

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix T

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 T: King Edward Memorial Park Foreshore

List of contents

	Page number
T.1 Introduction	1
T.2 Site description	1
T.3 Planning context	3
T.4 Description of development	4
Overview	4
Application for development consent	5
Construction	6
Site set-up	8
Shaft construction	9
Tunnel works	10
Secondary lining of shaft	10
Construction of other structures	10
Completion of works and site restoration	11
Operation	12
CSO drop shaft	12
Chambers and culverts	12
River wall	12
Ventilation structures	12
Electrical and control kiosk	13
Permanent restoration and landscaping	13
Access and movement	14
Typical maintenance regime	14
Scheme development	15
T.5 Site-specific planning considerations	19
Meeting the need	19
Good design	20
Minimise encroachment in the foreshore	22
Minimise temporary construction impacts on the park	22
Sensitive design to reflect the park and riverside setting	24

Enhance the setting of local heritage assets	24
Provide a permanent beneficial addition to the park	25
Conclusions.....	25
Water quality and resources.....	26
Flood risk	26
Air quality, emissions, dust and odour.....	28
Biodiversity and geological conservation	29
Landscape and visual impacts	30
Land use including open space, green infrastructure and green belt.....	31
Noise and vibration	34
Historic environment	35
Light.....	36
Traffic and transport.....	37
Waste management.....	40
Socio-economic.....	40
T.6 Overall conclusions	41
Annex T.1: Consideration of alternative sites	45
Annex T.2: Drawings for King Edward Memorial Park Foreshore.....	49

List of figures

	Page number
Figure T.1 Aerial photograph of King Edward Memorial Park Foreshore	2
Figure T.2 Visualisation of King Edward Memorial Park Foreshore.....	5
Figure T.3 Construction timeline.....	7
Figure T.4 Functional components diagram	11
Figure T.5 Visualisation of phase one consultation design	15
Figure T.6 Visualisation of phase two consultation design	17
Figure T.7 Estimated construction barge histogram	38
Figure T.8 Estimated construction HGV histogram.....	39

List of tables

	Page number
Table T.1 King Edward Memorial Park: Drawings that define the proposed development.....	5

Appendix T: King Edward Memorial Park Foreshore

T.1 Introduction

- T.1.1 In an average year, the North East Storm Relief Sewer combined sewer overflow (CSO) discharges approximately 782,000m³ of untreated sewage into the River Thames in front of King Edward Memorial Park in the London Borough of Tower Hamlets. The CSO discharges approximately 31 times a year and releases 200 tonnes of sewage derived litter.
- T.1.2 A worksite is required to connect the North East Storm Relief Sewer CSO to the main tunnel. The proposed development site is known as King Edward Memorial Park Foreshore, which is located in the London Borough of Tower Hamlets. The location of the site is illustrated in Annex T.
- T.1.3 This assessment is structured as follows:
- Section T.2 provides a brief description of the King Edward Memorial Park Foreshore site.
 - Section T.3 sets out the planning context for works in this location.
 - Section T.4 describes the site-specific development for which consent is sought and how the proposals evolved through consultation.
 - Section T.5 analyses the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
 - Section T.6 provides an overall conclusion of the site-specific assessment for the proposed works at the site.

T.2 Site description

- T.2.1 The proposed development site comprises the foreshore of the River Thames adjacent to King Edward Memorial Park and an area in the south of the park, including hard-surfaced sections of the Thames Path, an area of green space, and part of the multipurpose sports pitches to the west. An aerial photograph of the site is provided in Figure T.1 overleaf.
- T.2.2 The site is bounded by King Edward Memorial Park and The Highway to the north, the residential Free Trade Wharf building to the east, the River Thames to the south, and by the Shadwell Basin Outdoor Activity Centre and Glamis Road to the west. There is an existing jetty and decking in the river adjacent to the Free Trade Wharf to the east.
- T.2.3 The North East Storm Relief sewer runs beneath park in a southeasterly direction and discharges into the River Thames through the river wall. The CSO point is marked by three large openings in the river wall. The foreshore in this location is exposed when the tide is low, with a mean low water mark some 30m from the river wall. The River Thames in this location is characterised by a wide expanse of water, moored and passing vessels, and piers and structures situated in-river.

Figure T.1 Aerial photograph of King Edward Memorial Park Foreshore



- T.2.4 The Rotherhithe Tunnel passes beneath the park in a northeasterly direction and emerges in Limehouse. The presence of this road tunnel is marked by the ventilation building in the southern portion of the park, close to the river wall.
- T.2.5 King Edward Memorial Park is a well-maintained recreational area that comprises large grassed areas, pedestrian paths, mature trees, the King Edward memorial, a multipurpose sports pitch, tennis courts, a bowling green, a children's play area, a bandstand and large paved seating areas – some facing the river and some near the memorial, alongside The Highway.
- T.2.6 The multipurpose sports pitch, located in the western portion of the park, comprises a rectangular hard surfaced pitch delineated for a range of sports including football and surrounded by a high wire mesh fence. Two hard surface tennis courts are located immediately to the north of the multipurpose sports pitch, and a further two courts are located to the east. A park maintenance facility and Trees for Cities maintenance depot are also located to the east of the multipurpose sports pitch.
- T.2.7 The eastern part of the park, closest to Free Trade Wharf building, is locally designated as a wildlife area and is planted as a wildflower meadow. The park is a designated public open space.
- T.2.8 During park opening hours, the Thames Path runs through the park from Free Trade Wharf in the east along the river frontage, past the Rotherhithe Tunnel ventilation building, through a narrow alleyway and exits the park at Glamis Road in the west. Outside of park opening hours, an alternative Thames Path route is available along Glamis Road and The Highway.

T.2.9 Shadwell Basin Outdoor Activity Centre to the west is a community facility for all ages that makes use of the Shadwell Basin and River Thames. Also to the west, within the same complex as the activity centre, is the Pier Head Montessori Preparatory School. The area around Glamis Road is primarily residential and includes St Paul's Church.

T.2.10 The key features of the site are illustrated in Annex T.

T.3 Planning context

T.3.1 In developing the proposals and mitigation measures for the development at King Edward Memorial Park Foreshore Thames Water¹ had regard to the policies set out in the National Policy Statement for Waste Water (the 'NPS') and to local development plan designations where they are relevant to the application.

T.3.2 In this case, the local development plan comprises the *London Plan* (2011), the London Borough of Tower Hamlets' *Core Strategy* (April 2012), saved policies from the council's *Unitary Development Plan* (2007), and saved policies from the council's *Core Strategy and Development Control Plan Interim Planning Guidance* (2007).

T.3.3 The council has also submitted a draft *Managing Development* Development Plan Document (May 2012) for examination. Once adopted, this document will replace the saved policies from the *Unitary Development Plan* and *Interim Planning Guidance*. It is expected to be adopted in early 2013.

T.3.4 Planning of the King Edward Memorial Park began in 1910; however, it was not opened to the public until 1922. The North East Storm Relief Sewer outlet was incorporated into the embankment wall during the 1920s.

T.3.5 *Core Strategy* Policy SP04 provides the council's explicit support for the development of the project, and associated storm relief connections.

T.3.6 The site is partially within the River Thames, which is designated as part of the strategic Thames Policy Area and Blue Ribbon Network in the *London Plan*.

T.3.7 The site falls within the Wapping Wall Conservation Area and within an archaeological priority area.

T.3.8 The park is a designated public open space and the foreshore forms part of a Site of Metropolitan Importance for Nature Conservation. The Thames Path, a designated strategic riverside walkway runs along the southern boundary of the park.

T.3.9 There are a number of listed structures in proximity to the site. The Grade II listed, early 20th century Rotherhithe Tunnel ventilation building lies within the park, and Grade II listed steps lie approximately 35m to the west of the site.

¹ 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.

- T.3.10 No planning applications for the site were submitted within the last five years although there were planning applications relating to other areas in the park as set out below. An application was submitted for an advertisement hoarding within King Edward Memorial Park (Tower Hamlets planning application number PA/09/01273) but this was subsequently refused. Planning application PA/06/00959 and listed building consent application PA/06/00960 for the installation of a roof on the listed Rotherhithe Tunnel ventilation building were approved by the council and implemented in full.
- T.3.11 There are no extant planning permissions or pending applications, within the site boundary or its immediate vicinity.

T.4 Description of development

Overview

- T.4.1 The proposed development at King Edward Memorial Park Foreshore would intercept the existing North East Storm Relief CSO. A cofferdam area would be constructed in the foreshore in front of the park to provide a construction platform on which to build a CSO drop shaft. The base of the CSO drop shaft would be connected to the main tunnel. Flows from the existing North East Storm Relief Sewer would be diverted via an interception chamber into the shaft and then conveyed into the main tunnel.
- T.4.2 The works plan for this site, included in the *Book of Plans*, shows the main tunnel (Work No. 1d) and the King Edward Memorial Park Foreshore CSO drop shaft (Work No. 24a). Work No. 24b is the King Edward Memorial Park Foreshore associated development, namely works to intercept and divert from the CSO to the drop shaft.
- T.4.3 Figure T.2 overleaf provides a visualisation of the illustrative proposals at King Edward Memorial Park Foreshore.

Figure T.2 Visualisation of King Edward Memorial Park Foreshore



Application for development consent

T.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 (LLAU) and the Site works parameter plan, included in the *Book of Plans*, which defines the zones within which specific elements of the proposals would be located. Table T.1 below lists the relevant application drawings and their status.

Table T.1 King Edward Memorial Park: Drawings that define the proposed development

Drawing title	Status	Location
Proposed schedule of works	For approval	Schedule 1 to the <i>Draft Thames Water Utilities Limited (Thames Tideway Tunnel) Development Consent Order</i> (the 'Draft DCO')
Access plan	For approval	<i>Book of Plans</i> , Vol 13, Section 25
Demolition and site clearance	For approval	<i>Book of Plans</i> , Vol 13, Section 25
Site works parameter plan	For approval	<i>Book of Plans</i> , Vol 13, Section 25
Permanent works layout	Illustrative	<i>Book of Plans</i> , Vol 13, Section 25
Proposed landscape plan: Overall	Illustrative except the above-ground structures, which	<i>Book of Plans</i> , Vol 13, Section 25

Drawing title	Status	Location
	are indicative	
Proposed landscape plan: Foreshore area	Illustrative except the above-ground structures, which are indicative	<i>Book of Plans</i> , Vol 13, Section 25
Section AA	Illustrative	<i>Book of Plans</i> , Vol 13, Section 25
As existing and proposed elevation (various)	Illustrative	<i>Book of Plans</i> , Vol 13, Section 25
Kiosk design intent	Illustrative except the kiosk, which is indicative	<i>Book of Plans</i> , Vol 13, Section 25
Typical river wall design intent	Illustrative	<i>Book of Plans</i> , Vol 13, Section 25
Construction phases	Illustrative	<i>Book of Plans</i> , Vol 13, Section 25
Highway layout during construction (various)	Illustrative	7.10.21 <i>Transport Assessment</i> . King Edward Memorial Park Figures
Permanent highway layout (various)	Illustrative	7.10.21 <i>Transport Assessment</i> . King Edward Memorial Park Figures
River foreshore zones of working	For information	<i>Navigational Issues and Preliminary Risk Assessment</i> King Edward Memorial Park Foreshore

T.4.5 The Nationally Significant Infrastructure Project (NSIP) works (Work Nos. 24a) comprise the construction of a CSO drop shaft with an internal diameter of approximately 20m and depth of 60m. Associated development (Work no. 24b) comprises works to intercept and divert flow from the North East Storm Relief Sewer CSO to the King Edward Memorial Park Foreshore drop shaft (Work No. 24a) and to the main tunnel (east) (Work No. 1d) including the construction of a temporary cofferdam, an interception chamber, CSO overflow structures, hydraulic structures, chambers with access covers and other structures to manage and intercept flow.

T.4.6 The full description of the proposed development is provided in Schedule 1 to the *Draft DCO*. Further details of temporary construction works and permanent operational structures are contained below and an extended description is provided in the *Environmental Statement* (Vol 21).

Construction

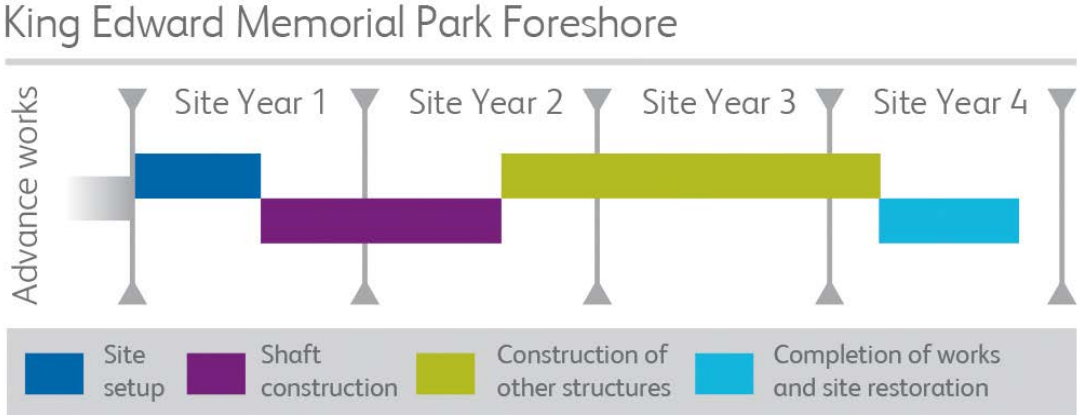
T.4.7 Construction is anticipated to take approximately three and a half years and would involve the following main works (with some overlaps):

- a. site set-up (approximately seven months)
- b. shaft construction (approximately 12 months)
- c. construction of other structures (approximately 20 months)

d. completion of works and site restoration (approximately six months).

T.4.8 Connection and diversion of utilities may be carried out in advance of the main activities listed above.

Figure T.3 Construction timeline



T.4.9 This site would operate to the standard and extended working hours for various phases and activities set out in the *Code of Construction Practice (CoCP)* Part A and B (Section 4). Standard working hours would be applied to all of the above phases of construction work apart from elements of shaft construction and secondary lining as described below.

T.4.10 Extended working hours are required at this site to allow for major concrete pours for shaft construction including diaphragm wall panels, base slab, roof slab and other large elements. It is assumed that extended hours would be required approximately twice a week during diaphragm walling for a total duration of approximately three months, and once a month during other major concrete pours. The exact timing of any extended hours of working would be consulted on with and notified to the London Borough of Tower Hamlets. During these periods only those activities directly connected with the task would be permitted within the extended hours.

T.4.11 Construction traffic would access the site from The Highway (A1203), travelling south down Glamis Road and turning left into the site from a new entrance on Glamis Road. Traffic would leave the site via the same route. Suspension or relocation of parking bays on Glamis Road would be required during construction. Some minor modifications would also be required to the junction of Glamis Road and The Highway to accommodate construction traffic turning into Glamis Road.

T.4.12 A construction access road would be required to serve the site. The route would run from the new Glamis Road entrance to the park and along the south side of the park to the main construction site on the foreshore. The access road would be retained permanently as an enhanced Thames Path route for pedestrians and cyclists. An illustration of the construction access route is shown on the Construction phasing plans in Annex T.

T.4.13 It is anticipated that an average of 12 heavy goods vehicles (HGVs) would access the site per day for the majority of the construction period. This would rise to approximately 41 HGVs per day over an estimated five-

month period during CSO drop shaft construction. 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.

- T.4.14 Potential layouts of the construction site are shown on the Construction phasing plans contained in Annex T. It should be noted that these layouts are illustrative only. The contractor may arrange the site in a different way, depending on the chosen construction method, provided that any environmental effects are appropriately managed and that the cofferdam does not exceed the maximum extent of temporary works platform shown on the Site works parameter plan in the *Book of Plans*.

Site set-up

- T.4.15 The park contains many trees, a number of which would need to be removed or pollarded for preparation of the construction access road from Glamis Road.
- T.4.16 Prior to any works, the construction site boundary would be established and secured and this would encompass the access route. The boundary would consist of hoardings, as specified in the *CoCP* and the *Design Principles* document, which accompanies the application. However, the eastern half of the construction access road would include open mesh fencing to maintain views from the park to the river.
- T.4.17 Power and water supplies would be required on-site, and utility diversions would be undertaken as necessary. During this phase, the children's playground would be relocated to its new location in the park and the multipurpose sports pitch would also be reconfigured.
- T.4.18 Due to the work along the embankment, the Thames Path would be diverted around the eastern part of the works with a controlled crossing across the construction access within the park.
- T.4.19 New access gates would provide access from Glamis Road. They would utilise an existing entrance and dropped kerb, however, both would need to be extended to permit lorry movements.
- T.4.20 Full pedestrian access would be retained along Glamis Road and appropriate site access signing would be provided to inform and remind pedestrians and lorry drivers of pedestrian safety.
- T.4.21 The approach to any land remediation that might be required cannot be defined at this stage. However, it is assumed that any remediation (probably unlikely at this site) would occur within this earliest phase of construction and that any associated lorry movements would be substantially lower than the peak during the main construction phases.
- T.4.22 As the site is partially within the River Thames foreshore, a cofferdam would be constructed. The piles used to form the cofferdam would be driven into the impermeable clays from a jack-up barge. The top level of the outer wall of the cofferdam would be set to existing flood defence level to maintain the level of defence during construction.

