

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Design and Access Statement

Doc Ref: **7.04**

Part 1

Acton Storm Tanks

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

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Box **69** Folder **A**
January 2013

Thames
Tideway Tunnel 
Creating a cleaner, healthier River Thames

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Section 6

Acton Storm Tanks

6.1 Introduction

6.1.1 A worksite is required to receive the 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. The site is adjacent to the London Borough of Hammersmith and Fulham to the east, and close to the London Borough of Hounslow to the south.

6.1.2 We have agreed with the London Borough of Ealing that some elements of the detailed design proposals would be drawn up at a later stage. The detailed design will be submitted to the local authority for approval in the form of a DCO requirement. Therefore, the majority of the images and plans in this section are for illustrative purposes only. The proposed landscape design is indicative, except for the layout of the above-ground structures, which is illustrative.



Figure 6.1: Aerial photograph of the existing Acton Storm Tanks site with LLAU indicated

6.2 Existing site context

6.2.1 Acton Storm Tanks is a Thames Water operational site that comprises six open storm water tanks, associated infrastructure, a pumping station, grassed areas and areas of hardstanding used for parking. The limits of land to be acquired or used for the site also include Canham Road and its junctions with Stanley Gardens and Warple Way. There are no heritage assets within the site.

6.2.2 The site is bounded by Canham Road to the north, Warple Way to the east and southeast, and a private car park to the southwest and west. To the north of the site are various light industrial business and commercial uses in Acton Park Industrial Estate beyond Canham Road.

6.2.3 The surrounding area is predominantly residential in character. The nearest properties sit on the northeastern corner of the site and the site boundary surrounds them to the north, south and west. The rear gardens of the properties adjoin the Thames Water operational site.

6.2.4 Beyond Warple Way to the east lies the newly built Factory Quarter development of high-rise flats and the five-storey 1930s housing estate known as Emlyn Gardens lies to the southeast.

6.2.5 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. The River Thames lies approximately 1.5km to the south of the site.

6.2.6 The private car park to the west of the site has a gated key fob activated access to the south and a secure pedestrian access to the north. Beyond the car park lie terraced houses along Greenend Road.

6.2.7 There is a scout hut immediately to the northwest of the site, which provides facilities for a number of community uses including scouting groups and a nursery school.

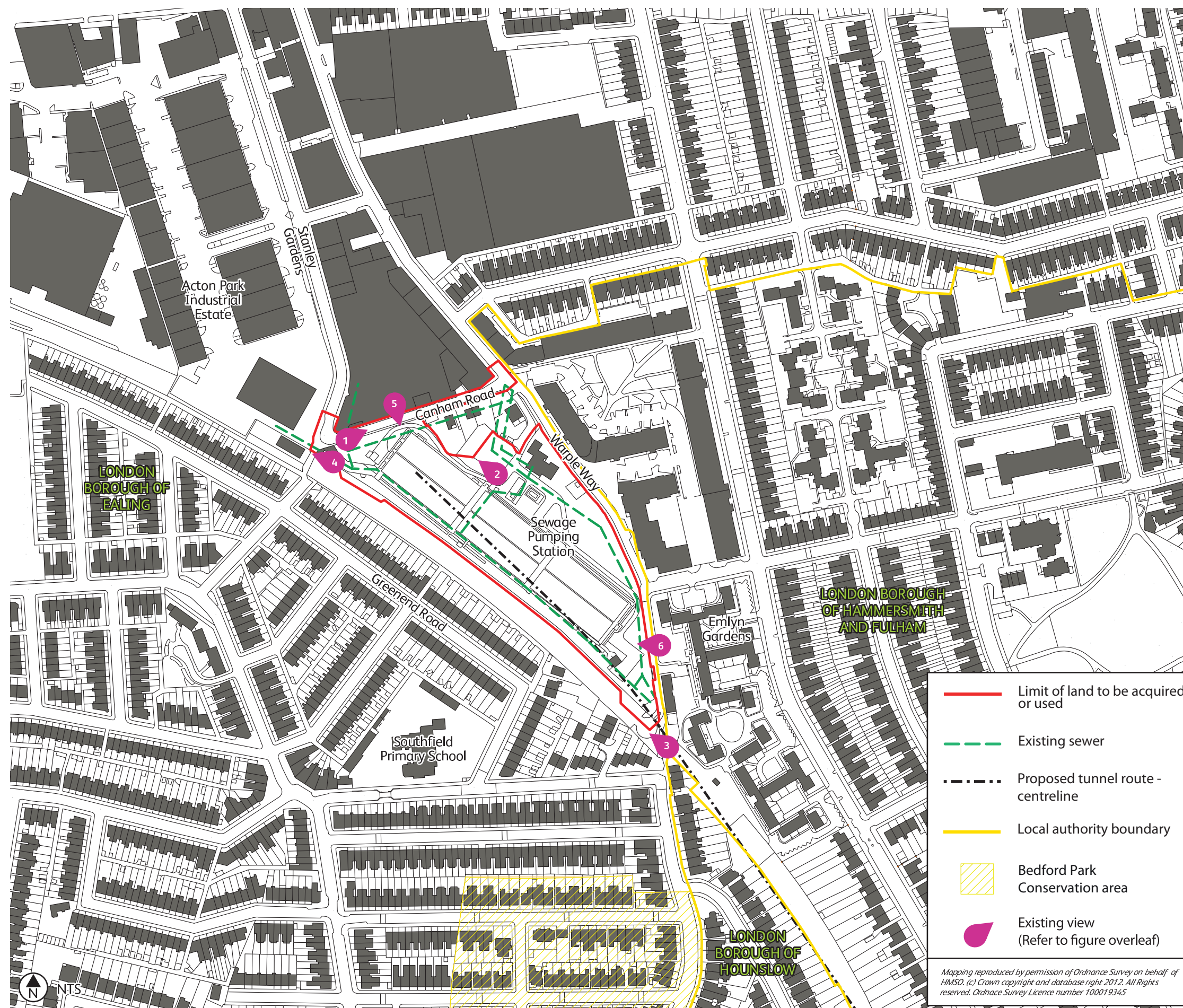


Figure 6.2: Existing site plan



Figure 6.3: Canham Road looking east



Figure 6.4: Inside the compound looking north to Canham Road



Figure 6.5: Private car park



Figure 6.6: Scout hut



Figure 6.7: Existing site boundary on Canham Road



Figure 6.8: Existing site boundary on Warple way

Thames Water compound

6.2.8 Existing concrete drainage infrastructure sits approximately 1.8m above ground along the western boundary of the site. There is a narrow grass verge including a number of trees between the site boundary and the private car park. The northern boundary on Canham Road features galvanised palisade security fencing. There is a triangular piece of overgrown land with some tree planting to the north of the storm tanks. There is some tree planting on the eastern boundary and part of the compound here is occupied by a telecommunication mast.

6.2.9 The site also includes an 'L-shaped' piece of overgrown land to the rear of the houses on Canham Road.

6.3 Existing site access and movement

6.3.1 The existing site access road intersects Canham Road a few metres before the junction with Warple Way.

Highways

6.3.2 Warple Way, Canham Road and Stanley Gardens form a clockwise, one-way, single carriageway loop subject to a width restriction of 7.5m. Access between the site and the local highway network is via this one-way system.

6.3.3 The southern section of Warple Way is a narrow road that provides local access to the private car park. Warple Way is one-way (northbound) between Cobbold Road and Canham Road.

6.3.4 The Vale (A4020) is a wide single carriageway with one lane in each direction that becomes a three or four lane carriageway with up to two lanes in each direction in certain sections. Some sections also have dedicated bus lanes. The majority of its junctions are controlled by traffic signals.

Car parking

6.3.5 No parking is permitted along The Vale near the junctions with Warple Way and Stanley Gardens from Monday to Saturday between 6pm and 8.30pm.

6.3.6 There are short sections of single and double yellow lines on both sides of Warple Way. The single yellow lines are predominantly located from the junction with The Vale to approximately half-way to the junction with Canham Road. The lines are 'no waiting' zones from Monday to Saturday between 8.30am and 6.30pm. The remaining sections of Warple Way are unmarked and provide unrestricted kerbside parking.

6.3.7 Canham Road provides unmarked kerbside parking along the northern side. There is a single yellow line on the southern side of the road, which is 'no waiting' Monday to Saturday between 8am and 6.30pm. The corner of Canham Road and Stanley Gardens also has single yellow lines to restrict parking near the corner.

