

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix K

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

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January 2013

**Thames
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Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement

Appendix K: Heathwall Pumping Station

List of contents

| | Page number |
|---|-------------|
| K.1 Introduction | 1 |
| K.2 Site description | 2 |
| K.3 Planning context | 5 |
| Planning policy | 5 |
| Planning history | 6 |
| K.4 Site-specific description of development | 11 |
| Overview..... | 11 |
| Application for development consent..... | 12 |
| Construction | 14 |
| Site setup..... | 15 |
| Shaft construction..... | 16 |
| Tunnel construction | 16 |
| Secondary lining..... | 16 |
| Construction of other structures..... | 17 |
| Completion of works and site restoration..... | 17 |
| Operation..... | 18 |
| Access..... | 19 |
| Scheme development..... | 20 |
| K.5 Site-specific planning considerations..... | 22 |
| Meeting the need..... | 22 |
| Good design | 23 |
| Maintain Middle Wharf as a viable waterborne freight use | 27 |
| Minimise impact of permanent structures | 28 |
| Divert and enhance the adjacent public right of way and provide an attractive open space..... | 28 |
| Enhance the attractiveness of the pumping station | 30 |
| Maintain operation of the Battersea Barge | 31 |
| Manage impacts of construction | 31 |
| Conclusions | 31 |
| Water resources and flood risk | 31 |

| | |
|---|-----------|
| Air quality, emissions, dust and odour..... | 34 |
| Biodiversity and geological conservation | 35 |
| Landscape and visual impacts | 36 |
| Land use including open space, green infrastructure and green belt..... | 37 |
| Noise and vibration | 37 |
| Historic environment | 39 |
| Light..... | 40 |
| Traffic and transport..... | 40 |
| Waste management..... | 44 |
| Socio-economic..... | 44 |
| K.6 Overall conclusions | 45 |
| Annex K: Drawings for Heathwall Pumping Station..... | 47 |

List of figures

| | Page number |
|--|--------------------|
| Figure K.1 Aerial photograph of Heathwall Pumping Station..... | 2 |
| Figure K.2 Artist's impression of the Riverlight Development (northeast)..... | 4 |
| Figure K.3 Artist's impression of the Embassy Gardens Development (southeast)... | 8 |
| Figure K.4 Key planning applications and proposals in the Nine Elms area..... | 10 |
| Figure K.5 Functional components diagram | 12 |
| Figure K.6 Construction duration | 14 |
| Figure K.7 Design Council CABE scheme review proposals..... | 25 |
| Figure K.8 Design Council CABE scheme review proposals..... | 26 |
| Figure K.9 Aerial view of the proposed development | 27 |
| Figure K.10 Estimated construction barge profile | 41 |
| Figure K.11 Estimated construction lorry profile | 42 |

List of tables

| | Page number |
|---|--------------------|
| Table K.1 Heathwall Pumping Station: Drawings that define the proposed development..... | 12 |

Appendix K: Heathwall Pumping Station

K.1 Introduction

- K.1.1 In an average year, the South West Storm Relief combined sewer overflow (CSO) and the Heathwall Pumping Station CSO, spill approximately 13 and 34 times a year respectively and discharge 228,000m³ and 655,000m³ respectively of untreated sewage into the River Thames in the London Borough of Wandsworth¹. On the basis that litter tonnages are proportional to discharge volumes, approximately 225 tonnes of sewage derived litter is also discharged from these CSOs in an average year. The Environment Agency identified the South West Storm Relief CSO and the Heathwall Pumping Station CSO as CSOs that needs to be controlled.
- K.1.2 The Heathwall Pumping Station site, which is located in the Nine Elms area of the London Borough of Wandsworth, was selected to intercept the CSOs and transfer flows into the main tunnel. The location of the site is identified on the Location plan in Annex K to this appendix.
- K.1.3 It is predicted that with the project in operation, in an average year, the South West Storm Relief CSO and the Heathwall Pumping Station CSO, would spill approximately once and four times a year respectively and discharge 3,900m³ and 63,000m³ a year respectively of untreated sewage. Similarly, the tonnage of sewage derived litter from the CSOs can be expected to reduce to approximately 18 tonnes, in a typical year. This represents a reduction of approximately 93 per cent compared to the operational base case. This assessment is structured as follows:
- a. Section K.2 provides a brief description of the Heathwall Pumping Station site.
 - b. Section K.3 sets out the planning context for works in this location.
 - c. Section K.4 describes the site-specific development for which consent is sought and the way in which the proposals evolved through consultation.
 - d. Section K.5 provides an analysis of the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
 - e. Section K.6 provides an overall conclusion of the site-specific assessment for the proposed works at this site.

¹ The current operation of the South West Storm Relief CSO and the Heathwall Pumping Station CSO was characterised using the catchment model of the sewer system (see *Environmental Statement* Vol 15, Section 14 and *Environmental Statement* Vol 3, Section 11 for further details of catchment modelling).

K.2 Site description

K.2.1 The site, approximately 1.3 hectares, comprises two riverside land parcels and extends partially on to the foreshore of the tidal Thames. The onshore parcels are Thames Water's operational Heathwall Pumping Station and the safeguarded Middle Wharf. The area of tidal Thames includes the river wall, a jetty and the Battersea Barge restaurant.

Figure K.1 Aerial photograph of Heathwall Pumping Station



K.2.2 The South West Storm Relief sewer and Heathwall Pumping Station CSO run below ground through the site and discharge into the River Thames below the low water line. Both CSOs are located approximately 80m north of the river wall.

K.2.3 The safeguarded Middle Wharf has been cleared and is now largely hardstanding, with the exception of the brick substation which remains. Office accommodation for the wharf is provided above the substation. Climbers have grown over the outer eastern boundary wall forming a 'green wall'.

K.2.4 The adjacent pumping station compound consists largely consists of the pumping station building and surrounding by hardstanding. The Heathwall Pumping Station building was built in the 1960s in a New Brutalist style in brick and concrete. Outside the western boundary of the pumping station there are two mature trees.

- K.2.5 A jetty, housing a crane, extends from Middle Wharf into the foreshore. The floating Battersea Barge restaurant is adjacent to the river wall and rests on a campshed at low tide. From discussions with the owner it is understood that the Battersea Barge operates in the evening Monday to Friday and Saturday and occasional Saturdays and Sundays for weddings.
- K.2.6 The site is altogether industrial in character and the boundary walls of the onshore parcels are topped with barbed wire. The As existing site features plan is provided in Annex K to this appendix.
- K.2.7 The site is bounded to the north by the River Thames, to the east by a small open space, to the south by the busy Nine Elms Lane (A3025), to the west by houseboat communities known as Nine Elms Pier and Tideway Village (in Tideway Dock), and the former Tideway Industrial Estate 'Riverlight' development, which is under construction. The Thames Path Public Right of Way runs away from the river around the wharf and pumping station, around the eastern (William Henry Walk), southern (Nine Elms Lane) and western boundaries of the site (Tideway Walk).
- K.2.8 Nine Elms Pier consists of 21 houseboats moorings. The closest houseboats are adjacent to the boundary with the furthest houseboat being 135m from the site boundary. The Tideway Village houseboat community consists of three houseboats. The houseboats range from 4m to 25m from the site boundary.
- K.2.9 The 'Riverlight' development (planning application reference 2011/3748), immediately to the east of the site on the former Tideway Walk Industrial Estate, is currently under construction. This major regeneration scheme was approved by the London Borough of Wandsworth in December 2011. The permission replaced a similar scheme including a hotel that was previously granted permission in March 2011. The site is currently a major construction site, which began in September 2011. The development will provide 806 new apartments, shops, cafés, bars, and restaurants. The scheme will significantly change the appearance and character of the area and the riverside will be dominated by several modern high rise towers. The site has been hoarded, cleared and foundation and basement works have been undertaken and the first blocks are under construction.
- K.2.10 All the blocks are anticipated to be complete before construction at Heathwall Pumping Station would begin. Block F would be approximately 10m from the site boundary.

Figure K.2 Artist's impression of the Riverlight Development (northeast)



- K.2.11 The wider area is predominantly industrial in nature with relatively low-mid-rise structures up to approximately four storeys in height. Some sites have ceased use and been cleared. The nearby (approximately 80m) Elm Quay residential block which extends up to approximately ten storeys is the main exception to the industrial setting.
- K.2.12 To the north across the river lie residential blocks (closest at a distance of approximately 130m from the site boundary) directly on the riverbank. To the northeast across the river is the Westminster Boating Base (150m from the club house to the site boundary) which is a water-based recreation activities charity teaching dinghy sailing, power-boating, kayaking, and canoeing, and a venue available for hire. To the east beyond the small open space is the Elm Quay Court residential block (approximately 50m to site boundary). To the south and south east, across Nine Elms Road are cleared former industrial sites. To the southeast, across Nine Elms Road is the Royal Mail sorting office.
- K.2.13 Existing access to the site is from four accesses off Nine Elms Lane, (A3205). Nine Elms Lane (A3025) is part of the Transport for London Road Network and a key HGV route, that runs northeast to Vauxhall and southwest to Battersea (Transport for London data published 2010 suggests a daily average flow of 500 to 1,500 HGVs per day). It connects to the A3 which is part of the Strategic Road Network.
- K.2.14 Although the area surrounding the Heathwall Pumping Station site is largely industrial in nature, planning policy is set to change the wider area. Riverlight is the most advanced in the immediate area, of several large-scale proposals to transform it from an industrial area into a residential neighbourhood. These proposals are at various stages in the planning and development process. Further information is provided below.

K.3 Planning context

K.3.1 In developing the proposals and mitigation measures for the development at Heathwall Pumping Station Thames Water² had regard to the policies set out in the NPS, and to local development plan designations where these are relevant to the application.

K.3.2 The statutory development plan comprises:

- a. the *London Plan* (2011)
- b. the London Borough of Wandsworth's *Core Strategy* (October 2010)
- c. the council's *Development Management Policies Document* (February 2012)
- d. the council's *Site Specific Allocations Document (SSAD)* (February 2012).

Planning policy

K.3.3 The site is within the Nine Elms area of the Vauxhall/Nine Elms/Battersea Opportunity Area (VNEB OA), one of 33 'opportunity areas' identified in the *London Plan*.

K.3.4 The opportunity areas are areas which can contribute to delivery of London Plan objectives by providing substantial development as set out in the *Vauxhall/Nine Elms/Battersea Opportunity Area Planning Framework (VNEB OAPF)* (2012), which is adopted as supplementary planning guidance to the *London Plan*. The *VNEB OAPF* identifies potential for 16,000 new homes and 20,000 to 25,000 jobs. One of the key environmental principles in the OAPF is to: "*Maximise opportunities to use the wharves for transportation by river of construction materials and demolition waste associated with new development in the opportunity area and the Thames Tideway Tunnel*" (p. 132).

K.3.5 The site is also within the Wandsworth Thames Policy Area, to the west of the proposed Focal Point of Activity known as 'Nine Elms near Vauxhall', as designated in the *Core Strategy*.

K.3.6 *Core Strategy* Policies PL9 and PL11 provide strategic policy for the Thames riverside and the Nine Elms area, supporting mixed use development with public spaces at key focal points along the riverside along with a riverside path, while promoting greater use of the river including for freight. The policies protect river infrastructure and the safeguarded wharves for trans-shipment of freight, waste and aggregates and protect routes to the main road network serving protected wharves. They also protect flood defences and seek to protect and enhance biodiversity. Within Nine Elms, the Heathwall Pumping Station site is within 'Nine Elms Riverside district' earmarked largely for residential mixed-use developments with an emphasis on providing active ground

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

floor frontages, including fronting Nine Elms Lane and riverside-focused pocket parks.

- K.3.7 Middle Wharf, within the Heathwall Pumping Station site, is safeguarded by a ministerial direction (and referred to in the *London Plan* Policy 7.26 and *Core Strategy* Policy PL9) from being redeveloped for non-waterborne freight handling uses. Temporary uses of a safeguarded wharf are permitted in some circumstances where they return the wharf to waterborne freight handling use. The *London Plan* requires that developments adjacent or opposite safeguarded wharves should be designed to minimise the potential for conflicts of use and disturbance.
- K.3.8 A designated Strategic Walking Route (the Thames Path) passes around the Heathwall Pumping Station and Middle Wharf along Nine Elms Lane. *Core Strategy* Policy PL 3 seeks to enhance conditions for walking and signage.
- K.3.9 All the on land parts of the site are subject to allocations set out in the SSAD (site allocations 10 and 22). Middle Wharf is allocated as a safeguarded wharf. Heathwall Pumping Station is allocated for the project.
- K.3.10 The SSAD also sets out the London Borough of Wandsworth's aspirations to realign the Thames Path (which passes through the site) along the riverside. An improved and realigned riverside walk is also identified in the *VNEB OAPF* as part of a wider public realm strategy for the area. Further relevant designations are as follows:
- a. The site is within the Wandsworth Archaeological Priority Area.
 - b. The site is within the Wandsworth Air Quality Management Area declared for nitrogen dioxide and particulate matter.
 - c. The foreshore section of the site is within the River Thames and Tributaries Site of Importance for Nature Conservation (metropolitan value).
 - d. Part of the site is located within the River Thames foreshore and as such it is classified as functional floodplain (Flood Zone 3b, where water must flow or be stored in times of need). The inland part of the site is located behind the River Thames flood defences within Flood Zone 3a (1 in 100 event).
 - e. To the north across the River Thames are Dolphin Square and Pimlico Conservation Areas which lie within the City of Westminster. The conservation areas boundaries extend to the borough boundary at the centre of the River Thames. At the closest point they are approximately 25m and 70m respectively from the site.

Planning history

- K.3.11 The onshore parcels of the site are long established industrial uses. The pumping station dates back to the 1960s and was formerly a sewage works. Middle Wharf has an established wharf use although operation recently ceased. The Battersea Barge within the foreshore has an established restaurant use.

- K.3.12 Adjacent to the east of the site, a planning application (planning application reference: 2011/1926) has been submitted to redevelop the nearby Nine Elms Pier into a Marina by the owners of the Nine Elms Pier. This would provide moorings for thirty three houseboats and two visitor boats. The application is currently subject to an Article 25 Direction issued by the Secretary of State restricting the council granting planning permission without specific authorisation. The Direction was issued to enable the Secretary of State to consider the implications of this application for development consent. Thames Water has been in discussions with the applicant and the London Borough of Wandsworth to consider the implications of the application for the proposed works at the Heathwall Pumping Station site and the nearby Kirtling Street Site, in particular with regard to waterborne navigational requirements and impacts.
- K.3.13 There are, significant redevelopment proposals adjacent and around the site. In total approximately 9,000 residential units are permitted in the vicinity of the site with a further approximately 3,500 in the surrounding area.
- K.3.14 In line with the policy and aspirations for regeneration set out in the *VNEB OAPF* and the *Core Strategy*, there are several permissions for major redevelopment adjacent to the site:
- K.3.15 To the southeast, across Nine Elms Lane, permission has been granted for a new US Embassy (planning application reference: 2009/1506 & (2009/1507) realignment of Pontoon Road). The site has been cleared. Construction is likely to commence shortly and it is anticipated that it would be complete prior to project construction.
- K.3.16 To the south, adjacent across Nine Elms Lane, permission has been granted for mixed use development including 1,982 homes, known as the Embassy Gardens development (planning application reference: 2011/1815). The site has been cleared. Construction is likely to commence shortly and it is anticipated that buildings A9, A10 and A11 would be complete prior to construction. The remaining buildings A01, A02, A03, A04, A05 and A07 would be completed during project construction.