- T.4.23 A concrete campshed would be constructed along the southern 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 it is likely that there would be some disturbance to the riverbed during construction of the cofferdam and campshed.
- T.4.24 It is assumed that the piles for the cofferdam would be driven using vibration piling techniques; although the intention would be to seek to maximise the use of pressed piling techniques, where reasonably practicable.
- T.4.25 Following removal and replacement of any soft material within the cofferdam, fill material would be placed on top of a geotextile layer on the foreshore.
- T.4.26 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 would be identified using the approach set out in the scour and accretion monitoring and mitigation strategy plan for temporary works in the foreshore (*Environmental Statement, Vol 3, Section 14, Appendix L.4*).
- T.4.27 The existing outfall for the North East Storm Relief Sewer would need to be channelled through the cofferdam. It is assumed that this would be achieved using a purpose-built flume structure within sheet piles.
- T.4.28 The Cole Stairs Storm Relief Sewer outfall, which would not be intercepted, would need to be extended through the temporary cofferdam. It would otherwise be retained in its current location in the permanent layout.
- T.4.29 Internal site roads, plant and material storage areas, offices, welfare and workshops would be established on the cofferdam.
- Shaft construction**
- T.4.30 The CSO drop shaft would then be constructed by means of diaphragm wall techniques.
- T.4.31 During diaphragm wall excavation, the trench would be filled with bentonite for ground support. On completion of excavation cycle, steel bar reinforcement cages would be lowered in before concrete is pumped into the trench in order to displace the bentonite and form a solid wall panel.
- T.4.32 This process would be repeated for each diaphragm wall panel in order to create the full circle of the shaft. Diaphragm wall excavated material would be processed as required and loaded onto lorries for transport off-site.
- T.4.33 The shaft excavation would commence once the diaphragm walls are complete. Excavated material would be put into skips within the shaft working area and hoisted by crawler crane from the shaft and deposited in a suitable storage area. After any required treatment, the material would be loaded onto a barge for transport off-site. Once the excavation is complete, a steel reinforced concrete base plug would be formed at the base of the shaft.

- T.4.34 It is anticipated that dewatering would be required. Dewatering wells would be drilled from the surface or within the shaft (a process known as 'internal dewatering') and groundwater extracted by pumps.
- T.4.35 It is anticipated that ground treatment would be required within the Chalk beneath the base slab and that treated blocks would be constructed either side of the shaft to facilitate the 'breaking-in' and 'breaking-out' of the tunnel boring machine.

Tunnel works

- T.4.36 As King Edward Memorial Park Foreshore shaft is online of the main tunnel, no connection tunnel is required. A temporary cradle would be constructed to receive the tunnel boring machine from Chambers Wharf and re-launch it to Abbey Mills Pumping Station. This provides the opportunity for maintenance to the tunnel boring machine.
- T.4.37 Tunnel portals with launch and reception seals would be formed in the shaft lining. The portals would be formed by cast *in situ* concrete with a sealing arrangement bolted to the shaft lining.

Secondary lining of shaft

- T.4.38 It is assumed that the secondary lining of the 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. Any reinforced concrete structures internal to the shaft and the roof slab would be progressively constructed in a similar manner from the shaft bottom.

Construction of other structures

- T.4.39 An interception chamber, connection culvert and valve chamber would be constructed to intercept the CSO and connect it to the CSO drop shaft. A below-ground storm overflow chamber would be constructed to allow the CSO to overflow into the River Thames after periods of exceptionally high rainfall when the tunnel system is full. In addition, air management structures comprising a below-ground chamber, ventilation column and below-ground louvre chambers for ventilation control and an electrical and control kiosk would be constructed on the site.
- T.4.40 Sheet pile walls would be used to provide support within which the below-ground chambers would be constructed. Walls would be constructed to a depth to minimise ground water ingress into the excavation and small pumps would be utilised to manage any ground water that does seep through. The pumps would discharge to the River Thames following treatment through a settlement system.
- T.4.41 Secant or sheet piled walls would be used to support the toe of the existing river wall. It is also anticipated that some grouting would be required to the toe of the existing river wall prior to excavating beneath this level for the interception chamber works.
- T.4.42 The walls, bases and roofs of the chambers and shallow foundations for above-ground structures would be formed by *in situ* concrete techniques.

It was assumed that on-site batched concrete would be pumped or skipped to the chamber.

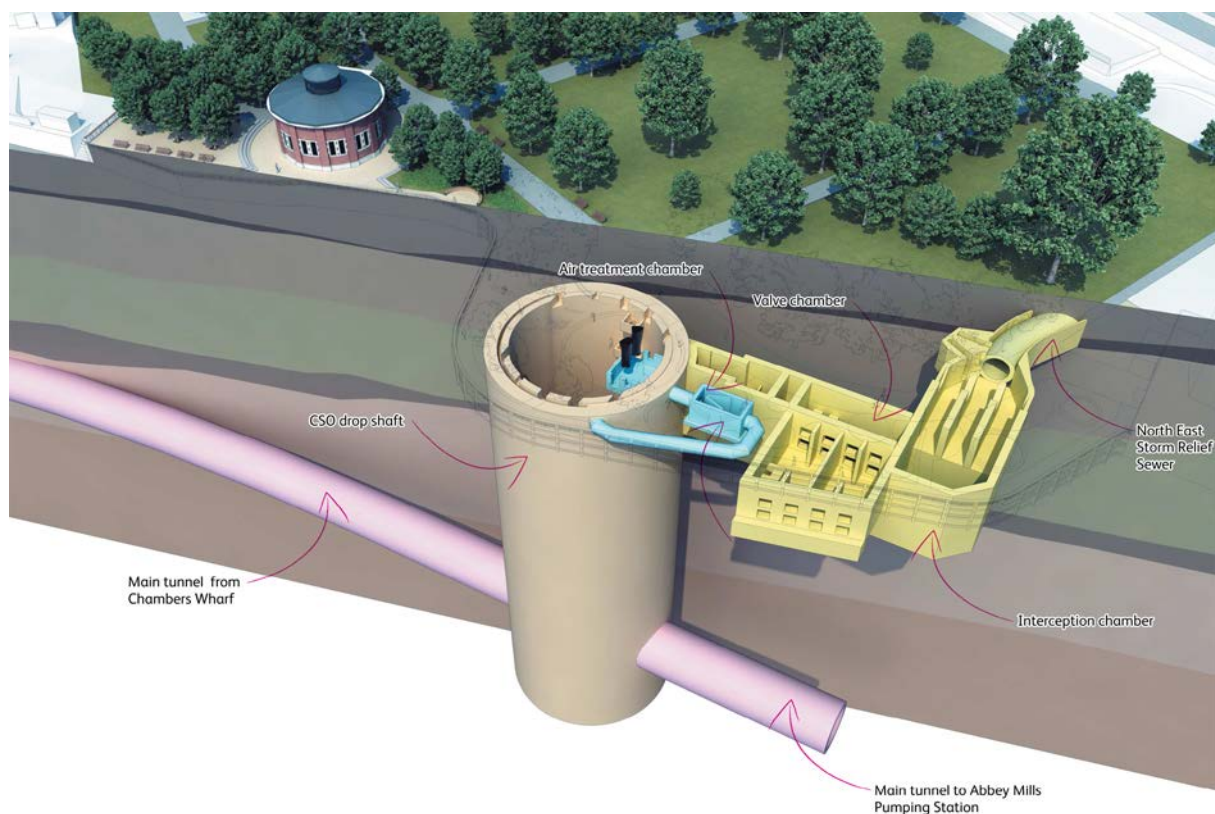
T.4.43 It is assumed that bored reinforced concrete piles would be used to support the below-ground chambers. The diameter, depth and spacing of the piles would depend on the structure design and ground conditions.

T.4.44 For the above-ground structures, including the kiosk and ventilation column, the components would be delivered by road and assembled on-site using suitable lifting equipment.

T.4.45 The new river wall would be built within the temporary cofferdam. It is assumed that the new river wall would be constructed as a piled wall that incorporates both driven tubular and steel sheet piles and a reinforced concrete structure.

T.4.46 Figure T.4 below illustrates the key functional components of the proposed works. It shows the existing CSO and proposed interception chambers and culverts in yellow, proposed ventilation structures in blue, and the main tunnel running through the base of the shaft in pink.

Figure T.4 Functional components diagram



Completion of works and site restoration

T.4.47 On completion of construction, the new river wall would be completed prior to removal of the temporary cofferdam.

T.4.48 Once the cofferdam fill is removed, the geotextile separating layer would be removed and the area of the foreshore where permanent scour protection is required would be excavated by an excavator by

approximately 1.5m. For areas that are below low water or outside the temporary cofferdam, it is assumed that the material would be removed by a long reach excavator or grab working either from the cofferdam or from a barge. The stone would be placed in the same manner.

- T.4.49 It is assumed that permanent scour protection and new outfall apron would consist of loose large stones placed just below foreshore level.
- T.4.50 Once the permanent scour protection is in place, the river bed would be reinstated to match the existing river bed conditions and the sheet piling forming the temporary cofferdam would be removed.
- T.4.51 Once the main elements of construction are completed, the final landscaping works, to be agreed with the London Borough of Tower Hamlets, would be undertaken including final treatments and surfaces, planting and installation of street furniture.

Operation

CSO drop shaft

- T.4.52 The King Edward Memorial Park Foreshore CSO drop shaft would be constructed and incorporated into a new permanent, above-ground structure extending into the foreshore of the site. The drop shaft would have an approximate internal diameter of 20m and be approximately 60m deep from ground level to invert of the tunnel.
- T.4.53 The base of the shaft would join up with the main tunnel. Combined sewage flows diverted from the North East Storm Relief CSO would be conveyed to the drop shaft via an interception chamber and from there into the main tunnel.
- T.4.54 Ground level access covers would be installed on the top of the shaft for inspection and maintenance purposes.

Chambers and culverts

- T.4.55 A storm overflow chamber, an interception chamber, a connection culvert and a valve chamber would be constructed to intercept the North East Storm Relief Sewer and divert the combined sewage flow into the drop shaft. All of these structures would sit below ground.
- T.4.56 Ground level access covers would be incorporated on top of the chambers for inspection and maintenance purposes.

River wall

- T.4.57 The new river wall would be constructed along the front of the new foreshore structure, built up to the flood defence level and tied in with existing flood defences at both ends.

Ventilation structures

- T.4.58 There would be three ventilation columns sited on the foreshore structure to serve the drop shaft and interception chamber. The two ventilation columns serving the drop shaft would have an approximate internal diameter of 1.2m and be approximately 4m minimum to 8m maximum high. These ventilation columns would be of the project's 'signature' design.

- T.4.59 The remaining ventilation column serving the interception chamber would have a smaller diameter and a maximum height of 6m. It would be located on the eastern part of the foreshore structure.
- T.4.60 Two ground-level ventilation grilles would be constructed to allow air movement within the interception and valve chambers.
- T.4.61 The below-ground air treatment chamber would contain a passive filter and would be connected to the ventilation columns. The air treatment chamber would have ground-level access covers for inspection and maintenance purposes.

Electrical and control kiosk

- T.4.62 An electrical and control kiosk containing gas monitors, electrical and metering equipment would be located along the eastern boundary of the park adjacent to Free Trade Wharf building. The control kiosk would be approximately 6.5m by 3m by 3m high (refer to the Permanent works layout plan in *Book of Plans*). An illustration of the completed works is provided in Figure T.2.

Permanent restoration and landscaping

- T.4.63 The proposed site features plan is presented in the *Book of Plans*. The final design on the landscape and restoration proposals would be subject to both the generic and site-specific design principles.
- T.4.64 The new section of river wall and approximately 0.2ha of reclaimed foreshore would be required to enclose the below-ground operational structures including the CSO drop shaft. This would be publically accessible and become part of the park.
- T.4.65 The area around the CSO shaft and chambers would be finished with hardstanding to provide operational access for cranes and maintenance vehicles. This hardstanding would be publicly accessible; however, Thames Water would retain a right of access over it and would install temporary security fencing when the area is required for maintenance purposes.
- T.4.66 The sports pitches would be refurbished and realigned during phase 1 of construction, and returned to public use from phase 2 of construction. The final configuration is to be agreed with the local authority.
- T.4.67 It is proposed that the children's playground would be relocated prior to commencing the main construction (included as a Requirement for the contractor in Part B of the *CoCP*). It is assumed that the playground would be further extended at the end of the construction subject to agreement with the local authority.
- T.4.68 The memorial benches and bandstand would be reinstated within the park as close to their current positions as possible.
- T.4.69 Soft landscaping would be provided around and over the shaft and chambers. The landscaping on top of these structures would need to be periodically removed to enable access to the shaft.
- T.4.70 The design would reinforce the character of the park, specifically by maximising the planting of large species of tree where technically possible.

The layout of existing paths and landscaped areas would be extended onto the foreshore structure, where possible, to full integrate it within the park.

- T.4.71 No lighting would be provided at this site, except for a low level light activated when accessing the kiosk for maintenance purposes in the hours of darkness.

Access and movement

- T.4.72 Vehicle access to the site during construction and operation would be from a newly constructed entrance on Glamis Road, as shown on the Construction phasing plans for this site (Annex T). Vehicles would leave the site via the same route.

- T.4.73 The access route would form part of the Thames Path and be publicly accessible to pedestrians and cyclists during opening hours of the park. The entrance would be gated when the park is closed and closed to pedestrians and cyclists when required for maintenance access.

- T.4.74 Further detailed information on traffic and access is provided in the *Transport Assessment* (Vol 19, Section 19.2).

Typical maintenance regime

- T.4.75 Site visits would be required approximately every three to six months to carry out inspections of the air treatment chamber, ventilation columns, vortex drop, interception chamber, valve chamber and electrical and control kiosk. It is likely that this would involve a visit by staff in a small van. Staff would open access covers to inspect and carry out minor maintenance of below-ground equipment. Access to the interception and valve chambers would be by fixed ladders recessed into the chamber walls.

- T.4.76 Should a major blockage occur, a crane or jetting lorry would be brought to the site to clear the blockage via the appropriate ground-level access cover.

- T.4.77 It is anticipated that approximately once every three years the filter media in the air treatment chamber would need to be replaced. This would be carried out via the appropriate ground-level access cover.

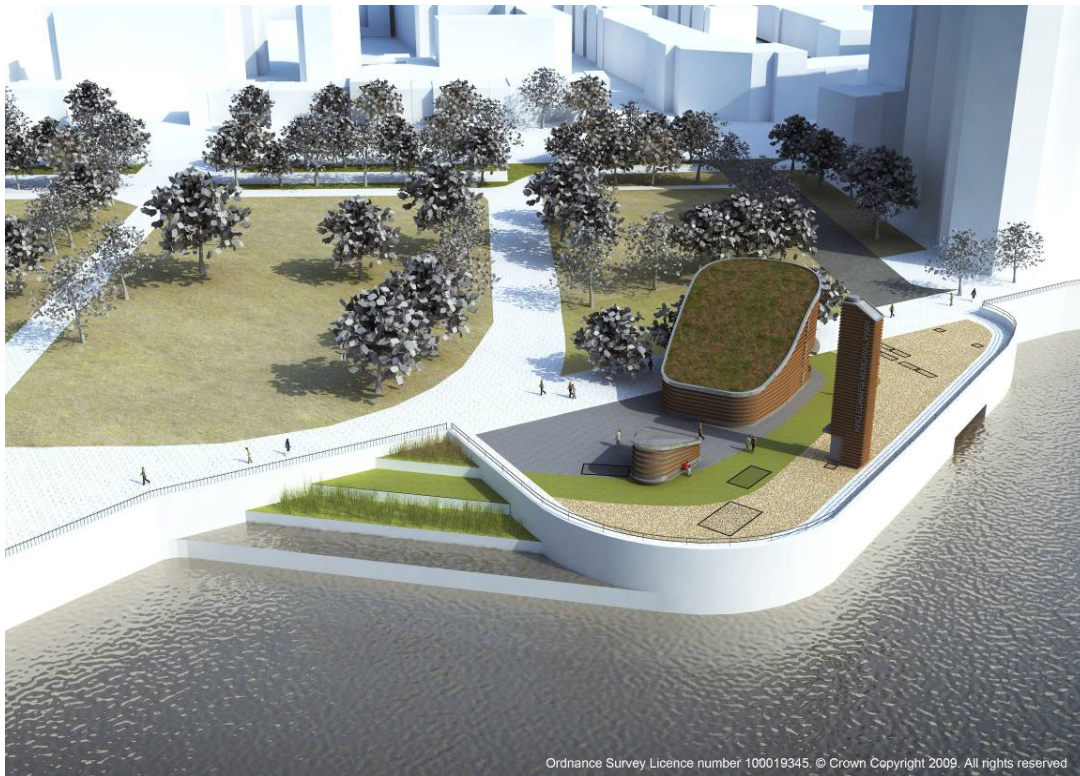
- T.4.78 It is anticipated that once every ten years, a major internal inspection of the main tunnel and below-ground structures would be required. It is likely that this would involve an expert team of inspection staff, a small support crew with support vehicles, and two mobile cranes to lower the inspection team and tunnel inspection vehicle into the drop shaft. This process would take several weeks and temporary fencing would be erected around the working area. It would involve temporarily removing turf and other landscaping to expose and open any buried access covers.

