

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix A

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

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January 2013

**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement

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Appendix A: Acton Storm Tanks

A.1 Introduction

- A.1.1 Catchment modelling¹ indicates that in an average year, the Acton Storm Relief combined sewer overflow (the CSO) spills approximately 29 times and discharges 312,000m³ of untreated sewage into the River Thames at Chiswick Eyot in the London Borough of Hounslow. On the basis that litter tonnages are proportional to discharge volumes, approximately 79 tonnes of sewage derived litter is also discharged from this CSO in an average year (*Environmental Statement* Vol 4, Section 14).
- A.1.2 A worksite is required to receive the proposed main tunnel from Carnwath Road Riverside and to connect the existing Acton Storm Relief CSO to the main tunnel. The proposed development site is known as Acton Storm Tanks, which is located in the London Borough of Ealing. It lies adjacent to the London Borough of Hammersmith and Fulham to the east, and is close to the London Borough of Hounslow to the south.
- A.1.3 The Environment Agency identifies the Acton Storm Relief CSO as a CSO that needs to be controlled, and Thames Water's² solution is for full interception. The CSO discharges have multiple impacts on water quality at the outfall location. This includes a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants and the discharge of sewage litter and effluent.
- A.1.4 Catchment modelling suggests that if the project is constructed as proposed, in a typical year, the CSO would not spill into the Thames. Similarly, the tonnage of sewage derived litter from the CSO would be reduced to zero (*Environmental Statement* Vol 4, Section 14.6). The location of the site is identified in the Site location plan in Annex A.
- A.1.5 This assessment is structured as follows:
- a. Section A.2 provides a brief description of the Acton Storm Tanks site.
 - b. Section A.3 sets out the planning context for works in this location.
 - c. Section A.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 A.5 provides an analysis of the principal site-specific planning considerations and the compliance of the proposals with relevant planning policy.
 - e. Section A.6 provides an overall conclusion of the site-specific assessment.

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

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

A.2 Site description

A.2.1 Acton Storm Tanks is located on land within an enclosed area of an existing Thames Water operational facility covering an area of approximately 2ha. The site is a long established utilities site and is predominantly covered in hardstanding. It comprises the existing pumping station in the east of the site, six open storm tanks and associated infrastructure. A grassed area exists in the southeastern part of the site and two areas of hardstanding for vehicle parking are located to the southwest and west of the storm tanks.

Figure A.1 Aerial photograph of Acton Storm Tanks



A.2.2 The site functions to control the frequency of discharge from the Acton Storm Relief CSO. Currently the operation of the site is managed such that four of the six storm tanks (tanks 1 to 4) fill with storm water when the Stamford Brook sewer reaches capacity. When tanks 1 to 4 are full, the sewer then discharges to the tidal Thames via the CSO. These four tanks therefore act to capture some storm flows and limit the volume and frequency of discharges at the CSO. Tanks 5 and 6 are kept in reserve and only filled when the CSO is unable to discharge due to tide-locking conditions.

A.2.3 The site is bounded to the north by Canham Road and light industrial business or commercial areas, including Acton Park Industrial Estate. A community hall is located immediately to the northwest of the site and is used for a number of community activities including scouting groups and a nursery school. A church is located further to the north of the site within

Long Island House at 1 to 4 Warple Way. To the southwest and west, the site is bounded by a third party vehicle parking area ('private car park') with a gated access and secure pedestrian access to the north. The limits of land to be acquired or used also include Canham Road and its junctions with Stanley Gardens and Warple Way.

- A.2.4 The surrounding area is predominantly residential in character. The nearest properties are a number of two-storey dwellings immediately to the northeast of the site on the southern boundary of Canham Road (1 to 5 Canham Road). These properties have rear gardens adjoining the Thames Water operational site, and the gardens are interspersed with mature trees which provide some visual screening. The shortest distance between 1 to 2 and 5 Canham Road and the site boundary is approximately 11m, and approximately 19m between 3 to 4 Canham Road and the site boundary.
- A.2.5 The east and southeast of the site is bounded by Warple Way. Beyond this, located within the London Borough of Hammersmith and Fulham, there are residential properties including the newly constructed five-storey apartment blocks known as the 'The Factory Quarter'. The Factory Quarter contains 450 residential units across seven blocks, as well as multi-use community focused meeting space, retail and commercial space. Tesla Court (1 to 40) forms part of this development and is approximately 12.5m from the site's eastern boundary. Further southeast are the apartment blocks Edison Court (1 to 66), Longford Court (250 to 269) and Emlyn Gardens, a five-storey 1930s housing estate. The shortest distance between Emlyn Gardens and the site boundary is 11.5m. The existing site is only visible from the upper floors of these apartment blocks, and there is some intermittent visual screening provided by semi mature trees and vegetation along Warple Way.
- A.2.6 Two storey terraced properties are also located along Greenend Road, beyond the car park to the southwest and west of the site. Many of Greenend Road properties have had loft conversions to provide additional accommodation. The shortest distance between the habitable rooms of the Greenend properties and the northwest site boundary is approximately 33m, and approximately 20m from end of the rear gardens. Mature trees at the end of the gardens of these properties provide a degree of visual screening on to the site.
- A.2.7 Southfield Primary School lies approximately 90m to the south of the site. Beyond this (approximately 125m from the site) is the Bedford Park Conservation Area. The conservation area designation stretches across the London Borough of Ealing and the neighbouring borough of Hounslow.
- A.2.8 The key features of the site are illustrated in the Existing site features plan in Annex A.

A.3 Planning context

- A.3.1 In developing the proposals and mitigation measures for the development at Acton Storm Tanks, Thames Water had regard to the policies set out in the National Policy Statement for Waste Water (the 'NPS'), and to local

development plan designations where these are relevant to the application.

- A.3.2 In this case, the local development plan comprises:
- a. the *London Plan* (July 2011).
 - b. The London Borough of Ealing's *Development Strategy (or Core Strategy)* (April 2012).
 - c. Saved policies from the council's *Unitary Development Plan* (2004), which is expected to be fully replaced by mid-2013 by the emerging *Development Management Plan Document*.
- A.3.3 The site has an established use and has been used as a sewage pumping station since the late 1800s. The existing storm tanks were built in the 1960s with the objective of delaying sewage and storm water spills into the River Thames.
- A.3.4 The Acton Storm Tanks site is allocated for "*Thames Tunnel³ operational requirements*" in the draft London Borough of Ealing *Development Sites Development Plan Document* (publication version 29 June 2012). Consultation on the *Final Sustainability Reports* for the *Development Sites Development Plan Document* ended on 16 November 2012, and the document is anticipated to be adopted in spring 2013. The *Development Plan Document* acknowledges that the delivery of the project has now been confirmed, and the indicative delivery timetable is 2021 to 2026. It states that the site was "*identified through on-going engagement with Thames Water regarding delivery of the Thames Tunnel and its implications for Ealing*" (p. 109).
- A.3.5 No relevant extant planning permissions or pending applications within the site boundary or its immediate vicinity were identified as a result of on-going application monitoring.

A.4 Site-specific description of development

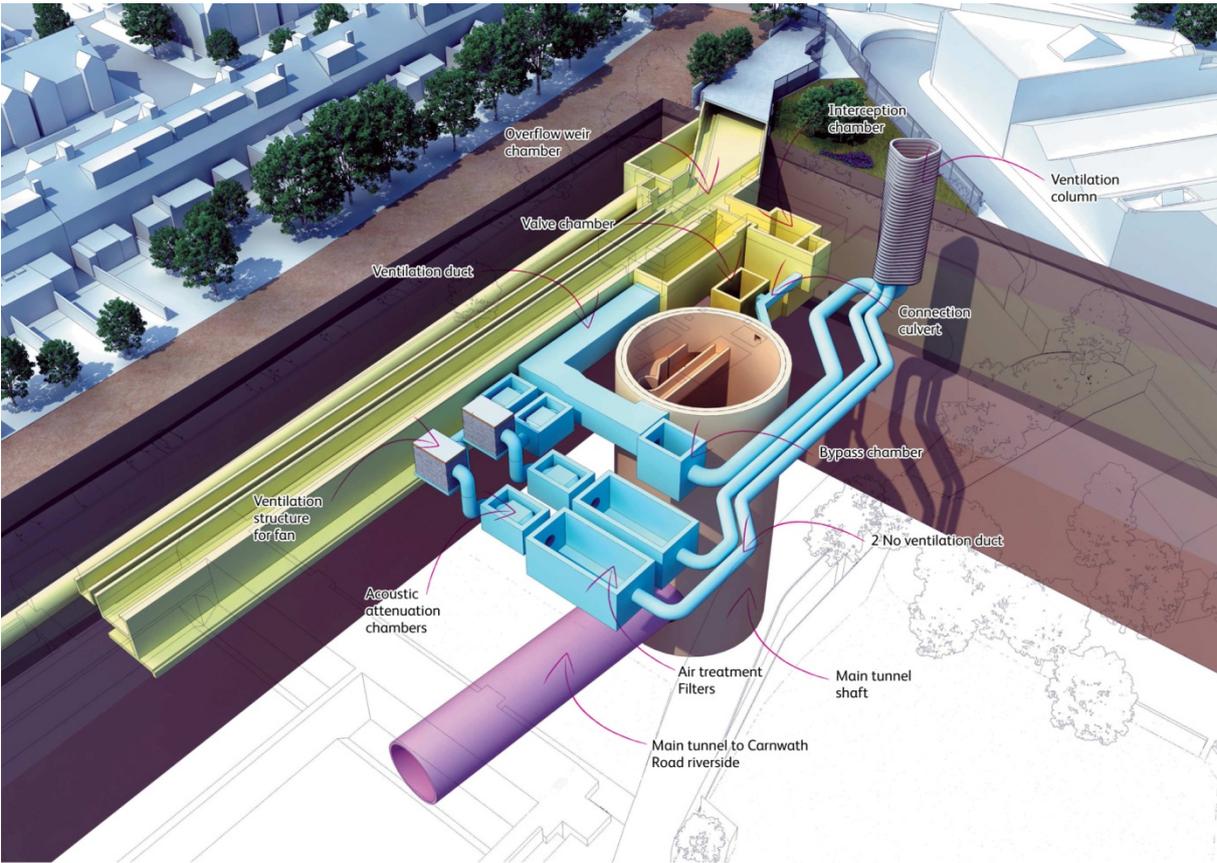
Overview

- A.4.1 The proposed development at Acton Storm Tanks would reduce the frequency of spills to the river from the Acton Storm Relief CSO. The works would convey flows from the inlet of the Acton Storm Tanks to the main tunnel.
- A.4.2 The works would require the construction of a CSO interception chamber, hydraulic structures (including valve chambers, overflow chambers, culverts and pipes), ventilation structures, a ventilation column and an electrical and control kiosk.
- A.4.3 Flows would be transferred from the relatively shallow depth of the existing pipework to the deeper level of the main tunnel via a drop shaft. The shaft would be approximately 31m deep and connect directly to the western end of the main tunnel.

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

- A.4.4 The shaft would receive the tunnel boring machine (TBM) for the Carnwath Road Riverside to Acton Storm Tanks main tunnel length.
- A.4.5 All permanent works would be surrounded by an operational maintenance hardstanding area. The area would be located within the existing perimeter of the existing Thames Water operational site.
- A.4.6 The works would result in the decommissioning and infilling of the two northernmost storm tanks (tanks 5 and 6). The remaining four tanks (tanks 1 to 4) would be hydraulically isolated from the sewer network through the construction of a permanent barrier within the existing inlet structure to those tanks.

Figure A.2 Functional components diagram



Application for development consent

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

Table A.1 Acton Storm Tanks: 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</i>

Drawing title	Status	Location
		<i>Tideway Tunnel) Development Consent Order</i>
Access plan	For approval	<i>Book of Plans, Section 5</i>
Demolition and site clearance plans (various)	For approval	<i>Book of Plans, Section 5</i>
Site works parameter plan	For approval	<i>Book of Plans, Section 5</i>
Permanent works layout	Illustrative	<i>Book of Plans, Section 5</i>
Proposed landscape plan (various)	Indicative	<i>Book of Plans, Section 5</i>
Section AA	Illustrative	<i>Book of Plans, Section 5</i>
As existing and proposed north elevation (various)	Illustrative	<i>Book of Plans, Section 5</i>
Ventilation column design intent	Illustrative	<i>Book of Plans, Section 5</i>
Construction phases plans (various)	Illustrative	<i>Book of Plans, Section 5</i>
Highway layout during construction (various)	Illustrative	<i>7.10.1 Transport Assessment: Acton Storm Tanks, Volume of Figures</i>

A.4.8 The Nationally Significant Infrastructure Project works (Work Nos. 2a) comprise the construction of a CSO drop shaft with an internal diameter of approximately 15m and depth of 31m. Associated development (Work no. 2b) comprises the works to intercept and divert flow from the Acton Storm Relief CSO to the Acton Storm Tanks main tunnel shaft (Work No. 2a) and into main tunnel (west) (Work No. 1a), including decommissioning, partial demolition and infilling of two existing storm tanks, works to establish a main tunnel reception site, construction of an interception chamber, CSO overflow structures, hydraulic structures, structures for air management plant and equipment and other structures to manage and intercept flow. The full description of the proposed development can be found in Schedule 1 to the development consent order, and further details of the temporary construction works and permanent operational structures are contained below.