Figure K.3 Artist's impression of the Embassy Gardens Development (southeast)



- K.3.17 A major regeneration scheme has also been approved in 2012 adjacent to the south of the site across Nine Elms Lane, on the site of the Royal Mail South London Mail Centre (known as Nine Elms Parkside) (planning application reference: 2011/2462), for mixed use development including 1870 homes. The site has been cleared for construction. Construction is likely to commence soon. It is anticipated that plots C and D would be under construction at the time of project construction, with plots A to D complete by the first year of project operation. Plots E to G would still be under construction.
- K.3.18 As part of the regeneration in the area, Transport for London is proposing to extend the Northern Line to Battersea, via a new station at Nine Elms. Consultations on the route options and sites for the project were held in 2010 and 2011. A further consultation was undertaken from 7 November 2012 to 30 December 2012. The Battersea Power Station redevelopment permission includes a two station extension of the Northern Line from Kennington (with one of two new tube stations located at the Power Station site and the other at Wandsworth Road). The actual tube extension will be the subject of a separate Transport and Works Act Order application, expected to be submitted in 2013. The proposed route passes

to the south of the Heathwall Pumping Station site. Transport for London anticipates that the new stations could be open by 2019.

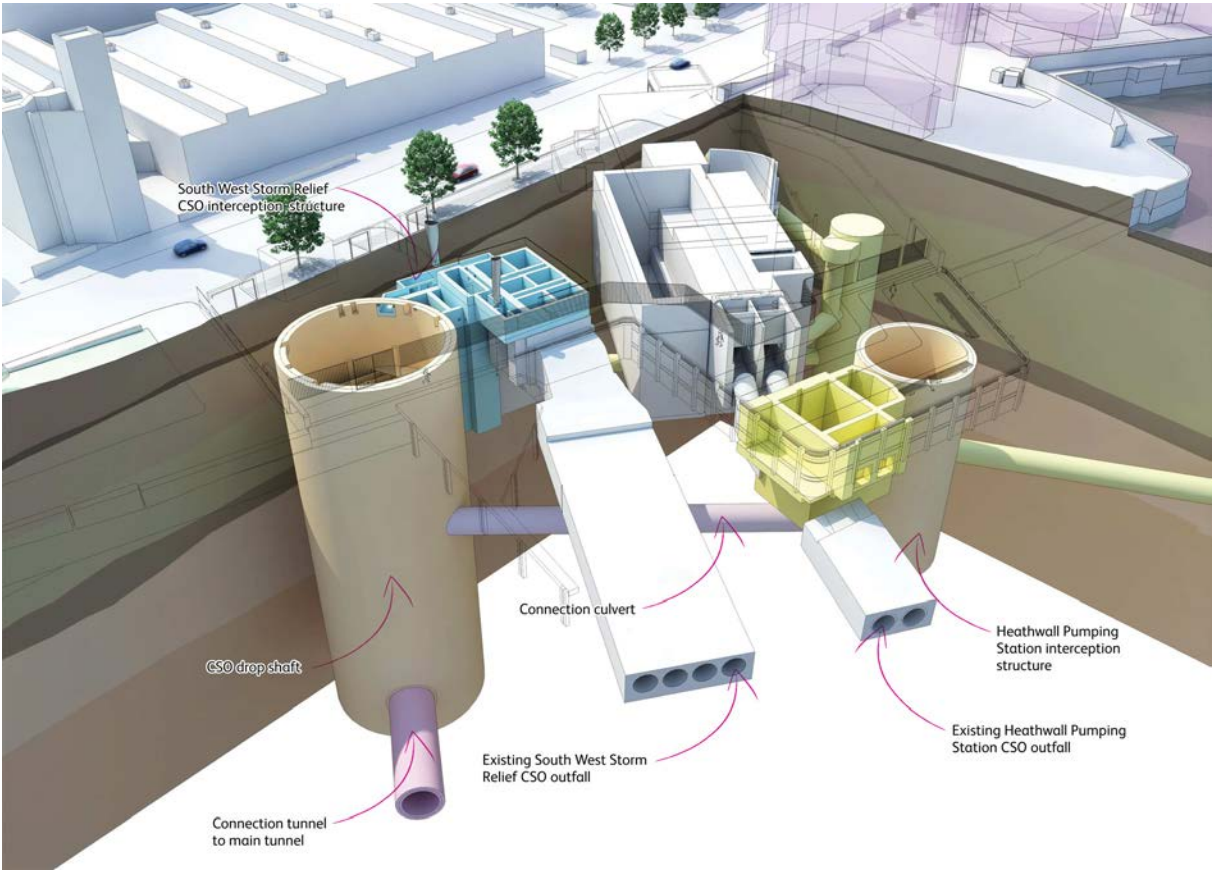
- K.3.19 The following planning applications have been approved within the wider area of the site:
- a. Sainsbury's Nine Elms (to the south) mixed use including 737 homes (London Borough of Lambeth planning application reference: 11/02326/OUT), (the planning committee resolved to grant subject to the signing of a Section 106 agreement in June 2012).
 - b. Marco Polo House (to west) mixed use including 456 homes (planning application reference: 2011/2089), approved March 2012.
 - c. Sky Gardens (to the south east) including 239 homes (planning application reference: 09/04322), approved September 2010.
 - d. The Battersea Power Station redevelopment (to the west), has outline planning permission (planning application reference: 2009/3575) for mixed use development including 3,800 homes.
- K.3.20 The following planning applications are understood to be in the pre-application phase:
- a. Battersea Gas Holders (to the southwest) mixed use including circa 800 homes.
 - b. Patcham Terrace (to the southwest) mixed use development.
 - c. Sleaford Street Industrial Estate (to the southwest) mixed use including circa 300 homes.
 - d. Heart of Nine Elms (to the east) mixed use including circa 493 homes.
- K.3.21 A plan of permitted and pending applications and pre-application proposals on the site, and in the vicinity, is provided below.

K.4 Site-specific description of development

Overview

- K.4.1 The proposed development at Heathwall Pumping Station would intercept the South West Storm Relief and Heathwall Pumping Station CSOs. The works would convey the flows from the existing CSOs, which discharge through culverts beneath the river to outfalls below mean low water level, to the main tunnel.
- K.4.2 The work would require the construction of CSO interception chambers, hydraulic structures (including chambers, culverts and pipes) and ventilation structures. Flows would be transferred from the relatively shallow depth of the existing sewers to the deeper level of the main tunnel via a CSO drop shaft and associated connection tunnel. The CSO drop shaft would be approximately 46m deep.
- K.4.3 Electrical and control equipment would be located within the existing pumping station. There would also be two local control pillars, one located adjacent to the CSO drop shaft and one located close to the Heathwall Pumping Station interception structure.
- K.4.4 Two signature ventilation columns would allow air into and out of the shaft and one smaller ventilation column together with a small breather unit within the pumping station compound would be used to provide ventilation to the interception chambers.
- K.4.5 The cover slab to the existing outfall chamber on the South West Storm Relief sewer would be extended to approximately 1.5m above ground level. Apart from the ventilation columns and local control pillars, all other structures would be finished flush with ground level.
- K.4.6 The interception chamber in the foreshore would be finished with hardstanding and a river wall parapet to provide flood defence to a new area of public realm. The CSO drop shaft would be reinstated with hardstanding and returned for use as a wharf.

Figure K.5 Functional components diagram



Application for development consent

K.4.7 The geographic extent of the proposals for which development consent is sought is defined by the limits of land to be acquired or used and the drawings listed in Table K.1.

Table K.1 Heathwall Pumping Station: 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 [(the 'Draft DCO')]</i> |
| Access plan | For approval | <i>Book of Plans, Section 16</i> |
| Demolition and site clearance | For approval | <i>Book of Plans, Section 16</i> |
| Site works parameter plan | For approval | <i>Book of Plans, Section 16</i> |
| Permanent works layout | Illustrative | <i>Book of Plans, Section 16</i> |
| Proposed landscape plan | Indicative save for layout of above ground | <i>Book of Plans, Section 16</i> |

| Drawing title | Status | Location |
|--|----------------------------------|--|
| | structures which is illustrative | |
| Section AA | Illustrative | <i>Book of Plans,</i> |
| As existing and proposed elevation (various) | Illustrative | <i>Book of Plans, Section 16</i> |
| Typical river wall design intent | Indicative | <i>Book of Plans, Section 16</i> |
| Fencing and gate design intent | Indicative | <i>Book of Plans, Section 16</i> |
| Construction phases | Illustrative | <i>Book of Plans, Section 16</i> |
| Highway layout during construction (phases) | Illustrative | 7.10.12 <i>Transport Assessment Heathwall Pumping Station Figures</i> |
| Permanent highway layout - Area 1 Work | Illustrative | 7.10.12 <i>Transport Assessment Heathwall Pumping Station Figures</i> |
| Construction base case highway layout | Illustrative | 7.10.12 <i>Transport Assessment Heathwall Pumping Station Figures</i> |
| River foreshore zones of working | For information | <i>Navigational Issues and Risk Assessment Heathwall Pumping Station</i> |

K.4.8 The Nationally Significant Infrastructure Planning works (Work Nos. 14a and b) comprise the construction of a CSO drop shaft with an internal diameter of approximately 16m and depth of 46m and a connection tunnel to the main tunnel. Associated development (Work no. 14c) comprises the works to intercept and divert flow from the Heathwall Pumping Station CSO and South West Storm Relief CSO to the Heathwall Pumping Station CSO drop shaft and into the Heathwall Pumping Station connection tunnel including construction of a temporary cofferdam, construction of a campshed, construction of new river wall, construction of an interception chamber, CSO overflow structures, hydraulic structures, chambers with access covers, structures for air management plant and equipment and other structures to manage and intercept flow, and temporary relocation of the Battersea Barge. The full description of the proposed development can be found in Schedule 1 to the DCO. Further details of temporary construction works and permanent operational structures are contained below.

K.4.9 At this site, approval is sought for the works shown on the Works plan showing the main tunnel (east central) (Work no. 1c), Heathwall Pumping Station CSO drop shaft (Work No. 14a), Heathwall/South West Storm Relief connection tunnel (Work no. 14b) and the Site works parameter plan which shows the relevant zones and limits of land to be acquired or used in which the associated development works would be undertaken (Work No. 14c) Access plans, and Demolition and site clearance plans.

The plans for approval are contained in the *Book of Plans* along with other plans showing the construction phasing and permanent works plans relevant to this site. These other plans are marked either for approval, for information, indicative or illustrative depending on the level of detail they are providing. The Good design subsection of this appendix explains the level of detail with regard to the proposed above-ground structures at this site and the need to obtain further approvals.

Construction

- K.4.10 The construction is programmed to take approximately three years and would involve the following main works:
- Site Year 1: site setup (approximately five months)
 - Site Year 1: drop shaft construction (approximately eight months)
 - Site Year 2: tunnelling (approximately four months)
 - Site Years 2 to 3: construction of other structures (approximately 22 months)
 - Site Year 3: completion of works and site reinstatement (approximately six months).

Figure K.6 Construction duration



- K.4.11 Connection of utilities and diversion of minor utilities may be conducted in advance of the main activities listed above.
- K.4.12 The majority of construction would occur during standard working hours from 8am to 6pm Monday to Friday and 8am to 1pm Saturdays. Construction activities may occasionally be required outside of these hours during key construction activities subject to agreement with the local authority.
- K.4.13 Heavy goods vehicle (HGV) movements would be limited to standard working hours. In exceptional circumstances HGV and abnormal load movements could occur up to 10pm on weekdays for large concrete pours and later at night on agreement with the local authority.
- K.4.14 A short period of 24-hour working would be required for the connection tunnel and secondary lining. During this period of continuous working, activities would be predominantly below ground, with support activities

- occurring at ground level. However, HGV movements would be limited to weekday daytime hours.
- K.4.15 Barge loading and transport away from the site would take place during standard working hours.
- K.4.16 Further information about working hours and site-specific restrictions are contained within the *Code of Construction Practice (CoCP)* Parts A and B which accompany the application.
- K.4.17 Construction vehicles would access the site via Nine Elms Lane (A3205) turning left into the site. Construction vehicles would leave the site onto Nine Elms Lane, turning left out of the site. It is anticipated that an average of six heavy goods vehicles would access the site per day for the majority of the construction period. This would rise to approximately 18 HGVs (36 two-way trips) per day over an estimated one month period during the construction of the cofferdam.
- K.4.18 The Construction phases plan is provided in Annex K to this appendix. 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.

Site setup

- K.4.19 The site boundary would be established and secured. Welfare and office facilities would also be set up and the existing access off Nine Elms Lane would be widened to accommodate construction vehicles accessing the site. The site boundary would be established and secured with hoarding as appropriate. Welfare and office facilities would also be set up. The boundary wall between the Thames Water compound and Middle Wharf would need to be demolished and the Middle Wharf site cleared.
- K.4.20 As the site is 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.
- K.4.21 A concrete campshed would be constructed along the southern face of the temporary cofferdam for 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. It is assumed that the piles 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. Following removal and replacement of any soft material within the cofferdam, fill material would be placed onto the foreshore on top of a geotextile layer.
- K.4.22 Monitoring of potential scour would be undertaken during the temporary construction works.

Shaft construction

- K.4.23 The 16m diameter CSO drop shaft at Middle Wharf would be constructed with a primary lining of precast concrete segmental shaft linings. Dewatering wells would be required. Approval would be sought from the Environment Agency so that extracted ground water can be discharged directly into the River Thames. Extracted water would be sampled on a regular basis to check water quality.
- K.4.24 The drop shaft is would be constructed as a segmental shaft and shaft construction would utilise caisson and underpinning techniques. The shaft would initially be sunk as a caisson and excavation would be by excavator with telescopic grab. A constant pressure would be applied to the rams and the shaft evenly excavated. When the rams reach full extension the rams would be retracted and the next ring built. Once the shaft enters the London Clay, the water contained within the shaft would be pumped out and underpinning techniques would be utilised. An excavator would work within the shaft loading crane hoisted skips.
- K.4.25 A steel reinforced concrete base plug would be formed at the base of the shaft. Prior to tunnelling works commencing a portal would be formed in the shaft lining. The shaft segments at the tunnel eye would be broken out and the eye concreted to stabilise the face.

Tunnel construction

- K.4.26 Sprayed concrete lining techniques would be used to construct the connection tunnel. This would be approximately 4m internal diameter and 60m in length. The tunnel would be progressively excavated and the sprayed concrete tunnel lining built up in even layers until the required profile is achieved. Dewatering and ground treatment techniques would be required for tunnel construction. The crawler crane used for the drop shaft construction would also be used to service the shaft during the connection tunnel construction. A heavy duty false work system would be assembled in the drop shaft to provide a working platform to construct this connection tunnel.

Secondary lining

- K.4.27 Secondary lining is an additional layer of concrete placed against the inside of a tunnel's primary sprayed concrete lining for watertightness and to improve the overall structural durability. Both the short connection tunnel and the shaft would have a reinforced concrete secondary lining.
- K.4.28 The secondary lining of the connection tunnel would be constructed by installing steel reinforcement, erecting a cylindrical shutter within a short length of tunnel and pumping concrete into the gap between the shutter and the primary lining. Once the concrete hardens sufficiently, the shutters would be removed and erected in the next section of tunnel.
- K.4.29 It is assumed that the lining of the CSO shaft would be made of reinforced concrete placed inside the shaft's primary support. The steel reinforcement would be assembled in sections and a shutter would be used to cast the concrete against. The shutter would be assembled at the

bottom of the shaft and sections of reinforcement installed and lining cast progressively up the shaft.

