

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix G

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

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**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement

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Appendix G: Carnwath Road Riverside

G.1 Introduction

- G.1.1 The proposed development site known as Carnwath Road Riverside is located in the London Borough of Hammersmith and Fulham. It was selected to accommodate the permanent structures required to operate the project. It is required to drive the main tunnel to Acton Storm Tanks, receive the main tunnel from Kirtling Street, and receive the Frogmore connection tunnel from Dormay Street. The location of the site is illustrated in Annex G.
- G.1.2 This assessment is structured as follows:
- a. Section G.2 provides a brief description of the Carnwath Road Riverside site.
 - b. Section G.3 sets out the planning context for works in this location.
 - c. Section G.4 describes the site-specific development for which consent is sought and the way in which the proposals evolved in response to consultation.
 - d. Section G.5 provides an analysis of the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
 - e. Section G.6 provides an overall conclusion of the site-specific assessment.

G.2 Site description

- G.2.1 The proposed site comprises three adjacent parcels of land: Whiffin Wharf and the safeguarded Hurlingham Wharf, which are both largely vacant areas of hardstanding with some existing unauthorised uses, and Carnwath Road Industrial Estate, which contains two-storey industrial, warehouse and retail units. The site also includes an area of the foreshore of the River Thames in front of all three land parcels. An aerial photo of the site is provided in Figure G.1 below.
- G.2.2 The site is bounded to the north by Carnwath Road, to the east by a four-storey residential block and a PC World superstore, to the south by the River Thames and to the west by three-to-four-storey high residential dwellings which overlook the site and the River Thames. The land which comprises Whiffin Wharf and Hurlingham Wharf is in a poor, unsightly condition. Both wharves are enclosed by poor quality, weathered hoarding, which is not maintained and blocks views of the river.
- G.2.3 The Thames Path diverts from the riverside at the western edge of the Carnwath Road Industrial Estate and diverts around the wharves. It bisects the site along the boundary with Hurlingham Wharf, runs along the northern boundary of the site (for the width of Hurlingham Wharf and

Whiffin Wharf), turns back to the riverside along the western boundary of Whiffin Wharf and continues towards the west.

Figure G.1 Aerial photograph of Carnwath Road Riverside



G.2.4 The surrounding area is characterised by a mix of land uses. Immediately to the north of site across Carnwath Road is the Piper Building, which includes the Piper Centre and features locally listed modernist murals. The Piper Building is a large mixed-use building that comprises residential properties, a health club and a car park. Four-storey residential blocks of Philpot Square lie on either side of the junction of Carnwath Road and Peterborough Road.

G.2.5 To the south of the site, on the opposite side of the River Thames, are multi-storey residential apartment blocks with commercial units at ground floor level, and the Western Riverside Waste Transfer Station. To the west, beyond the adjacent residential properties, lies Hurlingham Park, within which the Hurlingham Club for private members is located. To the northwest lie purpose-built industrial units, including a timber merchant, and other commercial and industrial uses in the Hurlingham Business Park. The existing site features are identified in Annex G.

G.3 Planning context

G.3.1 In developing the proposals and mitigation measures for Carnwath Road Riverside, Thames Water¹ had regard to the policies set out in the NPS

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

- and to local development plan designations where relevant to the application.
- G.3.2 In this case, the local development plan comprises the *London Plan* (2011) (Examination in Public on proposed minor alterations commenced 19 November 2012), the London Borough of Hammersmith and Fulham's *Core Strategy* (October 2011) and the council's saved *Unitary Development Plan* policies (as amended September 2007). The Examination in Public of the council's submission version *Development Management Plan Document* commenced in October 2012. Once adopted, this document will replace policies in the *Unitary Development Plan*. In March 2012, the council published a second draft (for public consultation) *Supplementary Planning Document for South Fulham Riverside*, which identifies the Carnwath Road Riverside site for future residential led mixed-use development.
- G.3.3 The site falls within the River Thames and Tidal Tributaries Site of Metropolitan Importance, which is of regional importance (*London Plan*) and designated across the borough in *Core Strategy* Policy OS1. The River Thames is also designated as part of the strategic Blue Ribbon Network.
- G.3.4 Hurlingham Wharf is subject to a direction made by the Secretary of State under articles 10(3) and 27 of the Town and Country Planning (General Development Procedure) Order 1995, and identified as a Safeguarded Wharf in *London Plan* Policy 7.26.
- G.3.5 Policy 7.26 seeks to increase the use of the Blue Ribbon Network for freight transport and states that safeguarded wharves should only be used for waterborne freight-handling use. Temporary uses should only be allowed where they do not preclude re-use of the wharf for waterborne freight-handling use. Development proposals that increase the use of a safeguarded wharf that is not currently handling freight by water will be supported (*London Plan*).
- G.3.6 Policy 7.26 also explains that: "*the redevelopment of safeguarded wharves for other land uses should only be accepted if the wharf is no longer viable or capable of being made viable for waterborne freight-handling and sites adjacent or opposite safeguarded wharves should be designed to minimise the potential for conflicts of use and disturbance*".
- G.3.7 The Greater London Authority (GLA) is currently undertaking a review of the safeguarding of wharves on London's waterways to update the 2005 *London Plan Implementation Report* on safeguarded wharves. The GLA's *Safeguarded Wharves Review 2011/2012 Consultation Draft* (published October 2011) and *Further Consultation Draft* (published July 2012) identifies a deficit of capacity in west London and confirms the intention to retain all the safeguarded wharves in the London Borough of Hammersmith and Fulham, including Hurlingham Wharf.
- G.3.8 Specifically in relation to Hurlingham Wharf, the draft *Safeguarded Wharves Review* states that: "*the Greater London Authority and the Port of London Authority to consider working with relevant stakeholders, including the Council and local developers to ensure that any re-development of*

adjacent sites does not reduce the viability of this site as a river freight wharf” (Table 7.1).

- G.3.9 It goes on to state that Hurlingham Wharf has been identified as a potential construction site for the project and *“[i]f the site is selected, the proposals should ensure that this wharf is used to transport bulk construction/excavation materials by water and that the site can be used as a viable wharf following completion of the [Thames Tideway] Tunnel” (Table 7.1).*
- G.3.10 The *Safeguarded Wharves Review Consultation Draft* and *Further Consultation Draft* both state that: *“the Thames Tideway Tunnel is a Thames Water project to construct a new tunnel under the Thames to link numerous sewerage outflow pipes and send this sewage to the Beckton treatment works further down the river. It is one the largest infrastructure projects in the UK and is likely to generate a large amount of spoil that has the potential to be used as a secondary aggregate. As the tunnel runs under the Thames, there is the general expectation that tunnel spoil and a large proportion of construction materials will be transported by barge using existing wharves” (para. 1.3.5).*
- G.3.11 A six-week consultation period for the changes to the *Further Consultation Draft* ran until 28 August 2012. The final new safeguarded wharves document is to be produced and was expected to be sent to the Secretary of State with recommendations for any required changes to the safeguarding Directions by autumn 2012. To date, the final document has not been produced, but it is anticipated that it will be submitted to the Secretary of State in early 2013.
- G.3.12 Two strategic policies from the *Core Strategy* are applicable to the site. Namely Strategic Policy A (Planning for regeneration and growth), which identifies the site within the wider South Fulham Riverside Regeneration Area, and Strategic Policy SFR (South Fulham Riverside), which sets the vision for the regeneration area as follows:
- “By the 2020s South Fulham Riverside will be a high quality and vibrant stretch of residential based riverside development. It will be well integrated with the residential hinterland and waterside, providing easy access to the river and riverside facilities. The appearance of developments will set new standards for river frontage schemes. There will be substantial new housing, offering affordable opportunities into home ownership, and local employment.*
- “People will not only live and work in the area, but will also visit it to enjoy the riverside location and facilities. The riverside walk will extend along the whole frontage and there will be opportunities for access to the river. At Chelsea Harbour there will be improved river transport facilities and if possible these will extend to additional jetties serving the area” (paras. 7.136 and 7.137).*
- G.3.13 *Core Strategy* Strategic Policy SFR identifies Hurlingham as a safeguarded wharf and the supporting policy text states that: *“the council will promote the consolidation of wharf capacity onto fewer and better located wharf sites, where road access to the strategic road network can*

be improved". It explains that *"it is the council's view that vacant and under-used wharves should be comprehensively assessed as part of the Mayor's review of safeguarding in London to determine their longer term use. This review may enable the Mayor of London to abandon the safeguarding designation of the vacant Hurlingham Wharf so as to optimise the regeneration potential of South Fulham Riverside. Any proposals for non-river use on the safeguarded wharf sites will need to be supported by viability assessments in accordance with the London Plan policy 7.26 'Increasing the Use of the Blue Ribbon Network for Freight Transport'"*.

- G.3.14 The *Proposed Submission Core Strategy* (2010) Policy SFR had promoted the de-designation of Hurlingham Wharf in favour of redevelopment, stating that the council *"will press for the Mayor of London to abandon the safeguarding designation of the vacant Hurlingham Wharf to allow a more flexible approach to development"* (para. 8.142). However, the Inspector's Report (*Report on the Examination into London Borough of Hammersmith and Fulham Core Strategy*, File Ref: PINS/H5390/429/3) on the *Core Strategy* specifically commented on Hurlingham Wharf and the council's aspiration to remove its safeguarding status, stating that the associated policy was *"effectively aspirational and not based on any new, up to date or robust evidence that contradicts that which supported the 2005 review (Safeguarded Wharves Review) in relation to need"*, (para. 68).
- G.3.15 The Inspector also commented that text in the *Proposed Submission Core Strategy* (2010) Policy RTC1 stating that the council will press for the safeguarding of vacant wharves to be withdrawn *"represents an inappropriate prejudgement by the council of an important strategic issue that is not based on sound or robust evidence. Moreover, the relevant issues are to be considered by the GLA's review in the near future in any event"* (para. 72).
- G.3.16 The *Core Strategy* was amended prior to adoption to reflect the Inspector's Report so that Policy SFR sets out only the council's long-term vision for residential development of Hurlingham Wharf and adjacent areas, rather than promoting an allocation which would be inconsistent with the *London Plan*. Text relating to the withdrawal of safeguarded wharves was also deleted from Policy RTC1.
- G.3.17 The second draft Supplementary Planning Document for the South Fulham Riverside Regeneration Area (the '*SFR SPD*') was published for public consultation March 2012. The document is intended to expand on *Core Strategy* Policy SFR by setting out the vision for the regeneration of the South Fulham Riverside area over the next 20 years. It identifies potential regeneration opportunities, sets out an approach for achieving the vision, and also provides development and design guidance. *SFR SPD* para. 7.2.7 recognises the safeguarding of Hurlingham Wharf and para. 8.4 confirms the council's long-term aspiration for residential mixed-use development in the regeneration area.
- G.3.18 The Thames Policy Area and Thames Path designations are both applicable to the site and are included in *Core Strategy* Policy RTC1. The Thames Path designation follows the existing route of the path and diverts

from the river to avoid Whiffin Wharf and the safeguarded Hurlingham Wharf. The proposed extended route of the Thames Path (as shown on the adopted London Borough of Hammersmith and Fulham *Proposals Map*, October 2011) extends along the frontage of both Whiffin and Hurlingham wharves.

- G.3.19 There are no listed buildings within or in close proximity to the site. However, the site lies within the Sands End Conservation Area and the Hurlingham Conservation Area is located approximately 200m to the north and west of the site. The site does not lie within an archaeological priority area; however, there is potential for archaeological remains in the foreshore from the late 19th century onwards. An Area of Archaeological Importance lies 50m to the west of the site, which covers the former settlement along Broomhouse Lane.
- G.3.20 Hurlingham Wharf was formerly used as cement works. The last occupier (Blue Circle Industries) carried out cement works at the site until 1997. Since this operation ceased, the site has remained vacant. Whiffin Wharf has been the subject of a number of temporary uses including vehicle storage and a waste recycling sorting facility. A number of unauthorised uses have taken place on the site, which have been subject of enforcement investigations by the council. The Carnwath Road Industrial Estate was granted consent for light industrial buildings in 1981 and has comprised two units with ancillary offices since the early 1980s. A variety of uses now occupy the building units including manufacturing, distribution, offices and trade sales.
- G.3.21 All three land parcels are the subject of comprehensive redevelopment proposals. A separate planning application for each parcel of land was submitted to the council in June 2012, and the planning statements associated with each application state that all proposed developments could be carried out independently, but were submitted simultaneously. All three applications were considered by the council's Planning Applications Committee on 8 January 2013. The committee resolved that the Executive Director of Transport and Technical Services should be authorised to determine the three full planning applications and two Conservation Area Consents, negotiate and complete a legal agreement under Section 106 of the 1990 Act and Section 278 Agreement (and other appropriate powers), and to grant permission subject to referral to the GLA and Secretary of State on completion of a satisfactory legal agreement subject to conditions. Details of the applications are summarised below.
- a. Whiffin Wharf (Reference 2012/02047/FUL): The redevelopment of a vacant former wharf to provide a mixed-use scheme comprising 71 dwellings, office floor space, basement car parking, a new Thames Path, associated hard and soft landscaping, public and private open space and a new area of public realm.
 - b. Hurlingham Wharf (Reference 2012/02046/FUL): The re-development of vacant, former wharf to provide a mixed-use scheme providing 148 dwellings, retail, restaurant/café and office floor space, basement car park, a new Thames Path, associated hard and soft landscaping, public and private open space and a new area of public realm.

- c. Carnwath Road Industrial Estate (Reference 2012/02048/FUL): The redevelopment of the site to provide a mixed-use scheme consisting of 255 dwellings (including the re-provision of eight existing flats that lie adjacent to the site), retail and restaurant/café floor space, basement car parking, associated hard and soft landscaping, public and private open space, and a new area of public realm.

G.3.22 The Carnwath Road Riverside site (made up of Whiffin Wharf, Hurlingham Wharf and Carnwath Road Industrial Estate) is subject to a Safeguarding Direction served on the council by the Secretary of State for the Department of Communities and Local Government on 24 April 2012 (replacing the previous direction dated 28 February 2012). The Direction prevents the council from granting planning permission in respect of any development on any land to which the Direction relates without the Secretary of State's specific authorisation. Therefore the recent committee resolution to approve the three planning applications will need to be referred to the Secretary of State. The Direction will remain in force until 31 March 2013.

G.3.23 The relevance of these planning applications is assessed in the Land use subsection below.

G.4 Site-specific description of development

Overview

G.4.1 The proposed development at Carnwath Road Riverside would enable the construction of the main tunnel; it would not directly intercept any combined sewer overflows (CSOs).

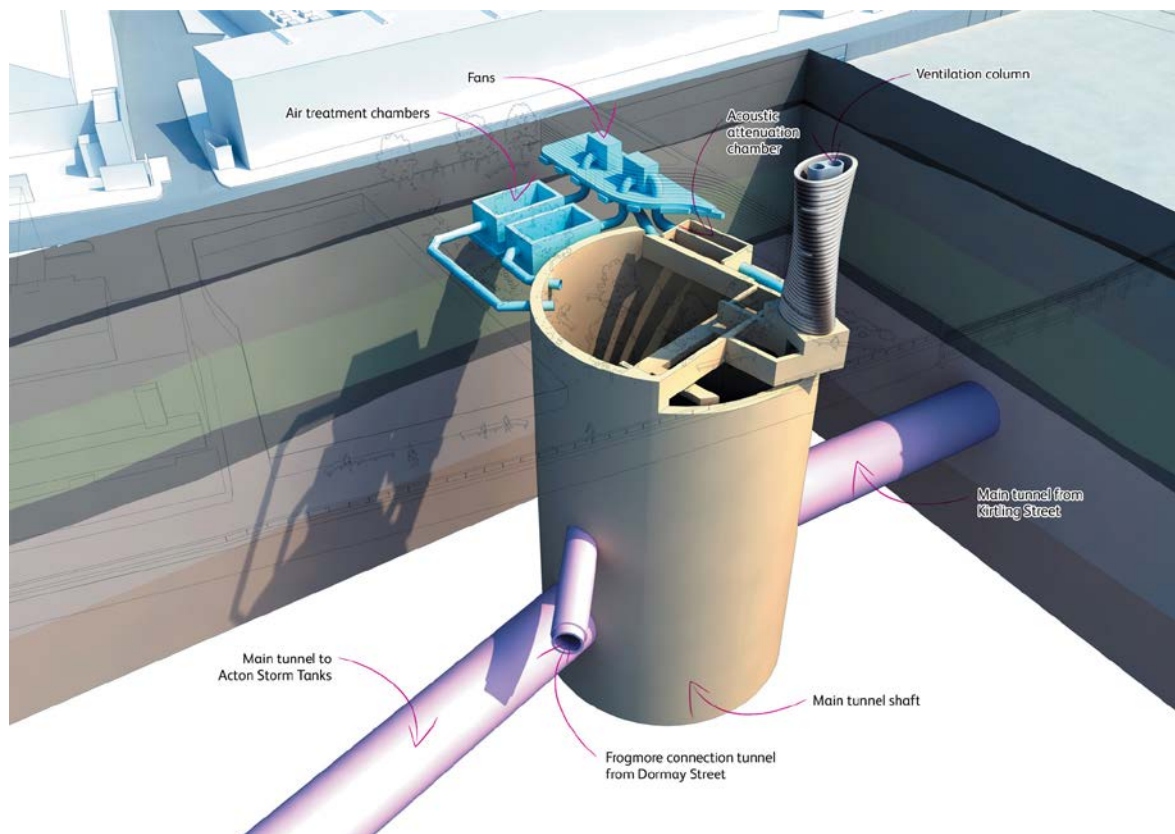
G.4.2 The site would be a drive site for the Carnwath Road Riverside to Acton Storm Tanks main tunnel drive and receive the tunnel boring machine (TBM) for the Kirtling Street to Carnwath Road Riverside drive. It would also receive the TBM for the Frogmore connection tunnel and enable the transfer of flows from the Frogmore connection tunnel to the deeper level of the main tunnel.