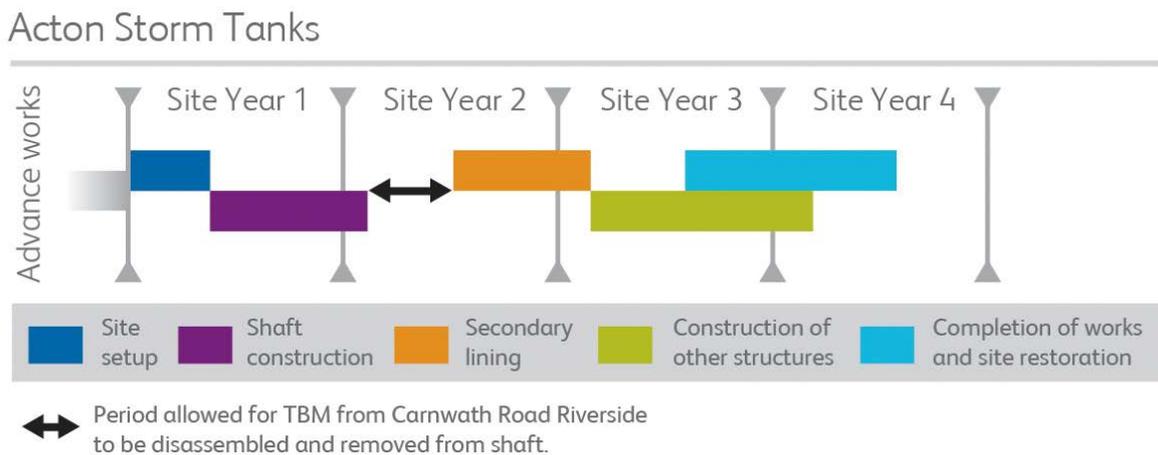
A.4.9 At this site, approval is sought for the works shown on the Works plan showing Work No. 2a, and the Site works parameter plan which shows the relevant zones and limits of land to be acquired or used in which the associated development works would be undertaken (Work No. 2b), Access plans, and Demolition and site clearance plans. The plans for approval are contained in the *Book of Plans* along with other plans showing the construction phasing and permanent works plans relevant to this site. These other plans are marked either for approval, for information, indicative or illustrative depending on the level of detail they 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

- A.4.10 Construction at Acton Storm Tanks is anticipated to take approximately three and a half years and would involve the following steps (with some overlaps):
- a. Site Year 1: site preparation (approximately five months)
 - b. Site Years 1 to 2: shaft construction (approximately eight months)
 - c. Site Years 2 to 3: secondary lining (approximately seven months)
 - d. Site Years 3 to 4: construction of other structures (approximately 12 months)
 - e. Site Years 3 to 4: completion of works and site restoration (approximately 12 months).
- A.4.11 The construction timeline is presented graphically in Figure A.3 below.

Figure A.3 Construction timeline



- A.4.12 The majority of construction 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.4.13 A period of 24-hour working would be required for secondary lining of the main tunnel. During this period of continuous working, activities would be predominately below ground, with support activities occurring at ground level. Heavy goods vehicle (HGV) movements however, would be limited to daytime hours.
- A.4.14 Further information about working hours and site-specific restrictions are contained within the *Code of Construction Practice (CoCP)* Parts A and B, which accompany the application.
- A.4.15 Construction vehicles would access the site via The Vale (A4020) carriageway. Vehicles would travel southbound along Warple Way, turn into Canham Road and then access the site via a new construction site entrance off Canham Road.

- A.4.16 Vehicles exiting the site would use the same access and turn left into Canham Road before travelling northbound along Stanley Gardens and returning to The Vale (A4020) carriageway.
- A.4.17 It is anticipated that an average of seven heavy goods vehicles would access the site per day for the majority of the construction period. This would rise to approximately 23 HGVs per day over an estimated five month period during part of the secondary lining of the main tunnel.
- A.4.18 There may be additional periods during key construction activities when these HGV numbers would need to be exceeded. Potential layouts of the construction site are shown on the Construction phasing plans, which are in Annex A. 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 that main construction activities are contained within the appropriate zones.

Site preparation

- A.4.19 Additional trees would be planted along sections of the eastern side perimeter fronting Warple Way. This would be conducted in advance of the main works.
- A.4.20 The site boundary would be established via the erection of timber hoarding and welfare and office facilities provided using stacked portable cabin style units. The maximum height of the hoarding would be up to 3.6m in height.
- A.4.21 A new construction access would then be constructed off Canham Road. The creation of this access would require kerb realignment, associated traffic management, utility diversion and the removal of sections of the operational site perimeter fence.
- A.4.22 Areas of parking suspension would be implemented in Warple Way, Canham Road and Stanley Gardens to facilitate heavy goods vehicle access.
- A.4.23 The two northerly storm tanks (tanks 5 and 6) would then be decommissioned. The internal faces of the tanks would be cleaned and any debris removed.
- A.4.24 The walls of storm tanks 1 to 4 would be raised by 1m to increase capacity prior to the decommissioning of tanks 5 and 6. The central concrete dividing wall between the two tanks would be demolished together with sections of the tank walls on the northern and eastern sides. Areas of the concrete base of tanks 5 and 6 would then be removed to enable the construction of the drop shaft through the tank base. Additional structural support may be installed within the tanks to enable the demolition of the base.
- A.4.25 The extent of demolition works is illustrated on the Demolition and site clearance plans.

Shaft construction

- A.4.26 The 15m internal diameter drop shaft would then be constructed through the part demolished bases of storm tanks 5 and 6.

- A.4.27 Shaft construction would initially commence from tank base level. A vehicle ramp would be constructed to enable access to the lower tank base from the ground level of the adjacent site.
- A.4.28 Shaft construction would comprise excavating in approximately 1m increments and then using a sprayed concrete lining to form the shaft walls. This process would be repeated until the required depth of shaft is reached.
- A.4.29 As the shaft is progressed, excavated material would be used to progressively infill tanks 5 and 6. Excavated material would be stock piled within the tanks and periodically moved over the entire tank base, thereby part filling the tanks. This process would be repeated until these tanks are filled to the adjacent ground level. The material would then be moved and compacted by mechanical plant and equipment.
- A.4.30 Once filled, further excavated material from the shaft would be lifted to ground level using a mobile crane prior to being deposited in a material handling area within the site, and subsequently removed from site by HGVs. The concrete required on the site may either be batched on site, or delivered ready mixed as required.

Tunnelling

- A.4.31 The site would receive the TBM from the Carnwath Road Riverside to Acton Storm Tanks main tunnel length. No tunnel construction would be undertaken from the site.
- A.4.32 The TBM 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 via road.

Secondary lining of main tunnel and shaft

- A.4.33 A secondary concrete lining would then be applied to the shaft and the main tunnel. This is required to improve their durability, water tightness and structural integrity.
- A.4.34 A noise enclosure would be constructed over the shaft. This is anticipated to comprise a 'warehouse' style structure and assembled from prefabricated components. Mobile cranes and other plant would be used for its construction.
- A.4.35 The process would involve casting an *in situ* concrete lining using a curved mould, or shutter, to form the internal face of the shaft and tunnel. The secondary lining would be progressed by continuously pouring concrete to the shutter as it is advanced either vertically up the wall of the shaft or horizontally along the length of the tunnel.
- A.4.36 Only half the Carnwath Road Riverside to Acton Storm Tanks tunnel length would be lined from this site. The remainder would be lined from the Carnwath Road Riverside site.
- A.4.37 The concrete for the secondary lining may either be batched on site, or delivered ready mixed to site. It would be pumped from surface level down to the connection tunnel or shaft.

Construction of other structures

- A.4.38 The internal layout of the shaft, including concrete access platforms and the concrete vortex generator would then be constructed.
- A.4.39 The extension to the overflow weir chamber to the northwest of tanks 5 and 6 and new overflow pipework would then be constructed along the western perimeter of the site. These works would bypass these tanks allowing hydraulic isolation except when the main tunnel is closed for maintenance. Areas of the adjacent private car park would be temporarily required to provide a short term working area. It is anticipated that this work may be conducted in a series of phases to minimise the impacts upon the car park. Refer to the Traffic and transport subsection for further details regarding the temporary impacts on the car park.
- A.4.40 In order to create the temporary working area, sections of the existing site perimeter fencing and retaining wall would be removed. It is anticipated that this working area would be surrounded by temporary weld mesh fencing to provide segregation from adjacent car park users.
- A.4.41 The extension to the overflow weir chamber would be constructed from *in situ* concrete poured into shuttering to provide the structure's shape. Modifications to the existing chamber would be required using mechanical plant.
- A.4.42 The overflow pipework would then be constructed using open cut techniques. The excavation would be suitably supported with precast pipes being installed sequentially.
- A.4.43 The access chamber would then be constructed to connect new overflow pipework to the existing CSO pipework. This would be constructed from *in situ* concrete poured into a shuttered excavation.
- A.4.44 In order provide sufficient working area for the access chamber, one of the existing access lanes to the car park would be temporarily suspended whilst the chamber is built. Vehicle access to the car park would be maintained via appropriate traffic management on the remaining access lane.
- A.4.45 Once work within the private car park is complete, the area would be reinstated and the temporary fencing removed.
- A.4.46 The interception chamber, valve chamber, ventilation structures and connection culvert would then be constructed. It is anticipated that these structures would be constructed within temporary sheet piled excavations, and formed from *in situ* concrete.
- A.4.47 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.
- A.4.48 The electrical and control kiosk would then be located within the building of the existing pumping station.

Completion of works and site restoration

- A.4.49 The area immediately adjacent to the new below ground structures would be finished in a hard landscape material to facilitate safe operational access. Soft landscaping would be provided around the perimeter of the area formally occupied by storm tanks 5 and 6.
- A.4.50 An area for sustainable drainage would be planted between the site and the boundary of 5 Canham Road. The area to the north of the site, bordering Warple Way, would be planted to provide visual screening.
- A.4.51 As the landscaping is progressed, 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.
- A.4.52 The remaining four storm tanks (1 to 4) would not be demolished or filled as part of the site restoration works. It is likely that they would be cleaned and any internal debris removed. Tanks 1 to 4 would be hydraulically isolated. In order to mitigate the risk of upstream flooding, they would only continue to function in exceptional circumstances. For further details refer to the Air quality, emissions, dust and odour subsection.
- A.4.53 The system would then be commissioned. Once all work is finished, any temporary fencing would be removed and any final landscaping requirements completed. All vehicles and equipment would then be removed from site.

Operation

CSO drop shaft

- A.4.54 The Acton Storm Tanks CSO drop shaft would be constructed within the two northernmost storm tanks of the site and serve as a reception shaft for the main tunnel boring machine. The drop shaft would have an approximate internal diameter of 15m and would be constructed at an approximate depth of 31m to tunnel invert level. The shaft would be finished at existing ground level.

Interception chambers and culverts

- A.4.55 The CSO interception chamber would be finished approximately 2m above existing ground levels for hydraulic and operational reasons. Flows from the CSO would be diverted via a modification to the existing channel to the interception chamber. A penstock would be provided at the inlet to this channel to control flows into the tunnel.
- A.4.56 The valve chamber would be finished at ground level and would be approximately 8m deep to chamber invert level. A below ground connection culvert would transfer the flow from the interception chamber to the shaft via the valve chamber.

Ventilation structures

- A.4.57 Most of the ventilation plant would be located underground within the existing storm tanks. The fans would be set at ground level inside individual acoustic housings.

A.4.58 The ventilation structure would sit within the north of the site adjacent to the CSO shaft. It would stand 15m high. A pressure relief structure (approximately 4m high), and an air inlet structure (approximately 2m high, integral with the interception chamber), would also sit adjacent to the shaft.

A.4.59 Underground structures would contain passive filters and connect the ventilation columns to the structures that they would ventilate. The underground structures would have ground level access covers for inspection and maintenance purposes.

Electrical and control kiosk

A.4.60 Electrical plant would be housed within the mechanical control centre room of the existing control and standby generator building. This room currently contains the switchboards and controls for the pumping station and storm tanks associated with the Thames Water facilities.

Permanent restoration and landscaping

A.4.61 The northern site boundary fence line might be set back from the existing alignment to create a wider footpath. The area between this fence line and the rear of the Canham Road footpath would be retained in Thames Water ownership.