Construction of other structures

- K.4.30 An interception and valve chamber would be built to intercept the existing Heathwall Pumping Station CSO. The outfall is a twin box concrete structure within the foreshore. The interception chamber would be constructed over the existing outfall in suitable stages with the flows being maintained while sections are blocked off prior to construction and broken out during piling and excavation works.
- K.4.31 A 10m internal diameter shaft, which forms part of the Heathwall Pumping Station interception structure, would be constructed adjacent to the outfall within the temporary cofferdam area in a similar manner to the CSO drop shaft. Secant piles would be driven to construct the valve chamber walls and connect to the shaft within the cofferdam area. Localised submersible pumps within the chamber would be utilised to manage ground water ingress. The pumps would discharge to the river or existing sewers after being treated through a settlement system.
- K.4.32 The connection culvert from the interception chamber to the CSO drop shaft would also be constructed using sprayed concrete lining techniques in a similar manner to the connection tunnel. The tunnel would be fully within the London Clay formation and hence neither ground treatment nor dewatering would be required.
- K.4.33 A new outfall would be constructed on the front of the new river wall to cater for the event that the main tunnel cannot accept any more flow. Flap valves would be fitted to prevent tidal flow entering the system.
- K.4.34 The interception chamber to the Southwest Storm Relief chamber would be constructed in a similar manner. The cover slab to the existing outfall chamber on the Southwest Storm Relief Sewer would be extended to approximately 1.5m above ground level to raise it to flood defence level and would be constructed in reinforced concrete.
- K.4.35 Air management structures comprising an underground air treatment chamber and associated ducts and ventilation columns would also be built and commissioned. Electrical and control equipment for operating the penstocks would be positioned within the existing Heathwall Pumping Station building, with local control pillars installed outside the building.

Completion of works and site restoration

- K.4.36 On completion of the main construction (outlined above) the new river wall would be finished prior to removal of the temporary cofferdam to ensure flood protection. Once the cofferdam fill is removed, the geotextile layer would be removed and permanent scour protection would be placed around the structure.

Operation

- K.4.37 The principal structures would comprise:
- a. an interception chamber, valve chamber and connection culvert to divert the flow from the existing Heathwall Pumping Station CSO into the drop shaft
 - b. modifications to the existing South West Storm Relief CSO chamber and construction of an interception chamber and valve chamber to divert the flow from the South West Storm Relief CSO into the drop shaft, including raising of the cover slab of the existing chamber above ground level
 - c. a drop shaft
 - d. a new CSO outfall for the Heathwall Pumping Station CSO
 - e. ventilation structures including a below-ground air treatment chamber and above-ground ventilation columns
 - f. electrical and control equipment located within the existing pumping station and two local control pillars outside the existing pumping station
 - g. a foreshore structure accommodating the Heathwall Pumping station CSO interception structures
- K.4.38 The Site works parameter plan is submitted for approval and would define zones for the location of permanent structures and minimum and maximum heights above ground.
- K.4.39 The ventilation columns and South West Storm Relief interception and flap valve chamber would be located in the two zones within which all permanent above-ground structures would be located (denoted by the purple line on the Site works parameter plan). The Site works parameter plan defines a maximum and in some cases minimum heights for these structures:
- a. ventilation column(s) within a defined zone in the pumping station compound to the east of the pumping station or on the western boundary of Middle Wharf, minimum 4m to maximum 8m high.
 - b. further ventilation column(s) (minimum 4m to maximum 8m high) within a defined zone within the pumping station compound to the east of the pumping station or on the western boundary of Middle Wharf, minimum 4m to maximum 8m high.
 - c. ventilation column(s) within a defined zone located to the north west of the pumping station building within the compound or within the Riverside Walkway, maximum height of 6m, as defined on the Site works parameter plan.
 - d. a raised South West Storm Relief interception and flap valve chamber within a defined zone within the pumping station compound to the east of the pumping station or on the western boundary of Middle Wharf, maximum height of 1.5m.

- K.4.40 The shaft would be located within the zone denoted by the blue line on the Site works parameter plan positioned on Middle Wharf and provides a small degree of flexibility for the drop shaft to move a short distance as the design is developed.
- K.4.41 The maximum extent of the top of river/parapet wall of the foreshore structure would be located within the zone denoted by the solid orange line on the Site works parameter plan in front of Heathwall Pumping Station. The foreshore structure would be built to the statutory flood levels as required by the site-specific design principles.
- K.4.42 All permanent site structures would be located in the zone denoted by the green line on the Site works parameter plan which consists of the majority of the land-based area of the site and the proposed foreshore (allowing for scour protection) but excludes an area that Thames Water operations uses to access Heathwall Pumping Station.
- K.4.43 Required landscaping would be located within a zone denoted by the orange hatched area on the Site works parameter plan.

Access

- K.4.44 The works would be accessed via existing entrances off Nine Elms Lane (two to the pumping station and two to Middle Wharf). The area around the CSO drop shaft would be finished with hardstanding to allow crane access to the structure and to allow the site to operate as a wharf. Access covers requiring regular access would be finished at ground level. Access covers requiring infrequent access (typically once every ten years) would be buried.
- K.4.45 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. Should a major blockage occur, a mobile crane or jetting lorry would be brought to the site to clear the blockage via the appropriate ground-level access cover.
- K.4.46 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 access covers in the hardstanding area.
- K.4.47 It is anticipated that once every ten years, a major internal inspection of the connection tunnel (in conjunction with the main tunnel) and underground 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 equipment 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.

Scheme development

- K.4.48 The proposed Heathwall Pumping Station site was identified and then assessed through a robust, qualitative, and iterative site selection process. The proposals were subject to extensive consultation and engagement, since the site was proposed as part of the project after phase one consultation.
- K.4.49 Following selection as a preferred site, this site was subsequently included in phase two consultation, and remained the preferred site since, although the design and site boundary were refined as a result of consultation and design development.
- K.4.50 At phase one consultation the adjacent Tideway Walk site was proposed as a combined site to intercept the Heathwall Pumping Station CSO and the South West Storm Relief CSO, to receive the main tunnel drive from Barn Elms, and drive the main tunnel to King's Stairs Gardens. Planning permission for mixed use residential development was granted, however, on the Tideway Walk site in March 2011 for the Riverlight development and construction works commenced. As a result a review of site selection was undertaken.
- K.4.51 Subsequently, the Heathwall Pumping Station site was proposed as the preferred site to intercept the two CSOs. The Kirtling Street site to the west, beyond Riverlight, was and remains the proposed site to drive the main tunnel in two directions to Chambers Wharf and to Carnwath Road Riverside.
- K.4.52 Consultation was subsequently undertaken including two rounds of review with the Design Council CABE in May and June 2011, followed by phase two consultation and Section 48 publicity. In addition, informal consultation and discussion continued throughout with local resident groups, businesses, landowners, and meetings with the London Borough of Wandsworth and other strategic stakeholders.
- K.4.53 The following site-specific characteristics were particularly relevant in arriving at the decision to use the Heathwall Pumping Station site:
- a. It allows the interception of both CSOs within one site.
 - b. The site is largely owned by Thames Water.
 - c. The area is largely industrial.
- K.4.54 One other short-listed site was identified which was entirely within the foreshore adjacent to Heathwall Pumping Station and Middle Wharf. This site was considered less suitable because of the more extensive works within the foreshore that would be required and the associated environmental impact and increased complexity of construction. The *Final Report on Site Selection Process*, which accompanies the application, provides more details.
- K.4.55 The initial proposals at the Heathwall Pumping Station site presented to the Design Council CABE included a drop shaft on Middle Wharf and an interception structure within the foreshore in front of Heathwall Pumping Station. A concept was proposed to integrate the foreshore structure into

what is to become a more residential local character, by providing a new area of public open space on top. It was also proposed to take advantage of the foreshore structure to divert the Thames Path around the riverside Heathwall Pumping Station infrastructure and along the river frontage, in line with policy aspirations. The permissive diversion would be accessible when maintenance and operation of the safeguarded Middle Wharf did not require its closure.

- K.4.56 The Design Council CABE was supportive of the designs presented to them and subsequent consultation material. They commented that the initial proposals clearly *“recognised that Nine Elms is to change beyond recognition over the coming decades”*.
- K.4.57 The final designs maintain the same basic arrangement, but were refined. The boundary of the site within the foreshore area was also refined. This was partly due to an increase in size required for the foreshore structure (see Good design subsection) and partly to allow for transport of materials by barge.
- K.4.58 The background to the design and refinements to the design are further detailed in the Good design subsection below.
- K.4.59 The extent of responses and the principal and outstanding comments that arose from pre-application consultation and Section 48 publicity for the site are outlined below.
- K.4.60 Phase two consultation revealed that key stakeholders were in support of the principle of the proposal and proposed site. The selection of the site was not disputed by stakeholders or the community and no alternative sites were put forward. The Greater London Authority expressed support for the use of the site. English Heritage stated that the site is more suitable than the other short-listed sites. The London Borough of Wandsworth expressed support for the interception of the CSOs and stated the site was a suitable location from which to do so. The Port of London Authority supported the site in principle subject to navigational safety issues.
- K.4.61 The principal issues that arose from pre-application consultation and Section 48 publicity for Heathwall Pumping Station are given below:
- a. Consultees including, the Greater London Authority identified concerns related to noise impacts during construction and possible population displacement due to relocation of homes. This issue was taken into account through the production of the *CoCP* as the proposals developed and is addressed in the Noise and vibration, subsection below.
 - b. Consultees including the Greater London Authority and Port of London Authority stated that Middle Wharf should remain viable as a safeguarded wharf following construction. This issue was accounted for through the design and is addressed in the Good design subsection and the Land use including open space, green infrastructure and green belt subsection below.
 - c. Consultees including, the Greater London Authority and London Borough of Wandsworth expressed concern on the impact on local

regeneration in the Vauxhall Nine Elms Opportunity Area. This issue was accounted for through the design, in particular through consultation with the London Borough of Wandsworth and is addressed below in the Good design and Land use including open space, green infrastructure and green belt subsections.

- d. Consultees including, the Design Council CABE provided comments that confirmed the suitability of the initial design concepts and helped to refine the designs. However, the council maintains that a 6m wide 'river walk' should be provided and that cantilevering could be used to achieve this. This issue is addressed in the Good design subsection below.

K.4.62 The *Consultation Report*, which accompanies the application, provides more details of consultation responses received and how they influenced the proposals.

K.5 Site-specific planning considerations

K.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at the Heathwall Pumping Station site, considering the issues and factors identified in the NPS and other issues relevant to the site as set out in para. K.4.61 above.

Meeting the need

K.5.2 The proposed works at Heathwall Pumping Station would be successful in meeting the specific need to intercept the Heathwall Pumping Station and South West Storm Relief CSO and would make an important contribution to the wider need for the project identified in the NPS.

K.5.3 In an average year, the South West Storm Relief CSO and the Heathwall Pumping Station CSO, spill approximately 13 and 34 times a year respectively and discharge 228,000m³ and 655,000m³ a year respectively of untreated sewage into the River Thames in the London Borough of Wandsworth³. The Environment Agency identified the South West Storm Relief CSO and the Heathwall Pumping Station CSO as CSOs that needs to be controlled and Thames Water's solution is full interception. The CSO discharges have multiple impacts on water quality in this location, including a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants and the discharge of sewage derived litter and effluent.

K.5.4 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 Heathwall Pumping Station would become operational the South West Storm Relief CSO and the Heathwall Pumping Station CSO are predicted to spill approximately 13 and 39 times a year respectively and discharge

³ The current operation of the South West Storm Relief CSO and the Heathwall Pumping Station CSO has been characterised using the catchment model of the sewer system (see *Environmental Statement Vol 15, Section 14* and *Environmental Statement Vol 3, Section 11* for further details of catchment modelling).

approximately 239,000m³ and 748,000m³ a year respectively of untreated sewage.

- K.5.5 Catchment modelling predicts that with the project in operation that in an average year, the South West Storm Relief CSO and the Heathwall Pumping Station CSO, would spill approximately once and four times a year respectively and discharge 3,900m³ and 63,000m³ a year respectively of untreated sewage.
- K.5.6 The frequency, duration and volume of spill at Heathwall Pumping Station site would therefore be reduced by approximately 93 per cent as a result of the operation of the project. Similarly, on the basis that litter tonnages are proportional to discharge volumes, the tonnage of sewage derived litter from the CSOs can be expected to reduce by approximately 93 per cent, to approximately 18 tonnes, in the typical year.
- K.5.7 This reduction would have a beneficial effect on water quality in the local area. The improved water quality would result in a significant local beneficial impact for the recreational users of the nearby Westminster Boating Base and residents of existing and emerging riverside developments.
- K.5.8 A broad consensus exists amongst stakeholders that there is a need to tackle the unacceptable discharges from CSO's along the Tidal Thames. The *Core Strategy* states that: “*the council supports the implementation of the Thames Tideway Sewer Tunnel scheme*”. The Greater London Authority stated in the *London Plan* that: “*the development of the Thames Tideway Sewer Tunnels to address London's combined sewer overflows should be supported in principle.*”

Good design

- K.5.9 Good design is about ensuring attractive, usable, durable and adaptable places and contributing to sustainable development (NPS para. 3.5.1). This section explains how this would be achieved at this site. The *Design and Access Statement*, which accompanies the application, provides further details.
- K.5.10 The key components for which approval is sought at this stage are: a foreshore structure, ventilation columns, a drop shaft on Middle Wharf, and return of Battersea Barge following temporary relocation. The key parameters for the works are detailed in the Operation subsection. A Landscape plan was prepared which is indicative (save for layout of above-ground structures, which are illustrative).
- K.5.11 The full details of permanent landscaping are reserved to be submitted for approval to the London Borough of Wandsworth. The details of operational lighting, detailed design of access, and details of surface and foul water drainage system are reserved to be submitted for approval to the council. These details would be in accordance with the plans and documents identified in Table K.1. Further detail is provided below on the development of the documents including the *Design Principles* document, the Site works parameter plan and CoCP Part B, which accompany the application.

- K.5.12 The amount, layout and scale of the proposed structures at the Heathwall Pumping Station site are primarily dictated by the function they need to perform. At Heathwall Pumping Station the key functional consideration is intercepting flows from the Heathwall Pumping Station and South West Storm Relief CSOs and transferring the flows into the main tunnel.
- K.5.13 The nature of the development is that the required structures are predominantly below ground; however, as the ground below the Heathwall Pumping Station compound is extremely congested with existing Thames Water infrastructure including two major sewers a structure is required within the foreshore to enclose structures required to intercept the CSOs. Ventilation columns are also required to ventilate the interception structures and shaft.
- K.5.14 The key design objective of the permanent works was to explore the ways that the works and foreshore structure could fit in and contribute positively to its environment.
- K.5.15 Early site analysis and subsequent engagement identified that it was important for the design to respond to the following key opportunities and constraints.
- K.5.16 The key opportunities at the site are as follows:
- a. Divert the Thames Path along the river in support of aspirations in the *SSAD* and the *VNEB OAPF*.
 - b. Provide a new area of riverside public realm on the Thames Path route in support of aspirations in the *VNEB OAPF*, exploiting the riverside location of the site to provide opportunities for people to sit and enjoy the views over the river.
 - c. Co-ordinate the scheme to tie in public realm with the public realm of other developments in the area, such as Riverlight to support a coherent overall public realm in the area.
 - d. Improve the visual appearance of the pumping station.
 - e. Improve the biodiversity and habitat value of the site in support of aspirations in the *VNEB OAPF*.
- K.5.17 The key constraints at the site are as follows:
- a. The safeguarded Middle Wharf and jetty must be able to continue as a waterborne freight handling use on completion of the works.
 - b. The Thames Water Pumping Station must be able to continue as an operational pumping station during and following construction.
 - c. The permanent works of any structure in the foreshore must be kept to a minimum to limit effects on aquatic ecology, river flows and navigation as far as possible.
 - d. The permanent works must integrate with the surroundings and the design and layout of other developments.
 - e. The Battersea barge restaurant must remain operational.

- f. The gradients of any public footpaths and open spaces across the site must be Disability Discrimination Act compliant.
- g. Flood protection must be maintained.

K.5.18 The design of the proposals for the site evolved through extensive consultation including two rounds of review with the Design Council CABE in May and June 2011 and engagement with key stakeholders such as the London Borough of Wandsworth and nearby businesses, landowners and residents.

K.5.19 An outline of the main design changes throughout the consultation period is provided below.