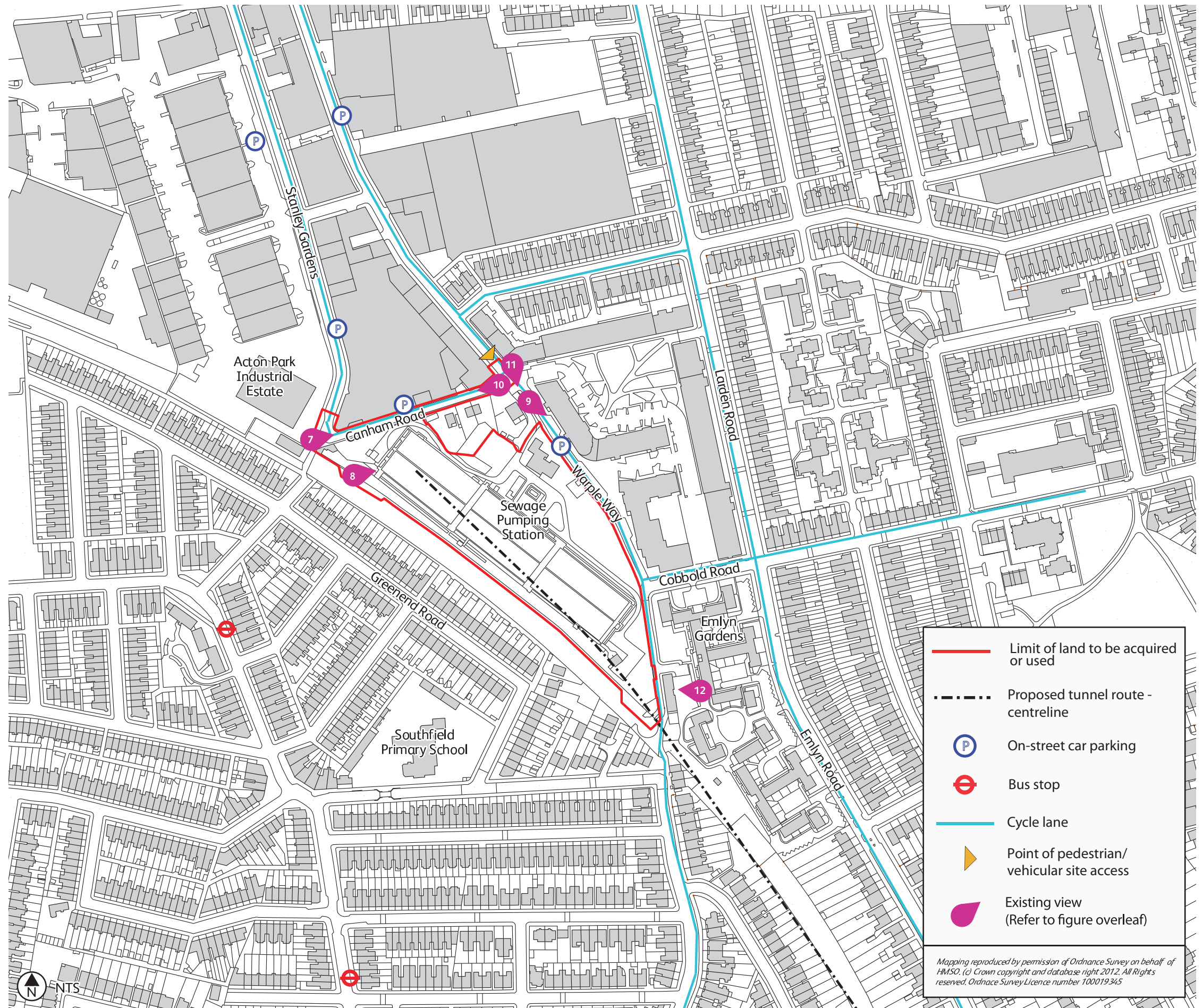


Figure 6.9: Existing site analysis plan



Figure 6.10: Northern corner of the proposed site



Figure 6.11: Storm tanks with Warple Way beyond



Figure 6.12: Warple Way looking south



Figure 6.13: Canham Road looking west



Figure 6.14: Existing entrance to storm tank site

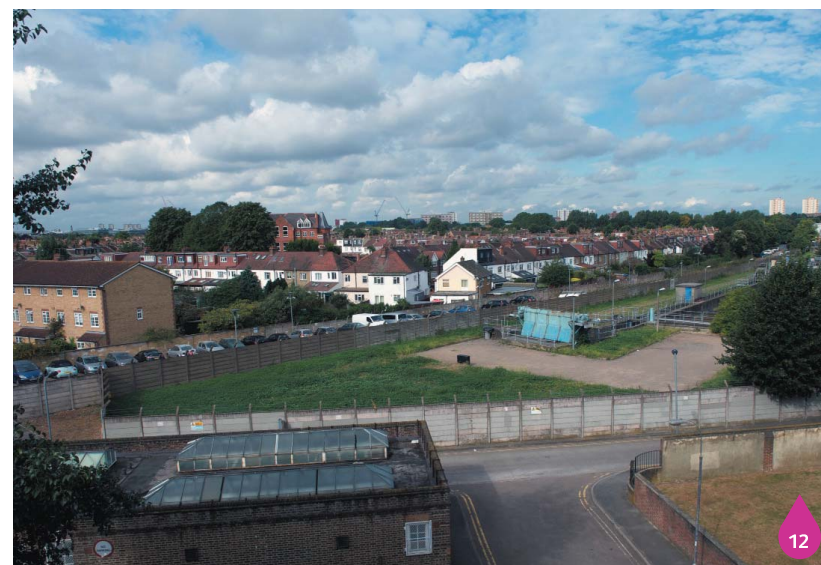


Figure 6.15: Storm tanks from Emyln Gardens

Stanley Gardens provides unrestricted parking along the majority of the eastern side of the road, and short sections of unrestricted parking on the western side. The remaining sections along the western side have single yellow lines and are 'no waiting' from Monday to Saturday between 8.30am and 6.30pm.

Public transport

6.3.8 The site is poorly linked to public transport; it lies 750m from Acton Central National Rail Station and 1km from Turnham Green Underground Station. There are a number of bus stops within 500m of the site.

Cycling routes

6.3.9 There are two Hammersmith and Fulham Strategic and Local Cycle Routes around the site, which run along Cobbold Road and Larden Road/ Emyln Road to the east of the site.

6.3.10 Sections of advisory cycle lanes are in place along The Vale, a number of which lead into dedicated bus lanes. Many of the junctions along The Vale provide advanced stop lines for cyclists, including the junction with Warple Way.

Pedestrian routes

6.3.11 Canham Road provides a one way east-west link between Warple Way and Stanley Gardens. It has footways on both sides; however, they are very narrow near the site boundary at a maximum width of 1.7m. There is a pedestrian Public Right of Way to Rugby Road from the western end of Canham Road. There are no Public Rights of Way within the site.

6.3.12 Warple Way provides a link between the site and The Vale and has footways on both sides of the road. It connects to Canham Road and Cobbold Road to the east and there is a footpath at its southern end to Woodstock Road.

6.3.13 Stanley Gardens connects Canham Road to The Vale and has footways on both sides of the road. There is no formal pedestrian crossing at the The Vale/Stanley Gardens junction.

6.3.14 The Vale provides a pedestrian footway on the southern side of the carriageway between Uxbridge Road in the east and High Street in the west. There are dropped kerbs and signalised crossing points at its junction with East Acton Lane/Warple Way.

Historical context

6.3.15 Lower and Middle Palaeolithic (700,000 to 40,000 BC) and prehistoric (700,000 BC to AD 43) remains are poorly represented in the assessment area.

6.3.16 It is likely that the site lay in an extensive agricultural area surrounding the Roman City of London (AD 43 to 410), which was located 10km to the east of the site; however, there is no evidence of Roman activity in the assessment area. Two Roman pits were found in the area of Acton shopping centre (1.0km northwest of the site), which indicate some Roman activity in the wider area.

6.3.17 Throughout the medieval period (AD410 to 1485), the site lay outside the main settled areas, possibly in open fields or woodland, 300m to the south of the London to Oxford (Uxbridge) Road. The main settlement, Church Acton or Acton town, lay 1.3km to the northwest of the site and the hamlet of East Acton lay 320m to the north of the site on the north side of Uxbridge Road. There would have been a few outlying farms near these settlements.

6.3.18 During much of the post-medieval period (AD 1485 to the present day), the site lay in open fields, and was subject to arable cultivation from at least the mid-18th century.

6.3.19 The site is considered to have low archaeological potential as it lay outside of the main settlement areas and archaeological finds to date have been sparse. This is probably due to the limited amount of archaeological investigation in the assessment area.

6.3.20 In the mid to late 19th century, a railway line (no longer extant) was constructed on a slight embankment adjacent to the southwestern boundary of the site. In the 1880s, the Metropolitan Board of Works constructed the Acton Sewage Disposal Works on the site. The work comprised filter beds, a pump house and a circular tank in the northern part of the site. It also included a house to the north of the site boundary.

6.3.21 Acton Pumping Station was built in 1887 on five and a half acres of land to collect sewage from the houses built on Warple Way after 1881. The waste was treated and the effluent discharged into the River Thames at Chiswick. The sewage works was much modified in the late 20th century and the earlier pump house was eventually demolished. Other late 20th century brick sheds were built to house associated machinery.

6.3.22 The closest natural watercourse was the western branch of Stamford Brook, known locally as the Warple, which bordered the site immediately to the east. By 1900, the brook had been covered over and is now a sewer. By 1902, a large filter bed covered the entire southern part of the site.

6.3.23 Storm water and sewage from houses built before 1881 continued to pass through the existing metropolitan sewerage system to Beckton until 1905 when the storm tanks were built to avoid unnecessary discharge into the River Thames. This scheme is essentially still in use today.