G.4.3 The works would require the construction of a main tunnel shaft, below-ground ventilation structures (including air treatment chambers, an acoustic attenuation chamber, culverts and pipes) and above-ground ventilation building and ventilation column. The main tunnel shaft would be 25m in diameter and approximately 42m deep.

G.4.4 All permanent works would be surrounded by an operational maintenance area. This would be hard landscaped on completion and be accessible to the public.

G.4.5 All works would be contained within the relevant zones as indicated on the Site works parameter plan. The functional components of the proposed works are illustrated in the diagram below

Figure G.2 Functional components diagram



Application for development consent

G.4.6 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 G.1.

Table G.1 Carnwath Road Riverside: 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 9</i>
Demolition and site clearance plan	For approval	<i>Book of Plans, Section 9</i>
Site works parameter plan	For approval	<i>Book of Plans, Section 9</i>
Permanent works layout	Illustrative	<i>Book of Plans, Section 9</i>
Proposed landscape plan	Indicative except the above-ground structures, which are illustrative	<i>Book of Plans, Section 9</i>
Section AA	Illustrative	<i>Book of Plans, Section 9</i>

Drawing title	Status	Location
As existing and proposed elevation (various)	Illustrative	<i>Book of Plans</i> , Vol 3, Section 9
Ventilation column design intent	Indicative	<i>Book of Plans</i> , Section 9
Ventilation building design intent	Indicative	<i>Book of Plans</i> , Section 9
Construction phases plans (various)	Illustrative	<i>Book of Plans</i> , Section 9
Highway layout during construction (phases)	Illustrative	7.10.5 <i>Transport Assessment: Carnwath Road Riverside Figures</i>
Permanent highway layout (phases)	Illustrative	7.10.5 <i>Transport Assessment: Carnwath Road Riverside Figures</i>
River foreshore zones of working	For information	<i>Navigational Issues and Preliminary Risk Assessment Carnwath Road Riverside</i>

G.4.7 The Nationally Significant Infrastructure Project (NSIP) works (Work No. 6a) comprise the construction of a main tunnel shaft with an internal diameter of approximately 25m and depth of 42m. Associated development (Work no. 6b) comprises the works to establish a tunnel drive and reception site for use in constructing, connecting and operating the main tunnel (Work No. 1a) and the main tunnel (Work No. 1b), and the Frogmore connection tunnel (Work No. 7). Further associated development includes demolition of existing buildings, ground preparation works, dredging and works to the existing river wall; construction of a temporary jetty and/or campsheds, a building to accommodate air management plant and equipment, ventilation columns and associated below ground ducts and chambers; modifications to the Carnwath Road/Wandsworth Bridge Road junction; and construction of permanent vehicle access(s) off Carnwath Road. The full description of the proposed development can be found in Schedule 1 to the *Draft DCO*, and further details of the temporary construction works and permanent operational structures are provided below.

G.4.8 At this site, approval is sought for the works shown on the Works plan (Work no. 6a and Work No. 6b); the Site works parameter plan, which shows the relevant zones and the limits of land to be acquired or used in which the associated development works would be undertaken; the Access plans; and the Demolition and site clearance plans. The plans for approval are contained in the *Book of Plans* along with other plans that illustrate 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 provide. Section 2 of the *Planning Statement* explains in more detail the overall approach to the level of detail and how the plans for approval were developed. The Good design subsection of this appendix explains the level of detail with regard to the proposed above-ground structures at this site and the need to obtain further approvals.

Construction phase

- G.4.9 The construction is programmed to take approximately six years and would involve the following main activities:
 - a. site preparation (approximately eight months)
 - b. shaft construction (approximately 14 months)
 - c. tunnelling (approximately 22 months)
 - d. secondary lining (approximately seven months)
 - e. construction of other structures (approximately 12 months)
 - f. completion of works and site restoration (approximately 13 months).

Figure G.3 Construction timeline



- G.4.10 The majority of construction works would occur from 8am to 6pm Monday to Friday and 8am to 1pm Saturdays. Construction may occasionally be required outside of these hours during key construction activities. A period of 24-hour working would be required for construction of the main tunnel and secondary lining. During this period of continuous working, activities would be predominately below ground, with support activities at ground level. Heavy goods vehicle (HGV) movements, however, would be limited to daytime hours. Further information in relation to working hours and site-specific restrictions are provided in the *Code of Construction Practice (CoCP)* Parts A and B, which accompany the application.
- G.4.11 Construction vehicles approaching from the north would access the site from the New Kings Road (A308) and Wandsworth Bridge Road (A217) and turn right into Carnwath Road. Construction vehicles approaching from the south would access the site via Wandsworth Road and Wandsworth Bridge and turn left into Carnwath Road.
- G.4.12 Vehicles would travel westbound along Carnwath Road before turning into the site via two new construction accesses. The easternmost access would be the primary access and would be used during normal site operations. The secondary access in the west of the construction site would be used less frequently and provide emergency access, if required.
- G.4.13 Vehicles exiting the site would travel eastbound along Carnwath Road, before turning either to the north or south.
- G.4.14 It is anticipated that an average of 19 HGVs would access the site per day for the majority of the construction period. This would rise to

approximately 45 HGVs per day over an estimated 17-month period during the construction of the main tunnel.

G.4.15 There may be additional periods during key construction activities when these HGV numbers would be exceeded. Further details regarding the number and breakdown of anticipated HGVs per day are provided within the *Transport Assessment*, which accompanies the application.

G.4.16 In order to minimise HGV movements, river transport would be used for bulk materials, such as excavated material, where practicable. It is anticipated that an average of two barges per day would access the site. Barge movements would be associated with the shaft and tunnel construction and secondary lining phases. It is anticipated that barge movements would be conducted on a continuous 24-hour, seven day a week basis due to the reliance on high tides.

G.4.17 Potential layouts of the construction site are shown on the Construction phasing plan provided in Annex G. It should be noted that these layouts are for guidance 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 main construction activities are contained within the appropriate zones.

Site preparation

G.4.18 The boundary of the main site would be established via the erection of timber hoarding and welfare and office facilities would be provided using stacked portable cabin style units. A 5m high hoarding/noise barrier would be installed on the western end of site, three-storey site offices to the east of the site, 2.4m hoardings along the river frontage for noise mitigation, and 3.6m hoardings around the rest of site.

G.4.19 The new construction accesses would then be constructed off Carnwath Road. This would require kerb realignment, associated traffic management and utility diversions. Areas of parking suspension would be implemented in Carnwath Road to facilitate HGV access. Mechanical plant, storage facilities and other construction equipment would then be delivered to site by road.

G.4.20 The light industrial units and other structures on the site would then be demolished and removed off-site by HGV. The two electricity substations on the site would not be demolished. The extent of demolition works is illustrated on the Site clearance and demolition plans within the *Book of Plans*.

G.4.21 Temporary and permanent utility supplies would also be provided, an internal site road would be constructed and the various areas of site support activities established. The selective pruning or removal of appropriate trees and the diversion of the Thames Path would be implemented at this stage.

G.4.22 The existing river wall would then be replaced. This would require the demolition of existing sections of the wall and the construction of a new wall along the current alignment. Mechanical plant would be used to demolish and reconstruct the wall.

G.4.23 The infrastructure to provide river access would then be constructed. There are two alternative ways of doing this and this would be decided by the contractor. Either a flat granular bed or a campshed would be constructed along the river wall to enable barges to sit during low tide; or, circular steel supports or piles would be drilled or augured into the foreshore to provide a vertical frame for a jetty structure. Steel sections would then be assembled between the piles to provide the shape and decking jetty. A campshed would be constructed adjacent to the jetty structure to facilitate barges at low tide. It is possible that either elevating/floating platforms or jack up barges would be used to install the piles and enable the assembly of the steel sections.

G.4.24 In order to improve vehicle access between Wandsworth Bridge Road and Carnwath Road, junction improvements would be conducted on the southern side of Carnwath Road. This would comprise the realignment of the kerb line and adjacent carriageway/footway together with associated landscaping. A working area would be established in areas of the highway and the car park of the adjacent retail premises. The work would require associated traffic and pedestrian management. Vehicle movements between the junction and Carnwath Road would be maintained during the improvement works.

Shaft construction

G.4.25 The 25m internal diameter drive shaft would then be constructed. It would be excavated in approximately 1m increments and a sprayed concrete lining would be used to form the shaft walls. This process would be repeated until the required depth is reached.

G.4.26 Excavated material from the shaft would be lifted to ground level using a mobile or crawler crane and deposited in a material handling area within the site. It would then be transferred to a barge by either a long reach excavator or overhead conveyors.

G.4.27 The concrete required on the site would either be batched on-site or delivered ready mixed, as required.

Tunnelling

G.4.28 A noise enclosure would be constructed over the shaft and adjacent concrete segment storage area. It is anticipated that this would comprise a 'warehouse' style structure assembled from prefabricated components. Mobile cranes and other plant would be used for its construction.

G.4.29 The TBM and other back-up facilities would then be lowered into the shaft via heavy lift mobile cranes. The final sections of the noise enclosure roof would then be completed. The main tunnel construction would then commence. The TBM would cut the ground by rotating a 'cutterhead'; it would be propelled forwards by hydraulic rams.

G.4.30 As the TBM advances, a temporary railway would be built within the tunnel to supply precast concrete segments and other equipment/materials. The precast concrete segments for the construction of the main tunnel lining would be delivered to site by HGV and stored on-site. The segments

would be lowered into the shaft by a crane located within the noise enclosure structure.

- G.4.31 Excavated material would be transported from the TBM to ground level by a series of horizontal and vertical conveyors. Material would then be either transferred directly to barges via additional conveyors, or to excavated material storage areas within the site.

Secondary lining of main tunnel and shaft

- G.4.32 A secondary concrete lining would then be applied to the shaft and the main tunnel. This is required to improve durability, watertightness and structural integrity. The process would involve casting an *in situ* concrete lining using a curved mould, or shutter, to form the internal face of the tunnel and shaft. The secondary lining would be progressed by continuously pouring concrete to the shutter as it is advanced either horizontally along the length of the tunnel or vertically up the wall of the shaft.

- G.4.33 Only half of the Carnwath Road Riverside to Acton Storm Tanks length and half of the Kirtling Street to Carnwath Road Riverside length would be secondarily lined from this site. The remainder would be lined from either the Acton Storm Tanks or Kirtling Street sites.

- G.4.34 It is anticipated that the concrete for the secondary lining would be batched on-site and pumped from surface level down to the tunnel. It is anticipated that the secondary lining process would need to be suspended to enable the reception and the removal of the TBMs from both Kirtling Street and the Frogmore connection tunnel. The TBMs would be lifted out of the shaft by a heavy lift mobile crane before being cleaned and disassembled at ground level. The components of the TBM would be removed off-site via road.

Construction of other structures

- G.4.35 The internal layout of the shaft, including concrete access platforms and the concrete vortex generator would then be constructed. These chambers would be constructed from *in situ* concrete.

- G.4.36 The above-ground ventilation column would then be constructed. It is anticipated that this would be formed from a combination of *in situ* and precast concrete. The structure would be built using shuttering enclosed within a scaffold frame and serviced by a mobile crane.

- G.4.37 The ventilation building would then be constructed. It is anticipated that this would be formed from *in situ* concrete with a prefabricated external cladding. A planted brown roof would enclose the structure to promote local biodiversity. The structure would be a maximum of 5.5m high. The electrical and control equipment would then be located within the ventilation building. Further details of the permanent works layout are illustrated in the *Book of Plans*.

Completion of works and site restoration

- G.4.38 On completion of the permanent structures, the area would be landscaped and the area of hardstanding for operational maintenance created. The

area immediately adjacent to the above- and below-ground structures would be finished in a hard landscaped material.

- G.4.39 As the landscaping progresses, the hoarding around the construction site would gradually be removed. Temporary weld mesh fencing would be used to surround any final landscaping works to maintain separation from adjacent pedestrians. The diversion of the Thames Path would then be removed and reinstated along its current alignment.
- G.4.40 A proportion of the western section of the site and the areas currently occupied by Hurlingham Wharf and Carnwath Road Industrial Estate would remain hoarded. These areas would not be required for permanent operational access and could be available for other uses once construction is complete.
- G.4.41 The system would then be commissioned. Temporary weld mesh fencing would surround the vehicles and equipment to provide a segregated safe working area. Once all work is finished, any temporary fencing would be removed and any final landscaping completed. All vehicles and equipment would then be removed from site.

Operation

- G.4.42 For the purposes of the application, each of the main operational structures is shown within a defined zone in which the structure would be located. The operational structures detailed in the Good design subsection of this appendix and the relevant plans form part of the application. The defined zones for the structures are shown on the Site works parameter plan.

Main shaft

- G.4.43 The shaft would be finished at ground level. Access covers would be incorporated at the top of the shaft for inspection and maintenance purposes.

Ventilation structures

- G.4.44 Air would be released through an approximately 15m high ventilation column located within a defined zone towards the southern side of Whiffin Wharf. The column would enclose four stacks and air movement zones.
- G.4.45 Underground structures would contain passive filters and connect the ventilation column to the structures they would ventilate. These would have ground level access and inspection covers.
- G.4.46 The ventilation building would have approximate dimensions of 20m long x 8m wide x 5.5m high. Its size and height are dictated by the size of the equipment within it and requirements for safe operational and maintenance access. Electrical plant would be accommodated within the ventilation building in the zone indicated on the Site works parameter plan.

Permanent restoration and landscaping

- G.4.47 Once the main elements of construction are complete, the final landscaping works would be undertaken including final treatments and surfaces, planting and installation of street furniture. The indicative

landscaping proposals and illustrative above-ground structures are shown on the Proposed landscape plan.

- G.4.48 Testing and commissioning would be undertaken once construction is complete. For the purposes of this assessment, completion of the commissioning stage represents the end of construction and the commencement of the operational phase.

Access

- G.4.49 A permanent area of hardstanding would be provided for access purposes. This area would surround the permanent infrastructure. A new permanent access off Carnwath Road would be created.

Typical maintenance regime

- G.4.50 Once operational, it is anticipated that Thames Water personnel would visit the site approximately every three to six months to carry out inspections of the equipment within the ventilation building. In addition, approximately every three to six months inspection of the air treatment chambers, ventilation column, acoustic attenuation chamber and vortex drop would be required. It is likely that inspections would involve a visit by personnel in a small van. Personnel would open access covers to inspect and carry out minor maintenance of below-ground equipment.

- G.4.51 It is anticipated that approximately once every three years, the filter media in the air treatment chambers would need to be replaced. This would be carried out via the access covers in the area of hardstanding.

- G.4.52 A major internal inspection of main tunnel and below-ground structures would be required once every ten years. It is likely that this would involve a small team of inspection personnel, support crew with support vehicles, and two mobile cranes to lower the inspection team and tunnel inspection vehicle into the drop shaft. This process could take several weeks and temporary fencing would be erected around the working area.

- G.4.53 Thames Water may also need to visit the site for unplanned maintenance or repairs, for example, in the event of a blockage or equipment failure. Such a visit may require the use of mobile cranes and vans.

Scheme development

- G.4.54 The Carnwath Road Riverside site was subject to significant consultation and public engagement through a variety of methods including formal and informal consultation events, stakeholder and public meetings and meetings with local resident groups. Meetings with the London Borough of Hammersmith and Fulham also took place regularly until August 2011, after which time the council declined to discuss Thames Water's proposals further due to its objection to the use of Carnwath Road Riverside and to the principle of the project as a whole. Nevertheless, Thames Water sought to address the concerns expressed by the council in its formal consultation responses, where possible.

- G.4.55 Throughout the consultation period and engagement with key stakeholders, the scheme evolved in response to feedback and on-going design development. The *Consultation Report*, which accompanies the

application, contains detailed information on the consultation process and the design developments in response to feedback. Further details are provided in the Good design subsection below.

- G.4.56 The Carnwath Road Riverside site was not presented at phase one consultation. At this stage, the preferred site was Barn Elms, which is a site of designated Metropolitan Open Land used as sports pitches. It is located to the west on the south bank of the river in the London Borough of Richmond upon Thames, and owned by the London Borough of Wandsworth.
- G.4.57 An explanation of the thoroughness of the site selection, review and back-check process that led to the change of main tunnel drive site from Barn Elms to Carnwath Road Riverside following phase one consultation is set out below. It is detailed further in Section 4 of the *Planning Statement* and the *Final Report on-site Selection Process*, which accompanies the application.
- G.4.58 The Barn Elms proposals received substantial objection at phase one consultation and further engineering work indicated different technical requirements. In addition, there were key engineering design developments relevant to the re-assessment of available sites to construct the western section of the main tunnel and the subsequent selection of Carnwath Road Riverside, as follows:
- a. Drive sites in London Clay no longer required the minimum larger site areas assessed prior to phase one consultation.
 - b. Further work found that a larger diameter tunnel was required at the western end of the tunnel than initially proposed in order to meet flow and storage requirements.
 - c. River transport constraints were identified between Putney Bridge and Hammersmith Bridge.
- G.4.59 During the site selection back-check process, a review was undertaken in order to assess the suitability of the main tunnel drive options. In order to choose between drive options, the assessment process involved a comparison of the advantages and disadvantages of the most appropriate sites available. The back-check process compared the use of Barn Elms as a main tunnel drive site for the construction of the western section of the main tunnel with Carnwath Road Riverside. A summary of the comparison points is presented beneath the subheadings below.

