

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Design and Access Statement

Doc Ref: **7.04**

Part 3

Greenwich Pumping Station

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

Hard copy available in
Box **69** Folder **C**
January 2013

Thames
Tideway Tunnel 
Creating a cleaner, healthier River Thames

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Section 26

Greenwich Pumping Station

26.1 Introduction

26.1.1 A worksite is required to connect the Greenwich Pumping Station CSO to the Greenwich connection tunnel and drive the connection tunnel to Chambers Wharf, where it would be connected to the main tunnel. The proposed development site is known as Greenwich Pumping Station, which is located in the Royal Borough of Greenwich immediately to the west of the administrative boundary with the London Borough of Lewisham.

26.1.2 We have agreed with the Royal Borough of Greenwich that some elements of the detailed design proposals would be drawn up at a later stage. The detailed designs would 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. However, the proposed works to the Grade II listed East Beam Engine House will be submitted as part of the application for development consent.



Figure 26.1: Aerial photograph of the existing Greenwich Pumping Station site with LLAU indicated

26.2 Existing site context

26.2.1 The site itself comprises Thames Water's existing operational Greenwich Pumping Station and associated buildings, two railway viaducts that bisect the site, Phoenix Wharf and a builder's yard. The two railway viaducts serve Network Rail and the Docklands Light Railway (DLR).

26.2.2 The site also includes a shared pedestrian and cycle path, which runs alongside the National Rail lifting bridge from Creekside, enters the site over the Ha'penny pedestrian bridge, continues diagonally across the site under the DLR viaduct and connects to Norman Road.

26.2.3 The Network Rail viaduct and the buildings associated with the pumping station are Grade II listed, including the east and west 19th century beam engine houses that adjoin the pumping station building, which are linked by a boiler house, and two 19th century coal sheds to the southwest of the pumping station.

26.2.4 The site lies in the flood plain of the River Ravensbourne, the lower part of which is known as Deptford Creek. The site falls within the tidal Flood Zone 3 of the River Thames and Deptford Creek, which is protected by flood defences. Deptford Creek is designated as a Site of Importance for Nature Conservation (Metropolitan and Borough Importance). The creek and the site fall within a Royal Borough of Greenwich designated Area of Archaeological Potential.

26.2.5 The site is bounded by the Brook Marsh Trading Estate, a vehicle repair garage and offices to the north, Norman Road to the east, Greenwich High Road to the south, and Deptford Creek to the west.

26.2.6 The area to the north of the site across Deptford Creek is predominantly industrial but also includes the Trinity Laban contemporary dance centre. To the northeast of Phoenix Wharf, the land uses are industrial and residential, including the multi-storey residential development on Tarves Way.

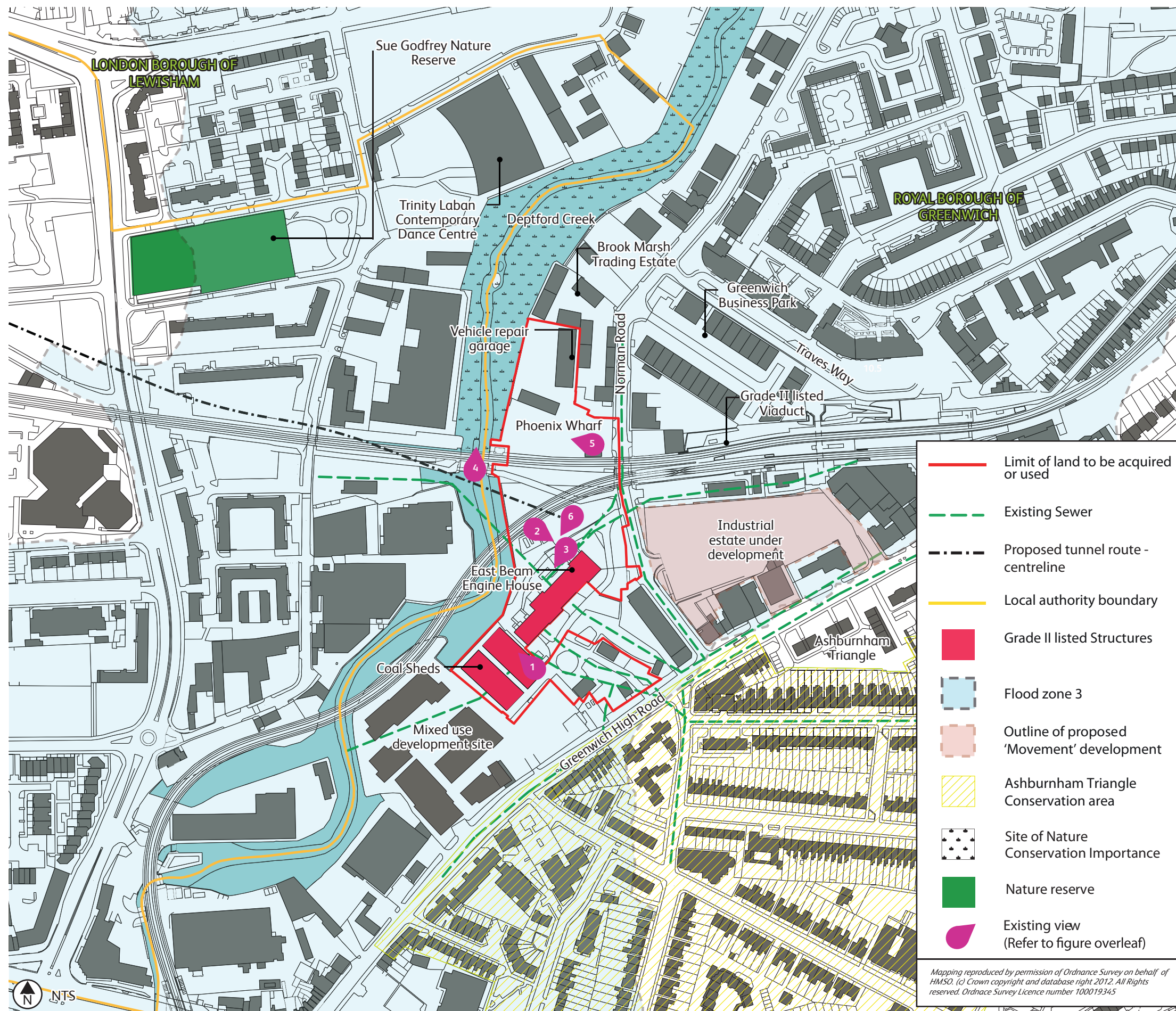


Figure 26.2: Existing site plan



Figure 26.3: Existing coal shed



Figure 26.6: View from under bridge on Deptford Creek toward Laban Centre



Figure 26.4: East Beam Engine House



Figure 26.7: View of Phoenix Wharf



Figure 26.5: East Beam Engine House



Figure 26.8: East Beam Engine House

26.2.7 Beyond Norman Road to the east lies the former Greenwich Industrial Estate, where an extant planning permission for a mixed-use development is currently being implemented. The redevelopment scheme includes 181 residential units, 358 student residential units, education/office floorspace, a 30 room hotel and associated restaurant, and a mix of community uses and public realm improvements.

26.2.8 Beyond Greenwich High Road to the south lie a multi-storey residential development, a mix of residential apartment blocks, terraced housing and retail terraces. The Ashburnham Triangle Conservation Area lies further to the south. The Premier Inn development forms the southwestern boundary of the site.

26.2.9 The western banks of Deptford Creek are characterised predominantly by industrial and commercial development, including two- and three-storey warehouses ranging from small units to large-scale sheds. The development pattern is typical of industrial estates and there are various small access roads informally arranged between Deptford Creek and the DLR line. There are also a number cultural uses and residential properties beyond. The Creekside Centre contains an environmental centre and is a designated Site of Importance for Nature Conservation of local importance. The Sue Godfrey Nature Reserve lies 400m to the northwest of the site.

26.2.10 The London Borough of Lewisham has undertaken a public consultation exercise on designating a conservation area opposite the site to the west of Deptford Creek, which could be realised in the near future.

Description of the existing pumping station compound and buildings

26.2.11 Greenwich Pumping Station was constructed in the 19th century. The main building was built in London Stock brick in an Italianate style. As the beam engine technology became redundant, the components of the building were adapted for other uses.

26.2.12 The West Beam Engine House was extended and converted for the installation of new pumps in 1905. It remains in use as a sewage pumping station today. Various additions have been made to the building to sustain its operation such as providing louvers within existing window openings and protruding duct work. Further, as an important piece of infrastructure, the operational pumping station is subject to security considerations and requires additional security fencing within the compound. This is currently galvanised palisade fencing.

26.2.13 At present the East Beam Engine House is disused and in an indifferent state of repair.

26.2.14 The boundary treatment of the compound varies. Along the majority of Norman Road it comprises a brick wall. On the public footpath, that bisects the site it currently comprises a mixture of galvanised palisade and wire mesh fencing.

