

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

Shad Thames 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 21

Shad Thames Pumping Station

21.1 Introduction

21.1.1 A worksite is required to control the Shad Thames Pumping Station CSO. The proposed works would mobilise capacity within the existing sewers upstream of the pumping station in order to manage combined sewage (storm water mixed with wastewater) flows without connecting the CSO to the main tunnel. The proposed development site is known as Shad Thames Pumping Station, which is located in the London Borough of Southwark

21.1.2 We have agreed with the London Borough of Southwark 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. The proposed roof plans, however, are for approval.

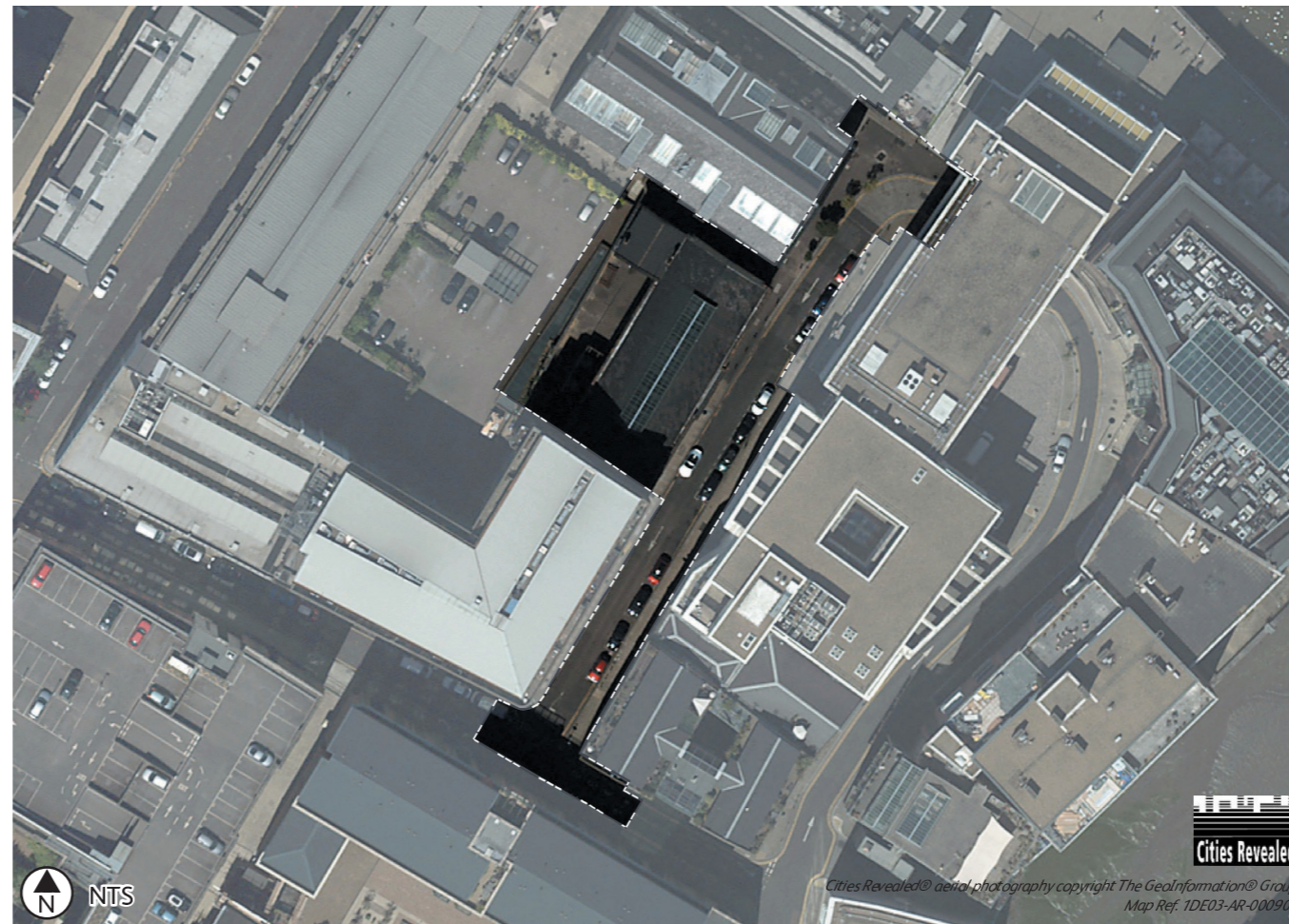


Figure 21.1: Aerial photograph of the existing Shad Thames Pumping Station site with LLAU indicated

21.2 Existing site context

21.2.1 The site itself comprises the early 20th century Thames Water operational pumping station, the length of Maguire Street and its intersection with Gainsford Street. To the rear of the existing pumping station building is a narrow yard, which contains a number of ancillary buildings, including a facilities building. The facilities building is largely unused except for some toilet facilities and a meeting room.

21.2.2 The site falls within the Tower Bridge Conservation Area, which is characterised by high density development arranged around narrow streets. The site also lies within the Borough, Bermondsey and River Archaeological Priority Zone.

21.2.3 The site falls within Flood Zone 3a (high probability) associated with the River Thames and is protected by flood defences.

21.2.4 The site is bounded to the north by the Grade II listed Wheat Wharf residential conversion, to the east by the Design Museum and Clove Building along Maguire Street, to the south by Tamarind Court, and to the west by a courtyard car park associated with Vanilla and Sesame Court.

21.2.5 The surrounding area mainly comprises former mid-rise warehouses (four to six storeys high) and buildings associated with the riverside docks between Tower Bridge and St Saviours Dock. The character of the townscape is consistent in terms of the scale of the buildings and the configuration of the narrow streets. The land use comprises residential development within converted or new buildings mixed with commercial uses, particularly at street level.

21.2.6 The Shad Thames Pumping Station CSO is located on the foreshore of the River Thames approximately 50m north of the site.

21.2.7 The Design Museum to the east of the site is a key land use in the area. The St Saviours Dock Conservation Area lies approximately 40m to the east of the site. St Saviours Dock lies approximately 70m from the site at the confluence of the 'lost' River Neckinger and the River Thames. A footbridge that forms part of the Thames Path links the western bank of the River Neckinger to the eastern bank.