Waterborne transport

- G.4.60 Carnwath Road Riverside includes a safeguarded wharf (Hurlingham Wharf); it has much better river access for the transportation of construction materials and tunnel arisings; and it would enable the use of significantly larger barges than at Barn Elms. Fewer HGV movements would be required on the surrounding road network as a result of the larger barges, which would help to minimise noise, dust and traffic impacts on nearby residential properties.
- G.4.61 The use of the Carnwath Road Riverside site would be an appropriate temporary use of the safeguarded wharf and would accord with its

allocation in *London Plan* Policy 7.26. The Barn Elms site has no existing direct access to the river for barges; there are no wharves on-site; and the area is significantly used for waterborne recreation.

Health and safety

- G.4.62 There would be fewer health and safety issues associated with using the river and, in particular, the dangers of interfacing with recreational boat users and users of the Thames Path at Carnwath Road Riverside than Barn Elms. The Construction Design and Management Regulations require practicable minimisation of potential risks and conflicts.

Vehicular access

- G.4.63 Carnwath Road Riverside has better road access and links to the strategic road network.

Impact on existing businesses

- G.4.64 The use of Carnwath Road Riverside would require the demolition of premises and relocation of existing businesses within the Carnwath Road Industrial Estate. However, these businesses would ultimately be demolished and relocated under the re-development aspirations for the site in the *Core Strategy*, the draft *SFR SPD* and the pending planning application for the site.

Impact on recreational users

- G.4.65 The use of Carnwath Road Riverside would avoid the potential impact on users of the Barn Elms Schools Sports Centre, the loss of four to five sports pitches to land take required for a main tunnel drive site, and the possible relocation of the Scout Hut and existing boathouse in order to access the site by road and river.

Land use and allocations

- G.4.66 Carnwath Road Riverside is a brownfield/previously-developed site that is partly vacant, whereas Barn Elms is a greenfield site. Use of Carnwath Road Riverside is supported in planning policy terms by its brownfield and partial safeguarded wharf status, although the area of Carnwath Road Riverside and beyond is currently proposed for regeneration. However, use of the site would be temporary, it would have a limited impact on the overall developable land available in the regeneration area, and it would not interfere with meeting the housing targets identified in adopted local and regional plans. Barn Elms is subject to more sensitive planning policy constraints, including Metropolitan Open Land.
- G.4.67 In environmental terms, the use of Carnwath Road Riverside, a brownfield site, would have fewer environmental impacts than use of the greenfield designated Metropolitan Open Land at Barn Elms. The use of Barn Elms also has the potential to impact on nearby ecological sites, including the London Wetland Centre Site of Special Scientific Interest, and the River Thames and Beverley Brook Sites of Importance for Nature Conservation.
- G.4.68 The use of Carnwath Road Riverside would leave a legacy of a landscaped public space in an area that lacks local access to parks.

Thames Path

- G.4.69 At Carnwath Road Riverside the Thames Path is already diverted around part of the proposed site, and a further short diversion was considered more acceptable than at Barn Elms. This is because the Thames Path is significantly less well used at Carnwath Road Riverside and a diversion around the site at Barn Elms would be long and less suitable.
- G.4.70 Following an extensive site selection back-check and assessment of available suitable sites, it was determined that Carnwath Road Riverside would be the preferred site to construct the western section of the main tunnel at phase two consultation. It would be used to drive the main tunnel to Acton Storm Tanks, receive the main tunnel from Kirtling Street and receive the Frogmore connection tunnel from Dormay Street.
- G.4.71 A significant number of alternative sites were suggested throughout the consultation process. A comprehensive back-check of all alternatives identified by Thames Water, stakeholders and members of the public throughout all phases of consultation was undertaken in accordance with the back-check processes outlined in the *Site selection methodology paper* and explained in Section 4 of the *Planning Statement*. No suitable alternative main tunnel drive sites, other than Barn Elms and Carnwath Road Riverside, were identified for the construction of the western section of the main tunnel. Further information on the assessment of the suitability of the alternative sites assessed is provided in the *Final Report on-site Selection Process* and the *Consultation Report*.
- G.4.72 Alternative main tunnel drive strategies that do not utilise a site at either Carnwath Road Riverside or Barn Elms were also suggested in consultation feedback; for example, drive the main tunnel west from Kirtling Street all the way to Acton Storm Tanks. However, the drive strategies put forward by stakeholders were assessed as unsuitable alternatives for the reasons detailed in Section 4 of the *Planning Statement*.
- G.4.73 The extensive site selection process did not identify any alternative sites (other than Barn Elms) that would be more suitable for the works required in this location.
- G.4.74 Prior to phase two consultation, drop-in sessions were held on 6 and 7 April 2011 at Hurlingham and Chelsea Secondary School on Peterborough Road to inform the local community of the potential use of the Carnwath Road Riverside site. Thames Water gathered views on local issues to be taken into account while developing its proposals. The drop-in sessions enabled Thames Water to inform stakeholders and members of the public of potential changes to the scheme and design developments as it assessed them.
- G.4.75 The proposed works at Carnwath Road Riverside continued to evolve in response to consultation responses and on-going engagement. Following further improvements and the identification of practical mitigation measures, the site was considered to be the most appropriate site to drive the western section of the main tunnel, receive the drive from Kirtling Street, and receive the Frogmore connection tunnel drive from Dormay

Street. Consequently, the site was publicised as Thames Water's proposed site at Section 48 publicity, which took place from July 2012 to October 2012.

- G.4.76 The principal issues that arose from consultation and Section 48 publicity are identified below. These are addressed in the planning assessment which follows:
- a. Objection to the selection and proposed use of the site: this issue is addressed above and in the *Final Report on-site Selection Process*.
 - b. Concern regarding the impact on the potential regeneration of the South Fulham Riverside area and on new housing provision: this is addressed in the Land use subsection below.
 - c. Concerns regarding the impact on the local economy and loss of jobs on the Carnwath Road Industrial Estate: this issue is addressed in the Land use and Socio-economic subsections below.
 - d. Concern regarding blight during construction of the proposed works: this issue is covered in Landscape and visual (including townscape) and Historic environment subsections below.
 - e. Concern regarding blight during operation of the proposed works: this issue is covered in the Good design and Landscape and visual (including townscape) subsections below.
 - f. Concern regarding loss of developer appetite to invest in the area due to the presence of the construction site: this issue is addressed in the Land use subsection below.
 - g. Proximity to residential properties and associated construction impacts on the community and surrounding area: this issue is addressed in the Air quality, emissions, dust and odour, Noise and vibration, Landscape and visual (including townscape), Traffic and transport and Socio-economic subsections below.
 - h. Concern regarding the impact of the ventilation column, size and odour: this issue is addressed in the Good design, Air quality, emissions, dust and odour, and Landscape and visual (including townscape) subsections below.
 - i. Concern regarding traffic impacts and road congestion during construction: this issue is addressed in the Traffic and transport subsection below.
 - j. Objection to the reinstatement of waterborne safeguarded uses on Hurlingham Wharf: this issue is addressed in the Land use subsection.
 - k. Concern regarding the temporary detour of the Thames Path: this issue is addressed in the Traffic and transport and Socio-economic subsections below.
- G.4.77 All issues raised throughout consultation and in discussions with stakeholders were taken into account while developing the proposals. Further information on the consultation process is set out in the *Consultation Report*. Relevant planning issues are covered in Section G.5.

G.5 Site-specific planning considerations

G.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at Carnwath Road Riverside. It considers the issues and factors identified in the NPS and other relevant issues set out in para. G.4.76 above.

Meeting the need

G.5.2 The proposed works at Carnwath Road Riverside would successfully meet the specific need to provide a drive site to construct the western section of the main tunnel, receive the drive from Kirtling Street and connect the main tunnel to the Frogmore connection tunnel, driven from Dormay Street. These works would make an essential contribution to the delivery of the project in accordance with the NPS.

G.5.3 The proposed site was identified and assessed through a comprehensive, qualitative, and iterative site selection process, and was subject to extensive consultation and engagement since April 2011. The site selection methodology was subject to its own consultation process with local authorities and key stakeholders, the London Borough of Hammersmith and Fulham commented in a letter dated 19 December 2008 that it considered the methodology “robust”.

G.5.4 Meetings with the council took place regularly until August 2011, the purpose of which was to keep the council informed of progress, developments, the site selection process and the consideration of Carnwath Road Riverside as an alternative to Barn Elms. The council refused further meetings when Carnwath Road Riverside was announced as the preferred site at phase two consultation.

G.5.5 The proposed use of Carnwath Road Riverside attracted both support from some stakeholders including the Port of London Authority, and considerable opposition from others, including the London Borough of Hammersmith and Fulham. There is broad consensus amongst stakeholders that there is a need to tackle the unacceptable discharges of CSOs into the tidal Thames; however, the opposition centres on the assertion that Thames Water selected the wrong site, the use of which would cause unacceptable impacts, and that better alternatives exist in terms of both site selection and project-wide solution.

G.5.6 The principal alternative main tunnel site option preferred by the stakeholders who object to the use of Carnwath Road Riverside is the Barn Elms site consulted on at phase one consultation. However, as set out above and given the site selection considerations outlined in detail in the *Final Report on-site Selection Process*, Thames Water believes that it is clear that the proposed site at Carnwath Road Riverside is necessary and appropriate, although careful design and operation is necessary to respect the following key sensitivities:

- a. the proximity of existing residential properties
- b. the loss of existing business premises on the Carnwath Road Industrial Estate

- c. the fact that the proposals would cause a delay to landowners' redevelopment proposals
- d. the need to carefully consider the design and visual impact of the permanent structures.

G.5.7 Overall, the specific need for the works proposed at Carnwath Road Riverside is justified, the selected site is well suited to meet the identified need, and is consistent with the NPS.

Good design

G.5.8 The proposals for Carnwath Road Riverside were carefully developed through a collaborative process of design review and extensive consultation. The amount, layout and scale of the proposed permanent structures are primarily dictated by the functional requirements.

G.5.9 The key functional requirements at this site relate to the need to build and ventilate the main tunnel in an efficient manner. This could be achieved by making efficient use of a brownfield site with river access to drive the main tunnel to Acton Storm Tanks, and to receive the main tunnel drive from Kirtling Street and the long connection tunnel drive from Dormay Street. The aesthetic components relate to the creation of a new, high quality landscaped public space, the design of the ventilation column as a local landmark and a site layout that would maximise the area available for future redevelopment while providing a buffer to Hurlingham Wharf. The functional and aesthetic elements were combined to create an attractive, useable and adaptable space.

G.5.10 Early site analysis and subsequent engagement identified that it was important for the design to respond to the site's identified constraints and to recognise its opportunities.

G.5.11 The site-specific design opportunities include:

- a. the potential to enhance riverside access and extend the riverside walkway
- b. the opportunity to create a new area of open space next to the river
- c. the ability to make use of the south-facing aspect and riverside location
- d. the potential to create a new feature in an area that has no overriding architectural style
- e. the opportunity to maintain and enhance the safeguarded wharf
- f. the opportunity to clear unmaintained, unattractive site hoardings and provide a platform for beneficial redevelopment across the majority of the site
- g. the opportunity to protect Whiffin Wharf from potential uses of the safeguarded Hurlingham Wharf by positioning the permanent works between the two sites to create a buffer.

- G.5.12 The site-specific design constraints include:
- a. the need to maximise the area available for future mixed-use residential-led development in line with local planning policy
 - b. the need to locate the ventilation column close to the River Thames to enable efficient air dispersion
 - c. the need to preserve the future use of the safeguarded Hurlingham Wharf, which is protected for waterborne freight-handling use under *London Plan* Policy 7.26.
- G.5.13 The design life of the major civil engineering components of the project, including buildings, is 120 years. The details of the external finishes of the ventilation columns and kiosks are not specified in the application, but would be submitted for the subsequent approval of the local planning authorities. These details must be in accordance with the *Design Principles* document, which accompanies the application. The site-specific design principles require materials to be high quality and long lasting. The project was designed to be durable and resilient to change.
- G.5.14 The design of the permanent use and the appearance of the above-ground structures at the site evolved through two rounds of formal consultation (interim engagement post phase one consultation, and phase two consultation) and through continued engagement with key stakeholders such as the Design Council CABE.
- G.5.15 In order to ensure design quality, two rounds of independent review hosted by the Design Council CABE were carried out prior to phase two consultation. The Design Council CABE panel stated at the sketch review held in May 2011 that the proposals responded appropriately to the challenges of the site and presented an opportunity for a new public riverside space. The panel welcomed the effort to demonstrate that the proposals would not preclude the future regeneration of the wider site.
- G.5.16 The comments received in the design reviews are reflected in the proposed designs for the site. The consultation process for the site is detailed in the *Consultation Report* and the *Design and Access Statement*, which accompanies the application.

Figure G.4 Illustrative aerial view of the completed site



G.5.17 The principal opportunities and constraints that influenced the design are discussed in this section under the following headings, and in more detail in the *Design and Access Statement*:

- a. the positioning of permanent structures on Whiffin Wharf
- b. the creation of a new landscaped public space
- c. the design of the ventilation column as a local landmark
- d. the use of high quality materials.

Positioning and design of the permanent structures on Whiffin Wharf

G.5.18 The shaft and permanent works can only be located on the Whiffin Wharf or Hurlingham Wharf plots. The main tunnel would run too close and potentially compromise the abutments of Wandsworth Bridge and also conflict with the proposed alignment of the National Grid cable tunnel, if the shaft and permanent works were sited on the Carnwath Road Industrial Estate plot.

G.5.19 In order to avoid precluding the use of Hurlingham wharf (safeguarded for cargo-handling uses), it is proposed that the permanent structures would be located on Whiffin Wharf. Activities on safeguarded wharves include uses that are not always compatible with residential developments, such as waste transfer or concrete batching plants. Consequently, in the proposed design the functional components are located along the boundary of the two wharves, in order to create a buffer between the potential future uses of the two sites (design principle CARRR.05). This would not prejudice the future use of either wharf.

G.5.20 In order to retain an area of developable land on Whiffin Wharf, the design team endeavoured to locate as much of the permanent equipment below-

ground as possible. This enabled a feasible footprint for development in the western part of the Whiffin Wharf site; this was broadly demonstrated in a preliminary architectural feasibility study undertaken to assist the design development process.

- G.5.21 Development of the engineering design post phase two consultation enabled more of the ventilation equipment to be accommodated below-ground than at phase two consultation. This resulted in a much smaller, single-storey ventilation building and a standalone ventilation column. The reduced size of the above-ground structures and the integration of plant and equipment within a smaller building minimised the land-take and footprint of the permanent works. Alternatives to the external appearance of the ventilation building were considered in several design studies, including a design that incorporated an accessible roof with a terraced public space leading up to it. However, the decision was made to pursue a simpler, more flexible scheme that could be integrated into any surrounding future development. This approach is reflected in the proposed design.
- G.5.22 Prior to commencing construction of the ventilation building and column, details of the external appearance and materials would be submitted to and approved by the local planning authority. These details must accord with the appropriate design principles, the Site works parameter plan and the indicative Building design intent and Ventilation column design intent drawings.
- G.5.23 Provision for an extended riverside walkway of a minimum width of 6m would be made across the frontage of Whiffin Wharf, except where the ventilation column encroaches into this width (design principle CARRR.21).

Creation of a new landscaped public space

- G.5.24 The surface of the proposed shaft would be incorporated into a new piece of landscaped public space in accordance with design principle CARR.02. A site-specific Requirement requires details of the permanent landscaping works to accord with the design principles, and to be submitted to and approved by the local planning authority. The new area of public realm would strengthen the links between Carnwath Road and the river and create a permanent space of enduring value. The position of the permanent structures and landscape treatment would screen the open space from traffic on Carnwath Road to create a useable and valuable local public space.
- G.5.25 Street furniture and areas of planting would be carefully positioned around the areas required for operational access. In addition, access covers that would require less frequent access are shown within an area identified for planting and would be screened by surrounding greenery.
- G.5.26 The new public space would be designed as a flexible area that could accommodate several different uses and cater for the needs of existing residents and future communities. Once the adjacent redevelopment of Whiffin Wharf is complete, the space could support active uses in the

ground floor of that development. This could be commercial activity or a community facility such as a nursery.

Design of the ventilation column

- G.5.27 It is proposed that the ventilation column is located in the southeastern corner of the site and at a distance from existing and planned residential properties. The change in location of the ventilation column from the northern side of the site close to Carnwath Road to the southeastern riverside edge was the result of design development following the two independent reviews hosted by the Design Council CABE. The prominent position close to the river would aid effective dispersion of ventilated air and act as a new landmark on the river's edge.
- G.5.28 The Design Council CABE panel responded positively to the design at phase two consultation and supported the proposed detached ventilation column, which would be visible from the river, with the ventilation building situated behind it.
- G.5.29 The configuration of the ventilation column was also explored and options included breaking up the mass into multiple, slenderer columns. However, the design team considered that separating the various components of the ventilation column would increase the structure's dominance in the new area of public space. The proposed design incorporates all the components into a discreet column, which is considered more appropriate.
- G.5.30 Design principle CARR.09 states that the ventilation column would stand a maximum of 15m high and have a minimum proportion of 1:4 (girth to height). While the functional requirements of the ventilation system dictate the required height, the external appearance of the column was creatively designed. The height and cross-section of the ventilation requirements at this site preclude the use of the signature ventilation column design; however, the form and design of the column were intended to make a visual reference to the signature design for consistency with other sites, (design principle CARRR.10).
- G.5.31 The proposed column is oval in shape when viewed from above and it appears to 'twist' around its vertical axis. The external appearance of the structure would differ depending on the perspective from the land or river. The twist of the structure was designed to represent water flowing down the vortex of the shaft and into the tunnel. This links the legacy design to the functional purpose of the structures. Signage would also be cast into the structure at low level as a story-telling feature.