A.4.62 The area around the shaft would be finished with hardstanding to allow crane access to the covers on top of the shaft. This hardstanding would not be publicly accessible. The area around the fan acoustic enclosures and below ground structures would be provided with sufficient hardstanding to provide vehicular access.

A.4.63 Access to the Acton Storm Tanks site would continue to be through the existing site access onto Canham Road, adjacent to the junction with Warple Way. The new direct access onto Canham Road would be utilised for infrequent maintenance activities only.

A.4.64 There would be tree and hedge planting along Warple Way in advance of site clearance and construction to partially screen views. Planting would be retained post construction.

A.4.65 The existing lighting scheme to the compound would be reinstated.

Typical maintenance regime

A.4.66 Once the project is operational, it is anticipated that Thames Water personnel would visit the site approximately every three to six months to inspect and carry out maintenance of the electrical and control, ventilation and below-ground equipment. This would likely involve a visit by personnel in a small van during normal working hours and may take several hours.

A.4.67 It is anticipated that a major internal inspection of the tunnel system and underground structures would be required once every ten years. This process would likely involve a small team of inspection staff and support crew and two mobile cranes to lower the team into the CSO drop shaft. The inspection would be carried out during normal working hours and would likely take several weeks.

- A.4.68 Thames Water may also need to visit the site for unplanned maintenance or repairs, for example, in the event of a blockage or an equipment failure. Such a visit may require the use of mobile cranes and vans.

Scheme development

- A.4.69 The proposed Acton Storm Tanks site was subject to over two years of extensive consultation and engagement. The site featured as a preferred site in two full rounds of public consultation; however, the proposed use of the site changed over time. At phase one consultation, Acton Storm Tanks was presented as a CSO site to intercept the Acton Storm Relief CSO, but was subsequently presented as a combined main tunnel reception site and CSO site at phase two consultation. The site was also subject to a phase of interim engagement and a period of pre-application publicity. Throughout this period, the scheme evolved in response to consultation, through engagement with key stakeholders, and through on-going design development. The *Consultation Report*, which accompanies the application, contains detailed information on the consultation process.
- A.4.70 At phase one consultation, which ran from September 2010 to January 2011, Acton Storm Tanks was the preferred site for intercept the Acton Storm Relief CSO with a long connection tunnel to the Hammersmith Pumping Station site. At this stage Hammersmith Pumping Station was the preferred site to receive the main tunnel.
- A.4.71 The main issues and concerns raised during phase one consultation in relation to the site were the potential impact on residential amenity during construction, existing odour problems on the site, increased congestion and alternative access arrangements, the impact on the conservation area, the need for the whole site to be improved and the impact of odour on completion of the works. Key comments in support of the proposed use of the site noted that the land is already in Thames Water's ownership for an existing utility purpose and that there is an opportunity to significantly improve the area through regeneration of the site.
- A.4.72 At phase one consultation, the London Borough of Ealing did not object to the use of Acton Storm Tanks to intercept the Acton Storm Relief CSO, but noted that future discussions would be necessary to provide further information on the construction and operational impacts. It specifically requested that investigations should be undertaken to *"resolve the problems of the strong unpleasant odours presently experienced by occupiers of properties within the vicinity of the site"*. The London Borough of Hammersmith and Fulham acknowledged the proposed use of the site and also highlighted the need to address the odour problems.
- A.4.73 Following phase one consultation, a planning application for mixed use development was submitted and approved covering the area around the Hammersmith Pumping Station site which meant there would be insufficient space to accommodate a main tunnel site in that location. In addition, further studies into the hydraulic requirements for the Acton connection tunnel were conducted and it was determined that a larger diameter tunnel was required than initially proposed in order to meet the flow and storage requirements of the main tunnel system. As a result of

these changes, the broad search area for the main tunnel site at the western end of the tunnel changed to the Acton Storm Tanks area.

- A.4.74 Acton Storm Tanks was large enough to potentially be suitable for use as a main tunnel reception site and the main tunnel could be extended to enable a direct connection to the CSO. Given the proposed change of use of the site, drop-in sessions for the local community were held on 26 and 27 July 2011 at the Scout Hut. All the comments were reviewed and taken into account as part of the site selection process. Key issues also raised at these sessions were:
- a. decommissioning the existing storm tanks
 - b. isolating the existing storm tanks
 - c. addressing the odour nuisance
 - d. addressing the inadequate footpath along Canham Road
 - e. refurbishing the concrete fence along Canham Road
 - f. landscaping and re-planting areas of the site.
- A.4.75 At phase two consultation, which ran from November 2011 to February 2012, Acton Storm Tanks was the preferred site to receive the main tunnel from Carnwath Road Riverside and remained the preferred site to connect the Acton Storm Relief CSO to the main tunnel. Three other sites were also shortlisted as potential alternative sites to receive the main tunnel: Commercial units Stanley Gardens, Acton Park Industrial Estate, and Industrial units Allied Way. These alternative sites were less suitable because they would result in both temporary and permanent loss of employment land and would potentially affect a number of community uses. In terms of tunnelling options, these sites could be used as main tunnel sites, but there would still need to be a site at Acton Storm Tanks to intercept the CSO.
- A.4.76 The principal reasons and site characteristics for the selection of the Acton Storm Tanks site are as follows:
- a. It is a brownfield, previously-developed site.
 - b. It is a Thames Water-owned site.
 - c. Its use would be broadly consistent with the existing established use of the site.
 - d. It would be less disruptive to existing employment uses compared with other alternative sites.
- A.4.77 The London Borough of Ealing was supportive of the proposed change in use of the site which is evident in its phase two consultation response: *“There are no objections in principle to proposing to drive a larger main tunnel up to the Acton Storm Tanks site from the river, rather than the connection tunnel proposed in Phase 1. The basis for this change is understood and accepted as being an appropriate amendment to the scheme. It is not considered that the longer construction period and larger construction area would have a more significant impact on the local area. In this respect it is noted that the overall construction period would be*

approximately three and a half years". The London Borough of Hammersmith and Fulham did not object to the change in use of the site.

- A.4.78 Following the proposed change in use of the site and in response to stakeholder feedback listed in para. A.4.74, there were a number of key design developments presented at phase two consultation. The shaft was relocated to the northwestern part of the site in place of existing storm tanks 5 and 6 to accommodate its increased size and the tanks would be decommissioned and filled in. The relocation also reduced potential construction impacts on local residents in nearby high rise apartment blocks on Warple Way. The four remaining tanks would be hydraulically isolated in order to reduce odour issues. Two new accesses were proposed from Canham Road and the footpath on the south side of Canham Road would be widened. Supportive feedback was received in relation to these design amendments from the London Borough of Ealing, the Design Council CABE and other key stakeholders, particularly given that the proposal would make use of the existing tanks. The Environment Agency does not object to the decommissioning of these tanks.
- A.4.79 In response to phase two consultation and on-going engagement, there were further design developments including a significant reduction in the number of above-ground structures on the site. Further details regarding these design changes are in the Good design subsection below, and in Section 6 of the *Design and Access Statement*, which accompanies the application.
- A.4.80 As a result of these improvements and the identification of mitigation measures, the Acton Storm Tanks was the most appropriate site to intercept the Acton Storm Relief CSO and to receive the western section of the main tunnel. It was therefore publicised as Thames Water's proposed site at Section 48 publicity, which ran from July 2012 to October 2012.
- A.4.81 The proposed site was identified and then assessed through a robust, qualitative, and iterative site selection process, and was subject to over two years of extensive consultation and engagement. The site selection methodology used to select the site was subject to consultation with local authorities and key stakeholders. For further details refer to the *Final Report on Site Selection Process*, which accompanies the application.
- A.4.82 No feasible or preferable alternative sites were put forward by stakeholders and the extensive site selection process did not identify any alternative sites that would be suitable for the works that are required.
- A.4.83 In summary, the principal issues that arose from pre-application consultation and Section 48 publicity for Acton Storm Tanks are as follows:
- a. Existing odour issues at the site: this issue is addressed in the Air quality, emissions, dust and odour subsection below.
 - b. Existing storm tanks: this issue is addressed in the Good design subsection below.

- c. Reduction in the size of the permanent above-ground structures and their relocation within Storm Tanks 5 and 6: this issue is addressed in the Good design subsection below.
- d. Disruption from construction noise and effect on air quality: this issue is addressed in the Noise and vibration and Air quality, emissions, dust and odour subsections below.
- e. Disruption from construction traffic on local businesses: this issue is addressed in the Traffic and transport subsection below.
- f. Effective site management and options for temporary replacement parking: this issue is addressed in the Good design and Traffic and transport subsections below.
- g. Disruption to pedestrian routes and pedestrian safety including widening of the footpath on the southern side of Canham Road: this issue is addressed in the Good design subsection below.
- h. Legacy of development: this issue is addressed in the Good design subsection below.
- i. Options for landscaping: this issue is addressed in the Good design subsection below.

A.5 Site-specific planning considerations

A.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at Acton Storm Tanks. It considers the issues and factors identified in the NPS and other issues relevant to the site, as set out in para. A.4.83.

Meeting the need

A.5.2 The proposed works at Acton Storm Tanks would be successful in meeting the specific need of facilitating construction of the western section of the main tunnel, receiving the tunnel boring machine driven from Carnwath Road Riverside and interception of the Acton Storm Relief CSO. These works would make an important contribution to meeting the wider need for the project and delivery of infrastructure as identified in the NPS.

A.5.3 Currently, in an average year, the Acton Storm Relief CSO discharges approximately 312,000m³ of untreated sewage into the tidal Thames at Chiswick Eyot. The CSO discharges approximately 29 times a year, and releases 79 tonnes of sewage derived litter.

A.5.4 Each discharge increases the risk of exposure to harmful microscopic organisms within the untreated sewage for river users who come into contact with water. An assessment of health impacts upon recreational users of the River Thames concluded that the risk of infection can remain for two to four days following a spill as the water containing the sewage moves backward and forward with the tide.

A.5.5 Assuming the average 29 spills per annum from the Acton Storm Relief CSO occur on separate days, there could be up to a maximum of 116 days per year when recreational users are at risk of exposure to untreated

sewage in the vicinity of the outfall as a result of the Acton Storm Relief CSO spills alone.

A.5.6 The CSO was identified by the Environment Agency as a CSO that needs to be controlled. The proposed solution to control the CSO is for full interception. The CSO discharges have multiple impacts on water quality in this location, including a localised effect of rapidly dropping dissolved oxygen levels, the release of pollutants and the discharge of sewage derived litter and effluent.

A.5.7 Modelling suggests that if the project is constructed as proposed, in a typical year, the CSO would not spill into the tidal Thames. The tonnage of sewage derived litter from the CSO would be reduced to zero. The number of days per year where recreational users would be at risk of exposure to harmful microscopic organisms within the untreated sewage would be reduced to zero. As a result of the improved water quality, there would be a significant beneficial impact for the recreational users of the stretch of the tidal Thames at Chiswick Eyot. There would also be significant reduction in odour at Acton Storm Tanks as a result of the proposals.

Good design

A.5.8 The amount, layout and scale of the proposed development are primarily dictated by the function it needs to perform. In this case, the function would be to transfer flows from the Acton Storm Relief CSO and direct flows into the main tunnel.

A.5.9 The site's location within an existing Thames Water operational site is also a consideration. This site is particularly constrained by existing wastewater infrastructure (both below and above ground) that would remain on-site and in use, during and after the completion of the proposed construction works.

A.5.10 Early site analysis and subsequent engagement identified that it was important for the design to respond to the following key opportunities and constraints.

A.5.11 The site-specific design opportunities included:

- a. Reduce the odour problems from the uncovered storm tanks by:
 - i decommissioning and infilling the two northernmost storm tanks (tanks 5 and 6)
 - ii hydraulically isolating the four remaining storm tanks (tanks 1 to 4)
- b. Improve the visual appearance of the site by:
 - i removing tanks 5 and 6
 - ii replacing the boundary fencing
- c. Continue the use of Acton Storm Tanks as a Thames Water operational site.
- d. Enhance the site's biodiversity and habitat value.
- e. Improve the public realm by widening the existing footpath on the southern side of Canham Road.

- f. Create a legacy through the design of the permanent structures.