K.5.20 The initial proposals at the Heathwall Pumping Station site presented to the Design Council CABE included a drop shaft on Middle Wharf and an interception structure within the foreshore in front of Heathwall Pumping Station. The location of the works was defined by the location of the CSOs and the fact that the pumping station and the extensive, associated below-ground infrastructure, restrict the works that can be undertaken within the pumping station itself. The concept sought to integrate the foreshore structure into what is to become a more residential area, by providing a new area of public open space on top. It was also proposed to take advantage of the foreshore structure to divert the Thames Path along the river frontage in line with policy aspirations. The permissive diversion would be accessible when operation of Middle Wharf did not require its closure.

Figure K.7 Design Council CABE scheme review proposals

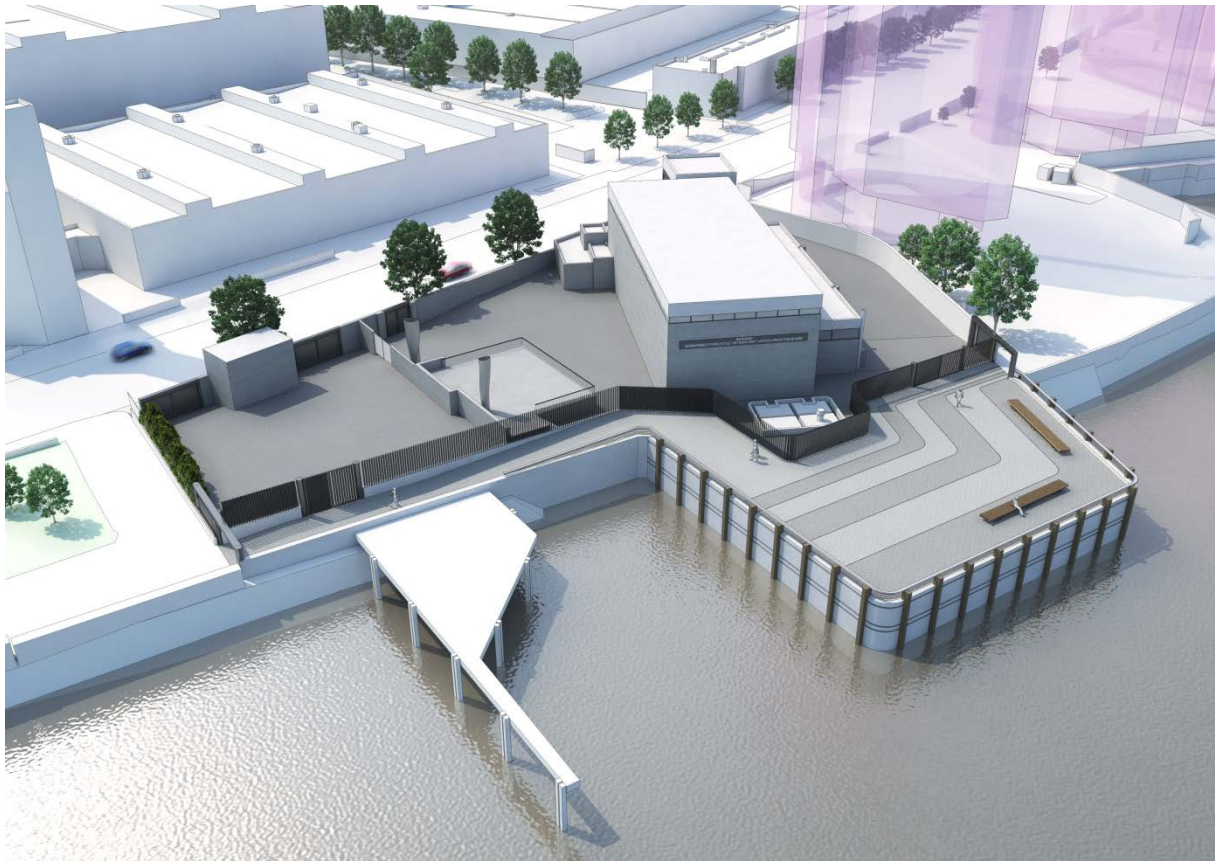


Figure K.8 Design Council CABE scheme review proposals



- K.5.21 The Design Council CABE was supportive of the designs presented to them and subsequent consultation material. The Design Council CABE commented that our initial sketch and scheme proposals “*clearly recognised that Nine Elms is to change beyond recognition over the coming decades*”. It stated that: “*We would support the idea of a walled enclosure to the jetty (foreshore structure) that adopts a foreshore character.*” The final designs maintain the drop shaft on Middle Wharf, the foreshore structure, a new open space and diverted Thames Path, but were refined through engagement and on-going engineering.
- K.5.22 The scheme was presented at a subsequent Design Council CABE review in more detail, with minor changes to the number and location of the proposed ventilation structures and proposed gates that could restrict access to the permissive Thames Path diversion when required.
- K.5.23 This design formed the basis for phase two consultation, which illustrated possible finishing to the public realm confirmed the retention of the jetty at Middle Wharf, and proposed repainting of the site boundary.
- K.5.24 At Section 48 publicity it was proposed to increase the size of the foreshore structure to incorporate safe access to structures that in previous proposals were sited beneath the foreshore. Parameters were developed to limit the extent of permanent foreshore works and the location of ventilation structures.
- K.5.25 A visualisation of the proposed above-ground development is provided below.

Figure K.9 Aerial view of the proposed development



K.5.26 Based on the analysis of opportunities and constraints, and the feedback from stakeholder consultations, the principal objectives that influenced the design of the proposals at this site include:

- a. Maintain Middle Wharf as a viable waterborne freight use.
- b. Minimise the impact of the permanent structures.
- c. Divert and enhance the adjacent Public Right of Way and provide an attractive open space.
- d. Enhance the attractiveness of the pumping station.
- e. Maintain the operation of the Battersea Barge.
- f. Manage the impacts of construction.

Maintain Middle Wharf as a viable waterborne freight use

K.5.27 The Greater London Authority and Port of London Authority have confirmed that the safeguarded Middle Wharf must remain viable as a waterborne freight handling use on the completion of construction.

K.5.28 Due to constraints within the pumping station site, including the location of the buildings and below-ground infrastructure, the shaft to intercept the South West Storm Relief CSO cannot be located within the existing Thames Water compound. This was therefore proposed to be located on Middle Wharf. Further interception works are proposed within the foreshore.

K.5.29 The Site works parameter plan was developed therefore to restrict the required ventilation columns within a defined zone within the Pumping Station compound or on the western boundary of Middle Wharf. The shaft on Middle Wharf would be finished at ground level to enable the wharf to return to a waterborne freight handling use.

K.5.30 These measures would restrict the permanent works to a defined part of the site which would enable Middle Wharf to continue to operate as a safeguarded wharf once the project is operational.

Minimise impact of permanent structures

K.5.31 NPS para. 3.5.3 states there may be opportunities to demonstrate good design in terms of siting relating to existing landform. In recognition of the change in Nine Elms to a largely residential district, the ventilation columns are proposed to be located within the existing industrial site, to minimise the visual impact. The Site works parameter plan was developed to restrict the proposed ventilation columns within a defined zone within the pumping station compound or on the western boundary of Middle Wharf. They would not be a significant addition in the context of the existing infrastructure. The proposed foreshore structure is the minimum size necessary to accommodate the required works. The maximum extent of the top of river/parapet wall of the foreshore structure was set by the zone denoted by the solid orange line on the Site works parameter plan in front of Heathwall Pumping Station. It was designed to create a new riverside open space, a concept which was supported by the Design Council CABE. They welcomed the provision of an open space on the proposed foreshore structure and noted that the design of this space should *“capitalise on this unique opportunity, creating a moment of delight and escape from the noise and pollution of Nine Elms Lane”*.

K.5.32 The details of the external finishes of the ventilation columns and kiosks must be in accordance with the design principles, which require materials to be high quality and long lasting. The design life of the major civil engineering components including buildings is 120 years, ensuring robustness. Design principle IRVI.05 requires that facing materials and detailing for new river walls shall be compatible with the visual character of existing adjacent river walls ensuring that good aesthetic and functional design can go together (NPS para. 3.5.1).

K.5.33 The Environment Agency suggested that an inter-tidal terrace should be included on the foreshore structure to provide habitat benefits. This option was investigated but is not suitable in this location because a terrace could be over sailed by the large barges that operate in the area and at the adjacent safeguarded wharf. This would compromise the impact protection zone required to protect the structures in the foreshore.

Divert and enhance the adjacent public right of way and provide an attractive open space

K.5.34 Due to differing objectives regarding diverting the Thames Path and maintaining the safeguarded wharf an adaptable solution was developed. The proposed foreshore structure allows for the Thames Path to be diverted around the infrastructure of the Heathwall Pumping Station which

- currently extends to the river wall, restricting access. In line with local policy aspirations it was proposed to provide a permissive diversion of the Thames Path next to the river. With the construction of the proposed foreshore structure there would be enough space to open a 4m wide pedestrian route between the pumping station building and the river.
- K.5.35 The Design Council CABE and the London Borough of Wandsworth welcomed the proposed realignment of the Thames Path along the river while acknowledging that the path must be closed for maintenance and when the operation of the safeguarded wharf requires.
- K.5.36 Design principle HEAPS.1 requires that a new, publicly accessible riverside walkway shall be constructed between Middle Wharf and the Riverlight development for access to the foreshore structure. Provision shall be made for its closure during essential maintenance activities and the operation of the safeguarded wharf if required. A diversion via Nine Elms Lane (along the route of the existing Thames Path) would be clearly signposted when the riverside walkway is closed.
- K.5.37 Design principle HEAPS.3 requires the riverside walkway to be as wide as possible (minimum of 4m, if practicable) without compromising the operation of the safeguarded wharf and Thames Water activities, or without encroaching into the River Thames.
- K.5.38 Design principle HEAPS.4 requires that materials and furniture in the public realm shall be in accordance with the public realm strategy in the Vauxhall Nine Elms Battersea Opportunity Area Planning Framework and be coordinated with materials used in the adjacent St James Riverlight development. This would help to ensure that the design can adapt to the emerging surrounding development and public realm proposals. Design principle HEAPS.09 requires that new lighting to the riverside walkway and foreshore structures shall be provided in accordance with the generic lighting principles with luminaries chosen to tie in with the Riverlight development.
- K.5.39 The indicative Landscape plan is designed to ensure coordination of the public realm with the adjacent 'Riverlight' proposals through the use of a unifying material palette. Metal gates are shown at the eastern and western edge of the site in order to divert pedestrian movement from along the river frontage at times when operational access to the foreshore structure or jetty is required. The full details of operational landscaping would be submitted for approval to the London Borough of Wandsworth.
- K.5.40 The council stated that it will seek to ensure that the realigned 'river walk' is 6m wide, suggesting that cantilevering could be used to achieve this. The option of widening this path to 6m was considered, however due to the constraints of existing buildings and structures it is not feasible to widen the path on the land side. Any widening would therefore have to take place on the river side, either by cantilevering or reclaiming land. Land reclamation for this purpose would be unacceptable to the Environment Agency. Cantilevering the path over the river would require removal of the existing river wall parapet and installation of a new parapet on the edge of the cantilevered structure in order to maintain the flood defence. The cantilevered structure would need to extend along the whole

river frontage to the east of the foreshore structure, i.e. in front of the whole of Middle Wharf, in order to achieve a path width of 6m. It would therefore be a significant structure, which may well require piled supports rather than being able to fully cantilever from the existing river wall. A significant structure of this sort would have environmental impacts and is not considered suitable.

Enhance the attractiveness of the pumping station

- K.5.41 Recognising the changing character of the area and in line with the council's comments, it is proposed to undertake cosmetic improvements to improve the attractiveness of the Pumping Station. Several options for the future of the pumping station were considered:
- K.5.42 A pre-feasibility study was undertaken to investigate whether the Heathwall Pumping Station could be relocated. The outcome of this, however, was that the availability of suitable alternative sites is extremely limited, primarily due to the considerable development planned and permitted in the local area. The complexity of relocating and the cost of securing an alternative site are prohibitive.
- K.5.43 A pre-feasibility study was also undertaken to investigate whether following construction, the pumping station could be built over by residential development, subject to an agreement with a developer. This approach would support local regeneration aspirations to provide housing and improve the appearance of the area. However it was concluded that the extent of the underground infrastructure at this site would prohibit the construction of the necessary foundations and therefore that construction over the pumping station would not be feasible.
- K.5.44 A further study was undertaken to investigate measures to improve the condition and visual appearance of the Heathwall Pumping Station. Repainting the pumping station would improve the external appearance of the building and provides the best value for money, so this option is being taken forward.
- K.5.45 Design principles were developed in consultation with the London Borough of Wandsworth. Design principle HEAPS.05 requires the removal of the barbed wire from the boundary and pumping station walls, and the cleaning and painting of the exterior of the building. Railings to the top of the wall shall be provided if needed for compliance with Thames Water security requirements. Design principle HEAPS.08 requires the planting of trees on Nine Elms Lane in accordance with the *VNEB OAPF's* Public Realm Strategy. These shall be positioned to cause minimum disruption to existing utilities in the footway. Design principle HEAPS.10 requires that high quality fencing shall be provided to the southern (back) edge of the riverside walkway. The fencing shall incorporate secure access gates to the pumping station and Middle Wharf. The fencing finishes shall tie in with the adjacent Riverlight development.
- K.5.46 The pumping station building is a large functional structure. The range of measures proposed is cosmetic but extensive and would enhance the appearance and attractiveness of the building.

Maintain operation of the Battersea Barge

- K.5.47 In line with comments from the London Borough of Wandsworth, and as agreed through engagement with the owners and the river wall owners, St James, the Battersea Barge restaurant would be moved by 7m to facilitate construction and then returned to its original position on completion of the works. This would be secured by a site-specific Requirement.

Manage impacts of construction

- K.5.48 Measures to minimise construction impacts were also developed. Key measures in the *CoCP* Part B that would be applied include the erection of hoarding incorporating suitable artwork on public facing sections and the use of 2.4m high noise barriers on the temporary cofferdam. A membrane would be installed between the river bed and temporary back fill material to protect the habitat within the foreshore. These measures would help to manage the impacts of construction on the environment.

Conclusions

- K.5.49 The design of the proposals at Falconbrook Pumping Station was carefully developed through a collaborative process of design review and extensive consultation.
- K.5.50 The site layout would meet the functional requirement to intercept the CSOs, while also ensuring that the safeguarded wharf can continue to function. A permissive alignment would be provided to divert the Thames Path next to the river, except when this would conflict with use of the wharf or maintenance of Thames Water infrastructure. The foreshore structure would provide an attractive public space on the waterfront and careful specification of materials and enhancements to the existing pumping station and boundaries would improve the visual appearance of the site. The design life of the major civil engineering components including buildings is 120 years.
- K.5.51 The functional and aesthetic elements were combined to create a sustainable, attractive, durable, useable and adaptable space in line with the NPS (paras. 3.5.1 to 3.5.3).