- T.4.79 The tunnel inspection vehicle required for the ten-yearly tunnel inspections would enter the main tunnel via a large access opening in the drop shaft cover slab. A four-person cradle would enter via a separate access opening in the same cover slab. A further access opening would be provided for CCTV surveys and secondary man access if required.

Scheme development

- T.4.80 The proposed King Edward Memorial Park Foreshore site was subject to over two years of extensive consultation and engagement. The site was presented as the preferred site in two rounds of public consultation, a phase of interim engagement, and a period of pre-application publicity. Throughout this period, the scheme evolved in response to consultation, engagement with key stakeholders, and on-going design development. The *Consultation Report*, which accompanies the application, contains detailed information on the consultation process.
- T.4.81 Two sites were originally shortlisted for interception of the North East Storm Relief CSO, King Edward Memorial Park itself and King Edward Memorial Park Foreshore. At phase one consultation, which ran from September 2010 to January 2011, the preferred site was King Edward Memorial Park Foreshore. Figure T.5 provides an illustration of the design presented at phase one consultation.

Figure T.5 Visualisation of phase one consultation design



- T.4.82 As detailed in the *Final Report on-site Selection Process*, which accompanies the application, further work to test the suitability of this site was undertaken in response to specific queries and objections raised at phase one consultation. This review included consideration of whether a smaller site in King Edward Memorial Park itself could be used to intercept the CSO, with an additional 'intermediate' site used to connect the intercepted CSO to the main tunnel via a deep shaft. The two sites in this scenario would be connected by a short connection tunnel.
- T.4.83 Three shortlisted sites were identified, namely Shadwell Basin, Limehouse Basin and Heckford Street. It was considered that the two basin sites

would be less suitable than Heckford Street for the following reasons: it would be technically challenging to undertake the construction works within water basins; the sites have poor access; and they are further away from the CSO. This would mean a longer connection tunnel from the CSO in King Edward Memorial Park.

- T.4.84 Therefore the two main options for further consideration were:
- a. Option 1 King Edward Memorial Park Foreshore: one site to intercept the CSO and connect to the main tunnel.
 - b. Option 2 Heckford and park: King Edward Memorial Park (to intercept the CSO in the northern part of the park) and Heckford Street (as an intermediate site with a deep drop shaft to connect flows to the main tunnel. The deep drop shaft would be used to drive a short connection tunnel back to the park).
- T.4.85 The use of the Heckford Street site would still require a worksite in King Edward Memorial Park to intercept the sewer. Heckford Street would be used to construct the connection tunnel and the shaft to drop the flows down to the main tunnel. This alternative option was raised by the community after phase one consultation and was subject to a period of interim engagement from March 2011 to July 2011.
- T.4.86 Comments raised by stakeholders during the interim engagement were taken into account prior to phase two consultation. Having carefully reviewed the relative advantages and disadvantages of the two options, on balance, Thames Water preferred Option 1. Therefore, following extensive analysis and design development, King Edward Memorial Park Foreshore remained the preferred site at phase two consultation, which ran from November 2011 to February 2012.
- T.4.87 The combination of both sites and the additional tunnelling works associated with the Heckford and park option would involve concurrent working at two sites, cause more disruption to the wider local community and require a greater number of HGV movements than the preferred option. Crucially, the use of the Heckford Street site would not avoid working in the park and associated disruption to park users. In addition, it would result in the disruption and potential loss of some businesses in an area where the local authority is seeking to protect employment uses through its planning policies. With the Heckford and park option, the connection tunnel would pass below more buildings at a shallower depth, and it would not be possible to utilise the River Thames to transport materials. Annex T contains further detail of the Heckford and park option and the reasons why it was not selected as the preferred site.
- T.4.88 The key design developments presented at phase two consultation included the rationalisation of the permanent works footprint, including repositioning the shaft and re-profiling the foreshore structure, the removal of the need for ventilation buildings, the consolidation and reconfiguration of the multipurpose sports pitches, and the provision of vehicular access from Glamis Road rather than The Highway. Further detail of the design developments undertaken is provided in the Good design subsection below and in the *Design and Access Statement*, which accompanies the

application. Figure T.6 provides an illustration of the design presented at phase two consultation.

Figure T.6 Visualisation of phase two consultation design



- T.4.89 Throughout the scheme development and consultation phases, Thames Water undertook a significant amount of work to minimise the disruption which would be experienced during construction. Following phase two consultation, the proposed works at King Edward Memorial Park Foreshore continued to evolve in response to consultation and on-going engagement. Following further improvements and the identification of mitigation measures, the site was considered the most appropriate site to intercept the North East Storm Relief CSO and connect to the main tunnel. It was publicised as Thames Water's proposed site at Section 48 publicity, which ran from July 2012 to October 2012.
- T.4.90 Significant work was undertaken prior to Section 48 publicity to respond to stakeholders' concerns and some key refinements were presented. In order to substantially reduce the overall construction area in the park and in particular in the multipurpose sports pitches to the west of the park, it was proposed that office, welfare and workshop facilities would be located at a suitable off-site location to be determined by the contractor. The provision of open-mesh fencing along the construction access route off Glamis Road was proposed to allow views through to the river and foreshore. Access to the riverside area would be retained through provision of a gated crossing of the access route. These amendments would mean that approximately 85 per cent of the park would be available to the local community during the construction period.

- T.4.91 Via the iterative Environmental Impact Assessment process, additional mitigation measures were identified, including further attenuation measures to address noise generated during construction.
- T.4.92 The possible use of the Heckford and park option was fully investigated and re-reviewed after phase two consultation, and before and after Section 48 publicity.
- T.4.93 The principal issues that arose from pre-application consultation and Section 48 publicity for King Edward Memorial Park Foreshore are provided below. These are subsequently addressed in the planning assessment in Section T.5:
- a. Objection to the proposed use of the site. The use of brownfield sites should be prioritised, specifically the Heckford Street site. The reasons for selecting the proposed site are flawed and questionable: this issue is addressed above, and in the Meeting the need subsection below. Annex T contains a summary of the Heckford Street alternative and the reasons why it was not selected.
 - b. Concern regarding the effect of the proposals on public open space, the use of the park, community, and recreation: this issue is addressed in the Good design, Land use including open space, green infrastructure and green belt, and Socio-economic subsections below.
 - c. Concern regarding amenity impacts arising from construction: this issue is addressed in the Air quality, emissions, dust and odour, Noise and vibration, Landscape and visual (including townscape) and Light subsections below.
 - d. Concerns regarding effect of the proposals on heritage features including the conservation area: this issue is addressed in the Good design and Historic environment subsections below.
 - e. Foreshore encroachment would be harmful to the character and appearance of the river and the riverside: this issue is addressed in the Good design and Landscape and visual (including townscape) subsections below.
 - f. The loss of trees, effects on local wildlife and habitats, and the impact on the Site of Importance for Nature Conservation: this issue is addressed in the Biodiversity and geological conservation subsection below.
 - g. Disruption to the use of the Thames Path caused by construction works or diversion: this issue is addressed in the Traffic and transport subsection below.
 - h. Concerns a regarding out the visual impacts of the proposed structures: this issue is addressed in the Good design and Landscape and visual (including townscape) subsections below.

T.5 Site-specific planning considerations

T.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at King Edward Memorial Park Foreshore. It considers the issues and factors identified in the NPS and other relevant issues such as noise, landscape and visual effects, and loss of open space that arose from consultation. The design response to each of these issues was informed by extensive consultation with stakeholders, as set out in the *Consultation Report*, and detailed below.

Meeting the need

T.5.2 The proposed works at King Edward Memorial Park Foreshore would be successful in meeting the need to intercept the North East Storm Relief CSO. They would make an important contribution to meeting the wider need for the project identified in the NPS.

T.5.3 Currently, in an average year, the North East Storm Relief Sewer CSO discharges approximately 780,000m³ of untreated sewage into the tidal Thames in front of King Edward Memorial Park. The CSO discharges approximately 31 times a year and releases 200 tonnes of sewage derived litter.

T.5.4 It is the sixth largest CSO by volume on the tidal Thames and was identified by the Environment Agency as a CSO that needs 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. The CSO discharges present elevated health risks for recreational users of the river. The river in this location is well used for recreational purposes as the Shadwell Basin Outdoor Activity Centre is located less than 100m to the southwest of the CSO.

T.5.5 It is predicted that the CSO discharges will continue to worsen both in terms of volume, frequency and content. By the time the proposed works at King Edward Memorial Park Foreshore are operational, in an average year the CSO is predicted to discharge approximately 848,000m³ of untreated sewage over 32 discharge events and release 214 tonnes of sewage derived litter.

T.5.6 Modelling suggests that with the project in operation the current annual discharges of untreated sewage would be reduced to approximately 85,000m³ (a reduction of 695,000m³ from the current level) and from 31 spills a year to a predicted four spills per year. This represents a reduction of approximately 90 per cent. This reduction would have a significantly beneficial effect on river water quality. The tonnage of sewage derived litter discharged by the CSO is expected to be reduced by approximately 193 tonnes to 21 tonnes per year.

T.5.7 The proposed site was identified and assessed through a robust, qualitative, and iterative site selection process and the proposals were developed through extensive consultation and engagement. The site selection methodology was applied in a transparent, consistent and fair

manner across all sites investigated over the route of the tunnel and was subject to consultation with local authorities and key stakeholders. The methodology was supported by the London Borough of Tower Hamlets and further endorsed in the council's phase one consultation response.

- T.5.8 All the relevant information that informed the site selection process in accordance with the agreed methodology was published prior to consultation. It was also made available and discussed in detail at a series of meetings with the community and the council.
- T.5.9 The proposed use of King Edward Memorial Park Foreshore attracted both formal support from some stakeholders, including the Greater London Authority, and considerable opposition from others, including the London Borough of Tower Hamlets. There is broad consensus amongst stakeholders that there is a need to tackle the unacceptable discharges from the North East Storm Relief CSO; however, the opposition centres on the belief that Thames Water selected the wrong site, the use of which would cause unacceptable impacts, and that a better alternative exists.
- T.5.10 The key challenge is the constrained location of the CSO and the high density of development in the locality, which limits the availability of suitable sites to intercept the CSO. The alternative option preferred by the majority of the stakeholders who object to the use of King Edward Memorial Park Foreshore is the Heckford Street Industrial Area. The option was seriously and robustly considered through the site selection methodology, as detailed in Annex T. However, King Edward Memorial Park Foreshore was selected after extensive consideration and engagement as the appropriate site to meet the identified need. The site is suitable and the application proposals would meet that need.

Good design

- T.5.11 The amount, layout and scale of the proposed structures are primarily dictated by the function they need to perform. At this site the key functional consideration is the need to intercept flows from the North East Storm Relief CSO and direct flows into the main tunnel.
- T.5.12 The site's location in the foreshore and the park is also a consideration. In particular, the site is constrained by the location of the North East Storm Relief CSO, which is to be intercepted, two smaller CSOs (which are not to be intercepted but need to continue to function during and after construction), and the presence of the Rotherhithe Tunnel to the west. The functional design proposed is durable and adaptable.
- T.5.13 Early site analysis and subsequent engagement identified that it was important for the design to respond to the following key opportunities and constraints.
- T.5.14 The site-specific design opportunities included:
- a. Return the site to public use following construction works and improve the public realm.
 - b. Create a permanent beneficial addition to the park in the form of the foreshore structure.

- c. Improve the quality and usability of the Thames Path.
 - d. Improve the relationship between the site and its historic surroundings, including nearby listed structures and the Wapping Wall Conservation Area.
- T.5.15 The site-specific design constraints included:
- a. The alignment of the North East Storm Relief CSO presents a challenge.
 - b. Impacts on neighbouring residential properties must be minimised.
 - c. The Bell Wharf CSO and Cole Stairs CSO which, by virtue of their discharge volumes and frequencies, do not need to be intercepted but must continue to function during and following construction.
 - d. The shaft must be located to optimise the alignment of the main tunnel.
 - e. The Grade II listed Rotherhithe Tunnel ventilation building lies in close proximity to the site.
 - f. The works must not impact on the Rotherhithe Tunnel. The alignment of the tunnel must also be considered.
 - g. Environment Agency policy seeks to minimise encroachment into the river. The project structures must minimise any impact on river flows and reduce the potential for scour.
 - h. The project structures must be protected from vessel impacts.
 - i. The site is located partly in the foreshore of the River Thames and partly in a public park.
 - j. The site falls within the Wapping Wall Conservation Area.
 - k. The foreshore is designated as a Site of Metropolitan Importance for Nature Conservation.
- T.5.16 The design of the proposals for the site evolved through two rounds of consultation and continued engagement with key stakeholders such as the Design Council CABE. The detail of the consultation process for the site is reported in the *Consultation Report* and the *Design and Access Statement*.
- T.5.17 The principal issues that influenced design at King Edward Memorial Park Foreshore arising from Thames Water's analysis of site opportunities and constraints were:
- a. Minimise encroachment into the foreshore.
 - b. Minimise temporary construction impacts on the park.
 - c. Create a sensitive design that reflects the park and riverside setting.
 - d. Enhance the setting of local heritage assets.
 - e. Provide a permanent beneficial addition to the park.
- T.5.18 The above design aspirations presented a significant challenge to balance potentially conflicting constraints and stakeholder concerns. For example,

there was a risk that minimising encroachment of the temporary works in the foreshore would necessitate locating more temporary works in the park. Similarly, in order to increase the permanent open space addition to the park, a larger foreshore structure would be required, which would increase the permanent encroachment in the foreshore.

- T.5.19 Thames Water recognised these tensions and sought to achieve an appropriate balance between the design aspirations. The development for which consent is sought reflects this understanding. Some of these tensions and the balance that was achieved for all of the above design aspirations are set out below in broad chronological order of how the design solutions were achieved.

Minimise encroachment in the foreshore

- T.5.20 Throughout design development, the functional design, footprint, and layout of the proposed infrastructure were refined and optimised with the aim of minimising encroachment of temporary and permanent structures in the foreshore.
- T.5.21 At phase two consultation, the CSO drop shaft was repositioned closer to the line of the existing river wall, and the foreshore structure was re-profiled to reduce its extent and minimise impacts on river flows and the foreshore habitat, in response to consultation comments received from the Port of London Authority and the Environment Agency. Detailed fluvial modelling helped to inform the proposals for the profile of the foreshore structure. A cantilevered walkway on the eastern and western sides of the foreshore structure was introduced to create a smooth and more attractive visual profile, while minimising the extent in the river. These design developments reduced the area of proposed permanent works in the foreshore by 15 per cent since phase one consultation.
- T.5.22 The proposed Glamis Road access, which forms part of the application, would be across mainly existing hardstanding areas along the southern part of the park. This provided the possibility of utilising the multipurpose sports pitches to the west of the park for construction support facilities. It was possible to significantly reduce the area of the proposed temporary works in the foreshore by utilising these existing hardstanding areas within the park for construction offices, welfare and workshop facilities that do not need to be located on the foreshore structure.

Minimise temporary construction impacts on the park

- T.5.23 The provision of vehicular access from Glamis Road rather than The Highway in response to highway safety concerns raised by Transport for London also assisted in reducing the potential impact of construction on the park. The previous access route from The Highway would have extended through the eastern part of the green area of the park, through the wildflower meadow. This area would not now be directly affected by the proposed works.
- T.5.24 One of the original reasons for the use of the foreshore for the worksite and to house the main permanent structures was to minimise the temporary loss of open space within the park, in a London area that lacks such spaces. However, a consequence of seeking to minimise the

encroachment of the development in the foreshore by utilising the multipurpose sports pitches was that interim designs indicated that a larger construction site area would be required in the park.