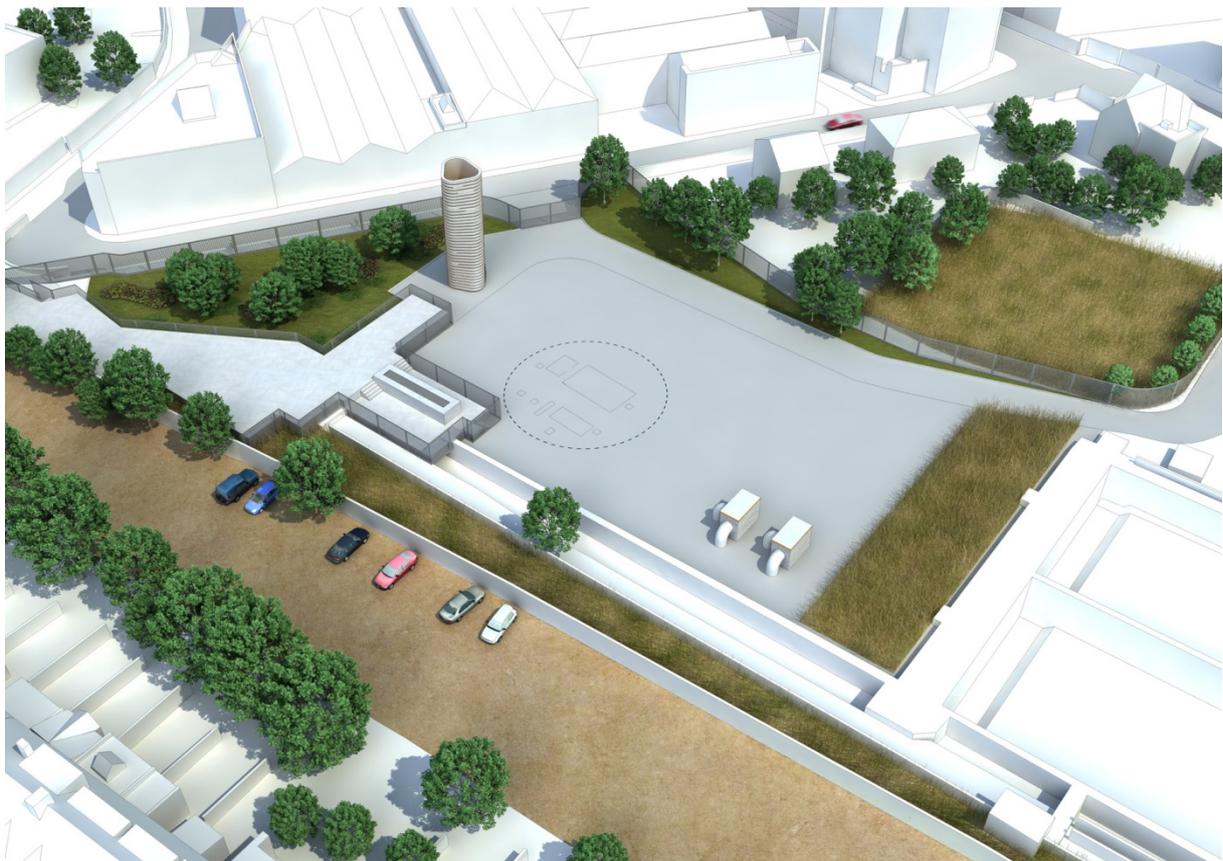
A.5.12 The site-specific design constraints included:

- a. There is existing wastewater infrastructure on-site both above and below ground.
- b. The permanent works would be in close proximity to sensitive receptors including residents along Warple Way and businesses north of Canham Road.
- c. The access to the site is constrained by the existing one-way system along Warple Way/Canham Road/Stanley Gardens.
- d. There are a number of abandoned sub-structures from the earlier waste treatment activities on-site especially in the area immediately to the north of the control and generator building near the existing access gate. Historical records indicate that there was once an abandoned pumping station wet well in this location as well as the sub-structure of the former site administration building.
- e. There is a high density of abandoned and operational utilities that serve the site including local sewers (storm water, foul water and combined).

A.5.13 Following phase one consultation and the subsequent change in use of the site, the design of the scheme evolved through two further rounds of formal consultation and continued engagement (including two design reviews) with key stakeholders such as the Design Council CABI, the London Borough of Ealing, and Thames Water's pan-London strategic stakeholders. Details of the consultation process for this site are reported in the *Consultation Report* and the evolution of the design is explained in further detail in the *Design and Access Statement*. Based on the analysis of opportunities and constraints, and the feedback from stakeholder consultations, the principal objectives that influenced the design include:

- a. reducing the above-ground structures
- b. achieving a high quality of design and careful siting of the ventilation structure
- c. improving the quality of the site
- d. managing construction impacts.

Figure A.4 Illustrative aerial view of completed site



Reduction of above-ground structures

- A.5.14 In terms of above-ground structures, the scheme proposes a maximum 15m high main ventilation structure, a 2m high inlet ventilation structure, a 2.5m high outlet ventilation structure, two 3.5m high ventilation structures for the fans, a 2m high overflow chamber, and a 2m high interception chamber. The broad locations within which these structures would be located are shown on the Site works parameter plan, which is for approval. All heights are maximum heights. Details of the external appearance and materials of the ventilation structures would in due course be submitted to the London Borough of Ealing for approval, pursuant to a site-specific Requirement.
- A.5.15 The principal above-ground features presented as part of the phase two scheme comprised a bulky ventilation building containing fans, filters and electrical and control equipment, and a 15m high ventilation structure. The London Borough of Ealing was supportive of this scheme but noted that it would be prepared to consider proposals for a “*less intrusive built form*”. The design of the structures would need to be high quality and make an “*appreciable contribution*” to the area’s appearance.
- A.5.16 Thames Water conducted an engineering review of the ventilation structures at this site and reconsidered the need for an above-ground ventilation and electrical control building. Consequently, the design was amended to locate the majority of the ventilation infrastructure below

ground and the electrical and control equipment within the existing control building on-site.

- A.5.17 This design change introduced a third outlet into the ventilation column and a separate outlet ventilation structure. The air management filters and noise control equipment would be located in below-ground chambers in tanks 5 and 6, which would be filled in to ground level with excavated material from the main tunnel shaft. The two smaller ventilation structures (approximately 3.5m high) within individual acoustic housings would be carefully sited at ground level in tank 5. These design changes avoid the need for a bulky ventilation building and significantly minimise land take thereby reducing the potential visual impact of the permanent works.
- A.5.18 In June 2012, a public meeting was held with the Southfield Park Triangle Residents' association in the Scout Hut in order to gather views on the design changes to the ventilation structures following phase two consultation. No concerns were raised in relation to these changes
- A.5.19 The council misinterpreted the proposed design at the Section 48 publicity stage. It noted in its response that a "*fourth ventilation structure 10 metres high*" was proposed, in addition to the 15m ventilation structure and three smaller structures. Thames Water clarified to the council at a subsequent meeting that an additional 10m ventilation structure did not form part of the proposal. The council accepted this and raised no further concerns in relation to this matter.
- A.5.20 The Design Council CABE was supportive of the phase two proposal and since then the scale and extent of the above-ground structures was reduced.

Achieving a high quality of design and careful siting of the ventilation structure

- A.5.21 The main ventilation structure proposed at Acton Storm Tanks would be a maximum of 15m in height. This is shown on the Site works parameter plan, which is for approval. The final detailed design would be guided by the potential solution illustrated in the *Design and Access Statement* and consistent with the generic and site-specific design principles, which would be secured by a Requirement or Section 106 agreement. Details of the external appearance and materials of the ventilation structure would in due course be submitted to the London Borough of Ealing for approval, pursuant to a site-specific Requirement.
- A.5.22 At phase two consultation, the Design Council CABE and the London Borough of Ealing supported the decision to locate the ventilation building and structure close to Canham Road. Although the ventilation building is no longer required as part of the proposal, the ventilation structure would be located north of tanks 5 and 6 (as shown on the indicative Proposed landscape plan) and design principle ACTST.5 would ensure that the ventilation structure would preferably be located close to the Canham Road frontage. This would reduce visual effects on the properties to the west and would ensure that the structure is located nearer to similar height buildings and in a prominent location near the public footpath.

- A.5.23 Throughout the various stages of consultation, the London Borough of Ealing and the Design Council CABE highlighted the potential for the above-ground structures to provide a long lasting legacy for the project and to enhance the townscape at this site. In accordance with this feedback, design principle ACTST.4 was developed so that the design of the ventilation column results in a local landmark which would enhance the local townscape and celebrate the project.
- A.5.24 The ventilation structure would stand a maximum of 15m high and would make a prominent feature in the local landscape. The *Design and Access Statement* suggests that the final design could help it become a valued, local landmark which could be sensitively lit at night within the proposed lighting scheme. The illustrative design suggests that the ventilation structure could be triangular in plan and could appear to ‘twist’ around its vertical axis therefore looking different when viewed from different angles. The twist effect would evoke the project’s ‘signature’ ventilation column design in order to create a visual link to other sites along the route, and this is ensured by design principle ACTST.4. For further details on the illustratively proposed design refer to Section 6.5 of the *Design and Access Statement*.
- A.5.25 Design principle ACTST.4 also commits to cladding the ventilation column in a high quality, robust and durable material. This design principle was developed in response to comments received from the London Borough of Ealing and the Design Council CABE, who both drew attention to the importance of the choice of materials. As stated in Section 6.5 of the *Design and Access Statement*, the illustrative potential solution is to construct the column with high quality, self-supporting reconstituted stone in precise units for a robust finish. However, details of materials would be submitted the council for subsequent approval under a site-specific Requirement, consistent with design principle ACTST.4, so this would ensure there is local input to the final solution.

Improving the quality of the site

- A.5.26 The decommissioning and removal of tanks 5 and 6 significantly improves the visual appearance of the site. This is shown on the Demolition and site clearance plan, which is for approval. Tanks 1 to 4 would be hydraulically isolated; however, they would continue to function in exceptional circumstances in order to mitigate the risk of upstream flooding. For further details with regard to this matter refer to the Air quality, emissions, dust and odour subsection.
- A.5.27 The London Borough of Ealing and other respondents requested that the footpath on the southern side of Canham Road should be widened as part of the proposals at Acton Storm Tanks. The Design Council CABE also noted that design should consider “*issues of site access, movement and permeability for all users, both within and around the site*”. In response to this feedback, the Canham Road footpath is proposed to be widened to a minimum of 2m width using land from the site. This is committed by design principle ACTST.2. The footpath would be constructed to meet adoptable standards and any new paving materials would match the existing. The increased width would enhance the quality of the streetscape along

Canham Road and improve pedestrian movements and linkages in the area. The final detailed proposals would in due course be submitted for approval by the London Borough of Ealing, pursuant to a site-specific Requirement.

- A.5.28 In order to improve the general appearance of the site, the fences along the boundary with Canham Road to the north of the site and the boundary with the private car park west of the site would be replaced with a new high quality boundary treatment, as required in design principle ACTST.7. The indicative Proposed landscape plan indicates where the fencing would be replaced, and Section 6.5.8 of the *Design and Access Statement* illustrates the potential appearance of the new fencing.
- A.5.29 The required areas of hardstanding would be minimised on site. In addition to reinstating existing planting, it is proposed to include new areas of low maintenance planting in the northern section of the site and to the east and south of the shaft, including an area for a sustainable drainage system (design principle ACTST.3). Design principle ACTST.10 requires species-rich wildflower grassland, native trees and scrub to be provided in appropriate areas as part of the reinstatement of the construction site. The indicative Proposed landscape plan suggests that an area to the south of tanks 5 and 6 could be used for this. Pursuant to a site-specific Requirement, details of the permanent landscaping works for the site would be subsequently submitted to the London Borough of Ealing for approval and would be in accordance with the indicative Proposed landscape plan and the relevant design principles.

Managing construction impacts

- A.5.30 Throughout the consultation period and through numerous design developments, Thames Water sought to limit potential construction impacts.
- A.5.31 During construction, the walls of storm tanks 1 to 4 would be raised by 1m to increase capacity prior to the decommissioning of tanks 5 and 6. Section 10 of the *CoCP Part B* ensures that, where possible, excavated material arising from works on the site would be utilised to fill these tanks. This could potentially reduce the number of HGVs on local roads.
- A.5.32 As stated in Section 4 of the *CoCP Part B*, the hoarding height on the western extent and on the boundary of the site with 1 to 5 Canham Road and Greenend Road would be increased from 2.4m to 3.6m. The hoarding would incorporate suitable art work on public facing sections, as stated in para. 4.3.4a of *CoCP Part A*. This would provide suitable screening and noise attenuation for neighbouring properties. Section 6 *CoCP Part B* states that the construction area around the shaft would be covered by an enclosure/building during the main tunnel secondary lining works. The building would have cladding with a specified sound reduction value. The building openings would be designed to be away from sensitive noise receptors and would be kept closed when not in use at night.
- A.5.33 Advanced tree planting is proposed on the boundary with Warple Way prior to construction, as set out in design principle ACTST.6. Section 13 of *CoCP Part B* requires advanced planting down the eastern boundary and

southeastern corner of the CSO site hoarding. This planting would help to screen construction activities on the site and contribute to the long-term improvements to the appearance of the compound boundaries.