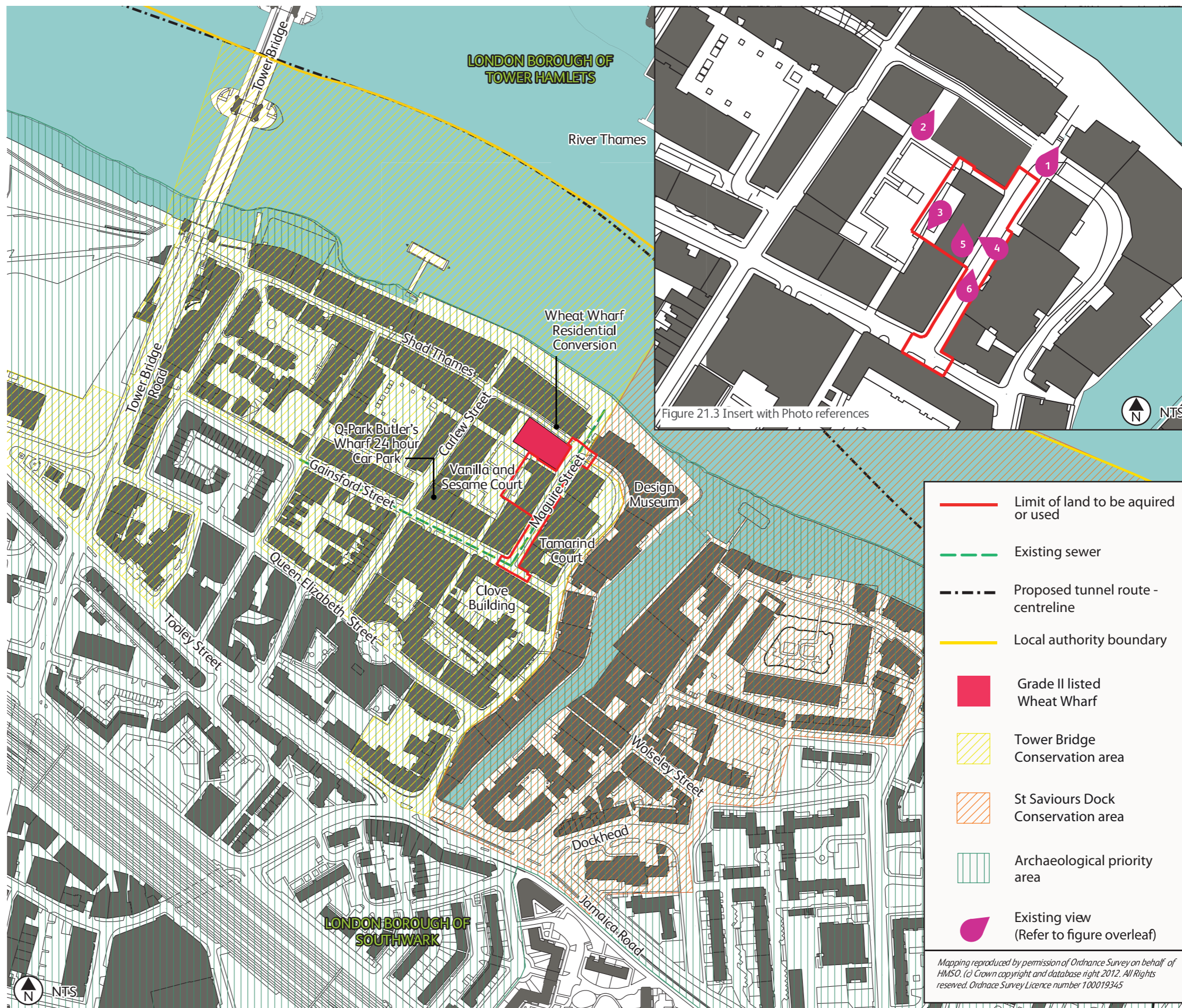


Figure 21.2: Existing site plan



Figure 21.4: View of Design Museum towards River Thames



Figure 21.7: Front door of main pumping station



Figure 21.10: Glazed brick type

21.2.8 To the south and west, the townscape is arranged in a grid formation parallel to the River Neckinger (north-south) and the River Thames (east-west). The mixed-use and residential buildings range from four to five storeys in height and are largely organised around courtyard spaces. Further to the west lies Butler's Wharf Pier and Tower Bridge beyond.



Figure 21.5: View of Design Museum



Figure 21.8: View inside pumping station



Figure 21.6: Existing switch gear and transformers



Figure 21.9: View down Maguire Street

Existing site access and movement

21.2.9 The pumping station is a Thames Water operational site and is not accessible to the public. The existing vehicle and pedestrian access to the pumping station is from Maguire Street.

Highways

21.2.1 Maguire Street lies approximately 300m to the north of Jamaica Road (A200), which forms part of the Transport for London Road Network. It is a one-way, southbound road with a 30mph speed limit. Traffic enters from Shad Thames to the north and exits into Gainsford Street to the south.

21.2.2 Gainsford Street is a two-way road that leads to Shad Thames to the east and Curlew Street to the west.

21.2.3 Shad Thames is a two-way road between its junctions with Jamaica Road and Gainsford Street, with one lane and a bus lane in both directions. North of its junction with Gainsford Street, it forms a one-way system (northbound) and passes under the Design Museum to merge with Maguire Street. It then continues west to Tower Bridge.

Car parking

21.2.4 There are 11 car parking bays along Maguire Street: eight are reserved for resident permit holders and three are pay and display. There are two disabled parking bays on Shad Thames.

21.2.5 The nearest private car park is associated with Vanilla and Sesame Court and is located to the rear of the site. The ground and lower levels of the car park are available for residential parking and about the rear of the pumping station. They can be accessed from Curlew Street, Gainsford Street and Shad Thames.

21.2.6 The Q-Park Butler's Wharf 24-hour car park is located approximately 120m from the site on Gainsford Street and contains 115 car spaces and nine disabled parking bays.

