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

Abbey Mills Pumping Station

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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Section 27

Abbey Mills Pumping Station

27.1 Introduction

27.1.1 A worksite is required to receive the main tunnel drive from Chambers Wharf and to connect the main tunnel to the Lee Tunnel, which would transfer combined sewage flows to Beckton Sewage Treatment Works for treatment. The proposed development site is known as Abbey Mills Pumping Station, which is located in the London Borough of Newham.

27.1.2 We have agreed with the London Legacy Development Corporation (the local planning authority for the area) that some elements of the detailed design proposals would be drawn up at a later stage. The detailed design 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. The scale of the above-ground structures, however, is indicative.

Figure 27.1: Aerial photograph of the existing Abbey Mills Pumping Station site with LLAU indicated

27.2 Existing site context

27.2.1 The site itself comprises an area of the pumping station complex. The new development would be concentrated near the Lee Tunnel shaft and the existing Station F pumping station.

27.2.2 A number of planning applications applicable to the site have been submitted in the last five years. The Lee Tunnel and Beckton Sewage Treatment Works Extension scheme comprises a sewage storage and transfer tunnel (the 'Lee Tunnel') between Abbey Mills Pumping Station and Beckton Sewage Treatment Works, and an extension to Beckton Sewage Treatment Works. The scheme is currently under construction. A number of other minor planning and listed building permissions are in place at Abbey Mills Pumping Station.

27.2.3 The site will be landscaped as part of the Lee Tunnel project works. The Thames Tideway Tunnel project would reinstate any of these works disrupted during construction.

27.2.4 The site falls within the Lee Valley Archaeological Priority Area and the Three Mills Conservation Area. There are no listed buildings on the site itself, however there are several within the pumping station complex, including the original Grade II* listed Station A pumping station. It lies partially within the wider Lee Valley Regional Park and falls within an area of search for a new area of Metropolitan Open Land, although this has not yet been defined or adopted.

27.2.5 The majority of the site is not designated for nature conservation; however, the surrounding watercourses (Prescott Channel, Channelsea River and Abbey Creek) are designated as Sites of Importance for Nature Conservation and form part of the London-wide Blue Ribbon Network. Part of the site extends into the Prescott Channel and therefore falls within the Site of Importance for Nature Conservation.

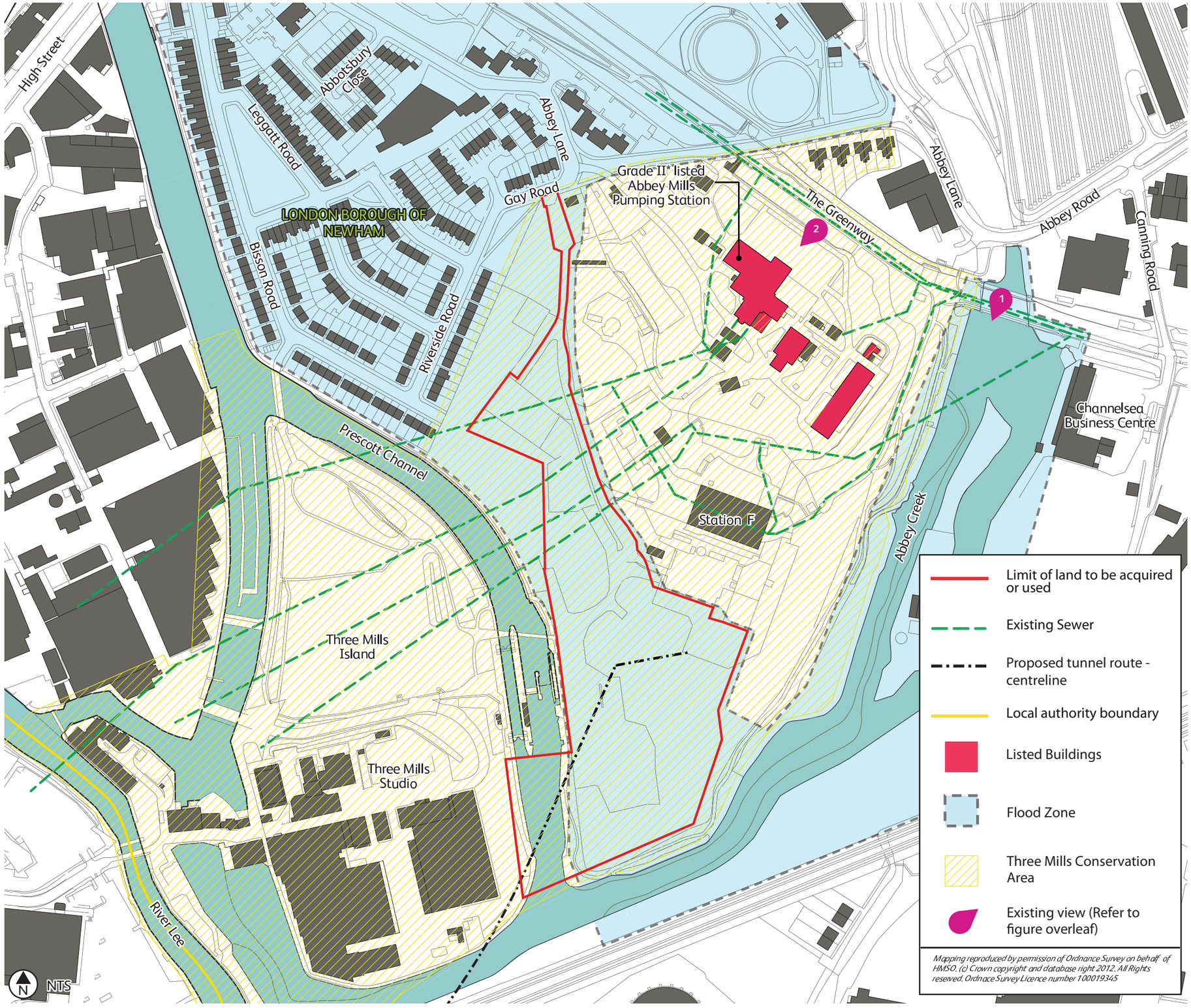

Figure 27.2: Existing site plan

Figure 27.3: Existing aerial view of Abbey Mills Pumping Station site and surroundings