High quality materials

- G.5.32 Reconstituted stone in precast units is proposed for the walls of the ventilation column in order to keep the area of the structure as small as possible. The units provide a high quality, self-supporting structural material and a robust and durable finish.
- G.5.33 The building and boundary treatment to the eastern edge of Whiffin Wharf would be clad in the same material as the ventilation column in accordance with design principle CARRR.16. It is proposed that the roof

of the ventilation building would be mono-pitched and enable water collection along the western perimeter (design principle CARR.20).

- G.5.34 The proposed hard landscape materials and furniture palette could comprise good quality contemporary fittings that would be hardwearing, durable and long-lasting in accordance with the NPS para. 3.5.2. Street lights, refuse bins and street furniture would be standard and robust to enable simpler management and maintenance. Hard surface materials selected for the development would be fit for purpose and appropriate to the setting in order to maintain their long-term quality.
- G.5.35 While the majority of the permanent operational structures are located underground, the site works parameters and design principles for the site and landscaping were carefully developed to ensure that the above-ground structures would be attractive, durable and reflect the existing local context and future redevelopment aspirations for the site.

Managing construction impacts

- G.5.36 Throughout the consultation period and through numerous design developments, Thames Water sought to minimise adverse construction impacts where practicable. The *CoCP* sets out how the environmental effects resulting from construction would be managed.
- G.5.37 Key scheme development changes to limit construction impacts at this site include:
- a. The *Transport Strategy* was amended to include the removal of the shaft excavated material off-site by barge in order to reduce number of HGVs on local roads.
 - b. The main shaft would be enclosed during main tunnel construction and secondary lining works; this would be secured under control measures in the *CoCP* Part B.
 - c. Planted hoardings would be used on the public-facing site boundaries; this is included in worksite layout arrangements in the *CoCP* Part A.
- G.5.38 The proposed construction layout at Carnwath Road Riverside is illustrated in the Construction layout plan in Annex G.

Conclusions

- G.5.39 The proposals for Carnwath Road Riverside were carefully developed through a collaborative process of design review and extensive consultation. The key functional requirements at this site relate to the need to construct and operate the project and ventilate the tunnel in an efficient manner. The aesthetic components relate to the creation of a new, high quality landscaped open space that enhances the setting of the site and responds positively to the surrounding environment. The functional and aesthetic elements were combined to create an attractive, usable and adaptable space in accordance with NPS paras. 3.5.1 to 3.5.3.

Water resources and flood risk

- G.5.40 The proposed works within the foreshore include the construction of a temporary campshed, or jetty and some sections of the river wall may

- need strengthening and/or rebuilding. No permanent works are proposed within the river.
- G.5.41 There are no significant groundwater issues for the construction or operational phases at this site. No impact is anticipated at the nearest licensed groundwater abstractions, which are located approximately 0.7km to the northwest of the site and held by the Trustees of the Hurlingham Club. There are no known unlicensed groundwater abstractions within 1km of the site.
- G.5.42 Measures to protect water quality and resources during construction are detailed in Section 8 of the *CoCP* Part A, and referred to in Section 8 of the *Planning Statement*. In accordance with the considered mitigation set out in the NPS, the *CoCP* covers activities that are subject to pollution control and incorporates good practice. Measures incorporated into *CoCP* Part A include:
- a. avoid using substances that could result in direct or indirect discharge to groundwater, wherever possible
 - b. ensure appropriate storage and containment of substances.
- G.5.43 The majority of the site is located within Flood Zone 3 and works within the foreshore would be located within the functional floodplain, which is classified as Flood Zone 3b. The site is protected from flooding by flood defences.
- G.5.44 A Flood Risk Assessment undertaken in accordance with Section 4.4 of the NPS is included within the *Environmental Statement*. It determined that the proposed development would be appropriate for the area as flood risk would remain unchanged. Flood risk would be managed through appropriate design measures and the development would not lead to an increase in flood risk in the surrounding areas.
- G.5.45 In accordance with the *CoCP* (Section 8), all site drainage during construction would be drained and discharged to the combined sewer. Where this is not practicable, accumulating surface water would be directed to holding or settling tanks, separators and other measures prior to discharge to the combined sewer. 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.
- G.5.46 The development is at residual risk of tidal flooding in the event of a breach in the local flood defence wall along the edge of the tidal Thames or overtopping of the defence wall as a result of a failure of the Thames Barrier. The consequence of a breach or failure of flood defences would not compromise the long-term operational function of the main tunnel; therefore no additional measures to those outlined in the *CoCP* are proposed.
- G.5.47 Flood risk from all sources has been managed as far as possible by means of design and the measures incorporated in the *CoCP* in order to

satisfy the criteria in NPS para. 4.10. No significant flood effects are likely from the proposed development.

- G.5.48 Potential scour would be monitored during the construction works pursuant to a Requirement. Any need for scour protection would be identified using the approach set out in the scour and accretion monitoring and mitigation strategy plan for temporary works in the foreshore (*Environmental Statement*, Vol 3, Section 14, Appendix L.4).
- G.5.49 The permanent operational area would be protected from flooding through the provision of a new flood defence wall located along the periphery of the operational area and would tie into existing flood defences, providing a continuous defence line along the embankment. The new defences would be designed to ensure that flood defences could be raised to meet the Thames Estuary 2100 Plan requirements in the future.
- G.5.50 The permanent design would comply with the drainage principles, including generic site drainage principle SDRN.04, which requires compliance with the Mayor of London's *Essential Standard*. This requires use of Sustainable Drainage Systems to achieve a 50 per cent attenuation of the undeveloped site's surface water run-off at peak times, wherever practical. Pursuant to a Requirement, the specific drainage details would be submitted to and approved by the local authority.
- G.5.51 The site would therefore meet the decision making criteria set out in the NPS in relation to water resources and flood risk. The Environment Agency has no outstanding concerns.

Air quality, emissions, dust and odour

- G.5.52 The site is located within the London Borough of Hammersmith and Fulham Air Quality Management Area. Local monitoring data and data observed and collated by Thames Water indicate that the air quality standard for nitrogen dioxide in the vicinity of the site is currently exceeded.
- G.5.53 The closest sensitive receptors to the development include:
- a. occupiers of adjacent residential dwellings along Carnwath Road, further residential properties located to the north within the Piper Building and northeast of the site within Philpot Square
 - b. the Thomas London Day School located 102m to the north of the site
 - c. nearby commercial and industrial premises located to the east and northwest of Carnwath Road.
- G.5.54 Through the measures included within the *CoCP*, all reasonable steps would be taken to minimise detrimental impact on air quality or amenity resulting from emissions and dust.
- G.5.55 Measures incorporated into the *CoCP* Part A to reduce air quality impacts include means of reducing or controlling vehicle and plant emissions, dust formation and re-suspension, dust present and particulate emissions. These would be observed across all construction and demolition activities at the Carnwath Road Riverside site. Further site-specific air quality measures were not considered necessary.

- G.5.56 An assessment of the air quality impacts of the proposed development during construction and operation is provided in the *Environmental Statement*, including the potential for impacts arising from emissions and dust. In accordance with NPS policy, and with the implementation of the CoCP measures, the overall effect on local air quality from construction would not be significant at any of the closest sensitive receptors.
- G.5.57 The CoCP Part A includes additional dust control procedures for main drive sites such as:
- a. additional screening of dust-generating activities
 - b. sealing of dust-generating surfaces
 - c. full-time road sweepers.
- G.5.58 The CoCP requires the contractor to ensure that dust monitoring would be carried out and monitoring locations agreed with the relevant local authority.
- G.5.59 The consideration of operational air quality impacts including odour is set out in Section 8 of the *Planning Statement*. The *Air Management Plan*, which accompanies the application, is designed to ensure that the air in the tunnel system is kept fresh, that a low pressure is maintained within the system to prevent unwanted releases, and that air is treated before release. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, there would be ventilation structures at all sites that would allow air to enter and leave the tunnel system.
- G.5.60 When the tunnel system is empty, clean air would be drawn in at specific sites by extracting air at other specific sites to keep the air in the system fresh. This means that odours would not build up while the system is empty. As the system fills, air displaced from the tunnels would initially be extracted and treated at the active ventilation sites before release. Later, depending of the level of filling, it would pass through the passive carbon filters. These filters clean the air and remove any odours before it is released.
- G.5.61 The filters would be within below-ground chambers and the fans would be acoustically shrouded within an above-ground housing. The fans would draw air from the tunnel system through the filters, which clean it before it is released through individual ventilation columns within a single compound column. Activated carbon would be used in the filters, which is a standard and proven way of treating air from wastewater operations.
- G.5.62 During heavy storm events (approximately four times during a typical year), the air pushed out of the tunnel system could exceed the capacity of the filters. It would be released through a separate ventilation column within the compound column to prevent damage to the odour control equipment. In this case, the excess air would be only partially treated. Under extremely rare storm events (approximately once every 15 years), untreated air may be released through a pressure relief structure. For at least 99 per cent of 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 odour.

- G.5.63 The construction and operational effects of air quality and odour at Carnwath Road Riverside would be consistent with the NPS decision making criteria to minimise detrimental impacts on amenity and the likelihood of nuisance (paras. 4.12.3, 4.11.4 and 4.11.5). Appropriate measures are proposed to ensure that the proposals would not lead to any substantial changes in air quality, emissions, dust or odour, or a significant loss of amenity during construction or operation.

Biodiversity and geological conservation

- G.5.64 The site is not designated for its geology or geomorphological importance. There are no internationally (Special Protection Areas, Ramsar sites) or nationally designated ecological sites (Sites of Special Scientific Interest, Marine Conservation Zones) in the vicinity. The River Thames, however, is a Site of Metropolitan Importance for nature conservation, designated by the Greater London Authority and adopted by all boroughs.
- G.5.65 If the campshed option is pursued, there would be a temporary foreshore land-take of up to approximately 3200m² during construction. The site has an existing barge bed or campshed associated with the safeguarded Hurlingham Wharf and the proposed works would entail extending this area into the Site of Metropolitan Importance. The *CoCP* Part A specifies that a membrane would be required to protect the underlying riverbed.
- G.5.66 This area would be reinstated on completion of the works. Although the successful re-establishment of habitat is uncertain, within the context of the wider Site of Metropolitan Importance and given the relatively small portion of the overall area affected, the impact would not be significant. There would be no permanent in-river works.
- G.5.67 In view of the measures incorporated into the design and the *CoCP*, potential aquatic ecology impacts on habitats, fish, invertebrates and marine mammals are predicted to be manageable and not significant. No further mitigation would be required.
- G.5.68 No potential impacts on terrestrial sites of ecological significance are identified in the *Environmental Statement*.
- G.5.69 Site clearance would result in the loss of existing buildings, approximately ten trees and scrub. There would also be potential habitat loss for breeding birds on-site. However, these effects would be localised and not significant.
- G.5.70 In accordance with the NPS, Thames Water sought to conserve and enhance biodiversity. Construction effects of the proposed development would be managed in accordance with the *CoCP* and the site-specific terrestrial ecology measures in the *CoCP* Part B. Measures include planting replacement native trees following construction.
- G.5.71 The provision of trees and ground cover planting is proposed as part of the landscaping scheme within the new area of public realm on Whiffin Wharf. In addition, a seeded brown roof is proposed for the ventilation building. Covering the roof with materials such as low nutrient rubble and gravels

would promote natural colonisation of plants of particular value to insects and birds. Furthermore, nesting features would be provided at appropriate locations on-site for black redstarts.

- G.5.72 Given the limited extent of the permanent works, the existing context of the environment on this brownfield site and the operational activities proposed on-site, no significant effects on terrestrial habitats or species are expected. However, the provision of positive measures could have a beneficial impact on local biodiversity. The proposals sought to conserve and enhance biodiversity and to minimise any negative impacts in accordance with the NPS, specifically para. 4.5.6.

Landscape and visual impacts

- G.5.73 The site does not lie within or in close proximity to any nationally designated landscapes. The local townscape shaped the design development and evolution in this location. Accordingly, the *Character Profile for the Sand Ends Conservation Area* was taken into account, in accordance with para. 4.7.2 of the NPS. The Sands End Conservation Area was designated to ensure that future development respects the riverside location and views from the locally listed Wandsworth Bridge, which is located 170m to the east of the site. The designation of the conservation area was not intended to safeguard the existing townscape character, which is of no special townscape or heritage value, “it was designated specifically with the future development of the riverside as a prime concern” (para. 6.2, p. 8). The River Thames, the river bank, water-borne uses and views across and along the River Thames are noted as the principal elements that define the character of the conservation area (para. 5.3).
- G.5.74 The *Environmental Statement* considers the conditions of the existing townscape on the site and within the Sands End Conservation Area as fair to poor, due to the disused nature of some components, the limited maintenance undertaken on others, and the dominance of hardstanding. The value of these townscape areas was also considered limited, due to their industrial and disused nature, and the presence of unmaintained, unattractive site hoardings that block views of the river.
- G.5.75 The townscape assessment established that there would be no significant impact on the character of the site itself or the Sands End Conservation Area from site clearance or temporary construction activities. However, there would be significant impacts on townscape and visual amenity generally during the construction phase due to the foreground visibility of construction activity from a number of viewpoints. The viewpoints affected include residences on Carnwath Road close to Dymock Street, northwest from residences on Smugglers Way close to Jews Row and northeast from residences on Eastfields Avenue (both located to the south of the site on the opposite side of the river).
- G.5.76 The construction layout and design were refined to minimise the visibility of the works, as far as practicable. Measures incorporated in the *CoCP* would reduce the townscape and visual impact of the works as far as

possible through the use of high quality hoarding, which could incorporate art work on public-facing sections.

- G.5.77 Despite this, the construction works would be a prominent feature of the local townscape and views due to site clearance, the presence of hoardings and the noise enclosure building, as well as general construction activity. The site's riverside location and the nature of works within the foreshore of the River Thames would make the activity particularly apparent.
- G.5.78 The visibility of construction is an unavoidable consequence of the scale of works required to construct the main tunnel and receive the Frogmore connection tunnel. The type and scale of the temporary construction activities proposed is not uncharacteristic of other major construction projects undertaken throughout central London, such as Crossrail, or the scale of regeneration development which is forecast over the next 20 years within the wider South Fulham Regeneration Area. It is a necessary consequence of renewal.
- G.5.79 Furthermore, the temporary works within the foreshore of the River Thames and the loading of barges would not be uncharacteristic of the activities associated with a working safeguarded wharf. The continued safeguarding of Hurlingham Wharf for waterborne freight-handling uses (*London Plan* Policy 7.26) is a material consideration in the assessment of the acceptability of townscape impacts from construction.
- G.5.80 The adverse townscape and visual effects identified within the *Environmental Statement* would be limited and relate to the temporary construction works only. The NPS recognises in para. 1.4.4 that NSIPs are likely to take place in mature urban environments and result in adverse townscape and visual effects, with many possible receptors. Large scale construction works are commonplace in London and the city has a high capacity to accommodate change. The construction works at Carnwath Road Riverside should be viewed in this context and would be experienced against the background of any planned residential development/major redevelopment of the site and surrounding area.
- G.5.81 Through stakeholder and public consultation, and significant design developments, the proposed scheme was refined to minimise its impact on the surrounding townscape and views during operation, and to provide a beneficial legacy for the local townscape.
- G.5.82 At this site there would be little above-ground activity associated with the operational phase, except for infrequent maintenance visits. Consequently, the operational use of the site would have no significant effect on the character of the site or surrounding townscape. Furthermore, the creation of a high quality public space next to the river would add positively to the character of the area.
- G.5.83 The design principles for the permanent above-ground structures (ventilation column, ventilation building and boundary wall) and landscaping were carefully developed to ensure that they would be sensitive to their surroundings and as visually attractive as possible. For example, the surface of the shaft would be incorporated into a new area of

landscaped public space, the proposed ventilation column was designed as a local landmark feature and the architectural treatment of the ventilation building and boundary was intended to coordinate with and complement the landscape design. This approach is in accordance with the criteria for good design set out in Section 3.5 of the NPS.

- G.5.84 The design principles would be secured through a DCO Requirement. This requires the detailed design including materials of above-ground structures to accord with the committed principles.
- G.5.85 The townscape assessment indicates that a commitment to high quality design and materials would result in beneficial effects on the character of the site, its surrounds, and residential and recreational viewpoints.
- G.5.86 The proposals were designed taking careful account of the landscape characteristics of the area to minimise adverse effects during the construction phase and to create long-term landscape and visual benefits, particularly through the provision of riverside open space. Accordingly, they are consistent with the approach required in Section 4.7 of the NPS.