Water resources and flood risk

- K.5.52 The proposals include establishing a construction site close to and within the River Thames, and a permanent structure within the foreshore. The site is located within the Source Protection Zone 1 for a Thames Water source located approximately 0.3km away to the southwest.
- K.5.53 The nearby Thames Water source abstracts from the lower aquifer. The shaft would be constructed however through the upper aquifer, which is classified by the Environment Agency as a secondary aquifer. There is no licensed groundwater abstraction from the upper aquifer within 1km of the site. There are no significant groundwater issues for construction or operational development at the site.
- K.5.54 The main risk to surface water quality during construction at the site would be as a result of works within the river. With the measures incorporated into *CoCP* Part A, including adherence to good pollution prevention

- practice, impacts on surface water resources and river flows would be avoided.
- K.5.55 The part of the site is located within the River Thames foreshore and classified as functional floodplain (Flood Zone 3b, where water must flow or be stored in times of need). The inland part of the site is located behind the River Thames flood defences within Flood Zone 3a (1 in 100 event).
- K.5.56 The Flood Risk Assessment undertaken in accordance with Section 4.4 of the NPS is included within the *Environmental Statement*. This shows that the proposed development would be appropriate for the area as flood risk to the development would remain unchanged. Flood risk would be managed through appropriate design measures and the development would not lead to an increase in flood risk on the surrounding areas. Therefore, no significant flood risk effects are likely.
- K.5.57 The temporary works would involve the construction of a cofferdam and temporary flood defences at the main site. The *CoCP Part A* requires that these are built to the statutory flood defence level. This would ensure a suitable level of flood protection is maintained during construction.
- K.5.58 During construction, including tunnelling under the river wall, the *CoCP Part A* requires the monitoring and maintenance of the flood defence to the statutory flood defence level, for both permanent and temporary works.
- K.5.59 In accordance with the *CoCP* (Section 8) all site drainage during construction would be drained and discharged to mains foul or combined sewers and where this is not practicable, the site would be drained such that accumulating surface water would be directed to holding or settling tanks, separators and other measures prior to discharge to the combined or surface water drains. Foul drainage from the site welfare facilities would be connected to the mains foul or combined sewer. This design measure would help manage the risk from this source during construction but would not reduce the level of risk associated with this flood source.
- K.5.60 The presence of temporary and permanent structures within the foreshore has the potential to reduce the availability of flood storage within the tidal Thames. The impact of the removal of flood storage was modelled on a project-wide basis and results show that the proposed project-wide works (both temporary and permanent works) would not have a detrimental impact on the flood storage or tidal levels within the tidal Thames. This is discussed further in the project-wide assessment.
- K.5.61 The proposed new structure would be protected by a new flood defence wall, so the site would be protected from tidal flooding. Design principle IRVR.01 requires that the new river wall would provide the same level of protection against flooding as the existing defences and be designed to ensure that the river walls can be raised to meet the Thames Estuary 2100 Plan requirements in the future. The residual risk of tidal and fluvial flooding to the operational area would be the same as the current risk behind the existing defences, so flood risk would remain unchanged.
- K.5.62 In agreement with the Environment Agency (as set out in its phase two consultation response), surface water runoff from the new foreshore structure would be discharged directly to the River Thames. Surface water

- runoff to the River Thames is not anticipated to increase surface water flood risk to the site or surrounding area due to its tidal nature, and would therefore not require attenuation prior to discharge, or result in a significant effect.
- K.5.63 Permanent site drainage would comply with the National Standards for Sustainable Drainage Systems under the Floods and Water Management Act 2010, in accordance with design principle SDRN.01.
- K.5.64 In the event of a storm coinciding with a high tide event, surface water drainage from the site may be restricted and would need to be stored on site. Design principle SDRN.02 would require on-site storage if necessary that would allow attenuation in the event of tide-locking of the surface water outfall, (which is most likely to occur during a storm event coinciding with a high tide). Pursuant to a Requirement the specific drainage details would be submitted and approved in writing by the local authority.
- K.5.65 The site would remain at residual risk of tidal flooding in the event of a breach in the local flood defence wall along the edge of the River Thames or overtopping of the defence wall as a result of a failure of the Thames Barrier. The consequence, however, of a breach or failure of flood defences or a failure of the pumping station, would not compromise the long term operational function of the main tunnel.
- K.5.66 Stakeholders identified concerns over the potential for scour as a result of the temporary cofferdam and permanent foreshore structure. The foreshore structure was designed and engineered to minimise the impediment of flow. Although some changes to flows are likely, the changes are unlikely to lead to further substantive deterioration of the morphological condition of the channel which is already modified by flood defences and channel dredging. A site-specific Requirement requires monitoring for scour to be undertaken and any appropriate mitigation measures implemented. Possible mitigation options include riprap or rock fill, articulated concrete blocks, gabion mattresses and grout filled mattresses.
- K.5.67 Acceptable measures and requirements are proposed to mitigate any effects (in line with NPS para. 4.2.9). This would ensure that the proposals would not lead to any adverse impacts on surface or ground water quality resources during construction or operation.
- K.5.68 Flood risk from all sources has been managed as far as possible through design and the measures incorporated in the *CoCP*, so the criteria in NPS para. 4.10 would be satisfied. No significant flood effects are likely from the proposed development.
- K.5.69 Once operational, the proposed works would have a significant beneficial impact on water quality in the tidal Thames in the vicinity of the site, reducing the risk of exposure to pathogens, reducing sewage derived litter and making an important contribution towards compliance with the Urban Waste Water Treatment Directive and the Water Framework Directive.

Air quality, emissions, dust and odour

- K.5.70 The entire borough of Wandsworth is designated as an Air Quality Management Area. The closest sensitive receptors to the site would be residential occupiers of adjoining houseboats and nearby Elm Quay and anticipated newly constructed properties.
- K.5.71 The CoCP Part A includes all reasonable measures, including requiring use of the measures in the *Best Practice Guidance, the Control of Dust and Emissions from Construction and Demolition* (Greater London Authority and London Councils) (2006). Others measures include those in relation to vehicle and plant emissions, measures to reduce dust formation and re-suspension, measures to control dust present and measures to reduce particulate emissions. These would be observed across all construction and demolition activities at the Heathwall Pumping Station site. The *Environmental Statement* (Vol 15, Section 9) reports that the measures in the CoCP would manage dust impacts that would otherwise occur within 50m of the site and that no significant impacts would arise through emissions.
- K.5.72 The consideration of operational air quality, odour and dust impacts is reported in the project-wide section of the *Planning Statement*.
- K.5.73 The project-wide air management plan is designed to ensure that the air in the tunnels is kept fresh, that a low pressure is maintained within the tunnels to prevent unwanted releases and that when air is released it is treated. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, at all sites there are to be ventilation structures which would allow air to enter and leave the tunnel system.
- K.5.74 When the tunnels are empty, clean air would be drawn into the tunnels at specific sites by the extraction of air at other specific sites so as to keep the air in the tunnels fresh. This means that odours would not build up while the tunnels are empty. As the tunnels fill, air displaced from the tunnels would initially be extracted and treated at the active ventilation sites before being released and later, depending of the level of filling, would pass through the passive carbon filters. These filters clean the air and remove any odours before it is released.
- K.5.75 At passive ventilation sites a passive carbon filter would be installed within a below ground chamber. During a typical year this treats all the air displaced from the particular shaft which would occur only when the shaft is drowned by the rising wastewater in the tunnel. During infrequent, extreme storm events (approximately once in 15 years), the air that is pushed out of the shaft could exceed the capacity of the passive filter and would be released untreated through a pressure relief structure to prevent damage to the passive filter. For 100 per cent of the time during a typical year, all air released would be treated, which means that all regulatory requirements would be met and there would be no nuisance odours or loss of amenity due to odours.
- K.5.76 Appropriate measures are proposed to ensure that the proposals would not lead to any significant deterioration, substantial changes or breaches

in, air quality, emissions or dust, during construction or operation, in line with the NPS (paras. 4.11.4 to 5).

- K.5.77 All reasonable measures have been taken to ensure that there would be no loss of amenity from odour in line with the NPS (para.4.3.11 to 15), during construction or operation.

Biodiversity and geological conservation

- K.5.78 The proposals would result in the temporary loss of an area of foreshore during construction and a smaller area permanently due to the foreshore structure and associated scour protection works. It would also include the demolition of part of the existing river wall.

- K.5.79 There are no internationally or nationally designated ecological sites in the vicinity of the site. However, the foreshore area of the site is located within the designated River Thames and Tidal Tributaries Site of Importance for Nature Conservation. Given the need for new infrastructure, the NPS states that sites of regional and local biodiversity interest should not be used in themselves to refuse development consent (para. 4.5.12).

- K.5.80 The *CoCP* Part B requires that a membrane would be installed between the existing river bed and temporary back fill material to prevent contamination of juvenile fish habitat. It also requires that areas of foreshore used for temporary works to be restored to similar condition and material prior to the works. It also requires a site-specific lighting plan to address the impact on terrestrial and aquatic ecology and include the use of low level directional lighting where possible while meeting safe working requirements. These measures would ensure that impacts on aquatic ecological interests are minimised. The size of the foreshore structure would be minimised as much as possible whilst meeting the functional requirements, as required by design principle IRVR.01.

- K.5.81 The *Environmental Statement* (Vol 15, Section 5) identifies a significant impact on habitat and designations due to a permanent loss of designated inter-tidal habitat. The loss of foreshore is unavoidable and compensation measures would be provided for the project as a whole. Opportunities to provide local improvements were sought. The Environment Agency suggested that an inter-tidal terrace should be included on the foreshore structure to provide habitat benefits. This option was investigated but is not suitable in this location because a terrace could be over sailed by the large barges that operate in the area and at the adjacent safeguarded wharf. This would compromise the impact protection zone required to protect the structures in the foreshore given the adjacent wharf.

- K.5.82 By intercepting the CSOs, the project itself would result in the reduction in the occurrence of dissolved oxygen related fish mortalities and would improve the quality of the local habitat.

- K.5.83 The foreshore site and surroundings have some local value for wintering birds and commuting bats. The *CoCP* Part A requires an ecological management plan for the site, which would appropriately manage effects of construction and avoid any adverse impacts.

K.5.84 There are no implications for geological conservation arising from the works at this site.

K.5.85 The site and surrounding area is heavily industrialised. Best practice measures would be applied to ensure that construction effects on geological and biodiversity interests are minimised. There would be an unavoidable local impact on aquatic ecology from the permanent foreshore structure required to intercept the CSOs. The extent of the structure has been minimised as much as possible. Opportunities were taken through good design to maximise benefits for biodiversity and mitigation was designed to comply with para. 4.5.17 of the NPS.

Landscape and visual impacts

K.5.86 The landscape quality within the site is poor due to the industrial nature of the pumping station and the disused Middle Wharf. The site is set amongst a wider industrial area and adjacent to the busy Nine Elms Lane.

K.5.87 The surrounding landscape on the south bank is dominated by industrial and commercial uses undergoing transformation into mixed use development. In contrast, the north bank of the Thames is generally made up of established residential areas and a boat club.

K.5.88 To minimise impacts, the *CoCP* Part B requires the use of hoardings with artwork on the public facing sections and the use of low level directional lighting where possible.

K.5.89 The construction works would however intensify the industrial character of the site. They are likely to cause unavoidable temporary impacts on the surrounding landscape, including impacts on views from residential properties on the north and south of the river and on users of the Thames Path. From several viewpoints this would be in combination with impacts from other project sites including Kirtling Street and Albert Embankment Foreshore.

K.5.90 The NPS recognises in para. 1.4.4 that nationally significant infrastructure projects are likely to take place in mature urban environments, with adverse townscape and visual effects within a built up environment, with many possible receptors. Large scale construction works are commonplace in London, and the surrounding Nine Elms area is set to become one of the largest redevelopment sites in London. The construction effects of the project are unavoidable and temporary, and should be considered in this context.

K.5.91 The design parameters and principles for the permanent above-ground structures were carefully developed to ensure they are sensitive to their surroundings and as visually attractive as possible, as detailed in the Good design subsection above. The new riverside Thames Path and new public space would considerably improve the appearance of this stretch of the Thames, and the enhancement works to the pumping station and boundary treatment would considerably improve the character of the site. The adverse landscape and visual effects during construction would be minimised as far as possible and the permanent works would improve the appearance of the area, in particular the setting of the Thames Path.

Land use including open space, green infrastructure and green belt

- K.5.92 The site is on partly vacant, previously developed land, with the exception of the foreshore area. Temporary and permanent works in the foreshore are needed in order to carry out the required interception. As detailed in the Planning context section above, the site and surrounding area is industrial in nature but is to undergo major transformation. Local land use policy encourages regeneration of the area while maintaining a balance between a new residential neighbourhood and water based freight uses.
- K.5.93 The Land use plan is provided in Annex K to this appendix.
- K.5.94 The foreshore area in this location is not accessible to the public as reported in the *Open Space Assessment*, which accompanies the application. The proposed foreshore structure would result in the loss of a small part of the foreshore. It would not, however, significantly prevent waterborne recreational use of the river. The scale of permanent works in the foreshore was minimised as far as possible, whilst ensuring the engineering requirements are met. There is a safeguarded wharf within the site and despite the presence of the Westminster Boating Base nearby, barge movements at the wharf and in the immediate vicinity of the proposed foreshore structure are established through past use and a key part of the safeguarded designation. There would, therefore, not be an impact on the use of the space for waterborne recreation.
- K.5.95 The site is subject to allocations in the *SSAD* (site allocations 10 and 22). Heathwall Pumping Station is specifically allocated by the London Borough of Wandsworth for part of the project. Middle Wharf is allocated as a safeguarded wharf and it is noted in the *SSAD* that the site is being considered by Thames Water for the project.
- K.5.96 The existing Pumping Station would remain operational throughout the works and the site layout would accommodate the successful functioning of the safeguarded wharf, on completion of the works. Middle Wharf is currently disused, but during construction materials would be transported by river and this would be in accordance with the safeguarding of the wharf.
- K.5.97 The proposals would require the temporary relocation of the Battersea barge by approximately 7m to the east. It would be returned to its existing position following construction pursuant to a Requirement and could remain operational throughout.
- K.5.98 The proposals would not preclude existing or new development or a use proposed in the development plan. Following construction, a new open space would be provided, where public access is currently restricted along the foreshore, providing an area to sit and enjoy views along the river.
- ### Noise and vibration
- K.5.99 The site is set amongst a wider industrial area and adjacent to the busy Nine Elms Lane. Part of the site is a safeguarded wharf. More recently houseboats have become established at a nearby former industrial pier.

- K.5.100 The surrounding Nine Elms area is set to become one of the largest redevelopment sites in London. Major construction is set to take place over the coming decades including the construction of significant associated infrastructure such as the proposed Northern Line extension.
- K.5.101 New residential developments are anticipated to emerge as part of the redevelopment, alongside existing wharves. The adjacent Riverlight development has commenced a major, approximately six year construction programme for the construction of six residential towers.
- K.5.102 Local and London Plan policy is to regenerate the area whilst maintaining the existing water based freight uses. It affords safeguarded wharves protection requiring adjacent or opposite developments of a sensitive nature to be designed to minimise the potential for conflicts of use and disturbance. Therefore higher noise insulation performance is usually required for nearby sensitive uses.
- K.5.103 The NPS recognises that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments, and in the short term, to lead to noise disturbance during construction.
- K.5.104 Heathwall Pumping Station is a short tunnel construction site and for practicality and safety reasons tunnel construction needs to take place during that phase, over extended periods of time, including working on a 24-hour, seven days a week basis.
- K.5.105 To manage noise impacts arising from construction the *COCP* includes all practicable on site noise mitigation measures. The *CoCP* Part B would require a 2.4m noise barrier on the temporary cofferdam and the compaction of material on site would be undertaken using machinery generating the lowest practicable vibration levels which still enables the required level of compaction to be achieved. Specifically, the use of large twin-drum vibrating rollers would only occur on occasions where vibration levels can be controlled to less than the impact criteria. The loading and unloading of barges would only be carried out during standard working hours.
- K.5.106 Large scale construction works are commonplace in world cities such as London. 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 Thames Tideway Tunnel no extreme cases have been identified at the date of the submission of the application for development consent which 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 of the *Statement of Reasons*, which accompanies the application) have been 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. In relation to construction, eligible works would be directed towards mitigation or other required actions to reasonably reduce disturbance from noise or construction activities.

