

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix P

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

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Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement

Appendix P: Victoria Embankment Foreshore

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Appendix P: Victoria Embankment Foreshore

P.1 Introduction

- P.1.1 Catchment modelling¹ indicates that in an average year the Regent Street combined sewer overflow (CSO) discharges 22,000m³ of untreated sewage into the tidal Thames in front of the Victoria Embankment in the City of Westminster, which is administered by Westminster City Council. The Environment Agency identified that the Regent Street CSO needs to be controlled.
- P.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 Blackfriars Bridge 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 as illustrated in Figure P.10.
- P.1.3 The CSO discharges have multiple impacts on river water quality, including a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants, and the discharge of sewage litter and effluent. On the basis that litter tonnages are proportional to discharge volumes, approximately six tonnes of sewage derived litter is discharged from this CSO in a typical year (*Environmental Statement*, Vol 17, Section 14). On completion of the project works, zero tonnes would be discharged from this CSO in a typical year.
- P.1.4 Victoria Embankment Foreshore was selected as a suitable site to control the CSO by connecting the northern Low Level Sewer No. 1 (the 'LLS (N)') to the main tunnel and to accommodate the permanent structures required. The location of the site is identified in the Location plan in Annex P.
- P.1.5 The proposed site was identified, assessed and selected through a robust, qualitative, and iterative site selection process, and the proposals were developed through extensive consultation and engagement.
- P.1.6 This section is structured as follows:
- a. Section P.2 provides a brief description of the Victoria Embankment Foreshore site.
 - b. Section P.3 sets out the planning context for works in this location.
 - c. Section P.4 describes the site-specific development for which consent is sought and how the proposals evolved in response to consultation.

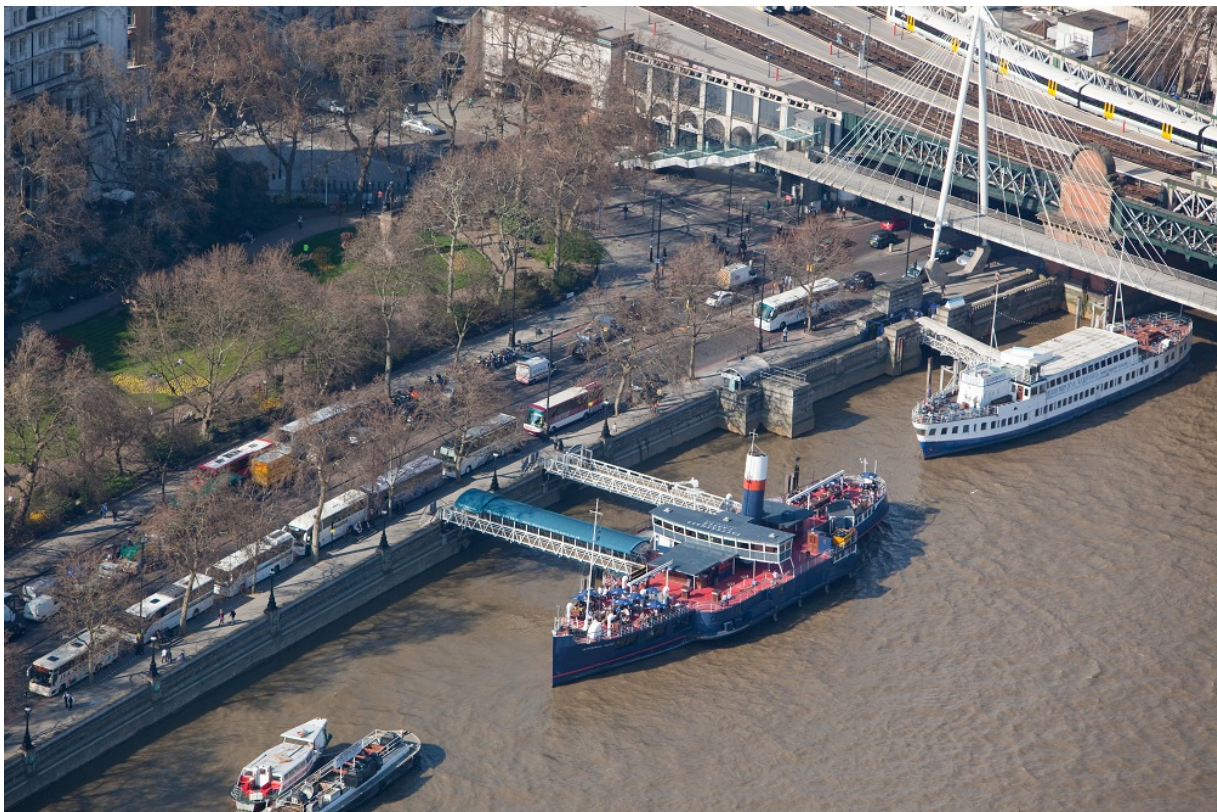
¹ The assessment of the beneficial effect of a reduction in sewage derived litter discharged to the tidal Thames was inferred from catchment modelling results of the reduction in discharge volume, frequency and duration and was not directly modelled. For further details on catchment modelling, refer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

- d. Section P.5 provides an analysis of the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
- e. Section P.6 provides an overall conclusion of the site-specific assessment for the proposed works at this site.

P.2 Site description

- P.2.1 The site itself comprises an area of the foreshore of the River Thames and a section of pavement and carriageway of Victoria Embankment. A permanently moored vessel, the Tattershall Castle (a floating bar and restaurant) and two service moorings lie within the site.
- P.2.2 An aerial photograph of the site is provided in Figure P.1 below.

Figure P.1 Aerial photograph of Victoria Embankment Foreshore



- P.2.3 The site lies at the eastern edge of the Whitehall Conservation Area, which includes a number of listed buildings, state buildings of international importance, statues, and monuments in a high quality built environment. Victoria Embankment is characterised by an avenue of mature London Plane trees, which receive a level of protection as part of the conservation area. The site also falls within the Lundenwic and Thorney Island Area of Archaeological Priority.
- P.2.4 The section of Embankment within the site features Grade II listed 'sphinx' benches, four 'sturgeon' lamp standards and catenary street lighting. These features are part of, or of group value with, the listed Victoria Embankment, which was constructed beside the River Thames when Sir

Joseph Bazalgette's sewerage system was installed between 1864 and 1870.

- P.2.5 The site is bounded to the north, east and south by the River Thames and to the west by Victoria Embankment, the pavement of which forms the Thames Path.
- P.2.6 The restaurant ship Hispaniola is moored nearby downstream from the Tattershall Castle, towards the southern Golden Jubilee footbridge and Hungerford Rail Bridge to the north. The northern Golden Jubilee footbridge, Embankment Millennium Pier and the Embankment London Underground Station lie beyond. A Grade II listed memorial to Sir Joseph Bazalgette is located approximately 25m to the north of the site.
- P.2.7 Along the western side of Victoria Embankment lies Whitehall Gardens, a Grade II registered park and garden, which is part of Victoria Embankment Gardens. The gardens are formally laid out with paths forming a roundel in the centre near the proposed site. The closest buildings to the site, including residential properties and the Grade II* listed Royal Horse Guards Hotel and National Liberal Club, are situated along Whitehall Court to the west of Whitehall Gardens. Charing Cross Station is located to the northwest of the site. Whitehall Court and the National Liberal Club along with the Golden Jubilee footbridges are noted as landmarks in the Whitehall Conservation Area audit.
- P.2.8 To the east, on the opposite side of the River Thames in the London Borough of Lambeth lie Riverside Walk, Jubilee Gardens and the London Eye. To the southeast is the Grade II* listed County Hall, which contains a hotel, restaurants and food outlets, the London Aquarium and other uses. The site is visible from the South Bank against the backdrop of moored vessels, mature London Planes, Whitehall Court and the National Liberal Club.
- P.2.9 The Palace of Westminster World Heritage Site, Whitehall Stairs, the Grade II listed Royal Air Force memorial and a service mooring lie to the south of the site.
- P.2.10 The key features of the site are identified in the As existing site features plan in Annex P.

P.3 Planning context

- P.3.1 In developing the proposals and mitigation measures for the development at Victoria Embankment Foreshore, Thames Water² had regard to the policies set out in the National Policy Statement for Waste Water (the 'NPS'), and to local development plan designations where these are relevant to the application.
- P.3.2 In this case, the local development plan comprises the *London Plan* (2011), Westminster City Council's *Core Strategy* (2011) and the saved

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.

policies of the council's *Unitary Development Plan (UDP)* (2007). The council also drafted and consulted on a *City Management Plan* and these policies are to be taken forward within an update to the *Core Strategy* along with updates in accordance with the *National Planning Policy Framework*. This is referred to by the council as the *City Management Plan Revision Core Strategy*.

- P.3.3 A number of planning policy designations apply to the site, mainly relating to heritage. The site lies within the Whitehall Conservation Area and the embankment wall and associated features such as the 'sturgeon' lamps and 'sphinx' benches are listed. The Palace of Westminster World Heritage Site boundary lies approximately 200m to the south, and St Stephens Tower 400m to the south.
- P.3.4 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*. *Core Strategy* Policy CS36 seeks to protect the linear character, views, habitats, accessibility and heritage of the Blue Ribbon Network through the appropriate design of development. The River Thames is designated as the River Thames and Tidal Tributaries Site of Importance for Nature Conservation and the site is considered a functional flood plain (Flood Zone 3b), although it is protected by the Thames Barrier. The site falls within designated linear views identified in the Mayor's *London View Management Framework* (King Henry VIII's Mound, Richmond to St Paul's Cathedral) and in river prospect views from the southern Golden Jubilee footbridge and from Jubilee Gardens. Local views south along Victoria Embankment and the views from the central roundel in Victoria Embankment Gardens/Whitehall Gardens are designated in the City of Westminster's *Whitehall Conservation Area Supplementary Planning Guidance*.
- P.3.5 Westminster City Council has designated a core Central Activities Zone (CAZ) under Policy CS6, within which the site lies. The CAZ is considered an appropriate location for residential, commercial and cultural uses apart from certain locations (not applicable to the site) at which particular priorities are set out. Saved *UDP* Policies CENT 1 and CENT4 seek to prevent the loss of uses supporting central London activities where they support its character and use, including activities that support the use and enjoyment of the River Thames. Saved *UDP* Policy RIV8 concerns proposals for the development of permanently moored vessels and requires that they possess maritime, River Thames or London-related significance. It also seeks to ensure that developments avoid effects on amenity, built heritage and views, and are fully accessible. The policy is continued in the consultation draft *City Management Plan* at 6.11, which will inform a forthcoming update to the *Local Plan*. Policy CS45 of the *Core Strategy* states that the council supports the timely implementation of the project.
- P.3.6 Given the site's location in the foreshore, the pavement and the carriageway, the bulk of the planning history applicable to the site and its immediate vicinity concerns the permanently moored vessels and the Golden Jubilee footbridge. Planning permission for the mooring of the

Tattershall Castle as a pub was first granted in circa 1982, and its opening hours were extended in 1987. Applications to enlarge the port side windows, various bridge alterations, and for replacement gangways and canopies with illuminated signage were granted permissions by Westminster City Council in 2003. Other proposals to incorporate canopies were refused in 2001 and 2003. In 2008 permission was granted for a new fascia sign and a new bar area on deck.

- P.3.7 Planning permission for the restaurant ship Hispaniola was first granted in 1974 and planning permission (which included Listed Building Consent) for a second access brow was granted by the council in 1976. In 1998 the council granted planning permission for the temporary relocation of the ship to a temporary mooring adjacent to the listed Cleopatra's Needle in order to facilitate the construction of the new footbridges (now the Golden Jubilee footbridges). This was granted in order to facilitate the timely implementation of the footbridges, since Hispaniola objected to the council's Transport and Works Act Order on this point. A further permission in 2001 extended the time period to two and a half years. The construction of the Golden Jubilee footbridges was undertaken pursuant to a number of other consents including a Transport and Works Act Order (1999), a variation to the Transport and Works Act Order (2001), a 1999 planning permission to relocate a kiosk temporarily, a Listed Building Consent for a concrete pier of 36m² adjacent to the listed embankment wall (2000), certificates of lawfulness of some design changes to the bridge (2000), and an application to fell trees in the conservation area (2002).
- P.3.8 Permissions have been granted nearby for small kiosks and ticket offices near the pier to the north. Some of these followed refusals of previous applications, and nearby a Transport for London Cycle Hire stand on the riverside footway beneath the Hungerford Rail Bridge was refused planning permission. There are no extant planning permissions or pending applications within the site boundary or its immediate vicinity.

P.4 Description of development

Overview

- P.4.1 The proposed development at Victoria Embankment Foreshore would control the existing Regent Street CSO by making a connection to the LLS (N).
- P.4.2 Making such a connection at this site and at Chelsea Embankment Foreshore and Blackfriars Bridge Foreshore would control the flows from ten other CSOs along the northern bank of the River Thames. This would avoid 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 Figure P.10.
- P.4.3 The proposed works comprise construction of a CSO drop shaft, an overflow weir chamber along the LLS (N) and a connection culvert to link the chamber to the drop shaft. The drop shaft would connect to the main tunnel via a short connection tunnel under the River Thames.

Application for development consent

P.4.4 The geographic extent of the proposals for which development consent is sought is defined by the limits of land to be acquired or used as illustrated in the *Book of Plans*.

Table P.1 Victoria Embankment Foreshore: Drawings that define the proposed development

Drawing title	Status	Location
Location plan	For information	<i>Book of Plans</i> , Section 18
As existing site features plan	For information	<i>Book of Plans</i> , Section 18
As existing landscape plan (various)	For information	<i>Book of Plans</i> , Section 18
Access plan	For approval	<i>Book of Plans</i> , Section 18
Demolition and site clearance (various)	For approval	<i>Book of Plans</i> , Section 18
Site works parameter plan	For approval	<i>Book of Plans</i> , Section 18
Site works parameter key plan	For information	<i>Book of plans</i> , Section 18
Permanent works layout	Illustrative	<i>Book of Plans</i> , Section 18
Proposed site features plan	Indicative (save for layout of above-ground structures, which is illustrative)	<i>Book of Plans</i> , Section 18
Proposed landscape plan (1 of 2)	Indicative (save for layout of above-ground structures, which is illustrative)	<i>Book of Plans</i> , Section 18
Proposed landscape plan (2 of 2)	For approval	<i>Book of Plans</i> , Section 18
Section AA	Illustrative	<i>Book of Plans</i> , Section 18
As existing and proposed river elevation	Illustrative	<i>Book of Plans</i> , Section 18
As existing and proposed detailed river elevation: Impact on listed structure	Illustrative (save for maximum extent of loss of listed structures, which is for approval)	<i>Book of Plans</i> , Section 18
As existing and proposed south elevation	Illustrative	<i>Book of Plans</i> , Section 18
As existing and proposed elevation (various)	Illustrative	<i>Book of Plans</i> , Section 18
Kiosk design intent	Indicative	<i>Book of Plans</i> , Section 18
Typical river wall design intent (various)	Indicative	<i>Book of Plans</i> , Section 18
As existing listed structure surface interface: Foreshore structure	For information	<i>Book of Plans</i> , Section 18
Proposed listed structure interface: Foreshore structure	Indicative	<i>Book of Plans</i> , Section 18

Drawing title	Status	Location
As existing and proposed listed structure interface: Weir structure	Indicative	<i>Book of Plans, Section 18</i>
Proposed mooring access details	Illustrative (save for the detail of spanning the listed wall which is for approval)	<i>Book of Plans, Section 18</i>
Construction phases	Illustrative	<i>Book of Plans, Section 18</i>
Existing utilities plan (various)	For information	<i>Utilities Statement</i>
River foreshore zones of working	For information	<i>Navigational Issues and Preliminary Risk Assessment Victoria Embankment Foreshore</i>
Existing highway layout	For information	<i>Transport Assessment</i>
Highway layout during utility diversion	Illustrative	<i>Transport Assessment</i>
Highway layout during construction (various)	Illustrative	<i>Transport Assessment</i>
Permanent highway layout (various)	Illustrative	<i>Transport Assessment</i>

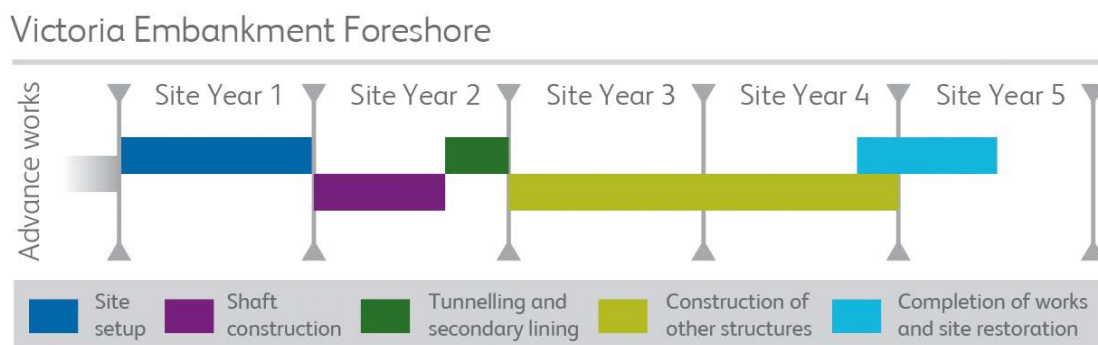
- P.4.5 The NSIP works (Work Nos. 16a and 16b) comprise the construction of a CSO drop shaft with an internal diameter of approximately 13m and a depth of 51m, and a short connection tunnel to the main tunnel (east central). Associated development (Work No. 16c) comprises works to control and divert flow from the LLS (N) including dredging and construction of temporary cofferdam, partial demolition of the existing river wall and construction of a new river wall, construction of an interception chamber, CSO overflow structures, hydraulic structures, chambers with access covers and other structures including culverts, pipes and ducts to modify, connect, control ventilate, de-aerate and intercept flow.
- P.4.6 Other works of associated development include the removal and subsequent reinstatement of existing listed features including lamp standards and benches, construction of electrical and control kiosks, construction of pits, chambers, ducts and pipes for cables, hydraulic pipelines, utility connections, utility diversions and drainage including reinstatement of a pipe subway, provision of construction access and permanent access, removal of existing mooring for the Tattershall Castle and its temporary relocation and the construction and use of a new permanently moored vessel and means of access, permanent removal of a (Class V) service mooring and construction of an amenity kiosk.
- P.4.7 The full description of the proposed development can be found in Schedule 1 to the *Draft Development Consent Order* (the 'Draft DCO'), and further details of the temporary construction works and permanent operational structures are set out below. An extended description is also provided in the *Environmental Statement* (Vol 17, Section 3).
- P.4.8 At this site, approval is sought for the works shown on the Works plan showing Work Nos. 16a and 16b and the Site works parameter plan,

which shows the relevant zones and limits of land to be acquired or used in which the associated development works would be undertaken (Work No. 16c). The Access plans and Demolition and site clearance plans are also for approval. The plans for approval are contained in the *Book of Plans* along with other relevant plans showing the construction phasing and permanent works. These other plans are marked either for approval, for information, indicative or illustrative depending on the level of detail they provide. Section 2 of the *Planning Statement* explains in more detail the overall approach to the level of detail and how the plans for approval were developed. The Good design subsection of this appendix explains the level of detail with regard to the proposed above-ground structures at this site and the need to obtain further approvals.