6.3.24 The site is occupied by six large uncovered modern storm tanks and associated buildings from the 20th century and fragmentary remains of the earlier 19th century sewage works. These are of low heritage significance and there are no heritage assets on the site.

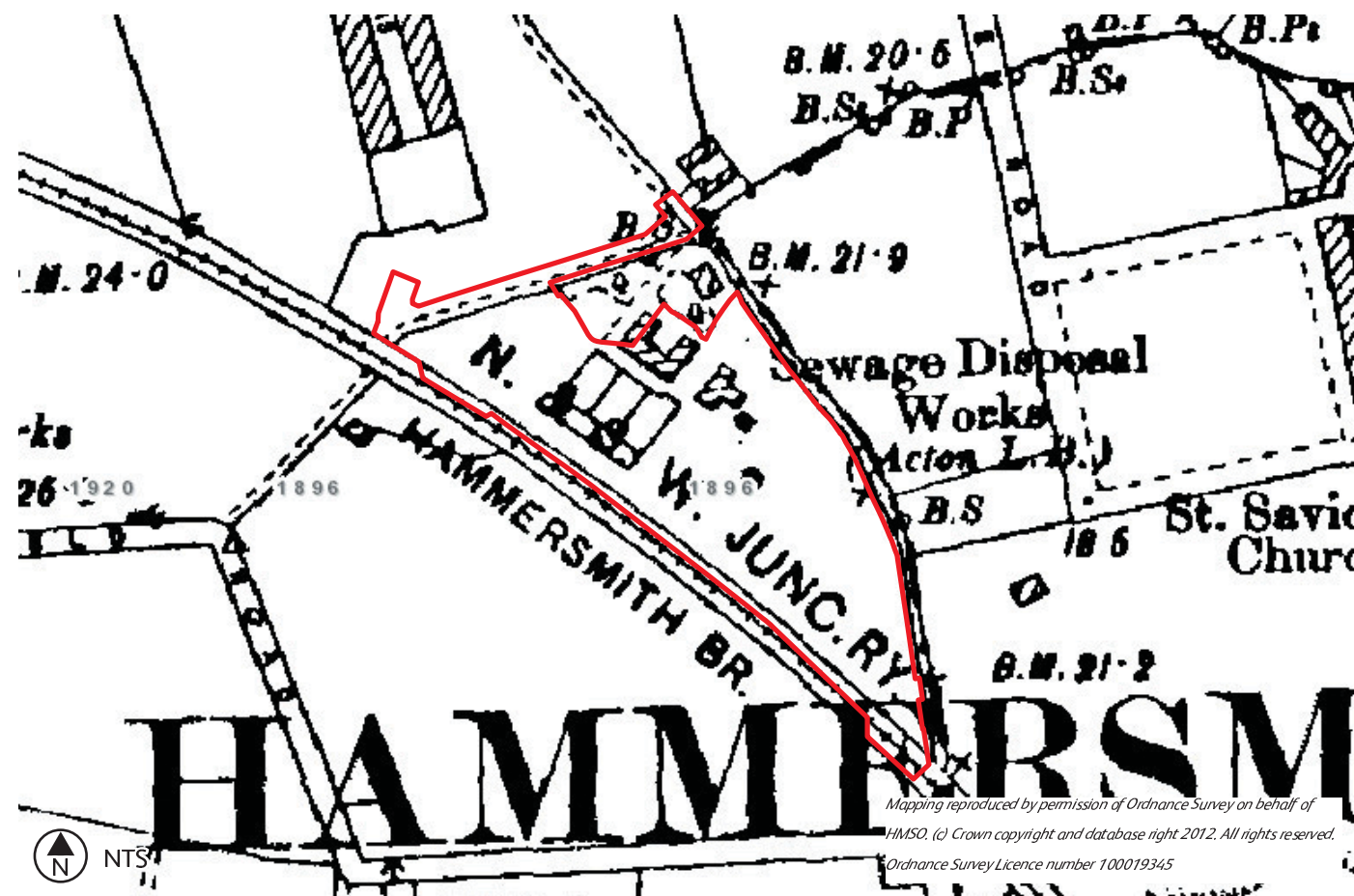


Figure 6.16: Historical map (1896-1898)

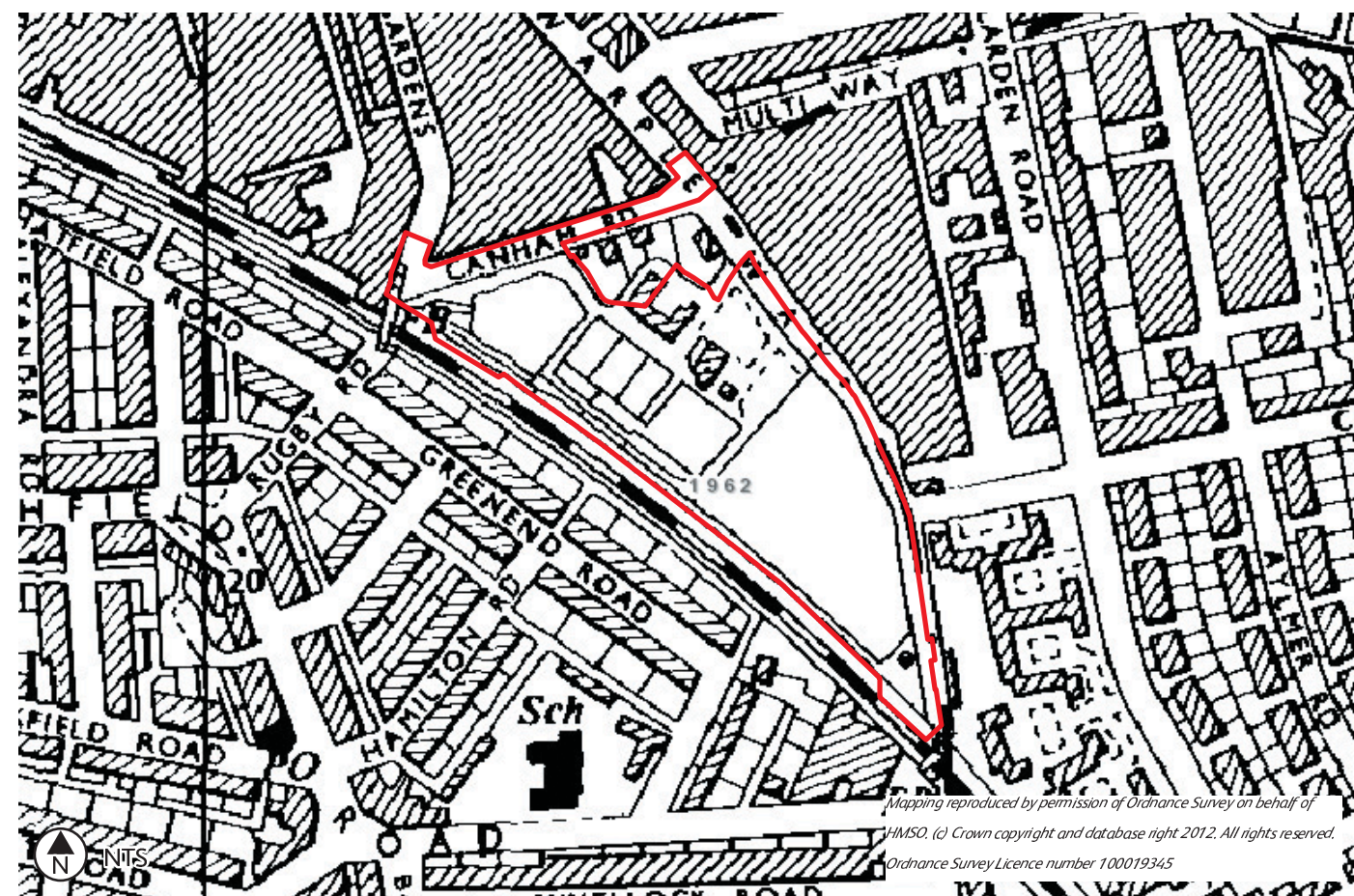


Figure 6.17: Historical map (1962-1968)

Site analysis: Opportunities and constraints

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.

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).