- T.5.25 Further design development was subsequently undertaken and the construction layout and design for works in the park was refined by proposing to locate office, welfare and workshop facilities in a suitable off-site location to be determined by the contractor. This substantially reduced the overall construction area in the park, particularly in the multipurpose sports pitches. The reconfiguration and consolidation of the multipurpose sports pitches as advanced works would enable this facility to remain in use throughout construction (design principle PTH1X.4).
- T.5.26 Thames Water proposed and discussed with the council a package of measures that could be implemented prior to commencing main construction including:
- a. the provision of tree planting along the central avenue (north to south) to assist in screening views of construction site from within the park
 - b. the possible relocation of the children's play area further to the north (or another improved location) within the park to provide an enhanced facility away from the existing Rotherhithe Tunnel ventilation building and proposed construction access
 - c. the provision of an enhanced and improved surface and quality of the multipurpose sports pitch, which could be reconfigured to be a football pitch (reflecting its predominant current use)
 - d. new planting along the construction access with time to mature before the works are complete that would form a screen during construction
 - e. provision of alternative means of launching small boats into the River Thames for the Shadwell Basin Outdoor Activity Centre, such as a floating pontoon attached to the Shadwell Basin lock or river wall subject to relevant consents from regulatory bodies including the London Borough of Tower Hamlets, the Port of London Authority, landowners and persons with land interest
 - f. closure of the existing western part of the Thames Path, which is part of a narrow alleyway, and incorporating the space into an enhanced landscaping scheme including a possible fitness activities zone
 - g. improvements to the wildflower meadow ecological area to the east of the park
 - h. new landscaping (both hard and soft) within the wider park, including around the Rotherhithe Tunnel ventilation building
 - i. possible enhancements of the dockside area around the Shadwell Basin, including benches and landscaping.
- T.5.27 The Design Council CABE considered that the principle of advanced permanent works and landscaping helped to address inconvenience during construction. It is proposed that the above measures would be discussed further with the London Borough of Tower Hamlets and details could be subject to consultation with the local community. Measures within

the LLAU would be secured through the landscaping Requirement. It is proposed that measures outside of the LLAU would be secured, where possible, through a Section 106 obligation with the council.

T.5.28 The *CoCP* sets out how the environmental effects from the construction of the project would be managed. The *Draft DCO* includes Requirements to carry out the construction works in accordance with the *CoCP*.

T.5.29 Specific measures to minimise temporary construction impacts at this site are set out in the *CoCP* Part B, including the provision of open mesh hoardings along the access route to maintain views of the river, and a gated crossing of the access route to enable access to the riverside part of the park. The above design developments and the measures in the *CoCP* would minimise the temporary construction impacts on the park. It should be noted that approximately 85 per cent of the park would be available to the local community during the construction period.

Sensitive design to reflect the park and riverside setting

T.5.30 An example of the optimisation and refinement of the functional design of the proposals for the benefit of the aesthetic design is the modification of the project-wide air management proposals after phase one consultation. By accommodating some of the required ventilation equipment below-ground, this removed the need for a large plant and buildings on-site.

T.5.31 While the majority of the proposals are below-ground, the design parameters and principles for the remaining above-ground structures (ventilation columns, control kiosk and river wall) and landscaping were carefully chosen to ensure they are sensitive to their surroundings and as visually attractive as possible. For example, the proposed ventilation columns were designed to be an architectural statement, as detailed in the *Design and Access Statement*.

T.5.32 Instead of locating the electrical and control kiosk on the foreshore structure, it is proposed to locate it at the eastern perimeter of the park. This would make it less visible and avoid interrupting views to the River Thames from the park. It would be designed not to form a means of scaling the boundary wall into the adjacent residential development (design principle KEMPF.01).

T.5.33 The final detailed proposals would, in due course, be submitted for approval by the London Borough of Tower Hamlets (pursuant to a Requirement).

Enhance the setting of local heritage assets

T.5.34 The site is located within the Wapping Wall Conservation Area. The Rotherhithe Tunnel ventilation building is a Grade II listed structure and is located within the park to the west of the proposed foreshore site. The Shadwell Dock stairs are also a Grade II listed structure and are located on the southern fringe of the park. There are several other listed structures in the wider area.

T.5.35 While the majority of the proposals are below-ground, the Site works parameter plan and design principles for the remaining above-ground structures (ventilation columns, control kiosk and river wall) and

landscaping were carefully chosen to ensure they are attractive, durable and sensitive to, and reflective of the setting of local heritage assets.

Provide a permanent beneficial addition to the park

- T.5.36 The existing combination of green space overlooking the River Thames, combined with well-used, multipurpose sports pitches and the Thames Path make this a vibrant community and city space. Therefore, another key objective for the proposals was to maximise and expand on the attributes that make the park a successful public space, while looking for ways to expand and enhance it in the future.
- T.5.37 At the final design review, the Design Council CABE also considered that there needed to be a strong relationship between the park and river in the design. The foreshore structure presents an opportunity to reinforce the character of the park by extending its green portion, including provision of a mature planting area and paths to the south (design principle KEMPF.06), as demonstrated in the illustrative proposals. The structure would increase the overall area of open space available to the community by 0.26ha and the new space would be integrated with the rest of the park, in accordance with NPS policy and relevant local development plan policies. This represents an approximate eight per cent increase in open space at King Edward Memorial Park, once the works are complete.
- T.5.38 The proposed permanent access route would be fully integrated with the landscaping proposals for the park as part of a new area of public realm and a potential new alignment of the widened Thames Path (design principle KEMPF.02). This would provide an improved and inclusive environment for pedestrians and cyclists and afford enhanced views of the listed Rotherhithe Tunnel ventilation building and the River Thames beyond (design principle KEMPF.05).

Conclusions

- T.5.39 In conclusion, the proposals for King Edward Memorial Park Foreshore were carefully developed through a collaborative process of design review and extensive consultation. The proposed development took account of both aesthetics and functionality through good design and architecture, as well as appropriate layout and siting, and would enhance the quality of the area. The site-specific design principles and requirements were developed with key stakeholders and the details of landscaping and materials would be submitted to the local planning authority for approval. They would be visually attractive, sustainable, usable and durable.
- T.5.40 In line with the NPS, the proposed designs for King Edward Memorial Park Foreshore evolved through the iterative consideration of alternatives and in response to consultation feedback throughout the development of the project. This process is detailed in the *Design and Access Statement*.
- T.5.41 The functional and engineering constraints at this site are relatively restrictive and there was limited scope to change the overall size and location of the foreshore structure and permanent works.
- T.5.42 Detailed design proposals to define the final external appearance and landscaping details would to be agreed with the local planning authority

should development consent be granted. The landscaping designs presented in the *Book of Plans* are illustrative only and may be subject to changes following further consultation with the local community and London Borough of Tower Hamlets.

- T.5.43 The key design alternative initially considered was to provide construction and maintenance access from The Highway, as presented at phase one consultation. However, for amenity and highway safety reasons, access from Glamis Road was preferred. The Glamis Road option would also provide an opportunity to improve the Thames Path in the southwestern corner of the park. Currently, the path in this section is a narrow alleyway between the Shadwell Basin Outdoor Activity Centre, the multipurpose sports pitches and the Trees for Cities maintenance depot.
- T.5.44 A number of detailed design alternatives were also considered, such as the positions for the siting of reinstated memorial benches and the bandstand.

Water quality and resources

- T.5.45 In terms of ground water resources, there are no licensed groundwater abstractions from the upper or lower aquifers located within a radius of 1km around the King Edward Memorial Park Foreshore site. The nearest abstraction source is located approximately 1.1km to the south, which abstracts from the Chalk for amenity purposes. There are no unlicensed groundwater abstractions in the London Borough of Tower Hamlets. The nearest defined Source Protection Zone to the site lies approximately 3.2km to the northeast. There are no environmental designations relevant to groundwater in the vicinity of the site.
- T.5.46 Measures to protect water quality and resources during construction are detailed in Section 8 of the *CoCP* Part A, and referred to in the project-wide assessment. In accordance with the approach suggested in the NPS, the *CoCP* covers activities that are subject to pollution control and incorporates good practice.
- T.5.47 After taking into account the measures incorporated into the design and *CoCP*, including adherence to good pollution prevention practice, there would be no adverse impacts on surface water resources, river flows and groundwater resources.
- T.5.48 Once operational, the project would reduce the number of discharges significantly from 31 to four. Therefore it would have a beneficial effect on water quality in the tidal Thames and contribute to the protection and enhancement of biodiversity of the Blue Ribbon Network.
- T.5.49 The site therefore meets the decision making criteria set out in the NPS as no adverse effects are expected on water quality or resources.

Flood risk

- T.5.50 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, was undertaken in accordance with Section 4.4 of the NPS and is included within the *Environmental Statement*.

- T.5.51 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.
- T.5.52 The permanent operational area would be protected from flooding through the provision of flood defences that 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, in order to accommodate climate change, the foreshore structure at King Edward Memorial Park Foreshore was designed so that the river walls can be raised to Thames Estuary 2100 Plan levels in the future.
- T.5.53 The new flood defences would be located along the periphery of the operational area and tie into existing flood defences, providing a continuous defence line along the embankment at all times. However, as at present, the site would be at residual risk of tidal flooding in the event of a breach in the new flood defence wall or overtopping of the defence wall as a result of a failure of the Thames Barrier. The consequence of a breach or failure of flood defences would not compromise the long-term operational function of the tunnel and therefore no additional measures in addition to those outlined above are proposed.
- T.5.54 Part B of the *CoCP* includes site-specific measures for temporary drainage of the construction access route and permeable surfacing on the temporary areas of hardstanding.
- T.5.55 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 Flood Risk and 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.
- T.5.56 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.
- T.5.57 The Flood Risk Assessment shows that the proposed development would be appropriate for the area as flood risk to the development would remain unchanged. The development would not lead to a significant increase in flood risk in the surrounding area. The presence of the foreshore structure has the potential to reduce the availability of flood storage within 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 Section 8 of the *Planning Statement*.

- T.5.58 Following the construction of the proposed development, the risk of flooding would remain unchanged. Therefore, the proposed development satisfies the decision making requirements of the NPS as set out in para. 4.4.10.

Air quality, emissions, dust and odour

- T.5.59 The site is located within the London Borough of Tower Hamlets Air Quality Management Area. Local monitoring data indicates that the air quality standard for nitrogen dioxide in the vicinity of the site is currently exceeded.
- T.5.60 The closest sensitive receptors to the development are occupiers of nearby residential dwellings and offices, and users of the park (including playgrounds and tennis courts) and the Shadwell Basin Outdoor Activity Centre.
- T.5.61 Through the measures included in the *CoCP*, all reasonable steps would be taken to minimise detrimental impacts on air quality or amenity resulting from emissions and dust, as required by the NPS. With the implementation of the *CoCP* measures, the overall effect on local air quality from construction (ie, effects from construction road traffic, tugs for river barges and construction plant) would not be significant at any of the closest sensitive receptors.
- T.5.62 The consideration of operational air quality, odour and dust impacts is reported in Section 8 of this *Planning Statement*.
- T.5.63 The project-wide *Air Management Plan* is designed to ensure that the air in the tunnels is kept fresh, that a low pressure is maintained within the tunnels to prevent unwanted releases and that when air is released it is treated. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, there would be ventilation structures at all sites that would allow air to enter and exit the tunnel system.
- T.5.64 When the tunnel system is empty, clean air would be drawn in at specific sites by the extraction of air at other specific sites to keep the air in the system fresh. This means that odours would not build up while the tunnels are empty. As the tunnels fill, air displaced from the tunnels would initially be extracted and treated at the active ventilation sites before release. Later, depending of the level of filling, it would pass through the passive carbon filters. These filters would clean the air and remove any odours before release.
- T.5.65 At passive ventilation sites, such as King Edward Memorial Park Foreshore, 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 this 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 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 a typical year, all air released would be treated. This meets all regulatory requirements and means that there would be no nuisance odours or loss of amenity due to odour.

- T.5.66 The construction and operational effects with regard to air quality and odour would be consistent with the NPS policy objectives (paras. 4.3.11 to 4.3.15 and 4.11.4 to 4.11.5) to minimise detrimental impacts on amenity and nuisance. Appropriate measures are proposed to ensure that the proposals would not lead to any, or substantial changes in, air quality, emissions, dust or odour or a significant loss of amenity during construction or operation

Biodiversity and geological conservation

- T.5.67 The site is located within the designated River Thames and Tidal Tributaries Site of Metropolitan Importance and adjacent to the Shadwell Basin Site of Importance for Nature Conservation.
- T.5.68 Construction effects on aquatic ecology would be managed in accordance with the *CoCP*. A membrane would be installed between the existing river bed and temporary back fill material to prevent contamination of juvenile fish habitat. The project would have no significant effect on the designated sites, aquatic habitats or species during construction.
- T.5.69 Throughout design development, the functional design, footprint, and layout of the proposed infrastructure were refined and optimised with the aim of minimising encroachment into the foreshore and minimising harm to foreshore habitats.
- T.5.70 Once operational, the project would result in the permanent loss of part of the designated intertidal habitat and intertidal feeding and resting habitat for fish. This loss would be unavoidable and is a consequence of the fact that the location of the CSO is highly constrained. The impacts on the foreshore are also an unavoidable consequence of the objective to minimise impacts on the park. Appropriate compensation measures would be provided in the form of off-site habitat creation but the impacts on the foreshore would constitute a significant adverse site-specific effect.
- T.5.71 By intercepting the CSO, the project would reduce the occurrence of dissolved oxygen related fish mortalities and improve the quality of the foraging habitat for fish, which constitutes a significant beneficial effect.
- T.5.72 The park is not designated for nature conservation. In respect of terrestrial ecology, the site currently comprises buildings, hardstanding, foreshore habitat, amenity grassland, scattered trees, a boundary tree line and shrub planting. There is also a pond and wildflower planting area within the park but outside of the site boundary. It is proposed to access the site from Glamis Road rather than The Highway, which means the wildflower planting area to the east of the park would not be directly affected by the proposed works.

- T.5.73 Given the limited extent of the permanent works, which would be mainly in the foreshore, operational activities would not give rise to significant effects on terrestrial habitats or birds. The provision of bat boxes would have a beneficial effect on bat populations.
- T.5.74 In accordance with NPS policy, the proposals for this location seek to maximise opportunities to conserve and enhance biodiversity. In addition, measures in the *CoCP* and the *Design Principles* would be implemented, including reinstatement and replacement of trees and planting and the provision of nest boxes and bat boxes. These measures would be addressed through final landscape designs to be discussed with and approved by the London Borough of Tower Hamlets and maximise opportunities to build in beneficial biodiversity features as part of good design (NPS para. 4.5.14).
- T.5.75 As required by the NPS (para. 4.5.17), the footprint of the proposals is no greater than necessary and measures are in place to mitigate any adverse effects and to implement proposals to enhance the value of long-term habitats on the site.

Landscape and visual impacts

- T.5.76 The King Edward Memorial Park Foreshore site does not lie within or in proximity to any nationally or locally designated landscapes. However, the local townscape shaped the design development and evolution of the proposed works in this location. The development of the project also took into account local Character Appraisals for Wapping Wall, St Paul's Shadwell, Wapping Pierhead and Narrow Street Conservation Areas, as well as the *Wapping Wall Character Appraisal and Management Guidelines*, produced by the London Borough of Tower Hamlets.
- T.5.77 Through robust site selection, extensive consultation, significant design developments and mitigation, the proposed scheme was refined to minimise its impact on the surrounding townscape and views during construction, and provide benefits once operational in terms of visual appearance and high quality design.
- T.5.78 The construction layout and design were refined to minimise the visibility of the works. The area of the proposed works in the green portion of the park was minimised by utilising existing hardstanding where possible. It is also proposed that the office, welfare and workshop facilities would be located at a suitable off-site location to be determined by the contractor. This substantially reduces visibility of the construction site, particularly in the multipurpose sports pitches to the west of the park. Measures were incorporated in the *CoCP* to reduce the townscape and visual impact of the works as much as possible.
- T.5.79 Despite this, the construction works would be a prominent feature of the local townscape and views due to site clearance, the presence of hoardings and construction activity, together with the site's location within the foreshore of the River Thames and in the park. The visibility of construction site is an unavoidable consequence of the scale of works required to intercept the CSO, which runs beneath the park in a dense urban environment.

