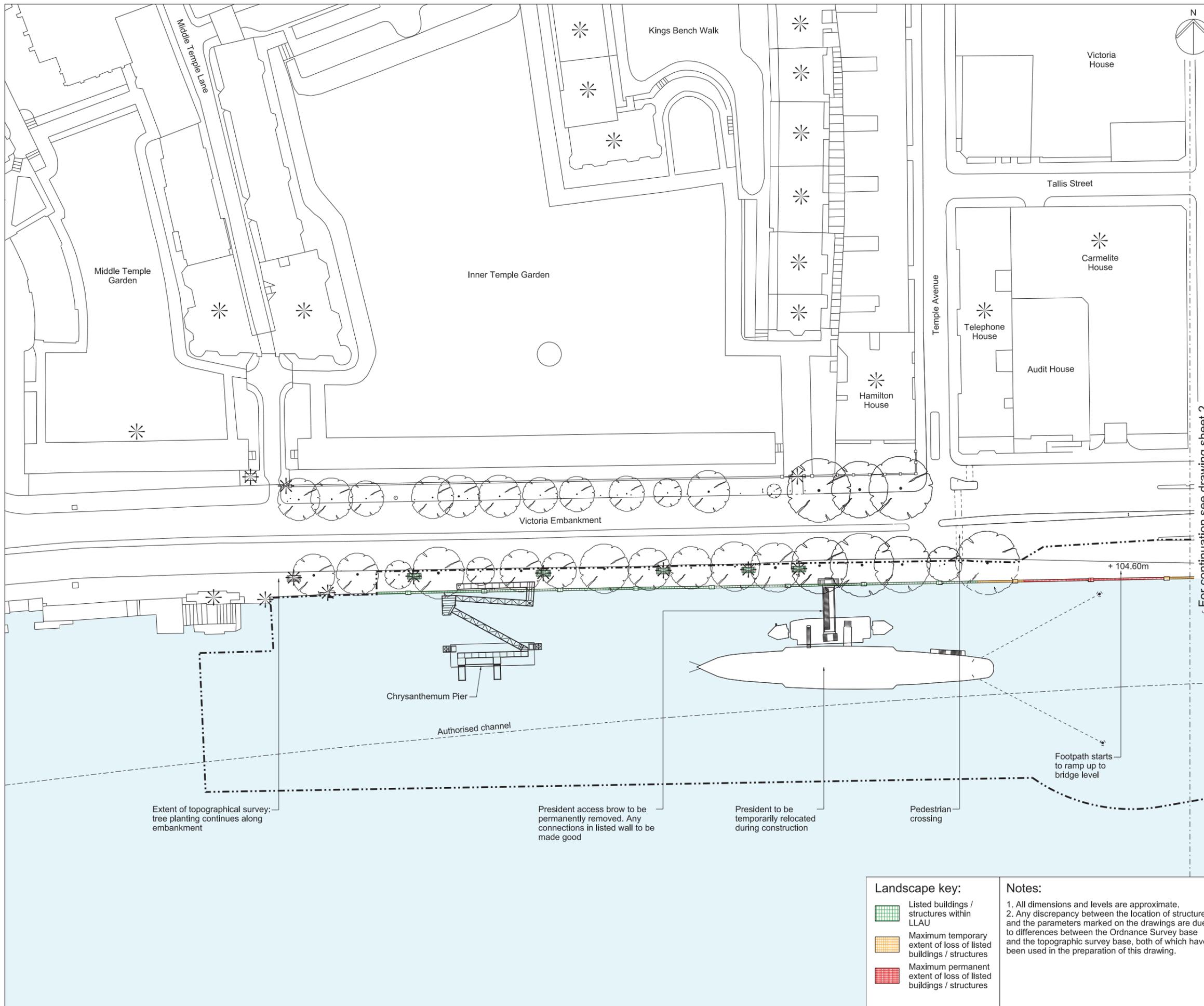
FOR INFORMATION

Location
Blackfriars Bridge Foreshore
 City of London

Document Information
Application for Development Consent
 Location plan

Book of plans - section 19
 DCO-PP-17X-BLABF-190001
 January 2013



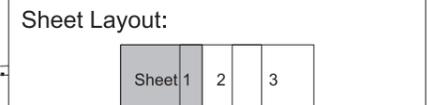


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:**
- Limits of land to be acquired or used (LLAU)
 - Authorised channel
 - Listed buildings/structures
 - Existing trees within surveyed area (trunk sizes vary)



FOR INFORMATION

Location
Blackfriars Bridge Foreshore
 City of London

Document Information
Application for Development Consent
 As existing site features plan
 Sheet 1 of 3
 Book of plans - section 19
 DCO-PP-17X-BLABF-190002
 January 2013



- Landscape key:**
- Listed buildings / structures within LLAU
 - Maximum temporary extent of loss of listed buildings / structures
 - Maximum permanent extent of loss of listed buildings / structures

Notes:

1. All dimensions and levels are approximate.
2. Any discrepancy between the location of structures and the parameters marked on the drawings are due to differences between the Ordnance Survey base and the topographic survey base, both of which have been used in the preparation of this drawing.