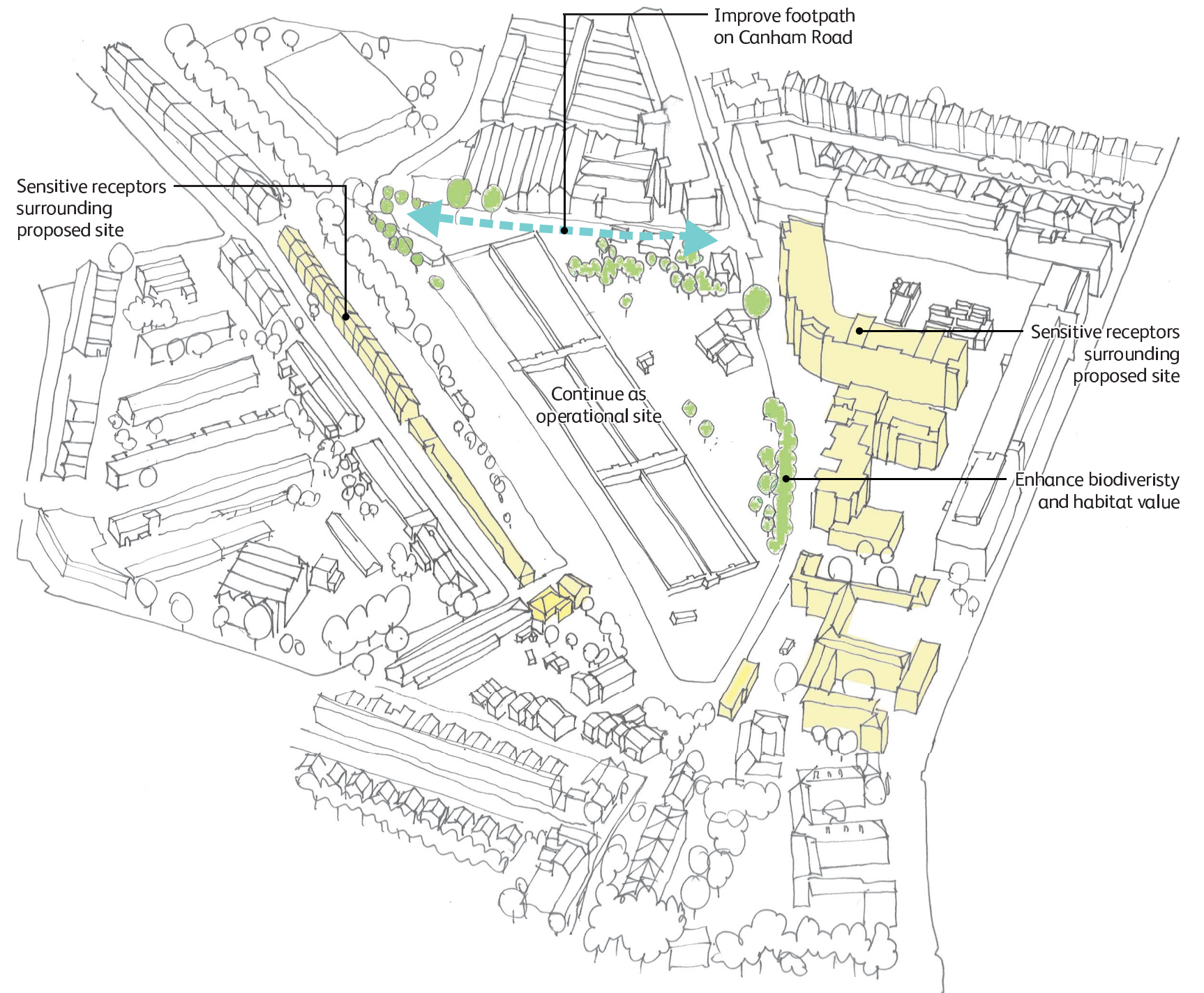


Figure 6.18: Existing site opportunities and constraints sketch

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6.4 Design evolution and alternatives

6.4.1 As the majority of the infrastructure for the project would be below ground, the key design objective of the permanent works was to integrate the functional components into the surroundings. The site-specific design objective at Acton Storm Tanks was to successfully integrate the works into the Thames Water operational site, having regard to the proximity of residents and other sensitive receptors.

6.4.2 The design of our proposals at the Acton Storm Tanks site was also significantly influenced by an extensive process of stakeholder engagement and design review. In order to ensure design quality, we undertook two rounds of review hosted by the Design Council CABI. We also held various pre-application meetings with the London Borough of Ealing and other strategic stakeholders such as English Heritage. More information on our public consultation process is provided in the *Consultation Report*, which accompanies the application.



Figure 6.19: Proposed view during design development

October 2010

Phase one consultation

6.4.3 At phase one public consultation, we proposed to use the site to intercept the Acton Storm Relief CSO and to receive a long connection tunnel driven from Hammersmith Pumping Station. Hammersmith Pumping Station was also presented as our preferred site to receive the main tunnel from Barn Elms.

6.4.4 At this stage, we proposed to include several above-ground structures at Acton Storm Tanks, including a ventilation column (with two integrated ventilation outlets) at the southern end of the compound and a rectangular kiosk to house electrical and control equipment. The area around these structures would remain hardstanding to enable maintenance vehicle access, which we proposed to soften with appropriate planting.

6.4.5 The rest of the site would be returned to its original condition. We did not propose to decommission or hydraulically isolate any tanks at this stage.

6.4.6 We received feedback from the London Borough of Ealing, the London Borough of Hammersmith and Fulham, the Greater London Authority, English Heritage and members of the public. The key concerns raised in relation to the permanent design included:

- the existing odour problems on the site from the uncovered tanks
- the potential impact on the Bedford Park Conservation Area
- the potential impact of subsidence on buildings and structures.



Figure 6.20: Proposed view from phase one consultation

6.4.7 Having considered the feedback received and on-going engineering design development, we undertook a site selection back-check (see the *Final Report on Site Selection Process*, Volume 3, which accompanies the application, for details). Since phase one consultation, a new planning application had been approved for a mixed-use development around Hammersmith Pumping Station. We learnt that there would be insufficient space to accommodate a main tunnel site in that location.

6.4.8 We conducted further studies into the hydraulic requirements for the Acton connection tunnel and determined that a larger diameter tunnel was required than initially proposed in order to meet the hydraulic and storage requirements of the main tunnel system.

6.4.9 Following phase one consultation, we explored the following considerations:

- using the site as a main tunnel reception site, which would require a larger works area within the existing tanks
- amending the design to include a ventilation building
- addressing the potential impact of the construction works on local residents.

6.4.10 We determined that Acton Storm Tanks should be our preferred site to receive the main tunnel from Carnwath Road Riverside for the following reasons:

- It is a brownfield site.
- It is owned by Thames Water.
- It is large enough to accommodate a main tunnel worksite.
- It is located on the line of the existing sewer.

April 2011

CABE sketch review

6.4.11 We held a sketch review based on an initial assessment and sketched ideas for the site with the Design Council CABE in April 2011. We proposed a 15m ventilation column and a ventilation (odour control) building (approximately 25m by 13m) to house the necessary electrical and control and air management equipment. We proposed to include a brown roof on the building.

6.4.12 We presented two options for the general location of the above-ground structures: between tanks 1 to 4 and Warple Way, or in the northwestern corner of the site to the north of tanks 5 and 6.

6.4.13 The Design Council CABE panel responded positively to the principle of locating the works at the northern end of the site and welcomed the decision to reuse tanks 5 and 6. The panel suggested that the proposed structures should be wholly incorporated into the existing storm tanks in order to reduce the visual impact on the surroundings.

6.4.14 The panel recommended constructing the structures in timber and providing green roofs, or alternatively, materials that would contribute to the character of Canham Road.

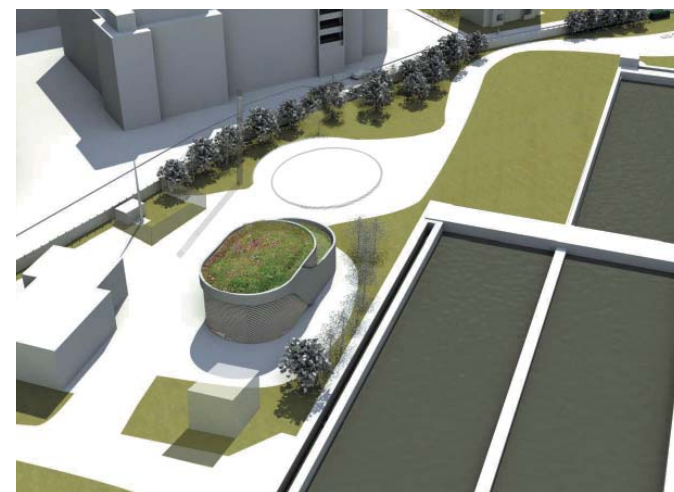


Figure 6.21: Proposed view from Design Council CABE sketch review

Interim engagement

6.4.15 Having considered the feedback received, we still believed that Acton Storm Tanks was the most appropriate site due to its size and location. We continued to engage with the London Borough of Ealing, the London Borough of Hammersmith and Fulham, Transport for London, the Port of London Authority, the Environment Agency and English Heritage in relation to design considerations. We sought to mitigate the potential impact of our works and revised the scope of the related environmental assessments.

6.4.16 As part of the interim engagement, we held drop-in sessions on 26 and 27 July 2011 at the Scout Hut on Rugby Road to gather views on local issues that we should take account of in developing our proposals for the site.

6.4.17 We also had regard to the following considerations:

- decommissioning the existing storm tanks
- isolating the existing storm tanks
- addressing the odour nuisance
- addressing the inadequate footway along Canham Road
- refurbishing the concrete fence along Canham Road
- landscaping and replanting areas of the site.