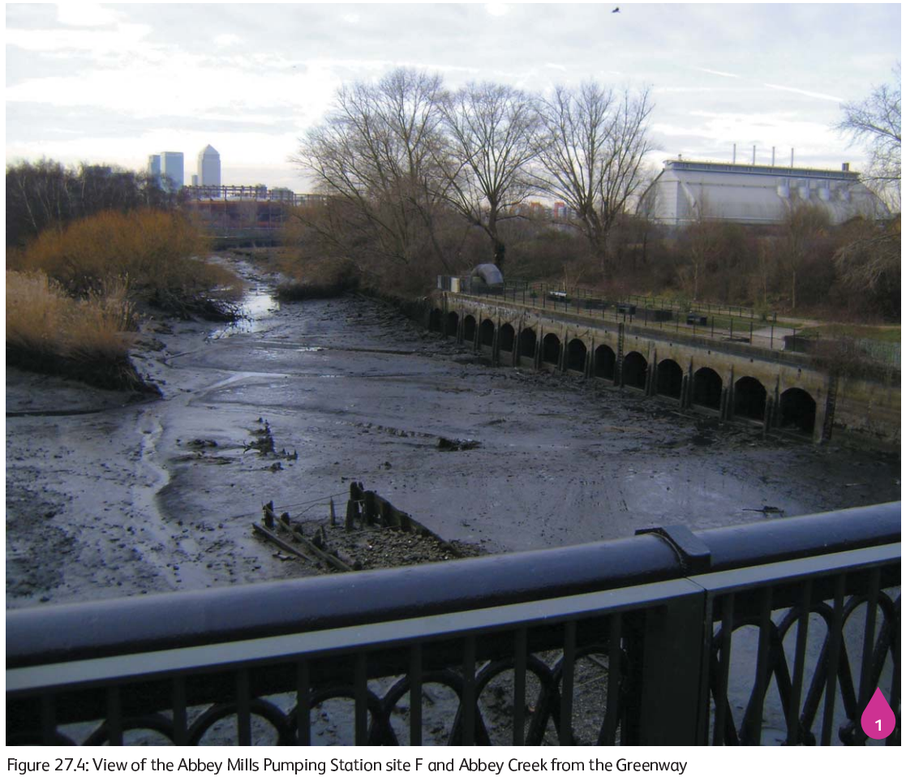

Figure 27.4: View of the Abbey Mills Pumping Station site F and Abbey Creek from the Greenway

Figure 27.5: Existing aerial view of Abbey Mills Pumping Station site and surroundings

Figure 27.6: View of the Abbey Mills Pumping station A

27.2.6 The main flood risk to the site is from the River Lee and its tributaries the Prescott Channel and the Channelsea River. The site lies within the 'high probability' flood zone and is protected by flood defences.

27.2.7 The site is bounded to the north and northeast by Abbey Mills Pumping Station and operational infrastructure and buildings, to the east and southeast by the Channelsea River and Abbey Creek, by the Prescott Channel to the west, and by Riverside Road to the northwest.

27.2.8 To the north of the site lies 'The Greenway', a green corridor that runs along the top of a man-made embankment above the Northern Outfall Sewer. The Greenway is designated as green space and Metropolitan Open Land.

27.2.9 Land use in the wider area is predominantly industrial; however, it is also an area of change and multiple major mixed-use developments have either been permitted or proposed within 500m of the site. Beyond the Channelsea River and Abbey Creek to the east is the Channelsea Business Centre on Canning Road and an area of disused land, which is subject to a policy allocation for a new district centre. There is also a gas works to the south.

27.2.10 The land to the west of the site, known as Three Mills Island, comprises a landscaped grassed area and various warehouses including Three Mills Studio. Three Mills Green is designated as a local park. The area to the northwest of the site is residential.

Existing site access and movement

27.2.11 Existing access to the site is from Stratford High Street, via Abbey Lane, Gay Road and the operational access road on the site.

27.2.12 For safety and security reasons, Abbey Mills Pumping Station is only accessible to Thames Water personnel and contractors involved in the operation of the works or routine maintenance. Access and movement around the site are governed by Thames Water's health and safety requirements.

Highways

27.2.13 Stratford High Street (A11) is a dual carriageway that runs west to east and forms part of the Strategic Road Network. It is subject to an 18 tonne weight restriction and a speed limit of 30mph. To the west it connects to the Blackwall Tunnel Northern Approach (A12) and Bow Road (A11), both of which form part of the Transport for London Road Network.

27.2.14 Abbey Lane is a two-way single carriageway that links Stratford High Street to Abbey Mills Pumping Station via Gay Road. Abbey Lane features a number of traffic-calming measures including speed humps, a traffic island, and a speed limit of 30mph. The junction of Abbey Lane and Stratford High Street is controlled by traffic signals.

27.2.15 Gay Road is a two-way single carriageway with a speed limit of 30mph.

Car parking

27.2.16 On-street parking is available on both sides of the majority of Abbey Lane and Gay Road and falls within a Controlled Parking Zone.

27.2.17 In total, there are 343 parking bays for residents on the surrounding roads. Bisson Road has the highest number of residential parking bays (135 in total). Blue Badge parking is available on Abbey Lane, Abbotsbury Close, Bisson Road and Leggatt Road.