26.2.15 Although they are located in the middle of the Thames Water compound and shielded by trees on the boundary, the pumping station buildings are visible to the public across the compound from Norman Road, Deptford Creek, the public footpath that runs up to Ha'penny footbridge and from the DLR.

26.2.16 There are several other buildings and structures within the compound on which the project would have no impact. The most notable structures are the listed coal sheds.

26.3 Existing site access and movement

26.3.1 The primary vehicle access to the site is off Greenwich High Road, and the secondary access is off Norman Road. There is also a separate access off Norman Road on both sides of the Network Rail viaduct.

Highways

26.3.2 Greenwich High Road (A206) is a single carriageway that provides a continuous northeast-southwest link between Nelson Road and Greenwich town centre.

26.3.3 Norman Road (B208) is a two-way single carriageway subject to a speed limit of 30mph. It provides a north-south link between Creek Road to the north and Greenwich High Road to the south. Greenwich High Road and Norman Road meet at a signalised junction.

Car parking

26.3.4 There are a number of marked parking bays along Norman Road, the majority of which are reserved for residential and business permit holders.

26.3.5 There are more residential permit parking bays on the surrounding streets.

Public transport

26.3.6 Greenwich Station is located approximately 300m to the east of the site off Greenwich High Road. It provides National Rail, Southeastern and DLR services between Lewisham and Bank, and Lewisham and Stratford. Deptford National Rail Station lies 620m to the west.

26.3.7 There are a number of bus stops within 640m of the site on Deptford Bridge (A2), Greenwich High Road and Greenwich South Street (A2211).

Pedestrian and cycle routes

26.3.8 Greenwich High Road has footpaths on both sides and provides a continuous northeast-southwest link between Nelson Road (A206) and Greenwich town centre to the northeast and Blackheath (A2) and Deptford Bridge to the southwest. Norman Road also has footpaths on both sides.

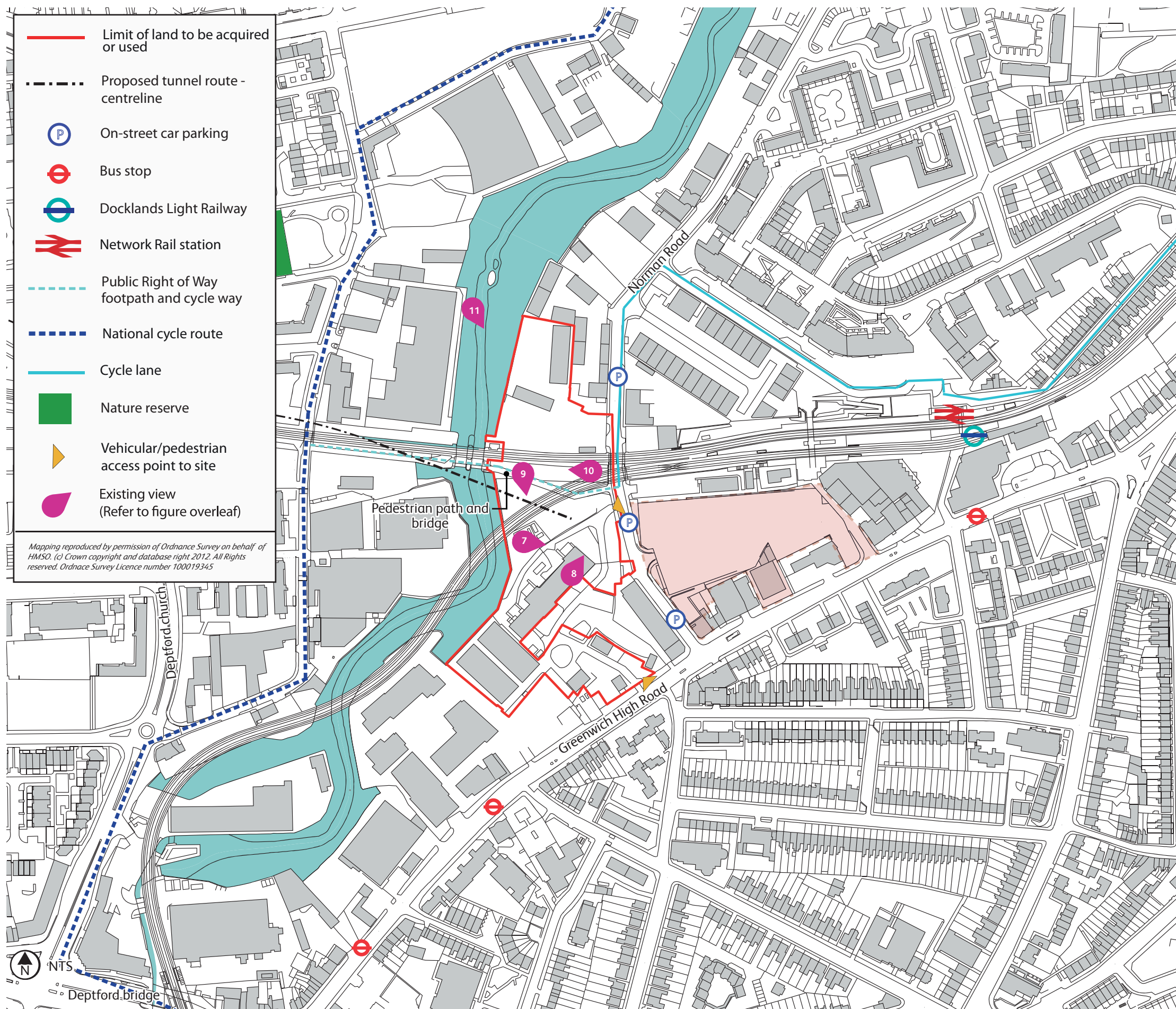


Figure 26.9 Existing site analysis

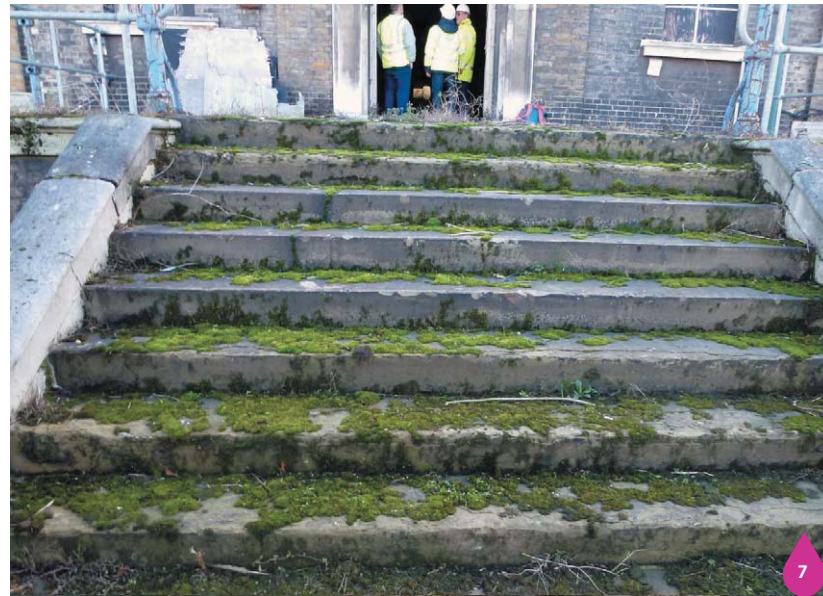


Figure 26.10: Stairs at East Beam Engine House



Figure 26.13: Image of 'The Movement' development ©Cathedral Group PLC



Figure 26.11: Interior of East Beam Engine House



Figure 26.14: View along Listed Viaduct



Figure 26.12: View from footpath



Figure 26.15: View of site from Deptford Creek

26.3.9 The shared pedestrian and cycle path across the site links to National Cycle Route 21 on Creekside, which runs to the west and south of the site on a traffic-free route alongside Brookmill Road (A2210). The path passes over Deptford Bridge before continuing on-road along Creekside, where it joins National Cycle Route 4 (Tower Bridge to Greenwich) in the north.

26.3.10 The closest section of the Thames Path is approximately 680m to the north of the site.

Historical context

26.3.11 There is evidence of late medieval land reclamation along Deptford Creek near the site. Morris' and Sim's maps of 1832 and 1838 show industrial uses such as a tanning works nearby, and modest housing fronting onto but set back from the street. The main part of the site remained undeveloped.

26.3.12 A major catalyst for development in the area was the construction of the London to Greenwich railway viaduct across Deptford Creek. This was the earliest passenger railway in London. It opened from Bermondsey to Deptford in 1836 and the extension to Greenwich opened approximately two years later.

26.3.13 Greenwich Pumping Station and the associated buildings were built between 1859 and 1865 by the Metropolitan Board of Works. The coal sheds and various wharves formed part of the complex and there was a system of railways and turntables to transfer coal between the wharves, the coal sheds and the pumping station.