Extent of topographical survey: tree planting continues along embankment

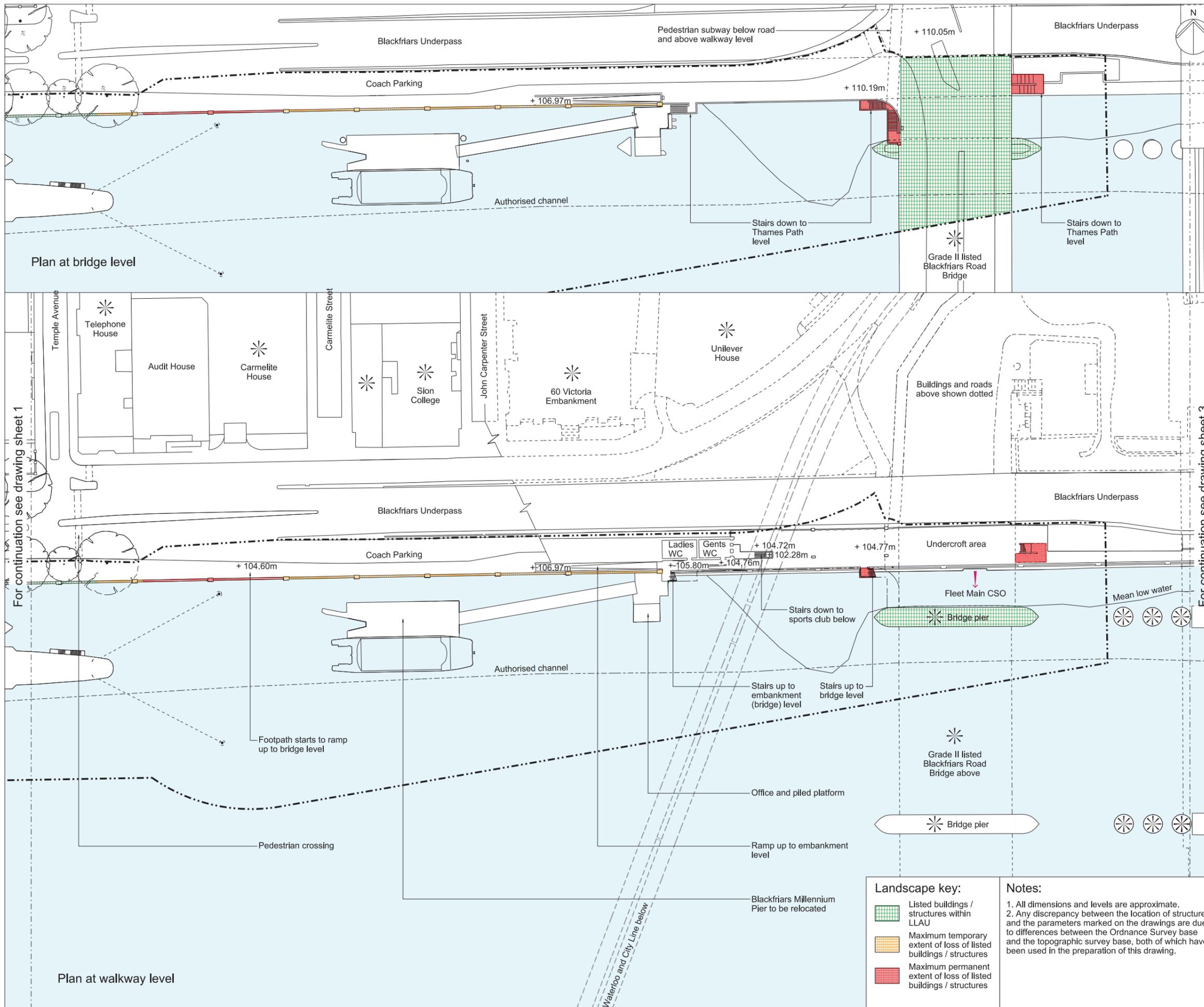
President access brow to be permanently removed. Any connections in listed wall to be made good

President to be temporarily relocated during construction

Pedestrian crossing

Footpath starts to ramp up to bridge level

For continuation see drawing sheet 2

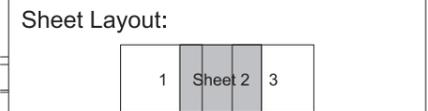


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- Key:**
- Limits of land to be acquired or used (LLAU)
 - - - - - Authorised channel
 - + 105.40m Existing levels (shown in metres above tunnel datum)
 - * Listed buildings/structures
 - Approximate position of CSO outlet
 - ⊙ Existing trees within surveyed area (trunk sizes vary)