21.2.7 There are four car clubs within 640m of the site.

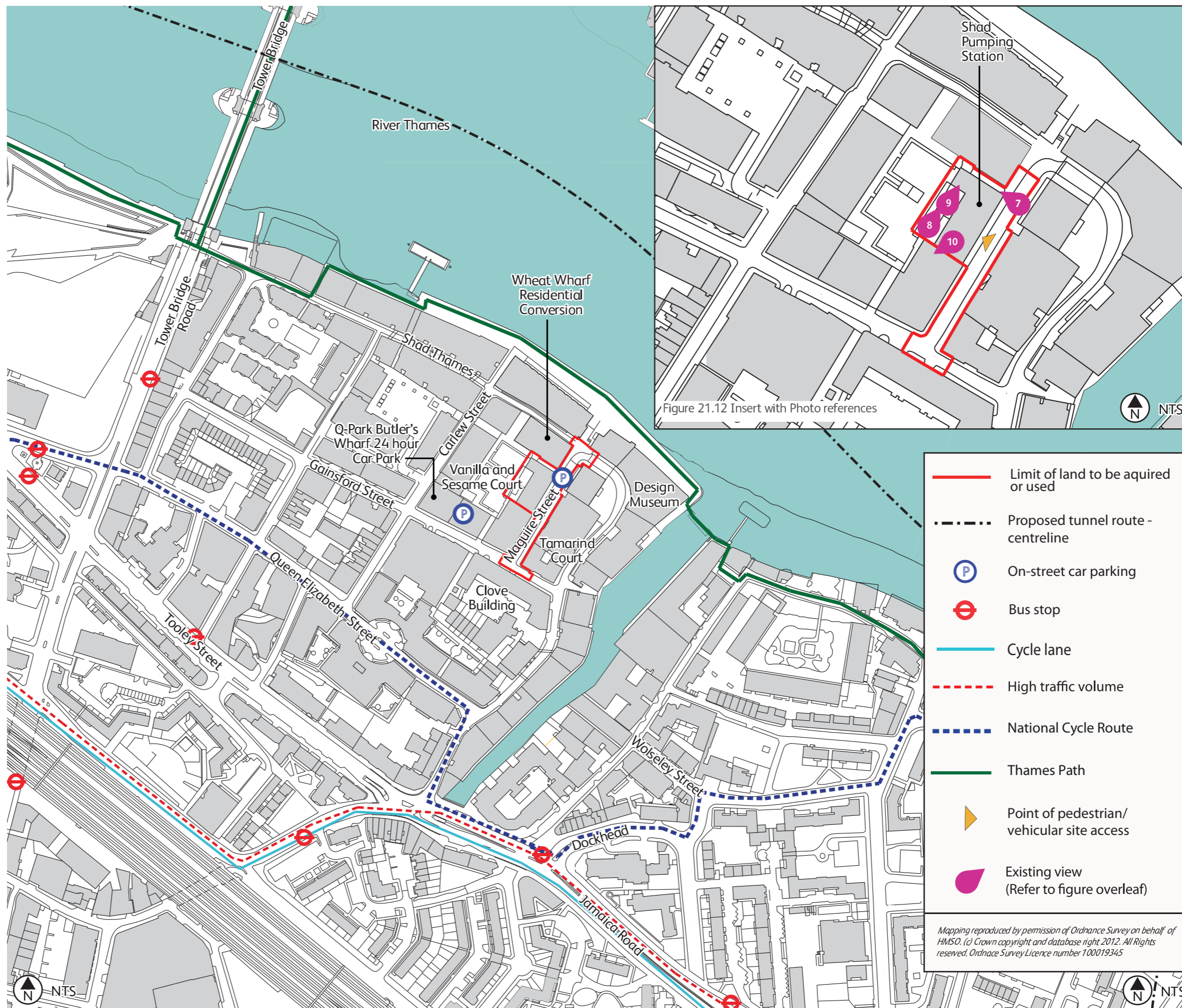


Figure 21.11: Existing site analysis



Figure 21.13: Moulding detail



Figure 21.14: Moulding detail at junction of the facilities building



Figure 21.15: Side gate pedestrian entrance



Figure 21.16: View of the facilities building from within courtyard



Figure 21.17: View within pumping station courtyard



Figure 21.18: View inside pumping station

Public transport

21.2.8 Bermondsey is the nearest London Underground station, which is located approximately 1.1km to the southeast of the site. Jubilee Line trains that serve this station travel west to Stanmore and Wembley, and east to Greenwich and Stratford.

21.2.9 London Bridge Station, which is located approximately 950m to the west of the site, provides First Capital Connect, Southeastern and Southern train services as well as London Underground services.

21.2.10 There are a number of bus stops within 640m of the site, which are located on Jamaica Road, Queen Elizabeth Street, Tower Bridge Road and Abbey Street.

Pedestrian routes

21.2.11 Shad Thames provides a northeast-southwest link between Jamaica Road and Butlers Wharf on the South Bank, with footways (1m wide) on both sides of the road. Maguire Street joins the end of Shad Thames and provides continuous footways (approximately 1.5m wide) on both sides of the road. Jamaica Road provides a continuous link between the site and Bermondsey Underground Station, with footways on both sides of the road.

21.2.12 The Thames Path lies approximately 60m to the north of the site. It runs adjacent to the river along Bermondsey Wall East and Chambers Street to the east and along Shad Thames to the west.

Cycle routes

21.2.13 National Cycle Route 4 runs approximately 230m to the south of the site along Queen Elizabeth Street. The route continues along Tooley Street to the west and along Dockhead, Wolsey Street, and Chambers Street to the east. The bus lanes along Jamaica Road can also be used for cycling.

21.2.14 The closest Cycle Superhighway to the site is CS7, which runs between Merton and the City. Southwark Bridge Road (2km to the west) is the closest point of CS7 to the site.

Historical context

21.2.15 The site lies entirely on alluvium within the floodplain of the confluence of the River Thames and the River Neckinger, less than 100m to the northeast of an outcrop of Kempton Park Gravel.

21.2.16 The site probably comprised dry ground suitable for cultivation and occupation in early prehistoric period (700,000 BC to AD 43); however, due to rising water levels, it became marshy and unsuitable for settlement by the later prehistoric period. There is some recorded evidence of Bronze Age and Iron Age activity 100m to the south of the site.

21.2.17 During the Roman period (AD 43 to 410), the site remained in a low marshy area, 1km to the southeast of the Roman settlement around the Thames bridgehead at Southwark. A further rise in water levels in the later Roman period inundated outlying areas, and it is therefore unlikely that the site was settled or cultivated.

21.2.18 The main settlement in the area during the medieval period (AD 410 to 1485) lay 1km to the northwest at Southwark. In the 13th century, the marshy site was situated on

the edge of a large open common known as Horsleydown, which was owned by the Order of St John of Jerusalem (the Hospitallers). A medieval manor known as 'Knight's Manor' and described as "the towered hall of the Knights of St John" lay 25m to the south of the site. In the early 14th century, the riverfront was embanked and used as a landing for boats, which probably attracted associated activity and settlement.

21.2.19 Development grew up along the edge of the River Thames to the north and the River Neckinger to the east, which was eventually canalised to form St Saviours Dock. By the mid-17th century, the riverfront and 'Savory Dock' (St Saviours Dock) were lined with buildings and the site lay in the open garden plots and orchards behind them.

21.2.20 Maps from the late 18th century indicate that industrial development in the area increased. The site appeared to contain small, probably domestic buildings.

21.2.21 By the 19th century, the character of the waterside district was almost entirely industrial. The site continued to be occupied by small, probably domestic structures until the existing pumping station was built in the early 20th century.