- A.5.34 The London Borough of Ealing initially suggested that Thames Water should provide replacement parking to compensate locate business users for loss of parking during the construction period. Thames Water subsequently undertook parking surveys which indicated a level of spare capacity. It was concluded that no replacement parking was necessary as spare capacity exists in the area to accommodate displaced demand. The council agreed with this approach. Further details on the measures incorporated to manage access and highway impacts at this site are in the Traffic and transport subsection.

Conclusion

- A.5.35 In conclusion, the proposals for Acton Storm Tanks 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 build and ventilate the tunnel in an efficient manner and to intercept the Acton Storm Relief CSO. The proposals demonstrate that this can be achieved by making efficient use of a brownfield site to receive the main tunnel from Carnwath Road Riverside and to connect the existing Acton Storm Relief CSO to the main tunnel. The aesthetic components relate to the creation of a new, high quality landscaped site and the design of the ventilation column as a local landmark. The functional and aesthetic elements were combined to create an attractive and adaptable space. Through a careful and considered site layout and appropriate landscaping, the proposal responds sensitively to the characteristics of the site and its neighbours, and is successfully integrated into an existing Thames Water operational site without compromising its future use.
- A.5.36 The design life of the major civil engineering components of the project is 120 years, including buildings. The details of the external finishes of the above-ground structures are not specified in the application, but are to be submitted for the subsequent approval of the local planning authority. These details must be in accordance with the design principles, which require materials to be high quality and long lasting. The project was therefore designed to be durable and resilient to change.
- A.5.37 The proposals at this site achieve a good design, in accordance with paras. 3.5.1 to 3.5.4 of the NPS.

Water resources and flood risk

- A.5.38 There are no licensed or known unlicensed abstraction sources from the upper or lower aquifers located within a radius of 1km around the site. The nearest defined Source Protection Zone for a Chalk source is located approximately 6km away to the east. There are no environmental designations relevant to ground water in the vicinity of the site.
- A.5.39 The Acton Storm Tank site is located in Flood Zone 1, 2 and 3a associated with the tidal Thames.

- A.5.40 A Flood Risk Assessment including the sequential and exception test undertaken in accordance with Section 4.4 of the NPS is included in the *Environmental Statement* (Vol 3, Section 15 and Vol 4, Section 15). This shows that the proposed development would be appropriate for the area as flood risk to the development would remain unchanged. Flood risk would be managed through appropriate design measures and the development would not lead to an increase in flood risk in the surrounding areas. Therefore, no significant flood risk effects are likely.
- A.5.41 In accordance with the *CoCP* (Section 8) all site drainage during construction would be drained and discharged to mains foul or combined sewers. Where this is not practicable, the site would be drained such that accumulating surface water would be directed to holding or settling tanks, separators and other measures prior to discharge to the combined or surface water drains. Foul drainage from the site welfare facilities would be connected to the mains foul or combined sewer. This design measure would help manage the risk from this source during construction but would not reduce the level of risk associated with this flood source.
- A.5.42 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 and therefore no additional measures above those outlined in the *CoCP* are proposed.
- A.5.43 Flood risk from all sources has been managed as far as possible through design and the measures incorporated in the *CoCP*, so the criteria in NPS para. 4.10 would be satisfied. No significant flood effects are likely from the proposed development.
- A.5.44 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*. The *CoCP* covers activities that are subject to pollution control and makes references to good practice as suggested in the NPS.
- A.5.45 Thames Water considered design approaches and measures to ensure surface water is positively drained from this site when operational. The permanent design would comply with the design principles, including generic site drainage design principle SDRN.04 which requires compliance with the Mayor's *Essential Standard*. This requires use of Sustainable Drainage Systems measures, 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 and approved in writing by the local authority.
- A.5.46 As shown on the indicative Proposed landscape plan, the area to the east of the shaft could be used as an area for a Sustainable Drainage System to attenuate storm water run-off from the new area of hardstanding. This is committed to by design principle ACTST.3. The final detailed surface water drainage proposals would in due course be submitted for approval

by the London Borough of Ealing (pursuant to a site-specific Requirement).

- A.5.47 The site therefore meets the decision making principles set out in the NPS, because no adverse effects are expected on water resources or flood risk. The Environment Agency has no outstanding concerns.

Air quality, emissions, dust and odour

- A.5.48 The site is located within the London Borough of Ealing Air Quality Management Area. It is also in close proximity to the boundaries of the London Borough Hammersmith and Fulham and the London Borough Hounslow. Both organisations have declared Air Quality Management Areas that cover the whole of their boroughs. Local monitoring data indicates that there are currently exceedences of the air quality standard for nitrogen dioxide in the vicinity of the site.
- A.5.49 The closest sensitive receptors to the development are occupiers of nearby residential dwellings, commercial and industrial premises to the north of Canham Road, on Warple way, and Southfield Primary School located to the south of the proposed site.
- A.5.50 Odour arising from the use of the existing storm tanks is an issue at this site when the tanks are in use and cleaned. The frequency of use of the tanks depends on the amount of rainfall. In a typical year, when the tanks are full, the excess water is discharged to the River Thames 29 times.
- A.5.51 As detailed in paras. A.4.64 to A.4.65, the London Borough of Ealing and the London Borough of Hammersmith and Fulham reported odour issues in their phase one consultation responses, and the impact of odour on residential amenity was also one of the main issues raised by the public during consultation.
- A.5.52 The London Borough Ealing compiled a list of odour complaints relating to Acton Storm Tanks. Sixteen complaints were received between July 2002 and June 2010 and originated from areas surrounding the site and 48 odour related complaints were recorded in the Thames Water database during 2007 to 2011 (*Environmental Statement* Vol 4, Section 14.4).
- A.5.53 The proposed construction works would result in the decommissioning and filling in of the two northernmost tanks (5 and 6). The proposed works would also hydraulically isolate the four remaining tanks (1 to 4). Tanks 1 to 4 would only continue to function in exceptional circumstances as explained below, which would significantly reduce odour from the site.
- A.5.54 Thames Water's proposal is to install a bypass pipe that would isolate the tanks under normal tunnel operating conditions. It would also eliminate the need to use the remaining tank infrastructure even during the very rare event of a spill to river (anticipated to be once every two to three years). The reason that there might be a very rare use of the remaining tanks is that hydraulic modelling shows that under certain conditions, there is a theoretical increased risk of sewer flooding if there is a combination of a large rainfall storm and a very high tide when the tunnel is not available during inspection or maintenance visits. Current operation is to avoid discharges of raw sewage to the river but at times, the tanks are operated

to limit flooding potential at the site. The Flood Risk Assessment for Acton Storm Tanks (*Environmental Statement* Vol 4, Section 15.3) explains in detail how the tanks operate at present.

- A.5.55 In order to cater for this very particular situation at Acton Storm Tanks where a very high tide effectively closes the CSO, the scheme was designed with the capability to discharge flows to the four remaining tanks in very exceptional circumstances to avoid sewer flooding. The use of these tanks would therefore only be considered during the ten yearly inspection and maintenance of the tunnel, when the tunnel would be closed for safety reasons. A normal storm event during the tunnel inspection period would result in the bypass pipe being used to spill excess flows from the Stamford Brook sewer directly to the river. As tunnel inspection and maintenance visits would be planned to avoid a spring tide, the likelihood of Thames Water having to divert storm flows to the four remaining tanks due to the non-availability of the tunnel system is very low.
- A.5.56 Section 7 of *CoCP* Part B ensures that monitoring should locations to cover receptors on Greenend Road. Baseline monitoring would be undertaken for a minimum of 12 months. The monitoring layout would include a continuous monitor located at each end of a transect of the site with regards to prevailing wind direction. An additional monitor would be located at the boundary of the site with 2 to 10 Greenend Road.
- A.5.57 The consideration of operational air quality impacts including odour are 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 tunnels is kept fresh, that a low pressure is maintained within the tunnels to prevent unwanted releases and that when air is released it is treated. This would be achieved by a combination of forced or active ventilation and treatment and passive air treatment. In addition, at all sites there are to be ventilation structures which would allow air to enter and leave the tunnel system.
- A.5.58 When the tunnels are empty, clean air would be drawn into the tunnels at specific sites by the extraction of air at other specific sites so as to keep the air in the tunnels fresh. This means that odours would not build up while the tunnels are empty. As the tunnels fill, air displaced from the tunnels would initially be extracted and treated at the active ventilation sites before being released and later, depending of the level of filling, would pass through the passive carbon filters. These filters clean the air and remove any odours before it is released.
- A.5.59 The filters are to be within below ground chambers and the fans are to be within above ground acoustic housings. The fans draw air from the tunnels through the filters, which clean the air before it is released through individual ventilation columns within one compound column. Activated carbon would be used in the filters; this is a standard and proven way of treating air from wastewater operations.
- A.5.60 During heavy storm events (approximately four times during a typical year), the air that is pushed out of the tunnel could exceed the capacity of the filters and 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. At least for 99 per cent of the time during a typical year all air released would be treated, which means that all regulatory requirements would be met and there would be no nuisance odours or loss of amenity due to odours.

- A.5.61 The decommissioning and filling in of tanks 5 and 6, and the hydraulic isolation of tanks 1 to 4 would have a significant positive effect in reducing the existing odour nuisance at Acton Storm Tanks whilst also addressing the requirement to eliminate unacceptable CSO spills at Chiswick Eyot. Tighter controls on air quality monitoring were applied at this site, as set out in *CoCP* Part B. There would be active ventilation controls at this site and these would ensure that detrimental impacts on amenity from odour are minimised. By resolving existing odour issues at the site and managing future odour emissions, the proposed works would provide a significant benefit to residential amenity in the immediate surrounding area, in accordance with paras. 4.12.3, 4.11.4 and 4.11.5 of the NPS.

Biodiversity and geological conservation

- A.5.62 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 of the site.
- A.5.63 As there would be no in-river works associated with the proposed development on this site, there would not be any impacts on aquatic ecology.
- A.5.64 In terms of terrestrial ecology, the site includes existing buildings areas of hardstanding, amenity grassland, scattered trees and dense scrub. Spoil and wood piles are also present. The site and surrounding area has some value for breeding birds and it also supports a range of invertebrates. In addition, surveys indicated that the site provides a habitat for common pipistrelle and soprano pipistrelle bats.
- A.5.65 The *CoCP* requires an ecological management plan to be prepared for the site, and details the approach to managing effects on ecological receptors. As a result, there would be no significant negative effect on terrestrial habitats or species.
- A.5.66 There are a number of site-specific measures set out in *CoCP* Part B to improve terrestrial ecology on site. Section 11 of the *CoCP* Part B requires bird and bat boxes to be installed and for replanting of moderate quality existing trees with high quality trees upon completion. Section 13 of the *CoCP* Part B requires trees and hedges to be planted along Warple Way in advance of construction for noise and sound attenuation. This planting would be retained post construction. Design principle ACTST.6 also seeks to ensure that material piles potentially used by hedgehogs and notable invertebrates would be relocated within the advanced planting. Design principle ACTST.10 requires species-rich wildflower grassland, native

trees and scrub to be provided in appropriate areas as part of the reinstatement of the construction site.

- A.5.67 The *Environmental Statement* (Vol 4, Section 6) concludes that as a result of advanced planting, habitat creation and reinstatement following construction, there would be an overall gain in semi-natural habitat. The advanced planting would also ensure that a habitat was maintained for breeding birds during construction. There would also be an increase in the diversity and abundance of invertebrates due to improvements to the quality and quantity of habitats on site. The provision of bat boxes would likely result in an increase in the local populations of common pipistrelle and soprano pipistrelle bats.
- A.5.68 In accordance with NPS policy, the proposed development and mitigation measures would avoid significant harm to biodiversity and geological conservation interests. Thames Water also sought to take advantage of the opportunities to conserve and enhance biodiversity and the works proposed to provide advanced planting, bat and bird boxes and the reinstatement of trees and planting would significantly improve the quality of the site. These measures would be addressed through final landscape designs to be discussed with and approved by the London Borough of Ealing, and would allow for the maximisation of opportunities for building in beneficial biodiversity features as part of good design (NPS para.4.5.14).