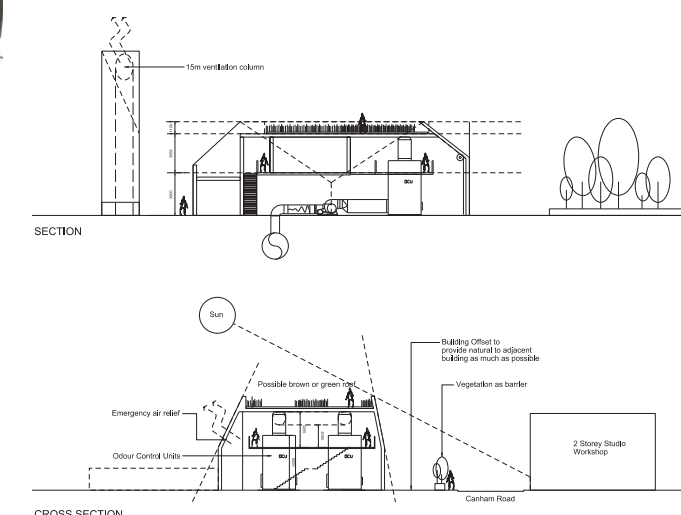


Figure 6.22: Proposed sketch sections from design development

June 2011

CABE scheme review

6.4.18 We held a more detailed scheme review with the Design Council CABE in June 2011. There were no significant developments in the design of the engineering components at this stage. The scheme included minor changes to the number and location of the ventilation structures.

6.4.19 We proposed to set the ventilation building back from the Canham Road boundary by approximately 5m to sit in line with the existing residential properties to the east. The building would form part of an improved boundary treatment to screen views into the operational site. This position would also make it possible to widen the Canham Road footpath.

6.4.20 The Design Council CABE panel supported the design of the ventilation building and the decision to align it with Canham Road.



Figure 6.23: Proposed view from Design Council CABE scheme review

November 2011

Phase two consultation

6.4.21 At phase two consultation, we received supportive feedback in relation to a number of aspects of the proposed design including:

- a. relocating the main tunnel shaft to the northern part of the site to reduce construction impacts on local residents
- b. decommissioning the existing storm tanks
- c. changing the site access on Canham Road to further reduce the effects on residents of Warple Way
- d. constructing a new ventilation building due to modifications to the project-wide air management proposals.

6.4.22 The London Borough of Ealing made a number of specific design-related comments, as follows:

- a. The proposed re-siting of the works to the northwestern end of the site in the two northern storm tanks is more appropriate.
- b. The proposed ventilation structures are in keeping with the scale and style of buildings in the industrial area to the north. They also offer the opportunity to celebrate the presence of one end of the Thames Tideway Tunnel in the local area.



Figure 6.24: Proposed view from phase two consultation

c. The irregular footprint and sloping upper section of the ventilation building would create a distinctive style and make a significant contribution to the street-scene in the area.

d. Setting the ventilation building back from the Canham Road footpath is a suitable position for it.

e. Brick would be an appropriate and robust material for the external finishes and relate well to the main materials in the area. The council encourages the use of a yellow stock brick. However, it would probably be necessary to use some special and/or contrasting bricks and other measures to break up the mass, provide visual interest (since the building has few openings), and create a high quality appearance.

6.4.23 The London Borough of Ealing and other respondents requested that the project widen the footpath on the southern side of Canham Road as part of the proposals.

6.4.24 The council also noted that it would be prepared to consider other proposals for a less intrusive built form. However, the design of the structures would need to be high quality and make an appreciable contribution to the area's appearance.

Design development

6.4.25 Following phase two consultation, we continued to liaise with the London Borough of Ealing to develop the design and design principles for the site in order to accommodate their aspirations for the area.

6.4.26 We conducted an engineering review of the ventilation structures at this site and reconsidered the need for an above-ground ventilation and electrical and control building. We consequently amended the design to incorporate the majority of the ventilation infrastructure below ground and the electrical and control equipment within the existing control building on-site.

6.4.27 This change introduced a third outlet into the ventilation column and a separate outlet ventilation structure. We proposed to enclose the remaining ventilation infrastructure (comprising various fans and air treatment equipment), which would require frequent maintenance, within above-ground enclosures to protect the equipment and provide acoustic screening.

6.4.28 We held a public meeting at the Southfield Park Triangle Residents' Association on 14 June 2012 in order to gather views on the design changes to the ventilation structures following phase two consultation and subsequent minor changes to the site boundary. No concerns were raised in relation to these changes.

6.4.29 There were no significant developments in the proposed design for this site following this stage.



Figure 6.25: Proposed view during design development

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6.5 Proposed design

6.5.1 This section describes the amount, layout and scale of the proposed development and how the functional components would be integrated into the existing site. Details of the proposed landscaping and appearance of the site are also embedded in the description where relevant.

Fixed principles

6.5.2 The Site works parameter plan illustrates the zones in which the proposed works would take place. The plan indicates the general location of the main tunnel reception shaft, the outlet ventilation structure, ventilation column, and ventilation structures. It also indicates the maximum and minimum height of the proposed structures (where applicable).

6.5.3 The site-specific design principles are included in the *Design Principles* document which accompanies this application. These principles establish the parameters for the above ground structures and landscaping on the site and have, where possible, been developed in consultation with the local authority. The site-specific principles should be read in conjunction with the project-wide design principles.

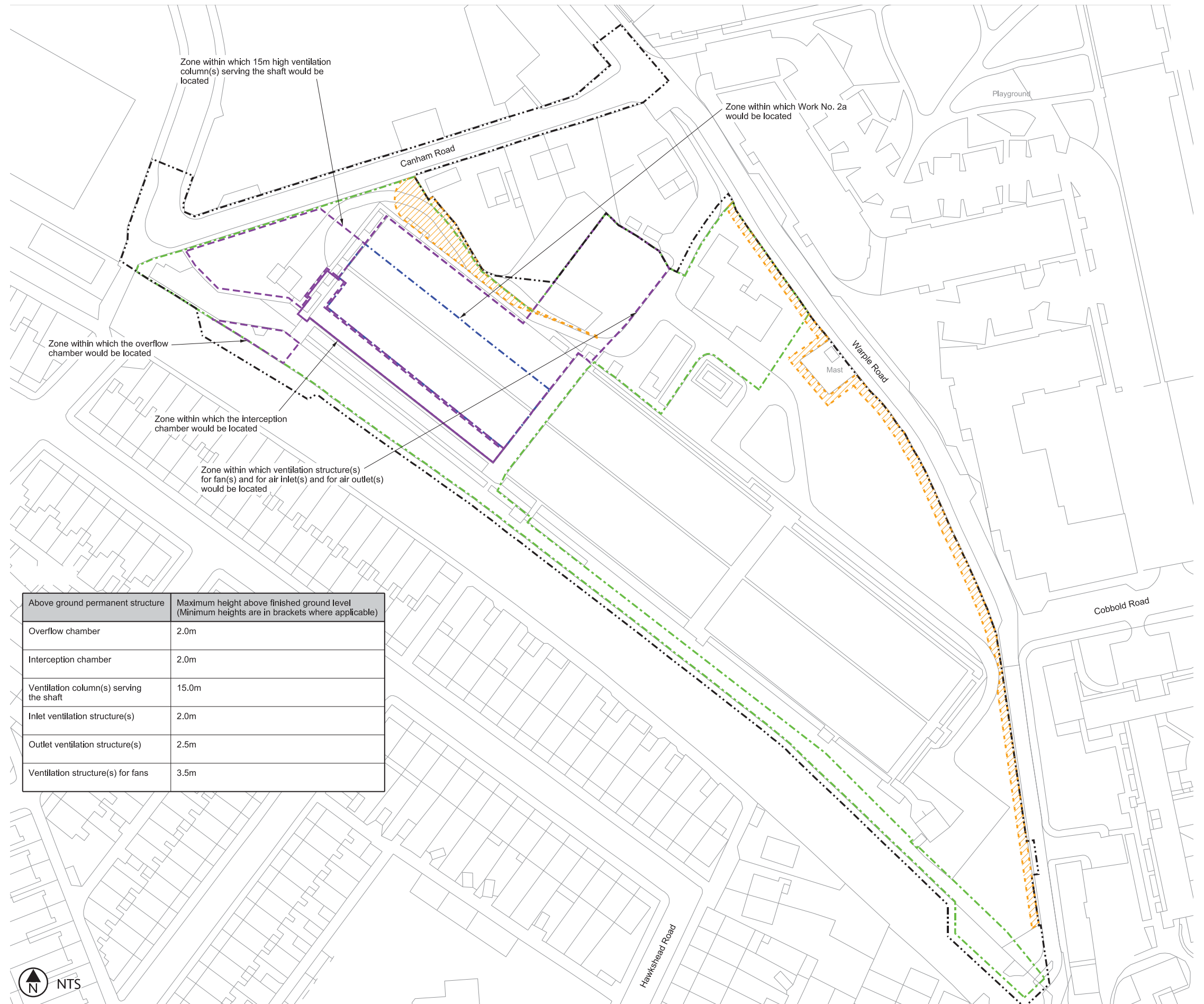


Figure 6.26: Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*

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Design objectives

6.5.4 All of the proposed above-ground structures would be located within the existing Thames Water compound. However, we recognised that incorporating a series of large structures within the compound and modifying the boundary treatments would affect the character and appearance of the local area. The main driver behind the development of the design for this site was to ensure that the structures would be as discreet as possible and would contribute positively to their environment. Our other objectives included:

- Improve the visual appearance of the site by improving the boundary treatments.
- Ensure the continued use of Acton Storm Tanks as a Thames Water operational site.
- Enhance the site's biodiversity and habitat value.
- Improve the public realm by widening the existing footpath on the southern side of Canham Road.
- Design the ventilation column to form a local landmark.