FOR INFORMATION

Location
Blackfriars Bridge Foreshore
 City of London

Document Information
Application for Development Consent

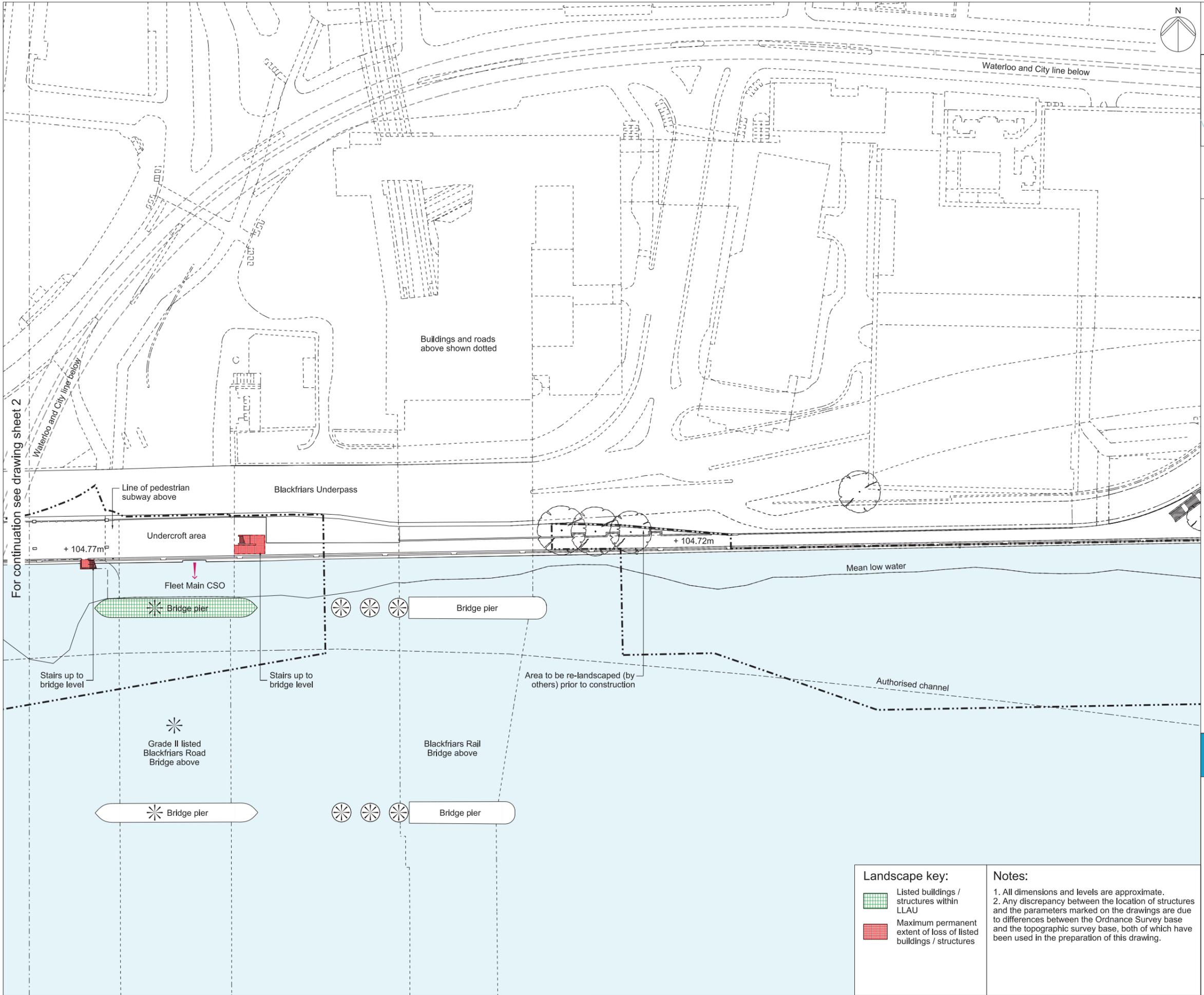
As existing site features plan
 Sheet 2 of 3
 Book of plans - section 19
 DCO-PP-17X-BLABF-190003
 January 2013



- Landscape key:**
- Listed buildings / structures within LLAU
 - Maximum temporary extent of loss of listed buildings / structures
 - Maximum permanent extent of loss of listed buildings / structures

Notes:

1. All dimensions and levels are approximate.
2. Any discrepancy between the location of structures and the parameters marked on the drawings are due to differences between the Ordnance Survey base and the topographic survey base, both of which have been used in the preparation of this drawing.



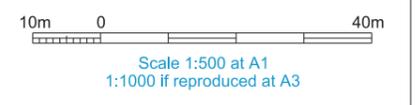
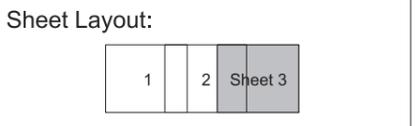
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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Authorised channel
 - + 105.40m Existing levels (shown in metres above tunnel datum)
 - Listed buildings/structures
 - Approximate position of CSO outlet
 - Existing trees within surveyed area (trunk sizes vary)