- K.5.107 The *Environmental Statement*, (Vol 15, Section 9) reports that the noise insulation as set out in the noise insulation and temporary re-housing policy would reduce noise impacts at Block F of the Riverlight development to avoid otherwise significant impacts during the day. No other potential significant noise impacts are identified during construction or operation and no significant impacts are identified as a result of vibration during construction or operation.
- K.5.108 The Riverlight development has commenced construction and any units which are occupied before this project commences would have been sold in the full knowledge of the possibility of this project.
- K.5.109 The works would be in the context of wider construction works in an area of established wharf use. The project demonstrates good design and the *CoCP* includes all practicable on site noise mitigation that could be adopted in accordance with paras. 4.9.8 and 4.9.9 of the NPS.
- Historic environment**
- K.5.110 The site does not contain any nationally designated heritage assets and has no historic value in terms of above-ground structures.
- K.5.111 Most of the site is located within an Archaeological Priority Area, in recognition of the archaeological potential of the Thames floodplain. This designation applies to the entire area of the Thames within Wandsworth.
- K.5.112 The *Environmental Statement* identifies potential for buried heritage assets, including: palaeoenvironmental remains within the alluvium and, on the foreshore, prehistoric riverside activity, early medieval (Saxon) fish traps and 18th and 19th century remains.
- K.5.113 The *CoCP* Part B requires that during construction of the new river wall including any in-river activities, the contractor's method for the river works would minimise the risk of impact on the known Saxon fish trap located on the foreshore outside of the northeastern corner of the site, by selecting suitable river plant and operating procedures.
- K.5.114 Pursuant to a Requirement a *Site-specific Archaeological Written Scheme of Investigation* would be submitted to and approved by the local planning authority before development commences. There are also provisions for dealing with unexpected finds. These measures would ensure that any impacts on heritage assets can be managed and mitigated.
- K.5.115 The NPS recognises in para. 1.4.4 that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments, with adverse construction effects on archaeology and cultural heritage likely to arise. Construction works similar to those proposed are commonplace in London, and therefore impacts on heritage assets, which are unavoidable and largely temporary, should be viewed in this context.
- K.5.116 The potential for adverse impacts has been minimised as far as possible and the proposals were developed to avoid unnecessary damage as far as

possible. The proposed mitigation would ensure that any unavoidable losses would be recorded and unexpected finds assessed, in line with NPS para. 4.10.18.

Light

- K.5.117 At night the site currently receives relatively low levels of light spill from river traffic and riverside developments, however, the large Riverlight residential development is anticipated to be at least partially complete before construction commences, increasing light spill. There is street lighting along Nine Elms Lane which runs adjacent to the southern boundary of the site and consequently night time lighting levels are high in this location.
- K.5.118 Heathwall Pumping Station is a short tunnel construction site and for practicality and safety reasons tunnel construction needs to take place over extended periods of time, including working on a 24-hour, seven days a week basis. The need for extended working hours does mean that artificial lighting would be required for extended periods during the tunnel construction and secondary lining phases.
- K.5.119 The *CoCP Part A* requires that the lighting would be positioned and directed so as not to unnecessarily intrude on adjacent buildings and land uses, and to prevent unnecessary interference with local residents or passing transport users. The *CoCP Part B* requires a site-specific lighting plan with low level directional lighting where possible. This would ensure that artificial lighting is appropriately managed during construction.
- K.5.120 Operational lighting would be minimal apart from low level lighting associated with the area of public realm. The design principles require light pollution to be minimised by means of capped, directional and cowed lighting units, during operation.
- K.5.121 The *Daylight/Sunlight Assessment*, which accompanies the application, reports that the site was scoped out as a result of the screening assessment as there would be no material impact on sunlight or daylight from construction or the permanent works.
- K.5.122 All reasonable measures are proposed to minimise effects (in line with NPS para. 4.12.7) and would ensure that the proposals would not lead to any significant impacts on amenity due to artificial light or any material loss of light to properties, during construction or operation.

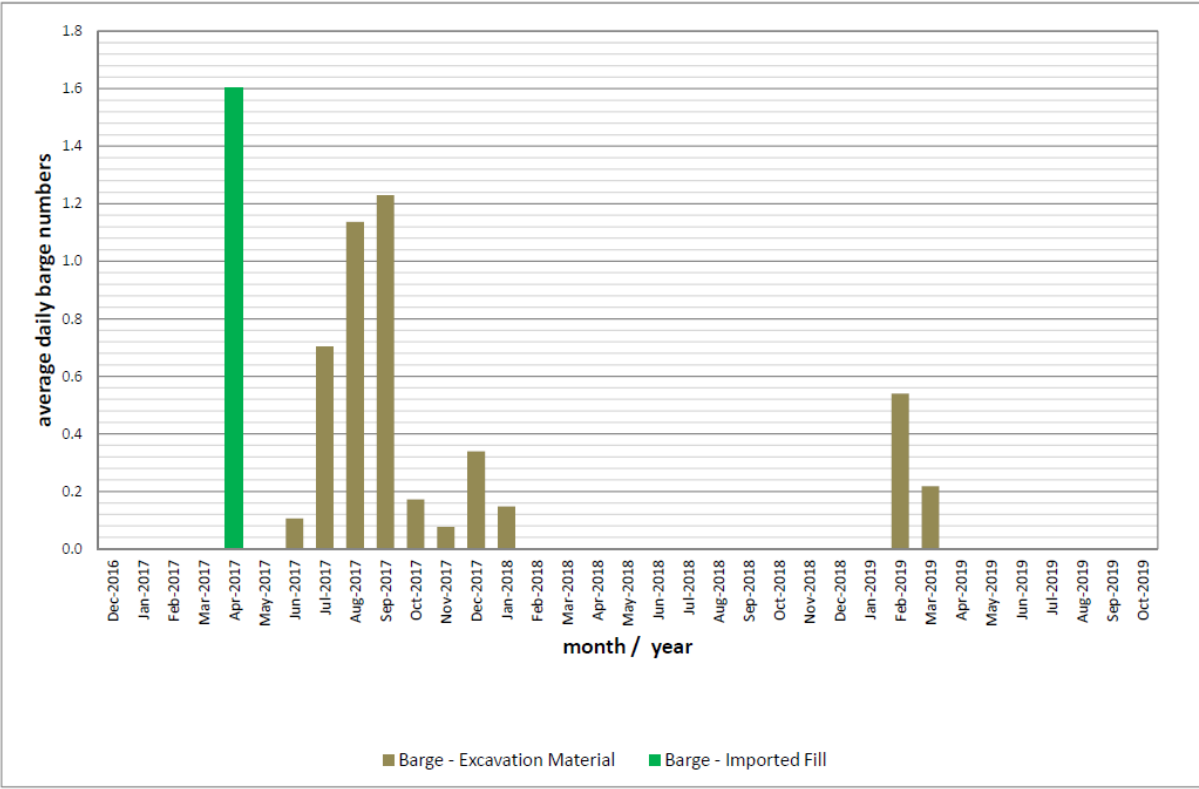
Traffic and transport

- K.5.123 The site is adjacent to the north of Nine Elms Lane, which is characterised by high levels of traffic. Nine Elms Lane (A3025) is part of the Transport for London Road Network and a key HGV route, that runs northeast to Vauxhall and southwest to Battersea (Transport for London data published 2010 suggests a daily average flow of 500 to 1,500 HGVs per day). It connects to the A3 which is part of the Strategic Road Network.
- K.5.124 The Public Transport Accessibility Level of the site is between 3a and 4, rated as 'moderate' (1 is the lowest accessibility and 6b is the highest accessibility). The *CoCP Part A* would require a travel plan to be produced

by the construction site contractor to encourage the use of public transport by those working on site. No worker parking would be allowed.

K.5.125 The *Transport Strategy*, which accompanies the application, sets out the overarching transport strategy for the project. A significant proportion of the construction materials and waste would be transported by barge in accordance with NPS guidance favouring this form of transport where it is cost effective. It is proposed to import and export at least 90 per cent of all cofferdam fill material by river and to transport at least 90 per cent of shaft excavated material by river at the Heathwall Pumping Station site. There would be an average peak of approximately two barges (four barge movements) a day during year one of construction which is not anticipated to impact existing river navigation patterns. The use of barges would provide local benefits in terms of reducing trips by HGVs by 2,700 (5,400 movements).

Figure K.10 Estimated construction barge profile



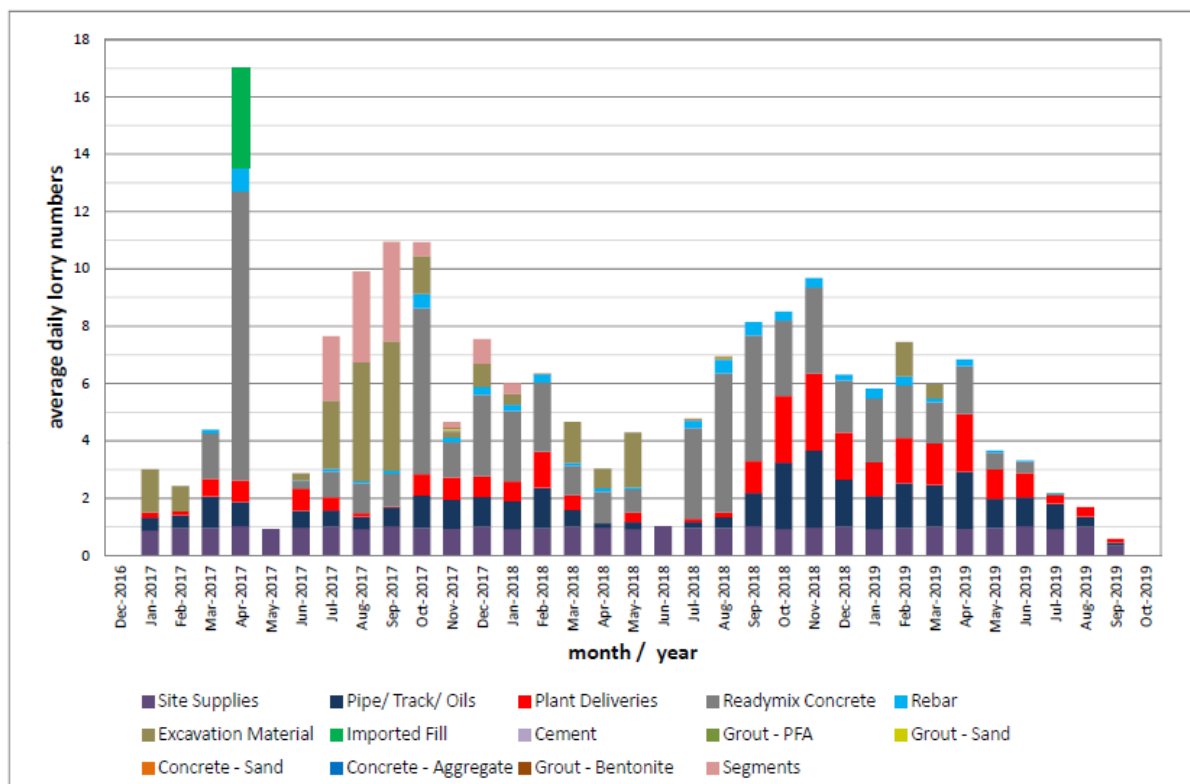
K.5.126 A *Navigational Issues and Preliminary Risk Assessment* was undertaken in consultation with the Port of London Authority. The design and footprint of the temporary permanent works in the river were minimised so that the structures are set back from the authorised channel. The permanent in-river works would extend approximately 25m from the river wall, which is no further out than the existing Middle Wharf jetty. The structure would be highly unlikely to present an additional hazard to navigation. Constraints have also been placed on the working areas within the river to minimise the duration and extent of obstructions in the river.

K.5.127 Regarding barge movements, the *CoCP Part B* requires that a site-specific river transport management plan would be produced setting out how river

access to site would be managed so as to minimise impact on the river and communicate this with the Port of London Authority, local borough and other stakeholders.

K.5.128 For HGV movements, an average a peak of 36 movements (18 two-way trips) is expected in site year one of construction. At other times in the construction period, vehicle flows would be lower than this peak figure.

Figure K.11 Estimated construction lorry profile



K.5.129 During construction typically vehicle movements would take place during the typical day shift of ten hours on weekdays (8am to 6pm) and five hours on Saturdays (8am to 1pm) with up to one hour before and after these hours for mobilisation and demobilisation of staff. Construction activity would occur twenty four hours a day for some periods but during such periods, construction vehicle movements would only occur during the ten and five hour periods stated above. Mobilisation and demobilisation may include: loading; unloading; and arrival and departure of workforce and staff at site and movement to and from the place of work. In exceptional circumstances HGV and abnormal load movements could occur up to 10pm for large concrete pours and later at night on agreement with the local authority.

K.5.130 The CoCP Part A requires appropriate control systems to be implemented to prevent congestion around the worksite and its access routes. No queuing outside of the site would be allowed unless otherwise agreed by the relevant authorities.

K.5.131 The CoCP Part B requires that site access would be located at the existing access to the pumping station, and one of the existing accesses to the

adjacent Middle Wharf. The contractor is required to put measures into place to prevent vehicles halting on Nine Elms Lane when entering the site. This may include the vehicle notifying the site in advance to ensure that the entrance gate is open, locating the security barrier at a distance within the site and use of a traffic marshal.

- K.5.132 For general construction vehicle access, no reversing to and from the site onto Nine Elms Lane would be allowed. Access to the site would be from the west turning left into the site from Nine Elms Lane (A3035). Egress from the site would be a left turn out travelling east towards Vauxhall.
- K.5.133 A section of footpath (approximately 5m) would be removed, but there would be minimal delay to pedestrian journeys as there would be no diversions, other than for a short period while the modifications to the crossover is made. The *CoCP* Part B requires appropriate management and signage would be provided on the pedestrian route at site accesses to minimise the risk of pedestrian accidents. The number of HGVs accessing the site would be comparatively low and no significant impacts are anticipated on road network operation. Some network delay may be experienced by other road users when large vehicles are accessing the site; however, this would be infrequent and temporary. There would be no changes to the layout of the existing highway network other than to form the construction site accesses. Due to the site being constrained, the contractor would be required to consider the use of a turntable, or restrict lorry size to meet the requirement to prevent reversing onto Nine Elms Lane.
- K.5.134 The transport demands created by the development in the operational phase would be extremely low and limited to occasional maintenance visits every three to six months. Larger cranes would need access to the shaft and tunnel every ten years.
- K.5.135 The *Environmental Statement* identifies potential adverse construction impacts on pedestrian accessibility using the Thames Path due to a loss of footway and an increase in potential conflicts with construction traffic at the site crossovers. There is also potential for adverse impacts on pedestrian access to occupiers and users of nearby residences and businesses including Riverlight, the Battersea Barge, Nine Elms Pier and Tideway Village.
- K.5.136 The *CoCP* Part A requires controls to ensure the safety of pedestrians crossing the haul route and requires that diversions are fully accessible and in line with Disability Discrimination Act requirements as far as practical. Consideration would be given to people with reduced mobility in the operation of the works. All reasonable steps would be taken to minimise the impacts. It also requires the production of a site-specific transport management plan to set out how vehicular access to the site would be managed so as to minimise impact on the local area and communicate this with the local borough and other stakeholders. This includes any works on the highway, diversion or temporary closure of the highway or public right of way.
- K.5.137 To reduce potential for hazards, the *CoCP* Part B would require signage, safe crossing points, and other required measures to be provided for

pedestrians and cyclists at site accesses. Access would be directly onto a key HGV route and would use existing access points to the pumping station or wharf. All reasonable measures would be taken to minimise impacts and any residual impacts on pedestrian accessibility are an unavoidable consequence of intercepting the CSOs and would cause only very short delays. In accordance with the NPS (para. 4.13.10) the site can exploit benefits of barging during construction to substantially reduce dependence on HGV traffic.

- K.5.138 The NPS recognises (para. 4.13.6) that new nationally significant infrastructure may give rise to substantial impacts on transport infrastructure. However, provided that the applicant is willing to mitigate adverse impacts, including by entering into development consent obligations, then development consent should not be withheld (para. 4.13.7). The number of HGVs accessing this site would be comparatively low and although some network delay may be experienced by other road users when large vehicles are accessing the site, due to the measures proposed this would be infrequent and temporary.