- T.5.80 The adverse effects identified within the *Environmental Statement* would be limited and relate to the temporary construction works only. The NPS recognises in para. 1.4.4 that NSIPs are likely to take place in mature urban environments and have adverse townscape and visual effects within a built-up environment with many possible receptors. Large scale construction works are commonplace in London and specifically in the London Borough of Tower Hamlets, with the Olympic Park, Crossrail, and a series of major mixed-use redevelopments either completed, under construction, or planned in the vicinity of the site. The construction effects of the project are unavoidable, temporary, and have been minimised as far as possible. They should be considered in this context.
- T.5.81 The permanent proposals in this location were carefully designed to provide a beneficial legacy for the local townscape. Once operational, the proposed development would have significant beneficial effects on the townscape character of the site and nearby views from the introduction of a new high quality area of public realm, high quality ventilation structures, an improved Thames Path, a new children's playground and replacement planting.
- T.5.82 While the majority of the proposals are below-ground, the design parameters and principles for the remaining above-ground structures (ventilation columns, control kiosk and river wall) and landscaping were carefully chosen to be sensitive to the surrounding townscape and as visually attractive as possible. For example, the proposed ventilation columns were designed as an architectural statement. The electrical and control kiosk would be located on the eastern perimeter of the park, which would make it less visible and avoid interrupting views to the River Thames from the park.
- T.5.83 The design principles and parameters are secured through a DCO Requirement. This requires the colours, materials and detailed design of the above-ground structures to accord with the agreed principles.
- T.5.84 The proposals are consistent with the approach required in Section 4.7 of the NPS, as they were designed taking careful account of the landscape characteristics of the area. By means of the considered construction layout, design and the *CoCP*, the construction effects would be minimised as far as possible.

Land use including open space, green infrastructure and green belt

- T.5.85 The impact of the project proposals on land uses and designations (as identified in the *Core Strategy* and retained policies) was a key consideration in the site selection process and design development. The land use plan in Annex T illustrates the land uses of the site and its surroundings.
- T.5.86 The project would be in accordance with *London Plan* Policy 5.14 and *Core Strategy* Policy SP04, which provide explicit support for the development of the project.

- T.5.87 Part of the proposed site, within the park, is designated public open space but does not form part of a Metropolitan Open Land designation, which is afforded the same protection as Green Belt. The *Open Space Assessment*, which accompanies the application, reviewed the quality and value of this area and assessed the potential impact the project would have on it.
- T.5.88 The council's *Open Space Study* (2006) identifies that Tower Hamlets is deficient in open space against the National Playing Fields Association standard of 2.4ha per 1,000 population. Some parts of the borough are outside of the Greater London Authority's accessibility thresholds for District and Local Parks of 1.2km and 400m respectively. King Edward Memorial Park is within the Shadwell Ward, which has an average amount of open space compared with other areas in the borough. There is 0.8 to 1.2ha of publicly accessible open space per 1,000 population, although this is below the National Playing Fields Association standard. The *Open Space Study* identifies King Edward Memorial Park as one of the highest quality open spaces in the borough. The park was awarded Green Flag status in July 2012 in recognition of its quality.
- T.5.89 The *Open Space Assessment* identifies that King Edward Memorial Park, which extends to approximately 3.3ha, provides a wide range of outdoor sports and other recreational functions. Approximately 75 per cent of the space is formal planted gardens, and 25 per cent is hard playing surface. The overall quality of King Edward Memorial Park was assessed as 'good' and of very high value as it supports a good range of recreational facilities for a site of this size. The assessment also identifies some areas within the park where improvements could be made, specifically in the multipurpose sports pitches.
- T.5.90 The extent of the proposed construction site was refined to minimise the amount of open space that would be physically affected by the temporary works and ensure the remainder is accessible and usable throughout construction.
- T.5.91 The proposed temporary diversion of the Thames Path would enable this key route through the open space to remain open. Access would be retained via a controlled crossing to the riverfront area around the Rotherhithe Tunnel ventilation building.
- T.5.92 The northern part of the park would not be physically affected by the proposed development and would remain accessible to the public.
- T.5.93 It is proposed that the construction office, welfare and workshop facilities would be located at a suitable off-site location to be determined by the contractor. This substantially reduces the temporary land take during construction particularly in the multipurpose sports pitches. The reconfiguration and consolidation of the multipurpose sports pitches and tennis courts, as advanced works, would enable this facility to remain in use throughout construction. The relocation of the children's playground would also enable this facility to remain in use throughout construction.
- T.5.94 The proposed construction programme was also optimised to minimise the duration of works in this location.

- T.5.95 The LLAU within the park cover an area of 0.87ha. However, a portion of this, around 0.35ha, is included in the LLAU specifically to allow the reconfiguration of the multipurpose sports pitch and the re-provision of the children's play area. These areas would continue to form part of the useable open space during the main construction phase. The construction phase would therefore entail the temporary removal of approximately 0.52ha of open space from public use, in the southern portion of the park. It should be noted that approximately 85 per cent of the park would be available to the local community during the construction period.
- T.5.96 The open space that would be temporarily used for project construction in this location is not surplus to requirements. Park usage surveys demonstrated that the river frontage part of the site park is well used. The surveys also demonstrated that the multipurpose sports pitch that would be reconfigured prior to construction of the works is not well used at present.
- T.5.97 Thames Water proposed and discussed with the council a package of advanced landscaping measures that could be implemented prior to commencing main construction (as detailed in para. T.5.26). It is proposed that these measures would be discussed further with the council and details could be subject to consultation with the local community.
- T.5.98 The site is partially within the River Thames, which is designated as part of the strategic Thames Policy Area in the *London Plan*. The foreshore in this location is not designated as open space in the *Core Strategy* and has limited public accessibility via the Shadwell Basin Outdoor Activities Centre. 0.88ha of this foreshore area would be temporarily lost during construction, which reduces to a permanent loss of 0.26ha once construction is complete. This would not represent a significant loss of open space or recreational facility, given the wider area of foreshore that would remain accessible in the vicinity.
- T.5.99 In undertaking the balancing exercise envisaged by paras. 4.8.13 and 4.8.14 of the NPS, the loss of open space therefore needs to be weighed not just against the benefits associated with the interception of the CSO, but also against the benefits of the longer term enhancement of the park as a whole. The existing CSO outfall would be addressed, with associated improvements to the park and foreshore environment.
- T.5.100 Opportunities for new, publicly accessible open space at this site were maximised. The permanent proposals would provide an additional 0.26ha of open space on the foreshore structure by extending the park and adding value to its open space function. This represents an approximate 8 per cent increase in open space at King Edward Memorial Park, once the works are complete. The proposed design principles and parameters would ensure the green portion of the park and mature planting area is extended to the south onto the foreshore structure. The works would improve the quality, usability, function and accessibility of the open space environment within the park; increase the overall area of open space available to the community; and integrate the new space with the rest of the park. Also, the proposed access route (comprising the Thames Path)

from Glamis Road would provide an improved and inclusive environment for pedestrians and cyclists.

- T.5.101 On this basis, it is considered that the loss of open space is outweighed by the provision of new open space, the package of open space and landscaping measures and enhanced sports facilities elsewhere in the park once the works are complete.
- T.5.102 Surrounding land uses were reviewed and considered in the site selection process and on-going design development. As a result of the proposed design principles and parameters, the proposed works would not prevent the continuation of surrounding land uses during construction or operation. Similarly, any extant planning permissions, committed developments, or policy allocations for future development would not be significantly impacted as a result of the works in this location.

Noise and vibration

- T.5.103 The current noise environment in the vicinity of the site is dominated by road traffic noise and background noise levels are relatively high. The *Environmental Statement* provides an assessment of expected noise effects during construction and operation. The nearest locations to the site that are sensitive to noise and vibration are the residential dwellings at Free Trade Wharf to the northeast and properties on Shadwell Pierhead, Glamis Road, Abbotshades Road and Glamis Place to the south, west, southeast (across the River Thames) and north respectively.
- T.5.104 A series of measures are set out in the *CoCP* and compliance with these measures would be secured through a Requirement. The measures include operating in accordance with best practice, selecting the most quiet, cost-effective plant available, and optimising plant layout to minimise noise emissions. The *CoCP* Part B also contains site-specific measures that are embedded within the design at this site including the provision of 2.4m high hoardings on the cofferdam sections perpendicular to the river wall, 3.6m hoardings around the main shaft working site, and a hoarding on the southern part of the access route to further attenuate construction noise.
- T.5.105 The NPS recognises that NSIPs are likely to take place in mature urban environments and to lead to short-term noise disturbance during construction.
- T.5.106 The implementation of the embedded measures would ensure many effects are not significant. However, despite these measures, some adverse impacts from noise are predicted during the construction phase at the Pier Head Montessori Preparatory School and Free Trade Wharf (south). At Pier Head Montessori Preparatory School adverse effects are predicted during the daytime for a period of one month and at Free Trade Wharf (south) adverse effects are predicted during the daytime for a period of 13 months.
- T.5.107 A significant vibration effect is predicted at Free Trade Wharf (south). The *CoCP* Part A seeks to ensure that piling methods that limit noise and vibration are selected where possible (*CoCP* Part A para 6.4.3d). If ground conditions at the King Edward Memorial Park site enable these methods to

be implemented, effects would not be significant. However, as the specific ground conditions would not be known until piling is underway, it cannot be guaranteed that these measures can be implemented. Therefore, in the worst case, significant effects would arise from piling at this location.

- T.5.108 Given the nature of the works proposed, no further practicable noise mitigation within the construction site was identified beyond the methods identified in the *CoCP*.
- T.5.109 The remaining possible significant noise and vibration effects are an unavoidable consequence of the scale of works required to intercept the CSO. The type and scale of the proposed construction activities is not uncharacteristic of major construction projects undertaken at constrained sites throughout London, such as Crossrail.
- T.5.110 The NPS advises that in situations where other forms of noise mitigation have been exhausted, noise insulation to dwellings or, in extreme cases, compulsory purchase of affected properties may be considered in order to gain consent for what might otherwise be an unacceptable development. In the case of the project, no extreme cases were identified at the date of submission of the application that would necessitate the compulsory acquisition of properties due to significant adverse effects. The Thames Tideway Tunnel noise insulation and temporary re-housing policy and the Thames Tideway Tunnel project compensation programme (included within Schedule 2 to the *Statement of Reasons*, which accompanies the application) were developed to offset the effects arising from construction related disturbance. The noise insulation and temporary re-housing policy would be implemented where predicted or measured construction noise levels exceed published trigger levels. The compensation programme was established to address claims of exceptional hardship or disturbance.
- T.5.111 In relation to construction, eligible works would be directed towards mitigation or other required actions to reasonably reduce disturbance from noise or construction activities. Residential properties at Free Trade Wharf (South) may be eligible for noise insulation as described under the policy which, if taken up, would reduce the predicted noise effects to a non-significant level. Pier Head Montessori Preparatory School may be eligible for compensation in respect of noise. If the identified mitigation measures for vibration cannot be implemented, properties at Free Trade Wharf (south) may be eligible for compensation under the policy.

Historic environment

- T.5.112 The site does not contain any nationally designated (statutorily protected) heritage assets such as scheduled monuments, listed buildings, or registered parks and gardens. However, there are a number of listed structures in proximity to the site. The Grade II listed early 20th century Rotherhithe Tunnel ventilation building lies within the park to the south of the site, and the Grade II listed Shadwell Dock Stairs lie approximately 35m to the west.
- T.5.113 The site lies within Wapping Wall Conservation Area. It is characterised by the remains of historic riverside settlement, shipbuilding and maritime

activity from the medieval and post-medieval periods, and remnants of 19th century industry.

- T.5.114 While not designated, King Edward Memorial Park was established in 1922 and is considered to be a heritage asset. The southern area of the site includes the 19th/20th century embankment river wall, the area of foreshore and the River Thames channel.
- T.5.115 The site lies within an Archaeological Priority Area, which defines an area of potential for palaeoenvironmental remains preserved in the deep alluvial deposits associated with the River Thames and for remains associated with riverfront activity.
- T.5.116 The NPS recognises that NSIPs are likely to take place in mature urban environments and to have adverse effects on heritage assets. The predicted effects of the construction works on the historic environment at this site include a significant effect on the historic character and appearance of the Wapping Wall Conservation Area, the character of King Edward Memorial Park and the setting of the listed Rotherhithe Tunnel ventilation building. However, because the proposed parameters and works were carefully sited and configured, there would be no direct impacts on designated heritage assets, or any loss of their significance. Any indirect effects would be limited to the construction period and reversed once construction ceases.
- T.5.117 It is anticipated that ground movement from tunnelling and construction could cause minor cracks up to 0.1mm wide on the listed Rotherhithe Tunnel ventilation building, which would have a negligible effect on its integrity (refer to the *Environmental Statement*, Vol 3, Appendix E). For this building, mitigation measures such as strengthening the building are not considered required or appropriate as they are likely to be more intrusive and damaging to heritage fabric than a carefully managed process of survey and repair of minor defects, if required, using appropriate materials and techniques.
- T.5.118 The operation of the project infrastructure at King Edward Memorial Park Foreshore would not result in any significant negative effects on heritage assets. It would have a significant beneficial long-term effect on the park.
- T.5.119 The proposals, therefore, were developed with the benefit of a thorough understanding of the significance of the site, its heritage status and the characteristics of its surroundings. The design developed, as far as practical, to minimise adverse effects on the historic environment and to take opportunities to enhance the long-term setting of heritage assets in the vicinity.

Light

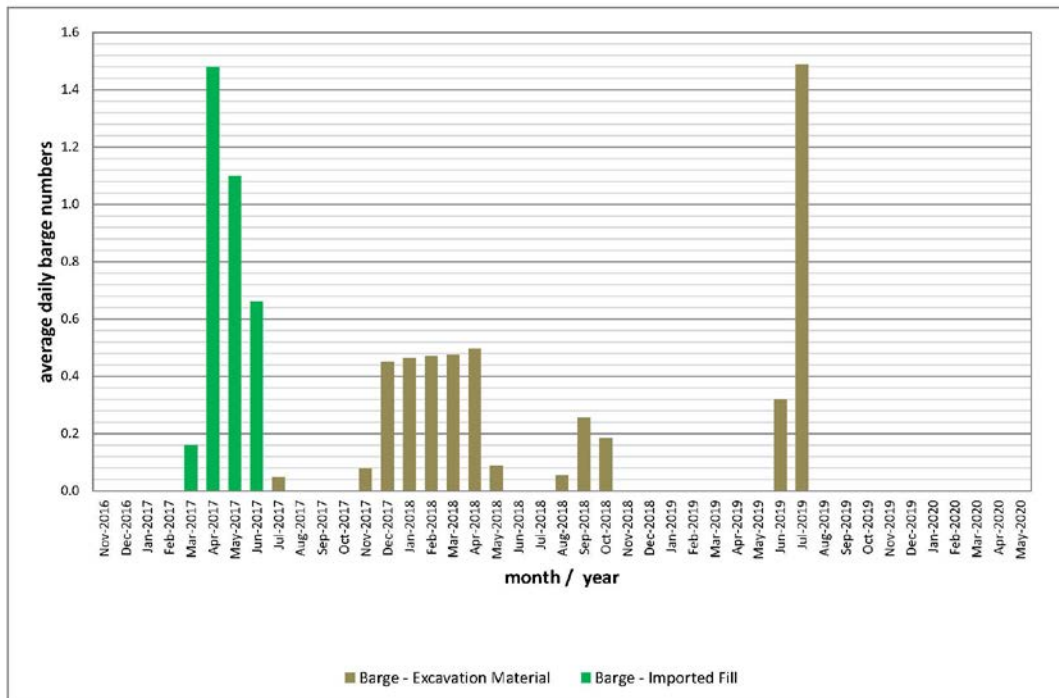
- T.5.120 The screening assessment of effects in the *Daylight/Sunlight Assessment*, which accompanies the application, concluded that there would be no material impact on sunlight or daylight from construction or the permanent works.

- T.5.121 Through the measures included within the *CoCP* all reasonable steps were considered, and would be taken, to minimise detrimental impact on amenity resulting from light.
- T.5.122 There would be minimal spill from site lighting during construction into the wider area. In the early evenings the surrounding area is well lit by street lighting and light spill from surrounding buildings.
- T.5.123 The proposed development would have no operational or public realm lighting requirements as the park is closed at night, apart from a low level light on the electrical and control kiosk door to enable maintenance access when necessary.
- T.5.124 There would therefore be no significant effects from lighting either during construction or operation.