For continuation see drawing sheet 2



FOR INFORMATION

Location
Blackfriars Bridge Foreshore
 City of London

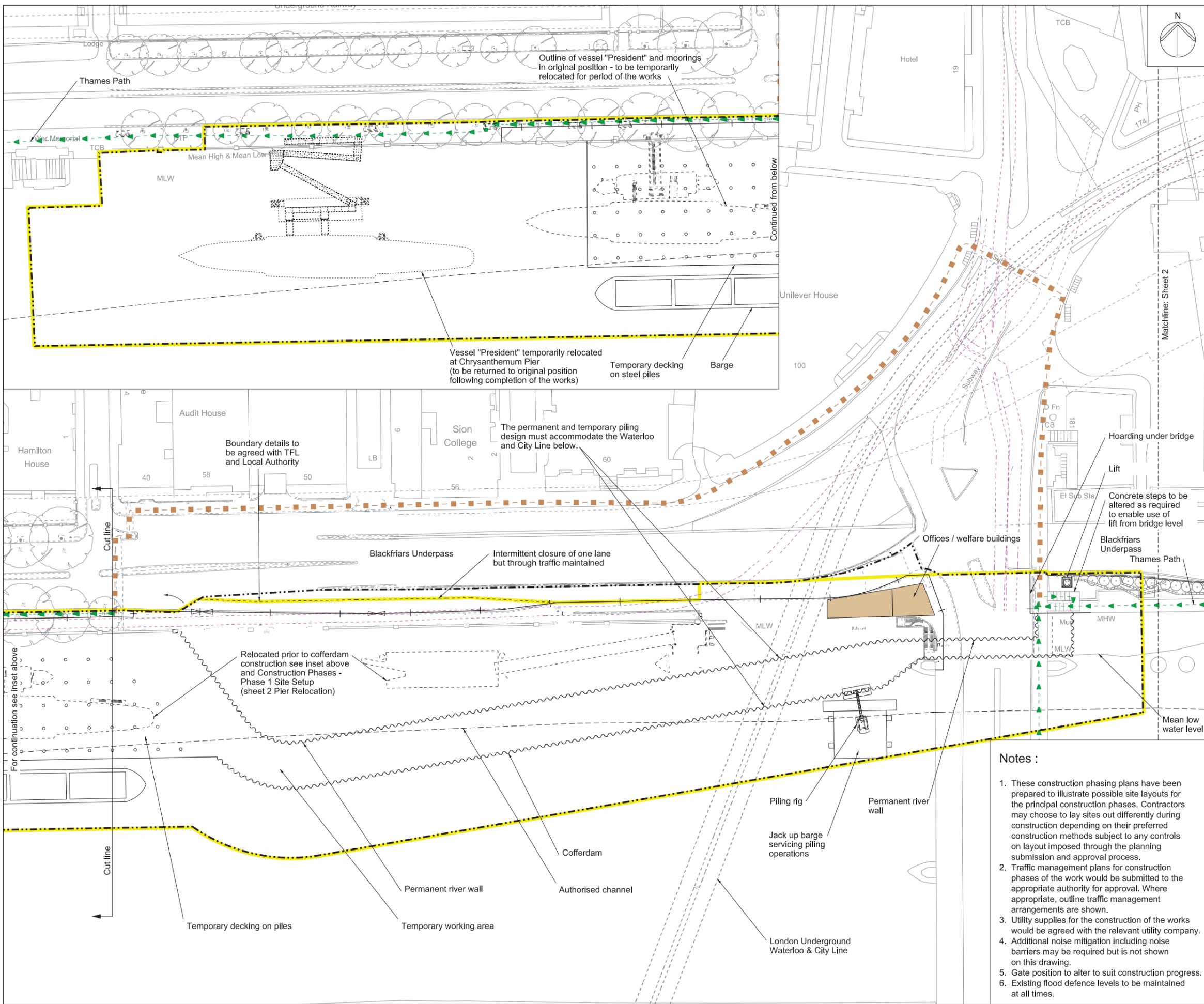
Document Information
Application for Development Consent

As existing site features plan
 Sheet 3 of 3
 Book of plans - section 19
 DCO-PP-17X-BLAF-190004
 January 2013



- Landscape key:**
- Listed buildings / structures within LLAU
 - Maximum permanent extent of loss of listed buildings / structures

- Notes:**
1. All dimensions and levels are approximate.
 2. Any discrepancy between the location of structures and the parameters marked on the drawings are due to differences between the Ordnance Survey base and the topographic survey base, both of which have been used in the preparation of this drawing.

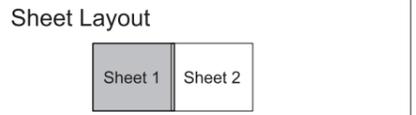


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - Route of temporary diversion of right of way
 - Site access
 - Existing sewers
 - Sheet piles