Construction

- P.4.9 Construction is programmed to take approximately four and a half years and would involve the following main works:
- site set-up (approximately 12 months)
 - shaft construction (approximately eight months)
 - tunnelling and secondary lining (approximately four months)
 - construction of other structures (approximately 24 months)
 - completion of works and site restoration (approximately eight months).
- P.4.10 The approximate timeline of construction is shown in Figure P.2 below.

Figure P.2 Construction timeline



- P.4.11 Connection of site utilities and diversion of major existing utilities could be carried out in advance of the main activities listed above.
- P.4.12 The majority of construction would occur during standard working hours of 8am to 6pm Monday to Friday and 8am to 1pm Saturdays. Construction activities could occasionally be required outside of these hours during key construction activities subject to agreement with the local authority.
- P.4.13 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.
- P.4.14 A short period of 24-hour working would be required for the connection tunnel and secondary lining phases. During this period of continuous

working, activities would be predominantly below ground, with support activities at ground level. However, HGV movements would be limited to weekday daytime hours.

- P.4.15 Barge loading and transport away from the site would take place on a continuous 24-hour, seven days a week basis as barge movements are linked to high tides.
- P.4.16 Further information in relation to working hours and site-specific restrictions is provided within the *Code of Construction Practice (CoCP)* Parts A and B.
- P.4.17 Construction vehicles would access the site from Victoria Embankment and turn left into the site. Construction vehicles would exit the site onto Victoria Embankment, turning left out of the site.
- P.4.18 An average of five HGVs would access the site per day for the majority of the construction period. This would rise to approximately 14 HGVs per day over an estimated one month period split between the construction of the cofferdam and other structures. There could be additional periods during key construction activities when these HGV numbers would be exceeded. Further details regarding the number and breakdown of anticipated HGVs accessing the site per day are provided within the *Transport Assessment*, which accompanies the application.
- P.4.19 Potential layouts of the construction site are shown on the Construction phases plans in Annex P. It should be noted that these layouts are illustrative only. The contractor could arrange the site in a different way, depending on the chosen construction method, provided that any environmental effects are appropriately managed and the cofferdam does not exceed the maximum extent of the temporary works platform shown on the Site works parameter plan.

Site set-up

- P.4.20 In advance of the main works, utility diversions, including two major gas mains and approximately 40 fibre optic cables, would be carried out in the carriageway and pavement of Victoria Embankment to facilitate later construction of the overflow weir chamber on the LLS (N). Traffic management measures and diversion of the Thames Path would be required to enable these diversions.
- P.4.21 The site boundary would be established and secured. Seven trees on Victoria Embankment would require removal during site set-up.
- P.4.22 Parts of the site are currently occupied by the Tattershall Castle and an associated mooring, which would first be temporarily relocated upriver to a position currently occupied by a City Cruises service mooring. Post construction, the vessel would be permanently relocated near the permanent site in a position currently occupied by a Class V service mooring (this is the Port of London Authority class of boat that uses the mooring), which is shown at the base of the photograph in Figure P.1 above. Both the City Cruises and the Class V service moorings would be removed during the works. The former would be reinstated following the works and the latter would be permanently removed.

- P.4.23 Other site works would include setting the required site access from Victoria Embankment, introducing the required traffic management activities, and carrying out modifications to the Thames Path.
- P.4.24 A temporary cofferdam would extend out from the existing river wall to create a working platform during construction. 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.
- P.4.25 The piles used to form the temporary 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.
- P.4.26 It is assumed that the piles would be driven using vibration piling techniques although silent piling techniques would be utilised where reasonably practical.
- P.4.27 A concrete campshed would be constructed along the eastern face of the temporary cofferdam to enable barges to sit safely on the river bed. It is assumed that no dredging would be required at this site, although there would likely be some disturbance to the riverbed during construction of the cofferdam and campshed.
- P.4.28 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.
- P.4.29 Potential scour would be monitored during the construction works. Any need for scour protection to the cofferdam, the adjacent river walls or other third party structures (such as bridge piers) would be identified using the approach set out in the scour and accretion monitoring and mitigation plan for temporary works in the foreshore (*Environmental Statement Vol 3, Section 14, Appendix L.4*).
- P.4.30 Internal site roads, plant and material storage areas, offices, welfare and workshops would be established on the cofferdam.

Shaft construction

- P.4.31 The CSO drop shaft would be constructed with a primary lining of segmental precast concrete shaft linings. Initially the shaft would be constructed as a wet caisson until it reaches London Clay and the groundwater is cut off. Pumps would discharge groundwater to the River Thames after treatment through a settlement system. The shaft would then be constructed using underpinning techniques.
- P.4.32 As the shaft enters the water-bearing Lambeth Group, dewatering wells would be drilled outside its periphery to control water ingress. Pumps would be placed in the drill casings to extract groundwater. Approval would be sought from the Environment Agency to discharge extracted ground water directly into the River Thames. Extracted water would be sampled on a regular basis to check its quality.

- P.4.33 Once the excavation is complete, a steel-reinforced concrete base plug would be formed at the base of the shaft. The size of the concrete base slab would require an extended working day in order to complete the concrete pour.

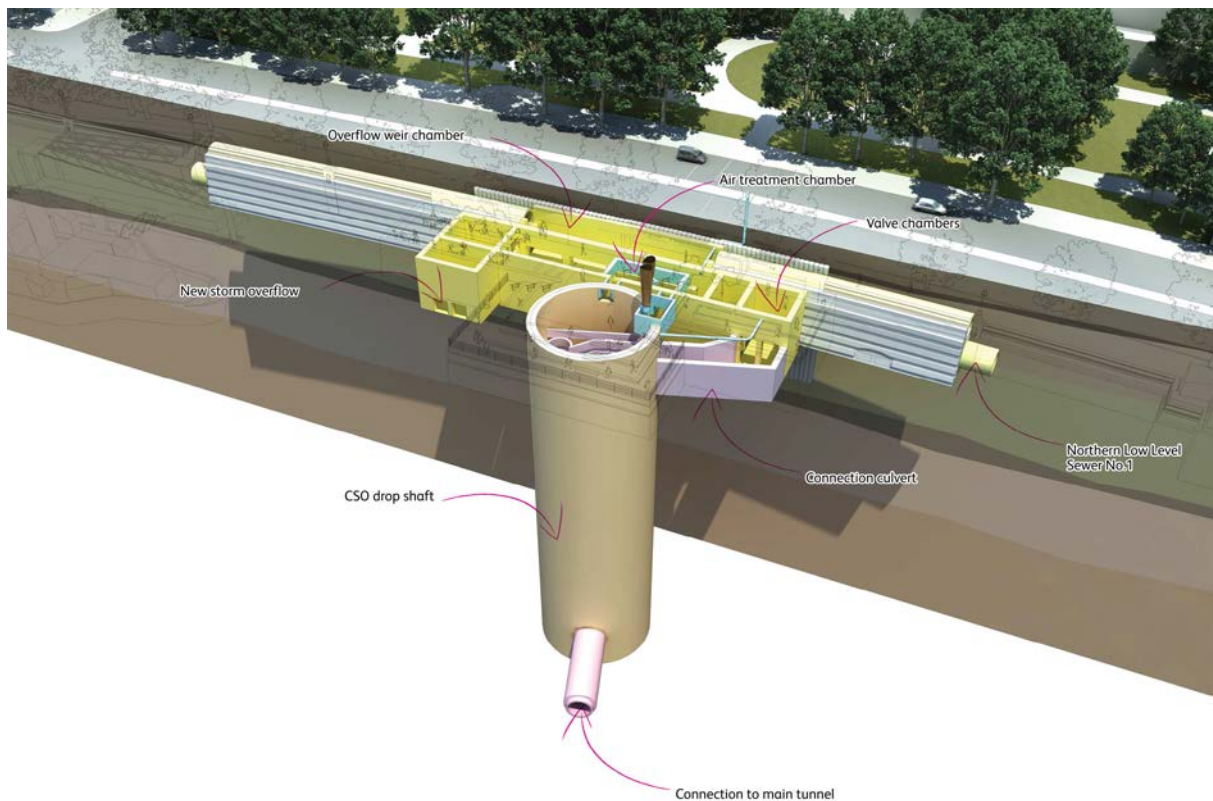
Tunnel construction

- P.4.34 In order to connect the CSO drop shaft to the main tunnel, an approximately 3m internal diameter connection tunnel (approximately 30m long) would be constructed using sprayed concrete lining techniques. The tunnel would be progressively excavated and the lining built up in even layers until the required profile is achieved.
- P.4.35 The excavated material would be transported along the connection tunnel to a temporary stockpile on the surface prior to loading onto barges for onward disposal.
- P.4.36 A tunnel portal would be formed in the shaft lining. The portal would consist of a cast *in situ* concrete portal tied to the shaft lining.
- P.4.37 Dewatering and ground treatment would be required for the connection tunnel works and to facilitate the connection tunnel break-in to the main tunnel.

Secondary lining of the shaft and connection tunnel

- P.4.38 Secondary lining is an additional layer of concrete placed against the inside of a tunnel's primary segmental concrete lining for watertightness and to improve overall structural durability.
- P.4.39 The secondary lining of the connection tunnel would be constructed by installing steel reinforcement, erecting a cylindrical shutter within a short length of tunnel and pumping concrete into the gap between the shutter and the primary lining. Once the concrete hardens sufficiently, the shutters would be removed and erected in the next section of tunnel.
- P.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. The steel reinforcement would be assembled in sections and a shutter used to cast the concrete against it. The shutter would be assembled at the bottom of the shaft, sections of reinforcement installed and lining cast progressively up the shaft.
- P.4.41 Once the secondary lining is complete the internal structures, including the vortex and drop tube, would be shuttered and concreted. See Figure P.3 overleaf for the Functional components diagram.

Figure P.3 Functional components diagram



Construction of other structures

- P.4.42 An overflow weir chamber, connection culvert and valve chamber would connect to the LLS (N) inside the Victoria Embankment wall and to the CSO drop shaft.
- P.4.43 The LLS (N) would be lined before the overflow weir chamber is constructed. The chamber would be constructed using secant or sheet piles and excavated to expose the low level sewer. The base slab and internal walls would then be constructed. Flow would be temporarily diverted from the sewer in order to break it out on completion of the chamber.
- P.4.44 Sheet pile walls would be used for support in order to construct the underground chambers. Walls would be constructed to a certain depth to minimise groundwater ingress into the excavation, and small pumps would be utilised to manage any groundwater that seeps through. The pumps would discharge to the River Thames following treatment through a settlement system.
- P.4.45 Ground treatment to the base of the existing river wall would be required during the interception and CSO works.
- P.4.46 The walls, bases and roofs of the chambers and shallow foundations for the above-ground structures would be formed by *in situ* reinforced concrete techniques. Concrete would be pumped or skipped to the chamber. The piled walls would be extended to the CSO drop shaft to

enable the connection culvert to be constructed in a similar manner to the chambers.

- P.4.47 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 structural design and ground conditions.
- P.4.48 A new outfall would be constructed on the front of the new river wall in the event that the main tunnel cannot accept any more flow. Flap valves would be fitted to prevent tidal flows entering the system.
- P.4.49 Air management structures comprising an underground air treatment chamber, associated ducts and ventilation columns, and the electrical and control kiosks would also be built and commissioned.

Completion of works and site restoration

- P.4.50 On completion of the main construction works, the new river wall would be finished before removing the temporary cofferdam to ensure flood protection.
- P.4.51 Once the cofferdam fill is removed, the geotextile layer would be removed and permanent scour protection placed around the structure.
- P.4.52 Once the main elements of construction are complete, the final landscaping works would be undertaken including final treatments and surfaces, planting and street furniture.

Operation

CSO drop shaft

- P.4.53 The CSO drop shaft would be constructed in the area of foreshore within and immediately adjacent to the position of the hull of the Tattershall Castle. The drop shaft would have an approximate internal diameter of 13m.
- P.4.54 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 the connection tunnel.
- P.4.55 Ground level access covers would be incorporated on the top of the shaft for inspection and maintenance purposes.

Overflow weir chamber and culvert

- P.4.56 An overflow weir chamber would be constructed below ground in the LLS (N). The chamber would be housed in the structure extending out into the river from the existing embankment (the 'foreshore structure').
- P.4.57 A connection culvert would be constructed to transfer flows from the overflow weir chamber to the CSO drop shaft. Access covers would be incorporated on top of the chamber for inspection and maintenance purposes.

Connection tunnel

- P.4.58 A connection tunnel would be constructed to connect the CSO drop shaft to the main tunnel under the river. Driven from the drop shaft, the tunnel

would be approximately 28m long and have an approximate internal diameter of 3m.

River wall

- P.4.59 River wall parapets would be provided around the foreshore structure at current flood defence levels. The new public space on top of the structure would be at the same height as the flood defences. The stepped terraces around the front sides of the structure would sit below the defence level and were designed to occasionally be submerged.

Ventilation structures

- P.4.60 Two ventilation columns would sit on the foreshore structure to serve the drop shaft. The minimum height would be 4m and the maximum 8m. A smaller diameter ventilation column would serve the interception chamber. It would stand approximately 6m high. The underground air treatment chamber would contain an air management filter and connect to the ventilation columns. The air treatment chamber would have ground level access covers for inspection and maintenance purposes.

Electrical and control kiosk

- P.4.61 The electrical and control equipment would be housed on the foreshore structure above the drop shaft. The kiosk to serve the drop shaft would be 6m high and the kiosk to serve the interception chamber would be 2m high.

Permanent restoration and landscaping

- P.4.62 Through close engagement with stakeholders including Westminster City Council, English Heritage and the Design Council CABE throughout the pre-application phase, a design was developed that is supported to an indicative level of detail. 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.
- P.4.63 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.
- P.4.64 Parts of the CSO drop shaft in the centre of the foreshore structure would be raised to approximately flood defence level in order to create a central viewing platform looking over the river towards the Palace of Westminster. Only the 'embankment terraces' that step down from the central viewing platform would be finished below flood defence level and an open balustrade would be created around this area.
- P.4.65 The central viewing platform would also enable occasional operational access by cranes and maintenance vehicles. Thames Water would retain a right of access and install temporary security fencing when the area is required for shaft maintenance purposes.
- P.4.66 Two stone clad electrical and control kiosks and the two amenity buildings/kiosks would be combined with a canopy structure to create a threshold to the new public space. They would be arranged to balance

permeability and separation between the Victoria Embankment footpath and the embankment terrace.

- P.4.67 The two amenity kiosks would be constructed between the electrical and control kiosks as an architectural means of creating a suitable entrance to the space. The kiosks would frame views of the River Thames from Whitehall Gardens and the gates of Embankment Gardens. They would also 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 other could provide ancillary storage/servicing. These kiosks would be operated by a third party and would require further consents to be obtained with the DCO for the benefit of that operator.
- P.4.68 The existing coach parking nearby on Victoria Embankment would be reinstated. Maintenance vehicles would access the structures via a reinforced vehicle crossing across the Victoria Embankment footpath. No drop kerb would be provided as access would be occasional.
- P.4.69 The Tattershall Castle is a permanently moored bar and restaurant and this represents an existing use of the land and water within the site boundary. A replacement mooring is proposed as part of the works, which would take the place of an existing Class V service mooring that would be permanently removed. A Requirement (VCTEF.10) is proposed for the new mooring to be used only by the Tattershall Castle. The operation may require appropriate operating and mooring/river works licenses that cannot be included in the DCO.
- P.4.70 The mooring/river works license would be determined by the Port of London Authority based on the results of a navigational safety assessment. Any new or altered premises license would be obtained under the Licensing Act 2003, although it is possible that the existing license may be transferred since the address for the vessel is likely to remain unchanged. In any event, the only permissible statutory grounds for refusing such a license are the prevention of public nuisance, public safety, the prevention of crime and disorder and the protection of children from harm. As the vessel would only move a short distance and would not be materially closer to neighbouring occupiers, the basis for judging the operating license is unlikely to change. In the event that the licenses are refused, the works to construct the new mooring would not be implemented.
- P.4.71 The mooring would include a new access ramp to the Tattershall Castle at a shallower, more accessible gradient than the existing. It would bridge over the river wall and fix to the embankment pavement with no physical and minimal visual impacts on the listed structure. The existing fixings to the listed wall would be carefully removed and the resulting scars made good using materials to match the surrounding stonework.

Access and movement

- P.4.72 Existing access to the site is directly from Victoria Embankment and across the section of the Thames Path adjacent to the proposed site.
- P.4.73 Although there is no existing vehicular access to the foreshore site, it would be accessed directly off Victoria Embankment (A3211), which is

part of the Transport for London Road Network, during construction and subsequent maintenance activities.

- P.4.74 During construction, vehicles would travel via the westbound carriageway of Victoria Embankment and turn left into the site through a new entrance as shown on the Construction phasing plans in Annex P. Traffic leaving the site would turn left onto the westbound carriageway of Victoria Embankment from a new temporary exit. Specific construction phases would require lane closures along Victoria Embankment. However, two-way traffic would be maintained by reducing the width of traffic lanes to keep at least one lane open in each direction. Further detailed information on traffic and access is provided in the *Transport Assessment* and access for maintenance during the operation of the development is described below.
- P.4.75 The new public space would form a legible and inclusive environment that would be safe and suitable for everyone, including people with disabilities, the elderly, and children in pushchairs. Where possible, within the heritage constraints of the design, a ramp would be provided in addition to steps. The gradient of the ramp would be 1:21 and it would be surfaced with a slip-resistant material. The final design of the new public space would comply with the Disability Discrimination Act. The ramps and steps would be a positive feature of the design and comply with the *Approved Document Part M* of the Building Regulations.
- P.4.76 The river-facing embankment terraces would be publicly accessible and steps would be provided for ambulant disabled people; however, it is not possible to provide step-free access without changing the nature of the design. Nevertheless, all visitors could enjoy the new public space from the raised viewing platform, which would improve visual access for wheelchair users.
- P.4.77 Contrasting colours and textured materials would be selected to take account of the visually impaired, where possible; however, the design palette was chosen to respect the historic surroundings.
- P.4.78 The design of the proposed mooring for the Tattershall Castle would improve accessibility to the vessel, as the existing mooring does not provide step-free access. The access ramps would be long enough to ensure a sufficiently shallow gradient at both low and high tide; the steepest gradient (at Mean Low Water Springs tide) would be 1:12 and the average would be much shallower. The width of the access stairs and ramps on the embankment footpath would be kept to a minimum to avoid obstructing pedestrian movements.