Use and programme

6.5.5 The site would remain an operational Thames Water compound and would not be accessible to the public.

Detailed description

6.5.6 We sought to incorporate sufficient flexibility in the proposed design to respond to further detailed engineering development and liaison with the local stakeholders.

6.5.7 In response to phase two consultation feedback, we propose to widen the Canham Road footpath to a minimum width of 2m using land from the site, as stated in the site-specific design principles. 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.

6.5.8 In order to improve the general appearance of the boundaries of the site, we propose to use a consistent architectural fencing panel along the boundary with Canham Road and the boundary with the private car park to the west. The fencing panel would be used to 'clad' the existing above-ground overflow weir chamber concrete above-ground sewer and the associated extensions (see below). This would help to blur the distinction between old and new and ensure visual consistency across the site.

6.5.9 We sought to minimise the required areas of hardstanding on the site. In addition to reinstating existing planting, we propose to include new areas of low maintenance planting in the northern section of the site and to the east and south of the shaft. 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.

6.5.10 The green area in the northern section of the site would screen views into the compound. We would select appropriate species having regard to screening, visual interest, biodiversity and maintenance considerations.

Advanced planting

6.5.11 We propose to undertake advanced tree planting on the boundary with Warple Way prior to construction, including extending the line of Lime trees on the eastern boundary. 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.

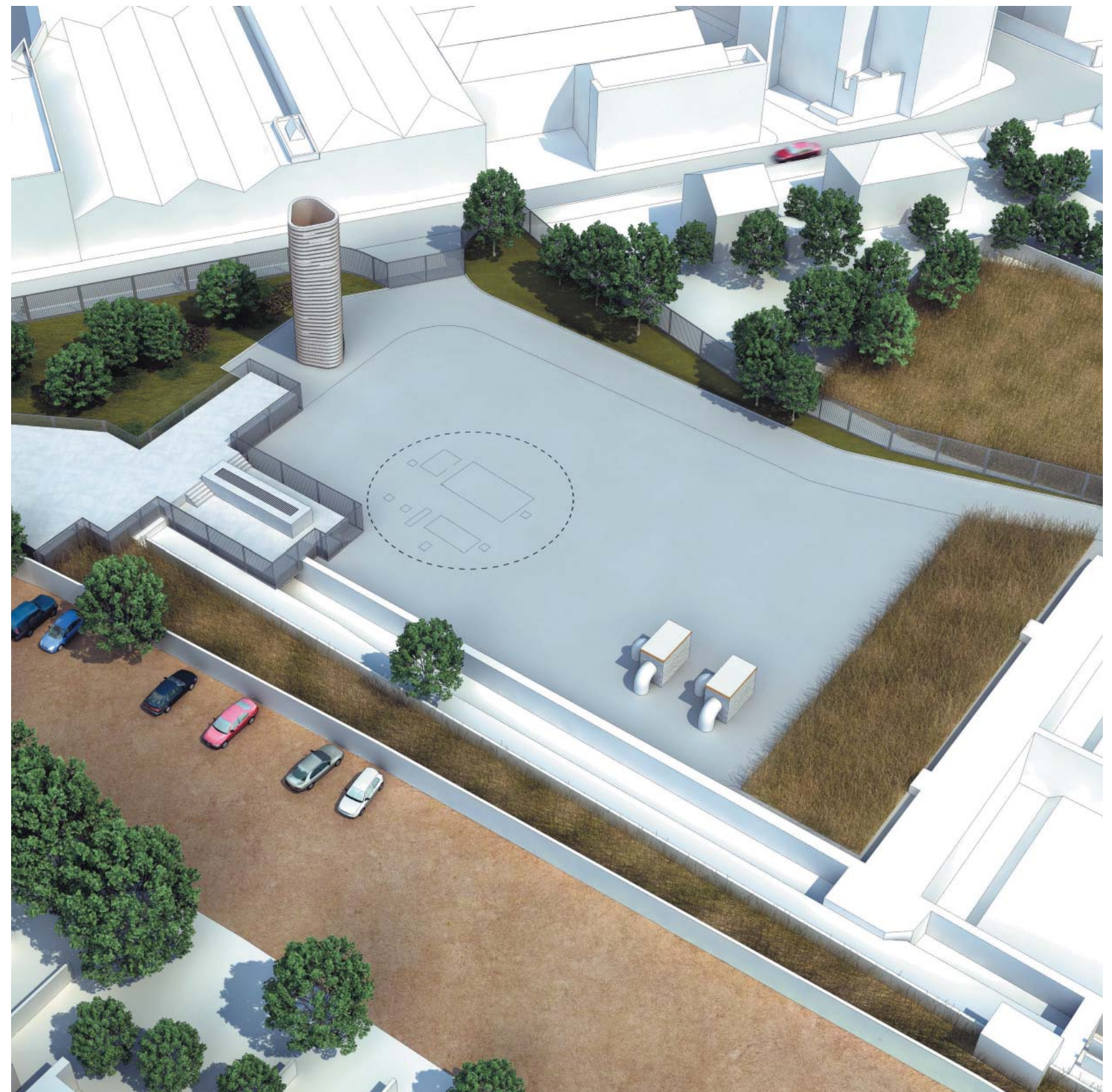


Figure 6.27: Proposed aerial view

Integration of the functional components

6.5.12 The majority of the proposed works are below-ground structures, including:

- a main tunnel shaft
- An interception chamber with an integrated air inlet structure
- a valve chamber
- a connection culvert
- air treatment filters and a bypass chamber.

6.5.13 Post construction, the following structures would be visible on the site:

- a ventilation column to serve the main tunnel shaft
- two other ventilation structures, including the outlet ventilation structure
- a ventilation structure for fans.

Main tunnel shaft

6.5.14 The main tunnel shaft would be approximately 15m in internal diameter. It would sit within tanks 5 and 6 the northwestern section of the site. This location would ensure sufficient space, increase the distance from residential properties on Warple Way, and make use of the existing tanks, in line with feedback received from stakeholders.

Ventilation structures

6.5.15 In addition to the Ventilation column (see below) there are several ventilation structures within the compound.

6.5.16 The outlet ventilation structure would stand approximately 2.5m high. It would be located adjacent to the main tunnel shaft. The structure would release air from the tunnel system under extreme weather conditions when the volume of air exceeds the capacity of the air treatment facilities.