26.3.14 The site around the operational buildings was largely open and trees extended as far as the railway viaduct. Railway Wharf and Phoenix Wharf were constructed to the north of the viaduct and terraced housing was introduced on Norman Road.

26.3.15 In the second half of the 19th century, the site lay in an essentially industrial landscape; there was a gas works on the opposite bank of Deptford Creek and a soap works opposite Phoenix Wharf. The path across the site and a pedestrian bridge across the creek were in place by this time.

26.3.16 In the early 20th century, the housing on the southern part of the site was demolished and replaced by a new ancillary building as part of the pumping station complex. The main pumping station building was extended to the west, and various tanks were installed to the south of the railway viaduct. More recently, the shared pedestrian and cycle path was diverted to run obliquely alongside the railway viaduct and fencing and other lightweight structures were added to the site.

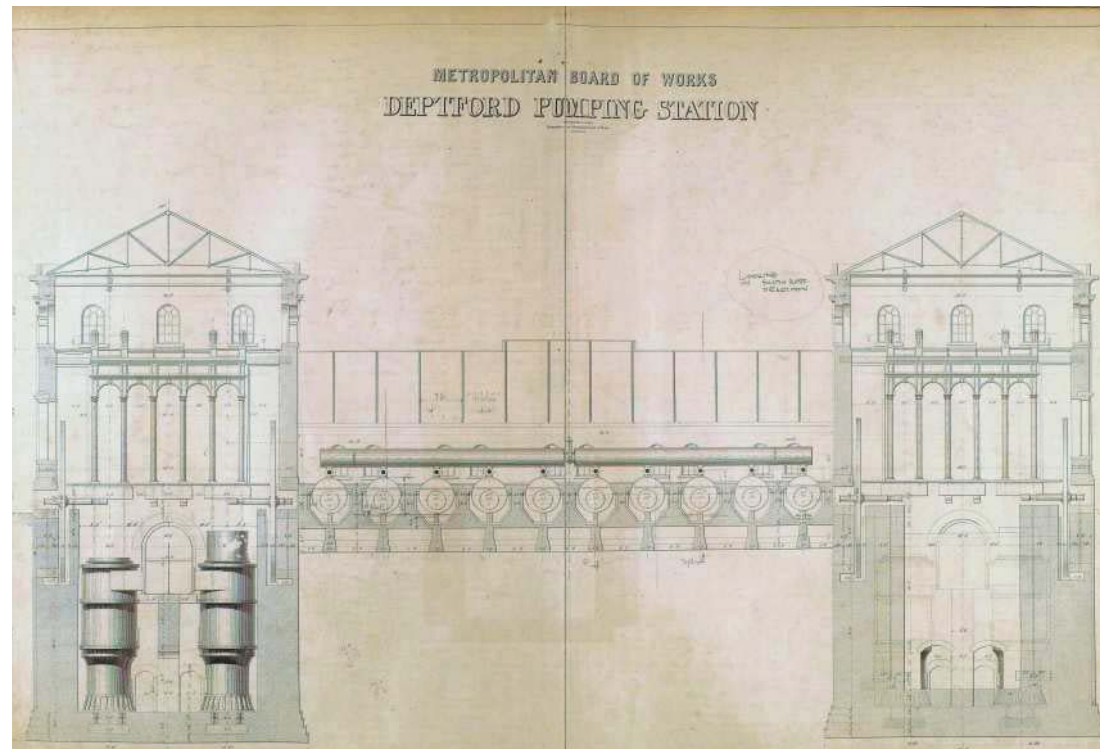


Figure 26.16: Original drawings of the Greenwich Pumping Station

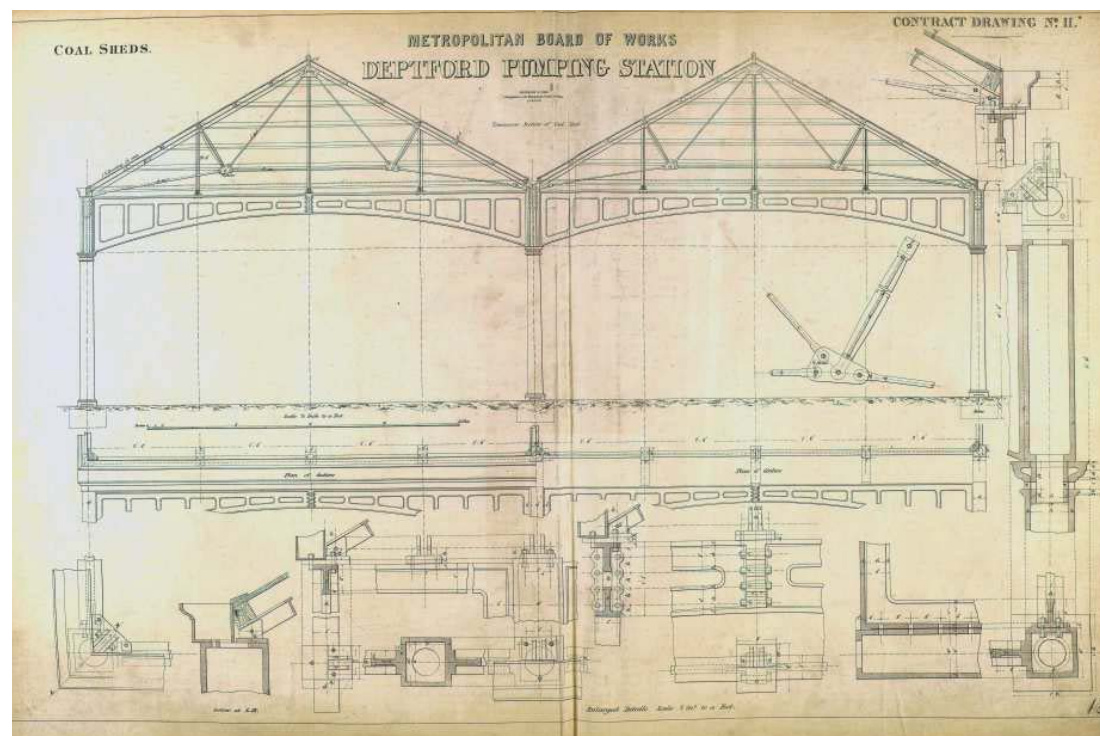


Figure 26.17: Original drawings of the Greenwich Pumping Station

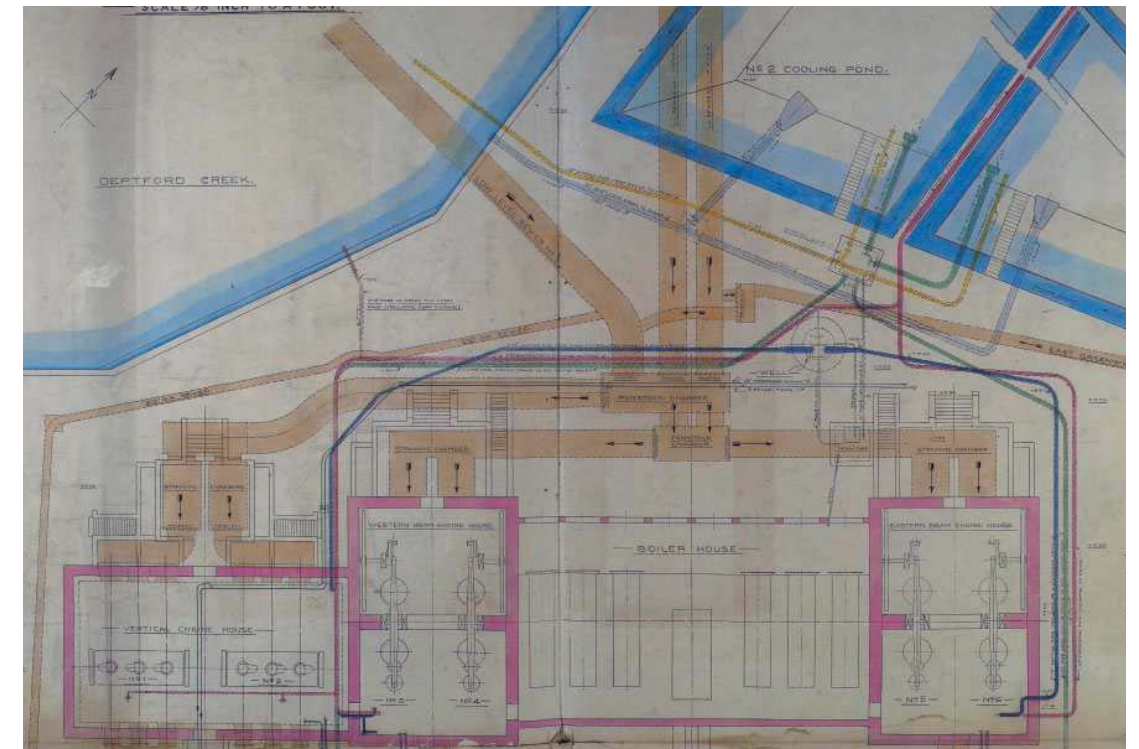


Figure 26.18: Original drawings of the Greenwich Pumping Station

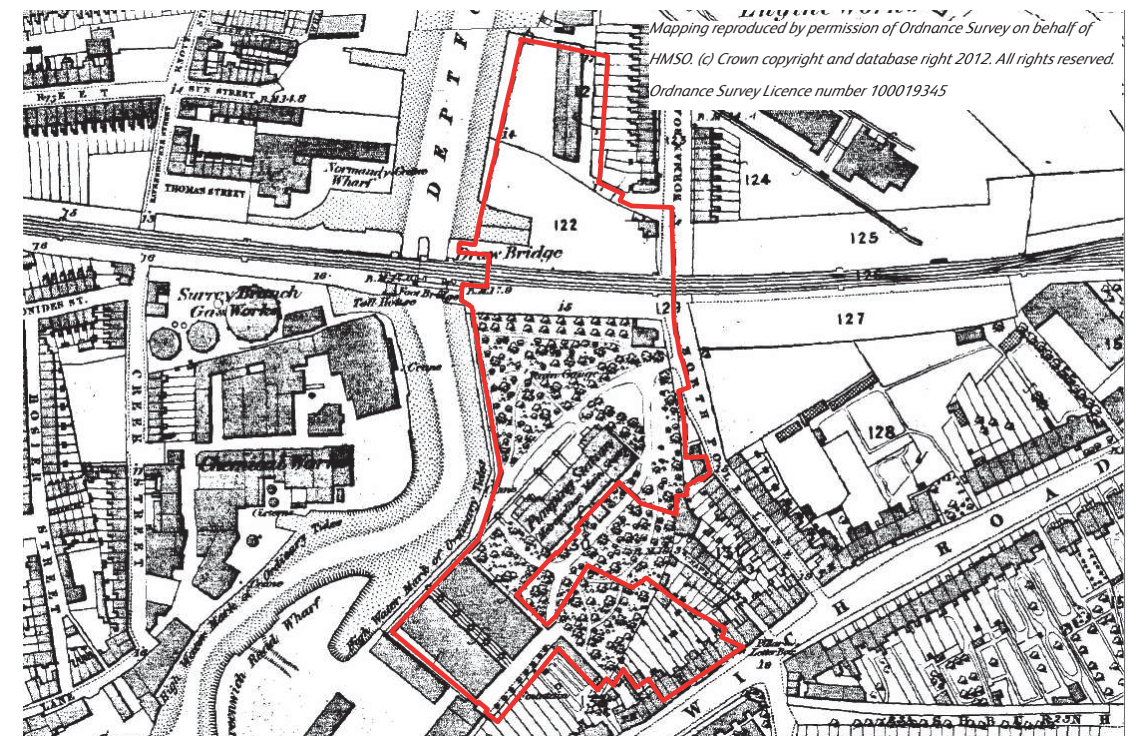


Figure 26.19: Historic map of site (1864-1895)

Site analysis: Opportunities and constraints

The site-specific design opportunities included:

- a. Restore and use the Grade II listed East Beam Engine House to house ventilation equipment and enhance the heritage value of the site.
- b. Make the site more sustainable by incorporating a biodiverse roof over the CSO drop shaft and enhancing the existing soft landscaping on the site.