Landscape and visual impacts

- A.5.69 The site does not lie within or in close proximity to any nationally designated landscapes. The local townscape shaped the design development and evolution of the proposed works in this location.
- A.5.70 The local *Character Appraisals and Management Plan for the Bedford Park Conservation Area* (produced by the London Borough of Ealing), as well as the *Ravenscourt and Starch Green Conservation Area Character Profile* (produced by the London Borough of Hammersmith and Fulham) were taken into account in this assessment, in accordance with para. 4.7.2 of the NPS.
- A.5.71 The existing landscape and visual quality of the site is generally good, but has no particular value due to its industrial usage. The boundary conditions of the site are generally in a poor condition due to a lack of fencing and vegetation maintenance, leaving potential for enhancement.
- A.5.72 The intensity of construction activity (and related visual and townscape impacts) throughout the phases would vary. The Acton Storm Tanks townscape and visual assessment (*Environmental Statement* Vol 4, Section 11) identifies residences on the junction of Warple Way and Canham Road where the impact of the construction activity in and around the site might be most visible, particularly because of their proximity. This includes the visibility of the site entrance and hoardings, and cranes and construction traffic along Canham Road. 1 to 4 Canham Road are perpendicular with a cluster of existing vegetation and trees which may provide some intermittent screening of the site from the habitable room windows of these properties. However, some of this vegetation lies within the site boundary so this may be removed during construction. No. 5

- Canham Road faces directly on to the site, so the existing vegetation would provide some screening, but to a lesser extent.
- A.5.73 As required by Section 4 of *CoCP* Part B, the hoarding height along the boundary with 1-5 Canham Road would be increased to 3.6m to provide suitable screening for these properties. As a result of mitigation, views from these properties are generally well contained and the nature of the construction activity is such that it would be temporary and well controlled.
- A.5.74 Views on to the site from the lower floors of Tesla Court would be partially obscured by 1 to 5 Canham Road, existing vegetation and existing boundary treatment. However, views into the site would be more visible from the upper floors. Likewise, there would be views on to the site from the upper floors of Edison Court and to a lesser extent, Emlyn Gardens. As required by Section 13 of the *CoCP* Part B, advanced planting along part of the Warple Way boundary would help to thicken the existing line of lime trees and dilute the temporary visual impact of construction from these properties.
- A.5.75 The two storey properties along Greenend Road are located slightly further from the site boundary than the properties along Warple Way. Many of these properties have had loft conversions to provide additional accommodation. The existing mature trees at end of the gardens of some of the properties provide an element of visual screening. As required by *CoCP* Part B, hoarding height along the boundary of the site and private car park would be raised to 3.6m. The hoarding would incorporate suitable art work on public facing sections which would add some visual interest to the setting of the area. As a result of this, there would be no significant visual impacts during construction on the Greenend Road properties.
- A.5.76 The *Environmental Statement* (Vol 4, Section 11) identifies a potential significant temporary visual impact from the Canham Road/Stanley Gardens junction (viewpoint 2.4). However, this viewpoint is located in an industrial area with no residential properties, therefore in planning terms the visual impact would be less significant, particularly given that the nature of the construction activity would be temporary and well controlled.
- A.5.77 Although construction activities would be visible for a temporary period, the NPS recognises in para. 1.4.4 that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments and result in adverse townscape and visual effects with many possible receptors.
- A.5.78 At this site there would be little above-ground activity associated with the operational phase of the project, apart from infrequent maintenance visits. Consequently, the operational use of the site would not have any significant effect on the character of the site or surrounding townscape. Furthermore, the visual improvements to the site during the operational phase would add positively to the character of the area. For further details on these improvements refer to the Good design subsection.
- A.5.79 In conclusion, construction activity would result in temporary visual impacts on sensitive receptors in close proximity to the site. A range of mitigation measures is applied to reduce these impacts as much as practicably possible. Once construction is complete Thames Water's

improvements to the quality of the site would benefit townscape and visual amenity. The proposals are therefore consistent with the approach required in section 4.7 of the NPS. The landscape and design proposals were designed taking careful account of the townscape characteristics of the area, to minimise adverse effects during construction and to create significant longer term townscape and visual benefits.

Land use including open space, green infrastructure and green belt

- A.5.80 The site is located within existing Thames Water operational land. Use of the site to construct the project is consistent with its current use. The Acton Storm Tanks site is allocated specifically for "*Thames Tunnel operational requirements*" in the draft London Borough of Ealing *Development Sites Development Plan Document* (Publication version 29 June 2012). For further details refer to Section A.3 of this Appendix.
- A.5.81 The Land use plan is provided in Annex A.
- A.5.82 Use of the site to construct the project is, therefore, consistent with its long established use and would positively re-use an existing brownfield site. The proposals at the Acton Storm Tanks site do not affect any open space.
- A.5.83 Operationally, whilst the permanent structures would remain within the curtilage of the existing Thames Water operational land, the proposal was designed to group the permanent structures in the northwest corner of the site.
- A.5.84 In conclusion, no land use implications arise from the use of an established Thames Water site for the interception of the Acton Storm Relief CSO and to receive the main tunnel from Carnwath Road Riverside.

Noise and vibration

- A.5.85 The noise conditions in the vicinity of the site are predominantly generated from road traffic noise arising from vehicles associated with the industrial area to the north of the site and occasional vehicles associated with the surrounding residential development. The nearest residential receptors are located at Canham Road, Tesla Court, and Edison Court on Warple Way, and Greenend Road.
- A.5.86 The NPS recognises that Nationally Significant Infrastructure Projects are likely to take place in mature urban environments, and in the short term, to lead to noise disturbance during construction.
- A.5.87 Measures to minimise potential adverse impacts from noise are detailed in the *CoCP* and are embedded within the project design, compliance with which is secured through a site-specific Requirement. These measures include operating in accordance with best practice, selection of the most quiet, cost effective plant available and optimising plant layout to minimise noise emissions. Section 6 of *CoCP Part B* ensures that the hoarding height at the Canham Road/Warple Way junction would be increased to 3.6m which would help to attenuate noise. A 3.6m hoarding would also be

erected across the site's western boundary closest to the properties along Greenend Road.

- A.5.88 Section 6 specifically ensures that suitable noise mitigation measures would be incorporated into the design of the concrete batching plant and tunnel fan ventilation units. Furthermore, all fixed plant including waste water plant would be enclosed.
- A.5.89 Section 6 also states that the construction area around the shaft would be covered by an enclosure/building during the main tunnel secondary lining works. The building would have cladding with a specified sound reduction value. The building openings would be away from sensitive noise receptors and would be kept closed when not in use at night. Furthermore, the fill material in the storm tanks would be compacted using machinery that generates the lowest practicable vibration levels. Specifically, large twin-drum vibrating rollers would only be used in locations where vibration levels can be controlled to less than the impact criteria.
- A.5.90 As a result of the proposed mitigation measures and demonstration of good design, there would be no significant noise or vibration effects at this site during the construction or operational phases, as confirmed in the *Environmental Statement* (Vol 4, Section 9).

Historic environment

- A.5.91 This site does not contain any significant (statutorily protected or otherwise important) heritage assets, nor are there any in the immediate vicinity.
- A.5.92 The Bedford Park Conservation Area lies 125m to the south of the site but no significant effects are likely from the site's proposals.
- A.5.93 Deep excavations would entirely remove any assets associated with the 19th century sewage works, including the pump house. However, these works would not constitute a significant effect for any surviving 19th to 20th century structural remains, because the assets themselves are not designated nationally or locally and they are of low heritage significance.
- A.5.94 The site has low potential regarding the possibility of containing earlier archaeological remains. It lies outside of the main settlement areas identified with these time periods and archaeological finds to date have been sparse.
- A.5.95 Measures would be taken to minimise the land take at the site. An approach to recording evidence is proposed that was developed and agreed with English Heritage.
- A.5.96 The design was developed, as far as is practical, to take opportunities to enhance the long term setting of the nearby industrial buildings to the north of Canham Road.
- A.5.97 In conclusion, both the construction and operational phases would not involve any activities which would affect buried or above-ground heritage assets. The proposals were developed with the benefit of a thorough understanding of the surrounding heritage assets, and to minimise effects on these assets.

Light

- A.5.98 The *Daylight/Sunlight Assessment* establishes that the proposed temporary and permanent works at Acton Storm Tanks would not have a material impact on sunlight or daylight of surrounding residential properties, therefore this issue was scoped out of the detailed assessment.
- A.5.99 For practicality and safety reasons tunnel construction needs to take place over extended periods of time, including working on a 24-hour, seven days a week basis. A short period of 24-hour working would be required at this site. During this period, the working would mainly take place below ground but artificial lighting would be required for the supporting activity at ground level for extended periods during the secondary lining phase. Measures are included within the *CoCP Part A* to ensure that all reasonable steps would be taken to minimise detrimental impact on amenity resulting from artificial light. For example, site lighting during construction would be capped and directional to ensure minimal light spill and lighting is only used when necessary and as such there would be no unreasonable effects on residential properties during the construction period.
- A.5.100 The operation of the proposed development would have no substantial lighting requirements and design principle ACTST.9 seeks to ensure that the existing lighting scheme for the compound would be reinstated following construction. The final detailed lighting proposals would in due course be submitted for approval by the London Borough of Ealing (pursuant to a site-specific Requirement).
- A.5.101 All reasonable steps would be taken to minimise any detrimental effects arising from the use of artificial lighting at the site in accordance with para. 4.12.7 of the NPS. As a result, there would be no significant artificial light effects on amenity during the construction or operational phases.

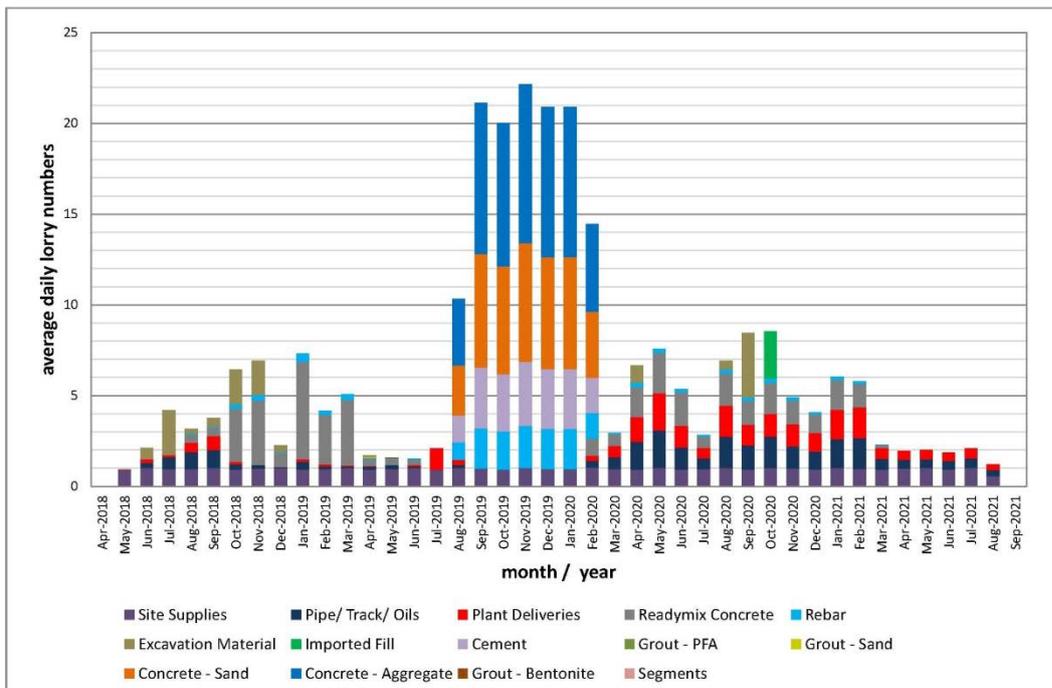
Traffic and transport

- A.5.102 The Acton Storm Tanks site has poor public transport accessibility. It is located 750m from Acton Central National Rail Station and 1km from Turnham Green Underground station. A number of bus stops are located along The Vale within 0.5km of the site. There are six daytime bus routes and three night bus routes operating along The Vale within 640m walking distance of the site.
- A.5.103 The location of vehicular access during construction and operation would be via a new access point off Canham Road. Vehicles would travel from The Vale one-way, via Warple Way, Canham Road and Stanley Gardens. This access would pass through industrial land and avoid traffic entering and exiting the site via the residential road located to the east.
- A.5.104 The use of rail for transportation of materials was investigated for this location, in order to reduce the number of HGVs required. However, due to the distance of rail facilities from the site and the potential for double handling of materials, Thames Water determined that the use of rail would

not be reasonably practical, cost-effective or mitigate transport impacts on the local area.

- A.5.105 At this site there would no parking provided within the site boundary for construction workers. There is unrestricted parking on Warple Way, Stanley Gardens and Canham Road. The Transport Assessment assumes, based on a robust assessment, that 48.5 per cent of workers journeys would be made by car. Parking surveys indicated that spare capacity exists in the area to accommodate displaced demand. A range of measures to reduce car use would be incorporated into a site-specific travel plan, which would be subject to a site-specific Requirement to submit to the local authority for approval.
- A.5.106 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. In exceptional circumstances, on agreement with the local authority, HGV and abnormal load movements could occur up to 10pm or later, for large concrete pours. Continuous working hours would be required for a period of time during secondary lining.
- A.5.107 As stated in the Transport Assessment, it is anticipated that an average of seven HGVs would access the site per day for the majority of the construction period. This would rise to approximately 23 HGVs per day over an estimated five month period during part of the secondary lining of the main tunnel. This is the period of greatest activity and is during Site Year 2 of construction. This histogram in Figure A.5 shows the construction vehicle profile during construction.