Traffic and transport

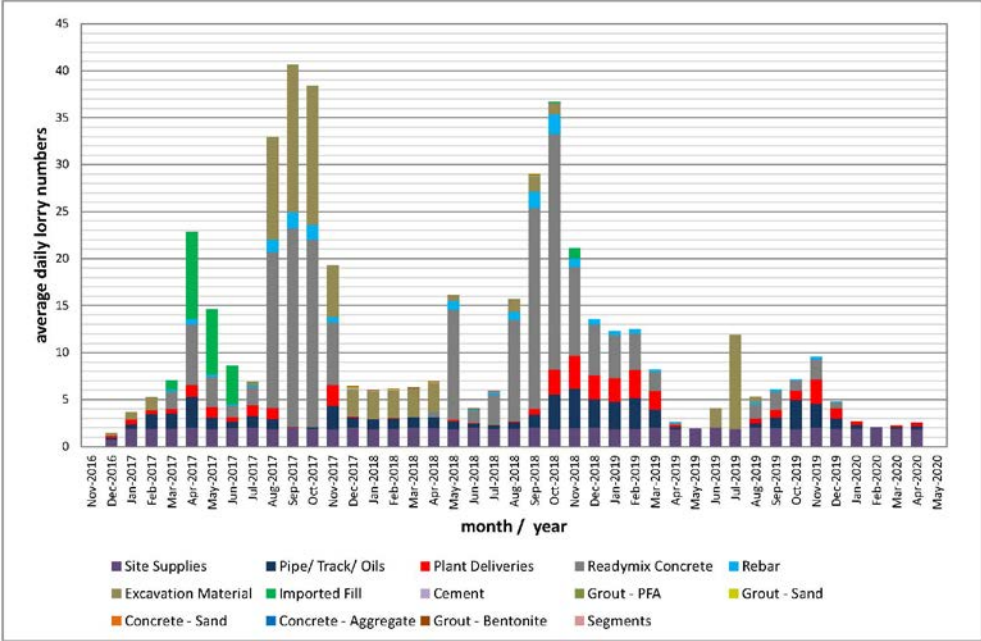
- T.5.125 The King Edward Memorial Park Foreshore site has moderate public transport accessibility. It is located in proximity to a number of local bus service routes, Limehouse National Rail and Docklands Light Rail stations, Shadwell Overground and Docklands Light Rail Stations, and Wapping Overground station.
- T.5.126 Construction and maintenance vehicle access is proposed via The Highway (A1203), Glamis Road and the new site access road.
- T.5.127 During construction vehicle movements would take place on weekdays between 8am to 6pm and on Saturdays from 8am to 1pm. Up to one hour before and after these hours would be required for mobilisation and demobilisation. Mobilisation may include loading, unloading, and arrival and departure of staff and movement to and from the site. In exceptional circumstances in agreement with the local authority HGV and abnormal lorry movements could occur up to 10pm on weekdays for large concrete pours. Thames Water would require contractors to produce a green travel plan to encourage workers to use public transport.
- T.5.128 A significant proportion of construction waste would be reused on-site in accordance with NPS policy, the London Plan Waste Management Hierarchy and the project-wide Waste Strategy. This would avoid the need to transport this material off-site by road.
- T.5.129 A significant proportion of the construction and excavated materials would be transported by barge, as set out in the *Transport Strategy*, which accompanies the application. During construction, it is proposed that 90 per cent of the cofferdam fill and 90 per cent of the excavated material from the shaft would be transported by barge and all other materials by road. As shown in Figure T.7 overleaf, it is estimated that between one and two barges would be used each day during these periods. Each barge would save approximately 55 lorries from using the road network.

Figure T.7 Estimated construction barge histogram



T.5.130 As advocated by the NPS, the number of HGVs would be kept as low as possible. As shown in Figure T.8 overleaf an average peak flow of 82 vehicle movements (41 HGVs) a day is expected during the two months of greatest activity during site year 1 of construction at this site. A second, smaller peak is expected for two months during year 2 of construction. At other times in the construction period vehicle flows would be considerably lower. During the peak months, construction traffic would only result in a slight reduction in capacity along The Highway (A1203) and a slight increase to delay on this part of the network. This would be a negligible impact given existing traffic levels and the strategic nature of this road.

Figure T.8 Estimated construction HGV histogram



- T.5.131 The construction works in this location would therefore not likely result in any significant transport effects on the local road network operation.
- T.5.132 The Thames Path runs adjacent to the riverside footway of King Edward Memorial Park and would be diverted around the eastern part of the construction worksite. Access would be maintained by the use of a controlled crossing of the construction access route. The diversion effects on pedestrian and cyclist amenity and safety would not be significant.
- T.5.133 Measures to further reduce transport impacts are detailed in the *CoCP* and *Transport Strategy*, including HGV management and control measures such as designated vehicle routes to sites for construction vehicles. There is also a provision for management plans for construction worker journeys to and from the site. In addition to the general measures in the *CoCP* Part A, the following measures are incorporated into the *CoCP* Part B in relation to the King Edward Memorial Park Foreshore site:
 - a. The site access would be via Glamis Road from The Highway (A1203). Access to the site would be from the north with left turn into the site and right turn out only.
 - b. The security barrier would be positioned to allow a standard rigid tipper vehicle to be wholly off the road while awaiting barrier operation.
 - c. A gated crossing would be provided in King Edward Memorial Park to enable the realigned Thames Path to cross the new access road. The gates would only be closed during vehicle movements. A traffic marshal would be deployed to ensure the safe movement of vehicles and public crossing.
 - d. The new site access road would extend from Glamis Road to the foreshore site. Where the access road crosses the existing playground it would operate with a single lane in each direction enabling vehicles

to pass one another. To the east of the existing playground between the football pitch/maintenance area and the foreshore would be a single lane only with appropriate traffic control.

- e. Areas of parking restriction would be confirmed with the London Borough of Tower Hamlets.
- f. Adequate advance notice and signage would be provided for the diversion of the Thames Path.

T.5.134 There would be no significant transport effects during the operational phase given the infrequent need for vehicle use.

T.5.135 The proposed works at King Edward Memorial Park Foreshore were designed to avoid substantial impacts on the surrounding transport infrastructure. In accordance with the decision-making criteria in the NPS (paras. 4.13.6 to 4.13.10), transport impacts would be successfully managed by means use of barges and committed *CoCP* measures. Consequently, no significant transport impacts are anticipated.

Waste management

T.5.136 The Waste Strategy was developed to provide a framework for the management of materials and waste that would be produced throughout the construction and operational phases. This ensures that the requirements set out in para. 4.14.6 of the NPS would be satisfied, and the Waste Strategy would be secured via an obligation in accordance with para. 4.14.7 of the NPS.

T.5.137 No particular site-specific waste issues are expected to arise at this site.

Socio-economic

T.5.138 The socio-economic issues and benefits of the project both during construction and operation are detailed in Section 7 of the *Planning Statement*.

T.5.139 The proposed construction site includes an area of green open space, part of a hard surfaced sports area, a works compound and an area of foreshore on the River Thames as well as a section of the Thames Path. Within the wider park, there are other areas used for sports including football, tennis and a bowling green as well as a children's playground and bandstand. Residential dwellings and the Shadwell Basin Outdoor Activity Centre surround the site. The site and surrounding area is well used for a range of purposes including walking, cycling, active and passive recreation and river-based activities.

T.5.140 During construction, there would be significant effects arising from the temporary reduction in the provision of public open space and significant amenity effects on users of the park, nearby residents, users of Shadwell Basin Outdoor Activity Centre and the Pier Head Montessori Preparatory School. However, when the project is operational, there would be a significant beneficial effect resulting from the permanent increase in an area of public open space and improved landscape at King Edward Memorial Park, which would support opportunities for healthy and active lifestyles.

- T.5.141 This site is expected to require a maximum workforce of 40 workers at any one time. These jobs and training opportunities would provide a stimulus to the local economy.
- T.5.142 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 number of people from particular 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 that may be displaced as a result of the project.
- T.5.143 The potential significant equalities impact at this site would be the differential impact on children, and pregnancy and maternity equalities groups from the temporary diversion of the Thames Path, and the deprivation equalities group from the impact of construction on the park, since these groups form a large part of the nearby population. The Thames Path diversion would be adequately signed and provide suitable pedestrian access throughout the entire construction period. The permanent enhancement of the public realm would have a beneficial effect on the same equalities groups.

T.6 Overall conclusions

- T.6.1 The project is proposed to prevent large volumes of sewage discharging into the tidal Thames. There is a need to intercept the North East Storm Relief Sewer CSO. The Environment Agency identified it as one of the 34 CSOs that require control by the project. In an average year, the CSO discharges approximately 31 times releasing a total of 782,000m³ of untreated sewage into the tidal Thames in front of King Edward Memorial Park in the London Borough of Tower Hamlets. Intercepting the CSO would make a fundamental contribution to meeting the wider need for the project identified in the NPS.
- T.6.2 King Edward Memorial Park Foreshore was selected as the appropriate site to meet the need following extensive consideration and engagement. The site is suitable and the application proposals would meet the identified need.
- T.6.3 The reduction of discharges from the North East Storm Relief CSO would improve the water quality in the tidal Thames in this location with consequent benefits to ecology and amenity. It would also help reduce sewage derived litter and the health risks to river users.
- T.6.4 Given the site's location in the foreshore of the River Thames and in part of King Edward Memorial Park, it is inevitable there would be some disturbance during the construction period. While Thames Water sought to minimise any disturbance that would be experienced through sensitive design and mitigation, some significant negative effects are likely to remain. These comprise principally:
- a. permanent loss of part of the designated intertidal habitat and intertidal feeding and resting habitat for fish

- b. noise effects at the Pier Head Montessori Preparatory School, and residential properties at Free Trade Wharf (south) and a vibration effect at Free Trade Wharf (south) during construction
 - c. townscape and visual impacts of construction
 - d. significant effect on the historic character and appearance of the Wapping Wall Conservation Area, the character of King Edward Memorial Park, and the setting of the listed Rotherhithe Tunnel ventilation building during construction
 - e. socio-economic effects resulting from the temporary reduction in the provision of open space and identified amenity effects.
- T.6.5 The assessment above explains that the proposals incorporate measures to limit the effect of each of these impacts. For each effect, the project design was refined and all practicable mitigation identified and committed to, in accordance with the NPS. The remaining impacts are an unavoidable consequence of intercepting the CSO, which runs directly beneath the park, in a dense urban environment.
- T.6.6 The proposals at King Edward Memorial Park Foreshore would also give rise to a number of other significant beneficial effects, comprising:
- a. significant improvements in river water quality due to reduced spill frequency, duration and volume from the North East Storm Relief CSO, which would result in significant reductions in sewage derived litter and health risks to users of the river in this location
 - b. a significant beneficial effect on bat populations due to the provision of bat boxes
 - c. significant beneficial effects on the townscape character of the site and nearby views through the introduction of new high quality area of public realm, high quality ventilation structures, a widened Thames Path, new children's playground and replacement planting
 - d. a socio-economic benefit from the permanent increase in public open space and improved landscaping at King Edward Memorial Park.
- T.6.7 The project's legacies in this location would be substantial. The proposed design principles and parameters would extend the green portion of the park and mature planting area to the south onto the foreshore structure. The works would increase the overall area of open space available to the community and integrate the new space with the rest of the park. Also, the proposed access route (comprising the Thames Path) from Glamis Road would provide an improved and inclusive environment for pedestrians and cyclists.
- T.6.8 The proposed works at the King Edward Memorial Park Foreshore site and the mitigation measures developed and advanced as part of the application 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.
- T.6.9 Section 8 of the *Planning Statement* considers the implications of the local effects of the works at King Edward Memorial Park 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 King Edward Memorial Park Foreshore, and the project as a whole, are compliant with the NPS and that development consent should be granted.

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Annex T.1: Consideration of alternative sites

- 1.1.1 The proposed site was identified and then assessed through a robust, qualitative, and iterative site selection process, and the proposals were developed through extensive consultation and engagement. The site selection methodology used to select the site was applied in a transparent, consistent and fair manner across all sites investigated over the route of the tunnel, was subject to consultation with local authorities and key stakeholders. The methodology was supported by the London Borough of Tower Hamlets and further endorsed in the council's phase one consultation response.
- 1.1.2 All the relevant information that informed the site selection process in accordance with the agreed methodology published prior to consultation was made available and discussed in detail at a series of meetings with the community and Council.
- 1.1.3 The proposed use of King Edward Memorial Park Foreshore attracted both formal support from some stakeholders, including the Greater London Authority, and considerable opposition from others including the London Borough of Tower Hamlets. There is broad consensus amongst stakeholders that there is a need to tackle the unacceptable discharges from the North East Storm Relief CSO, however the opposition centres on the belief that Thames Water selected the wrong site, the use of which would cause unacceptable impacts, and that a better alternative exists.
- 1.1.4 The key challenge is the constrained location of the CSO, and the high density of development in the locality which limits the availability of suitable sites that could be used to intercept the CSO. The alternative option preferred by the majority of those stakeholders objecting to the use of King Edward Memorial Park Foreshore is the Heckford Street site. The option was seriously and robustly considered through the site selection methodology. However, King Edward Memorial Park Foreshore was identified by Thames Water as the right site to meet the need of intercepting the North East Storm Relief CSO.
- 1.1.5 Further work to test the suitability of this site was undertaken in response to specific queries and objections raised at phase one consultation. This review included consideration of whether a smaller site in King Edward Memorial Park itself could be used to intercept the CSO, with an additional 'intermediate' site used to connect the intercepted CSO to the main tunnel via a deep shaft. The two sites in this scenario would be connected by a short connection tunnel.
- 1.1.6 Three shortlisted sites were identified, namely Shadwell Basin, Limehouse Basin and Heckford Street. It was considered that the two basin sites would be less suitable than Heckford Street because it would be technically challenging to undertake the construction works within water basins, the sites have poor access and they are further away from the CSO. This would mean a longer connection tunnel from the CSO in King Edward Memorial Park.

- 1.1.7 Therefore the two main options for further consideration were:
- a. Option 1: King Edward Memorial Park Foreshore – one site to intercept the CSO and connect to the main tunnel
 - b. Option 2: King Edward Memorial Park (to intercept the CSO in the northern part of the park) and Heckford Street (for use as an intermediate site with a deep drop shaft to connect flows to the main tunnel. The deep drop shaft would be used to drive a short connection tunnel back to the park). This option is collectively referred to as the ‘Heckford and park option’.
- 1.1.8 The alternative option preferred by those stakeholders objecting to the use of King Edward Memorial Park Foreshore is Option 2. While promoted by objectors as a ‘brownfield’ option, this alternative would still require a worksite in the open space at King Edward Memorial Park to intercept the CSO. The Heckford Street site would be used to construct the connection tunnel and the shaft to drop the flows down to the main tunnel.
- 1.1.9 The option was seriously and robustly considered through the site selection process. The site selection methodology used was applied in a transparent, consistent and fair manner across all sites investigated over the route of the tunnel.
- 1.1.10 King Edward Memorial Park Foreshore was identified as the selected CSO site for the application for the following reasons:
- a. Only one site is needed to intercept the CSO and connect it to the main tunnel. This eliminates the cumulative effects of undertaking construction works at two sites at the same time and would increase construction efficiency. Use of a single site would also simplify operational and maintenance arrangements.
 - b. Use of King Edward Memorial Park Foreshore would have a lower cost given that it only requires works in one location and removes the need for an additional connection tunnel. This option would also cause less disruption to the local community, would create less traffic on local roads, and would not require 24-hour working.
 - c. Use of King Edward Memorial Park Foreshore does not require the hydraulic and air management facilities that are required for the Heckford and park option.
 - d. The Heckford and park option would require the construction of a relatively shallow connection tunnel, would have increased construction health and safety risks compared to the single site option.
 - e. Use of King Edward Memorial Park Foreshore would allow the main tunnel to run under the River Thames and not beneath local buildings. There would also be no need for a connection tunnel that would run under a number of properties, which would be required for the Heckford and park option.
 - f. Use of King Edward Memorial Park Foreshore on the foreshore would retain opportunities to use the river to transport materials, which would

reduce road transport requirements compared to the use of the Heckford and park option.

- g. In planning policy terms, King Edward Memorial Park Foreshore was considered the most suitable CSO site. This option would require only one site, which would avoid the combined planning policy implications of two sites. Furthermore, this option had the planning policy benefit of providing a permanent extension to the publicly accessible open space in the park and the opportunity to enhance the route of the Thames Path through the park. There would also be the opportunity to reinstate recreational facilities and enhance the park on both before and upon completion of the works.
- h. Use of King Edward Memorial Park Foreshore would avoid direct impact on businesses at Heckford Street, which would be contrary to local policy.
- i. Use of the Heckford Street site would substantially increase the land acquisition cost relative to use of King Edward Memorial Park Foreshore. The displacement of the existing business occupiers on the Heckford Street site would lead to multiple compensation claims for disturbance and relocation costs.
- j. More residential properties would potentially be affected if the Heckford Street site were used due to the close proximity of residential properties to this site and the greater number of HGV movements likely to be required to access the site.