- c. Replace any trees removed during construction with appropriate species to enhance the site's setting and biodiversity potential.
- d. Reinststate the shared pedestrian and cycle path and potentially improve the surrounding area of public realm.

The site-specific design constraints included:

- a. the DLR and Network Rail viaducts and associated rights of access
- b. the proximity of sensitive receptors such as residential dwellings to the south and west of the site
- c. the proximity of implemented development to the east of the site at the former Greenwich Industrial Estate
- d. the layout of the existing operational pumping station and the extensive underground infrastructure on-site
- e. the Grade II listed buildings on-site
- f. the shared pedestrian and cycle path on-site.

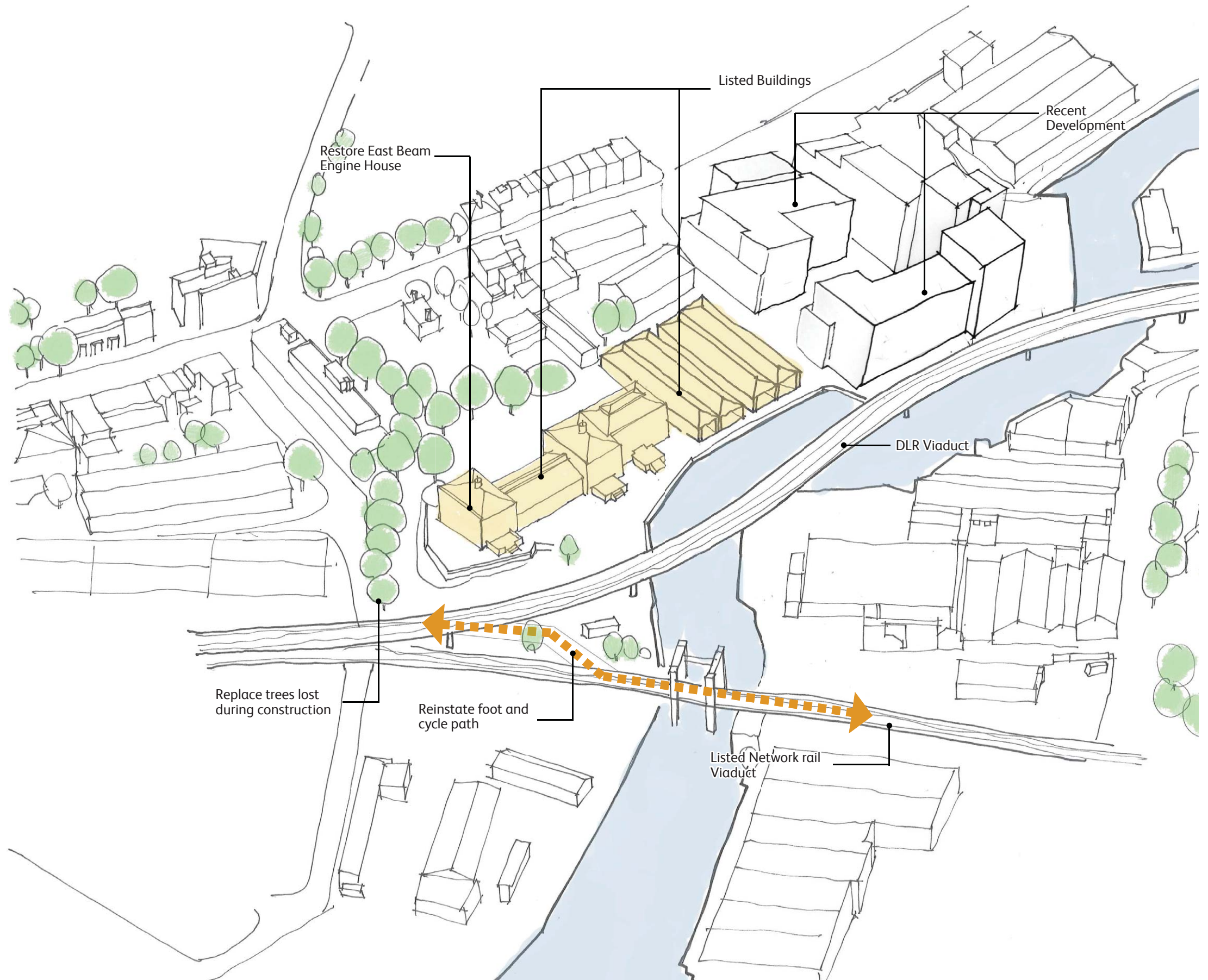


Figure 26.20: Existing site opportunities and constraints sketch

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26.4 Design evolution and alternatives

26.4.1 As the majority of the infrastructure for the project would be below-ground, the key design objective for the above-ground permanent works was to integrate the functional components into the surroundings. The site-specific design objective at Greenwich Pumping Station was to successfully integrate the works into an existing Thames Water operational site and to protect and enhance the Grade II listed East Beam Engine House.

26.4.2 The design of our proposals at the Greenwich Pumping Station site was also significantly influenced by an extensive process of stakeholder engagement and design review. In order to ensure design quality, we undertook a design review hosted by the Design Council CABE. We also held several pre-application meetings with the Royal Borough of Greenwich and other strategic stakeholders. More information on our public consultation process is provided in the *Consultation Report*, which forms part of the application.