ILLUSTRATIVE

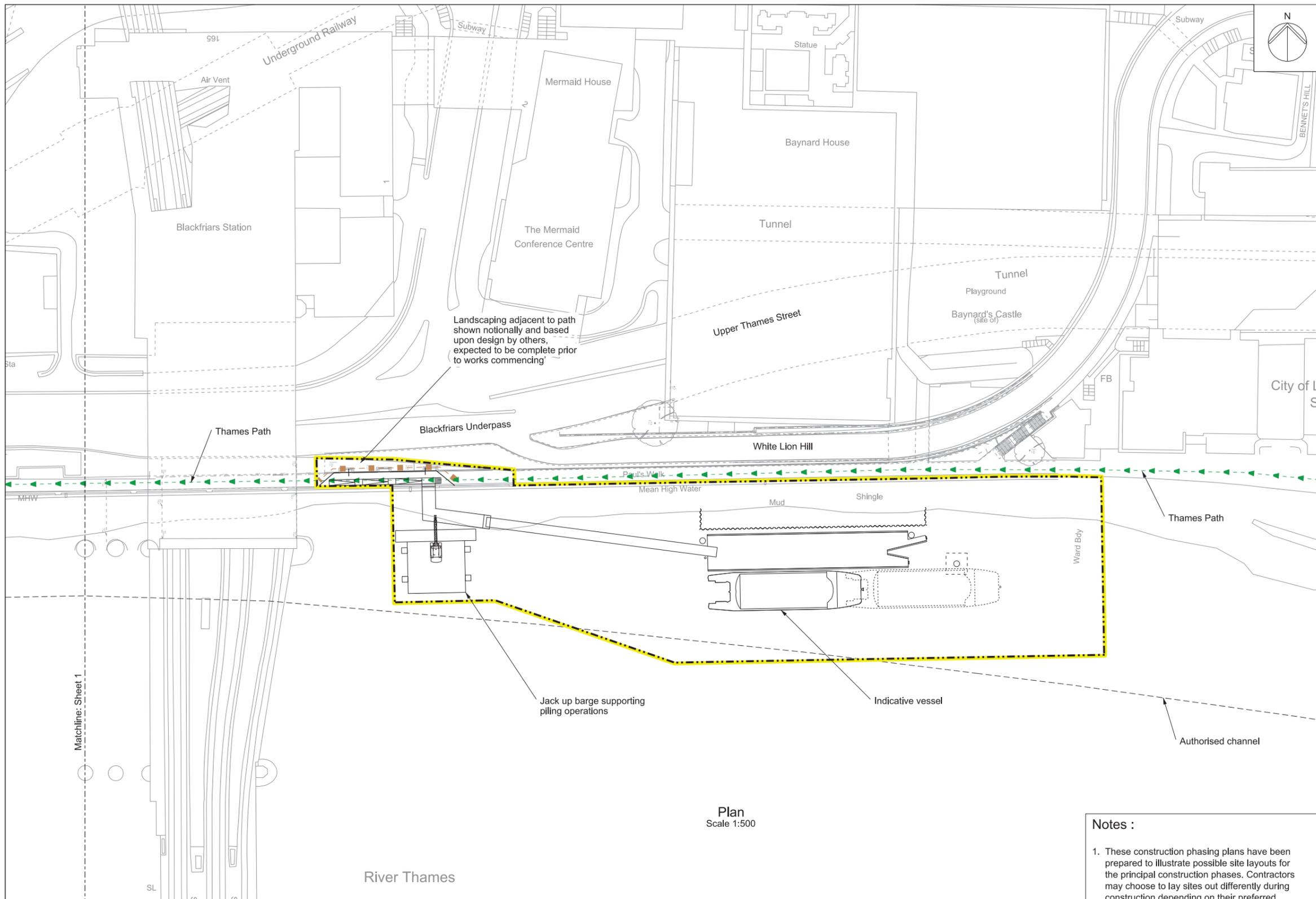
Location
Blackfriars Bridge Foreshore
City of London

Document Information
Application for Development Consent

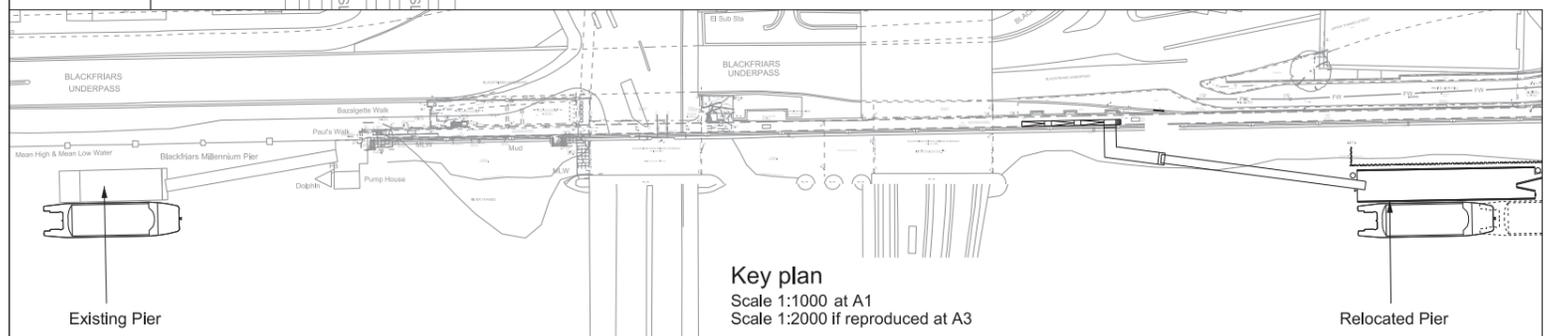
Construction phases - phase 1
Site setup sheet 1 of 2 - main works
Book of plans - section 19
DCO-PP-17X-BLAF-190047
January 2013



- Notes :
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
 2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
 3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
 4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.
 5. Gate position to alter to suit construction progress.
 6. Existing flood defence levels to be maintained at all times.