Typical maintenance regime

- P.4.79 Access to the site would be directly from Victoria Embankment between replacement trees and across the adjacent section of the Thames Path. The Thames Path would likely require temporary closure and diversion during inspections and maintenance.
- P.4.80 Once the project is operational, it is anticipated that Thames Water personnel would visit the site approximately every three to six months to inspect and carry out maintenance of the electrical and control, ventilation

and below-ground equipment. This would likely involve a visit by personnel in a small van during normal working hours and may take several hours. Given this low usage, no drop kerb is proposed.

- P.4.81 It is anticipated that a major internal inspection of the tunnel system and underground structures would be required once every ten years. This process would likely involve a small team of inspection staff and support crew and two mobile cranes to lower the team into the CSO drop shaft. The inspection would be carried out during normal working hours and would likely take several weeks. A crane may need to be positioned on the foreshore structure and some maintenance vehicles would need to park in the coach bays and on the adjacent footpath.
- P.4.82 Thames Water may also need to visit the site for unplanned maintenance or repairs, for example, in the event of a blockage or an equipment failure. Such a visit may require the use of mobile cranes and vans.

Scheme development

- P.4.83 The proposed site was identified, assessed and selected through a robust, qualitative, and iterative site selection process, and was subject to over two years of extensive consultation and engagement. The site selection methodology was subject to consultation and engagement with local authorities and key stakeholders and is described in more detail in the *Final Report on Site Selection Process*, which accompanies the application.
- P.4.84 An alternative site at Victoria Embankment Gardens nearby was shortlisted at phase one consultation. This site would have had negative impacts on heritage, community, traffic and transport, noise, dust, residential amenity, health and safety (due to the longer connection tunnel required), and impacts on the London Underground Circle and District line tunnels. Furthermore these impacts would all be difficult to mitigate effectively. Westminster City Council noted in comments on this site option (letter dated 5 March 2010) that the gardens are “*irreplaceable*” and the inevitable damage would be “*wholly objectionable*”. It also noted that it would likely be the worst site in terms of loss of amenity as it lies immediately in front of a hotel and apartments.
- P.4.85 By contrast at each stage of consultation it was feasible to effectively address and mitigate many of the potential impacts from the Victoria Embankment Foreshore site highlighted by stakeholders. Westminster City Council noted in comments on this site option (letter dated 5 March 2010) that the impacts at the foreshore site would comprise “*impact on mooring of Hispaniola and Tattershall Castle; Grade II listed Embankment Wall and original landing piers; London Underground network; Vehicular access to and from site; Impact on City of Westminster assets; Pier access and river passenger services; Permanent structures on site for future maintenance; Scour, hydrological and hydraulic impacts on river and foreshore*”. During and following phase one consultation, it was possible to begin developing effective mitigation for these impacts. No alternative preferred site was identified subsequent to phase one consultation.

- P.4.86 Following phase one consultation, interim design work sought to move the foreshore structure to the west in order to ameliorate or mitigate a number of the impacts identified by Westminster City Council and other stakeholders. The move avoided directly impacting on the Hispaniola mooring; provided greater separation from the London Underground (Bakerloo line) tunnel structures; improved the alignment and visual linkage with the Victoria Embankment Gardens' historic garden roundel and gate; and avoided direct impacts on the listed landing pier. The move was achieved by devising a new engineering approach, namely a longer (20m) overflow weir along the LLS (N) to control the Regent Street CSO rather than a shorter (10m) overflow weir and direct interception of the CSO. This would control the CSO and increase capacity in the LLS (N).
- P.4.87 Another significant change arising from phase one consultation was the change to an entirely orthogonal shape for the foreshore structure in response to requests from stakeholders. Fluvial modelling was undertaken as an orthogonal shape would have greater fluvial impacts than a curved one such as presented at phase one consultation; however, it was determined that these impacts would be acceptable.
- P.4.88 These two changes, along with other design changes described in the Good design subsection below, were the subject of two reviews hosted by the Design Council CABE.
- P.4.89 The phase one and two scheme locations are illustrated in Figure P.4 and Figure P.5 below. The 'roundel', a circular central path, in Victoria Embankment Gardens is visible at the left edge of Figure P.4, and through trees in the top right corner of Figure P.5 as a reference point. Figure P.9 shows the final scheme location and the roundel is visible in the top of the frame.

Figure P.4 Phase one consultation scheme location (north of roundel)



Figure P.5 Phase two consultation scheme location (aligned with roundel)



- P.4.90 Having incorporated many of the suggestions from the Design Council CUBE reviews, a number of design-related suggestions and objections were received at phase two consultation. The scheme location was accepted by the majority of respondents, including Westminster City Council and English Heritage. The engineering approach continued to be challenged in order to permit stakeholder engagement on designs of different shapes, layouts and sizes of the foreshore structure. The preparation of each design for discussion involved extensive architectural and engineering work.
- P.4.91 This work resulted in a revised design known as the ‘island option’, which was presented to stakeholders at a period of targeted consultation and a further review hosted by the Design Council CUBE. Three options were presented at the Design Council CUBE review: the island option, a symmetrical option and a mirrored version of the phase two design. Detailed visualisations are reproduced overleaf.

Figure P.6 Island design



Figure P.7 Mirrored design



Figure P.8 Symmetrical design



P.4.92 In response to the feedback received from the Design Council CABE, English Heritage and Westminster City Council at targeted consultation, the proposed layout was amended to provide a more formal and symmetrical design. The new design combines elements of the phase two consultation architecture with the targeted consultation engineering design developed for the island in order to minimise the encroachment into the river. See Figure P.9 below for the indicative completed design.

Figure P.9 Victoria Embankment Foreshore visualisation



- P.4.93 Further detailed improvements focused on the character/use of the public realm and relationship with listed and other heritage assets. The design and positioning of the temporary mooring for the Tattershall Castle were amended to improve accessibility and reduce visual impact. This was in response to comments from the Port of London Authority, which noted that it had no in principle objection to the approach to the temporary and permanent relocation of the vessel.
- P.4.94 The site position and layout as currently proposed is strongly supported by Westminster City Council and English Heritage and they requested that Thames Water submit the design at an indicative level of detail "*wherein lies more control and less opportunity for subsequent changes*" (letter dated 4 October 2012).
- P.4.95 Suitable nearby locations for the permanent relocation of the Tattershall Castle were also examined during the pre-application engagement. Thames Water took account of local views and likely impacts on the conservation area and World Heritage Site. It was also guided by the principle of reducing impact on the vessel's use, as highlighted in the written response from Westminster City Council to the draft worksites in 2010 and subsequently by other stakeholders, such as the Greater London Authority and Port of London Authority at phase one consultation. In detailed design work, Thames Water considered ways to avoid direct impacts from the mooring on the listed embankment wall. The council, in response to phase two consultation, Section 48 publicity and on-going engagement objected to the principle of relocating the vessel in the vicinity and commented on the *Draft DCO* that it should not be relocated within Westminster. English Heritage responded to Section 48 publicity that the vessel should be located away from views along Horse Guards Avenue. The proposed location accords with this request.
- P.4.96 Thames Water considered the site remained the most appropriate site to control the Regent Street CSO and publicised it as the proposed site at Section 48 publicity, which ran from July 2012 to October 2012.
- P.4.97 The principal issues that arose from all the phases of pre-application consultation and Section 48 publicity for Victoria Embankment Foreshore are subsequently addressed in the planning assessment in Section P.5. The issues are summarised below:
- a. The effect of foreshore encroachment on the character and appearance of the river and the riverside: this issue is addressed in the Good design, Historic environment and Landscape and visual (including townscape) subsections below.
 - b. Concerns regarding the scale of the proposed site (given the conservation area and views of the World Heritage Site) and appropriate massing, proportions, detailing and materials for the historic context: this issue is addressed in the Good design, Historic environment, Landscape and visual (including townscape) and Land use including open space, green infrastructure and green belt subsections below.

- c. Issues relating to the visual relationship with the River Thames and Victoria Embankment Gardens while creating pleasant spaces away from the busy Victoria Embankment: this is addressed in the Good design, Historic environment and Landscape and visual (including townscape) subsections below.
- d. A variety of concerns regarding the Tattershall Castle comprising the need to relocate it and minimise disruption to its business and its effect on views of the conservation area and World Heritage Site when relocated: these issues are addressed in the Good design, Historic environment, Landscape and visual (including townscape) and Socio-economic subsections below.
- e. Concerns regarding potential effects on navigation at the nearby Embankment Pier during construction and operation: this issue is addressed in the Traffic and transport subsection below.

P.5 Site-specific planning considerations

P.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at Victoria Embankment Foreshore. It considers the issues and factors identified in the NPS along with other issues relevant to the site, including those arising from consultation.

Meeting the need

P.5.2 The proposed works at Victoria Embankment Foreshore would successfully meet the need to tackle the unacceptable discharges from the Regent Street CSO and ten other CSOs along the north bank of the river, by connecting the LLS (N) to the main tunnel. They would therefore make an important contribution to meeting the wider need for the project identified in the NPS.

P.5.3 In a typical year, the Regent Street CSO discharges 22,000m³ of untreated sewage into the River Thames in front of the Victoria Embankment in the City of Westminster.

P.5.4 The CSO was identified by the Environment Agency as needing to be controlled. The CSO discharges have multiple impacts on river 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.

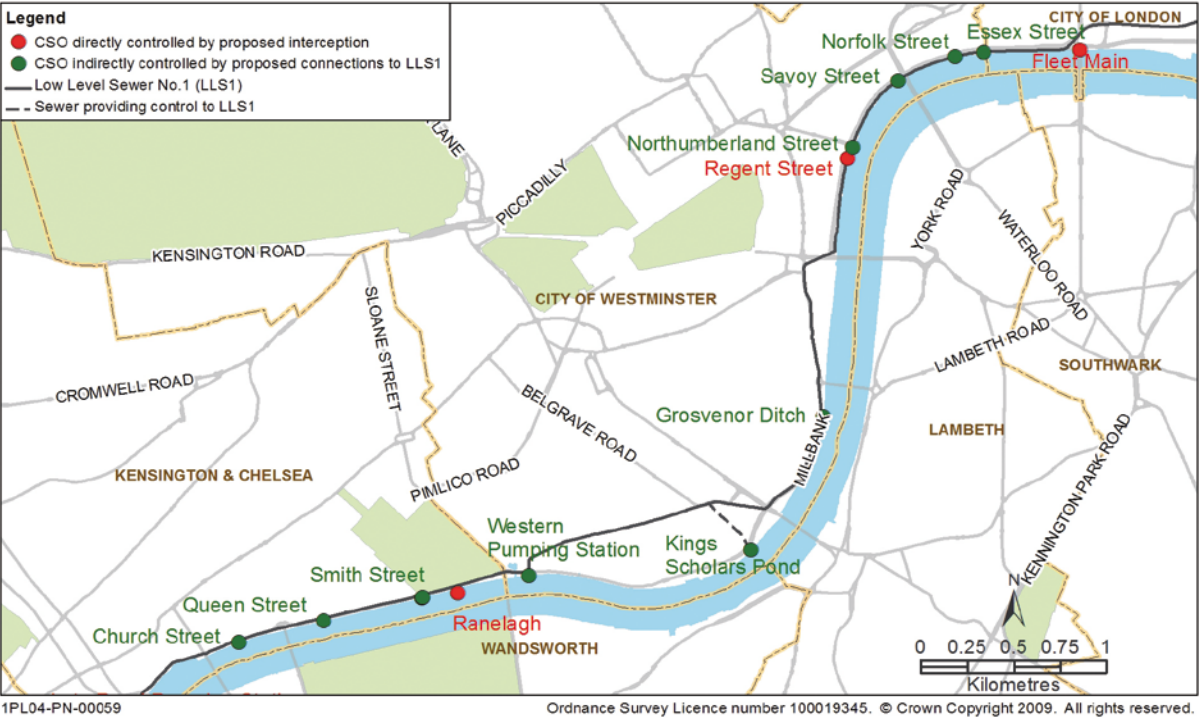
P.5.5 It is predicted that the Regent Street CSO discharges will continue to worsen in terms of volume, frequency and content. By the time the proposed works at Victoria Embankment Foreshore are operational, it is predicted that the CSO will discharge approximately 26,000 m³ of untreated sewage in approximately ten discharge events in a typical year and release six tonnes of sewage derived litter. The assessment of the beneficial effect of a reduction in sewage derived litter and pathogens discharged to the tidal Thames was inferred from catchment modelling results of the reduction in discharge volume, frequency and duration. The effect was not modelled directly.

P.5.6 Modelling suggests that the current annual discharges of untreated sewage from the Regent Street CSO would be reduced to 0m³ in five discharge events (or ten in the 2020s) a year to a predicted level of zero events per year with the project in operation. This reduction would have a substantial beneficial effect on water quality.

P.5.7 In addition, the 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 construction of overflow weirs along the LLS (N) at this location and at Chelsea Embankment Foreshore and Blackfriars Bridge 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 the three connections to the LLS (N) would reduce annual discharges by 88 per cent from current levels to 249,700m³.

P.5.8 As illustrated in Figure P.10 below, some of these ten existing CSOs are located near residential neighbourhoods, major institutions, business locations, and 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 stakeholders. English Heritage noted this as a feature in favour of this site in a letter in response to phase two consultation (dated 4 July 2012). Westminster City Council wrote during phase two consultation to suggest design improvements *“whilst welcoming the reduction in the number of proposed worksites of your latest proposal”*.

Figure P.10 The ten CSOs along the northern bank that would be controlled by the three connections to the northern Low Level Sewer No.1



P.5.9 For the reasons set out above, and taking into account the various design and environmental mitigation measures described throughout this appendix, Victoria Embankment Foreshore is the most suitable site to

control the Regent Street CSO by connecting the LLS (N) to the main tunnel.

Good design

- P.5.10 The amount, layout and scale of the proposed development are primarily dictated by the functional requirement to transfer and direct flows from the Regent Street CSO and the LLS (N) into the main tunnel.
- P.5.11 The NPS (para. 3.5.1) requires wastewater infrastructure developments to be sustainable and, having regard to regulatory and other constraints, to be as attractive, usable, durable and adaptable as possible. Therefore, the design must take account of both aesthetics and functionality.
- P.5.12 It was determined through early site analysis and subsequent engagement that it was important for the design to respond to a number of key constraints and potential opportunities. The constraints included:
- a. the location of the Regent Street CSO and the LLS (N)
 - b. the Grade II listed Victoria Embankment river wall, sturgeon lamps, catenary lamp standards and sphinx benches
 - c. designated and protected views along the riverside, including views of the World Heritage Site
 - d. the setting of Grade II* listed buildings and Grade II registered parks and gardens
 - e. the line of mature trees along the listed wall
 - f. the busy Victoria Embankment (A3211)
 - g. the Westminster CAZ and large numbers of tourists in the vicinity
 - h. existing coach parking
 - i. the proximity of the Bakerloo, Circle and District Line tunnels, the Golden Jubilee footbridges, Hungerford Rail Bridge, Embankment Pier and river traffic
 - j. major utilities within a pipe subway directly above the LLS (N) and within the embankment walls
 - k. the depth and relatively fast flow of the River Thames at this point
 - l. the Tattershall Castle and the Hispaniola, which are moored within/adjacent to the site.
- P.5.13 The site-specific design opportunities included:
- a. Help to indirectly control flows from ten other CSOs along the northern bank of the River Thames.
 - b. Create a new high quality public space on top of the proposed foreshore structure, exploiting the southeast aspect to enable views.
 - c. Improve visual access to the River Thames.
 - d. Introduce ecological enhancements.

- P.5.14 Based on the analysis of opportunities and constraints, and the feedback from stakeholder consultations, the principal objectives that influenced the design include:
- a. Enhance visual access to the River Thames.
 - b. Create a simple and elegant new landmark public space of a fitting stature for the monumental context of the site.
 - c. Frame views to create a visual link between Embankment Gardens and the River Thames.
 - d. Develop a variety of pleasant spaces by providing seating, addressing shade and microclimate, ensuring the right degree of separation from Victoria Embankment, and providing opportunities for commercial activities to further 'activate' the space.
 - e. Develop a contemporary architectural language for the foreshore structure that complements the context including appropriate massing and proportions, sensitive detailing and selection of high quality materials.
 - f. Locate the proposed trees in line with the historic rhythm and alignment of trees along Victoria Embankment.
 - g. Minimise the impact on nearby heritage assets and views of them, and (where possible) preserve and enhance them.
- P.5.15 These objectives are considered in turn below, following a description of how impacts from construction were reduced through good design.
- Managing construction impacts**
- P.5.16 The impacts arising from construction at this site would be largely unavoidable; however, the site is not close to residential properties. Amenity effects would mainly affect users of the Thames Path (who would be diverted to the west of the site), Victoria Embankment Gardens to the west, the Tattershall Castle and the Hispaniola, and road users. Accordingly the hoardings on the western boundary would be increased to 3.6m in height. They would also be faced with artwork and include viewing windows, as provided for in the *CoCP* Part B.
- P.5.17 Impacts on the permanently moored vessels were minimised by locating the works to the south of the Hispaniola, minimising the works area, and providing for the temporary and permanent relocation of the Tattershall Castle to a new, well-designed mooring nearby to the south.
- P.5.18 Impacts on river morphology and ecology were reduced by minimising the area required for construction in the foreshore, and using directional lighting, as provided for in the *CoCP* Part B. The extent of works would be minimised by limiting the extent of the section of the listed river wall that would be dismantled or otherwise impacted. Impacts on road users were minimised, as set out in the *CoCP* Part B, by maintaining four traffic lanes (two in each direction) except for short durations during utility diversions where only one lane on the westbound carriageway would be maintained. This would be achieved by narrowing existing outer traffic lanes; existing coach parking would also be suspended.

P.5.19 In general, good design in respect of minimising construction impacts focussed on reducing the direct impact and extent of the works. Figure P.3 above illustrates how the engineering components were designed orthogonally to fit closely together in order to minimise the overall permanent working areas required.

Enhance visual access to the River Thames

P.5.20 The new public realm on the foreshore structure is expected to be well used due to high footfall along the embankment and the visibility of the site from the footbridges. It would be well designed, varied and welcoming. The design is illustrated in Figure P.11 at low tide and in Figure P.12 at high tide. The proposals here are indicative and reflect the stakeholders' consensus that this is an appropriate design solution. The final detailed design must be in accordance with these details, in particular the overall massing of the foreshore structure, as well as the design principles for this site.