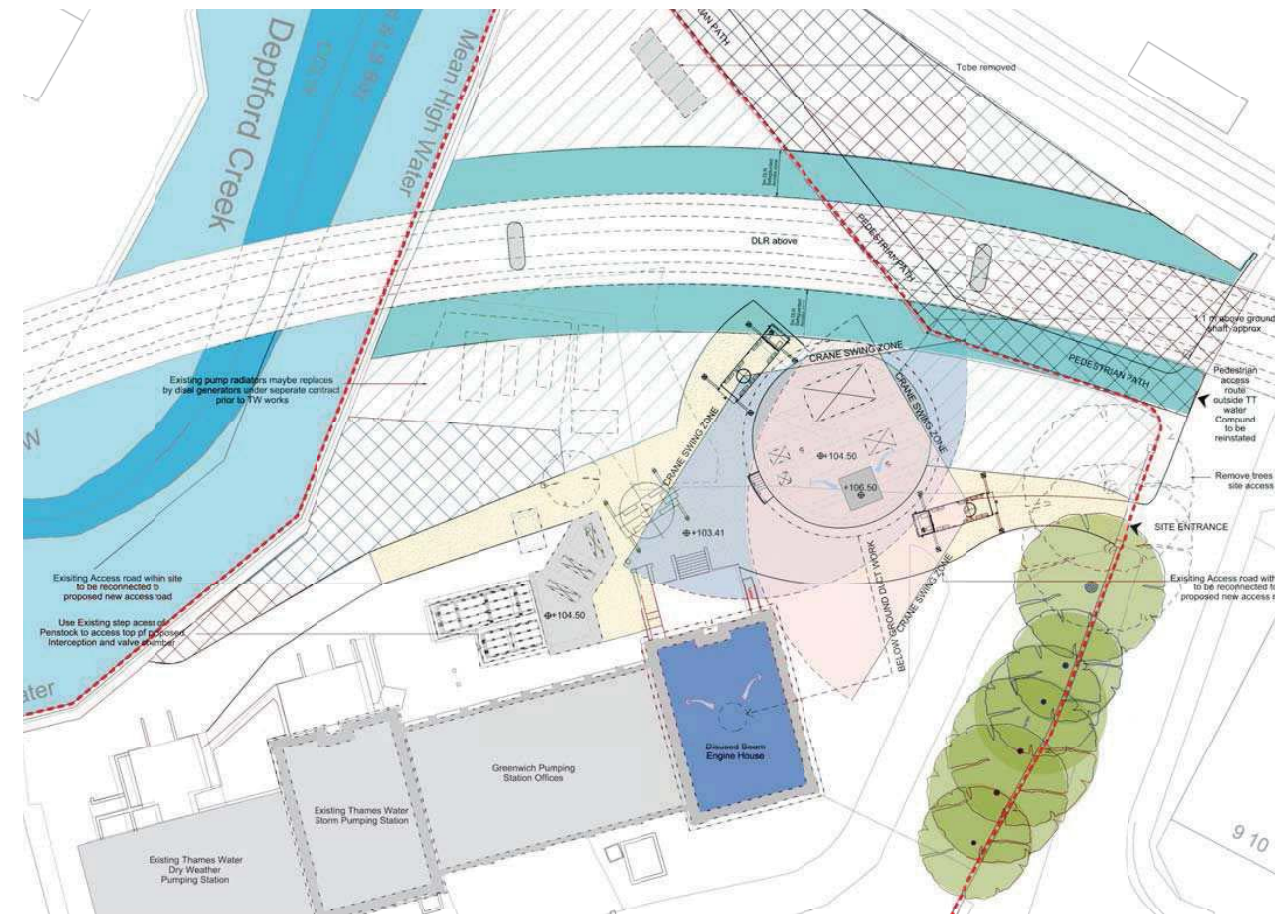


Figure 26.21: Design Council CABE Sketch review

October 2010

Phase one consultation

26.4.3 At phase one consultation, we proposed to position the CSO drop shaft in the northeastern corner of the site to the rear of the beam engine houses. We proposed to construct a separate ventilation building to house the air management and electrical and control equipment to the south of the drop shaft.

26.4.4 We received various design-related comments from the Royal Borough of Greenwich, the Greater London Authority and English Heritage as well as members of the public, as follows:

- The Greenwich connection tunnel has the potential to impact on redevelopment proposals at 30-52 Norman Road.
- The existing heritage of the site should be preserved and any new structures should not impact on the listed buildings or the Ashburnham Triangle Conservation Area.
- Any new buildings on the site should be sympathetic to the residential character of the area.
- The proposals are not designed for ease of maintenance.



Figure 26.22: Phase one consultation

Design development

26.4.5 Following phase one consultation, we explored the following design considerations:

- integrating the ventilation equipment into the disused East Beam Engine House in order to avoid the need for a new structure
- allowing additional space around the coal sheds during construction
- dismantling the coal sheds during construction
- optimising the position of the drop shaft to respond to changes in the alignment of the Greenwich connection tunnel due to changes at other sites.



Figure 26.23: Investigation into the use of the East Beam Engine House

May 2011

CABE sketch review

26.4.6 We held a sketch review based on an initial assessment and sketched ideas for the site with the Design Council CABE in April 2011. The concept sketches set out the proposed use of the site, the layout of the below-ground and above-ground infrastructure, and the vehicular access/egress.

26.4.7 We proposed to re-open the gated access on Norman Road to enable cranes and maintenance vehicles to reach the drop shaft and to restrict vehicle movements to the northern part of the site.

26.4.8 We proposed to reinstate the shared pedestrian and cycle path potentially along an alternative route in agreement with the Royal Borough of Greenwich.

26.4.9 We proposed to rationalise the security fences on the site to create a more logical space, subject to Thames Water's safety and security requirements. We also proposed to enable maintenance access to the CSO drop shaft via a set of steps and walkways over the shaft and implement an area of hardstanding around its perimeter.

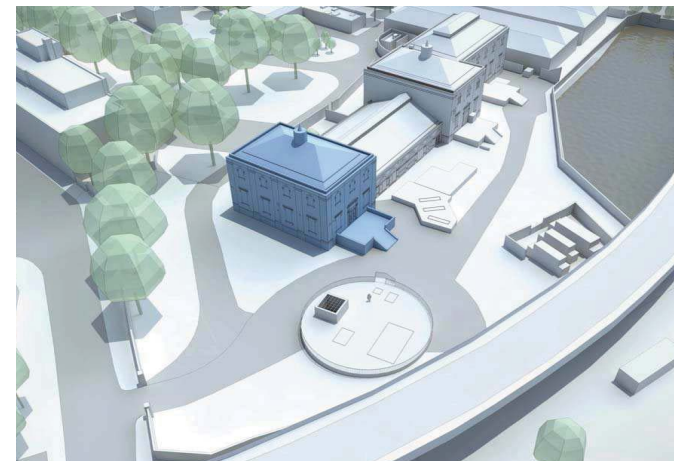


Figure 26.24: Aerial image from Design Council CABE sketch review

26.4.10 Finally, we proposed to make use of the listed East Beam Engine House. The design team and the Royal Borough of Greenwich conservation officer discussed ways of restoring the building, including housing the electrical and ventilation equipment inside it. The Greenwich conservation officer considered that the proposed works were in keeping with the history of the site and saw the project as an evolution of the Victorian sewerage system.

26.4.11 The Design Council CABE panel generally supported our proposals. It commented that re-use of the East Beam Engine House would be a beneficial outcome and was preferable to constructing a new, isolated building on the site.

26.4.12 The panel also suggested making parts of the operational site (such as the coal sheds) publically accessible for educational purposes, subject to security considerations.



Figure 26.25: Design Council CABE Sketch review

February 2012

Phase two consultation

26.4.13 At phase two consultation, the design-related feedback included:

- a. The drop shaft is in close proximity to the DLR viaduct.
- b. The scale of effects on the local area and community is a concern.
- c. The proposed dismantling and re-erection of the listed coal sheds is unacceptable.
- d. There is an opportunity to provide pedestrian access to Deptford Creek to link to the recently constructed footpath adjacent to Skillions/Merryweather Place.

26.4.14 The Design Council CABE reiterated its support for the proposals, including the re-use of the East Beam Engine House.



Figure 26.26: Phase two consultation

April 2012

Section 48 publicity

26.4.15 In response to consultation feedback and further design development, we amended our proposals at Section 48 publicity to retain the historic coal sheds throughout construction.

26.4.16 As a result of design development, we extended the above-ground shaft structure to include a valve chamber and amended the stepped access.

26.4.17 The illustrative design of the permanent structures is closely based on the proposals at phase two consultation. Any further detailed designs submitted for approval would comply with the relevant heritage principles set out in the *Design Principles* document that accompanies the application.



Figure 26.27: Aerial image from Section 48 publicity

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26.5 Proposed design

26.5.1 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

26.5.2 The Site works parameter plan defines the zones in which the proposed works would take place. The plan indicates the general location of the CSO drop shaft, associated chambers and ventilation structures. It also indicates the maximum and minimum height of the proposed structures (where applicable).

26.5.3 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..