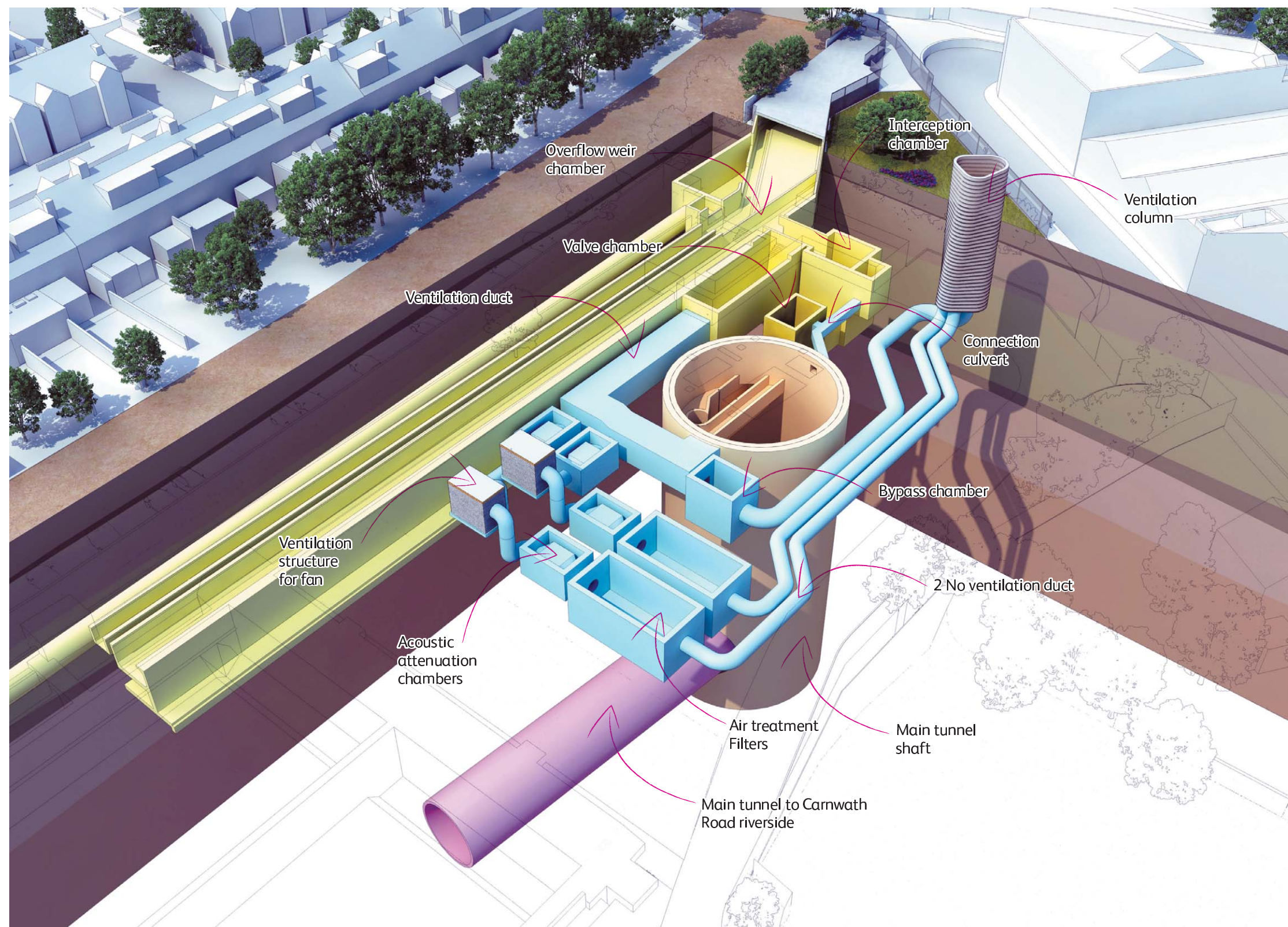


Figure 6.28: Proposed functional components diagram: below ground view

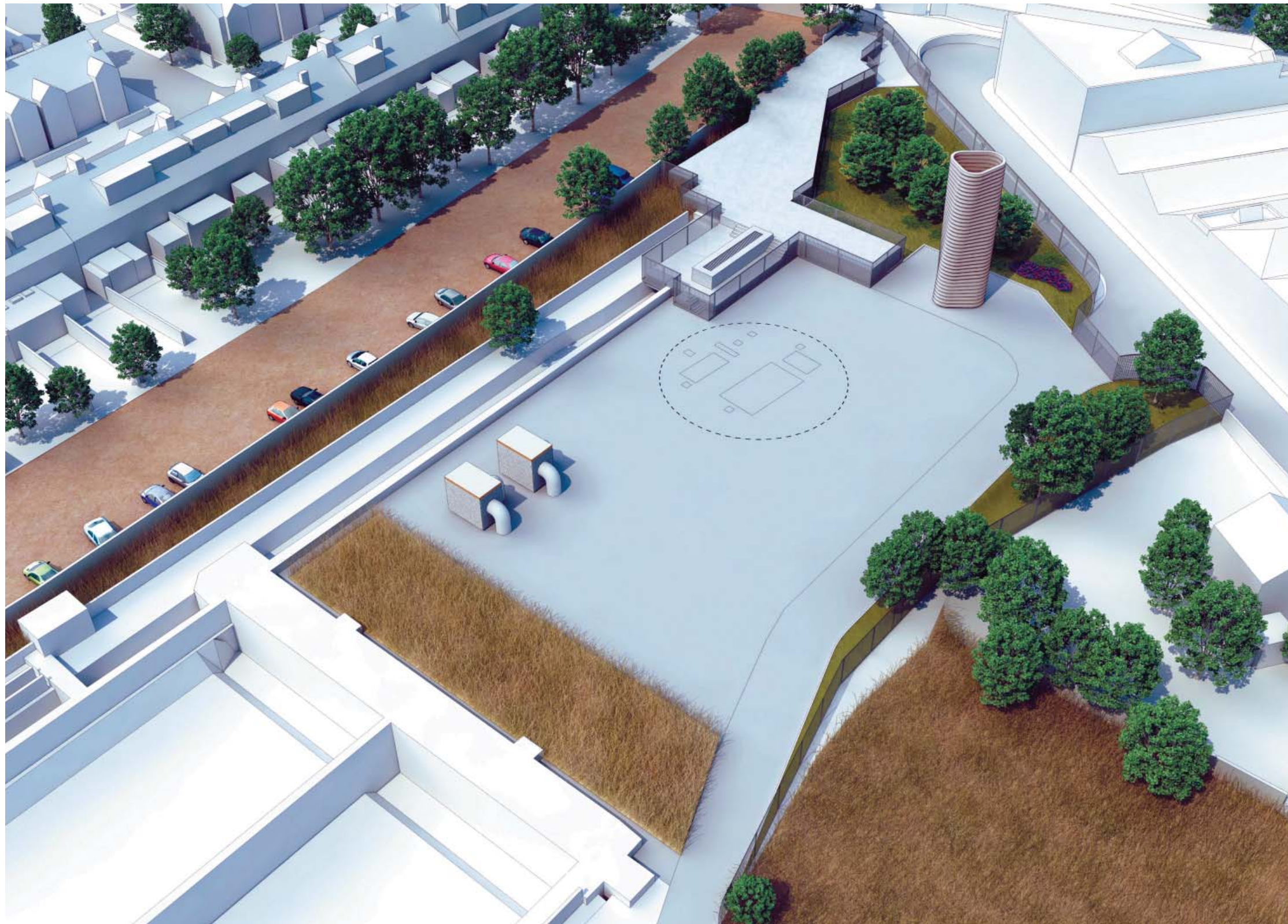


Figure 6.29: Proposed functional components diagram: above ground view

6.5.17 We propose to incorporate the air management filters and noise control equipment 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.

6.5.18 We propose to position the two smaller ventilation structures for fans within individual acoustic housings at ground level in tank 5. For operational, durability and health and safety reasons, these structures must be located above ground. Avoiding the need for a bulky ventilation building minimised land take and significantly reduced the footprint and visual impact of the permanent works.

6.5.19 We propose to incorporate planting between the ventilation structures and residential properties to the east to create a visual buffer.

Other works

6.5.20 We propose to modify the existing above-ground overflow weir chamber to the northwest of tanks 5 and 6 and create a new overflow pipe along the western boundary of the site. To provide a sufficient working area, an area of the private car park would be required during construction of the overflow pipework and modifications to the overflow weir chamber. This will enable the hydraulic isolation of the remaining storm tanks.

6.5.21 Electrical plant would be accommodated within the mechanical control centre of the existing control and standby generator building. This part of the building currently houses the switchboards and controls for the Thames Water facilities associated with pumping station and storm tanks.

6.5.22 Areas of hardstanding would be included within the site to facilitate maintenance vehicle access and incorporate access covers to the below-ground infrastructure. We sought to keep the areas of hardstanding to a minimum and to ensure that any such areas are appropriate to the Thames Water operational site.

Ventilation column

6.5.23 The number and size of the ventilation columns is determined by the air management requirements for the site. At Acton Storm Tanks we propose to include one 15m ventilation column to ventilate the main tunnel shaft. It would sit to the north of tanks 5 and 6 in order to minimise the visual and townscape effects on residents of Warple Way. The column would incorporate three ventilation outlets.

6.5.24 It would stand 15m high, which would make it a prominent feature in the local landscape. The design of the column should help it become a valued, local landmark which could be lit up at night within the proposed lighting scheme. The illustrative design suggests that it could be triangular in plan. The column appears to 'twist' around its vertical axis and therefore looks different when viewed from different angles. The twist effect evokes the project's 'signature' ventilation column design in order to create a visual link to other sites along the route.

6.5.25 We propose to construct the column with high quality, self-supporting reconstituted stone in precast units for a robust finish, which would feature the banded project-wide motif. Higher up the column, the joints between the bands would be wider. Lower down, the joints would be closer together to reduce climbability. Signage could also be cast into the stone.

Landscaping and appearance

Hard landscape palette

6.5.28 The proposed hard landscaping material palette comprises good quality, robust and fit-for-purpose materials that are appropriate to the setting in order to maintain long-term quality.

- The reconstituted stone cladding on the ventilation column would feature an acid-etched finish to create softness and expose the natural stone aggregate. It would be matched to the landscape colour pallet.
- The architectural fencing panels would be attractive and robust. They may feature bespoke signage to add visual interest to the boundaries.
- Paving within the compound would be utilitarian and easy to maintain. We envisage using concrete or dense bitumen macadam surfacing to match the existing.

Soft landscape palette

6.5.29 The soft landscaping palette would promote biodiversity and provide habitat for birds and insects. It would also provide visual interest. Elements include:

- deciduous trees
- wetland plants and trees
- native and non-native shrub, perennial and grass species.



Figure 6.30: Example of high quality fencing ©Christian Richters



Figure 6.31: Example of high quality fencing ©Bolles & Wilson Architects



Figure 6.32: Wetland plants and trees

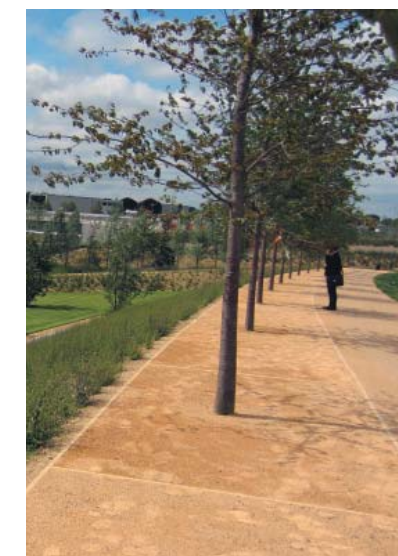


Figure 6.33: Deciduous trees



Figure 6.34: Example of native and non-native shrubs, perennials and grasses

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6.6 Access and movement

6.6.1 The site is not currently publicly accessible and this would not change following construction. Pedestrians would pass along the widened Canham Road footpath. The site is broadly flat and there are few constraints on designing a path that is accessible to all. In line with project-wide aspirations and good practice, pedestrian routes would meet the best standards of accessibility.