Waste management

- K.5.139 The Waste Strategy was developed to provide a framework for the management of materials and waste that would be produced throughout the construction and operational phases of the project. This ensures that the requirements set out in para. 4.14.6 of the NPS would be satisfied, and the Waste Strategy would be secured via an obligation in accordance with para. 4.14.7 of the NPS.
- K.5.140 No particular site-specific waste issues arise at this site.

Socio-economic

- K.5.141 The construction site is expected to require a maximum workforce of approximately 40 workers at one time. This would not significantly alter the demand for services in the surrounding area. Any socio-economic effects on the demand for services arising from the construction workforce at this site would be insignificant compared to the long term changes in this major regeneration area and the significant increase in residential population this would bring.
- K.5.142 As detailed above, there may be potential construction impacts on pedestrian accessibility on the Thames Path. However, these are unavoidable and delays to pedestrians would be minimal. All reasonable steps would be taken to minimise impacts.
- K.5.143 The *Equalities Impacts Assessment*, which accompanies the application, states that there may be a disproportionate impact during construction for children and older people due to perceived safety and severance issues associated with the movements of large construction vehicles. The *CoCP* Part A requires controls to ensure the safety of pedestrians crossing the haul route and requires that diversions are fully accessible and in line with Disability Discrimination Act requirements as far as practical. Consideration would be given to people with reduced mobility in the

operation of the works. All reasonable steps would be taken to minimise the impacts.

- K.5.144 The Battersea Barge restaurant would need to be temporarily relocated approximately 7m to the west to allow for construction. It would be returned to its original position following construction pursuant to a requirement. The small temporary relocation would not significantly impact the business.
- K.5.145 There would be some negative socio-economic impacts arising from the disruption likely to be caused by construction, but these would be minimised as far as possible and not significant. Once operational there would be a substantial benefits to the recreational users of the River Thames in this location including the nearby Westminster Boating Base due to the significant reduction in discharges from the Heathwall Pumping Station and the South West Storm Relief CSO.

K.6 Overall conclusions

- K.6.1 There is a need to intercept South West Storm Relief CSO and the Heathwall Pumping Station CSO. In an average year, the CSOs discharge approximately 228,000m³ and 655,000m³ respectively of untreated sewage into the tidal Thames. The Environment Agency identified the Heathwall Pumping Station CSO as a CSO that needs to be controlled.
- K.6.2 The Heathwall Pumping Station site was selected after extensive engagement as the site on which to meet the need. The site is appropriate and the application proposals would directly meet the identified need. The proposals underwent extensive pre-application consultation and engagement since the site was proposed as part of the project after phase one consultation. The feedback received helped to minimise any potential impacts and achieve a quality design.
- K.6.3 Given the location of the CSOs, close residential dwellings, and the extent of the required works, 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 negative effects are likely to remain. These comprise:
- a. unavoidable temporary landscape impacts on nearby landscape and viewpoints
 - b. unavoidable temporary short term (one month) noise impacts at Riverlight Block F due to surface construction noise (the noise insulation as set out in the noise insulation and temporary re-housing policy would reduce noise impacts to avoid this significant impact)
 - c. unavoidable temporary impacts on pedestrian accessibility on the Thames Path
 - d. potential impacts on any below ground heritage assets
 - e. permanent impact on inter-tidal habitat due to the required foreshore structure.

- K.6.4 For each of these impacts, the project design was refined and all practicable mitigation identified and committed to, in accordance with the advice in the NPS. The residual impacts are an unavoidable consequence of intercepting the CSOs, in a dense urban environment.
- K.6.5 The industrial nature of this area and established water borne freight use is compatible with the use of river based transport that would significantly reduce road based transport associated with construction.
- K.6.6 The proposals at the Heathwall Pumping Station site would give rise to significant beneficial effects, including on river water quality, and due to the realigned Thames Path and new public space next to the foreshore.
- K.6.7 The improvements to water quality would considerably improve the setting of the significant waterside residential development proposed and under construction. The proposed new riverside Thames Path and new public space, would also considerably improve the environment of the riverside for recreational users. The improved pumping station and boundary treatment would improve the character of the site, upgrading this infrastructure and supporting the transition towards a largely residential district.
- K.6.8 The proposed works at the Heathwall Pumping Station site, and the mitigation measures developed and advanced as part of the application for development consent, directly accord with the approach detailed by the NPS. Adverse effects have been minimised as far as possible and opportunities have been taken to enhance the local environment and to leave a positive legacy.
- K.6.9 Sections 8 and 9 of the *Planning Statement* consider the implications of the local effects of the works at Heathwall Pumping Station and the other sites, and describe 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 Heathwall Pumping Station, and the project as a whole, are compliant with the NPS and that development consent should be granted.

Annex K: Drawings for Heathwall Pumping Station

List of drawings

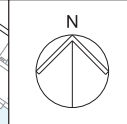
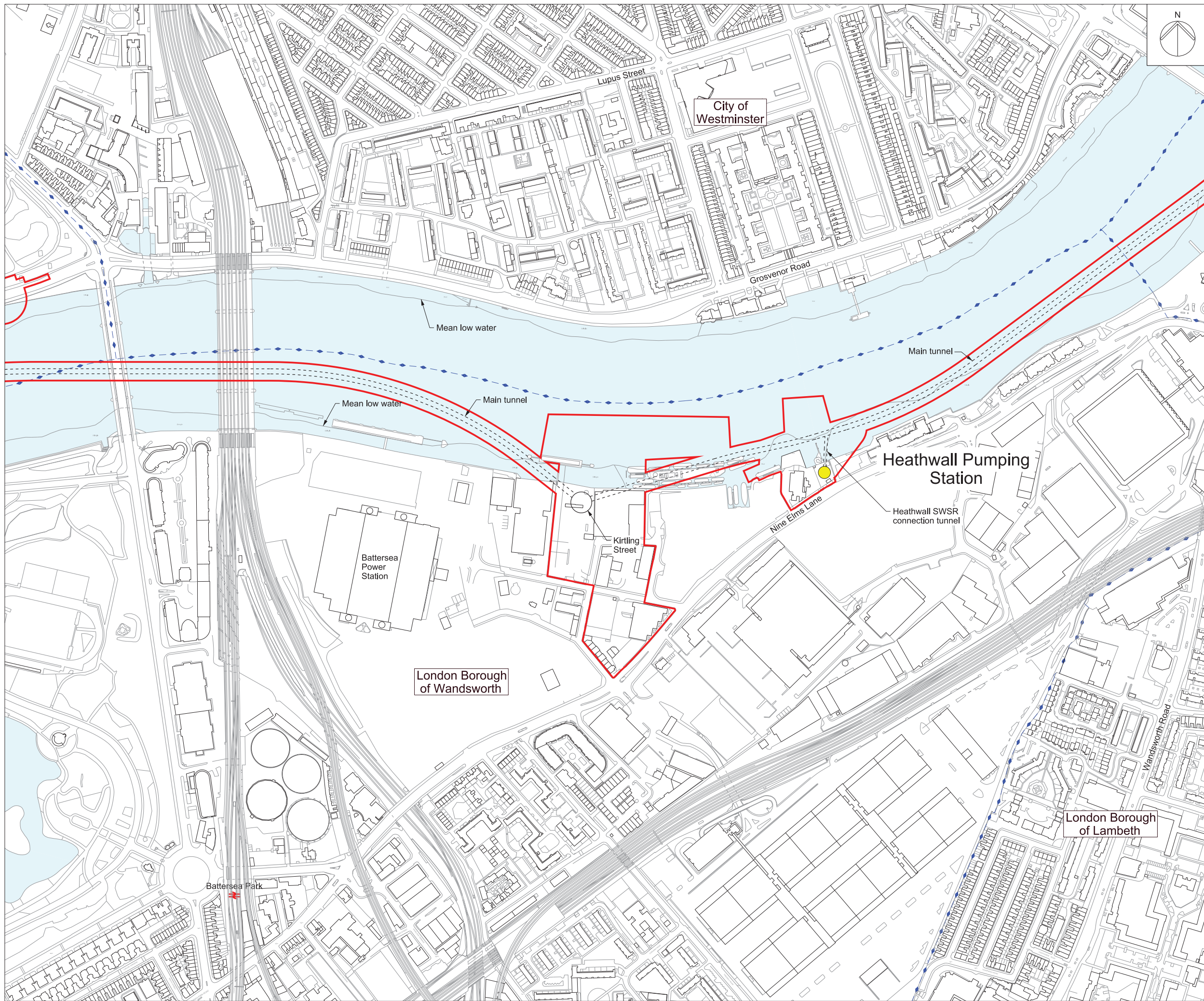
Heathwall Pumping Station: Location plan

Heathwall Pumping Station: As existing site features plan

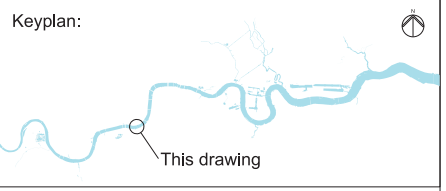
Heathwall Pumping Station: Construction phases plan

Heathwall Pumping Station: Land use plan

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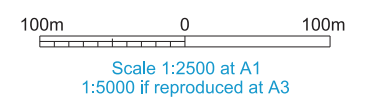


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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

Notes:

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



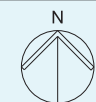
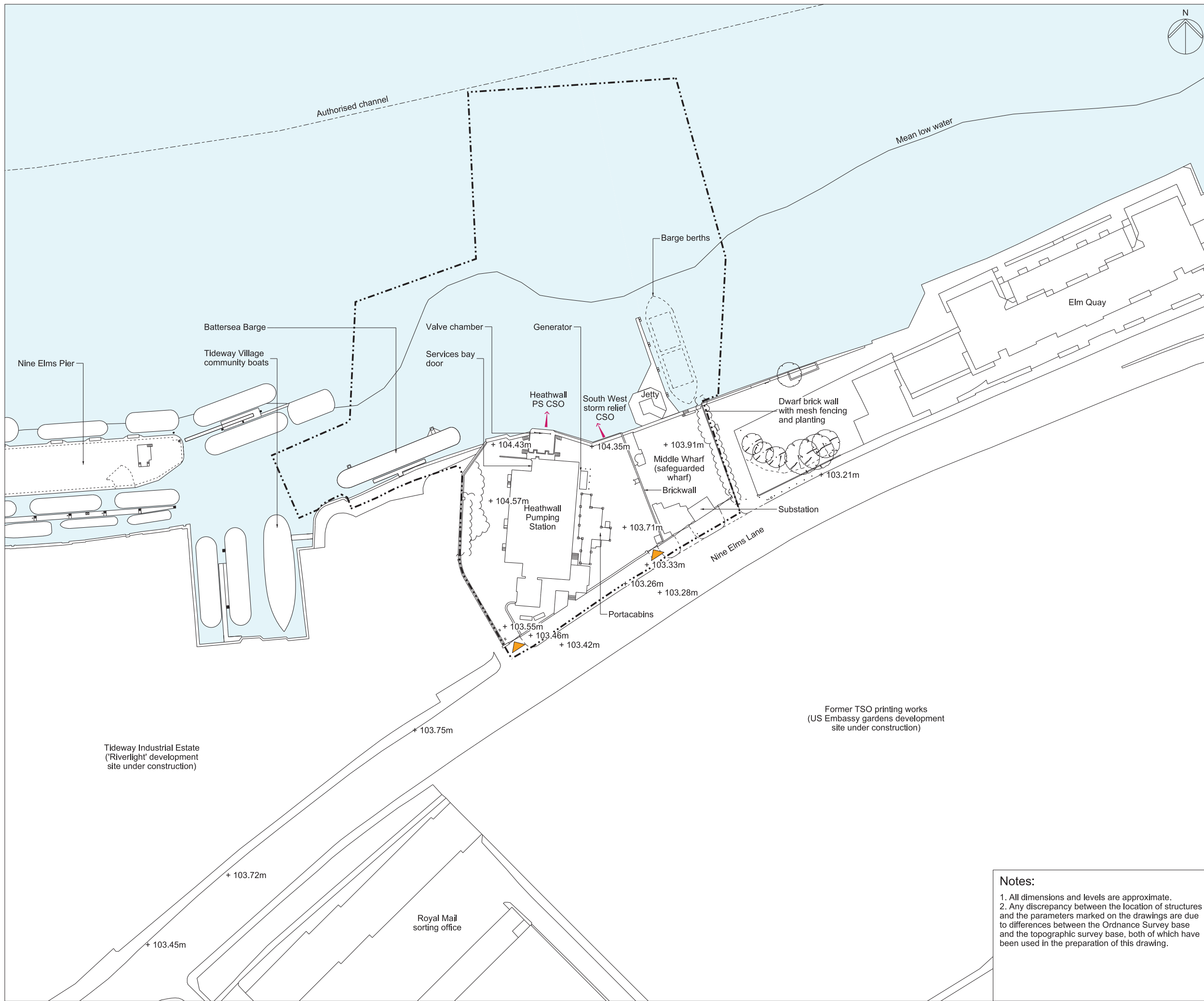
FOR INFORMATION

Location
Heathwall Pumping Station
 London Borough of Wandsworth

Document Information
Application for Development Consent
 Location plan

Book of plans - section 16
 DCO-PP-14X-HEAPS-160001
 January 2013



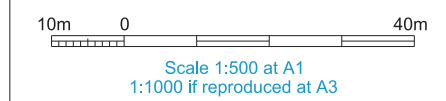


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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



FOR INFORMATION

Location
Heathwall Pumping Station
 London Borough of Wandsworth

Document Information
Application for Development Consent

As existing
 Site features plan
 Book of plans - section 16
 DCO-PP-14X-HEAPS-160002
 January 2013



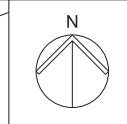
Notes:

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.