P.5.21 The embankment terraces would form a raised central viewing platform (a level difference of approximately 1m) and a range of sitting and standing places overlooking the River Thames. The simple, elegant horizontal terraces stepping down towards the river would be unique in central London. They would be surrounded by railings to ensure safety. This would be an exciting location (particularly at high tide) in which to experience the river, by standing or sitting closer to the water level without a solid parapet wall between. This concept was first suggested by the Design Council CABE and Westminster City Council at the design review prior to phase two consultation; however, the engineering design at that stage could not accommodate a lower height. Following phase two consultation, the Design Council CABE responded that while the structure did not need to be symmetrical, steps down to the water would be welcomed, whereas the council recommended a symmetrical layout and a less bulky structure.

P.5.22 These comments were taken on board and a set of engineering components were carefully designed to facilitate both symmetry and, through the stepped terraces at the edge, reduce bulk, as illustrated in Figure P.11 below.

P.5.23 The square terraces would fall in approximately 400mm increments, which is a comfortable height for seating. They would be arranged slightly asymmetrically in order to maximise the area oriented towards the views to the south and east. The lowest step would flood only at the highest tides (three times per typical year).

P.5.24 The indicative design shows the twin ventilation columns positioned in the southwestern corner of the raised central viewing platform on the foreshore structure. The detailed positioning would be agreed with the council and the ventilation columns could be located anywhere within the relevant parameters. They would create a backdrop to the viewing area and draw users of the Thames Path towards the river and encourage the use of this space. Users of the southern Golden Jubilee footbridge and further afield would also likely be attracted to visit it in order to experience the change in levels and enjoy views of and greater access to the river.

Figure P.11 Proposed design of the new public realm and river wall at low tide



Figure P.12 Proposed design of the new public realm and river wall at high tide



Creation of a simple, elegant public space

P.5.25 Given the busy character of the embankment in this location, as shown in Figure P.13 overleaf, part of this objective was to design a public space that would be well used and interesting to visit, yet more tranquil than the adjacent embankment. The design team also sought to frame this space with a few strong, visual elements.

Figure P.13 View north along Victoria Embankment



P.5.26 The layout comprises three main components: the combined kiosk and canopy structure, the embankment terrace, and the projecting river-facing terraces. The broad types of materials, form and uses for each area were presented at the various phases of consultation with stakeholders to test the response to these objectives. Figure P.14 shows a visualisation from the same position as in Figure P.13.

Figure P.14 Visualisation north along Victoria Embankment



P.5.27 The two electrical and control kiosks would be placed at the threshold of the new public realm, above the engineering structures. They would be supplemented with two amenity buildings/kiosks and a canopy to reinforce the sense of a threshold. This responds to a request from Westminster City Council following phase two consultation for *“linear definition”* and

“robust abutments to the footway” at the threshold (letter dated 4 July 2012). An ancillary commercial use could be operated in the public space from the amenity kiosks by others. It could help activate the space since it forms a ‘corner’ within the site adjacent to the Thames Path. The four kiosks and canopy above would perform a number of valuable architectural functions, in particular providing a simple, elegant opening into the space. They also create an appropriate degree of separation between the busy Victoria Embankment footpath and the embankment terrace, similar to existing historic features along the embankment. The kiosks would be clad in natural stone and the canopy would be planted with climbers to soften the space and provide shade, as stated in the *Design Principles* document.

- P.5.28 The ground level of the terrace would be flush with the existing Victoria Embankment footpath in order to facilitate pedestrian and maintenance vehicle access. The treatment of high quality paving slabs would relate to, yet be distinguishable from, the adjacent footpath. The terrace would be characterised by planters and low walls forming simple, rectangular benches. A simple arrangement of steps and ramps would be provided up to the raised central viewing platform (a level difference of approximately 1m). This would balance the objectives of a simple, elegant space with objectives of accessibility, formality and stature.
- P.5.29 The foreshore structure needs to project into the river beyond the CSO drop shaft to accommodate other below-ground infrastructure. Some of this infrastructure would sit at a lower height; therefore it was possible to split this part of the structure into a series of horizontal terraces stepping down towards the river. The terraces would reference existing projections such as Whitehall Stairs.

[Visual link to Victoria Embankment Gardens](#)

- P.5.30 The engineering design and detailed positioning of the works took account of the objective of building a relationship between the new public space and the roundel in Victoria Embankment Gardens. Through careful consideration of different engineering approaches between phase one and phase two consultation, it was possible to achieve this and increase separation from the Bakerloo line tunnels. A longer overflow on the LLS (N) was proposed as the means to control the CSO rather than a short weir in this location and a direct connection to the CSO. As described in the Scheme development subsection above, this provided a number of design benefits.
- P.5.31 The alignment of the new river wall shown in the drawings submitted for approval is fixed and subject to a DCO Requirement. This provides certainty as to the extent of any effects on the listed embankment wall and the river, and responds to a number of suggestions from Westminster City Council and English Heritage. Stakeholders supported the alignment with the roundel and separation from the listed landing bay and London Underground tunnel structures. The council noted in a meeting on 21 February 2011 that this move south was excellent. A pedestrian crossing was also considered; however, it was determined that it would not be feasible given the proximity to existing signalled crossings.

A variety of pleasant spaces

- P.5.32 The southern end kiosk would form an amenity building that could be used for commercial purposes in the future by others and seating could be provided on the adjacent section of the terrace. This area would be more enclosed and shaded by new trees. During pre-application engagement, a number of different activities for the public realm were discounted, such as a Transport for London cycle hire location or an inward-looking seating arrangement. The proposed design responds to suggestions for a varied, flexible space. The use of the amenity kiosk would be determined by the future operator and subject to relevant consents.
- P.5.33 The embankment terraces would provide seating opportunities and an intimate location in which to experience the river close to the water level without a solid parapet wall.
- P.5.34 The northern end of the structure, which would contain the central viewing platform and the associated ramps and steps, would be characterised by movement and enjoyment of views. This part of the site would mediate between the kiosks and canopy and the busy embankment.
- P.5.35 Westminster City Council is keen to engage on the detailed design of the public space in this sensitive location. Therefore, having agreed an indicative design, a number of site-specific requirements and design principles are proposed, some of which focus on ensuring the variety and character of the three sub-areas.

Appropriate massing, proportions, detailing and materials

- P.5.36 The foreshore structure would be an orthogonal shape to echo the existing Bazalgette projections, such as the listed Cleopatra's Needle/Whitehall Stairs and steamer piers. It would sit an appropriate distance from adjacent steamer bay piers in order to complement the rhythm of the existing embankment projections. The avoidance of the steamer bay piers recognises their significance as intrinsic features of the listed embankment. In this way the design team took all appropriate opportunities to demonstrate good design in terms of siting relative to existing (and currently planned) landscape character, landform and vegetation in line with para. 3.5.3 of the NPS.
- P.5.37 The new granite river wall would be set at a slight incline to reduce its apparent bulk. This approach was welcomed by the Design Council CABE and other stakeholders. The indicative design shows horizontal grooves cut into it to represent the heights of particular tides. The grooves would reduce backwash and break up the apparent mass of the foreshore structure, while maintaining its formality and stature. The surrounding parapet (set at current flood defence level) would be solid around the main part of the structure above the river terraces and could be raised to Thames Estuary 2100 Plan levels.
- P.5.38 The ventilation columns would be the 'signature' design, in accordance with design principle FNCC.04. The columns would be positioned to avoid compromising key views. The details would be discussed further with Westminster City Council and English Heritage.

P.5.39 In terms of the durability of the design and the materials, the design life of the major civil engineering components of the project, including buildings, is 120 years. 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 in other respects, for example the ability to raise river walls at a later date to Thames Estuary 2100 Plan levels.

New trees to complement the spacing of existing trees

P.5.40 The loss of some mature London Planes along the embankment during the construction period would be unavoidable. However, minimising the area of highway required for the works and maintaining traffic flow would reduce the area of tree loss. Replacement London Planes and additional planting is proposed on the foreshore structure to provide shade and improve the microclimate. The scale of the planting would not compete with or disrupt the established rhythm of the London Planes.

Minimise the impact on nearby heritage assets and views thereof

P.5.41 The construction and permanent works would have an unavoidable impact on the listed embankment wall. The extent of listed wall affected is not the absolute minimum, since the need for appropriate proportions and symmetry requires a balancing approach, as discussed with Westminster City Council and English Heritage. Thus a shape is required that accommodates the engineering components and does not encroach more into the river than required. This necessitates removal of slightly more of the wall than if a shorter section of wall were used entailing further encroachment into the river. This minimises the wider effects on the historic setting of the conservation area, river prospect views and views towards the Palace of Westminster. The council and English Heritage agreed with this balancing approach and supported the proposed orthogonal, symmetrical foreshore structure design, which minimises its apparent bulk in linear and oblique views.

P.5.42 The mooring of the Tattershall Castle would be permanently relocated. The location and design of the new mooring addresses concerns regarding the effect on heritage assets and views as well as the need to minimise impact on the business.

P.5.43 During construction, the mooring would be moved south near Whitehall Stairs, where the two service moorings within the site would be temporarily removed for the duration of the works. Here, the Tattershall Castle would partially obscure views of the river from Horse Guards Avenue. However, this effect would be temporary and would be filtered by trees and traffic.

P.5.44 The mooring would be moved back north towards the foreshore structure close to its current position following construction. The new mooring and access ramps would lie parallel to the listed wall in order to reduce the projection of the vessel when viewed from the Golden Jubilee footbridges or along the riverside. The mooring would be structurally independent of the wall; no historic fabric would be removed and the works would be

reversible. A concrete piled 'bank seat' would be constructed in the River Thames away from the cast iron caissons at the base of the listed wall in order to improve accessibility and avoid any direct impact on the listed structure.

- P.5.45 The existing mooring features an array of cables and pipes hanging off the access brow and across the wall parapet; these cables would be run under the replacement mooring walkway, where practicable, and integrated into the mooring structure in order to reduce visual clutter. The bearings of the two existing access brows are bolted directly into the river-facing side of the listed wall; the bearings would be carefully removed and any damage made good. The new accesses would bridge over the listed wall and affix to pavements.
- P.5.46 The sensitively sited and designed permanent mooring was developed following substantial engagement with stakeholders, including landowners, according to specialist engineering and heritage advice. The permanent site would be only a short distance from the current position with no material change to the visual appearance of the vessel. This would reflect the existing baseline condition and secure localised improvements in near views of the mooring. The use of the vessel would be compatible with the CAZ designation and re-provision of the mooring would minimise any socio-economic effects on the existing business.
- P.5.47 Westminster City Council and English Heritage raised objections to the proposed relocation of the vessel, which resulted in successive improvements to the positioning, mooring design and relationship to listed structures. For example, the permanent mooring would sit away from linear views along Horse Guards Avenue, as requested by English Heritage at Section 48 publicity. Further discussion of the relocation of this business is set out in the Land use and Socio-economic subsections.
- P.5.48 The design principles that relate to the mooring are VCTEF.8, which covers the method of access and VCTEF.5, which covers the reinstatement of a service mooring.

Conclusion

- P.5.49 The proposals for this site were carefully developed through a collaborative process of design review with key stakeholders to be sustainable, durable and as visually attractive as possible. Regard was had to the characteristics of neighbouring and constituent land uses comprising mainly active and passive tourism and leisure opportunities and central London activities. The new public realm would increase the amount, accessibility and enjoyment of the river frontage, and would form an adaptable and flexible series of spaces in which to sit and enjoy views of built heritage and the River Thames.
- P.5.50 Like the much larger Bazalgette embankment, the works would provide well-designed major infrastructure to preserve and extend the amenity of the riverside for many decades.

Water resources and flood risk

Water quality and resources

- P.5.51 There are no licensed groundwater abstractions from the upper aquifer, and six licensed groundwater abstractions from the Chalk or lower aquifer within 1km of the site. The licensed abstractions from the lower aquifer (Chalk) would be unaffected as construction would take place entirely within the upper aquifer, the London Clay Formation and the Lambeth Group.
- P.5.52 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 or groundwater resources.
- P.5.53 Modelling suggests that the current annual discharges of untreated sewage from the Regent Street CSO would be reduced from five discharge events a year (or ten in the 2020s) to a predicted level of zero events per year with the project in operation. In addition, the 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 construction of overflow weirs along the LLS (N). In a typical year, these ten CSOs together discharge 2,138,000m³ of untreated sewage into the tidal Thames in the Royal Borough of Kensington and Chelsea and the City of Westminster. Modelling suggests that the three connections to the LLS (N) would reduce annual discharges by 88 per cent from current levels to 249,700m³.
- P.5.54 These reductions would have a substantial beneficial effect on river water quality and are described in more detail in the Meeting the need subsection above. This would also contribute to the protection and enhancement of biodiversity of the Blue Ribbon Network and the tidal Thames.
- P.5.55 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

- P.5.56 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 including the sequential and exception test undertaken in accordance with Section 4.4 of the NPS is provided in the *Environmental Statement* (Vol 3, Section 15; Vol 17, Section 15).
- P.5.57 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.

- P.5.58 The permanent operational area (apart from the small floodable section of steps described in the Good design subsection above) 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 foreshore structure at Victoria Embankment Foreshore was designed so that the river walls could be raised to Thames Estuary 2100 Plan levels in the future.
- P.5.59 The new flood defences would be located along the periphery of the operational area and would 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.
- P.5.60 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 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.
- P.5.61 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.
- P.5.62 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 a significant 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 foreshore of the tidal 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.
- P.5.63 Following the construction of the proposed development, the risk of flooding would remain unchanged. Therefore, the proposed development satisfies the decision making principles of the NPS as set out in para. 4.4.10.

Air quality, emissions, dust and odour

- P.5.64 The NPS states that the decision maker should give substantial weight to air quality issues where any deterioration or substantial changes in air quality are experienced or where there are breaches of national or relevant statutory air quality limits (para. 4.11.4).
- P.5.65 The site is located with the City of Westminster Air Quality Management Area for NO₂ and PM₁₀. Local monitoring data indicates that NO₂ levels are currently exceeded in the air quality standards the vicinity of the site. There are no PM₁₀ monitoring sites within 1.1km of the site.
- P.5.66 The nearest receptors that could be sensitive to air quality changes are the nearby residential dwellings (in Whitehall Court), commercial/office premises, the Hispaniola and the Tattershall Castle, the Royal Horse Guards Hotel, and users of Whitehall Gardens/Victoria Embankment Gardens. Other receptors in the vicinity include recreational users of the river and the Thames Path.
- P.5.67 An assessment of the air quality impacts arising from emissions and dust from the proposed development during construction and operation is provided in the *Environmental Statement* (Vol 17, Section 4).
- P.5.68 All reasonable measures are included in the *CoCP* and would be implemented to minimise any detrimental impacts on amenity resulting from air quality, emissions and dust as identified in the NPS (para. 4.11). With the *CoCP* measures in place, 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 significant at any of the closest sensitive receptors.
- P.5.69 The operational air quality, odour and dust impacts are described in the project-wide section of this document. The project-wide *Air Management Plan*, which accompanies the application, is designed to ensure that the air in the tunnel system is kept fresh, that a low pressure is maintained within the system to prevent unwanted releases and that air is treated when released. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, there would be ventilation structures at all sites that would allow air to enter and leave the system.
- P.5.70 When the tunnel system is empty, clean air would be drawn in at specific sites by the extracting air at other specific sites to keep the air in the system fresh. This means that odours would not build up while the system is empty. As the tunnels fill, displaced air would initially be extracted and treated at the active ventilation sites before release. Later, depending on the level of filling, it would pass through the passive carbon filters. These filters would clean the air and remove any odours before release.
- P.5.71 At this site, a passive carbon filter would be installed within a below-ground chamber. During a typical year, the filter would treat 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 (approximately 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.

- P.5.72 Therefore there would be no significant loss of amenity at Victoria Embankment Foreshore in line with NPS policy.
- P.5.73 In line with the objectives of the NPS, appropriate and reasonable measures are proposed in the *CoCP* and *Air Management Plan* 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

Biodiversity

- P.5.74 The NPS requires developments to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The NPS states that appropriate weight should be attached to designated sites, protected species, habitats and other biodiversity and geological interests within the wider environment (para. 4.5.7).
- P.5.75 There are no internationally or nationally designated ecological sites in the vicinity of the site. However, the *Environmental Statement* assessed the potential effects of the project in this location on aquatic (Vol 16, Section 5) and terrestrial ecology (Vol 17, Section 6).
- P.5.76 Surveys were undertaken at the site to understand the aquatic ecology. A thin area of sand and gravel foreshore is exposed at low tide with no marginal vegetation and limited intertidal habitat. In this location the river is confined by the river wall. Surveys and data searches indicated a low diversity of fish but demonstrated the presence of pollution-sensitive invertebrates.
- P.5.77 During construction there would be a temporary loss of habitat due to land take for the cofferdam, which would not be significant. The effects on all other receptors would not be significant and would be managed in accordance with the *CoCP*.
- P.5.78 The *CoCP* Part B identifies a site-specific requirement to install a membrane between the river bed and temporary back fill material to prevent contamination of habitat and to preserve potential archaeology.
- P.5.79 The *CoCP* also requires the contractor to produce an ecological management plan for each site, which would detail the approach to managing effects on ecological receptors with reference to the results of the terrestrial ecology assessment. Furthermore, the *CoCP* Part B states that a site-specific lighting plan is required to address the impact on terrestrial and aquatic ecology. Low-level lighting would be used where possible.

- P.5.80 During operation, the permanent loss of designated intertidal habitat would be mitigated as part of an overall mitigation strategy. No significant effects are anticipated on the other receptors and no mitigation is proposed.
- P.5.81 The extent of the permanent works in the river was reduced as far as practicable during construction and operation. Connecting the LLS (N) to the main tunnel would avoid the need for sites to intercept up to ten other CSOs along the northern embankment in central London.
- P.5.82 The reduction in nutrient levels entering this heavily modified stretch of the river would have beneficial effect on habitats and fish, by reducing fish kills and locally improving invertebrate diversity and abundance. There would be no impact on fish from water velocity changes due to the foreshore structure or the permanent relocation of the Tattershall Castle.
- P.5.83 In respect of terrestrial ecology, the site comprises hardstanding and habitat is limited to seven semi-mature London Plane trees, which would be removed. The trees provide amenity and shade, but have low intrinsic biodiversity value and support only small numbers of common nesting bird species. A narrow strip of foreshore is exposed at the lowest seasonal tides and is not considered important for wintering birds. The London Planes would be replaced and additional trees would be planted on the foreshore structure, subject to approval from the local authority. Adverse effects on terrestrial ecology are not anticipated during construction or occasional maintenance works in the operational phase.
- P.5.84 In accordance with para. 4.5.3 of the NPS, the proposed development would avoid significant harm to biodiversity and Thames Water sought to conserve and enhance biodiversity in this location. In addition, design principles and measures in the *CoCP* would address adverse effects during construction. The indicative landscape design maximises opportunities for beneficial biodiversity features.