Land use including open space, green infrastructure and green belt

- G.5.87 The impact of the proposals on land uses and designations (as identified in the *Core Strategy* and saved policies) was a key consideration in the site selection process and on-going design development. The land uses of the site and its surroundings are illustrated on the Land use plan in Annex G.
- G.5.88 Whiffin Wharf and the Carnwath Road Industrial Estate are identified for residential-led redevelopment within the *Core Strategy* and draft *SFR SPD*. Hurlingham Wharf is also located within the SFR regeneration area and the council has expressed a long-term vision for the redevelopment of the site, subject to the outcome of the Mayor of London's *Safeguarded Wharf Review*.
- G.5.89 The site is the subject of three separate planning applications for comprehensive redevelopment. Planning applications were submitted to the council in June 2012 for Whiffin Wharf, Hurlingham Wharf and the Carnwath Road Industrial Estate, details of which are set out earlier in the assessment. The Safeguarding Direction served on the council by the Secretary of State on 24 April 2012 prevents the council from granting planning permission for any of the applications without specific authorisation. The applications were considered by the council's Planning Applications Committee on 8 January 2013. The committee resolved to grant permission subject to referral to the GLA and Secretary of State on completion of a satisfactory legal agreement, and subject to conditions. The purpose of the Safeguarding Direction is to ensure that land is available for use as part of the project and signifies recognition by the Secretary of State of the national importance the project and the need to safeguard sites in the short term for its construction.
- G.5.90 It is accepted that the construction works across these three areas might delay the implementation of redevelopment across these sites, although

this delay is not considered as important as the need to facilitate construction of the project, as set out below. On Whiffin Wharf, the project may prevent the full redevelopment of the site.

- G.5.91 The draft *SFR SPD* includes a statement opposing the inclusion of Carnwath Road Riverside as a drive site for the project “*as it would significantly disrupt the regeneration proposals in this SPD to deliver the vision for South Fulham Riverside. The Carnwath Road sites are coming forward in the first stages of regeneration and are vital to create the stimulus and resources to fund the vital transport infrastructure improvements. There is also concern regarding the detrimental impact significant lorry movements would have on the strategic road network and the negative impact the tunnel works would have upon local residents*” (Section 7.2.8).
- G.5.92 However, no significant weight should be attached to the draft *SFR SPD* as it cannot be adopted in its current form.
- G.5.93 Contrary to Section 7.2.8 of the draft *SFR SPD*, the proposals would not significantly disrupt the regeneration proposals in the *SFR SPD* area. The land take required for the construction period is temporary and considered insignificant in the context of the overall developable land available within the *SFR SPD* area. The proposed construction area would occupy 1.5 ha during the construction period of six years. This would constitute approximately seven per cent of an identified potential 21ha of land within the entire regeneration area.
- G.5.94 Furthermore, and contrary to assertions at Section 7.2.8 of the draft *SFR SPD*, the Carnwath Road Riverside site is not vital for the early development phases of South Fulham Riverside in terms of housing targets or as a stimulus to fund vital transport improvements. The Inspector’s Report of July 2011 on the *Core Strategy* confirmed the following;
- a. There is no evidence of any urgency for the development of residential sites in South Fulham to come forward in the short term to help deliver the borough’s strategic housing requirements (para. 71).
 - b. It would be inappropriate for the council to pre-judge the *Safeguarded Wharf Review* (para. 72).
 - c. There is clear potential across the borough for an even greater number of dwellings than those anticipated and there is no shortage in the borough against the *London Plan*’s strategic housing target (paras. 84 et sequens).
 - d. The *Core Strategy* should not over-estimate the housing yield in South Fulham given the possible impact of the need to accommodate the project (para. 92), even though the NPS had not at that stage been designated (para. 112).
 - e. As a result, the *Core Strategy* itself confirmed the safeguarded status of the wharf (7.140) and defers to the Mayor of London’s review of safeguarding (7.141).

- f. The *Core Strategy* also recognises a significant over capacity of housing sites in the borough (7.146).
- G.5.95 Overall, the 20-year housing forecasts within the draft *SFR SPD* exceed the *Core Strategy* indicative targets, and it is important to note that there are four other major regeneration areas with similar or greater indicative targets to South Fulham Riverside that will also play a significant role in accommodating phased growth within the *Core Strategy* plan period across the borough.
- G.5.96 On the basis of no evidence and the findings of the binding Inspector's Report, no weight should be attached to the objection that the Carnwath Road Riverside sites are required in the short-term for residential led development.
- G.5.97 The draft *SFR SPD*, which identifies Hurlingham Wharf to come forward for redevelopment within zero to ten years (Appendix 2, p.145), and the current planning application for mixed-use development pre-judge the *Safeguarded Wharf Review*. The *Safeguarded Wharves Review Further Consultation Draft* acknowledges that the use of the site for the project "should ensure that this wharf is used to transport bulk construction/ excavation materials by water and that the site can be used as a viable wharf following completion of the [Thames Tideway] Tunnel" (Table 7.1). The proposals for the use of Hurlingham Wharf for the project would therefore be in accordance with its safeguarding and suitable waterborne freight uses identified in the *London Plan*.
- G.5.98 The emerging draft *SFR SPD* cannot change the policies of the *Core Strategy* or be inconsistent with the *London Plan*. In the recent judgement in Abdul Wakil (T/A Orya TexTiles & Ors) v Hammersmith and Fulham LBC and Orin Shepherd's Bush Ltd, the council's approach to the preparation of an SPD was found to be procedurally flawed and unlawful and the document held to be a Development Plan Document, rather than an SPD. Thames Water wrote to the council on two occasions requesting confirmation of whether it maintains that the SPD procedure is the correct one for the production of the *SFR SPD* but did not receive a response to either request for clarification on this matter.
- G.5.99 A number of consultation comments from phase two consultation and Section 48 publicity, including from the London Borough of Hammersmith and Fulham, raised concerns regarding the loss of existing businesses at the Carnwath Road Industrial Estate site and the current level of employment they provide. The socio-economic assessment did not identify any significant effects associated with the loss of these existing business premises, and Thames Water is committed to complying with the provisions of the statutory compensation code, so the reasonable costs and expenditure incurred in association with the relocation of these businesses may be eligible for compensation. A fuller explanation of the socio-economic assessment can be found in the associated subsection below.
- G.5.100 Moreover, the redevelopment proposals contained within the *Core Strategy* and draft *SFR SPD* do not seek to retain these existing business premises and the new commercial floor space proposed as part of the

redevelopment proposals are unlikely to be suitable for the wholesale, storage and distribution uses that operate from the site at present. The temporary use of this site for construction would not therefore impact on the mixed-use allocation or the long-term development aspirations for the site.

- G.5.101 Once operational, the layout of the permanent works on Whiffin Wharf would minimise the total area of land-take and leave a viable site for future redevelopment. All temporary works would be removed from Hurlingham Wharf and the site would be reinstated ready for development in accordance with its planning designation as a safeguarded wharf.
- G.5.102 Overall, it is recognised that the proposals would delay redevelopment aspirations on the Carnwath Road Riverside site. However, given the absence of more suitable alternative sites a delay to these regeneration aspirations should not outweigh the need for the use of the site for the project. Greater weight should be attached to the need for the NSIP, particularly since, once the temporary works are complete, it would still be possible to implement a redevelopment scheme within the *Core Strategy* plan period.
- G.5.103 Furthermore, the project would deliver significant land use benefits to the site and local area by leaving a permanent legacy of public landscaped open space, extending the Thames Path across the frontage of Whiffin Wharf, and improving the site of Hurlingham Wharf and its river wall, to the benefit of future uses.
- G.5.104 The proposed works would not prevent the continuation of any existing adjacent land uses, although there would be some unavoidable impacts on neighbouring land uses during construction. These were reduced as far as possible through careful design and through control of construction activities. Similarly, no extant planning permissions, committed developments, or policy allocations for future development within the wider area would be significantly impacted as a result of the works at this site.

Noise and vibration

- G.5.105 The assessment of potential noise impacts arising from the construction and operation of the project at the Carnwath Road Riverside site are set out in the *Environmental Statement*. The noise assessment profiles the variation in construction noise levels across the construction programme with the aim of refining mitigation design and reducing the significant effects of construction noise and vibration where possible.
- G.5.106 The current noise environment in the vicinity is dominated by road traffic. The nearest receptors to the site that would be sensitive to the potential noise and vibration effects are the residential dwellings on Carnwath Road, the Piper Building, Philpot Square and Dymock Street.
- G.5.107 On the southern bank of the River Thames, the Riverside Quarter residential development (located in the London Borough of Wandsworth), may also be sensitive to potential noise impacts from the site. The office building at 50 Carnwath Road is the only non-residential noise sensitive receptor identified in the *Environmental Statement*. In accordance with NPS policy, a series of measures detailed in the *CoCP* are embedded

within the project design. The measures include operating in accordance with best practice, selecting the quietest, most cost-effective plant available, and optimising plant layout to minimise noise emissions.

- G.5.108 The *CoCP* Part B also contains site-specific measures to reduce noise and vibration effects, including:
- a. enclosure of the main shaft during main tunnel construction and secondary lining works
 - b. enclosure of the concrete batching plant, grout plant, conveyors to load barges and storage/handling areas
 - c. 5m high site hoarding/noise barrier on the western end boundary and 7.5m on the eastern boundary of the site
 - d. 3.6m high hoarding on the northern boundary and 2.4m high hoarding along the river wall adjacent to the barge loading area
 - e. screening of the material handling area by a three-sided enclosure and roof clad with suitable noise attenuation material
 - f. the western site access would not be routinely used in order to reduce noise effects on adjacent properties.
- G.5.109 The NPS recognises that NSIPs are likely to take place in mature urban environments and to lead to noise disturbance during construction in the short term. The implementation of the embedded design measures would ensure that there are no adverse vibration effects.
- G.5.110 No significant adverse noise effects arising from the construction works or road-based construction traffic were identified at the nearest residential receptors within 15m of the site boundary, namely 81 to 87 Carnwath Road, 89 to 101 Carnwath Road, 5 Carnwath Road and the Piper Building. No other residential properties in the vicinity of the proposed works are located close enough to be subject to significant adverse noise effects. Furthermore, no non-residential noise sensitive receptors would experience significant noise effects within the vicinity of the site.
- G.5.111 The noise assessment concluded that there would be significant adverse noise effects at 89 to 101 Carnwath Road during the construction phase associated with river-based transport. This is due to the proximity of these receptors to the barging facilities, which would be located approximately 45m away from these properties, and the likelihood of river transport operating on a 24-hour basis. At both daytime and night-time, the operational noise level of river traffic would be greater than the ambient background noise level. This could cause disturbance to these receptors. No adverse noise effects resulting from river transport are predicted at any other sensitive receptors in the vicinity of the site.
- G.5.112 No further practicable on-site noise mitigation can be adopted beyond the measures identified in the *CoCP* to reduce the adverse impact of river transport at 89 to 101 Carnwath Road.
- G.5.113 The NPS advises that in situations where other forms of noise mitigation have been exhausted, noise insulation to dwellings or, in extreme cases, compulsory purchase of affected properties may be considered in order to

gain consent for what might otherwise be an unacceptable development. In the case of the project, no extreme cases were identified at the date of submission of the application that would necessitate the compulsory acquisition of properties due to significant adverse effects. The Thames Tideway Tunnel noise insulation and temporary re-housing policy and the Thames Tideway Tunnel project compensation programme (included in Schedule 2 to the *Statement of Reasons*, which accompanies the application) were developed to offset the effects arising from construction related disturbance. The noise insulation and temporary re-housing policy would be implemented where predicted or measured construction noise levels exceed published trigger levels. The compensation programme was established to address claims of exceptional hardship or disturbance. In relation to construction, eligible works would be directed towards mitigation or other required actions to reasonably reduce disturbance from noise or construction activities.

- G.5.114 The noise levels predicted at 89 to 101 Carnwath Road do not exceed the thresholds given in the noise insulation and temporary re-housing policy and as such these properties would not be eligible for noise insulation under this policy. However, these properties may be eligible for compensation under the Thames Tideway Tunnel compensation programme.
- G.5.115 Although the use of barges would result in some daytime and night-time noise impacts, they provide a significant transportation advantage by removing approximately 47,250 HGVs from the local highway network. This equates to 94,500 two-way HGV movements over the duration of the construction works at this site.
- G.5.116 There would be no significant noise or vibration effects during the operation of the site.
- G.5.117 Thames Water has employed all possible measures to mitigate the effects of noise at this site. The project demonstrates good design and mitigates and minimises adverse impacts on health and quality of life in accordance with NPS paras. 4.9.8 and 4.9.9. Some residual noise effects would remain; however these are an unavoidable consequence of the commitment to river transport, in accordance with NPS para. 4.13.10.

Historic environment

- G.5.118 The *Environmental Statement* and the *Heritage Statement*, which accompany the application, both describe the importance of the heritage assets that may be affected by the proposed development and the contribution of their setting to their significance.
- G.5.119 The site does not contain any nationally designated (statutorily protected) heritage assets such as scheduled monuments, listed buildings, or registered parks and gardens. There are also no listed structures in proximity to the site.
- G.5.120 The site lies within the Sands End Conservation Area. This area was designated to ensure that any future development respects the riverside location and views from the locally listed Wandsworth Bridge, rather than to safeguard the existing townscape character, which is not of special

heritage interest. Apart from the Sands End Conservation Area, there are no locally designated heritage assets within the site. The modernist murals on the Piper Building are locally listed. However, these murals are sited on the opposite side of the building from the site, the site does not form a part of their setting and they would remain visible to the public throughout.

- G.5.121 The site does not lie within an Archaeological Priority Area. While there is potential for late 19th century archaeological remains within the foreshore, it is anticipated that any heritage assets, would not be of the necessary significance to merit a mitigation strategy of permanent preservation *in situ*. Pursuant to a Requirement, any impacts on archaeology would be fully mitigated by a programme of investigation and recording, as appropriate, to create a permanent record of all elements of interest for posterity. Mitigation would be carried out in accordance with a scope of works (a *Site-specific Archaeological Written Scheme of Investigation*), which would be agreed in advance with statutory consultees to ensure that the scope and method of fieldwork are appropriate.
- G.5.122 The main heritage impact of the proposals at Carnwath Road Riverside would be on the character and appearance of the Sands End Conservation Area from the presence of construction works. However, this impact would be temporary and the site would be given over to riverside uses with no permanent negative effects.
- G.5.123 The creation of the new high quality area of landscaped public space and the high quality design of the permanent above-ground structures would be beneficial overall and considerably improve the present condition of the site. The scale and form of the proposed development would be in keeping with the height and mass of most of the surrounding buildings, and would enhance the character of the Sands End Conservation Area.
- G.5.124 During construction, there may be localised impacts on views to the Sands End Conservation Area from Wandsworth Bridge and from the opposite bank of the river. The impacts of construction would be temporary, and mitigation measures incorporated in the *CoCP* would reduce the visual impact of the works as much as possible such as through the use of high quality hoarding. Important views along the River Thames from the opposite bank of the river and from Wandsworth Bridge would be enhanced by the permanent works.
- G.5.125 The use of the Carnwath Road Riverside site would not result in any significant negative effects on heritage assets during construction or operation. The NPS recognises in para. 1.4.4 that NSIPs are likely to take place in mature urban environments and adverse construction effects on historic environment receptors are likely to arise. Construction works similar to those proposed are commonplace in London and impacts on heritage assets, which are unavoidable and largely temporary, should be viewed in this context.
- G.5.126 Thames Water sought to minimise impacts on the historic environment, wherever practicable and in consultation with key stakeholders such as English Heritage. The sensitive design and the range of mitigation measures detailed in the *CoCP* Parts A and B, and the design principles,

would minimise any negative impacts on the fabric and settings of nearby heritage assets, in line with the requirements of the NPS and the *Sands End Conservation Area Character Profile*. In summary, the heritage impact of the proposals would be acceptable and the proposals would cause no substantial harm to any of the heritage assets on or near the site.

Light

- G.5.127 The *Daylight/Sunlight Assessment*, which accompanies the application, assessed the potential impact of the construction works and permanent structures on the daylight and sunlight amenity of surrounding properties. The screening assessment concluded that the permanent works would have no material impact. During the construction phases, it is possible that the acoustic shed, maintenance workshop and storage required on-site would have an impact on the daylight and sunlight at the closest residential receptors, namely 89 to 101 Carnwath Road to the west of the site. The proposed temporary support/welfare buildings may impact on the windows in the flank wall of 5 Carnwath Road to the east of the site. While these impacts could affect the amenity of the above properties, they would be temporary, unavoidable and have been minimised as far as possible.
- G.5.128 Through the measures in the *CoCP*, all reasonable steps have been, and would be taken, to any minimise detrimental impact on amenity resulting from artificial light as required by the NPS.
- G.5.129 The surrounding area is lit in the early evenings by street lighting and light spill from surrounding buildings. Limited effects from construction lighting on night-time character were identified in the *Environmental Statement* on the basis that the site would generally only be lit in the early evening during winter, and any site lighting during construction would be capped and directional to minimise light spill in accordance with the *CoCP*. In addition, the *CoCP* Part B makes provision for a site-specific lighting plan.
- G.5.130 Carnwath Road Riverside is a main 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. During this period, working would mainly take place below ground but artificial lighting would be required for the supporting activity at ground level for extended periods during the tunnel construction and secondary lining phases. Measures are included within the *CoCP* to ensure that all reasonable steps would be taken to minimise any detrimental impact on amenity from artificial light. For example, site lighting during construction would be capped and directional and only used when necessary. Therefore, there would be no unreasonable effect on residential properties during the construction period.
- G.5.131 The *Design and Access Statement* and *Design Principles* set out measures for incorporating low level lighting within the new area of public realm, along the Thames Path and on the permanent structures. However, due to the density of the surrounding built environment, which is heavily influenced by light spill from street lights and residential properties,

the sensitivity of this site to additional lighting would be low and would cause no detrimental effect.