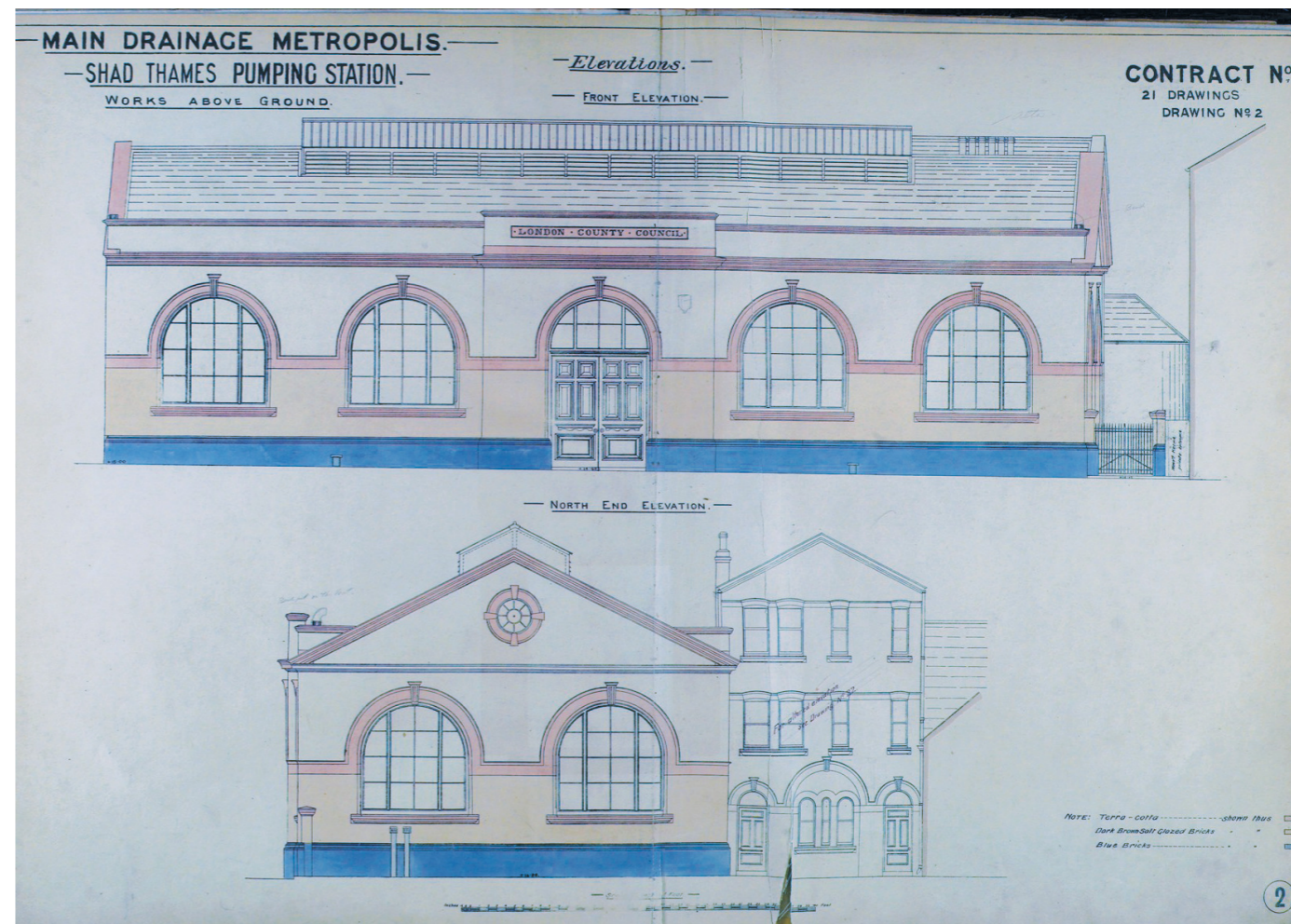


Figure 21.20: Photo of original elevation for existing pumping station

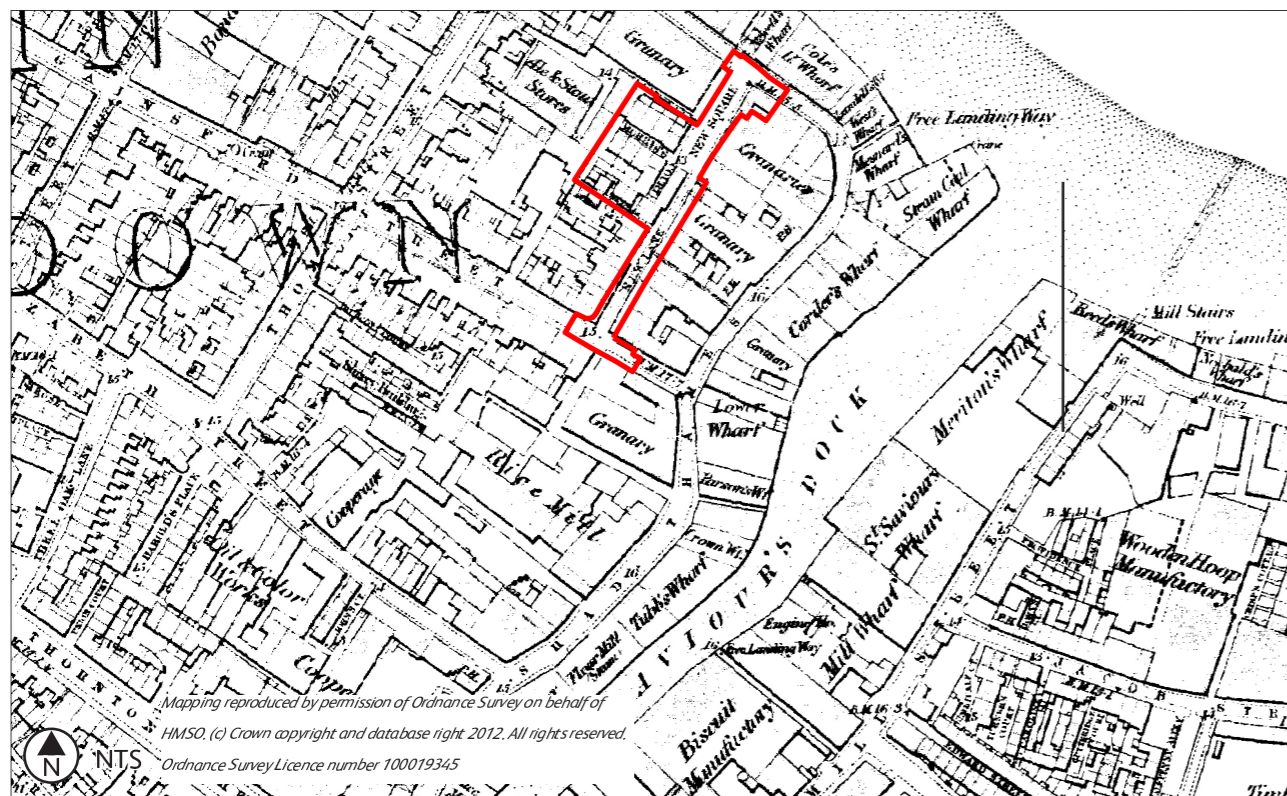


Figure 21.19: Historic map from 1878

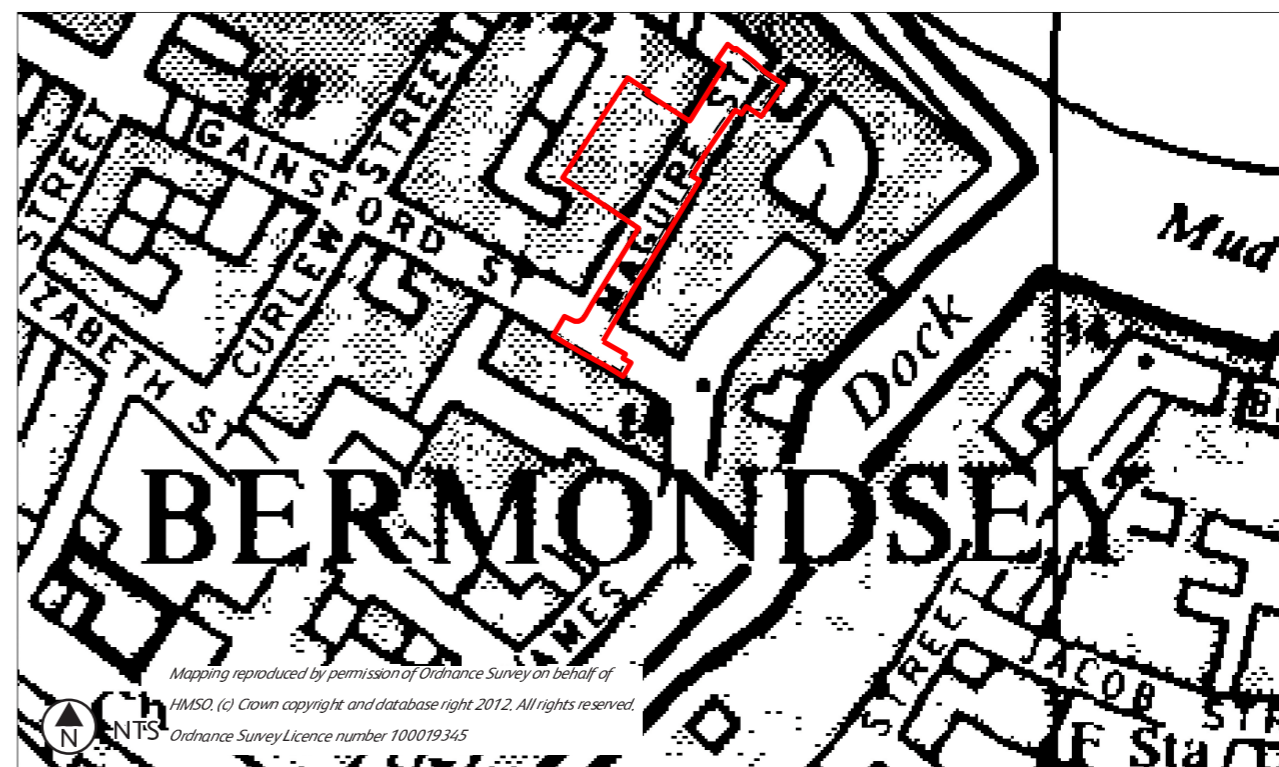


Figure 21.21: Historic map from 1968

Site analysis: Opportunities and constraints

The site-specific design opportunities included:

- a. Utilise the form and function of the existing pumping station and operational site to incorporate the required works.
- b. Provide a new vehicle access to the site.
- c. Ensure that any new buildings and works to the existing pumping station integrate with the surrounding site context and built form

The site-specific design constraints included:

- a. traffic management and access issues associated with the one-way configuration of Maguire Street and a section of Shad Thames
- b. the location of existing sewers and below-ground chambers within Maguire Street
- c. the proximity to relatively high density commercial and residential development
- d. the structural arrangement of the pumping station and the configuration of the existing facilities building.
- e. the proximity of listed buildings
- f. the Tower Bridge Conservation Area.