1.1.11 For the above reasons it is considered that King Edward Memorial Park Foreshore is the right site to meet the need to intercept the North East Storm Relief Sewer and convey the flows to the main tunnel.

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Annex T.2: Drawings for King Edward Memorial Park Foreshore

List of drawings

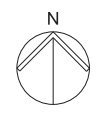
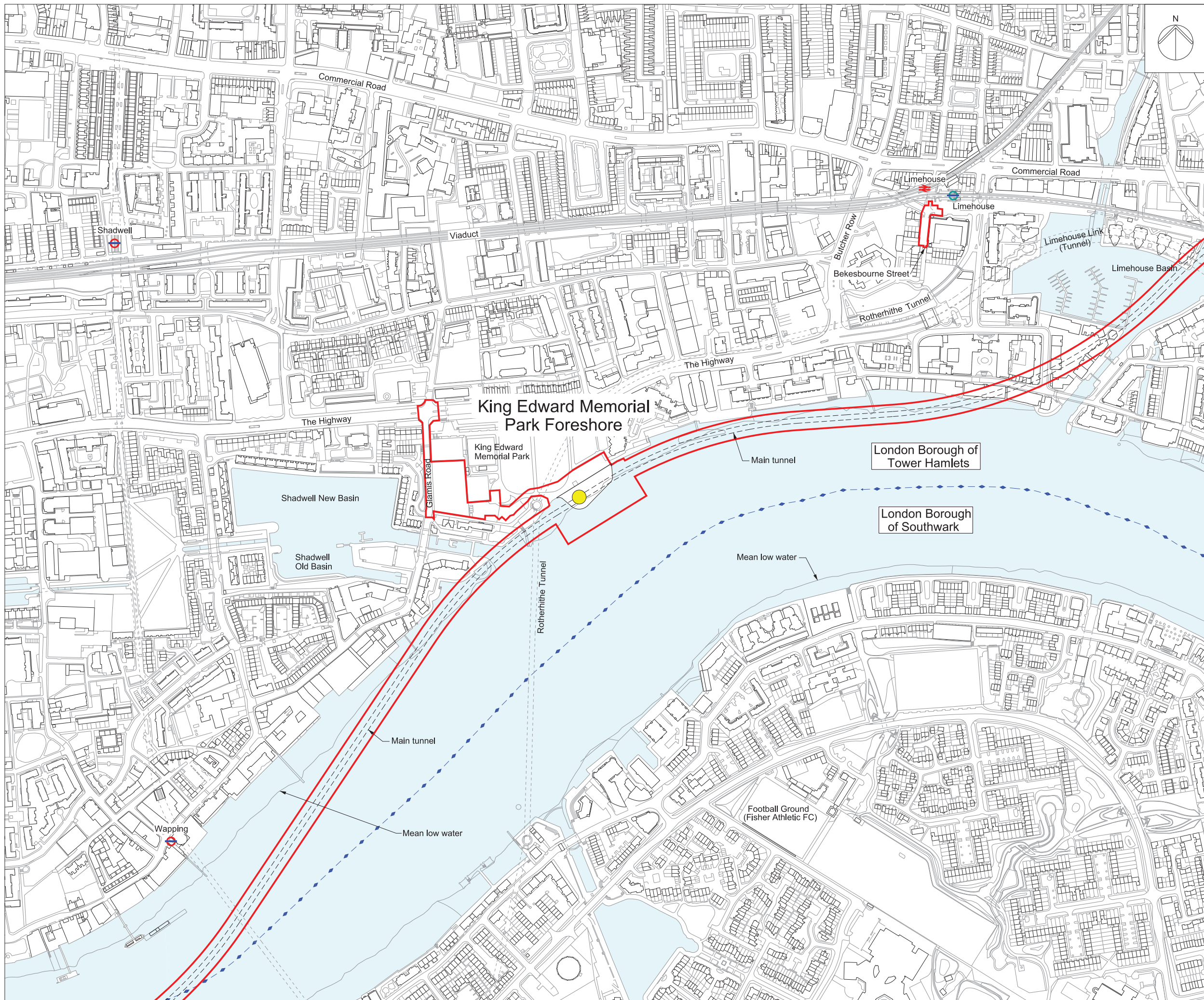
King Edward Memorial Park Foreshore: Location plan

King Edward Memorial Park Foreshore: As existing site features plan

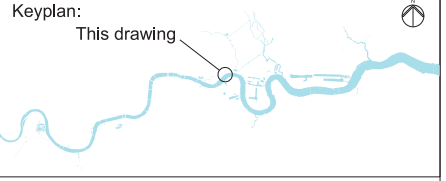
King Edward Memorial Park Foreshore: Construction phases plans

King Edward Memorial Park Foreshore: Land use plan

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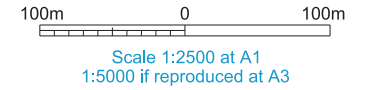
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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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

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



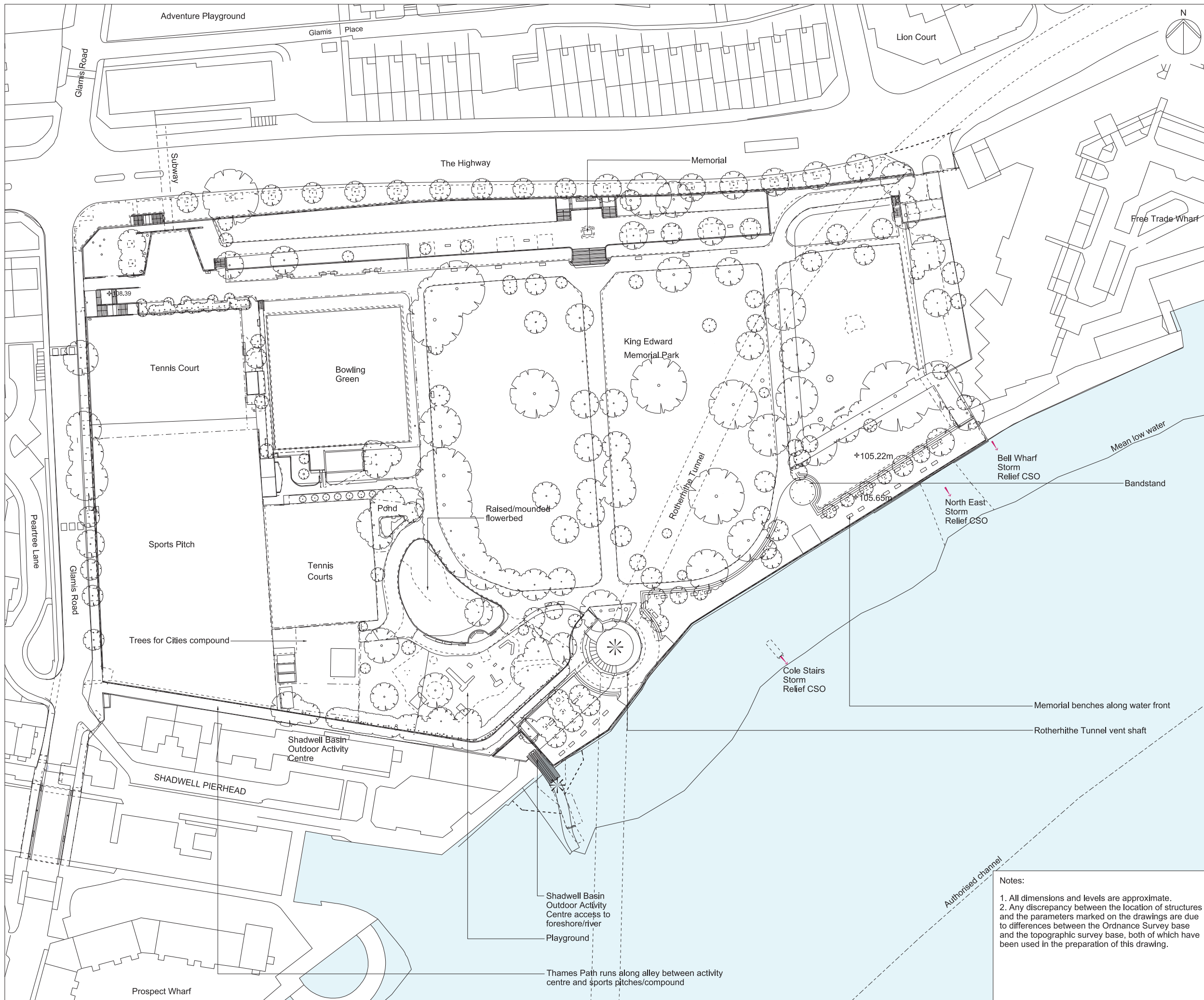
FOR INFORMATION

Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

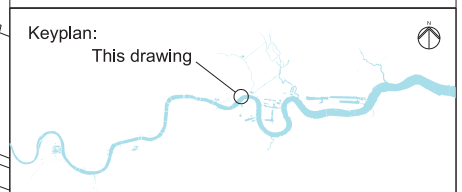
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Application for Development Consent
Location plan

Book of plans - section 25
DCO-PP-24X-KEMPF-250001
January 2013



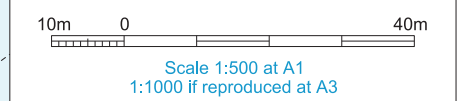


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:**
- Limits of land to be acquired or used (LLAU)
 - Zone within which permanent above ground structures would be located
 - Zone within which required landscaping would be located
 - Maximum extent of foreshore structure
 - Authorised channel
 - Existing levels (shown in metres above tunnel datum)
 - Proposed levels (shown in metres above tunnel datum)
 - Consented development footprint (by others)
 - Listed buildings/structures
 - Approximate position of CSO outlet
 - Existing trees within surveyed area (trunk sizes vary)



FOR INFORMATION

Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

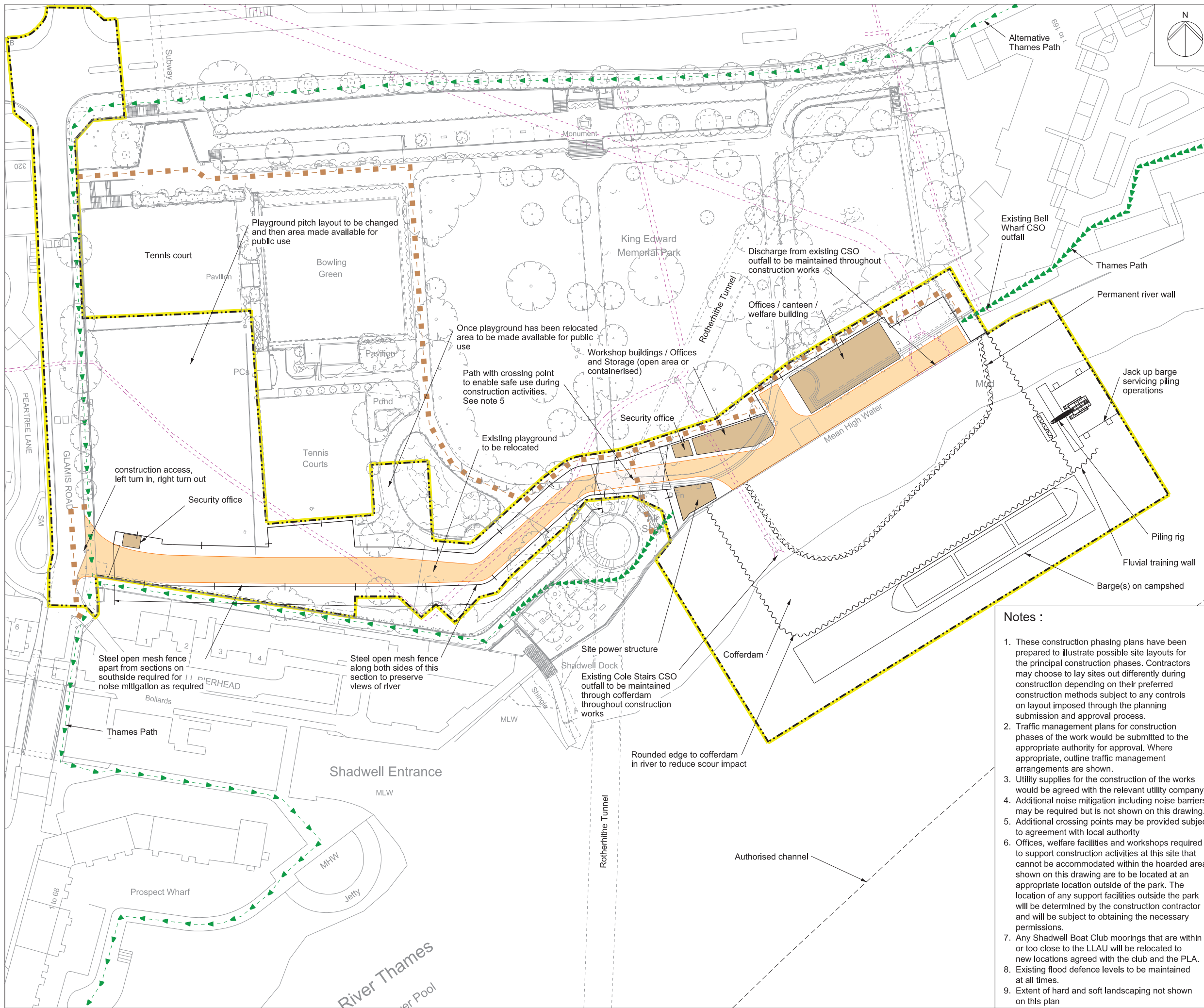
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Application for Development Consent

As existing
Site features plan
Book of plans - section 25
DCO-PP-24X-KEMPF-250002
January 2013

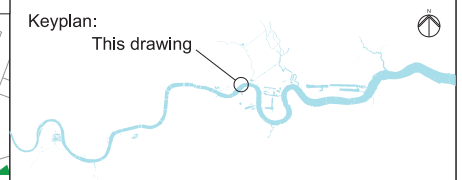


Notes:

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.



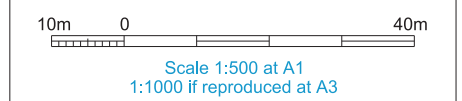
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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - ▶▶▶ Existing permissive right of way
 - ▶▶▶ Existing public right of way
 - - - Route of temporary diversion of right of way
 - ⊘ Site access
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

- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
 2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
 3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
 4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.
 5. Additional crossing points may be provided subject to agreement with local authority
 6. Offices, welfare facilities and workshops required to support construction activities at this site that cannot be accommodated within the hoarded area shown on this drawing are to be located at an appropriate location outside of the park. The location of any support facilities outside the park will be determined by the construction contractor and will be subject to obtaining the necessary permissions.
 7. Any Shadwell Boat Club moorings that are within or too close to the LLAU will be relocated to new locations agreed with the club and the PLA.
 8. Existing flood defence levels to be maintained at all times.
 9. Extent of hard and soft landscaping not shown on this plan