Plan
Scale 1:500



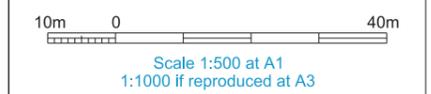
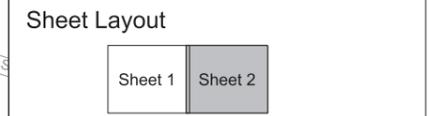
Key plan
Scale 1:1000 at A1
Scale 1:2000 if reproduced at A3

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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - Route of temporary diversion of right of way
 - Existing sewers



ILLUSTRATIVE

Location
Blackfriars Bridge Foreshore
City of London

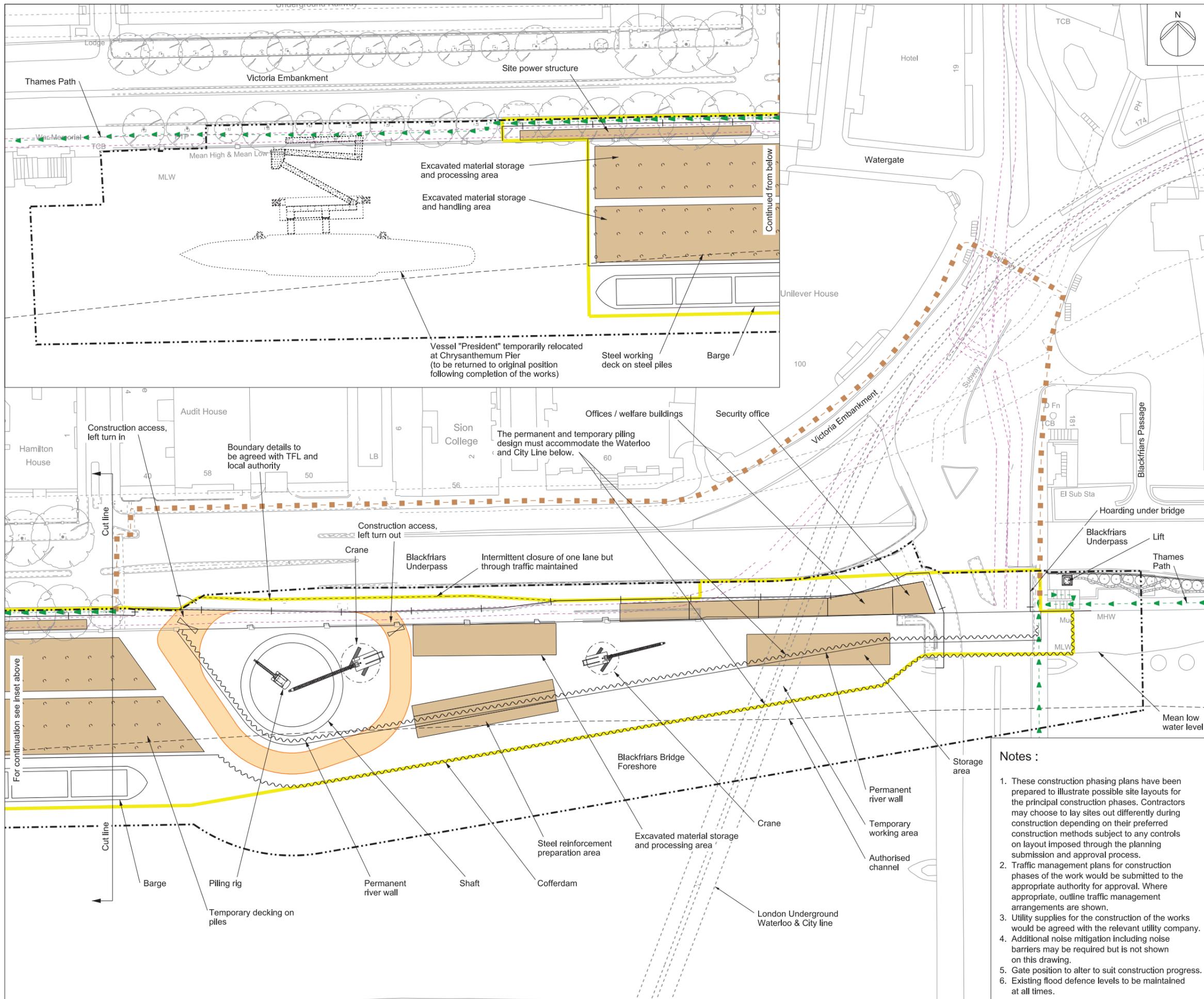
Document Information
Application for Development Consent

Construction phases - phase 1
Site setup sheet 2 of 2 - pier relocation
Book of plans - section 19

DCO-PP-17X-BLAF-190048
January 2013



- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
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 6. Existing flood defence levels to be maintained at all times.