Geological conservation

- P.5.85 The site is not designated for its geology or geomorphological importance.

Landscape and visual effects (including townscape)

- P.5.86 The *Environmental Statement* (Vol 17, Section 11) presents the findings of the assessment of likely significant effects on townscape and amenity at Victoria Embankment Foreshore, both during construction and operation, and identifies mitigation measures where necessary.
- P.5.87 The townscape character of the site, characterised by Grade II listed lamp standards, a historic riverside stone wall, an avenue of mature London Plane trees and two permanently moored vessels, is in good condition.
- P.5.88 The *Environmental Statement* took account of the *London View Management Plan*; the *Savoy, Strand, Whitehall and Westminster Abbey and Parliament Square Conservation Area General Information Leaflets* produced by the City of Westminster; the *Whitefriars and Temples Conservation Area Character Summaries* produced by the City of London; the *Temples Conservation Area: Management Strategy* produced by the City of London; the *South Bank Conservation Area Statement* produced by the London Borough of Lambeth; *The Palace of Westminster and*

Westminster Abbey including St Margaret's Church World Heritage Site Management Plan; the Core Strategy; and the saved policies of the UDP, in accordance with para. 4.7.2 of the NPS. Townscape character assessments were also taken into account and their sensitivity to change determined. Character areas were defined for Victoria Embankment Gardens and Jubilee Gardens Reach, River Thames – Central London Reach.

- P.5.89 The NPS recognises in para. 1.4.4 that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments and cause adverse townscape and visual effects within a built-up environment, with many possible receptors. Although only a short stretch of the entire Victoria Embankment would be directly affected at this site, construction activity would likely have visual impacts due to the prominent location on the riverside and high numbers of visitors. The works would be particularly visible from the nearby footbridges and Thames Path, which would be diverted across the road during construction. The works would affect views of the conservation area, listed structures/buildings and the World Heritage Site from vantage points downstream and across the river. The visual impact could be significant but the location and nature of the works are unavoidable. The proposed mitigation measures were considered in consultation with stakeholders.
- P.5.90 Hoardings would be installed and the extent of the worksite was minimised as far as practicable given the general project approach of limiting encroachment into the foreshore and the importance of minimising impacts on the strategic highway network. It is unlikely that users of the adjacent Whitehall Gardens section of the Victoria Embankment Gardens and Jubilee Gardens across the river would experience significantly reduced amenity. The former is inward-looking and would be screened by trees and road traffic and the latter is some distance away and also inward-looking. No reasonable mitigation other than the *CoCP* is possible due to the highly exposed nature of the construction activities required.
- P.5.91 The permanent works were designed to provide a beneficial legacy for the local townscape. The NPS states that operational sites should be designed carefully, having regard to siting, operational and other relevant constraints. Para. 4.7.6 states that the effects on the local landscape depend on its existing character, quality, value and capacity to accommodate change.
- P.5.92 The existing landscape character is of high quality and valued by the visitors such as users of the Thames Path and the Golden Jubilee footbridges, and residents of the area. However, it has a high capacity to accommodate change. Along this stretch of the Victoria Embankment are Whitehall Stairs, Cleopatra's Needle, two river services piers and three service moorings between Westminster Pier and the Tattershall Castle. Across the river lie the South Bank Centre and the London Eye and its river services pier. The Golden Jubilee footbridges span the embankment and its concrete caissons are situated both on the embankment and within the river. Well-designed infrastructure that provides public amenity can also provide long-term townscape benefits.

- P.5.93 Once operational, the site and the relocated Tattershall Castle would remain prominent in a small number of linear views of the embankment wall, such as from the Thames Path, the Golden Jubilee footbridges (see Figure P.15) and to a lesser extent parts of the South Bank. This is unavoidable given the location and the relevance of minimising disruption to the Tattershall Castle, and other modern elements are of similar or greater prominence in views such as the parked coaches, the London Eye, the on-going development of many tall buildings at Vauxhall and the Shell Centre, and the Hispaniola. The majority of views would not experience significant change. The new public realm would create new opportunities for public enjoyment of new near and long views of built heritage and the river.

Figure P.15 Panoramic view from the Golden Jubilee footbridge of the River Thames, Victoria Embankment and the World Heritage Site



- P.5.94 The NPS seeks to ensure that reasonable mitigation is provided where possible and appropriate. Having considered alternative approaches, the proposal to relocate and redesign the Tattershall Castle mooring a short distance upstream and permanently remove a Class V service mooring (as shown in Figure P.1 above) is reasonable and appropriate and mitigates the majority of the identified landscape effects and provides good public amenity.
- P.5.95 The size of the foreshore structure was reduced where consistent with heritage and flood risk policy aims. The proposed design for the mooring of the Tattershall Castle would be more accessible and improve the appearance of the mooring in near views without causing significant or new impacts on long views. There would be two, rather than three, service moorings between the Tattershall Castle and Westminster Pier. The use of natural stone and planting in the indicative design would be subject to approval by the local planning authority in accordance with the site-specific design principles and requirements. These measures would ensure the structure is visually attractive, sustainable, usable and durable and that it provides further benefits to the townscape and public amenity.

Land use including open space, green infrastructure and green belt

- P.5.96 The impact of the proposals on land uses and designations (as identified in the *Core Strategy* adopted 26 January 2011 and Saved *UDP* policies) was a key consideration in the site selection process and on-going design development. The Land use plan in Annex P illustrates the land uses of the site and its surroundings. At a regional/metropolitan level, the River Thames is designated as the River Thames and Tidal Tributaries Site of

- Importance for Nature Conservation and is part of the Blue Ribbon Network. It also forms part of the core CAZ.
- P.5.97 The assessment of potential effects on heritage designations, trees, protected views and archaeology are discussed in the Heritage subsection of this document.
- P.5.98 In respect of the Blue Ribbon Network, in developing the proposals for this site Thames Water had regard to the riverside location, local architectural references, long views of the riverside, and sought to improve access and the local character. The river terraces reference nearby projections such as Whitehall Stairs and Cleopatra's Needle and create new views. The proposed use has particular relevance to the context of the Victoria Embankment, as the works would upgrade the Bazalgette sewer system, which instigated the construction of Victoria Embankment, and provide public amenity.
- P.5.99 During construction, approximately 1.23ha of foreshore would be required for the cofferdam. This would reduce to 0.1 ha once the construction works are complete. The foreshore is currently inaccessible but this permanent land take would represent a loss of open space. However, the new area of publicly accessible open space to be created by the project would be a major benefit, albeit of a different character. The extent of the permanent works in the river has been reduced as far as practicable during construction and operation. Connecting the LLS (N) to the main tunnel would avoid the need for sites to intercept up to ten other CSOs along the northern embankment in central London.
- P.5.100 The use of a national cycle route and the Thames Path for sitting, walking and relaxation would be affected both directly and indirectly by the temporary works but measures to mitigate impacts are included in the CoCP Part B (Section 5). For example, the Thames Path diversions would be clearly signposted and use existing crossings, remain near to the riverside and run adjacent to Whitehall Gardens. The measures identified meet the criteria in the NPS (para. 4.8.24) and the impacts have been minimised as far as practicable taking into account their location in a mature urban environment as envisaged in the NPS.
- P.5.101 During construction, adverse amenity effects on the residents of nearby dwellings, institutions and open space users are not anticipated. The design of the operational structure in the foreshore would preserve the enjoyment of the public open space and Site of Importance for Nature Conservation at Whitehall Gardens/Embankment Gardens.
- P.5.102 Once the project is operational, the new area of public realm that would be created at Victoria Embankment Foreshore would provide space for sitting and relaxation and enjoying new views of the riverside as described in Good design subsection above. The new space would form part of the Thames Path and a wider regional network of open space, which would be a beneficial, direct and permanent impact of the project.
- P.5.103 The potential commercial use of one of the amenity kiosks at the edge of the public open space on the foreshore structure would be dependent on others bringing forward and obtaining the necessary consents for

operation. It is envisaged that one amenity kiosk would be located at the southern end and could operate as a café or similar, with a small area for tables and chairs on the southern corner of the embankment terrace in order to help activate the space. Due to the small size of the adjacent corner space, the kiosk would not form a destination or impact on amenity. The northern amenity kiosk would be used for storage/servicing. The amenity kiosks would be ancillary to the public realm, encourage use of the space and provide visual separation from the busy Victoria Embankment.

- P.5.104 The Tattershall Castle represents an existing use of part of the land and water within the site boundary. A replacement mooring is proposed as part of the works. This would be subject to obtaining appropriate operating and mooring/river works licenses, which cannot be included in the application. The mooring/river works license would be determined by the Port of London Authority based on the results of a navigational safety assessment. Any new or altered premises license would be obtained under the Licensing Act 2003. It might be possible to transfer the existing license since the address for the vessel is likely to remain unchanged and there may be no statutory grounds for refusing such a licence.
- P.5.105 Westminster City Council's advice in relation to the proposal to relocate the Tattershall Castle evolved over time. The council commented on earlier proposals for this site (letter dated 5 March 2010) that a key planning issue with the site would be the *"impact on mooring of Hispaniola and Tattershall Castle"*, which Thames Water sought to mitigate. In subsequent meetings and in response to phase two consultation, the council objected to the principle of relocating the Tattershall Castle upstream of the foreshore structure. In a meeting (16 May 2011), it also commented that inclusion of these works within the DCO would be inappropriate, preferring separate planning and Listed Building Consent applications to be made. Following Section 48 publicity, in a letter dated 4 October 2012, the council commented that any such designs *"should all form part of the Development Consent Order"*. Within its response to the *Draft DCO*, in a report in an e-mail dated 19 November 2012, it stated that *"a new location for the Tattershall Castle will have to be found outside the City of Westminster"*.
- P.5.106 English Heritage had concerns in relation to the mooring design and location, seeking to avoid impacts on views along Horse Guards Avenue.
- P.5.107 The Tattershall Castle is a former passenger ferry dating from 1934 and has been permanently moored in this location since 1984. It has been altered over time through various planning permissions granted by Westminster City Council including alterations to the bridge of the vessel, replacement of existing gangways and canopies, removal of the paddles and replacement of six windows with three larger windows in 2003. The works required a Listed Building Consent to change the gangway and its fixings to the listed embankment wall. In granting permission for these substantial improvements, the principle of the land use appears to be well established. The submissions for the 2003 permissions explained that the

application concerned a refit that would cost several million pounds and enable many more years of operation.

- P.5.108 *Core Strategy* Policy CS6 (Core CAZ), saved *UDP* Policy CENT 1 (The Central Activities Zone) and Blue Ribbon Network policy designations, as described in the Planning context subsection above, are relevant since they apply directly to this location. These policies and accompanying text confirm that uses supporting the use and enjoyment of the River Thames, water-dependent uses such as moorings, and waterfront-enhancing uses such as bars support these designations and their loss should be avoided. The relocation and permanent use of Tattershall Castle with an accessible mooring is supportive of these policy designations.
- P.5.109 As landowner of the embankment wall and licensing authority, Westminster City Council is able to exercise some controls over its use. The latest access agreement for the crossover of the wall is valid until 2029. The existence of a premises licence granted in 2007 is relevant in considering whether any amenity issues might arise. The current premises licence is non-expiring and allows for a capacity of 900 people and the serving of alcohol from 10am to 3am Monday to Saturday and from 12pm until 12am on Sunday. The economic contribution of this use is a material consideration since the business employs 20 to 40 people directly, with seasonal variations.
- P.5.110 Any new or altered premises license would be obtained under the Licensing Act 2003, although the existing license may be transferrable. In any event the only statutory grounds for refusing such a license are the grounds of the prevention of public nuisance, public safety, the prevention of crime and disorder and the protection of children from harm. Given that the vessel would only move a short distance and be no nearer to residential or other premises, the basis for judging the operating license is unlikely to change. In the event the licenses are refused, the works to construct the new mooring would not be implemented.
- P.5.111 It is considered from both on the facts of its operation and from the grant of various permissions and licenses in 1984 and subsequent years that the premises support the aspirations of the designated CAZ and the Blue Ribbon Network.
- P.5.112 Westminster City Council's objection to the principle of relocating the vessel a short distance upstream (or indeed anywhere within Westminster as noted within its response to the *Draft DCO*, report sent in e-mail 19 November 2012) does not refer to the CAZ designation. It mainly refers to saved *UDP* Policy RIV 8, which will be replaced by draft *City Management Plan* Policy 6.11 (Proposals for permanently moored vessels). This policy contains the same wording in respect of the principle of such proposals as Policy 7.45(iv) of the *District Plan* (both the version placed on deposit April 1978 and subsequently in 1982), namely that vessels must be of "*national importance, or having some special association with London or the Thames or some special maritime interest and whose external appearance is retained as far as possible in their original condition*". Since the Tattershall Castle was moored here in August 1982, it would have been granted planning permission at that time. It follows that the proposal

to moor this vessel at Victoria Embankment was granted planning permission in the context of the 1978 *District Plan* policy. In terms of the built heritage context, then as now the proposal was visible from the previous Hungerford footbridges and involved a crossing over the embankment wall (listed since 1970) within a conservation area (Government Precinct conservation area designated in 1969, subdivided into four conservation areas in 1987 including Whitehall). The *Hispaniola* has been moored nearby since 1974. The supporting text in the draft *City Management Plan* refers to inclusion on the National Register of Historic Ships as relevant and the vessel appears on this register. In summary, given the approval of the initial mooring of the vessel in 1981/2 against substantially the same built heritage and local policy context, a re-location nearby does not engage substantially new principles of local policy.

- P.5.113 A similar proposal involving relocating existing vessels nearby was accepted in recent years also to facilitate an infrastructure project. The officer's report (dated 5 March 1998) for the planning application for the replacement Hungerford footbridges in Westminster stated that construction may require the relocation of the *Hispaniola*. Subsequently, applications were granted enabling its nearby relocation for two and a half years. The officer's report for this application stated that *UDP* policy RIV 8 was not relevant. Furthermore an informative within the decision notice confirmed that the temporary relocation "*would not be construed by the City Council as an 'abandonment' of the permitted use under the planning Acts*" in order to affirm to the business that it could return to its previous site on completion of the works.
- P.5.114 The policy is clearly intended for proposals for additional vessels rather than the relocation of existing vessels. This is made explicit in the 'reasoned justification' in the *City Management Plan* for Policy 6.11, which states that the riverfront is a finite resource thus "*the number of permanently moored vessels must be limited*". The refusal at appeal for a permanently moored vessel a mile upstream at Victoria Tower Gardens on Millbank in 2004 was made for four reasons (effects of likely new signage on local character; introduction of a detrimental new use; lack of disabled access; flood risk and ecology) all of which stemmed from the fact it was additional and in an area of the river where no such use previously existed. None of these reasons arise with the proposal to relocate the Tattershall Castle.
- P.5.115 The principle of a temporary nearby relocation and a permanent location close to the existing is sound insofar as local policy designations and nearby land uses are concerned for the following reasons:
- a. The use of the vessel in this location is supported in CAZ and Blue Ribbon Network policy.
 - b. The vessel was granted planning permission in the context of very similar built heritage designations and local policy principles in respect of its significance and association with London as contained in current local policy.
 - c. Current local policy is demonstrably concerned with proposals for additional vessels rather than relocations.

- d. Several permissions have been granted for a significant refit and changes to the appearance of the vessel, along with on-going licenses for the use and the gangway. These supported and facilitated the continued use of the vessel for many years.
 - e. The relocation of the Hispaniola to facilitate the footbridge project was permitted without question of the principle of the use continuing at the nearby relocation site or abandonment of use at the original site.
- P.5.116 The NPS requires impacts on existing and proposed land uses near the proposed development site and potential conflicts with proposals to be considered in a development plan. It also states (para. 4.15.10) that the decision maker should have regard to potential socio-economic impacts that are both relevant and important. The decision maker is required to consider whether an adverse impact would be temporary or reversible within a reasonable timescale. In this case, it is both relevant and important to make reasonable proposals to relocate, rather than extinguish, a business operation that directly employs 20 to 40 people (varying by season). If the Tattershall Castle were not relocated nearby it would likely experience a significant decline in trade since it relies on its central London riverside location near transport hubs, tourist walking routes and attractions, which would impact on its viability.
- P.5.117 At present, publicly accessible boats are unusual in central London. The Queen Mary at Savoy Pier closed in 2009 and was in a lower footfall location. Savoy Pier is now the subject of redevelopment proposals for passenger services. Even quieter locations further from transport hubs, such as Lambeth or Grosvenor Embankment, would also not have sufficient footfall. The Hispaniola's mooring has good footfall but is in beneficial use and it is not likely that the mooring would accommodate the Tattershall Castle.
- P.5.118 The relocation is required to facilitate the timely construction of the project, which would have substantial benefits to the entire River Thames, the largest component of the Blue Ribbon Network in Westminster and Greater London. The scheme would increase the length, accessibility and enjoyment of the river frontage both at this site and project-wide.
- P.5.119 In accordance with para. 4.8.5 of the NPS, a review was undertaken to identify any major development projects nearby. At Victoria Embankment Foreshore there are no current proposals in the immediate vicinity that would change the land use around this site. No extant planning permissions, committed developments, or policy allocations for future development would be adversely impacted as a result of the works in this location.
- P.5.120 In conclusion, the creation of new high quality public realm and the relocation of an existing established central London activity, subject to careful siting and design, would be appropriate in relation to the NPS and the balance of local policy considerations. There would be a permanent loss of foreshore open space; however, this would be compensated by the creation of a new, high quality public realm, albeit of a different character. The permanent relocation of the business a short distance away and the

siting of the works to avoid impacts on other businesses are considered reasonable and appropriate mitigation in relation to land use impacts.

Noise and vibration

- P.5.121 The noise environment in the vicinity of the site is dominated by road traffic and rail noise. The nearest locations that are sensitive to noise and vibration are the residential dwellings at Whitehall Court across the highway, the park to the west of the site, and the bar/restaurant uses in the Tattershall Castle and Hispaniola.
- P.5.122 The *Environmental Statement* predicts (Vol 17, Section 9) no significant noise or vibration effects arising from construction or operation, except at the Tattershall Castle and the Hispaniola in the daytime during the first few months of construction, which would likely experience higher indoor noise levels than usually expected within a restaurant.
- P.5.123 The NPS recognises that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments and to lead to short-term noise disturbance during construction. In accordance with NPS policy, a series of measures to minimise noise emissions was embedded within the design, as detailed in the *CoCP*, including operating in accordance with best practice and optimising plant layout. With mitigation in place, significant adverse impacts on health and quality of life from noise would be avoided.
- P.5.124 Further bespoke measures would be required to address any significant noise effects during construction, which are set out in the *CoCP* Part B. The measures include the use of localised screens and enclosures to reduce noise from particularly loud, static operations and restricting barge loading/unloading to standard working hours.
- P.5.125 The owners of the Tattershall Castle and Hispaniola may be eligible to apply for compensation through the Thames Tideway Tunnel compensation programme (see Schedule 2 to the *Statement of Reasons*, which accompanies the application), which was established to address claims of exceptional hardship or disturbance. The compensation programme would be directed towards mitigation works or other required actions to reasonably reduce disturbance from noise.
- P.5.126 There would be no operational noise issues.