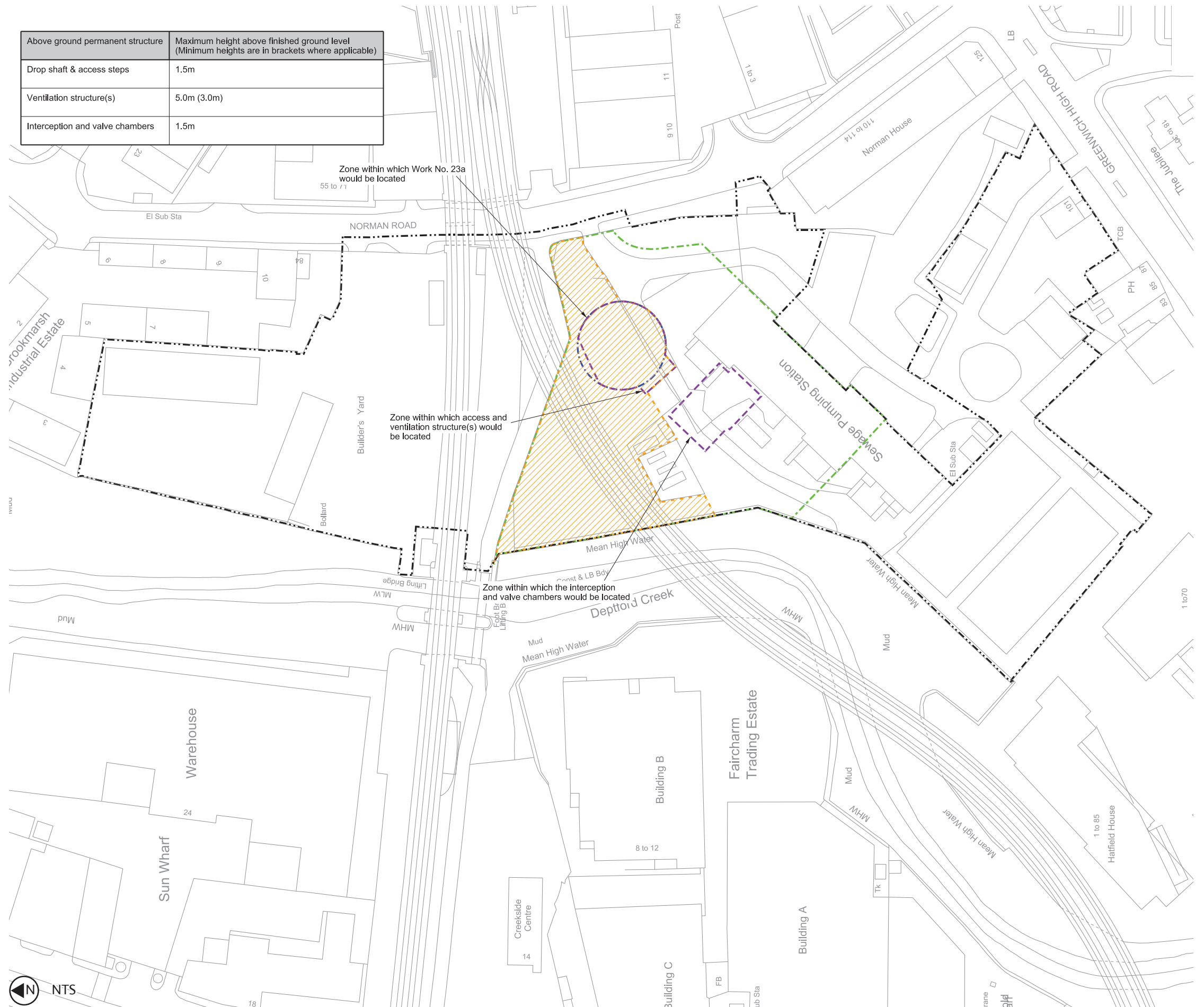


Figure 26.28: Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*

Use and programme

26.5.4m The site is not publically accessible and the entry points on Norman Road and Greenwich High Road are secured. The main function of site would remain a Thames Water operational site.

26.5.5 Our works can be split into three broad areas: works outside the Thames Water compound, works inside the compound and works to the East Beam Engine house.

26.5.6 The refurbished East Beam Engine House would accommodate the air management plant for the Greenwich connection tunnel and the electrical and control equipment for the site. The works to the East Beam Engine House are set out in the *Heritage Statement*, which accompanies the application.

Works outside of the Thames Water Compound

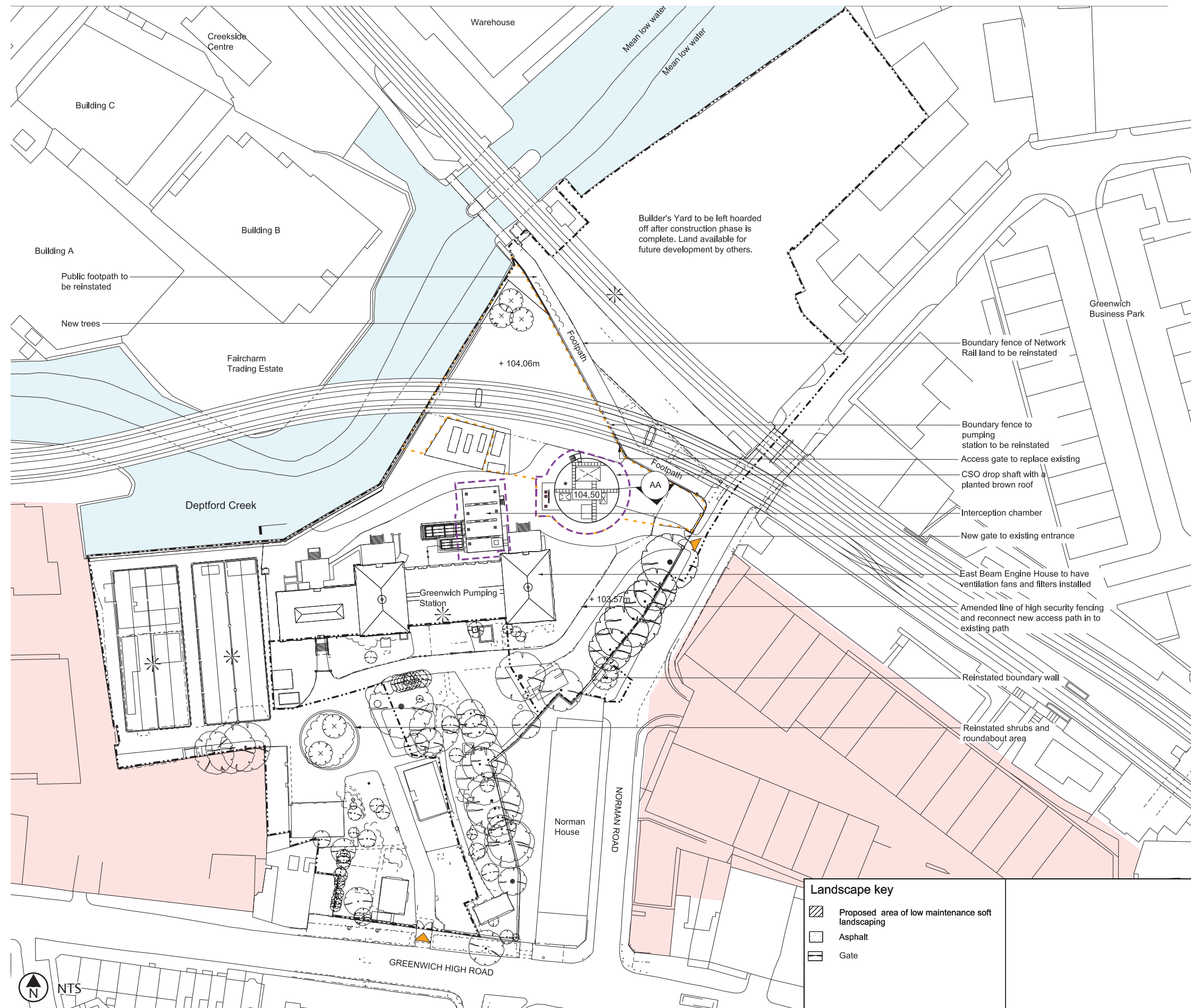
26.5.7 Additional land outside of the Thames Water compound would be required for the construction works. On completion of the works, this area would be hoarded off and made available for development by others.

26.5.8 In order to accommodate the proposed works, the widened permanent access and temporary construction access off Norman Road, two trees may need to be removed from the public realm, as illustrated on the site clearance and demolition plan. In line with our design principles the trees would be replaced with new trees.

26.5.9 During construction it would be necessary to temporarily divert the route of the footpath that bisects the site closer to the listed railway viaduct. We currently propose to reinstate it along its current alignment following construction. However, local stakeholders have indicated in discussions that it may be preferable to retain the temporary alignment in order to link to the recently constructed footpath adjacent to Skillions/Merryweather Place. The design team remains receptive to emerging regeneration proposals for the area and may be able to facilitate them subject to relevant security considerations, and legal and planning agreements. At present, there are no such proposals, agreements or approvals, therefore this opportunity does not form part of the application.