- G.5.132 Feature lighting would be incorporated in accordance with the lighting design principles, which seek to balance the need to provide a safe environment and to reduce light pollution. In addition, lighting of the ventilation column would accommodate any provisions deemed necessary by the Civil Aviation Authority, as the site is located on the approach to Battersea Heliport (design principle CARRR.12).
- G.5.133 All reasonable steps would be taken to minimise any detrimental effects arising from the use of artificial lighting at this site in accordance with the NPS (para. 4.12.7).

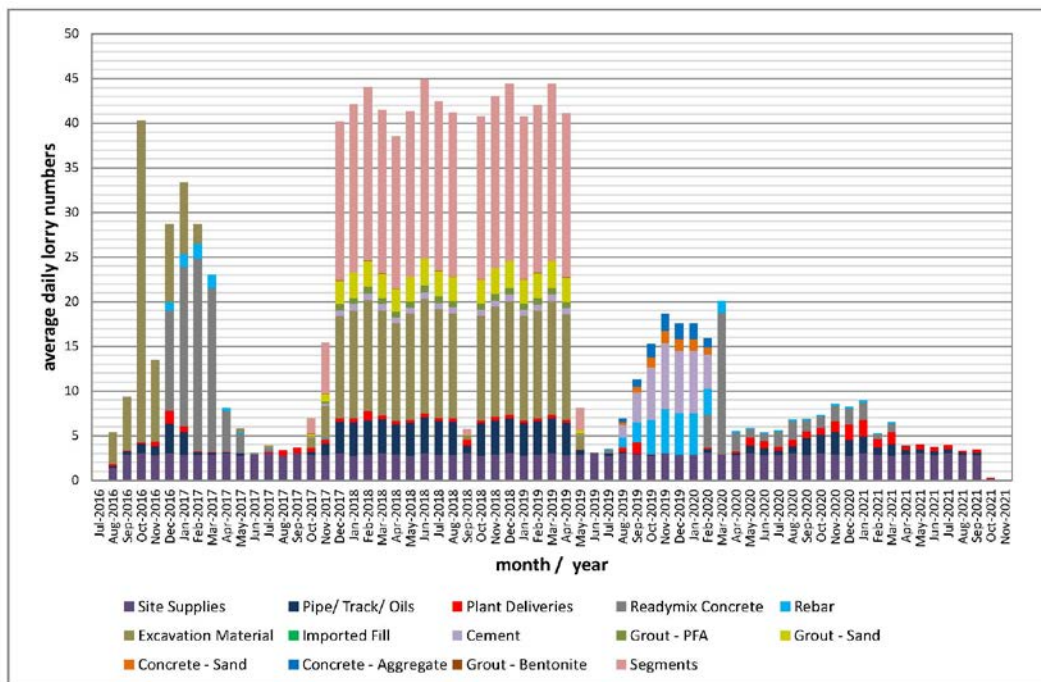
Traffic and transport

- G.5.134 The *Environmental Statement* and *Transport Assessment* consider the likely transport effects at this site in respect of the proposals for both the construction and operational phases. The project-wide approach to managing transport is set out in the *Transport Strategy*, which accompanies the application.
- G.5.135 The Public Transport Accessibility Level rating for the site is 2, which is poor. This is because the site is located approximately 1.1km from Putney Bridge Underground station, 1.3km from Imperial Wharf railway station and 1.1km from Wandsworth Town main line Rail Station. There are five daytime bus routes and two night bus routes that operate within 640m walking distance of the site, and one hail-and-ride bus service (Route 424), which operates along Carnwath Road and runs between Putney Heath and Fulham Football Club.
- G.5.136 During construction, there would be approximately 165 construction workers employed at this site at any one time. Further details are provided in the *Transport Assessment*.
- G.5.137 At this site, no parking would be provided for workers within the site boundary in order to minimise the number of workers who travel to and from the site by car. Pursuant to a Requirement, a site-specific construction workforce travel plan would be submitted to and approved by the local planning authority in advance of commencing the main works.
- G.5.138 The vehicular access both during construction and operation would be via new access points off Carnwath Road. Carnwath Road intersects Wandsworth Bridge Road and Townmead Road at a signalised junction to the east and Broomhouse Lane in the west. Wandsworth Bridge Road forms part of the Strategic Road Network and provides a link between Wandsworth Common in the south and Fulham and Chelsea in the north. All construction vehicles would enter and exit the site via Carnwath Road and Wandsworth Bridge Road. This route would avoid traffic entering and exiting the site via narrow residential roads to the north and west.
- G.5.139 During construction, vehicle movements would typically take place on weekdays between 8am to 6pm and on Saturdays from 8am to 1pm. Up to one hour before and after these hours would be used for mobilisation and demobilisation. Mobilisation may include loading, unloading, arrival

and departure of staff and movement to and from the site. In exceptional circumstances, in agreement with the local authority, HGV and abnormal load movements could occur up to 10pm or later, for large concrete pours.

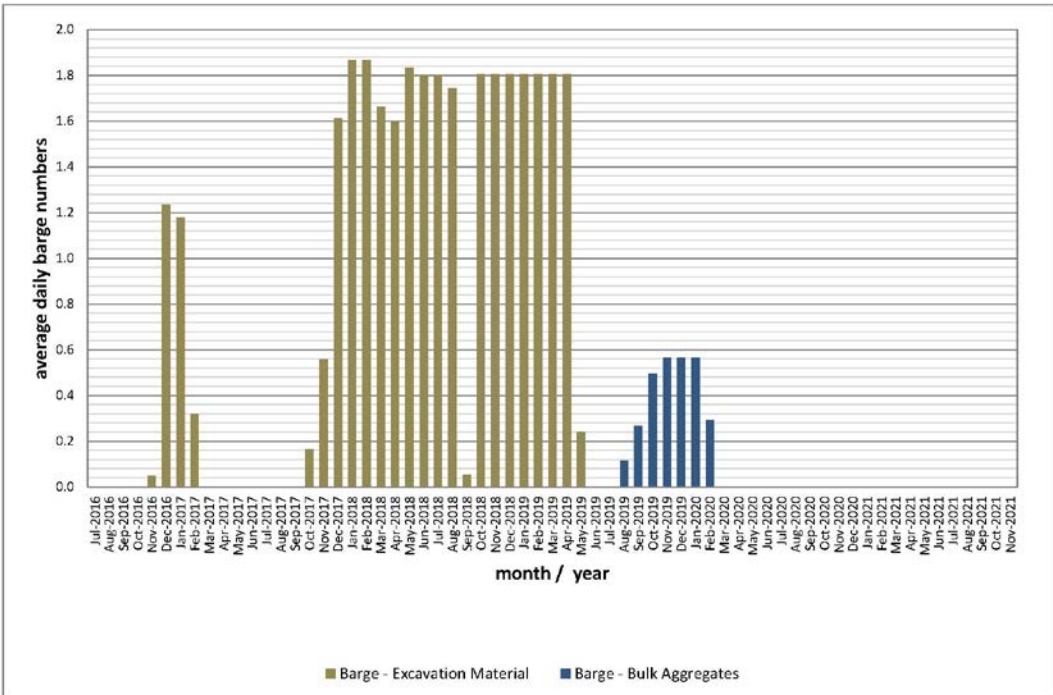
G.5.140 The peak construction traffic movements vary during the phases of construction works. A histogram of the average daily HGV visits at Carnwath Road Riverside is illustrated below. This assessment is based on the average day in the peak month and is a reasonable ‘worst case’ scenario. During many months vehicle numbers would be lower. Further detailed information on construction vehicle numbers and access arrangements can be found in the *Transport Assessment*.

Figure G.5 Estimated construction lorry profile



G.5.141 Approximately 90 per cent of excavated material is proposed to be transport off-site by barge and approximately 90 per cent of secondary lining aggregates would be transported to the site by barge. The peak number of barge movements would occur within Year 2 of construction with an average of four barge movements a day.

Figure G.6 Estimated barge movement profile



- G.5.142 The use of barges would significantly reduce the number of HGVs on the local highway network by approximately 47,250 HGVs, which equates to 94,500 two-way HGV movements over the full duration of construction at this site. The use of the river to transport waste arisings and deliver secondary lining materials would operate on a 24-hour basis with the tide of the river, and movements would take place during the day and at night. No significant change to river navigation conditions was identified as a result of the use of barges at this site.
- G.5.143 A junction improvement to Carnwath Road/Wandsworth Bridge Road/ Townmead Road is proposed to provide an improved vehicle turning space and a safer pedestrian environment. This improvement would be a permanent enhancement of the junction and would partially deliver a necessary upgrade to the local transport network, which was identified in the *SFR SPD*.
- G.5.144 A small number of car parking spaces would need to be temporarily suspended during construction works in order to allow unimpeded access of HGVs and to avoid conflict with road users in the surrounding area. These works comprise three sections of suspended parking totalling 12 parking spaces on Carnwath Road. Single yellow line parking restrictions would be added where these sections of parking are suspended, which would operate from 7am to 7pm, Monday to Saturday. The hours of operation of the existing single yellow line parking restrictions and loading restrictions on Carnwath Road would also be extended to no parking or loading 7am to 7pm Monday to Saturday.
- G.5.145 Car parking surveys were completed along the route of the access along Carnwath Road and no significant impact on car parking provision for the duration of the construction period was identified.

- G.5.146 Measures to reduce transport impacts are detailed in the *CoCP*. These include HGV management and control measures such as designated vehicle routes to sites for construction vehicles.
- G.5.147 In addition to the general measures in the *CoCP* Part A, the following measures are incorporated into the Carnwath Road Riverside *CoCP* Part B in order to reduce transport effects:
- a. The security barrier would be positioned to allow a standard rigid tipper vehicle to be wholly off the road while awaiting barrier operation
 - b. The western access would be only used for emergency access or specific deliveries and not routinely used due to the proximity of adjacent properties.
 - c. The eastern access would be left-turn in right-turn out. The western access would be left-turn in only.
 - d. The diversion of the Thames Path would be adequately signed.
- G.5.148 The *Transport Assessment* identified that the Wandsworth Bridge Road/Carnwath Road/Townmead Road junction in the construction base case would operate over capacity during the AM peak and within capacity during the PM peak. The addition of the project traffic (anticipated to be 90 two-way construction vehicle movements during the peak hours) results in an overall increase in delay of two seconds per vehicle in the PM peak. On any one arm, the maximum delay would be 14 seconds per vehicle in the AM peak hour.
- G.5.149 Following the implementation of the above design measures, including the suspension of car parking along Carnwath Road and modifications to the Wandsworth Bridge Road/Carnwath Road/Townmead Road junction, the *Transport Assessment* concluded that the changes to the transport networks would not be significant and no additional measures are required for the construction phase.
- G.5.150 During the operational phase, there would be very occasional vehicle trips to and from the site for maintenance activities. Access for a light commercial vehicle would be required on a three to six monthly basis. In addition, once every ten years, a major internal inspection of the tunnel and underground structures would be required. This would involve a small team of inspection staff and two mobile cranes, and might require temporary suspension of on-street parking in the vicinity of the site.
- G.5.151 There would be no significant transport effects during the operational phase from infrequent and short-term maintenance trips to the site. No mitigation is therefore required for this phase.
- G.5.152 The location of the permanent works and access arrangement from Carnwath Road would facilitate the extension of the Riverside Walk along the frontage of the Whiffin Wharf site, which is a positive permanent legacy of the proposed works.
- G.5.153 The construction works in this location would not likely result in any significant transport effects on road network operation or delays. No significant effects on pedestrian and cyclist amenity, safety or on local

public transport services were identified. Thames Water is willing to enter into obligations and requirements to secure necessary highway improvements and to mitigate transport impacts as required by the NPS para. 4.13.7, and therefore, development consent should not be withheld, and limited weight should be applied to residual transport effects.

Waste management

- G.5.154 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
- G.5.155 There are no particular site-specific waste issues associated with the use of this site.

Socio-economic

- G.5.156 The project-wide socio-economic issues and benefits of the project and equalities considerations are detailed in Section 8 of the *Planning Statement*.
- G.5.157 The proposed construction site includes the Carnwath Road Industrial Estate, which currently accommodates five businesses, and Whiffin and Hurlingham Wharves which are largely vacant with some temporary uses. Residential properties adjoin the site to the east and west, and further dwellings are positioned on the northern side of Carnwath Road. The Thomas London Day School is located 105m to the north of the site.
- G.5.158 The community profile from the socio-economic assessment suggests that the local community is made up of predominantly white residents, who generally experience moderate to good health, with life expectancy standards varying between the sexes. A significant proportion of residents within 250m of the site experience deprivation.
- G.5.159 This site would be one of the main focal points of construction and job opportunity and is expected to require a maximum workforce of approximately 165 workers at any one time. This opportunity would represent a major benefit to the local employment market, including jobs and training opportunities.
- G.5.160 Any socio-economic effects on the demand for services arising from the construction workforce at this site would be insignificant compared with the long-term changes in this major regeneration area and the significant increase in residential population this will bring.
- G.5.161 The construction works would result in the demolition of premises at, and thus displacement of businesses from, the Carnwath Road Industrial Estate. The Carnwath Road Industrial Estate is part of a wider designation as a mixed-use development area within South Fulham Riverside. The site's allocation and current planning application for redevelopment suggests that it is likely that the site would come forward for redevelopment over the *Core Strategy* plan period.
- G.5.162 Although the construction period is temporary, the displacement and impact on the businesses is likely to be permanent as, once relocated, it is

unlikely that any business would return. Despite the conclusion that the outcome is likely to be the permanent relocation of the existing businesses, this was not considered to be a significant impact in the socio-economic assessment. This is due to a moderate to high availability of alternative commercial premises within the London Borough of Hammersmith and Fulham. It is acknowledged, however, that the businesses, in particular the trade counter businesses, may face difficulty finding suitable alternative premises. While reasonably specialised, the businesses in question are not unique.

- G.5.163 The effect of relocating on the businesses would involve costs and expenditure associated with the move including but not limited to removal expenses, legal and surveyor fees, taxes, costs of adapting new premises, temporary loss of profits during the period of the move, and any diminution of goodwill following the move. Thames Water is committed to complying with the provisions of the statutory compensation code, so the reasonable costs and expenditure incurred in association with the move and as a direct consequence of the project may be eligible for compensation.
- G.5.164 Thames Water is not aware of alternative locations for the affected businesses that may have been identified. Although the businesses appear to be part of companies that have operations at other sites as well as the Carnwath Road Industrial Estate. Therefore the option of consolidating operations within other branches elsewhere could be available.
- G.5.165 Measures incorporated into the *CoCP* Part A seek to resolve or limit significant air quality, construction dust, noise, vibration, and visual impacts, which could have amenity effects, socio-economic implications or impacts on equalities groups. Further site-specific measures, designed to reduce socio-economic, equalities and amenity effects are incorporated into the *CoCP* Part B and detailed under the relevant subsections.
- G.5.166 No significant construction effects were identified at the Thomas London Day School, therefore there are no socio-economic or equalities implications for the school.
- G.5.167 During the construction phase, there would be adverse noise effects associated with river-based transport at 89 to 101 Carnwath Road. This is due to the proximity of these receptors to the barging facilities and the likelihood of river transport operating on a 24-hour basis. The noise levels predicted at 89 to 101 Carnwath Road do not exceed the thresholds given in the Thames Tideway Tunnel noise insulation and temporary re-housing policy and as such these properties would not be eligible for noise insulation under this policy. However, these residents may be eligible for compensation under the Thames Tideway Tunnel compensation programme.
- G.5.168 The Thames Path routes through and around the site and would need to be temporarily diverted during construction. The diversion would continue the path along Carnwath Road for an additional 110m before connecting back to the riverside along the back of the Hurlingham Retail Park. The overall length of the Thames Path would be unchanged. The *CoCP* Part B makes provision for this diversion to be adequately signed and for the new

eastern route section to have high quality lighting for safety and security. The western site access route would only be used as an entry for emergency access or specific deliveries and not routinely used due to the proximity of adjacent properties.

- G.5.169 In accordance with the NPS (para. 4.15.6), an *Equalities Impact Assessment* was undertaken. It describes the demographics of the surrounding area and assesses whether a disproportionate number of people from particular equalities groups would be affected by the generic impacts associated with the project, including air emissions, flood risk, noise and vibration. It also outlines the impact on people who live, work or own businesses that may be displaced as a result of the project.
- G.5.170 The *Equalities Impact Assessment* identifies a potential differential impact at this site on children and pregnancy/maternity groups arising from the temporary diversion of the Thames Path. Impacts would be mitigated by clear signage and use of existing safe road crossings. The accessibility of the crossings was audited and the length of the diversion minimised. Potential differential impacts on children and pregnancy/maternity groups would also arise from the pedestrian route across site access points, the movement of large construction vehicles and the suspension of on-street car parking. The *CoCP* sought to minimise these impacts by ensuring that the works would be carried out in such a way as to limit inconvenience to the public from increased traffic flows and the disruptive impacts of construction traffic. Measures included in the *CoCP* would also assist in improving any perceived safety and security issues. There are also proposals for consultation and a community liaison plan to ensure clear lines of communication and that detailed issues could be addressed by the contractor. All other identified potential impacts were not considered differential.
- G.5.171 During operation there would be various positive beneficial socio-economic and equalities effects. The new area of public realm would be designed to positively enhance the surrounding environment and provide a lasting legacy to existing and future communities surrounding the site. The new landscaped public space would provide improved amenity for users and new, predominantly passive, recreational opportunities.
- G.5.172 At this site, the public realm would strengthen the link between Carnwath Road and the River Thames. The extended riverside walkway would be a minimum width of 6m and meet Disability Discrimination Act requirements to ensure accessibility for all. Hurlingham Wharf would continue to be available for use as a safeguarded wharf in accordance with its designation in *London Plan* Policy 7.26.