Figure A.5 Estimated construction lorry profile



- A.5.108 In order to accommodate construction vehicles on the one-way route along Warple Way, Canham Road and Stanley Gardens, approximately 15 car parking bays would need to be suspended for the duration of the construction phase. These suspensions were agreed with the London Borough of Ealing. These parking spaces would not be re-provided as parking surveys demonstrate there is sufficient parking capacity in the vicinity of the site to accommodate these suspensions. Taking into consideration the infrequent and temporary nature of the arrival of vehicles at the site, it is anticipated that there would not be a significant impact on parking in the local area.
- A.5.109 The exit lane of the car park adjacent to the southwest side of the site would need to be closed for a short period during the latter stages of construction. During this period, access to the car park would be restricted to a single lane.
- A.5.110 Measures to further reduce transport impacts are detailed in the *CoCP* Part A. These include HGV management and control measures such as designated vehicle routes to sites for construction vehicles. There is also a provision for management plans, for construction workers journeys to and from the site. In addition to the general measures in the *CoCP* Part A, the following traffic and vehicle control measures are incorporated into the *CoCP* Part B.
- a. The site access is to be from The Vale via Warple Way and Canham Road with only a left turn into the site and left turn out. Vehicles would egress to The Vale via Canham Road and Stanley Gardens.
 - b. The site entrance would be designed to prevent vehicles over-swinging the footpath.
 - c. Safe access for construction vehicles would be maintained during winter conditions, along Warple Way, Canham Road and Stanley Gardens.
 - d. A security barrier would be positioned to allow a standard rigid tipper vehicle to be wholly off the road whilst awaiting barrier operation.
 - e. Five sections of on-street parking on Canham Road, Warple Way and Stanley Gardens would be suspended with no re-provision during construction.
 - f. During the works proposed within the car park adjacent to the southwest of the site, the existing number of car parking spaces in use would be maintained.
 - g. Some temporary parking suspension would be required in the car park during construction, but not for the duration of the construction period.
 - h. Traffic marshals would manage entry and egress of vehicles across the entrance and pedestrians crossing, particularly with the existing nursery.
- A.5.111 In conclusion, construction works in this location are not likely to result in any significant transport effects on road operation or delays. A range of measures are in place in the *CoCP* and travel plan which would mitigate

any potential significant impacts. In accordance with para. 4.13.7 of the NPS, appropriate requirements are proposed to minimise impacts at this site. HGV traffic at this site would not be substantial, and there is spare car parking capacity in the immediate area to accommodate displaced demand. In addition, there would be no significant effects regarding pedestrian and cyclist amenity, safety or local public transport services.

- A.5.112 During the operational phase there would be very occasional vehicle trips to and from the site for maintenance activities therefore there would be no significant traffic impacts.

Waste management

- A.5.113 The project-wide Waste Strategy was developed to provide a framework for the management of materials and waste that would be produced throughout the construction and operation of the project. This ensures that the requirements set out in para. 4.14.6 of the NPS would be satisfied, and the Waste Strategy would be secured via an obligation in accordance with para. 4.14.7 of the NPS.
- A.5.114 No particular site-specific waste issues arise at this site.

Socio-economic

- A.5.115 The project-wide socio-economic issues and benefits of the project both during construction and operation, and equalities considerations are detailed in Section 8 of the *Planning Statement*.
- A.5.116 Within the immediate area (within 250m) residential properties surround the site to the north east, east, south and west. Generally, these comprise a mix of two storey dwellings and high rise apartment blocks. There are also commercial and factory buildings located within Acton Park Industrial Estate and Stanley Gardens to the north. There are also a number of community and recreational land uses, including a community hall (which functions as a scout hut and nursery), a primary school and semi-private amenity spaces associated with Factory Quarter and Emlyn Gardens.
- A.5.117 The community profile suggests that the local community is made up of residents who are predominantly White, who generally experience good health and have high life expectancy and experience effectively no measureable deprivation.
- A.5.118 In accordance with the NPS, the project undertook an initial *Equalities Impact Assessment* in order to identify potential (direct or indirect) adverse, differential or positive impacts on equalities groups and to determine whether a full *Equalities Impact Assessment* should be undertaken. Given the scale of the project and the potential for impacts on certain equalities groups, it was determined that a full assessment should be undertaken.
- A.5.119 The *Equalities Impact Assessment* concluded that there are no differential negative equalities issues at this site.
- A.5.120 Construction is expected to require a maximum workforce of approximately 40 workers at any one time. This would not significantly

alter the demand for services in the surrounding area. These jobs and training opportunities would provide a stimulus to the local economy.

- A.5.121 There would be no socio-economic impacts on the amenity of users of the semi-private amenity space at Emlyn Gardens or Factory Quarter, or on the amenity of the community hall users.
- A.5.122 The widening of the Canham Road footpath would bring about long term benefits by improving the public realm and pedestrian movements and linkages in the area.
- A.5.123 As a result of the improved water quality, there would significant beneficial impact for the recreational users of the highly used stretch of the Thames at Chiswick Eyot.

A.6 Overall conclusions

- A.6.1 There is a need to intercept the Acton Storm Relief CSO. In an average year, the CSO discharges approximately 29 times and discharges 312,000m³ of untreated sewage into the River Thames at Chiswick Eyot in the London Borough of Hounslow. The Environment Agency identified the Acton Storm Relief CSO as a CSO that needs to be controlled.
- A.6.2 The reduction of discharges from the Acton Storm Relief CSO would significantly improve the water quality in the Thames with consequent benefits to water quality, ecology, recreation and amenity. It would also help to reduce sewage derived litter and the health risks to users.
- A.6.3 Acton Storm Tanks was selected after extensive consideration and engagement as the appropriate site on which to meet the need. The site is suitable and the application proposals would meet the identified need through full interception.
- A.6.4 Given the site's location in proximity to residential development, it is inevitable there would be some disturbance during the construction period. While Thames Water sought to minimise any disturbance that would be experienced through sensitive design and mitigation, some temporary townscape and visual effects during construction at the Warple Way/Canham Road and the Canham Road/Stanley Gardens junctions are likely to remain.
- A.6.5 The assessment above explained that the proposals incorporate measures to limit the effect of each of these impacts. For each of these effects, the project design was refined and all practicable mitigation identified and committed to, in accordance with the advice in the NPS. The residual impacts are temporary and are an unavoidable consequence of intercepting the CSO, which runs beneath a small section of the southern corner of the Acton Storm Tanks site, in a dense urban environment.
- A.6.6 The proposals at Acton Storm Tanks would give rise to a number of other significant beneficial effects:
 - a. Reduction in the odour problems from the uncovered storm tanks by:
 - i decommissioning and infilling the two northernmost storm tanks (tanks 5 and 6)

- ii hydraulically isolating the four remaining storm tanks (tanks 1 to 4)
- b. Improvements to the visual appearance of the site by:
 - i removing tanks 5 and 6
 - ii replacing the boundary fencing
 - iii landscaping including advanced planting on Warple Way
- c. Improvements to the public realm by widening the existing footpath on the southern side of Canham Road.
- d. Improvements in biodiversity that would benefit:
 - i bat populations due to the provision of bat boxes.
 - ii invertebrates due to the improvements in quality and quantity of habitats on site following advance planting and site re-instatement.
- e. Improvements in water quality would benefit:
 - i Ecology, particularly fish populations.
 - ii Recreational users of the river at Chiswick Eyot.
- f. An area for a sustainable drainage system to help to attenuate storm water run-off.
- g. Creation of a legacy through the design of the permanent structures.

A.6.7 The proposed works at the Acton Storm Tanks site and the mitigation measures developed and advanced as part of the application for development consent directly accord with the approach required by the NPS. Adverse effects have been minimised as far as possible and opportunities have been taken to enhance the local environment and to leave a positive legacy.

A.6.8 Sections 8 and 9 of the *Planning Statement* considers the implications of the local effects of the works at Acton Storm Tanks and the other sites, and describes the overall balance between impacts and benefits associated with the project as a whole, against the guidance in the NPS. It concludes that the works at Acton Storm Tanks, and the project as a whole, are compliant with the NPS and that development consent should be granted.

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Annex A: Drawings for Acton Storm Tanks

List of drawings

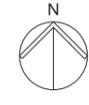
Acton Storm Tanks: Location plan

Acton Storm Tanks: As existing site features plan

Acton Storm Tanks: Construction phasing plans

Acton Storm Tanks: Land use plan

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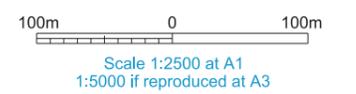


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

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

Notes:

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



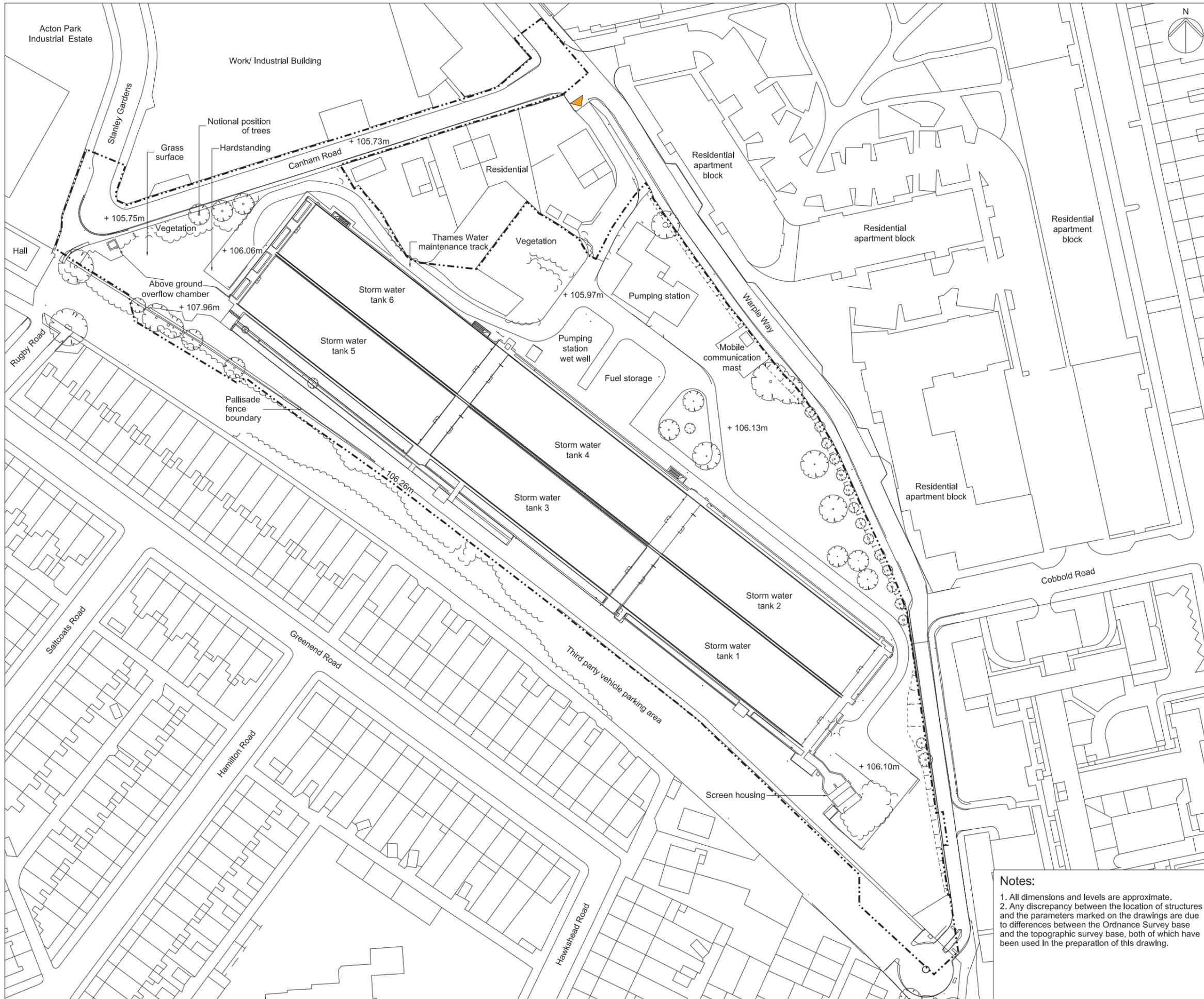
FOR INFORMATION

Location
Acton Storm Tanks
 London Borough of Ealing

Document Information
Application for Development Consent
 Location plan

Book of plans - section 5
 DCO-PP-02X-ACTST-050001
 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)
 - + 105.40m Existing levels (shown in metres above tunnel datum)
 - Existing trees within surveyed area (trunk sizes vary)
 - Thames Water access