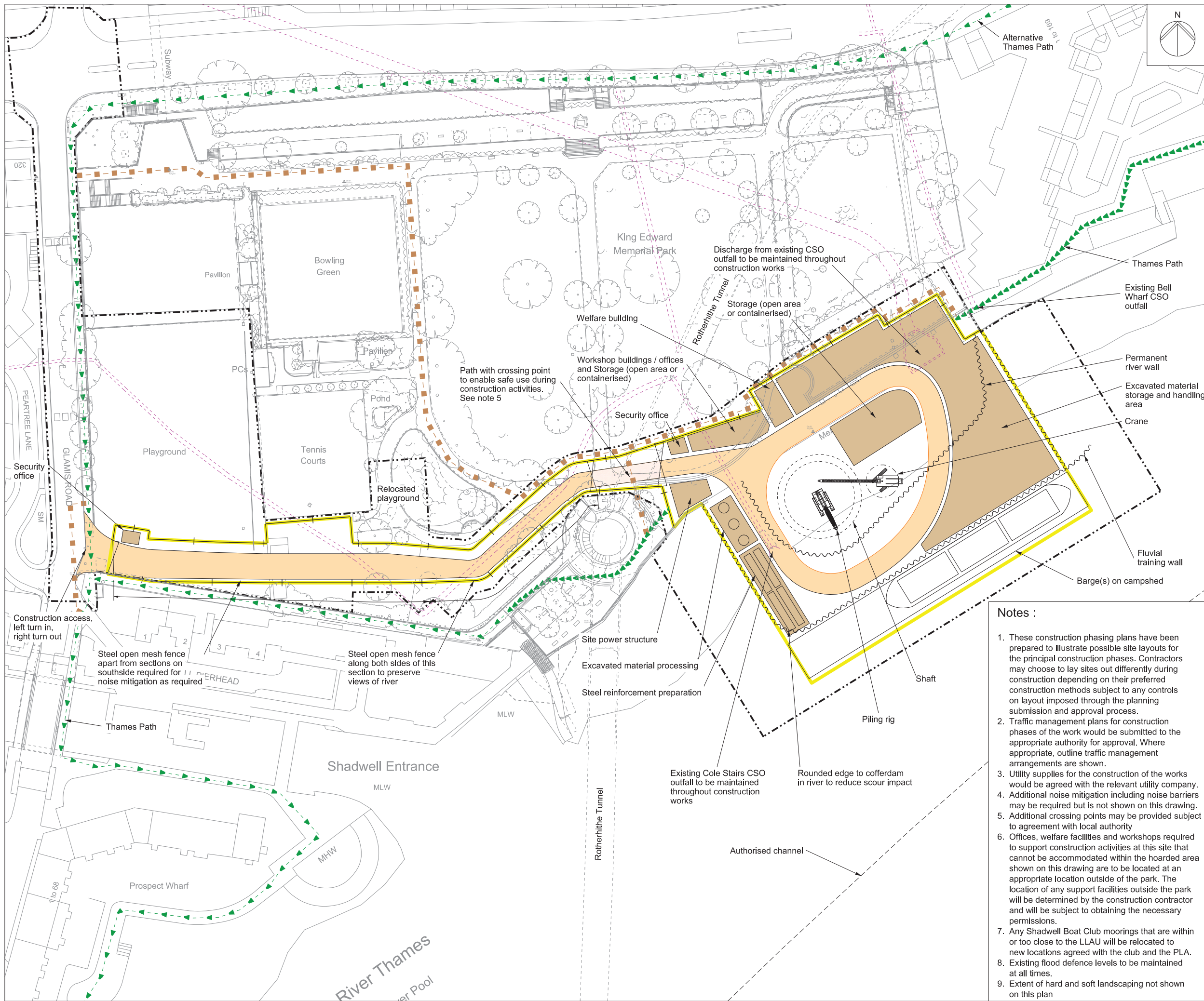


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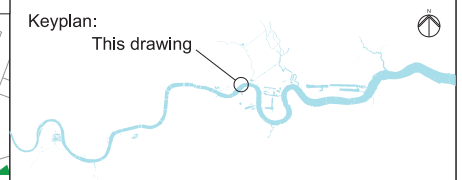
Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

Document Information
Application for Development Consent
Construction phases - phase 1
Site setup
Book of plans - section 25
DCO-PP-24X-KEMPF-250015
January 2013





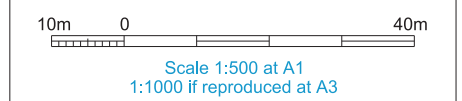
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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - ▶▶▶ Existing permissive right of way
 - ▶▶ Existing public right of way
 - - - Route of temporary diversion of right of way
 - ⊘ Site access
 - Access / haul route
 - - - Existing sewers
 - ~ Sheet piles
 - Permanent river wall
 - Existing Bell Wharf CSO outfall
 - Excavated material storage and handling area
 - Crane
 - Fluvial training wall
 - Barge(s) on campshed

- 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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 9. Extent of hard and soft landscaping not shown on this plan

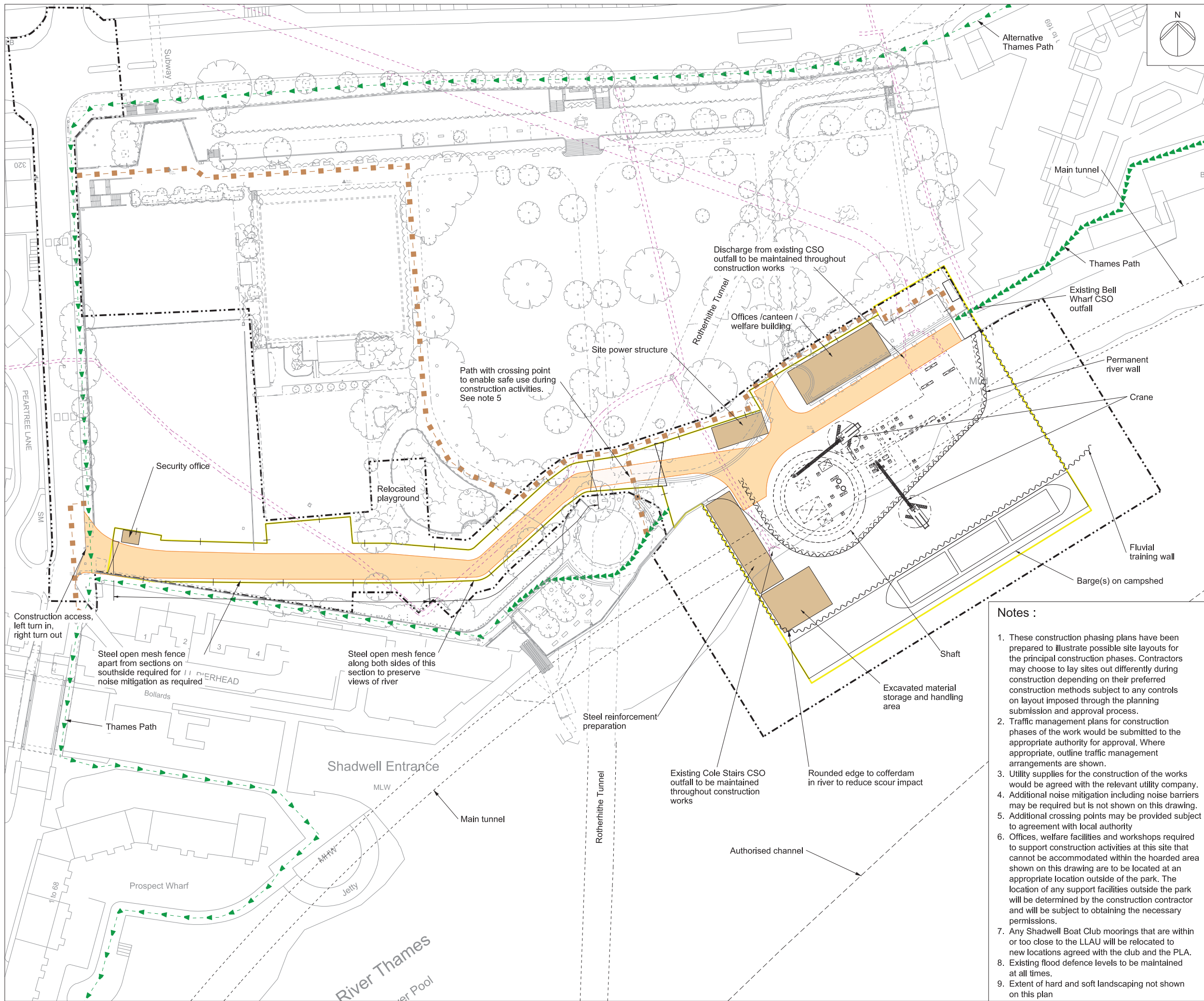


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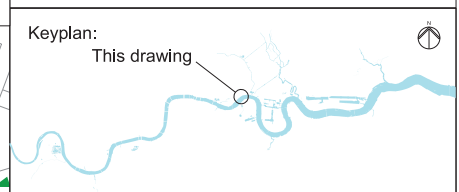
Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

Document Information
Application for Development Consent
Construction phases - phase 2
Shaft construction
Book of plans - section 25
DCO-PP-24X-KEMPF-250016
January 2013





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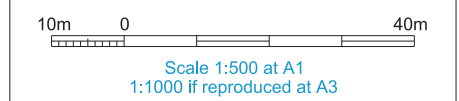
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Key:

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	Hoarding
	Maximum extent of working area
	Existing permissive right of way
	Existing public right of way
	Route of temporary diversion of right of way
	Site access
	Access / haul route
	Existing sewers
	Sheet piles

Notes :

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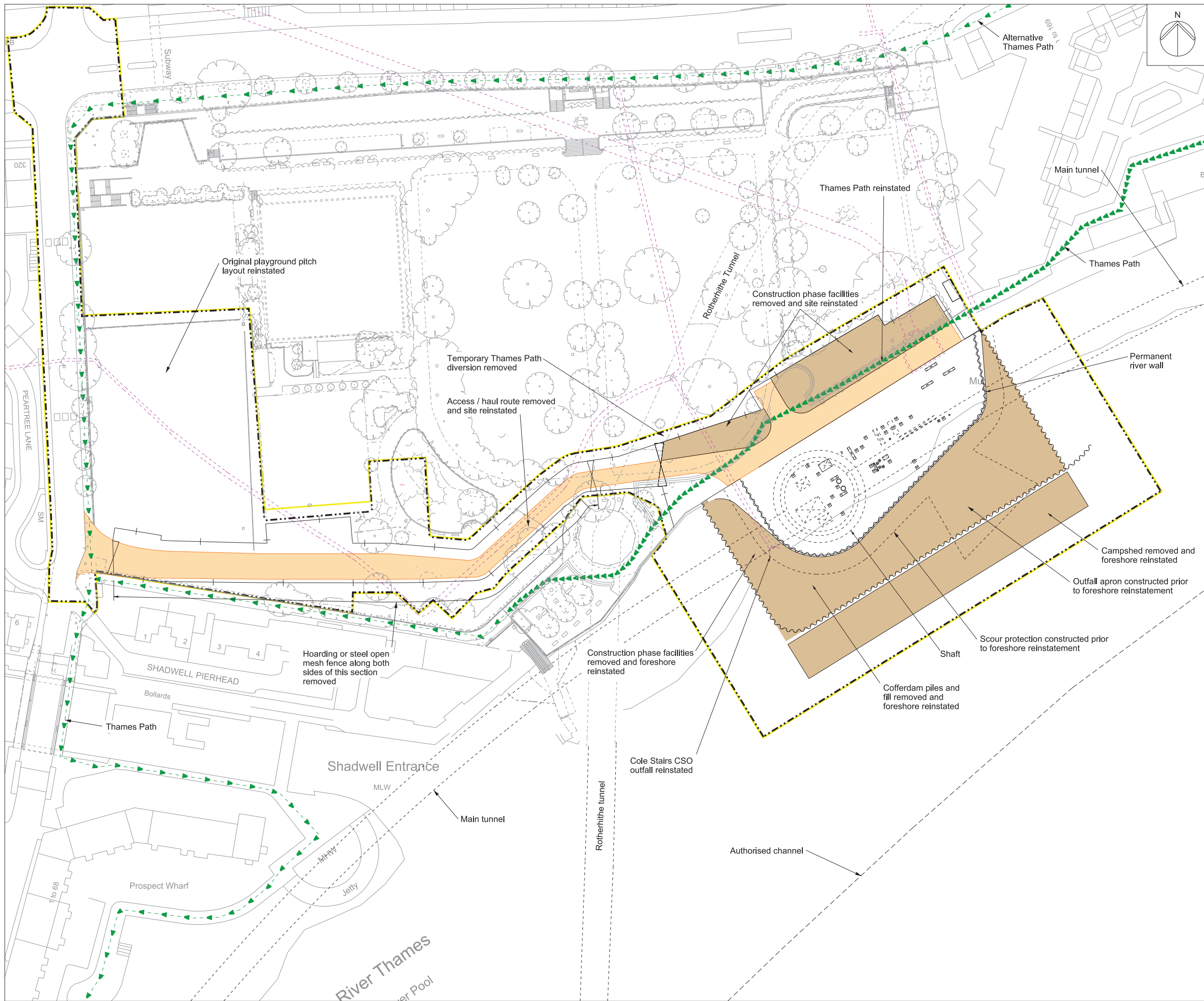


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Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

Document Information
Application for Development Consent
Construction phases - phase 3
Construction of other structures
Book of plans - section 25
DCO-PP-24X-KEMPF-250017
January 2013



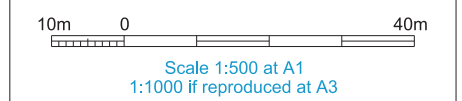


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 - ▶▶▶ Existing public right of way
 - ⊘ Site access
 - Access / haul route
 - Existing sewers
 - ~ Sheet piles

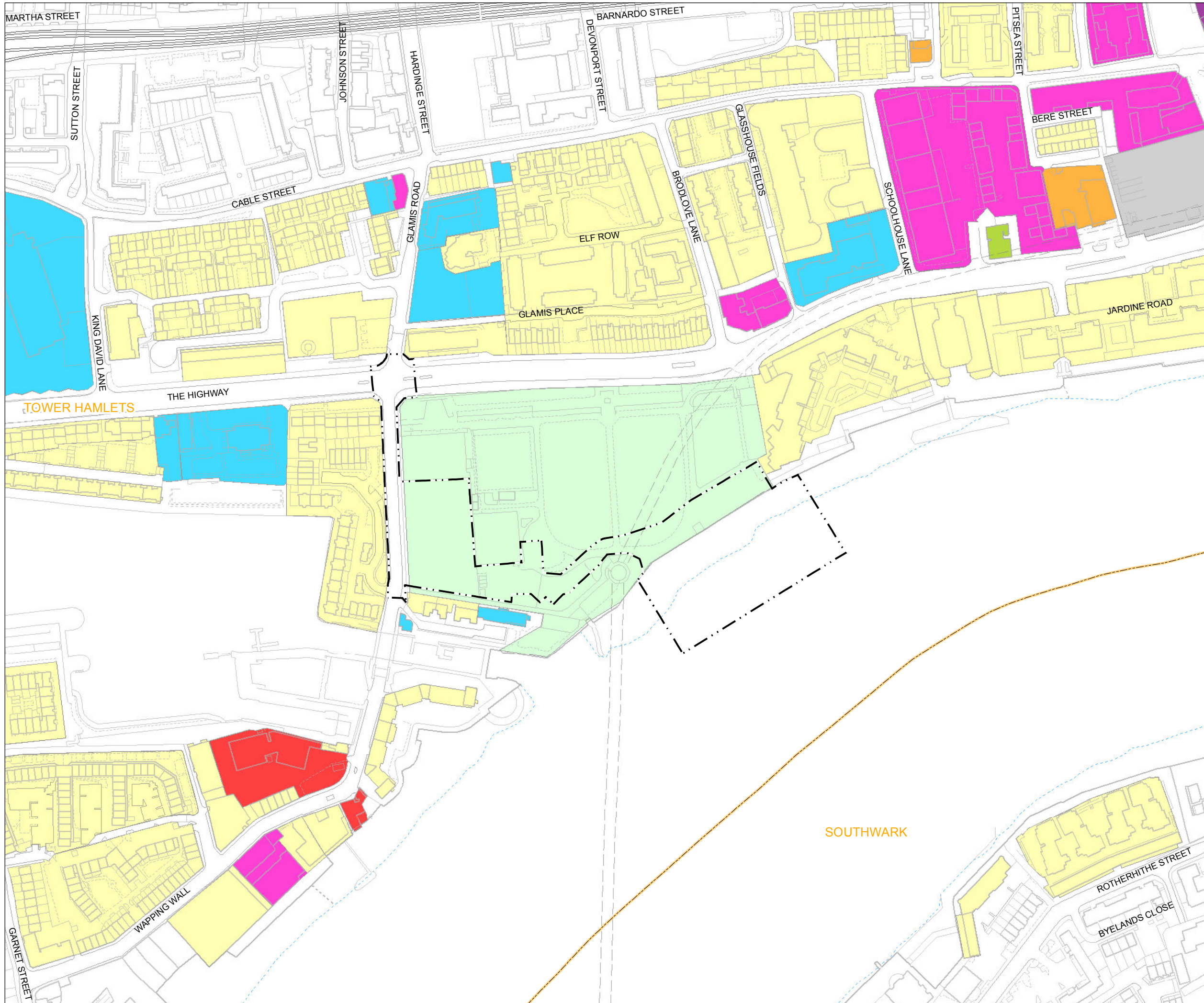


ILLUSTRATIVE

Location
King Edward Memorial Park Foreshore
London Borough of Tower Hamlets

Document Information
Application for Development Consent
Construction phases - phase 4
Site demobilisation
Book of plans - section 25
DCO-PP-24X-KEMPF-250018
January 2013

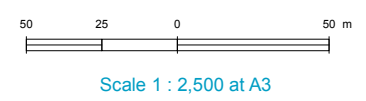




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- Key**
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Land Use**
- Class A1-A5 (Shops, Financial & Professional Services, Restaurants, Drinking Establishments and Hot Food Takeaways)
 - Class B1 (Business (Offices except A2) 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
King Edward Memorial Park Foreshore
 London Borough of Tower Hamlets

Document Information
Planning Statement
 Land use

1PL03-MG-00813
 January 2013



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