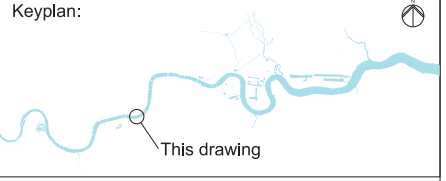
Tideway Industrial Estate ('Riverlight' development site under construction)

Former TSO printing works (US Embassy gardens development site under construction)

Royal Mail sorting office

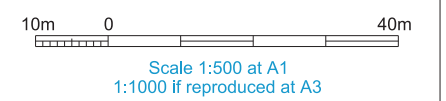
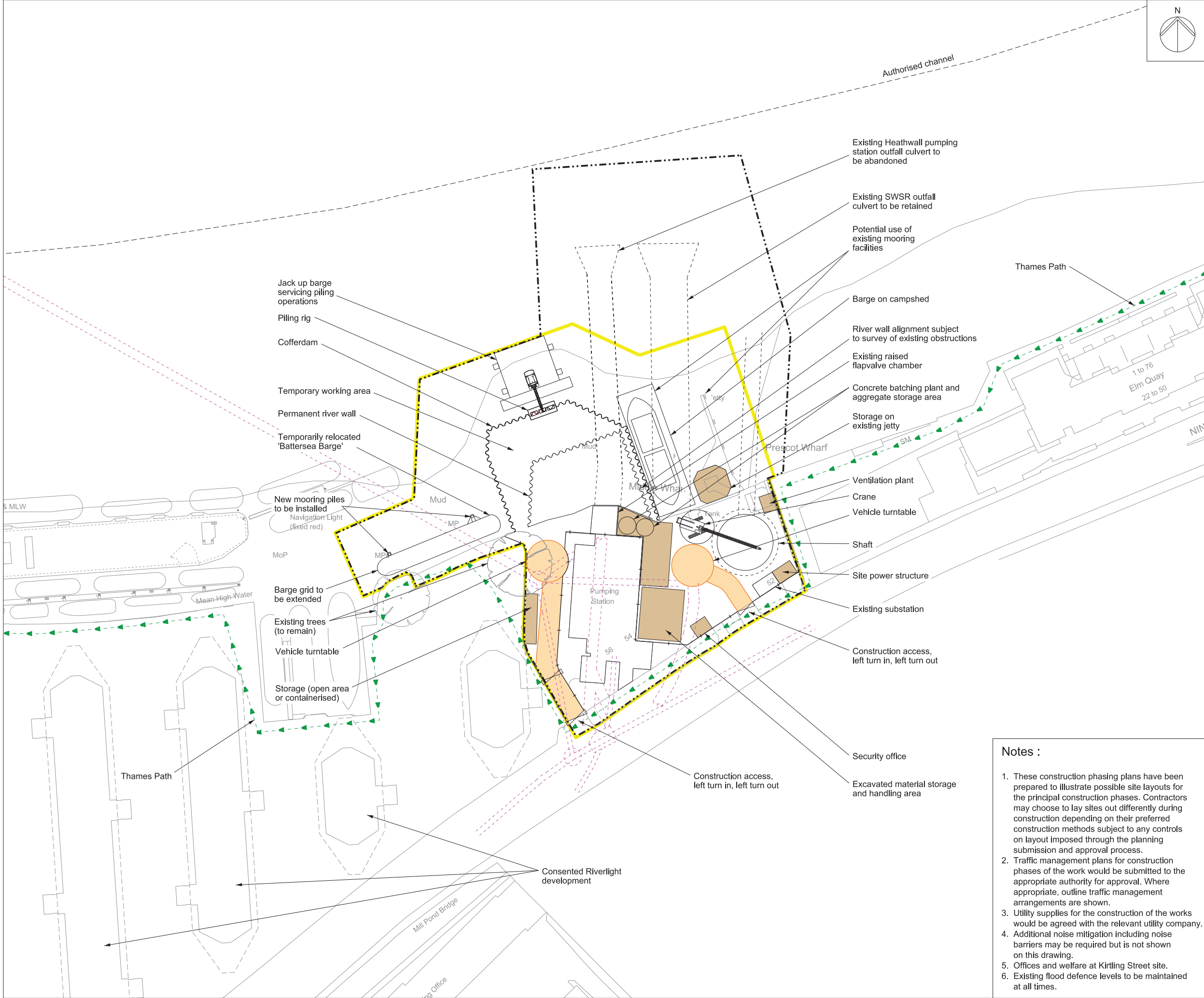


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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



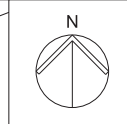
- Notes :
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed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

ILLUSTRATIVE

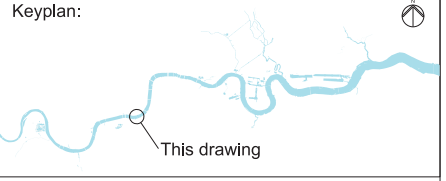
Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent
Construction phases - phase 1
Site setup shaft construction & tunnelling
Book of plans - section 16
DCO-PP-14X-HEAPS-160014
January 2013





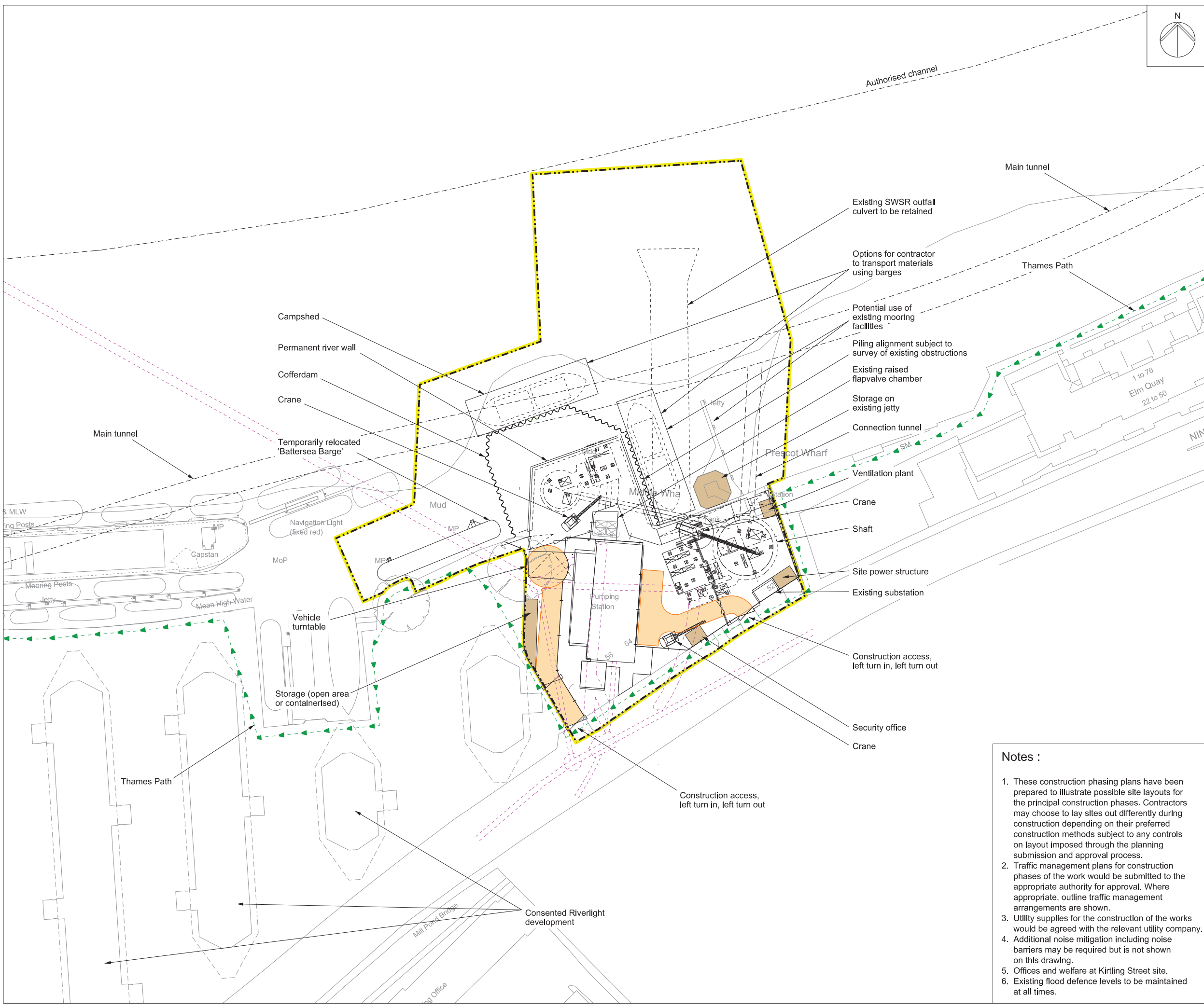
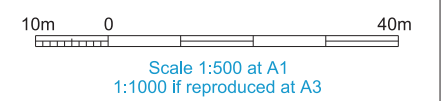
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Key:

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



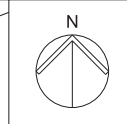
- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed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

ILLUSTRATIVE

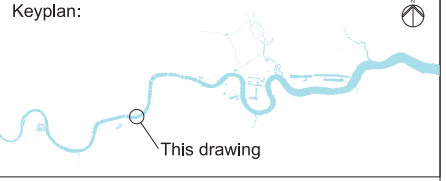
Location
Heathwall Pumping Station
 London Borough of Wandsworth

Document Information
Application for Development Consent
 Construction phases - phase 2
 Construction of other structures
 Book of plans - section 16
 DCO-PP-14X-HEAPS-160015
 January 2013





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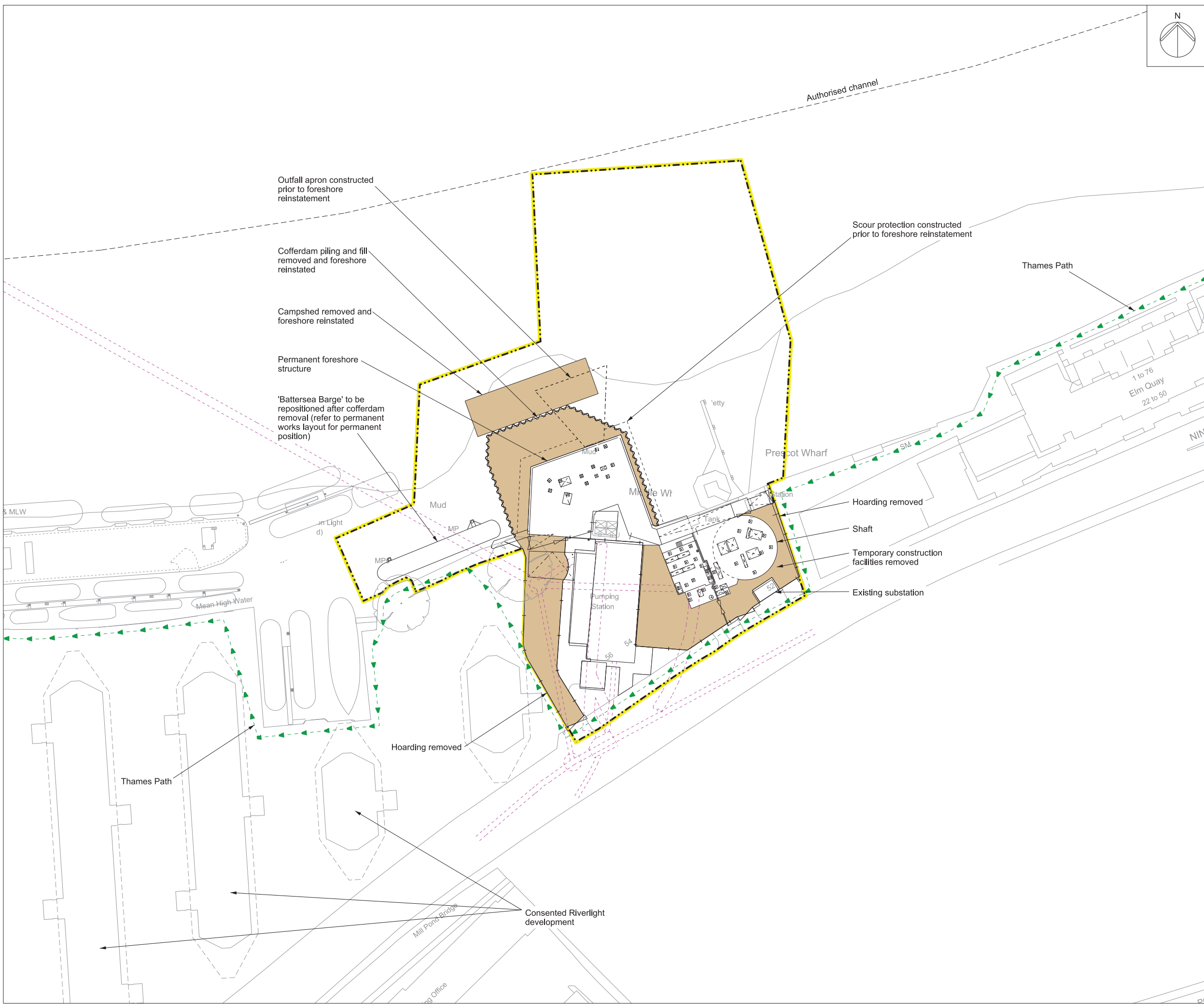
- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - Site access
 - Existing sewers
 - Sheet piles

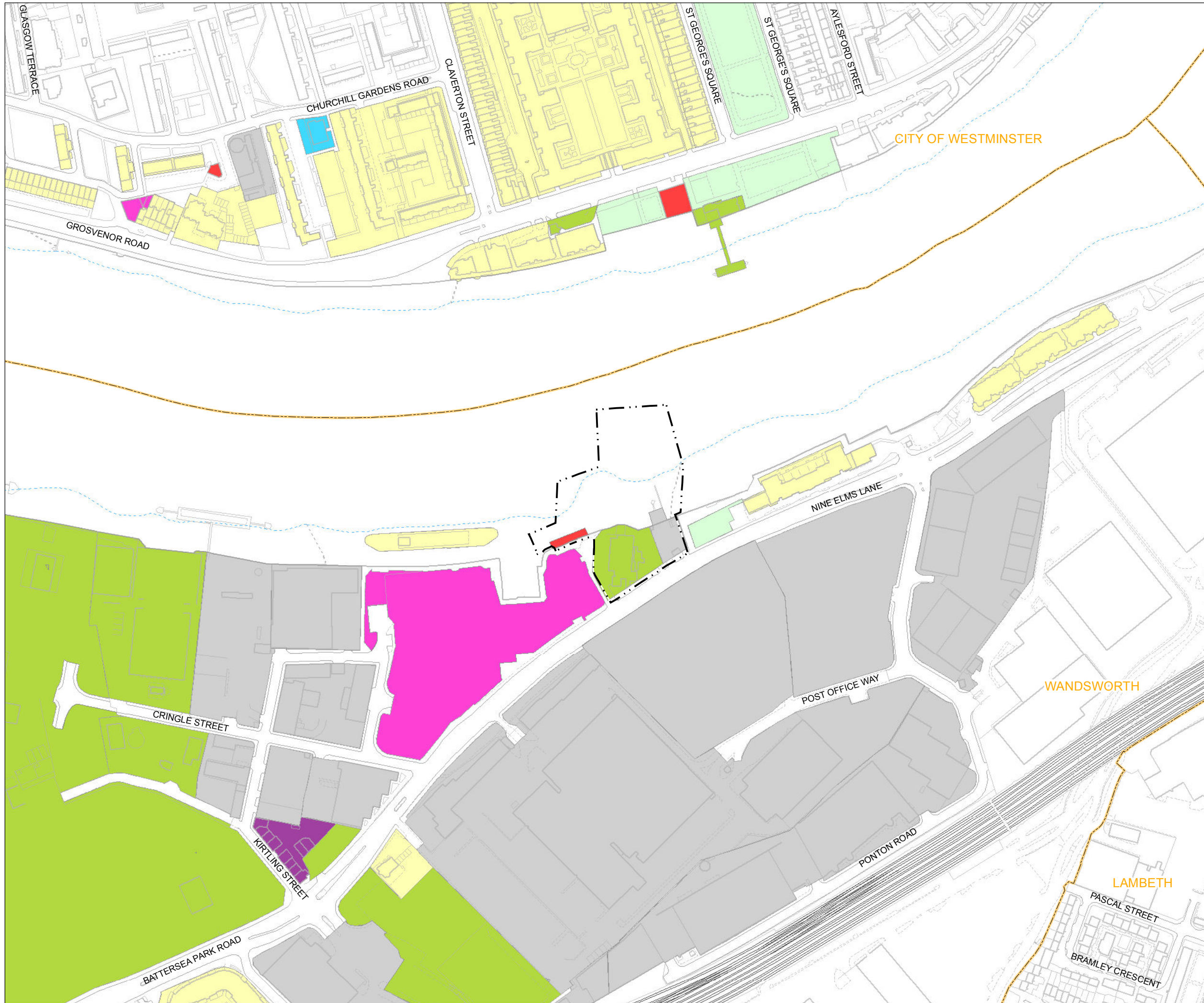
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ILLUSTRATIVE

Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent
Construction phases - phase 3
Site demobilisation
Book of plans - section 16
DCO-PP-14X-HEAPS-160016
January 2013

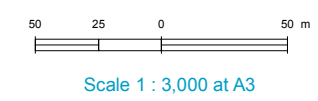




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- Key**
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Land Use**
- Class A1-A5 (Shops, Financial & Professional Services, Restaurants, Drinking Establishments and Hot Food Takeaways)
 - Class B1 (Business (Offices except A2) Research and Development, Light Industry)
 - Class B2-B8 (General Industrial / Storage or Distribution)
 - Class C3-C4 (Dwelling Houses)
 - Class D1-D2 (Non Residential Institutions (Community Facilities) and Assembly and Leisure)
 - Mixed Use
 - Other
 - Open Space



FOR INFORMATION

Location
Heathwall Pumping Station
 London Borough of Wandsworth

Document Information
Planning Statement
 Land use

1PL03-MG-00815
 January 2013

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