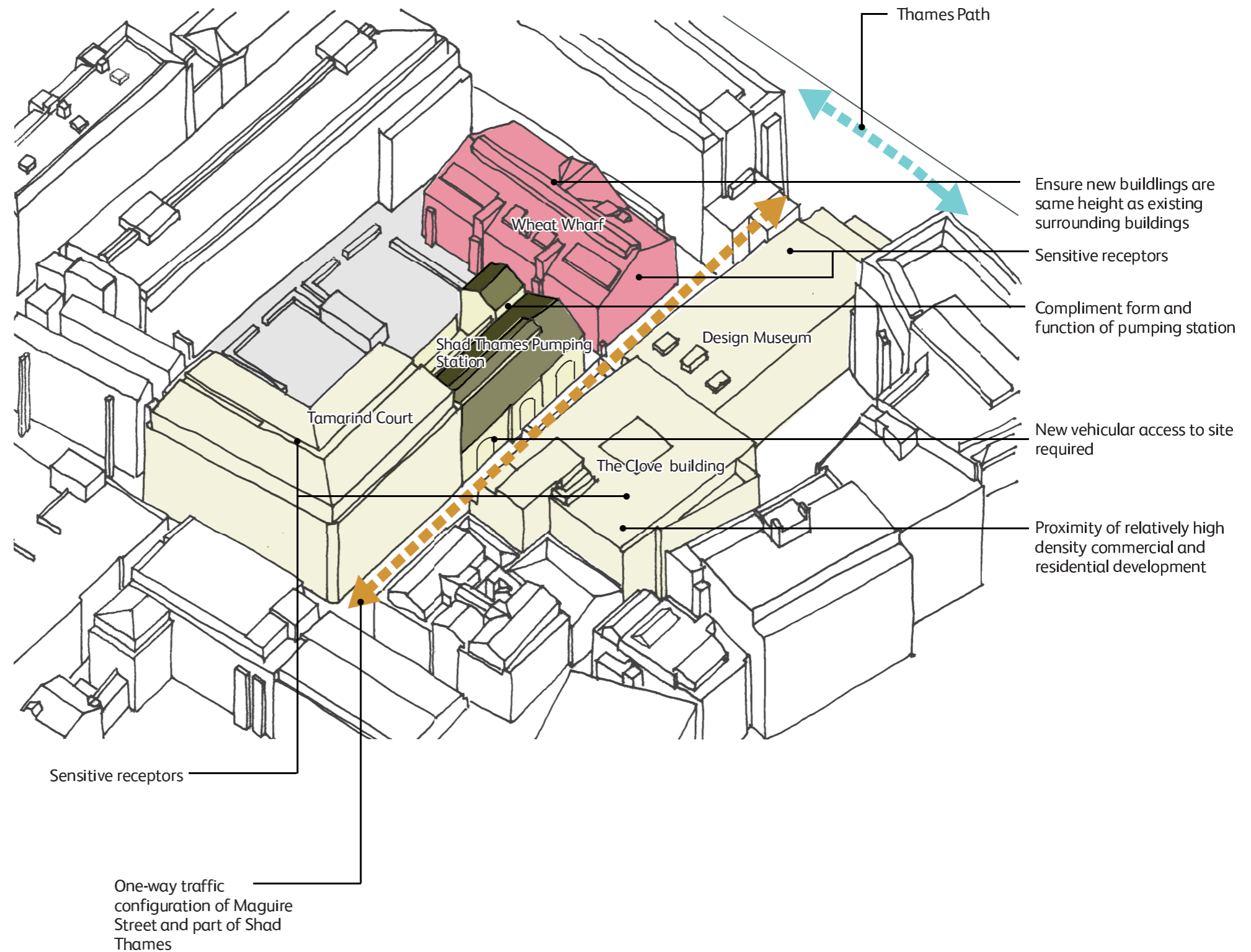


Figure 21.22: Existing site opportunities and constraints sketch

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21.3 Design evolution and alternatives

21.3.1 As the majority of the infrastructure for the project would be below ground, the key design objective of the permanent above-ground works was to integrate the functional components into the surroundings. The site-specific design objective at Shad Thames Pumping Station was to successfully integrate the works into the congested operational site while minimising the impact on the existing pumping station and the commercial and residential surroundings.

21.3.2 The design of our proposals at this site was also 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 CABI. We also held various pre-application meetings with the London Borough of Southwark and other strategic stakeholders. More information on our public consultation process is provided in the *Consultation Report*, which accompanies the application.

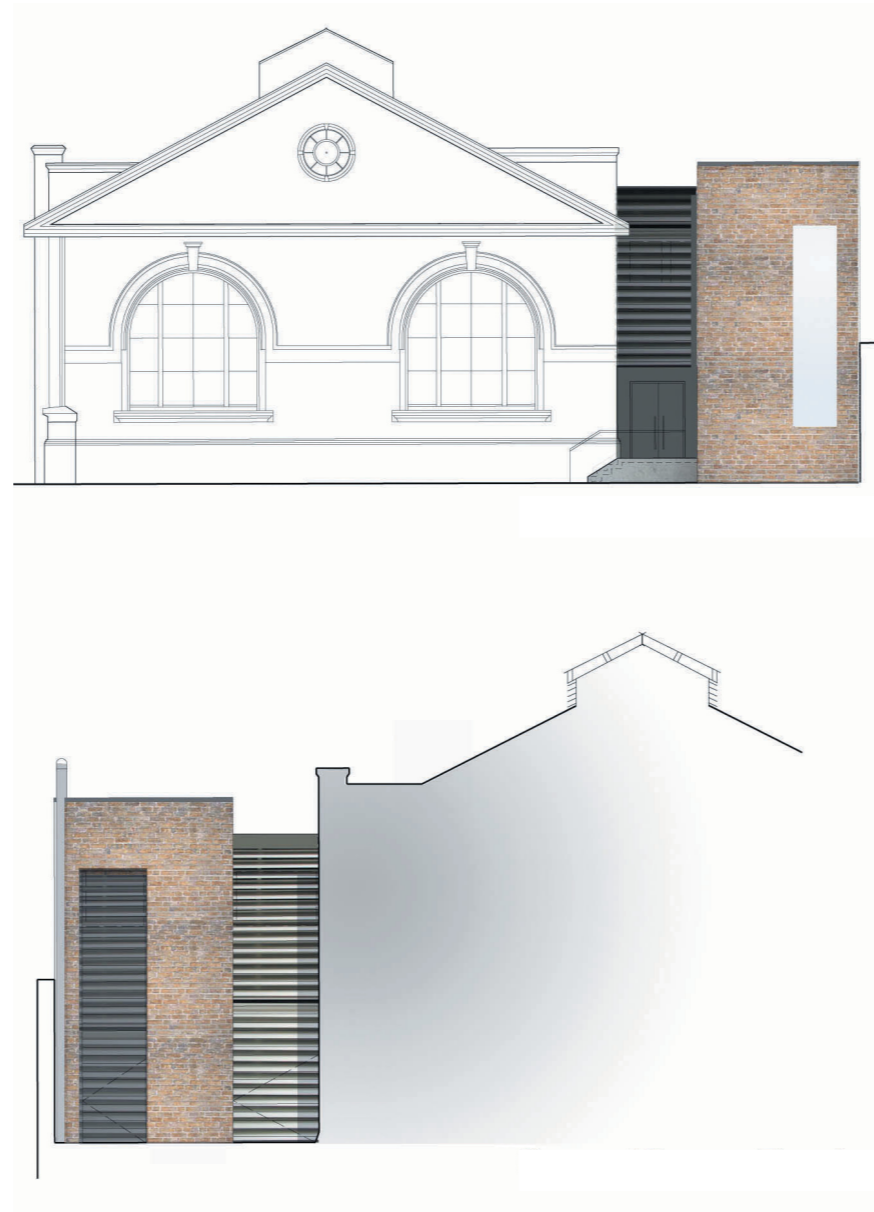


Figure 21.23: Elevation drawing during design development

October 2010

Phase one consultation

21.3.3 We did not propose any works at Shad Thames Pumping Station at phase one consultation. At this stage, we proposed to connect the Shad Thames Pumping Station CSO to the main tunnel from a worksite known as Druid Street. We proposed to use the St John's Playground to carry out the construction works and to accommodate the permanent structures required to operate the main tunnel.

21.3.4 Following phase one consultation, we undertook further technical work and determined that it was no longer necessary to connect this CSO to the main tunnel. Consequently, we proposed to undertake works to control the CSO at Shad Thames Pumping Station.

21.3.5 Under the revised scheme, we proposed to install new pumps to return combined sewage stored in the Southwark and Bermondsey Storm Relief Sewer to the high level sewerage system via the Great St John's Sewer in Maguire Street. During extreme storm events, the existing pumps in Shad Thames Pumping Station would discharge storm flows into the River Thames.

21.3.6 We also explored the following design considerations:

- providing new pumps and modifying existing pumps and internal pipe work at the Shad Thames Pumping Station
- modifying the existing sewers within Maguire Street and Gainsford Street
- configuring new electrical equipment within the pumping station site.