6.6.2 We propose to create a new vehicle access off Canham Road for use during construction to avoid using the access off Warple Way, which would be retained permanently. A section of the Thames Water boundary wall/fence on Canham Road would need to be removed in order to create the access.

6.6.3 Section 38 road adoptions are included in the application for development consent. Any such roads would meet the London Borough of Ealing's standards of construction.

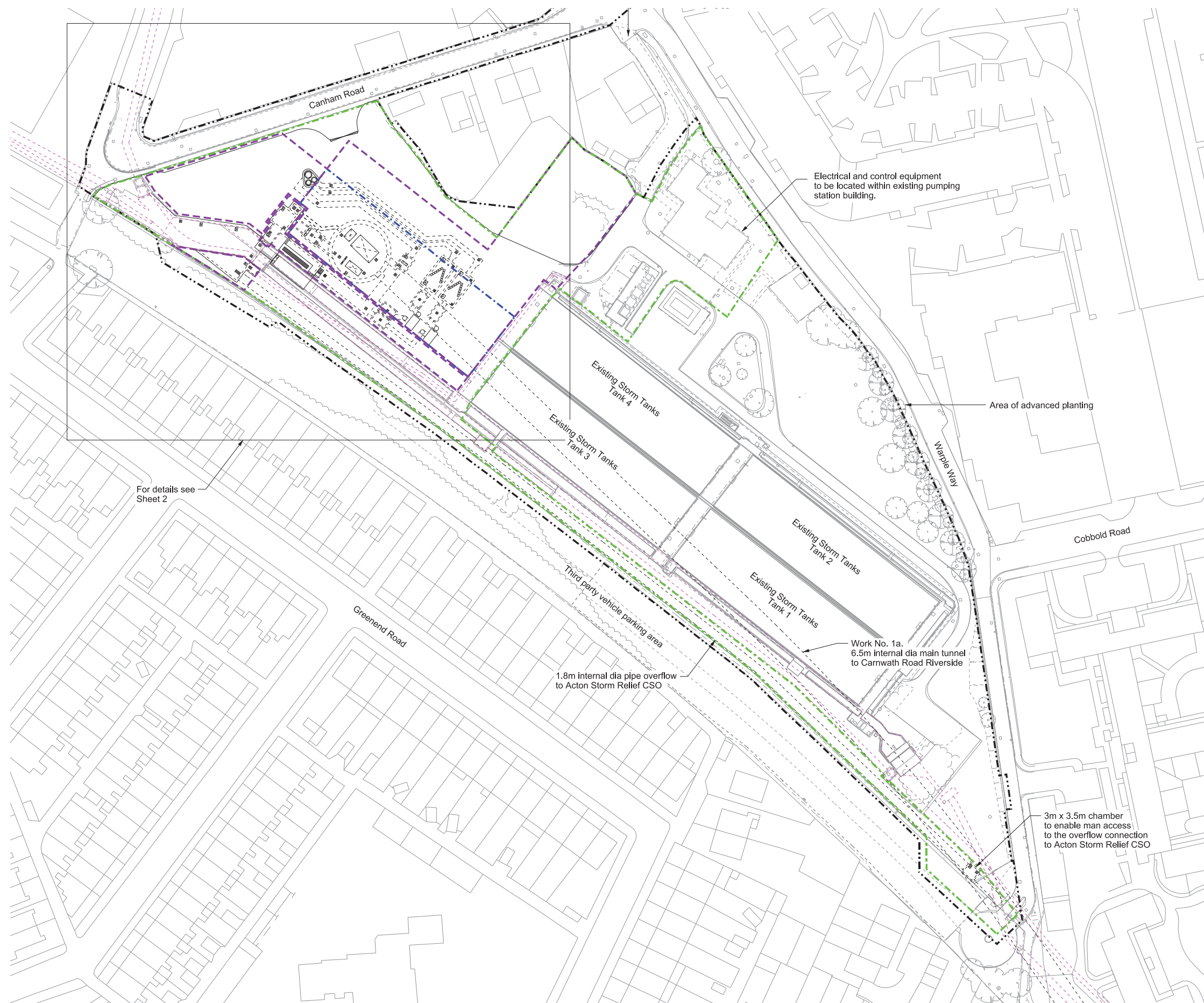
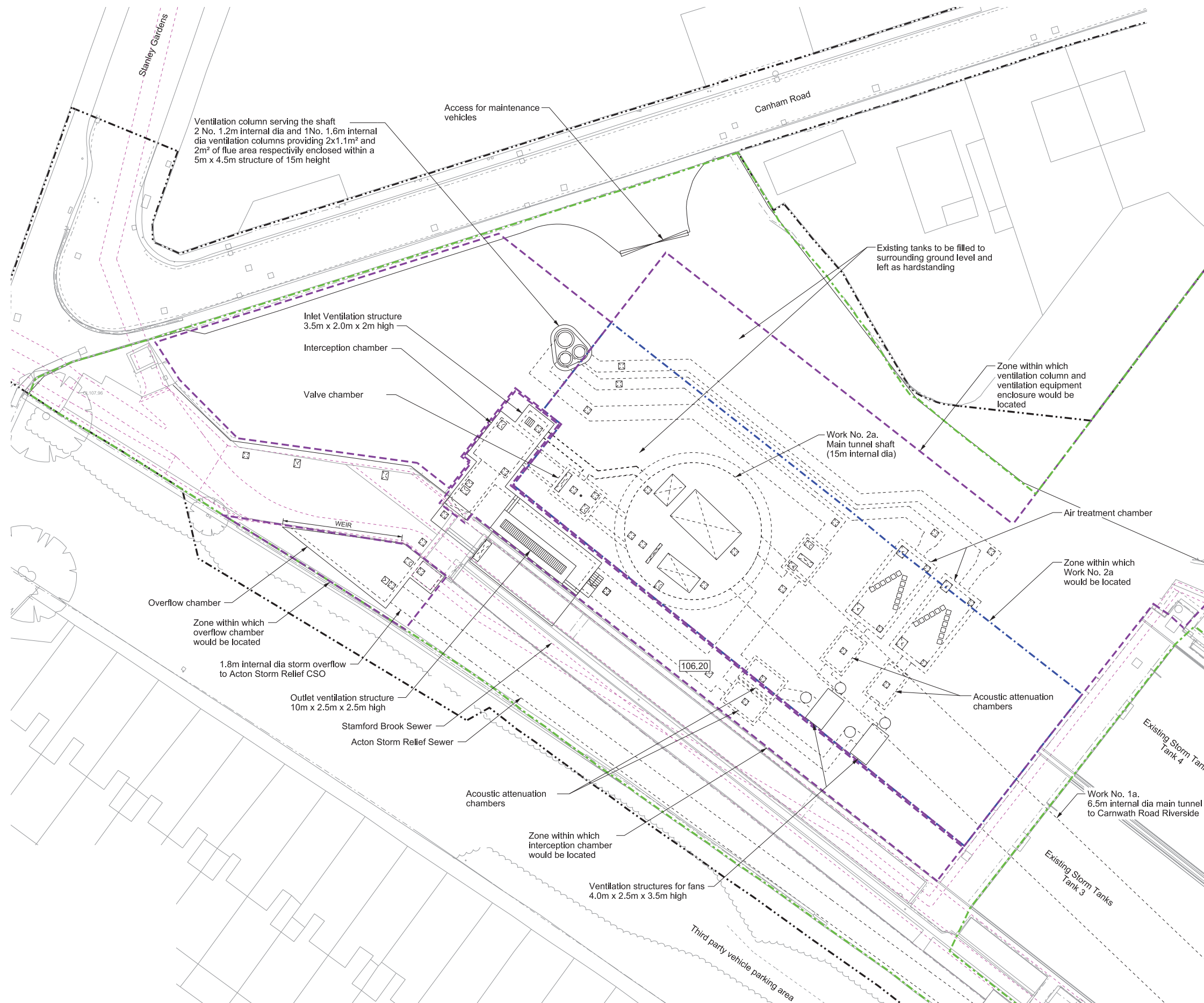


Figure 6.35: Permanent works layout - refer to Permanent works layout sheet 1 of 2 in the *Book of Plans*



Thames Water access requirements

6.6.4 The primary permanent access to the site would be via the existing access off the Warple Way and Canham Road junction. New access off Canham Road would be provided for larger or wider vehicles associated with major maintenance activities.

6.6.5 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. This would be in addition to access requirements for the existing operational compound.

6.6.6 It is anticipated that a major internal inspection of the tunnel system and underground structures would be required approximately 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 main tunnel shaft. The inspection would be carried out during normal working hours and would likely take several weeks.

6.6.7 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.

6.6.8 Temporary parking bay suspensions may be necessary where particularly large vehicles are required for maintenance activities.

Figure 6.36: Permanent works layout - refer to Permanent works layout sheet 2 of 2 in the Book of Plans

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