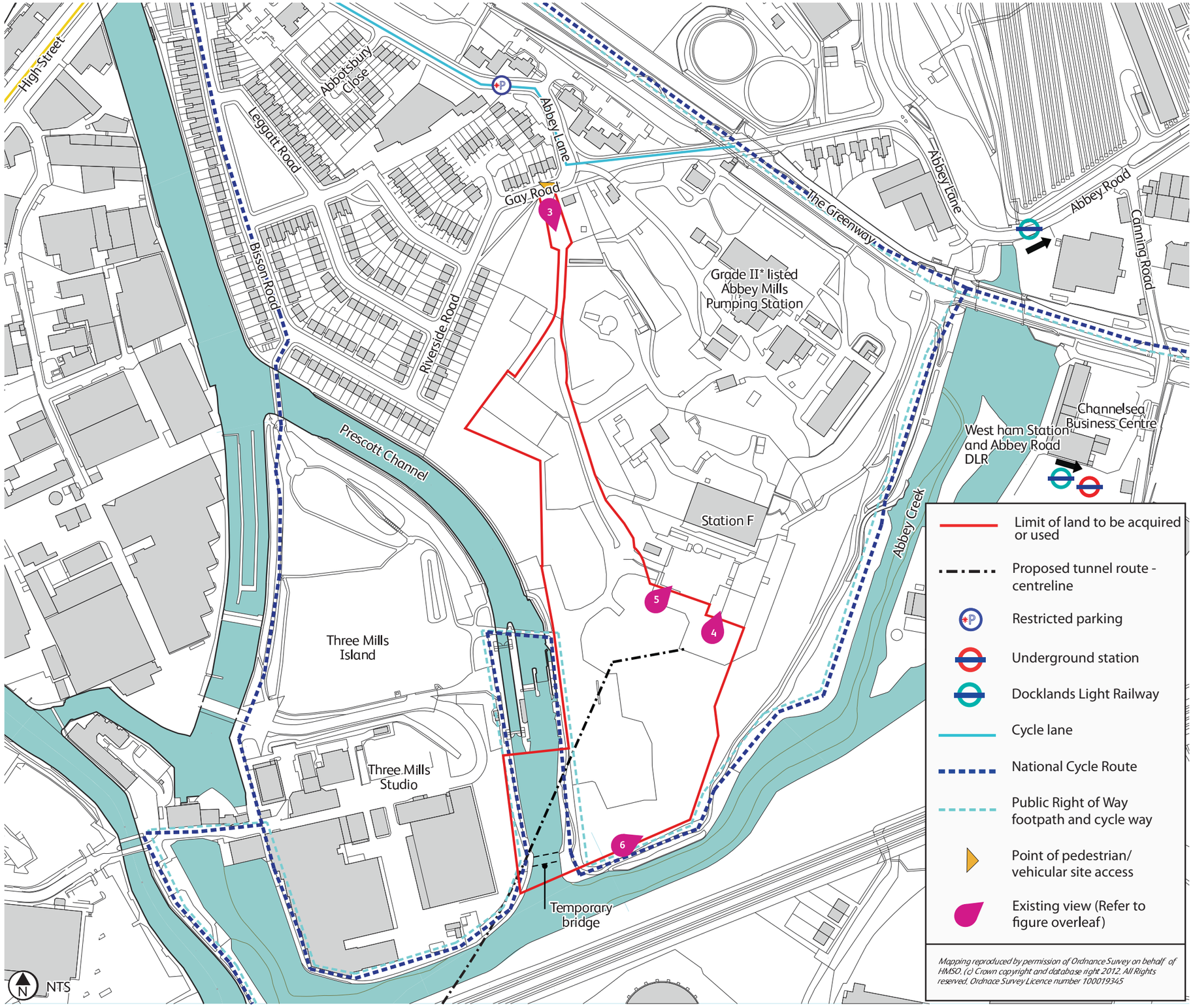

Figure 27.7 Existing site analysis

Figure 27.8: View of existing access to the site

Figure 27.10: View within Abbey Mills Pumping Station site

Figure 27.9: View of existing Station F building

Figure 27.11: View along the boundary path adjacent to the site

27.2.18 No on-street parking is permitted along Stratford High Street.

27.2.19 All parking associated with the operation of Abbey Mills Pumping Station is within the operational site.

Public transport

27.2.20 West Ham Underground Station and Railway Station lie approximately 400m to the southeast of the site, and Stratford Underground Station and Railway Station approximately 1.5km to the northeast.

27.2.21 The closest Docklands Light Railway Station is Abbey Road, which is located approximately 640m to the east of the site. Docklands Light Railway services are also available from West Ham, Stratford High Street (1km to the northeast), Stratford and Pudding Mill Lane (1.1km to the northwest).

27.2.22 There are a number of bus stops within 640m of the site. The stops are located on Abbey Lane/Warton Road and serve five daytime bus routes and four night bus routes.

Cycle routes

27.2.23 A designated on-road London Cycle Route runs along Abbey Lane. It continues off-road, eastwards along The Greenway and around the southeastern boundary of the site.

27.2.24 There is also a designated on-road London Cycle Route along Bisson Road that links to Three Mills Lane, via an off-road London Cycle Route along the Three Mills Wall River. It continues to Bromley-by-Bow Underground Station. Cyclists can access Bisson Road via off-road London cycle routes along Stratford High Street and The Greenway.

27.2.25 The closest Cycle Superhighway is CS2, which routes along the A118 from Bow to Aldgate.

Pedestrian routes

27.2.26 There are footpaths along both sides of Gay Road and Abbey Lane.

27.2.27 The Greenway includes a Public Right of Way footpath and cycleway. At the southern boundary of the site, a footpath runs on a temporary alignment along the Prescott Channel via a bridge. It continues to the west of the site, along the eastern margin of the Three Mills Wall River to Three Mills Island and Three Mills Green. On completion of the Lee Tunnel project works at the site, the footpath will be permanently reinstated.

Historical context

27.2.28 The site lies 2.1km to the north of the River Thames and is surrounded by numerous channels that form part of the River Lee.

27.2.29 During the prehistoric period (700,000 BC to AD 43), the site lay in a low-lying area of gravel islands and terraces surrounded by marshland. There is some evidence of prehistoric activity or occupation in the area.

27.2.30 During the Roman period (AD 43 to 410), the site lay approximately 6km to the northeast of the Roman City of London and 1km to the south of the nearest major Roman road. A small settlement may have developed at the crossing of the River Lee at Old Ford, approximately 1.4km northwest of the site.

27.2.31 During the later medieval period (AD 1066 to 1485), the settlement remained concentrated around the parish church on the eastern side of the Lee Valley, 875m to the northeast of the site. The abbey of St Mary Stratford Langthorne was built in AD 1135, and its western precinct boundary lay approximately 310m to the northeast of the site.

27.2.32 Rocque's map of 1746 indicates that the site lay in a reclaimed part of Stratford Marsh and was probably used for pasture. The main settlement of Stratford grew up along the main road (now the High Street) 410m to the northwest of the site. In later part of the 18th century, flood defences were constructed along the eastern edge of the site.