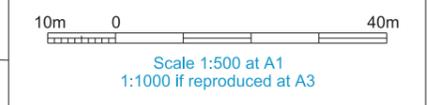
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Keyplan:
This drawing

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Key:

- Limits of land to be acquired or used (LLAU)
- Hoarding
- Maximum extent of working area
- Existing public right of way
- Route of temporary diversion of right of way
- Site access
- Access / haul route
- Existing sewers
- Sheet piles



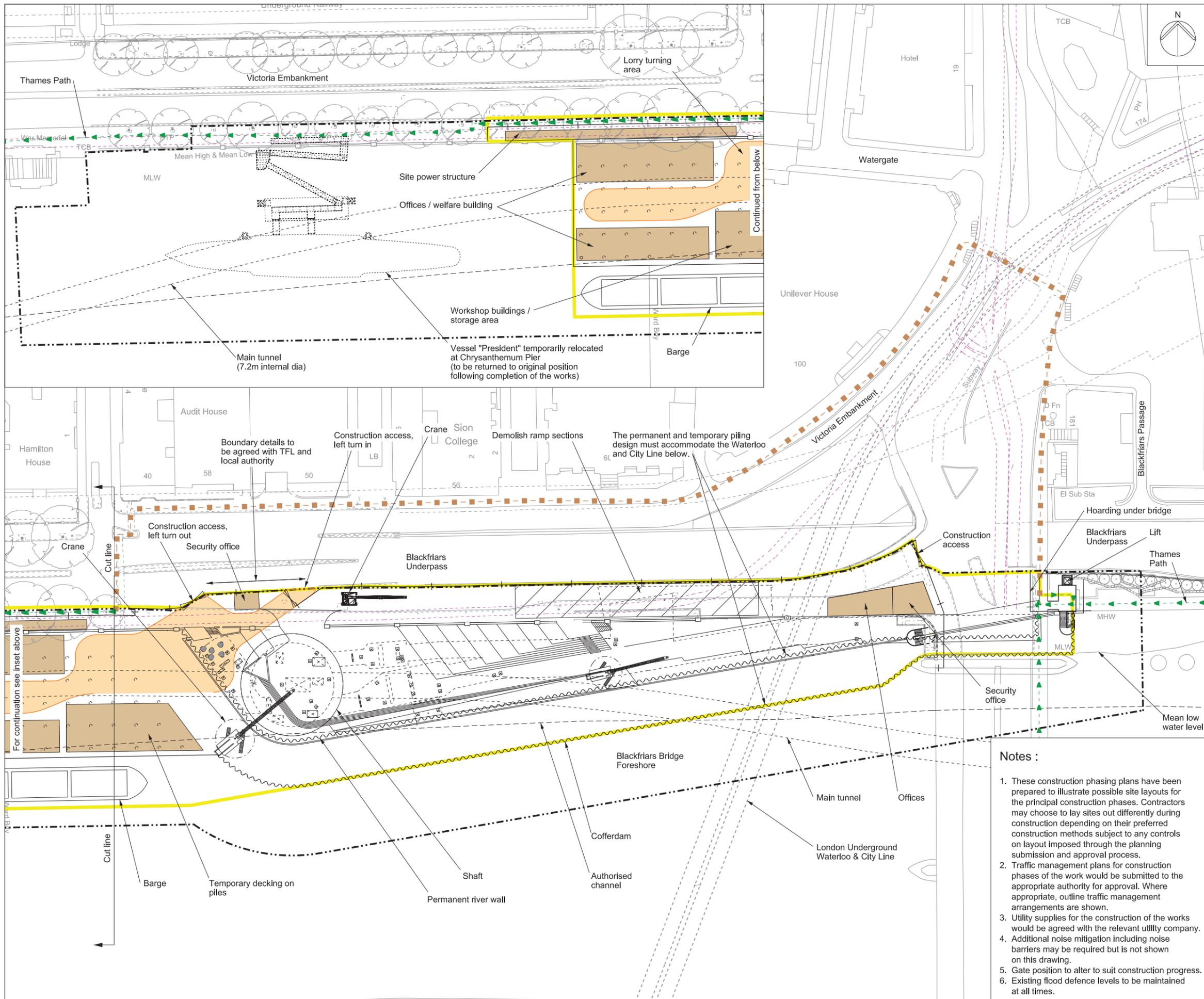
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
 2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
 3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
 4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.
 5. Gate position to alter to suit construction progress.
 6. Existing flood defence levels to be maintained at all times.