G.6 Overall conclusions

- G.6.1 The Carnwath Road Riverside site is required to construct the western section of the main tunnel, receive the tunnel boring machine driven from Kirtling Street and the Frogmore connection tunnel driven from Dormay Street. The need and the principle for the project is established at the national level in the NPS. The capture of CSO discharges within the main tunnel would substantially reduce the flows of untreated sewage into the tidal Thames. The proposed works in this location are essential to the successful delivery and operation of the project.
- G.6.2 This assessment presented an analysis of the key planning considerations associated with the proposed works at Carnwath Road Riverside, in accordance with the relevant assessment criteria identified in the NPS. The potential impacts of the construction and operation of the project in this location were carefully considered throughout design development and amended where possible to take account of consultation feedback from key stakeholders and members of the public. Further information is provided in the *Consultation Report, Design and Access Statement and Environmental Statement*.
- G.6.3 Given the site's location on a riverside site in central London, disturbance during the construction period is inevitable. While Thames Water sought to minimise disturbance and adverse construction impacts wherever practicable through sensitive design and mitigation, some significant construction impacts would likely remain. These comprise:
- a. noise effects from river-based construction transport at residential properties at 89 to 101 Carnwath Road
 - b. townscape and visual effects.
- G.6.4 In order to address each of these adverse effects, the project design was refined and all practicable mitigation applied. Properties at 89 to 101 Carnwath Road may be eligible for compensation under the Thames Tideway Tunnel compensation programme. The residual noise effects are an unavoidable consequence of the commitment to river transport, in accordance with NPS para. 4.13.10, which would remove approximately 94,500 two-way HGV movements from the local road network over the duration of construction at this site.
- G.6.5 The proposals at Carnwath Road Riverside would also give rise to a number of beneficial effects, including:
- a. meeting the need identified in the NPS through the delivery of the project and the capture of the CSO discharges identified by the Environment Agency
 - b. socio-economic benefits from the provision of a new landscaped area of public space on the river and extension of the riverside walk
 - c. beneficial effects on the townscape character and appearance of the site from the new high quality area of public realm, high quality above-ground structures, the extended Thames Path and replacement planting.

- G.6.6 The proposed works at the Carnwath Road Riverside site and the mitigation measures developed and advanced as part of the application directly accord with the approach required by the NPS. Adverse effects have been minimised as far as possible and opportunities taken to enhance the local environment and leave a positive legacy.
- G.6.7 Section 8 and 9 of the *Planning Statement* consider the implications of the local effects of the works at Carnwath Road Riverside and the other proposed development sites. It describes the overall balance between impacts and benefits associated with the project as a whole, against the guidance in the NPS and concludes that the works at Carnwath Road Riverside, and the project as a whole, are compliant with the NPS and that development consent should be granted.

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Annex G: Drawings for Carnwath Road Riverside

List of drawings

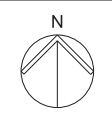
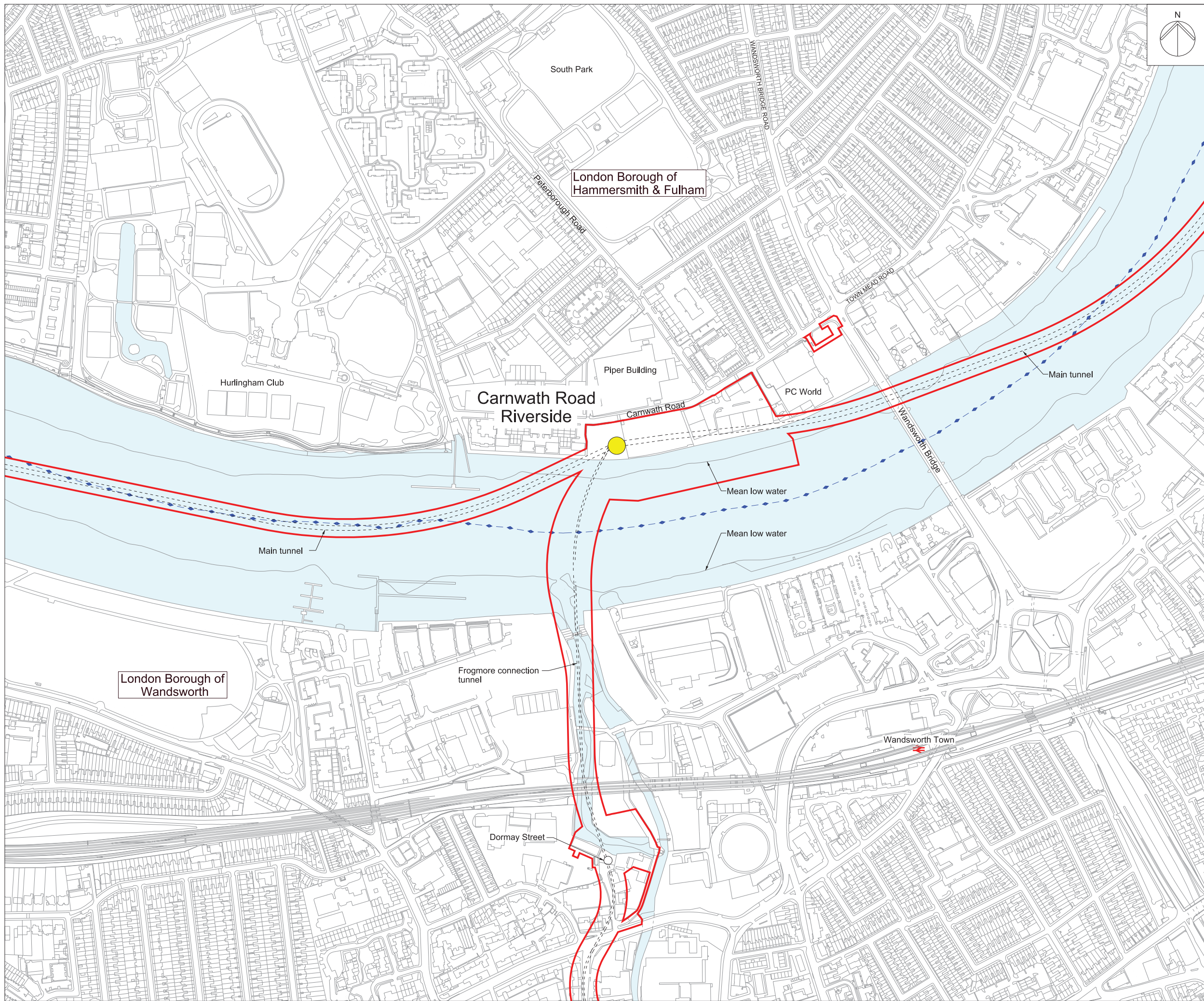
Carnwath Road Riverside: Location plan

Carnwath Road Riverside: As existing site features plan

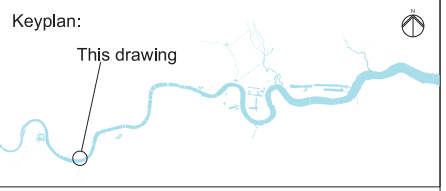
Carnwath Road Riverside: Construction phases plans

Carnwath Road Riverside: Land use plan

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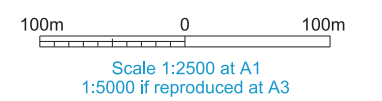


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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

Notes:

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



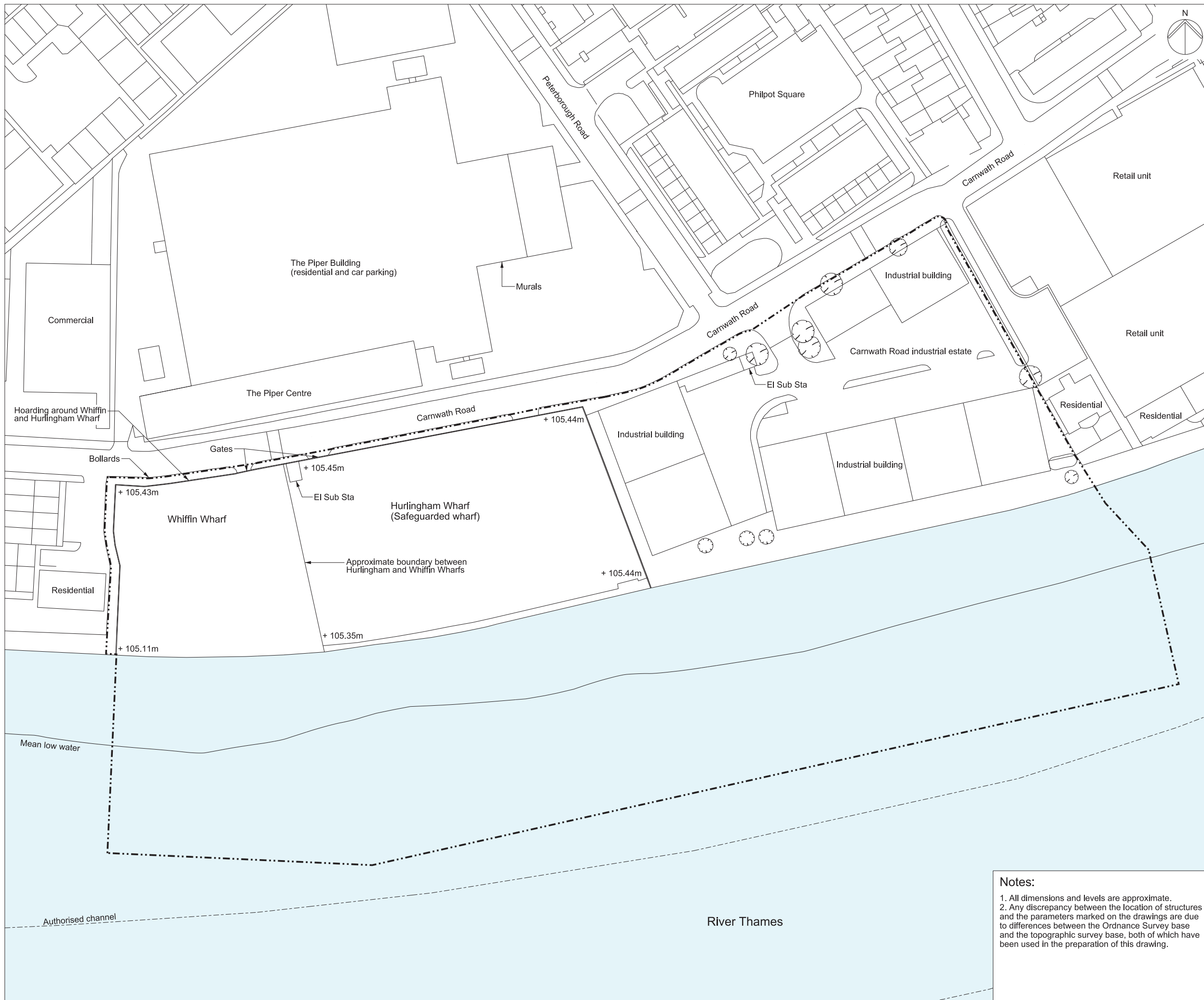
FOR INFORMATION

Location
Carnwath Road Riverside
London Borough of Hammersmith & Fulham

Document Information
Application for Development Consent
Location plan

Book of plans - section 9
DCO-PP-06X-CARRR-090001
January 2013



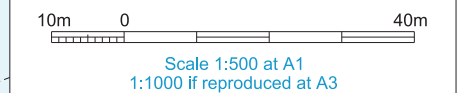


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:**
- Limits of land to be acquired or used (LLAU)
 - Authorised channel
 - + 105.40m Existing levels (shown in metres above tunnel datum)
 - ⊙ Existing trees approximate positions



FOR INFORMATION

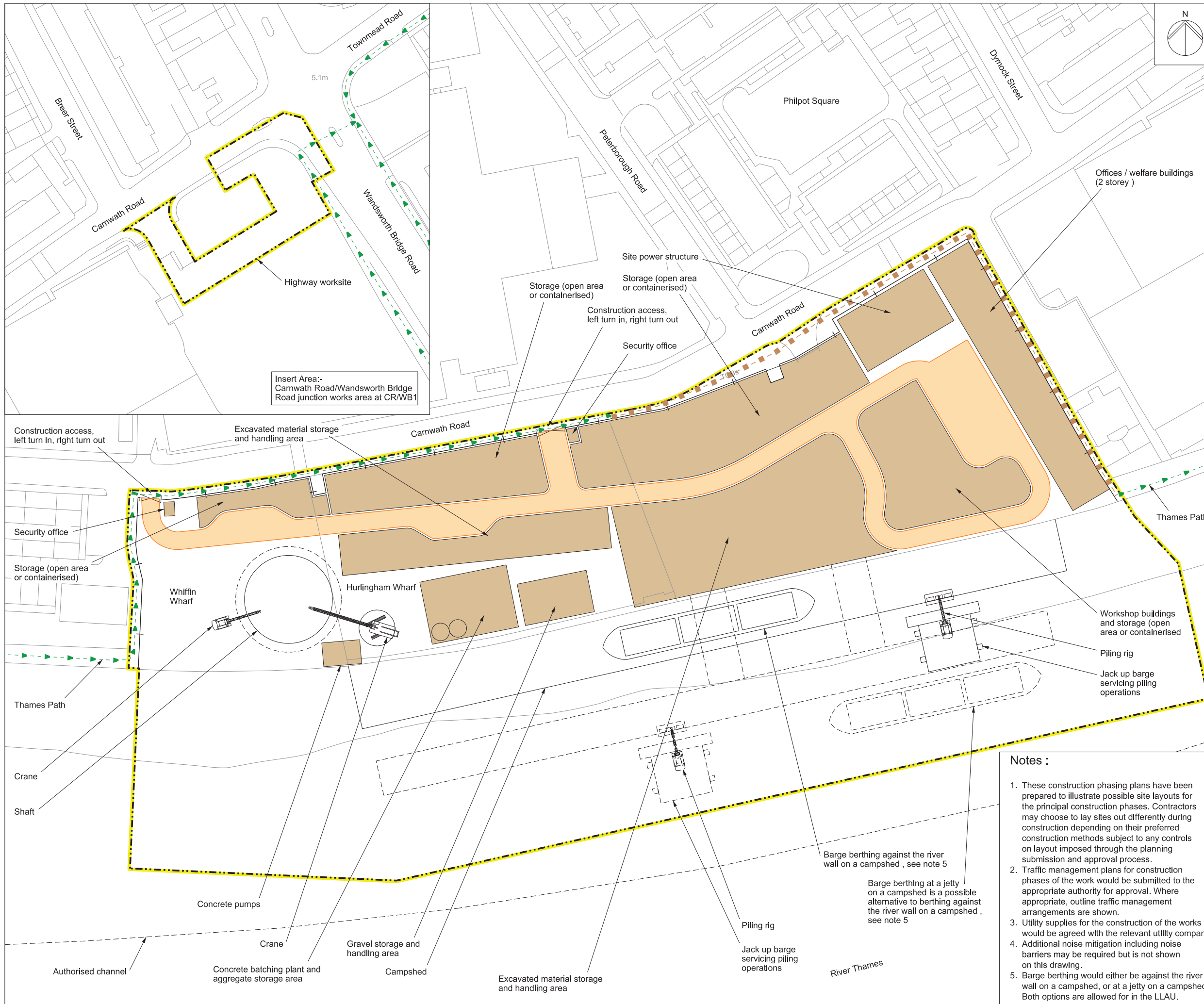
Location
Carnwath Road Riverside
London Borough of Wandsworth

Document Information
Application for Development Consent
As existing
Site features plan
Book of plans - section 9
DCO-PP-06X-CARRR-090002
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.