Historic environment

- P.5.127 The likely significant effects on heritage assets as a result of the construction and operation of the proposed development at this site were assessed and are presented in the *Heritage Statement* and the *Environmental Statement* (Vol 17, Section 7).
- P.5.128 The majority of the new infrastructure would be underground. The design parameters and principles for the remaining above-ground structures and landscaping were carefully developed to ensure that they would be sensitive to, and not adversely affect the setting of local heritage assets.

Listed buildings and structures

- P.5.129 The listed river wall was built in 1864/70 and forms part of Bazalgette's grand embankment scheme. It is of high heritage significance. The Tattershall Castle is on the National Historic Ships Register and is considered to be of some heritage significance.
- P.5.130 There are a number of heritage features in the vicinity, the closest of which are the Grade II listed Bazalgette Memorial from circa 1891 (high heritage significance) and Whitehall Gardens Grade II* registered park and garden (high heritage significance) on the opposite side of the carriageway. A number of other listed structures are situated nearby as described in the Site context subsection above. The site is within the Whitehall Conservation Area and forms part of the setting of the southern edge of the Savoy Conservation Area and the Palace of Westminster, Westminster Abbey and St Margaret's Church World Heritage Site, the boundary of which is 400m to the south.
- P.5.131 The NPS recognises that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments and to have adverse effects on built heritage. During construction, there would be a significant but temporary effect on the listed wall from the unavoidable temporary removal of the Grade II listed 'sturgeon' lamp standards, Grade II listed catenary lamp stands and the Grade II listed 'sphinx' benches. These elements would be reinstated as part of the landscape design wherever possible. Where the assets could not be used, they would be offered to Westminster City Council to be relocated. The necessary losses would be partly mitigated by a programme of photographic and/or standing structure recording as appropriate, ensuring that their significance can be appreciated by future generations in line with the *Overarching Archaeological Written Scheme of Investigation*, which accompanies the application. The residual effects would be negligible, with the exception of effects on the river wall, which would be significant.
- P.5.132 The parapet of the river wall would be locally dismantled (temporarily for the most part and permanently for a small section), which would constitute a significant effect. This would also impact on the character of the Whitehall Conservation Area. However, construction would have no significant effects on the setting of the World Heritage Site, the Savoy Conservation Area, Whitehall Gardens, the Tattershall Castle or the Hispaniola due to the distance or relative size of the construction activity and visual screening.
- P.5.133 It is proposed to relocate the mooring used by the Tattershall Castle to the south of its current location. During construction the mooring would be formed opposite Horse Guards Avenue and finally moved northwards to be closer to the proposed new river structure. This is to minimise the permanent effect on the views towards the river along Horse Guards Avenue. The new permanent mooring for the Tattershall Castle would pass over the listed river wall in order to avoid direct harm to the historic fabric. The mooring would be supported by a bank seat. There would be no overall significant effect on the setting of the listed river wall or the Whitehall Conservation Area from the works to relocate the mooring.

- P.5.134 The *Heritage Statement* states that during works, the listed embankment wall, sphinx benches and catenary lamp standards would be protected by a combination of barriers and working practices (as set out in the *CoCP*). Full details of the approach to be taken would be subject to a DCO Requirement.
- P.5.135 Once operational, it is unlikely that there would be significant effects on the historic character and appearance of Whitehall Conservation Area or the setting of the river wall and associated heritage assets, due to the high quality design and the scale of the foreshore structure. No mitigation over and above that already embedded in the design is possible given the foreshore location of the operational infrastructure.

Archaeology

- P.5.136 The site lies within the Saxon Lundenwic and Thorney Island Area of Special Archaeological Priority. All below-ground works during construction would potentially truncate or entirely remove any buried archaeological assets within the footprint of the works. The NPS recognises that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments and to have adverse effects on archaeology. In terms of effects on the character and setting of above-ground heritage assets, the peak construction phase would be Year 2, when the shaft would be under construction and cranes would be present at the site. Works could give rise to effects on palaeoenvironmental and post-medieval remains and there is high potential to disturb buried structures such as caissons associated with the construction of the Victoria Embankment. This would have a significant but unavoidable effect while constructing the connection to the LLS (N) within the wall.
- P.5.137 The desk-based study of the site suggested that no buried heritage assets of high significance are anticipated that might merit a mitigation strategy of permanent preservation *in situ*. The effects identified could be successfully mitigated by a suitable programme of archaeological investigation before and/or during construction, drawing on a range of techniques. This would achieve preservation by record in accordance with the *Overarching Archaeological Written Scheme of Investigation*. This would ensure that the findings contribute to an improved public understanding and appreciation of the significance of these aspects of London's past, and would mitigate any losses due to the proposed works. This would satisfy the criteria of para. 4.10.18 of the NPS.
- P.5.138 Further evaluation and mitigation would be carried out in accordance with a *Site-specific Archaeological Written Scheme of Investigation*, based on the principles in the *Overarching Archaeological Written Scheme of Investigation*, to ensure that the scope and methods of fieldwork are appropriate. The *Site-specific Archaeological Written Scheme of Investigation* would be submitted in accordance with a DCO Requirement.
- P.5.139 Site-specific measures incorporated in the *CoCP* Part B to mitigate construction effects include:
- a. hoarding on the western boundary increased from 2.4m to 3.6m, which would incorporate suitable art work and viewing windows

- b. a site-specific lighting plan
 - c. site areas to maintain two-way flow along Victoria Embankment and two lanes each way, except for short durations during utility diversions, with minimum lane widths of 3.25m (outer) and 3.0m (inner)
 - d. a *Site-specific Archaeological Written Scheme of Investigation* and a membrane to be installed between the river bed and back fill material to prevent contamination of habitat and preserve potential archaeology.
- P.5.140 The impact of the project works at this site would be minimised by the low massing of the foreshore structure, its high quality design, and by the form and materials of the above-ground structures, which would relate sensitively to the wider Victoria Embankment. While construction would have some negative impacts on heritage assets, none would amount to 'substantial harm'.
- P.5.141 In respect of the archaeology within the temporary and permanent sites, any adverse effects would be mitigated as necessary by pre-construction investigations, a watching brief, recording of affected areas, and monitoring of the effects of river scour, satisfies para. 4.10.14 in accordance with paras. 4.10.18 to 4.10.21 of the NPS.
- P.5.142 The negative effects on the fabric and settings of the heritage assets within and near the site would be minimised. In all cases, the effects would constitute less than substantial harm. The impact of the cofferdams, cranes and hoardings would also be low in overall heritage terms as they would temporary. The proposals were developed with the benefit of a thorough understanding of the significance, heritage status and characteristics of the site and its surroundings. The design was developed to enhance the setting in the long term.

Light

- P.5.143 The screening assessment in 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.
- P.5.144 The NPS requires the decision maker to be satisfied that all reasonable steps have been taken to minimise any detrimental impact on amenity from artificial light.
- P.5.145 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 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 *CoCP* to ensure that all reasonable steps would be taken to minimise detrimental impact on amenity resulting 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 effect on residential properties

during the construction period. The surrounding area is lit by street lighting and experiences light spill from surrounding buildings and the railway and footbridges, given its central London location. Visual receptors typically have limited sensitivity to additional lighting in the early evening.

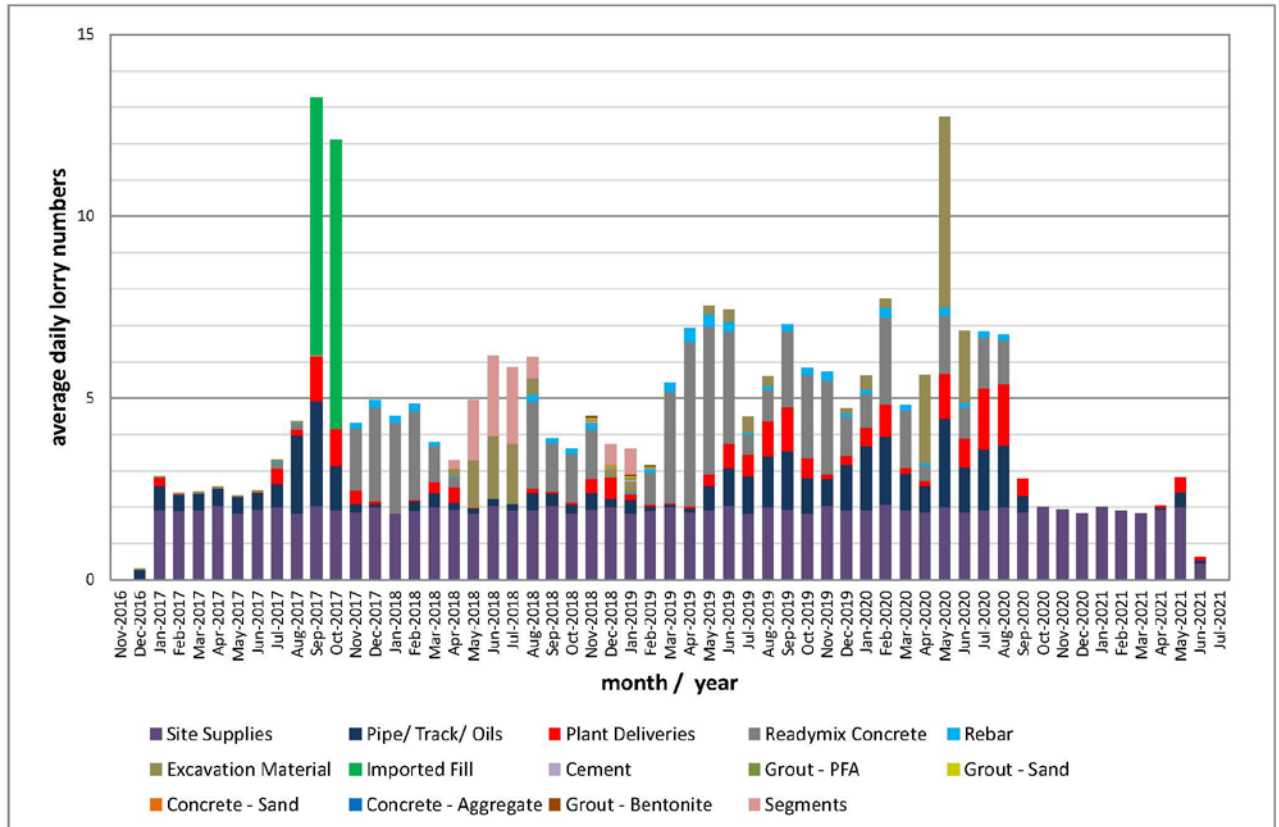
- P.5.146 During construction, the site would only be lit in the evenings in winter. There would be minimal spill of site lighting into the wider area due to the measures set out in the *CoCP*.
- P.5.147 Design principle VCTEF.07 states that the festoon lighting to Victoria Embankment shall be reinstated as far as possible and terminate on either side of the foreshore structure. An illustrative lighting design was developed for all lighting to the structure and is set out in the *Design and Access Statement*. Careful consideration was given to how the scheme might appear at night in its historic context, while ensuring accessibility and creating visual interest. The illustrative design was developed in line with the site-specific design objectives and the detailed design would comply with the scheme-wide design principles, which are all applicable at this site.
- P.5.148 In summary, all reasonable steps have been and would be taken to minimise any detrimental effects arising from the use of artificial lighting at the site.

Traffic and transport

- P.5.149 The *Transport Strategy*, which accompanies the application, sets out the overarching transport strategy for the project. The *Environmental Statement* (Vol 17, Section 12) and *Transport Assessment* (Vol 11) provide a robust assessment of the likely significant transport effects at this site during both the construction and operational phases and set out the mitigation measures.
- P.5.150 It is proposed to access this site directly off Victoria Embankment (A3211), which is part of the Transport for London Road Network.
- P.5.151 The site has excellent public transport accessibility: the Embankment London Underground station, Charing Cross National Rail Station and numerous bus routes are in close proximity. The Public Transport Accessibility Level of the site was calculated using Transport for London's approved methodology. The site has a Public Transport Accessibility Level rating of 6b, which is 'high' (1 is the lowest accessibility and 6b is the highest).
- P.5.152 There are car and motor cycle parking bays and an off-street car park in the area, and several coach parking bays along Victoria Embankment.
- P.5.153 During construction, vehicle movements would typically take place during normal working hours in accordance with the *CoCP* between 8am and 6pm on weekdays and from 8am to 1pm on Saturdays.
- P.5.154 Measures to reduce transport effects incorporated into the *CoCP* Part A include HGV management and control measures such as designated vehicle routes to sites for construction vehicles. The implementation of these measures was assumed for the assessment of construction effects.

P.5.155 During construction, the peak number of HGV movements would be 14 per day (28 two-way vehicle trips). Due to the location of the construction site in the foreshore it is intended that two-way traffic would be maintained throughout the construction period. There would be no adverse effect on road network operation and delay.

Figure P.16 Estimated construction lorry profile



P.5.156 The number of HGV movements would be comparatively low in the context of the strategic highway network. Highway layout changes and diversion routes would be required, which would be unlikely to result in delays or significant effects on road network operation, but would impact on coaches due to the suspension of the bays.

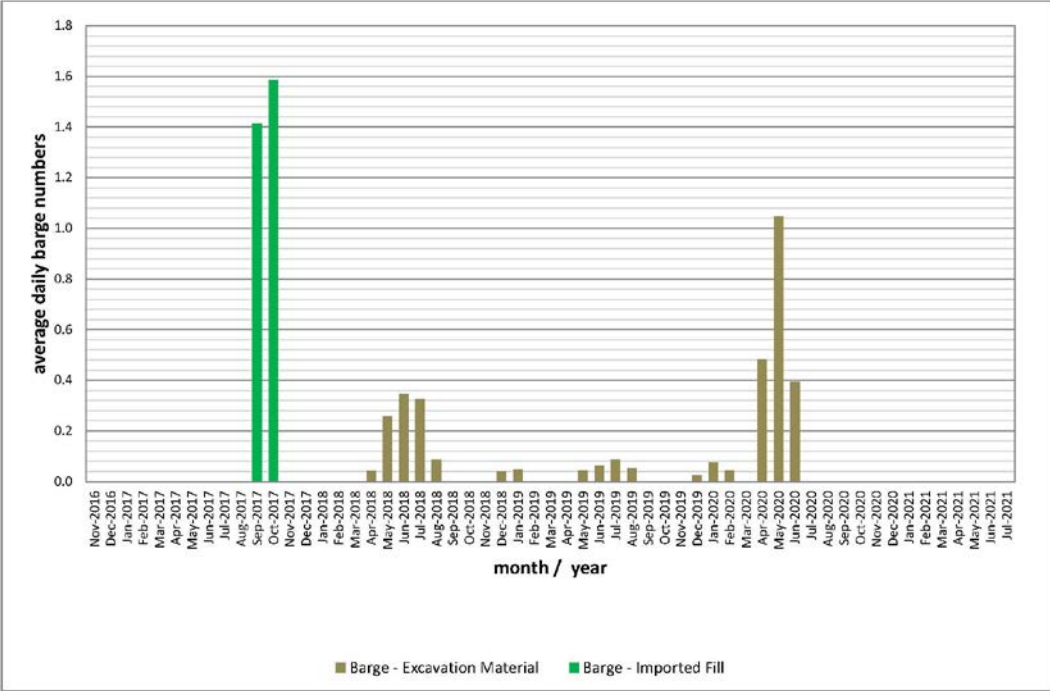
P.5.157 Effects on pedestrian facilities would be unavoidable given the site's location. The Thames Path would be diverted across the road using existing signalled crossings. There would not likely be any effects on amenity and safety for cyclists. The diverted route would be a short additional distance and would be clearly signposted to mitigate the effects on pedestrians.

P.5.158 The project was designed to limit the effects on the transport networks as far as possible. At this location, mitigation measures during the construction phase would include clear signage of diversions, traffic signal optimisation to improve pedestrian crossing time and junction capacity, and measures to ensure the frequency of bus services.

P.5.159 During construction, all excavated material would be removed from the site by barge; however, for the purposes of the *Transport Assessment*, a

minimum of 90 per cent was assumed to allow some flexibility to use road when river transport is unsuitable or unavailable. This is in line with para. 4.13.10 of the NPS, which seeks water-borne transport over road transport where cost-effective.

Figure P.17 Estimated construction barge profile



P.5.160 The peak number of barge movements would occur within Year 1 of construction and would be an average of four barge movements per day. Each barge would remove approximately 55 lorries from the road network. The impact of the additional barges on river navigation in the vicinity of the site would not be significant. A navigational risk assessment was undertaken for this site, which was discussed with the Port of London Authority, and is presented in the *Navigational Issues and Preliminary Risk Assessment*, which accompanies the application.

- P.5.161 In addition to the general transport measures within the *CoCP*, the following site-specific measures are incorporated into the *CoCP* Part B:
- a. Vehicular construction access to the site would be from Victoria Embankment with left turn into the site and a left turn out.
 - b. Site areas would be designed to maintain two-way traffic flow on Victoria Embankment.
 - c. Construction works would maintain two lanes on both carriageways, except for short durations during utility diversions where only one lane of the westbound carriageway would be open.
 - d. Coach parking would be suspended to enable the full use of traffic lanes on the westbound carriageway. Re-provision of parking spaces on Albert Embankment between Tinworth Street and Black Prince

Road. Coach parking to be removed only after alternate provision is in place.

- e. A suitable central safety barrier would be installed between alternative direction lanes.

- P.5.162 The transport demands in the operational phase would be extremely low and limited to occasional maintenance visits every three to six months and every ten years, which would require larger cranes to enable access to the CSO drop shaft. The occasional suspension of up to two on-street coach parking spaces would be required to enable maintenance vehicles to enter the site, which would not have a significant effect on coach parking in the area. No mitigation would be required during the operational phase.
- P.5.163 Once operational, there would be a benefit to pedestrians using the Thames Path from the gain in public space and extended pavement.
- P.5.164 The proposed transport mitigation measures would reduce transport impacts from construction traffic as far as possible, in accordance with the requirements of the NPS. The residual impacts would be an unavoidable consequence of the location of the CSO. The permanent operation of the scheme would have negligible vehicle impacts from maintenance access a few times each year and on-going beneficial impacts from extending and improving the quality of the Thames Path.