FOR INFORMATION

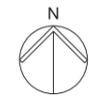
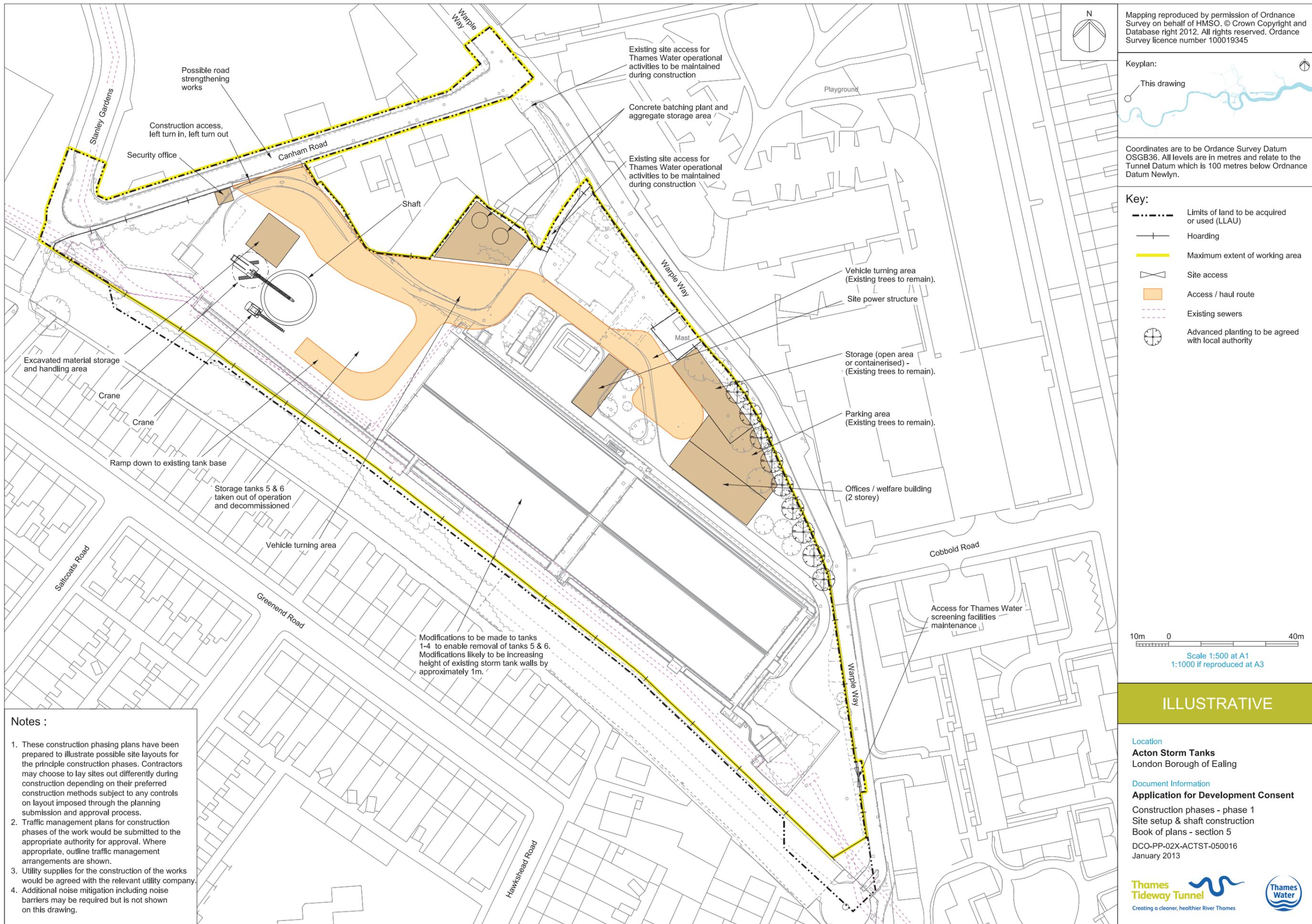
Location
Acton Storm Tanks
London Borough of Ealing

Document Information
Application for Development Consent
As existing
Site features plan
Book of plans - section 5
DCO-PP-02X-ACTST-050002
January 2013

Notes:

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





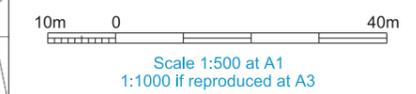
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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key:

	Limits of land to be acquired or used (LLAU)
	Hoarding
	Maximum extent of working area
	Site access
	Access / haul route
	Existing sewers
	Advanced planting to be agreed with local authority



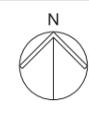
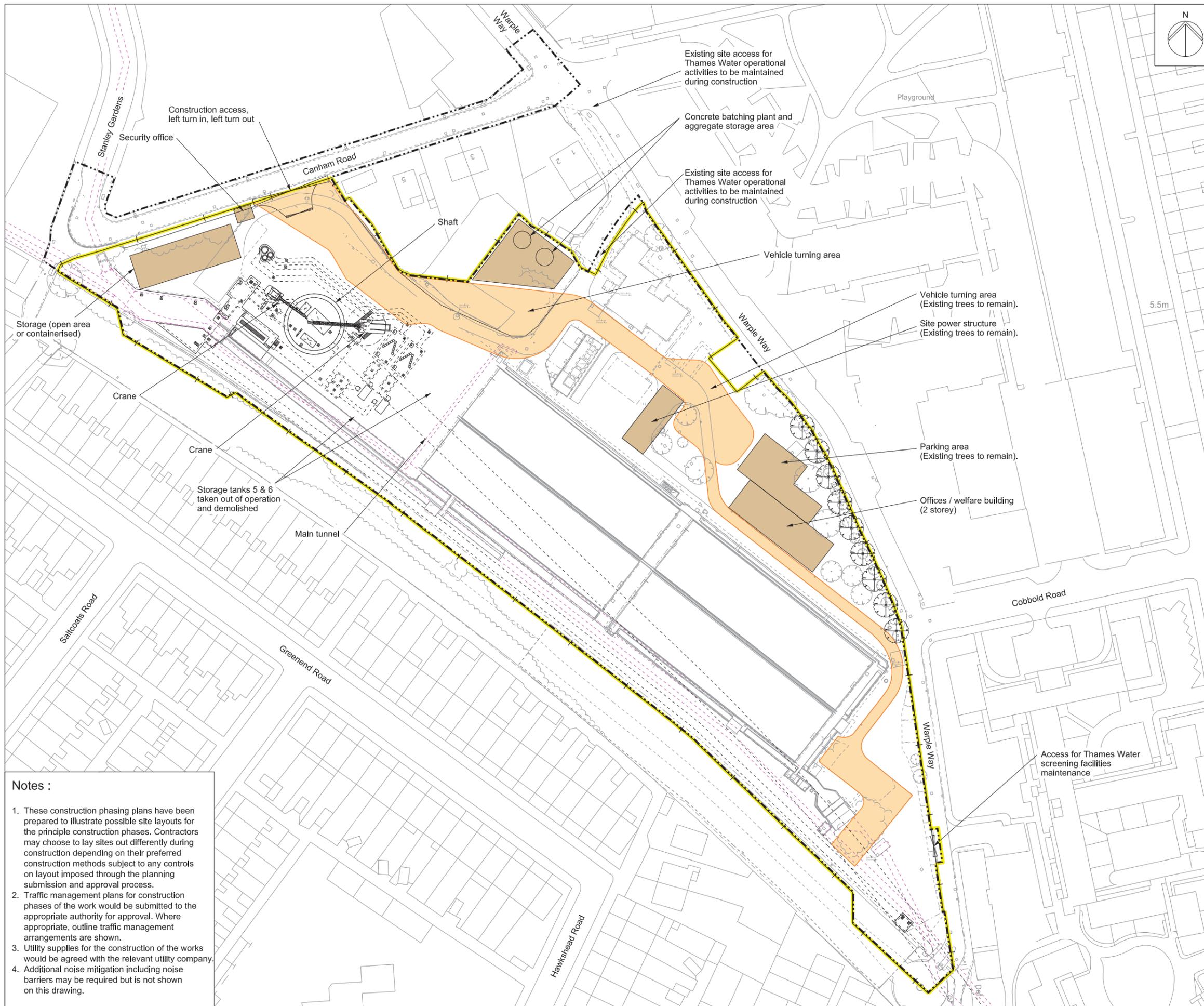
ILLUSTRATIVE

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

Location
Acton Storm Tanks
 London Borough of Ealing

Document Information
Application for Development Consent
 Construction phases - phase 1
 Site setup & shaft construction
 Book of plans - section 5
 DCO-PP-02X-ACTST-050016
 January 2013





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Keyplan:



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
- Site access
- Access / haul route
- Existing sewers
- Advanced planting to be agreed with local authority



Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Notes :

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Acton Storm Tanks
London Borough of Ealing

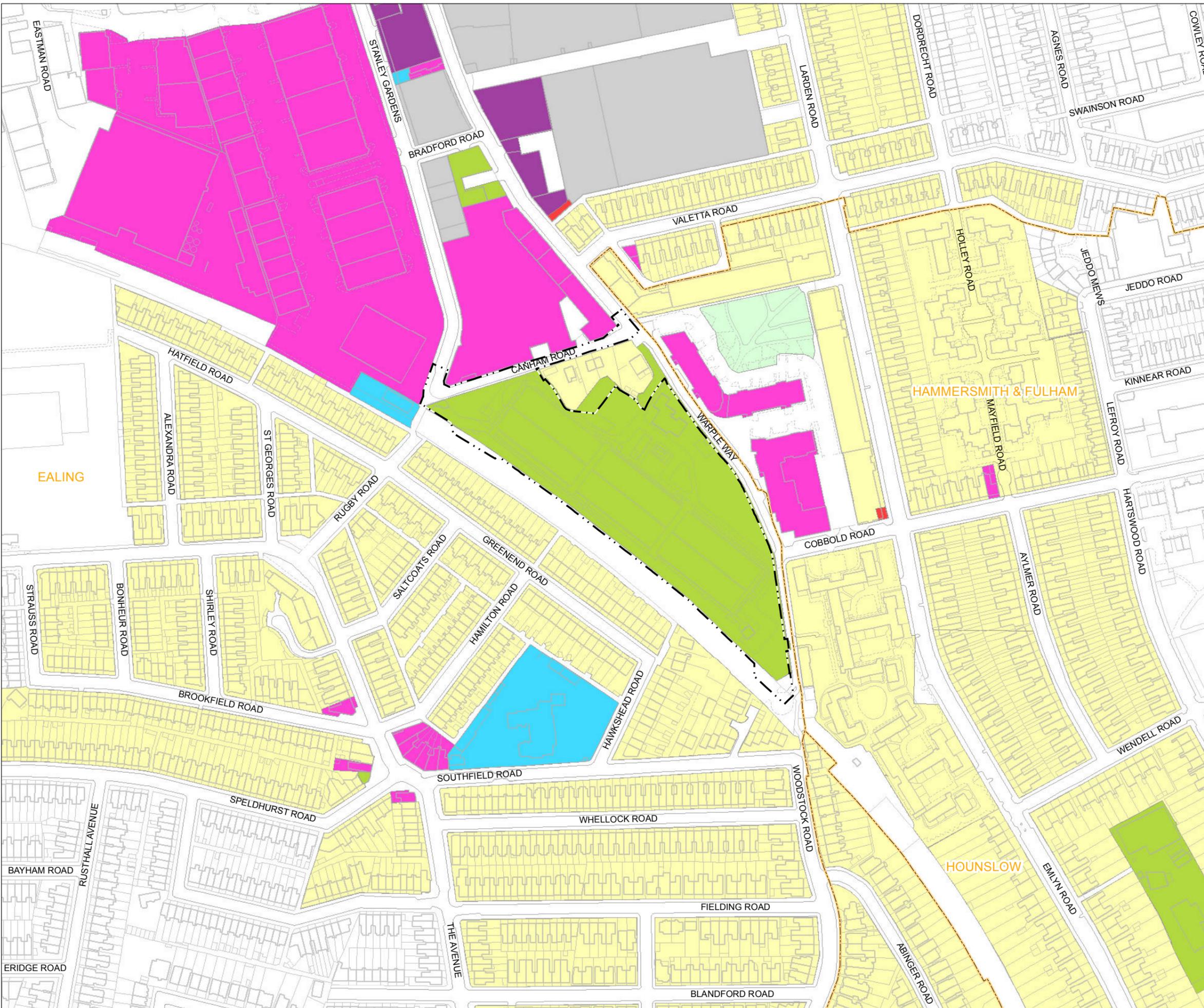
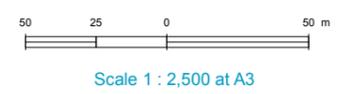
Document Information
Application for Development Consent
Construction phases - phase 2
Other structures & secondary lining
Book of plans - section 5
DCO-PP-02X-ACTST-050017
January 2013



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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
Acton Storm Tanks
 London Borough of Ealing

Document Information
Planning Statement
 Land use

1PL03-MG-00812
 January 2013



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