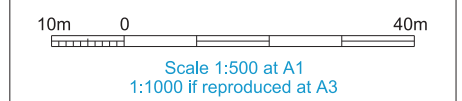
Insert Area:-
Carnwath Road/Wandsworth Bridge
Road junction works area at CR/WB1

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



ILLUSTRATIVE

Location
Carnwath Road Riverside
London Borough of Hammersmith & Fulham

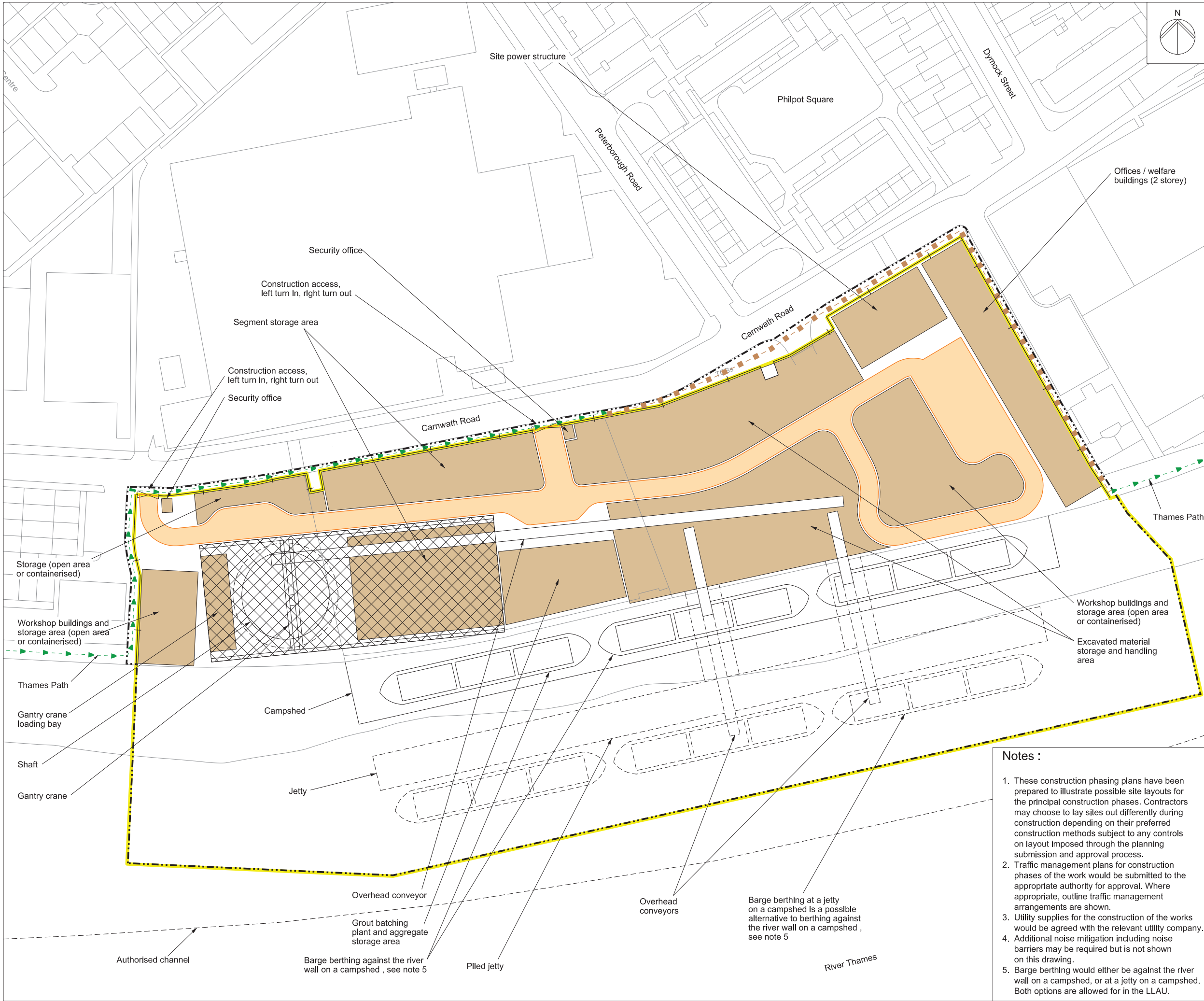
Document Information
Application for Development Consent
Construction phases - phase 1
Site setup & shaft construction
Book of plans - section 9
DCO-PP-06X-CARRR-090014
January 2013



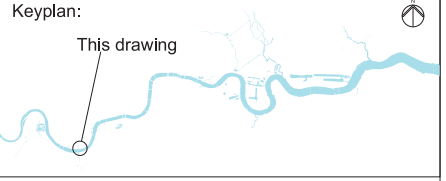
- Notes :**
- These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
 - 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.
 - Utility supplies for the construction of the works would be agreed with the relevant utility company.
 - Additional noise mitigation including noise barriers may be required but is not shown on this drawing.
 - Barge berthing would either be against the river wall on a campshed, or at a jetty on a campshed. Both options are allowed for in the LLAU.

Barge berthing against the river wall on a campshed, see note 5

Barge berthing at a jetty on a campshed is a possible alternative to berthing against the river wall on a campshed, see note 5

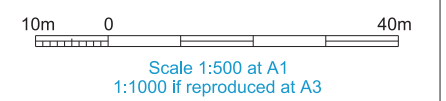


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - Route of temporary diversion of right of way
 - Site access
 - Access / haul route
 - Noise enclosure over shaft and gantry crane



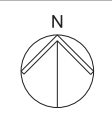
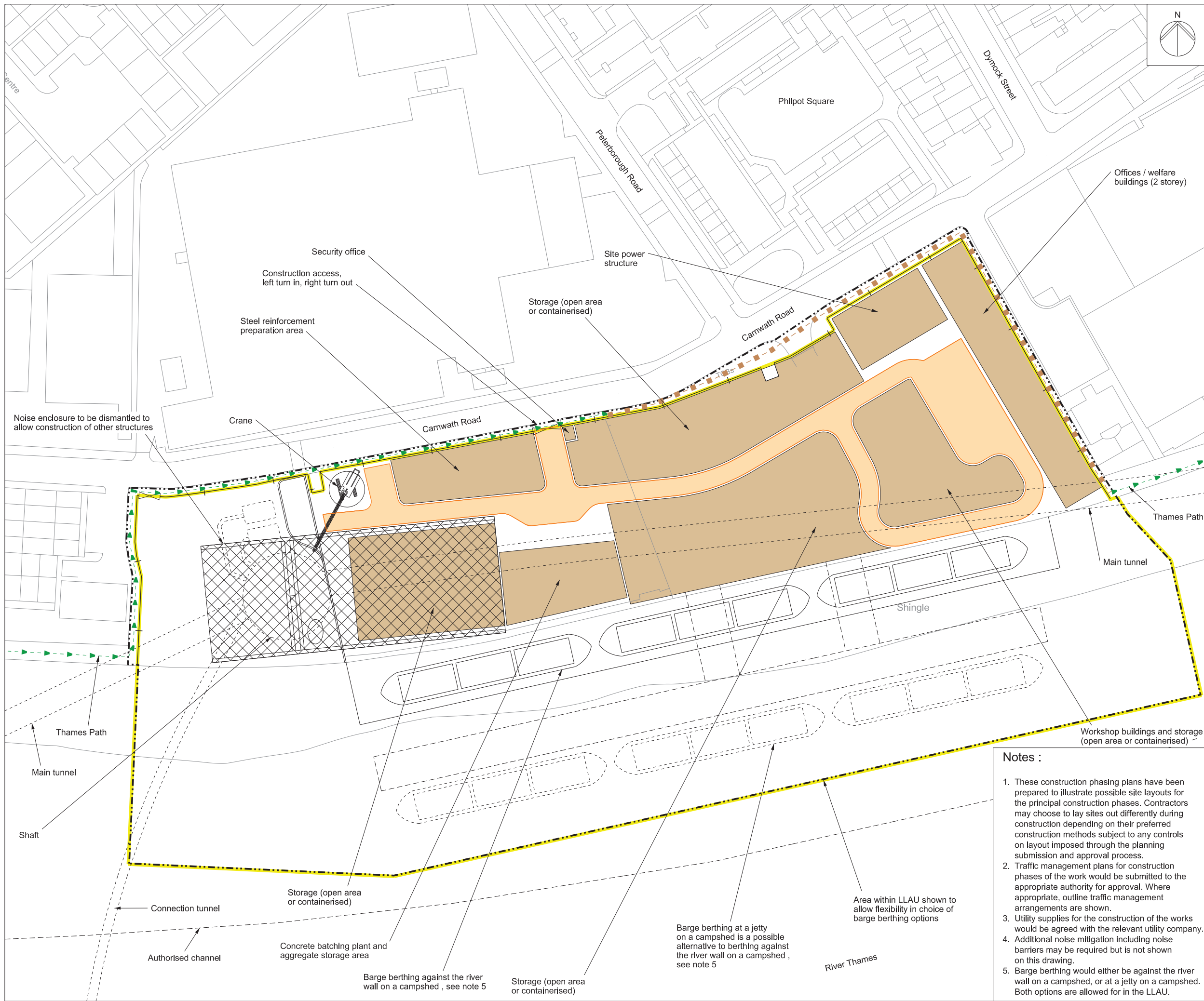
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Location
Carnwath Road Riverside
London Borough of Hammersmith & Fulham

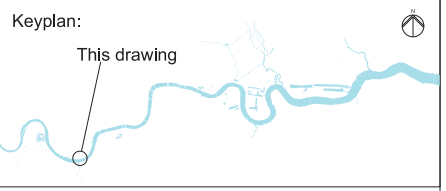
Document Information
Application for Development Consent
Construction phases - phase 2
Tunnelling
Book of plans - section 9
DCO-PP-06X-CARRR-090015
January 2013



- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key:
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Existing public right of way
 - Route of temporary diversion of right of way
 - Site access
 - Access / haul route
 - Noise enclosure over shaft and gantry crane

10m 0 40m
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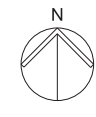
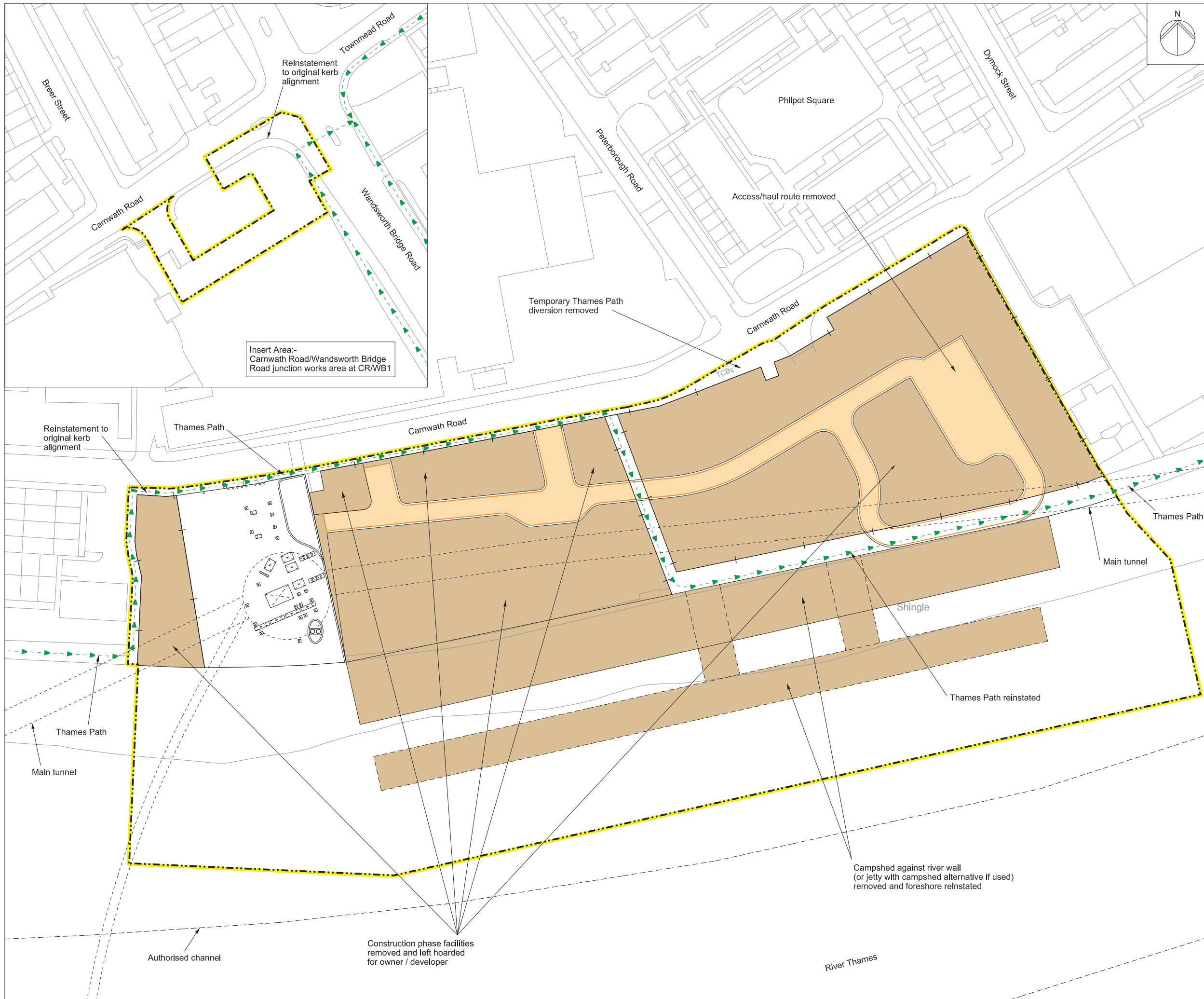
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Location
 Carnwath Road Riverside
 London Borough of Hammersmith & Fulham

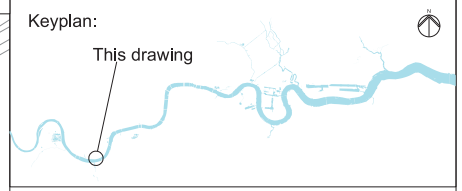
Document Information
Application for Development Consent
 Construction phases - phase 3
 Secondary lining & other structures
 Book of plans - section 9
 DCO-PP-06X-CARRR-090016
 January 2013



- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
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 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. Barge berthing would either be against the river wall on a campshed, or at a jetty on a campshed. Both options are allowed for in the LLAU.

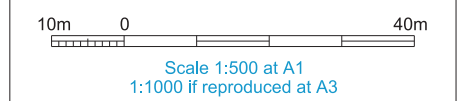


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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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



ILLUSTRATIVE

Location
Carnwath Road Riverside
 London Borough of Hammersmith & Fulham

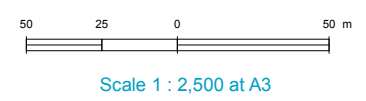
Document Information
Application for Development Consent
 Construction phases - phase 4
 Site demobilisation
 Book of plans - section 9
 DCO-PP-06X-CARRR-090017
 January 2013



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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

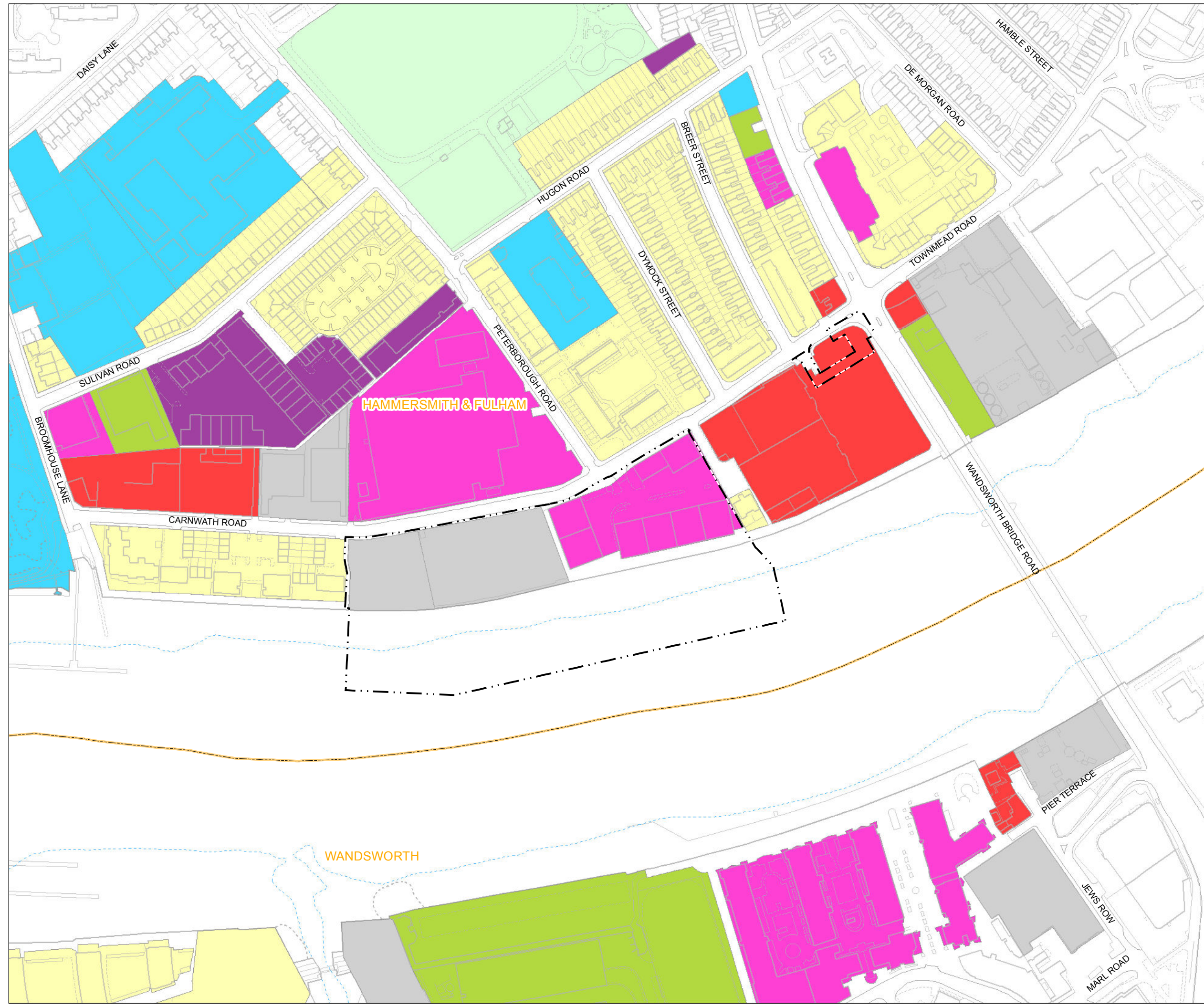


FOR INFORMATION

Location
Carnwath Road Riverside
London Borough of Hammersmith & Fulham

Document Information
Planning Statement
Land use

1PL03-MG-00806
January 2013



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