27.2.33 In 1854, the London, Tilbury and Southend Railway opened 40m to the southeast of the site on the eastern bank of the Channelsea River. Also in the mid-19th century, schemes were devised for main sewers to drain into the River Thames at Beckton on the northern bank and at Erith on the southern bank. The Northern Outfall Sewer, which passes to the north of the site, was constructed 160m to the northeast of the site in the late 1850s and early 1860s under the supervision of Sir Joseph Bazalgette. The richly decorated Abbey Mills Pumping Station was built in 1865/8.

27.2.34 In the mid-20th century, the central part of the site was used as allotment gardens and the Prescott Channel was constructed along the southwestern edge of the site.

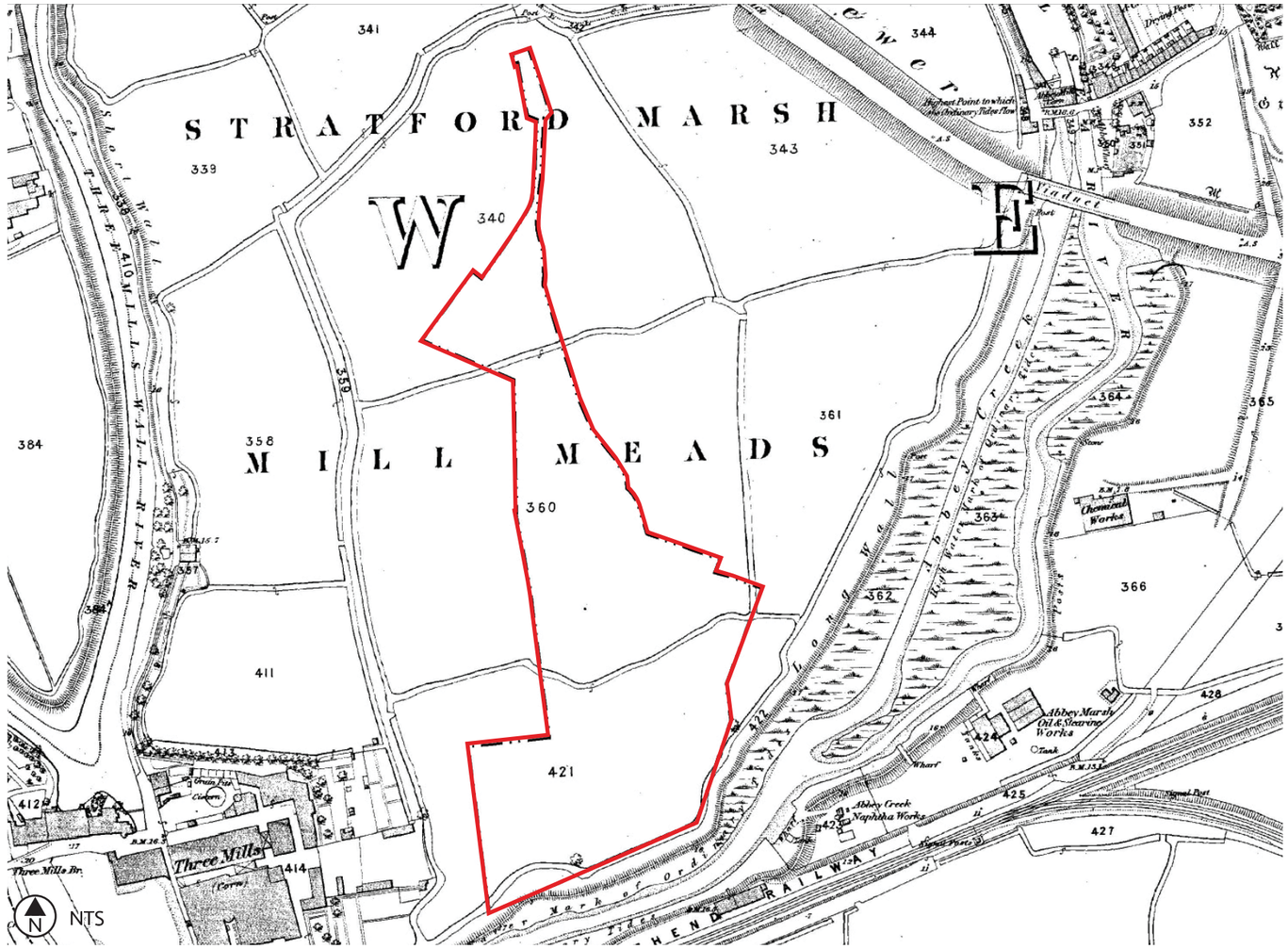

Figure 27.12: Historic mapping featuring the Abbey Mills Pumping Station site (1862-1895)

Site analysis: Opportunities and constraints

The site-specific design opportunities included:

a. Preserve and contribute to the historical use of the site as a strategic wastewater pumping station.

b. Design the works with the flexibility to fit with the existing operational pumping station site and the final layout of the Lee Tunnel project works.

The site-specific design constraints included:

a. The works must fit the layout of the existing pumping station infrastructure and Lee Tunnel project works, which are currently under construction.

b. The Thames Tideway Tunnel must be connected to the Lee Tunnel in this location.

c. The adjacent watercourses are designated Sites of Importance for Nature Conservation and the part of the site within the Prescott Channel falls within this designation.

d. The site falls within the Three Mills Conservation Area and is in proximity to a number of listed structures and buildings.

e. The site is designated green space.