Figure 26.29: Works within the compound



26.5.10 In either case, we intend to improve the footpath by utilising high quality materials and implementing a lighting scheme. We also plan to respond to comments from the Design Council CABE and make the pumping station more visually accessible by implementing a high quality fencing treatment. The fencing may be created in collaboration with a local artist to inform passers-by of the function and historical importance of the pumping station and the industrial history of the area.

Works within the Thames Water compound

26.5.11 The project's operational structures would be located within the Thames Water compound. The compound is an operational site and reinstatement works need to be both functional and low maintenance. The proposed above-ground structures would be minimal and would not detract from the setting or character of any of the existing buildings. Further details are provided in the *Heritage Statement*.

26.5.12 We sought to enhance the setting of the listed buildings by means of the proposed landscaping scheme, in line with the design principles. We would also improve the improved security fencing of the compound.

26.5.13 Construction of the CSO drop shaft and widening of the current access gates requires the removal of up to six trees within the site. These trees would be replaced with the same number of new trees in the northern corner of the site.

26.5.14 We sought to minimise the required areas of hardstanding. We propose to seed the rest of the site with low maintenance meadowland grass planting.

Figure 26.30: Proposed site features plan - refer to Proposed site features plan in the *Book of Plans*

Integration of the functional components

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

- a. a CSO drop shaft
- b. a CSO interception chamber
- c. a valve chamber
- d. a connection culvert
- e. associated hydraulic structures, culverts, pipes and ducts.

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

- a. a raised CSO drop shaft structure
- b. raised CSO interception and valve chambers
- c. a raised ventilation structure

26.5.17 The CSO drop shaft would be approximately 17m in internal diameter. It would be positioned to the north of the East Beam Engine House and surrounded by hardstanding and fencing. Due to hydraulic requirements, the drop shaft would be finished approximately 1.5m above ground level. The roof of the drop shaft structure would feature a biodiverse roof and access covers.

26.5.18 The high pressure relief structure would be integrated into the drop shaft structure and raised by approximately 4m.

26.5.19 The CSO interception structures would stand approximately 1m above ground level. They would be located to the west of the northern entrance podium of the East Beam Engine House.

26.5.20 Active ventilation plant would be housed within the East Beam Engine House on the eastern side of the building. Treated air would be released through existing openings in the building.

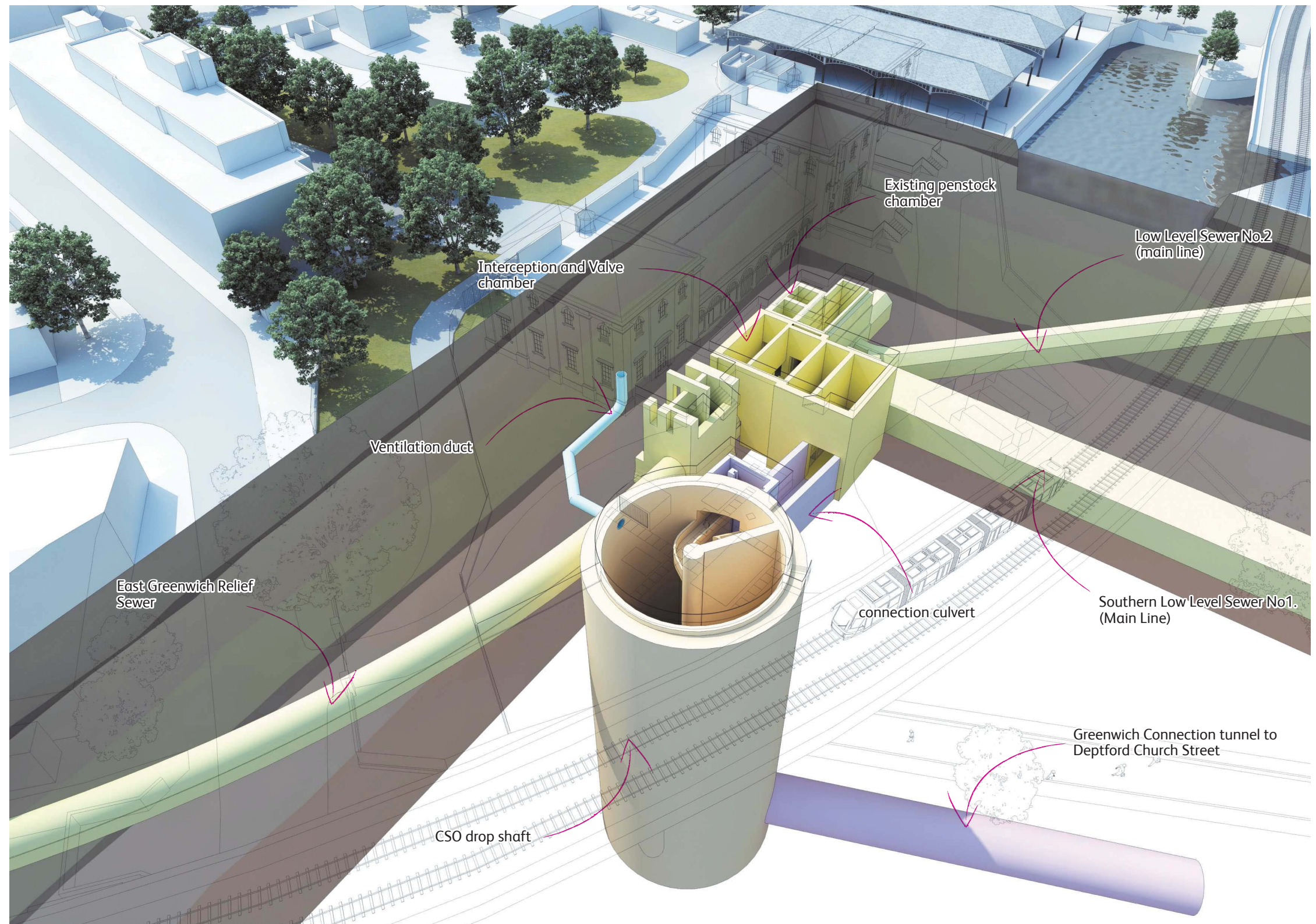


Figure 26.31: Functional components diagram: below ground view



Figure 26.32: Functional components diagram: above ground view

26.5.21 The necessary electrical and control equipment would also be housed within the East Beam Engine House. This use of the East Beam Engine house for operational purposes would be consistent with its original use.

26.5.22 Areas of hardstanding would be included to facilitate maintenance vehicle access and incorporate access covers to the below-ground infrastructure.

Landscaping and appearance

Hard landscape palette

26.5.23 The proposed hard landscape materials palette must be appropriate to the operational and historic setting. They must also be robust and fit-for-purpose in order to ensure long-term quality.

26.5.24 The hard landscaping materials and furniture palette comprises two main features, which would serve different functions as follows:

a. The new fencing and walling for the compound would enable views in to the site for passers-by. It is understood that the design of this boundary could be part of a separate wider consultation with the local authority and other stakeholders.

b. The internal security fencing would secure the access to the CSO drop shaft. The finishing and materials of the fencing would meet Thames Water standards while respecting the setting of the pumping station buildings.

Soft landscape palette

26.5.25 The soft landscape palette would comprise:

a. The roof of the CSO drop shaft structure would feature a minimal biodiverse roof with various gravel mediums to create a colourful patchwork effect. The planting substrate would be housed in a number of discreet, removable trays to enable access to the access covers on the roof of the structure. The diagrams opposite illustrate the desired effect

and demonstrate two ways in which it could be achieved. No trays would be placed over the more frequently accessed covers.

b. As part of our on-going efforts to improve biodiversity, we propose to sow the remaining land with low maintenance meadowland grass.

c. The removed trees may be replaced with new semi-mature *Platanus x hispanica* (London Planes), unless agreed otherwise with the local authority at a later stage.