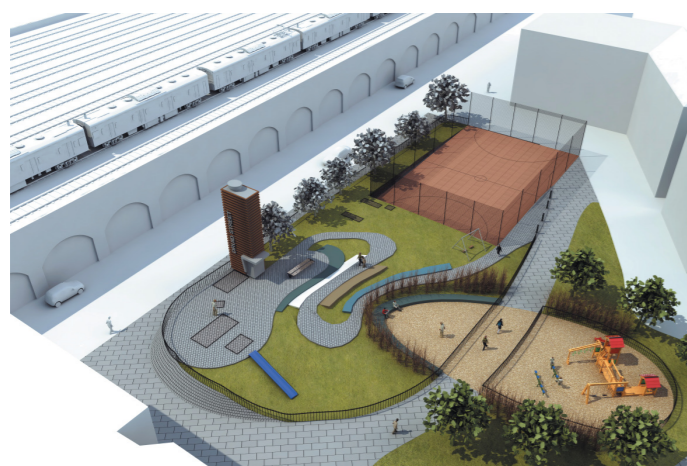


Figure 21.24: Druid Street site at phase one consultation

May 2011

CABE sketch review

21.3.7 We held a sketch review based on an initial assessment and sketched ideas for the site with the Design Council CABE in May 2011. The concept sketches and elevations set out the proposed use of the pumping station site, including the indicative layout of the engineering elements, options for the configuration of switchgear equipment and for the treatment of the façade.

21.3.8 The options for accommodating the new electrical switchgear equipment included either retaining the existing footprint of the pumping station or extending it into the courtyard at the rear of the pumping station building.

21.3.9 The Design Council CABE panel stated that the emerging proposals for Shad Thames Pumping Station were well considered.

"The idea of a simple, modest extension to the pumping station that is visibly separate from the main building was considered sensible, given the site's tight urban context. We think that a building form of a vernacular expression and muted tones could work well here but it should be apparent from the ordering and scale of the fenestration that it is not a residential building. The choice of construction method and materiality should reflect the challenges of building in an infill site and the relative timescales required for construction [Letter dated 12 May 2011]"

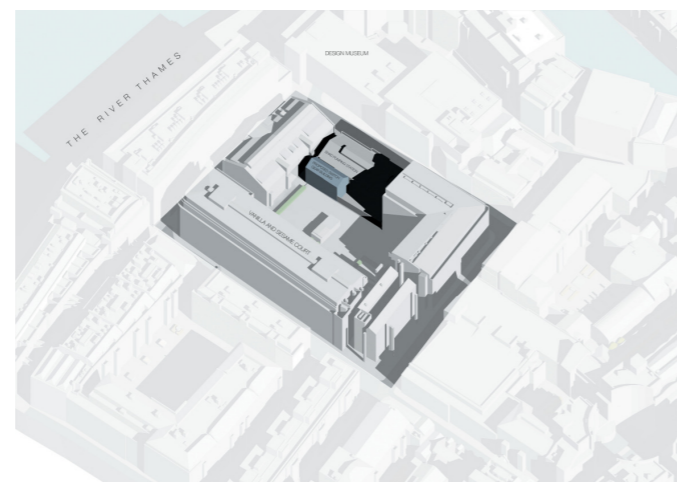


Figure 21.25: Massing Studies for Design Council CABE sketch review

Interim engagement

21.3.10 We held drop-in sessions on 8 and 9 July 2011 at the Beormund 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.

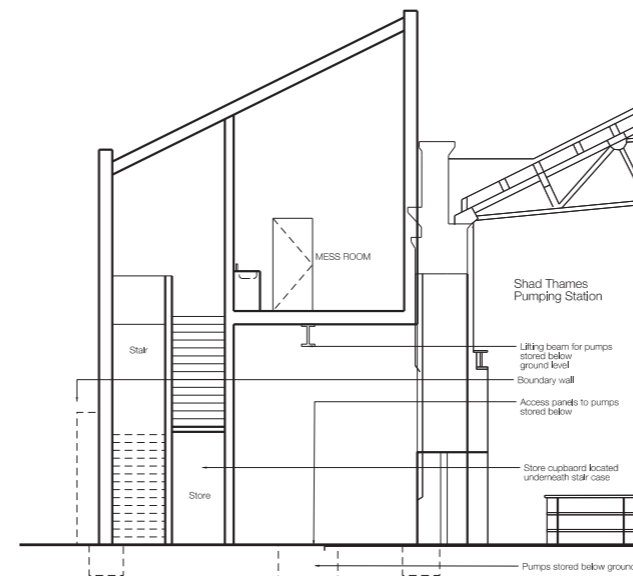


Figure 21.26: Design development drawings

February 2012

Phase two consultation

21.3.11 At phase two consultation, the key concerns raised in relation to design included:

- Compared to the phase one consultation interception at Druid Street, the use of the Shad Thames Pumping Station site appears to downgrade the usefulness of the CSO system in this area, which would result in more sewage overflows into the River Thames.
- The height of permanent structures should be reduced to avoid impacts on residential amenity.
- The effect of construction activities on the historic environment, noise and vibration effects, and the potential for ground movement during works are of concern.

21.3.12 The London Borough of Southwark made the following specific comments in relation to design:

"Without prejudice to the council's objection to the proposal, further discussion should take place in connection with the demolition of an existing section of the pumping station building and the acceptability of the design of the three storey extension along with other alterations to the building including the new vehicular access doors on the front elevation."

"The council will need to be satisfied that the proposal is consistent with Policy 3.12 and 3.13 of the Southwark Plan and Core Strategy strategic policy 12 which seeks to ensure that development achieve [sic] a high quality of both architectural and urban design, enhancing the quality of the built environment [Letter dated 8 February 2012]"

21.3.13 The Design Council CABE also responded to phase two consultation and reiterated its support for the "well-considered", "modest" proposals for the pumping station.



Figure 21.27: Phase two consultation

Section 48 publicity

21.3.14 In response to the feedback received and further design development, we amended our proposals to reduce the height of the replacement facilities building to the rear of the site and minimise the number of openings in the pumping station in order to reduce its visual bulk.

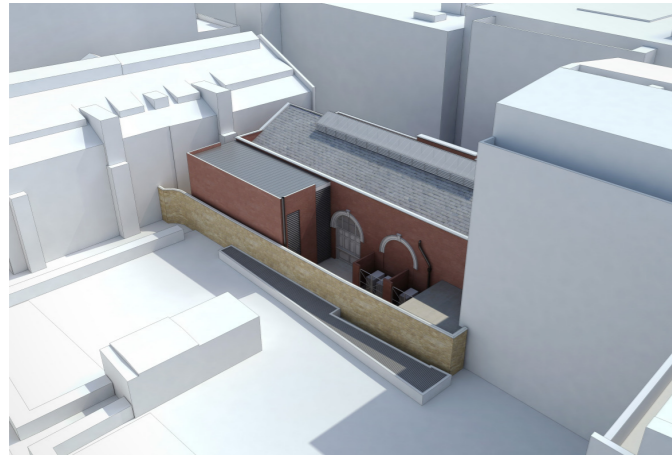


Figure 21.28: Section 48 publicity

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21.4 Proposed design

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

Fixed principles

21.4.2 The Site works parameter plan defines the zones in which the proposed works would take place. The floor plans and elevations indicate the appearance and layout of the replacement facilities building and the changes to the eastern elevation of the pumping station.