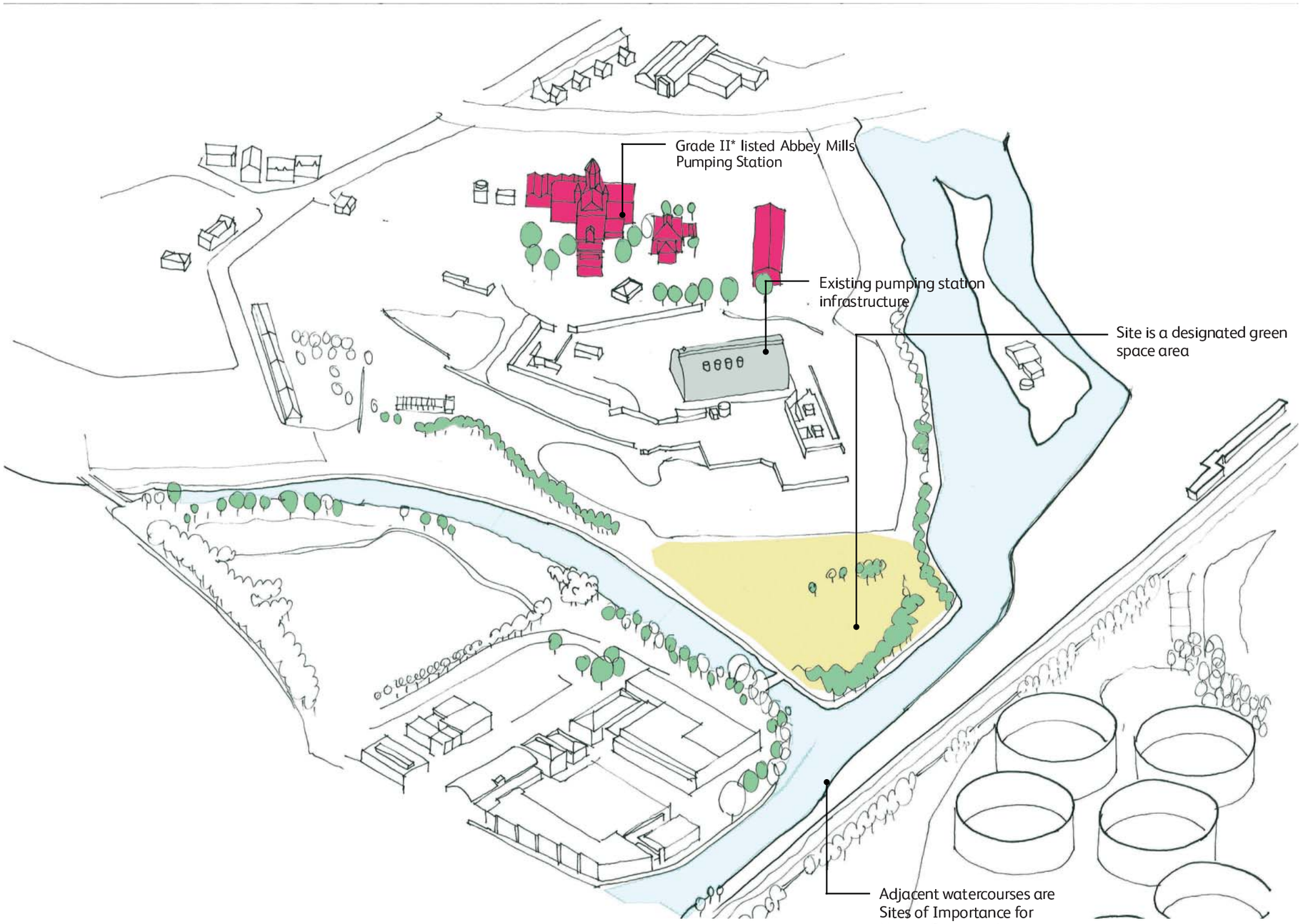

Figure 27.13: Existing site opportunities and constraints sketch

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27.3 Design evolution and alternatives

27.3.1 As the majority of the infrastructure for the project would be below ground, the key design objective for the permanent above-ground works was to integrate the functional components into the surroundings. The site-specific design objective at Abbey Mills Pumping Station was to successfully integrate the works into the operational site, to respect the nearby heritage assets and to avoid significant effects on the Sites of Importance for Nature Conservation.

27.3.2 The design of our proposals at Abbey Mills Pumping Station was also significantly influenced by an extensive process of stakeholder engagement and design review. In order to ensure design quality, we undertook a review hosted by the Design Council CABE. We also held various pre-application meetings with the London Borough of Newham, the London Legacy Development Corporation, 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 27.14: Site analysis diagram undertaken during design development

November 2010

Phase one consultation

27.3.3 At phase one consultation, Abbey Mills Pumping Station was presented as our preferred site to construct the eastern section of the main tunnel and to connect it to the Lee Tunnel.

27.3.4 The proposals included a new area of hardstanding to house the shaft, the top of which would be raised approximately 1m above ground level, and a bund around the works to shield them from view. No other above-ground structures were proposed because the project would make use of the ventilation fans and air filters installed as part of the Lee Tunnel project.

27.3.5 We held drop-in sessions on 21 and 22 November 2010 at Stratford Old Town Hall and on 21 November 2010 at St Mark's Community Centre to inform the local community of the potential use of the site. We also gathered views on local issues that we should take account of in developing our proposals.

Figure 27.15: Phase one consultation

Design development

27.3.6 Following phase one consultation, we made two key changes to the design as follows:

a. We reduced the internal diameter of the shaft from approximately 25m to 20m following a revision of the tunnelling strategy.

b. We incorporated a ventilation column and associated ventilation structures for the main tunnel shaft as a result of further modelling and modifications to the project-wide air management strategy.

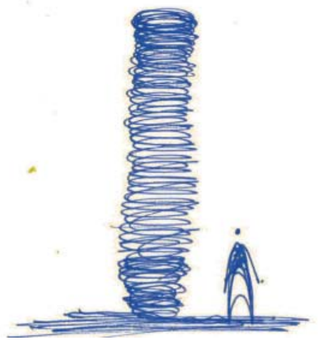

Figure 27.16: Ventilation column sizes were subject to change

April 2011

CABE sketch review

27.3.7 We held a review based on an initial site assessment and sketched ideas for the site with the Design Council CABE in April 2011.

27.3.8 The Design Council CABE panel was generally supportive in its comments. It advised that, given the notable design quality of both Bazalgette's and Allies and Morrison's pumping stations in this area, the appearance of the project's structures required the same degree of thought and attention. The panel also suggested that in designing the ventilation column, we should have regard to the Lee Tunnel project structures under construction nearby.