Waste management

- P.5.165 The waste strategy set out in the *Environmental Statement* was developed to provide a framework for the management of materials and waste generated throughout the construction and operational phases. No particular waste issues would arise at this site.

Socio-economic

- P.5.166 The project-wide socio-economic benefits of the project are detailed in the route-wide section of this document. The site-specific socio-economic assessment, reported in the *Environmental Statement*, is summarised below.
- P.5.167 The site and surrounding area is well used for walking, cycling, sightseeing by tourists and pub/restaurant uses at the Tattershall Castle and Hispaniola.
- P.5.168 During construction, there would be no significant effects on the amenity of users of the permanently moored vessels, the Thames Path or Whitehall Gardens.
- P.5.169 Once operational, there would be a benefit from the gain in public space associated with the extension of the Thames Path.
- P.5.170 If the Tattershall Castle were not relocated during construction and operation, or relocated some distance away, there would be significant socio-economic impacts from the loss of employment and daytime and night-time activity.
- P.5.171 The Tattershall Castle is one of very few venues to drink and eat 'on the water' in central London, and provides good river views and the

experience of being on a boat. Such a use is consistent with CAZ and Blue Ribbon Network designations as evidenced by the various planning applications granted to refit the vessel. It is a popular and well-established business that directly employs 20 to 40 people and has no undue amenity impacts as evidenced in its planning and licensing history, described in the Planning context and Land use subsections above.

- P.5.172 The planning consideration to minimise direct impacts on an existing business within the site is considered important and relevant and consistent with other planning objectives. This issue was raised by stakeholders at several points in the pre-application engagement process. The “*impact on the mooring of Hispaniola and Tattershall Castle*” was the first of eight “*site specific issues*” raised by the Westminster City Council about this proposed worksite in a letter in 2010. The Port of London Authority and the Greater London Authority both raised it at phase one consultation. The Greater London Authority also highlighted “*the need to relocate businesses, both on a temporary and permanent basis*” as a strategic issue at Section 48 publicity.
- P.5.173 Thames Water sought to identify a practicable form of mitigation for this impact through appropriate engagement with stakeholders and landowners. In meetings with the owners of the Tattershall Castle, it was established that a high footfall location is required for its permanent location and the established location is well known. Due to the footfall requirement and the disruption from a long move, the vessel should be moved as short a distance as practicable.
- P.5.174 In accordance with the NPS, the *Equalities Impact Assessment*, which accompanies the application, describes the demographics of the surrounding area and assesses whether a disproportionate population from equalities groups would be affected by the generic impacts associated with the project, including air emissions, flood risk, noise and vibration. The assessment also outlines the impact on people who live, work or own businesses in the vicinity that may be displaced as a result of the project.
- P.5.175 The potential significant equalities impact at this site would be the differential impact on older people arising from the temporary diversion of the Thames Path, since older people form a large part of the population nearby. All other identified potential impacts are considered proportionate. Impacts would be mitigated by clear signage and use of existing safe road crossings. The accessibility of the crossings was audited and the length of the diversion minimised.
- P.5.176 The socio-economic baseline in the locality, the likely socio-economic impacts, and their application to particular equalities groups were identified and minimised by means of good design. The distance of the necessary relocation of the Tattershall Castle was minimised and a new improved permanent access would be provided.

P.6 Overall conclusions

- P.6.1 The need for the project is established at the national level in the NPS. In an average year, the Regent Street CSO discharges approximately 22,000m³ of untreated sewage into the tidal Thames at Victoria Embankment Foreshore. Connecting to the LLS (N) to control this CSO is estimated to prevent all of these flows of untreated sewage and would help to substantially reduce flows from other CSOs along the northern embankment.
- P.6.2 The reduction of discharges from the Regent Street CSO would significantly improve the water quality in the tidal Thames in this location and have associated benefits for water quality, ecology, and amenity. The project would also help reduce health risks to river users and reduce the amount of sewage derived litter. The project would reduce the estimated discharges from this CSO to zero.
- P.6.3 In addition, up to ten other CSOs along the northern embankment in Kensington and Chelsea and Westminster would be controlled by the overflow weirs along the LLS (N) at this site and at Chelsea Embankment Foreshore and Blackfriars Embankment Foreshore. Through good engineering design, the project would therefore reduce discharges from these CSOs from current levels of over two million m³ per year by an estimated 88 per cent. It would also avoid the inevitable construction, traffic and other disruption from additional worksites.
- P.6.4 Due to the position of the Regent Street CSO, the site needs to be in this location, which is a historic and high quality section of the embankment that features heritage assets of national importance. There would inevitably be some disturbance during the four-year construction period; however, through sensitive design and mitigation (where required) Thames Water sought to minimise any disturbance in accordance with the criteria of the NPS and with regard to relevant local policy designations.
- P.6.5 During construction some unavoidable effects such as loss of river habitat, visual effects on heritage assets, landscape and views are anticipated given the prominent location on the riverside. The site area has been minimised as far as possible, and the effects would be temporary and typical of a busy urban context. Where possible, project-wide (CoCP Part A) and site-specific (CoCP Part B) mitigation measures were developed.
- P.6.6 The legacy of the project in this location would be substantial, including the new high quality area of public realm providing a new view point of the surrounding built heritage and near views of the River Thames. This would benefit Londoners and the high numbers of visitors to Victoria Embankment.
- P.6.7 Thames Water undertook close and continual engagement with stakeholders including Westminster City Council, the Design Council CABI and English Heritage. An indicative level of design detail was agreed, along with a set of requirements and design principles. Valuable contributions by these and other stakeholders contributed to the evolution of the design. There is a high level of commitment to the indicative design

detail at this site among stakeholders, and a consensus that the design would deliver a high quality, successful outcome.

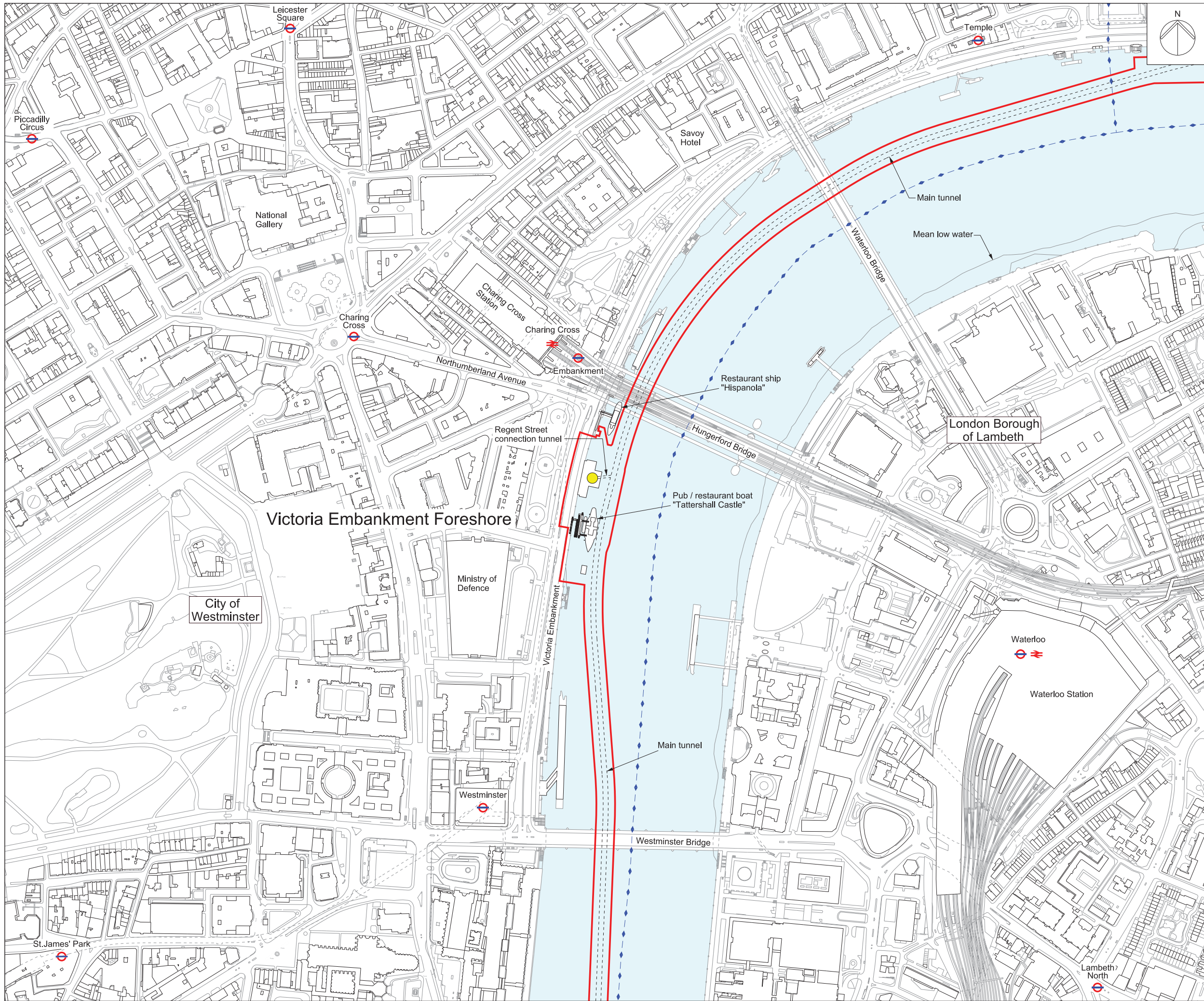
- P.6.8 Through careful engineering design of the below-ground structures and the range of approaches to architecture and landscaping, every effort has been made to minimise any adverse impacts. The foreshore structure was designed to reference and respect Victoria Embankment's original function as part of the Bazalgette sewerage system. The permanent works were carefully designed to be both attractive and accessible, with formal stone river walls, ramps and steps to the new foreshore structure, and the creation of a varied and flexible arrangement of new spaces from which to enjoy views of built heritage and the River Thames. The design took account of pre-application engagement and would increase the amount, accessibility and enjoyment of the riverside in line with the CAZ, conservation area and Blue Ribbon Network designations of the site.
- P.6.9 The relocation of the existing business within the site to a nearby location would be required to facilitate the project and to avoid inevitable significant socio-economic impacts. Through engagement with landowners and stakeholders it was possible to avoid impacting the Hispaniola directly. It was also possible to move the Tattershall Castle to a suitable site a short distance to the south by removing an existing service mooring and providing the Tattershall Castle with a more accessible and attractive mooring design. This would not result in additional impacts on heritage, views or amenity. The principle of the use is well established and is demonstrably a core central London activity.
- P.6.10 There would be some residual temporary construction impacts on the Thames Path and views of the embankment, and temporary and permanent effects on the listed river wall. These impacts would be unavoidable and are the subject of practical and feasible mitigation measures.
- P.6.11 The proposed works at Victoria Embankment Foreshore, 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 taken to enhance the local environment and leave a positive legacy.
- P.6.12 Section 8 of the *Planning Statement* considers the implications of the local effects of the works at Victoria Embankment 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 Victoria Embankment Foreshore, and the project as a whole, are compliant with the NPS and that development consent should be granted.

Annex P: Drawings for Victoria Embankment Foreshore

List of drawings

- Victoria Embankment Foreshore: Location plan
- Victoria Embankment Foreshore: As existing site features plan
- Victoria Embankment Foreshore: Construction phases plans
- Victoria Embankment Foreshore: Land use plan

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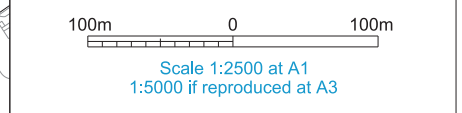


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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

Notes:

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



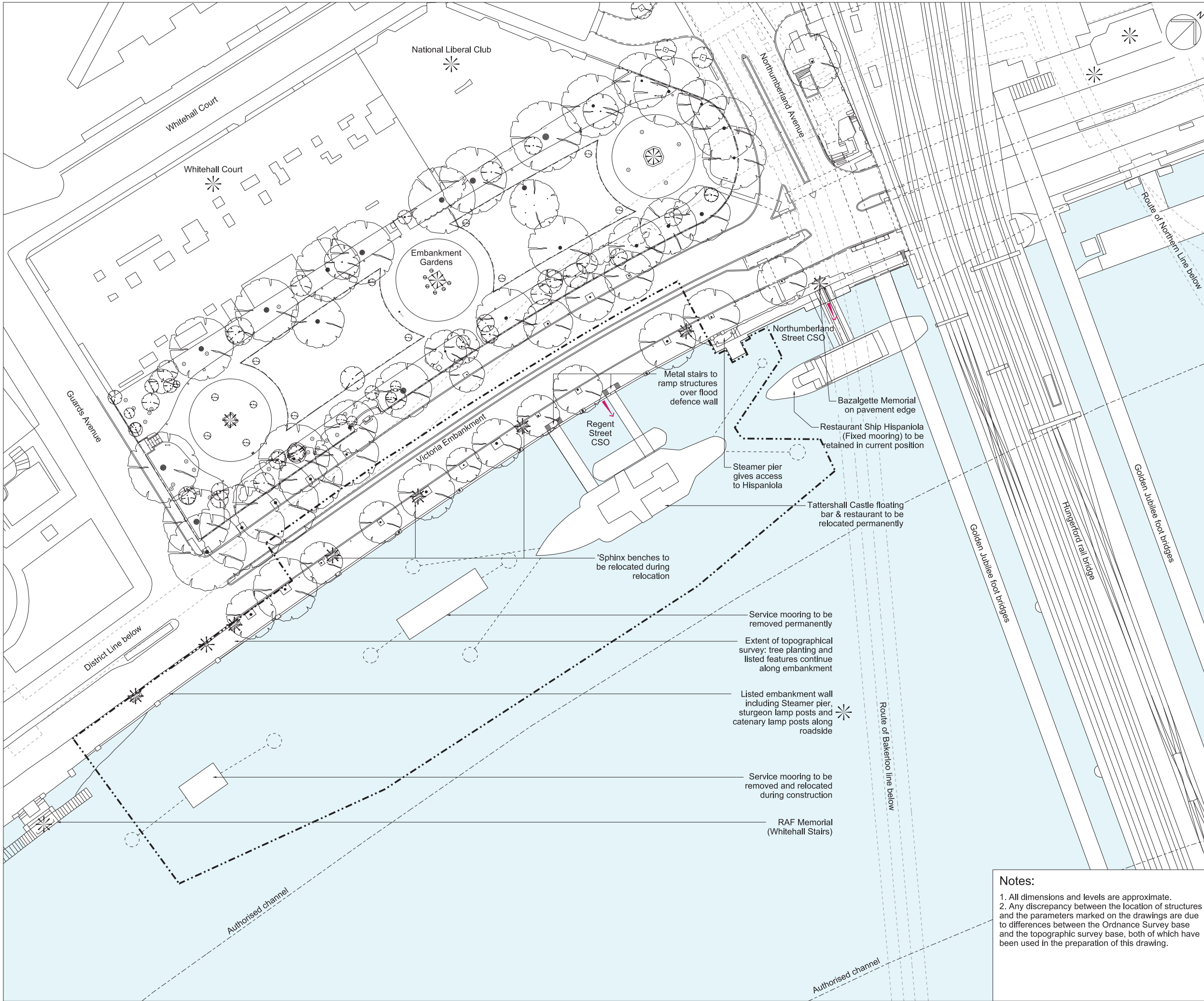
FOR INFORMATION

Location
Victoria Embankment Foreshore
City of Westminster

Document Information
Application for Development Consent
Location plan

Book of plans - section 18
DCO-PP-16X-VCTEF-180001
January 2013



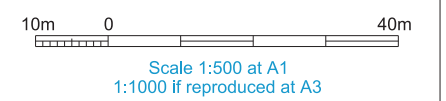


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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



FOR INFORMATION

Location
Victoria Embankment Foreshore
City of Westminster

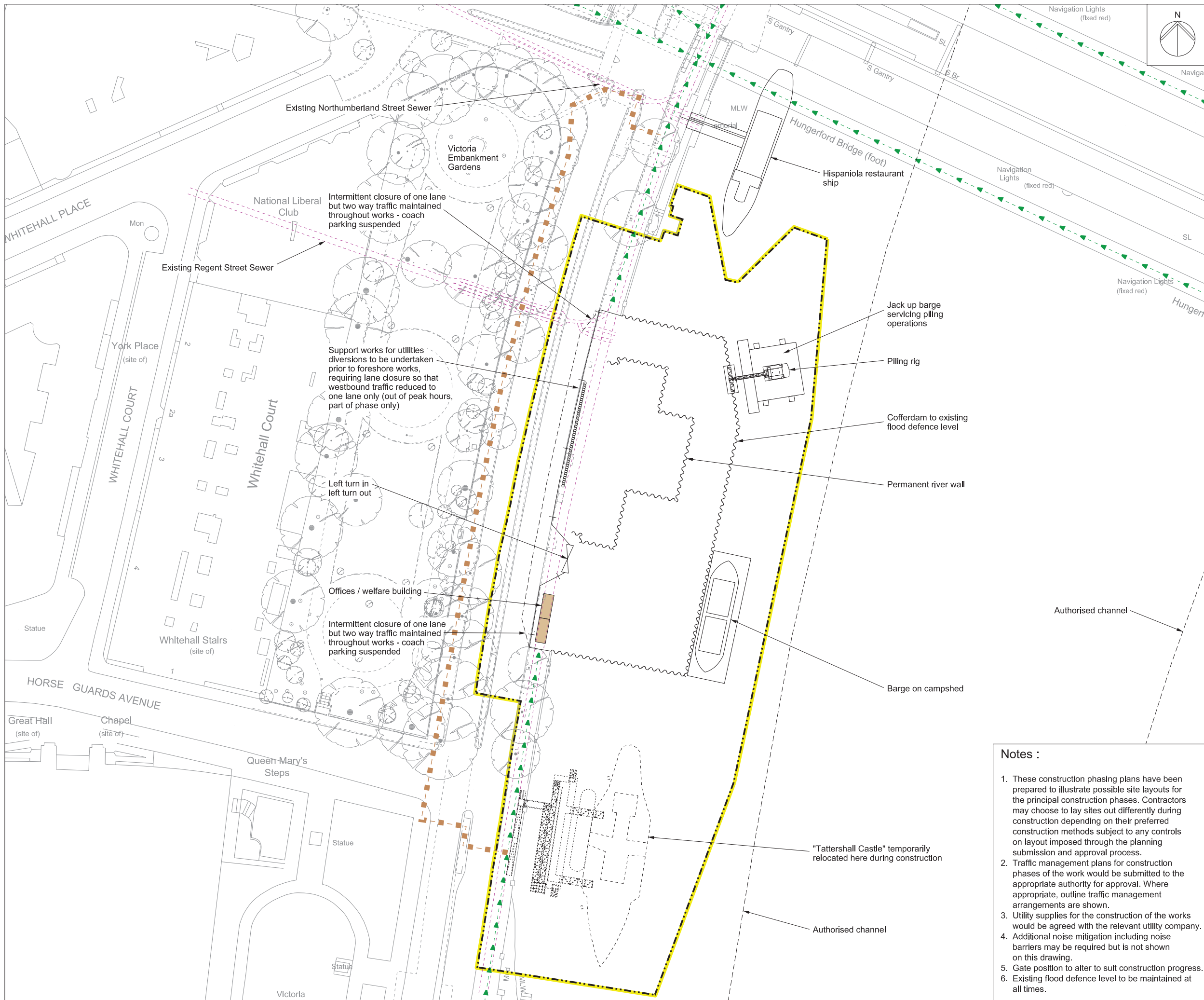
Document Information
Application for Development Consent

As existing
Site features plan
Book of plans - section 18
DCO-PP-16X-VCTEF-180002
January 2013



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.