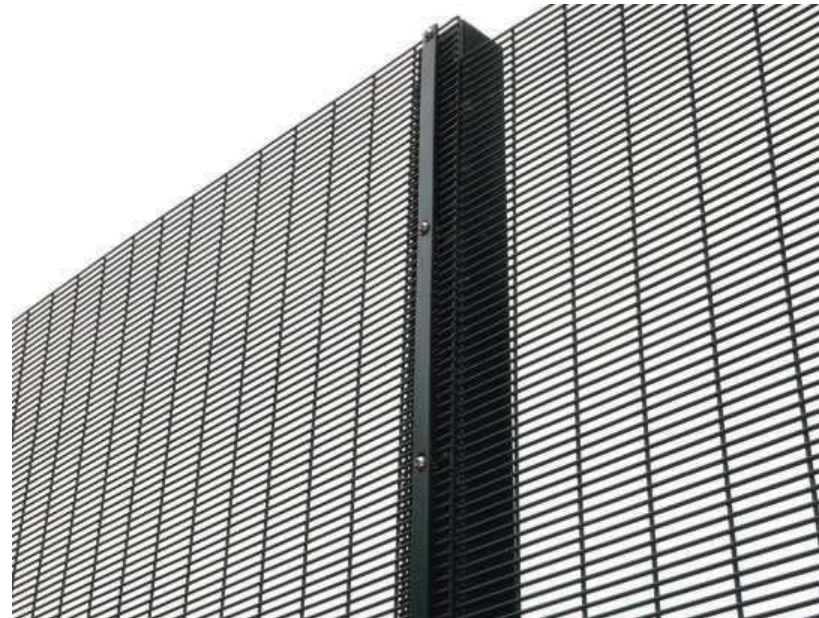


Figure 26.34: Typical fencing



Figure 26.36: Example of decorative boundary wall



Figure 26.35: London Plane tree planting

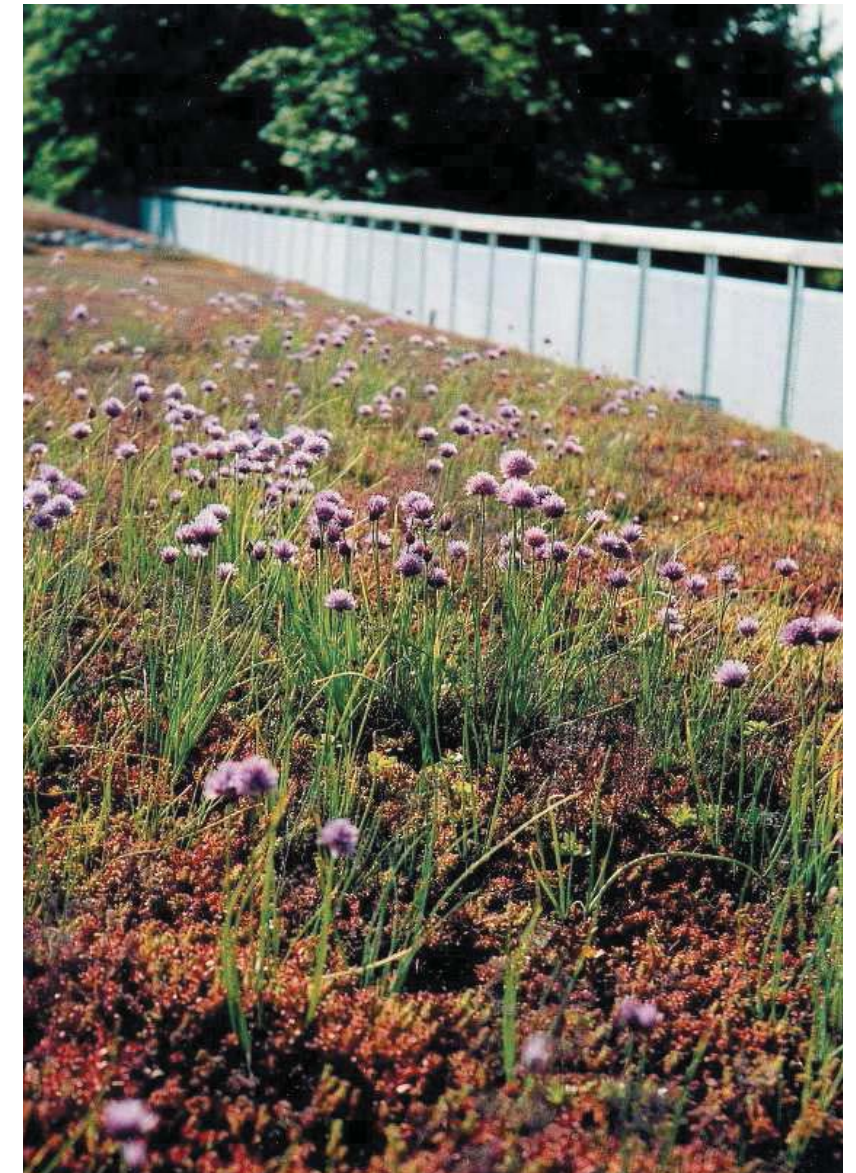


Figure 26.37: Brown roof planting



Figure 26.33: Typical Louvre example

26.6 Access and movement

26.6.1 During construction, the shared pedestrian and cycle path would be diverted north of its current route. It would be reinstated following construction with an appropriate lighting scheme in compliance with the Disability Discrimination Act. The reinstatement works would be agreed with the Royal Borough of Greenwich and relevant stakeholders.

26.6.2 For safety and security reasons, the site would not be publically accessible and it is not possible to provide pedestrian access alongside Deptford Creek as part of the project.

26.6.3 Thames Water's health and safety and security requirements govern access and movement around this strategic site and this would not change during project construction or operations. Routine maintenance associated with the site and plant would be undertaken in accordance with normal site operating procedures and health and safety policy.

Thames Water access requirements

26.6.4 The permanent access to the CSO drop shaft would be from the widened gate on Norman Road. The operational pumping station and East Beam Engine House would be accessed via the gate on Greenwich High Road.

26.6.5 The interception and valve chambers would be accessed via a fixed ladder. The existing entrance to the East Beam Engine House would be maintained.

26.6.6 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.

26.6.7 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.

26.6.8 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.

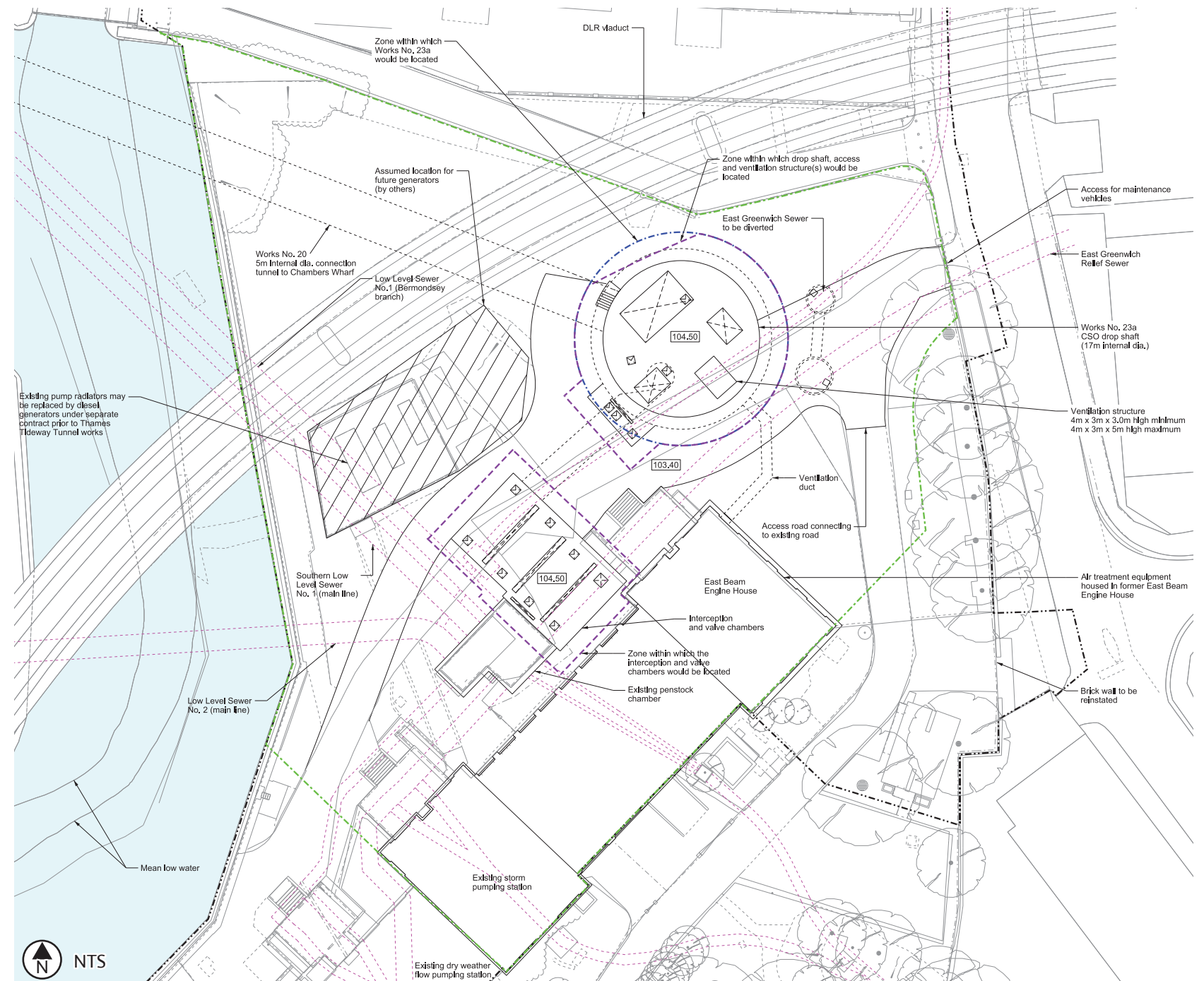


Figure 26.38: Permanent works layout - refer to Permanent works layout in the *Book of Plans*

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