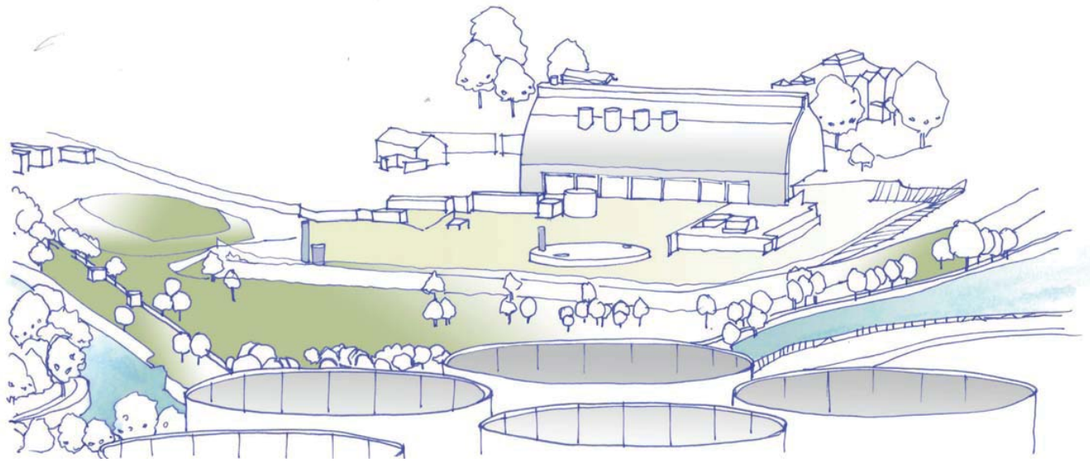

Figure 27.17: Design Council CABE sketch review

December 2011

Phase two consultation

27.3.9 The extent and layout of the structures did not alter greatly between the sketch review and phase two consultation. However, we omitted the bunding around the works as it became clear that the Lee Tunnel project would be responsible for the landscape design.

27.3.10 At phase two consultation we held drop-in sessions on 5 and 6 December 2011 at Stratford Old Town Hall and on 8 and 9 December 2011 at St Mark's Community Centre in order to gather feedback on our proposals.

27.3.11 The main comments received in relation to the design of the permanent structures included:

a. The design proposals are good.

b. The permanent building and site design should be sensitive to the setting and the character of the local townscape.

27.3.12 The London Borough of Newham made the following comments:

a.mMinimise/reduce the size of the permanent site and the area of hardstanding.

b.MIncorporate open/green space and retain any land not required for operational purposes as open space.

c. Consider the use of permeable surfacing.

Figure 27.18: Phase two consultation

April 2012

Section 48 publicity

27.3.13 Following phase two consultation, we continued to liaise with representatives of the London Legacy Development Corporation to develop the design and design principles for the site.

27.3.14 There were no significant design developments at this site following phase two consultation. However, we increased the size of the ventilation structures, in line with the project-wide air management strategy. We also proposed to include an electrical and control kiosk.

Figure 27.19: Section 48 publicity

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27.4 Proposed design

27.4.1 This section describes the amount, layout and scale of the proposed development and how the functional components would be integrated into the existing site.

Fixed principles

27.4.2 The Site works parameter plan defines the zones in which the proposed works would be carried out. The plan indicates the general location of the main tunnel shaft, ventilation structures and column, and the electrical and control kiosk.

27.4.3 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.

Design objectives

27.4.4 Our main objective for the design of the above-ground structures was to allow the flexibility for their final layout and appearance to respond to the Lee Tunnel project works and the changing nature of the site.

27.4.5 Throughout the design development process, we sought to refine and optimise the functional design, footprint, and layout of the proposed works. The layout is constrained by the existing built sewage infrastructure within the site and the adjacent watercourses. It is also dictated by the functional requirement to transfer flows from the main tunnel to the Lee Tunnel, the need for regular routine maintenance, and by health and safety legislation.

27.4.6 In line with the London Borough of Newham's *Core Strategy* Policy SP5, we also had regard to the setting of the listed buildings and the conservation area. The site lies approximately 130m southwest of the Grade II listed industrial buildings around the Grade II* listed Abbey Mills Pumping Station A, however it is physically and visually separated by modern pumping station buildings and infrastructure. We believe that the sensitive design of the permanent works would have a minor beneficial effect on the character and appearance of the Three Mills Conservation Area and the setting of the nearby heritage assets.

Above ground permanent structure	Maximum height above finished ground level (Minimum heights are in brackets where applicable)
Ventilation structure(s) outlets	4.5m (2.5m)
Ventilation structure(s) inlets	4.0m (2.0m)
Electrical and control kiosk(s)	2.5m
Ventilation structure(s)	5.0m (2.0m)
Ventilation column(s)	8.5m

Table 2

Above ground permanent structure	Maximum plans dimension (Minimum in brackets where applicable)
Ventilation structure(s) inlets	Length 4.0m (2.0m) Width 4.0m (2.0m)
Ventilation structure(s)	Length 7.0m (4.0m) Width 6.0m (3.0m)
Ventilation structure(s) outlets	Length 4.0m (2.0m) Width 5.0m (3.0m)