ILLUSTRATIVE

Location
Blackfriars Bridge Foreshore
City of London

Document Information
Application for Development Consent
Construction phases - phase 2
Shaft construction
Book of plans - section 19
DCO-PP-17X-BLAF-190049
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

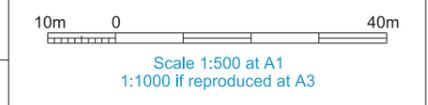


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Keyplan:
This drawing

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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - - - Route of temporary diversion of right of way
 - ⊗ Site access
 - Access / haul route
 - - - Existing sewers
 - ~ Sheet piles



ILLUSTRATIVE

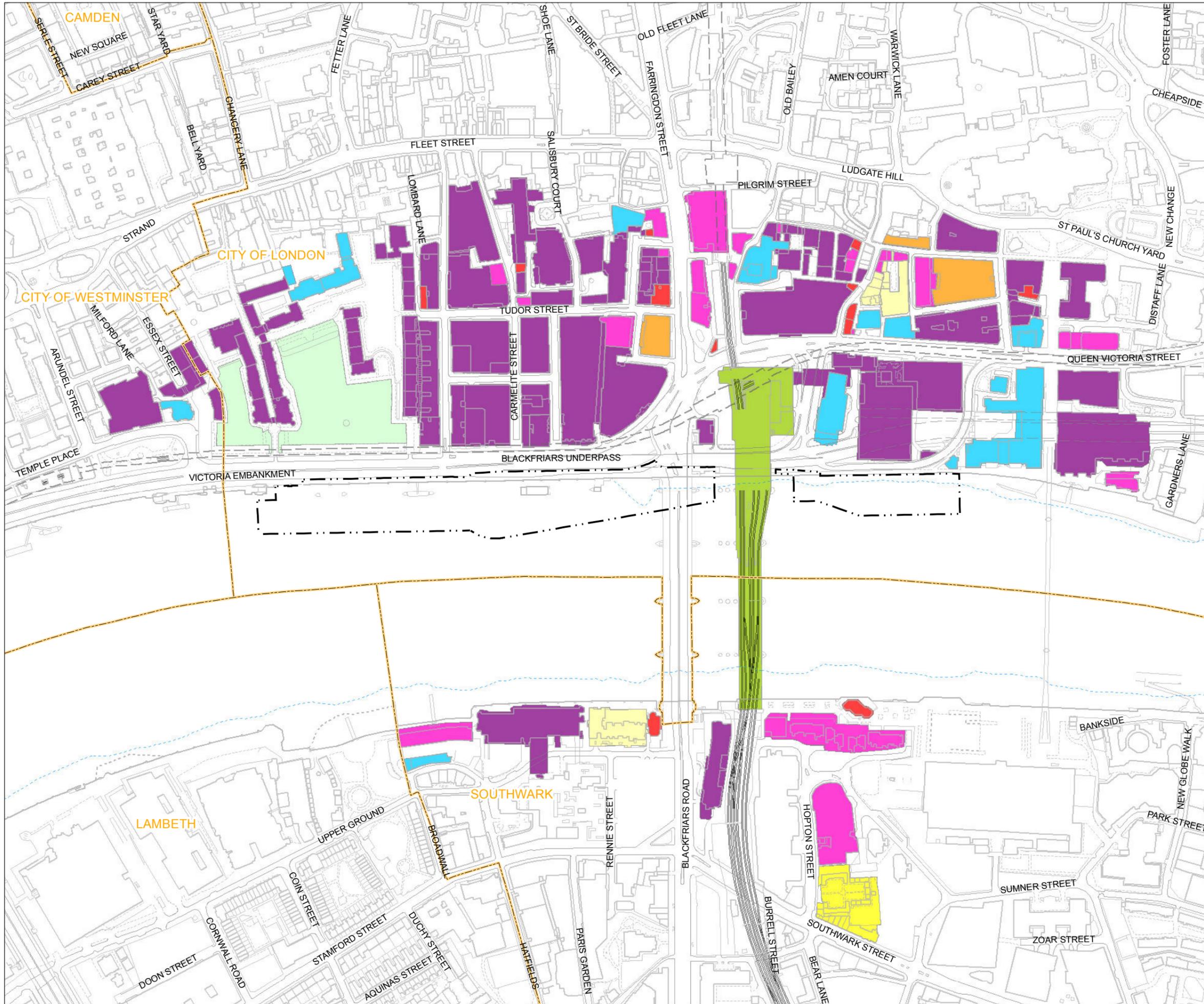
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
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 3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
 4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.
 5. Gate position to alter to suit construction progress.
 6. Existing flood defence levels to be maintained at all times.

Location
Blackfriars Bridge Foreshore
City of London

Document Information
Application for Development Consent
Construction phases - phase 3
Construction of other structures
Book of plans - section 19
DCO-PP-17X-BLAF-190050
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



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- Key**
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Land Use**
- Class A1-A5 (Shops, Financial & Professional Services, Restaurants, Drinking Establishments and Hot Food Takeaways)
 - Class B1 (Business (Offices except A2) Research and Development, Light Industry)
 - Class C1 (Hotels)
 - Class C2-C2A (Residential Institutions)
 - Class C3-C4 (Dwelling Houses)
 - Class D1-D2 (Non Residential Institutions (Community Facilities) and Assembly and Leisure)
 - Mixed Use
 - Other
 - Open Space



Scale 1 : 4,000 at A3

FOR INFORMATION

Location
Blackfriars Bridge Foreshore
 City of London

Document Information
Planning Statement

Land use

1PL03-MG-00807
 January 2013



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