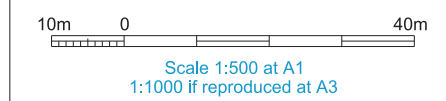
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Keyplan:
This drawing

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
- Secant piles installed



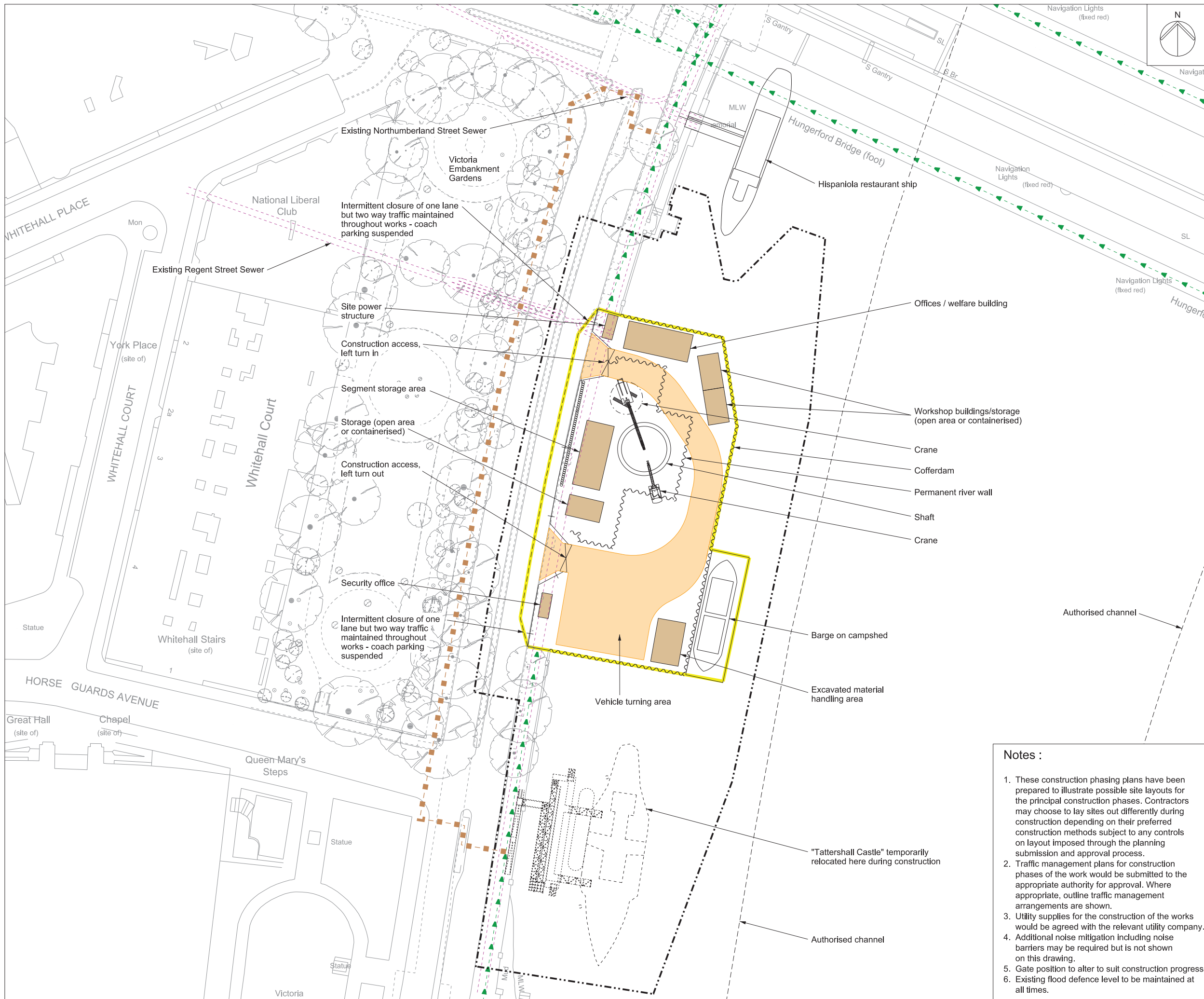
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed 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 level to be maintained at all times.

ILLUSTRATIVE

Location
Victoria Embankment Foreshore
City of Westminster

Document Information
Application for Development Consent
Construction phases - phase 1
Site setup
Book of plans - section 18
DCO-PP-16X-VCTEF-180028
January 2013





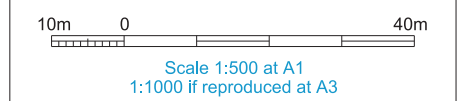
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Keyplan:
This drawing

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
- Access / haul route
- - - Existing sewers
- ~ Sheet piles
- o Secant piles installed



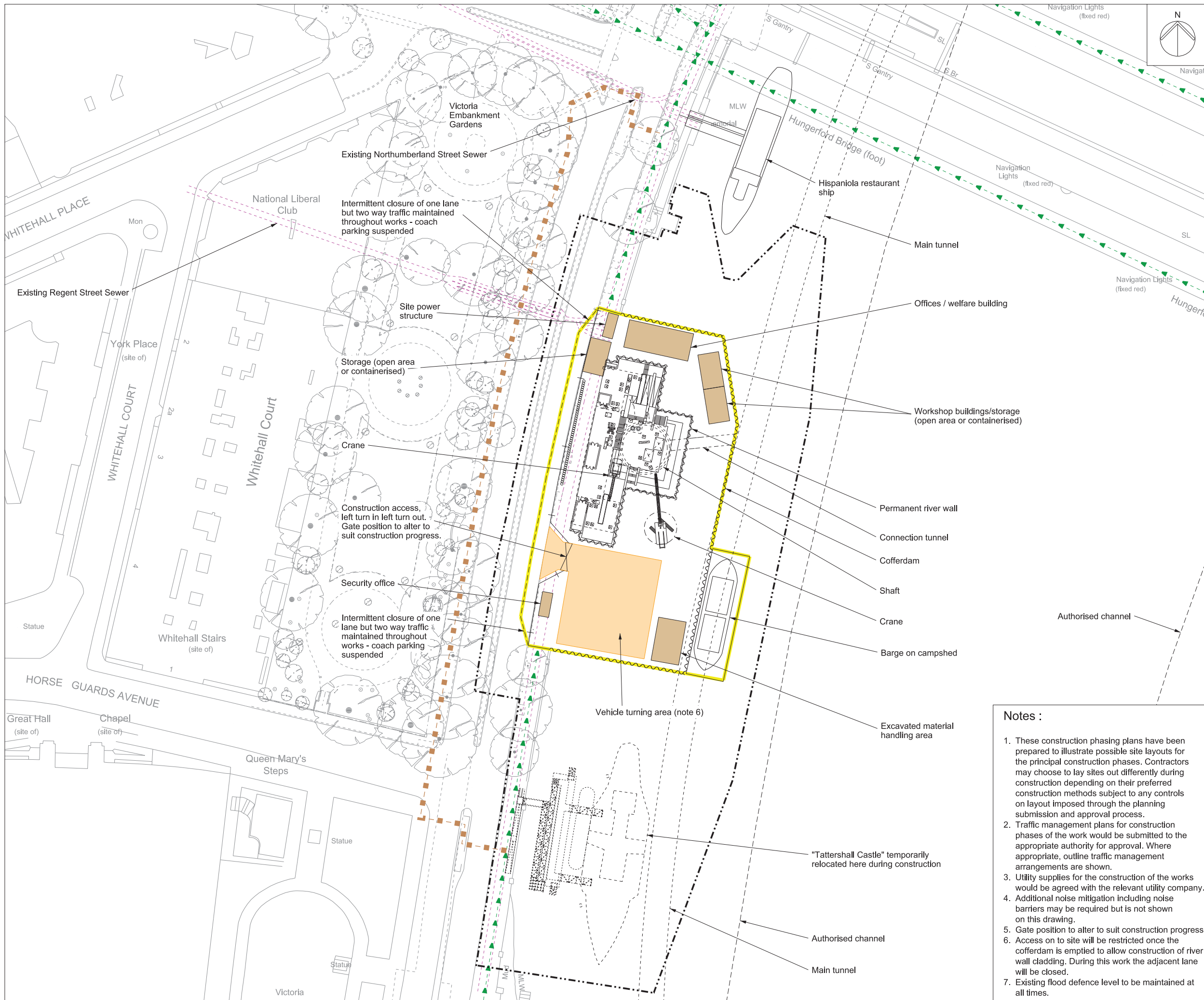
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed 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 level to be maintained at all times.

ILLUSTRATIVE

Location
Victoria Embankment Foreshore
City of Westminster

Document Information
Application for Development Consent
Construction phases - phase 2
Shaft construction and tunnelling
Book of plans - section 18
DCO-PP-16X-VCTEF-180029
January 2013





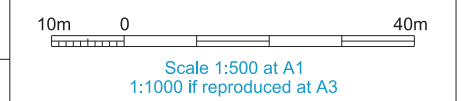
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Keyplan:
This drawing

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
	Access / haul route
	Existing sewers
	Sheet piles
	Secant piles installed



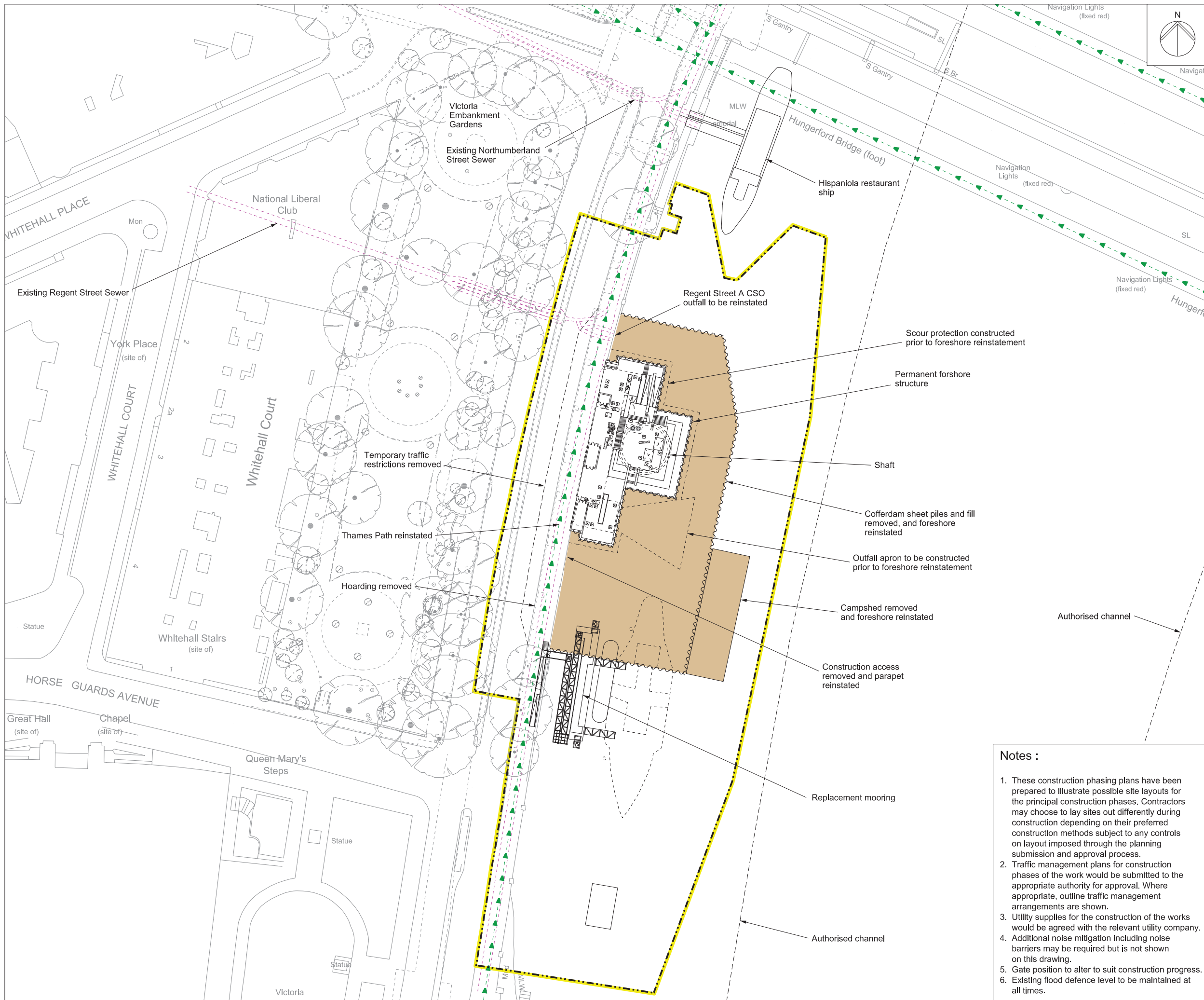
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed 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. Access on to site will be restricted once the cofferdam is emptied to allow construction of river wall cladding. During this work the adjacent lane will be closed.
 7. Existing flood defence level to be maintained at all times.

ILLUSTRATIVE

Location
Victoria Embankment Foreshore
City of Westminster

Document Information
Application for Development Consent
Construction phases - phase 3
Construction of other structures
Book of plans - section 18
DCO-PP-16X-VCTEF-180030
January 2013





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

10m 0 40m
Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Victoria Embankment Foreshore
City of Westminster

Document Information
Application for Development Consent
Construction phases - phase 4
Site demobilisation
Book of plans - section 18
DCO-PP-16X-VCTEF-180031
January 2013

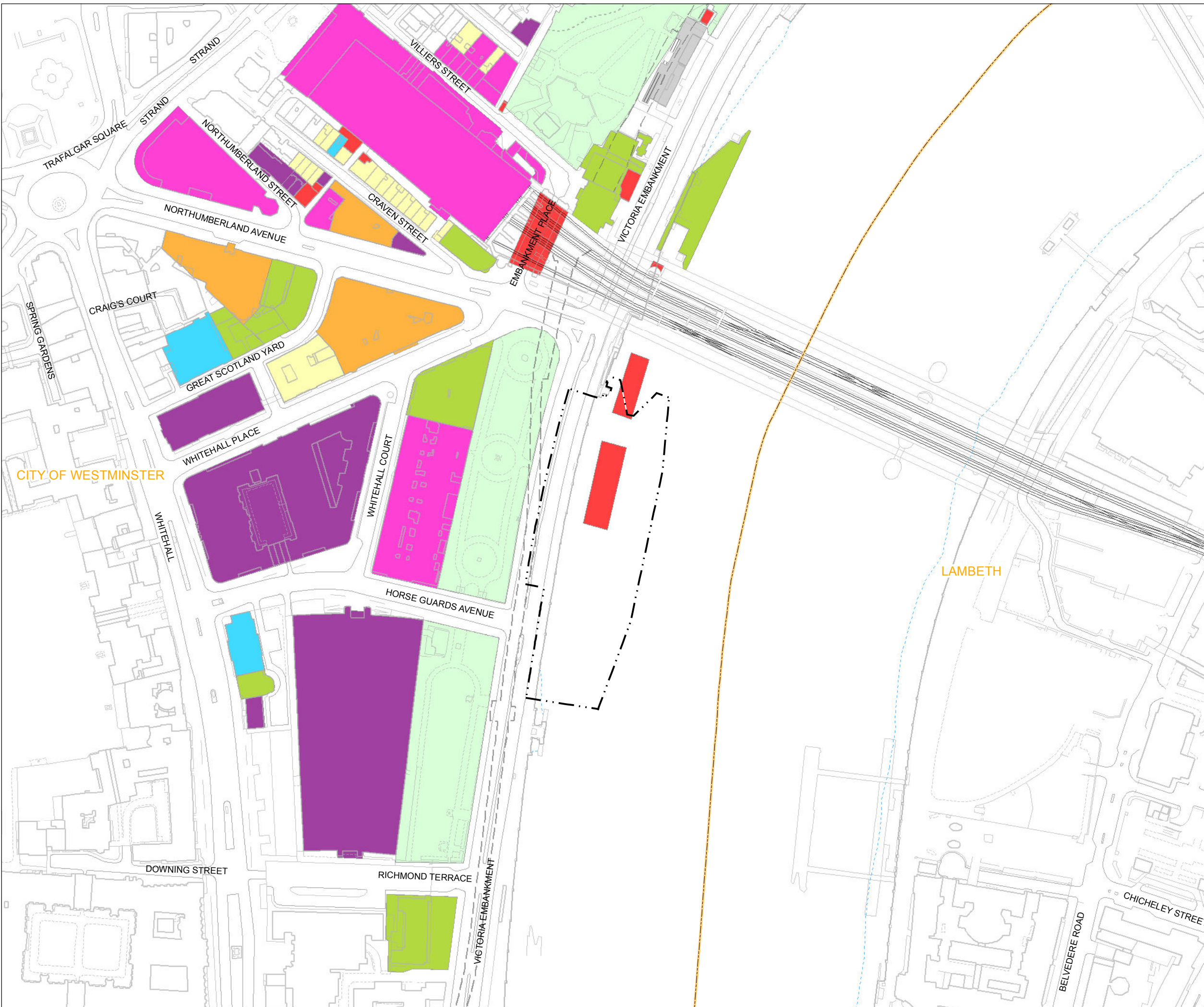
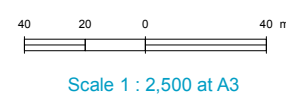


- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed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

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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 B2-B8 (General Industrial / Storage or Distribution)
 - Class C1 (Hotels)
 - Class C3-C4 (Dwelling Houses)
 - Class D1-D2 (Non Residential Institutions (Community Facilities) and Assembly and Leisure)
 - Mixed Use
 - Other
 - Open Space



FOR INFORMATION

Location
Victoria Embankment Foreshore
 City of Westminster

Document Information
Planning Statement
 Land use

1PL03-MG-00823
 January 2013



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