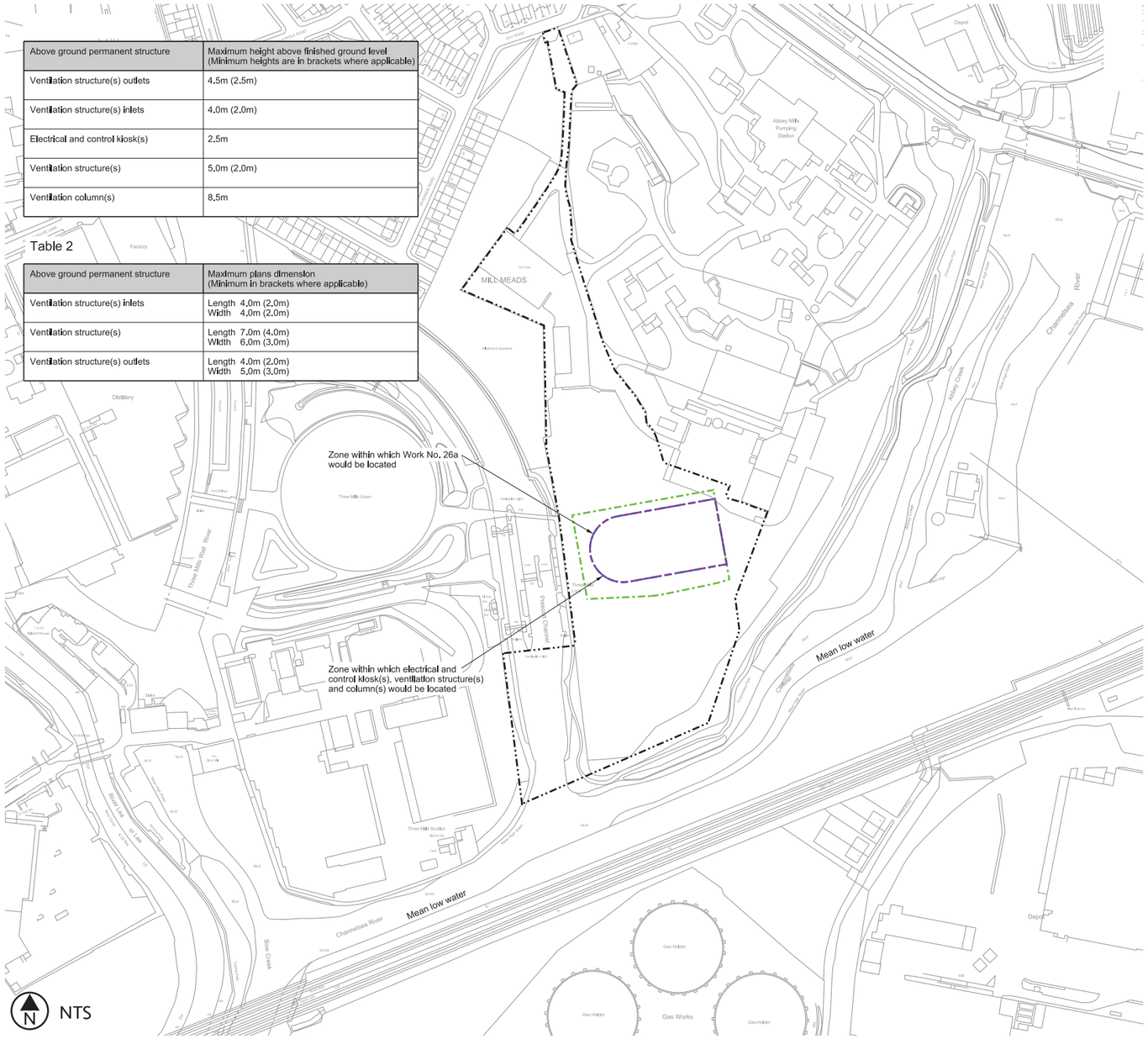

Figure 27.20: Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*

Integration of the functional components

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

a. a main tunnel reception shaft

b. a connection tunnel

c. a ventilation duct.

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

a. a ventilation column

b. an electrical and control kiosk

c. reinstatement works including fencing.

Main tunnel shaft

27.4.9 The main tunnel reception shaft would be approximately 20m in internal diameter. It would be connected to the Lee Tunnel shaft via the connection tunnel. It would be ventilated by means of a duct to the Lee Tunnel ventilation equipment, which would be provided as part of the Lee Tunnel project.

Ventilation column

27.4.10 The number and size of the ventilation columns is determined by the air management requirements for the site. At Abbey Mills Pumping Station, we propose to include one ventilation column, which would be up to approximately 8.5m high, and associated ventilation structures. The final design of the ventilation structures and column would seek to be consistent with the backdrop of the Lee Tunnel project works and the Station F pumping station, in line with the advice of the Design Council CABE and design principles .Therefore the 'signature' design would not be used.

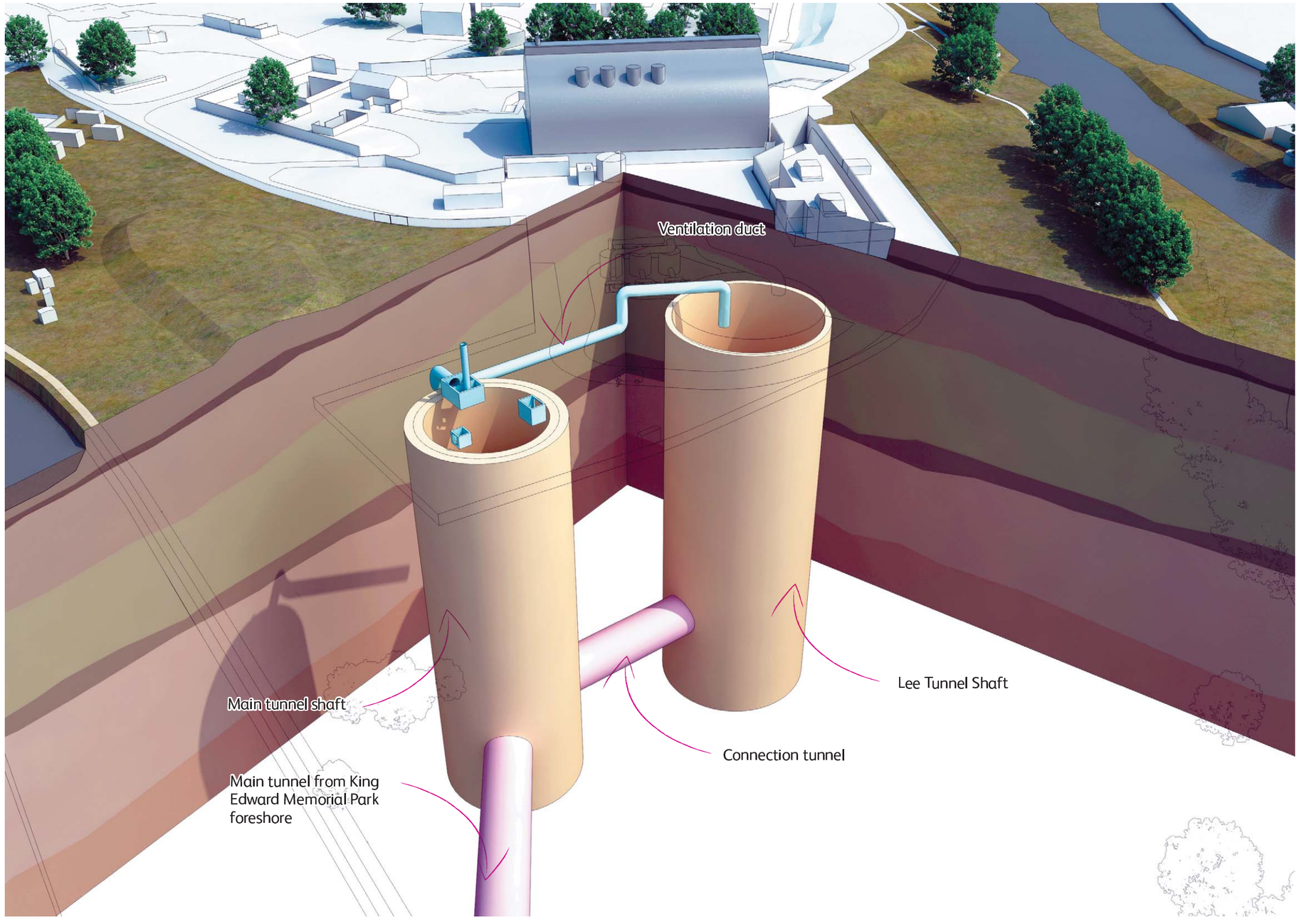

Figure 27.21: Functional components diagram: below ground view

Figure 27.22: Functional components diagram: above ground view

Electrical and control kiosk

27.4.11 The electrical and control kiosk would stand approximately 2.5m high and be located on the southern boundary of the zone in which the permanent works would be located defined on the Site works parameter plan. It would be a plain, generic structure with no bespoke cladding. The scale and design would be consistent with the existing structures, plant and buildings.

27.4.12 Improved areas of hardstanding would be included to facilitate maintenance vehicle access and incorporate access covers to the below-ground infrastructure.

Landscaping and appearance

27.4.13 Design principles states that planting and fence treatments on the boundary would be completed as part of the Lee Tunnel project works. The Thames Tideway Tunnel project would reinstate any of these works disrupted during construction. For this reason, we have not proposed any additional landscaping.

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27.5 Access and movement

27.5.1 We do not propose to make any alterations to the existing vehicular access points or internal roads.

27.5.2 Pedestrian access around the outside of the Abbey Mills Pumping Station site would not be affected by our proposals. The footpath around the southern part of the site would be reinstated as part of the Lee Tunnel project works.

Thames Water access requirements

27.5.3 Permanent access to the works would be via the existing Thames Water entrance off Gay Road, and the existing site roads and extensions to be constructed as part of the Lee Tunnel project.

27.5.4 Thames Water's health and safety requirements govern access and movement around the site and this would not change. Routine maintenance and servicing associated with the site and plant would be undertaken according to normal operating procedures at the site.

27.5.5 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.

27.5.6 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 main tunnel shaft. The inspection would be carried out during normal working hours and would likely take several weeks.

27.5.7 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.

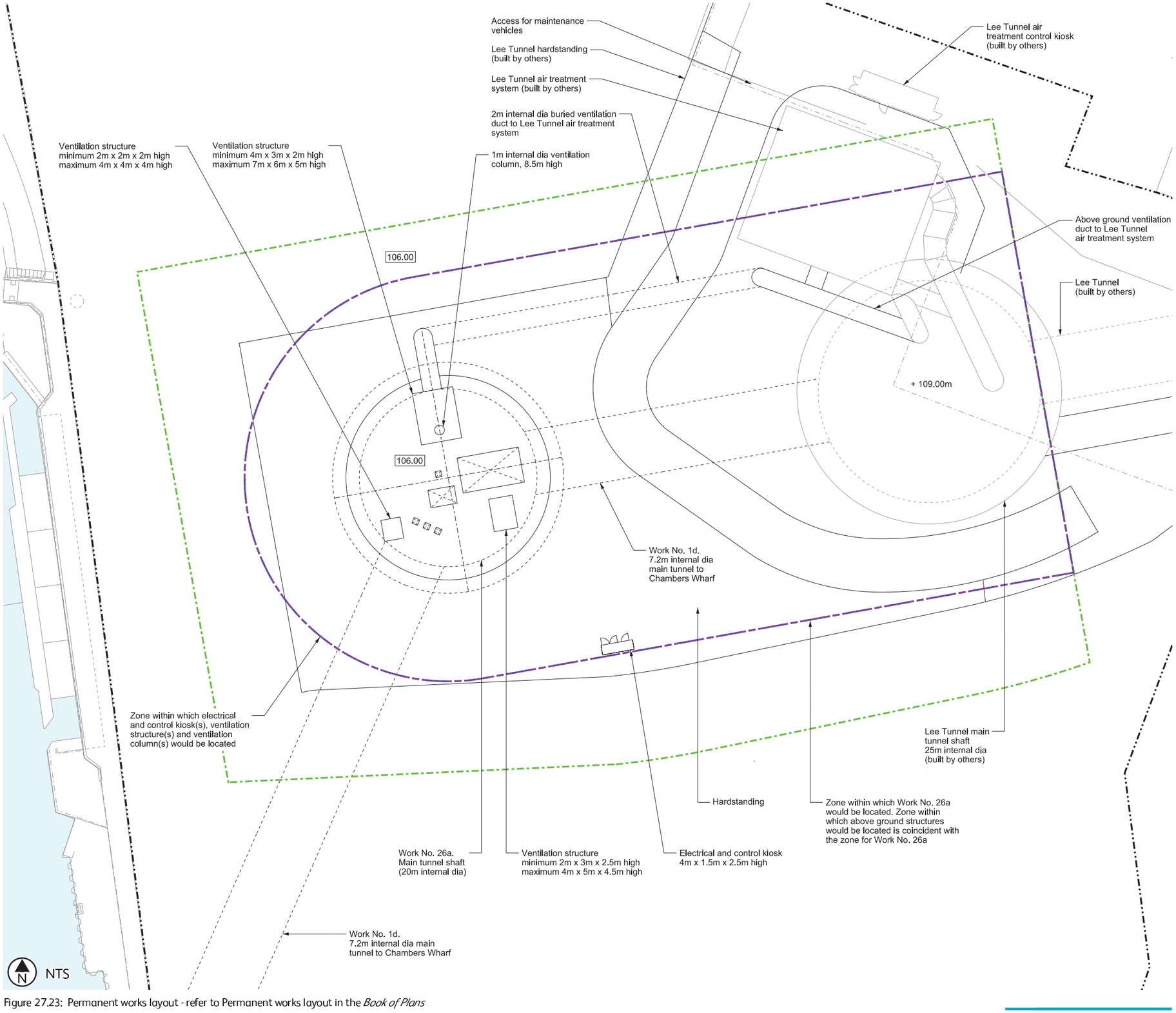

Figure 27.23: Permanent works layout - refer to Permanent works layout in the *Book of Plans*

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