21.4.3 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

21.4.4 In addition to our operational objectives, our main aim for the works at Shad Thames Pumping Station was to respect the character of the Tower Bridge Conservation Area and the functional but attractive existing pumping station building.

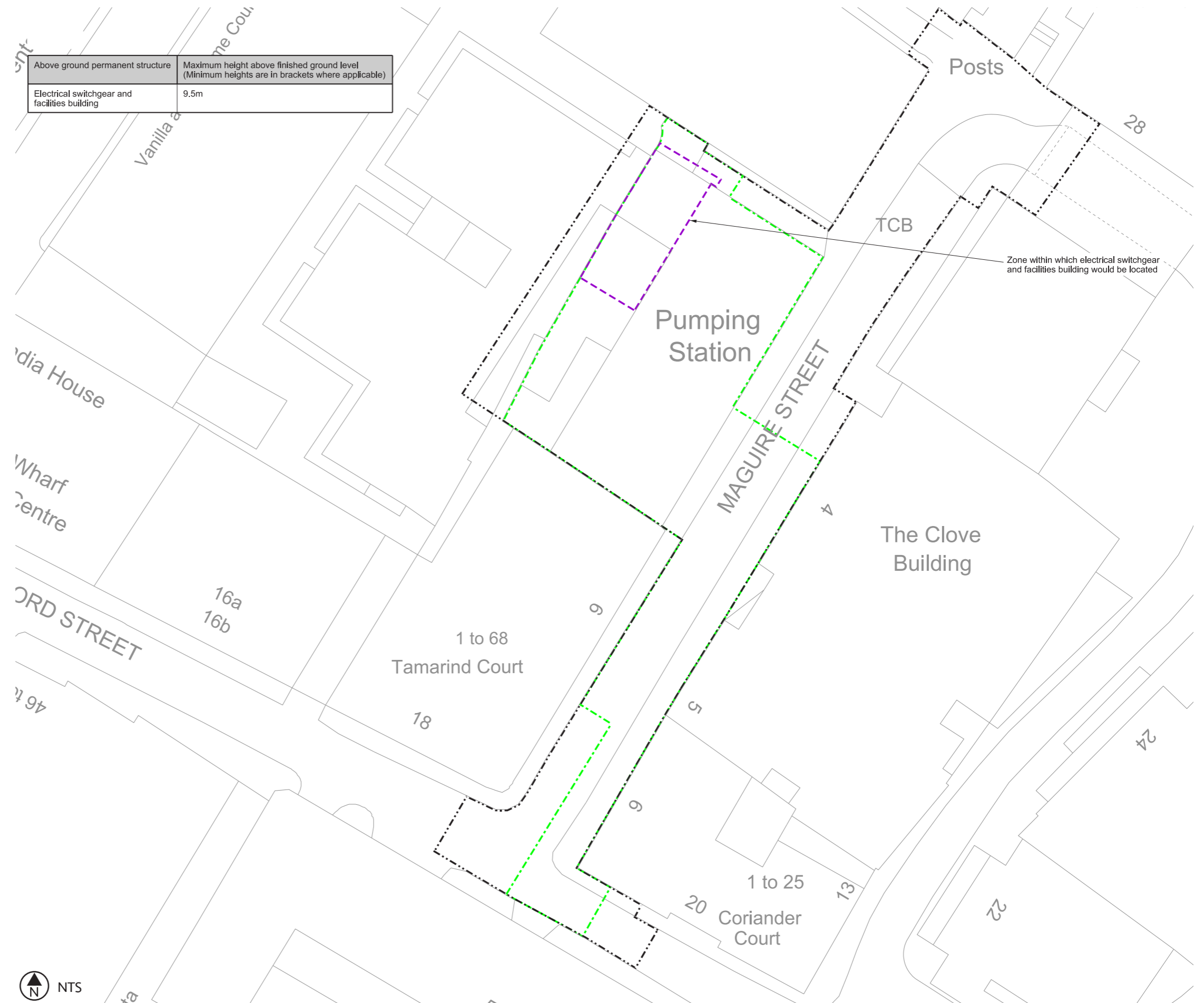


Figure 21.29 Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*

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Integration of the functional components

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

- a. a new wet well
- b. a connection chamber
- c. a sensor chamber.

21.4.6 Post construction, the following works and structures would be visible on the site:

- a. a new facilities and switchgear building
- b. a ventilation column
- c. a new vehicle access on Maguire Street and modifications to the façade of the pumping station building
- d. a reinstated boundary wall to the rear of the pumping station.

Wet well and works in the highway

21.4.7 The wet well to receive and store incoming combined sewage flows would be constructed as part of a new drain-down pumping station, which would pump the combined sewage stored in the Southwark and Bermondsey Storm Relief Sewer into the existing sewerage network. The wet well would be constructed within the pumping station building and would be approximately 15m deep and approximately 3.6m in internal diameter.

21.4.8 A new connection chamber to the Great St John Sewer would be constructed beneath Maguire Street. A sensor chamber to monitor flows in the Duffield Sewer would be positioned beneath the Gainsford Street carriageway.

Ventilation columns

21.4.9 The number and size of the ventilation columns is determined by the air management requirements for the site. At Shad Thames Pumping Station, we propose to connect one ventilation column (approximately 9.5m high) to the wet well adjoining the replacement facilities and switchgear building.

Rear wall

21.4.10 The wall to the rear of the pumping station would be removed in order to facilitate the works and would be reinstated following construction. The reinstated wall would be built with red bricks to ensure that it is sympathetic to the surrounding conservation area.

Works to the existing pumping station

21.4.11 The new drain down pumping station would be constructed within the existing pumping station building; however, due to certain health and safety and engineering requirements, it must be separated from the existing equipment. An internal partition would be constructed at the southern end of the building to separate the two elements.

21.4.12 A new door would be required in order to access new drain down pumping station from Maguire Street. Like the existing central door to the pumping station, the new door would need to accommodate vehicles turning into the building from Maguire Street. We propose to enlarge the existing arched window opening to the south by extending the sill level down to ground level to provide suitable access. The window opening would be wide enough to accommodate Thames Water maintenance vehicles. It would be replaced with new glazing and doors to match the existing central door.

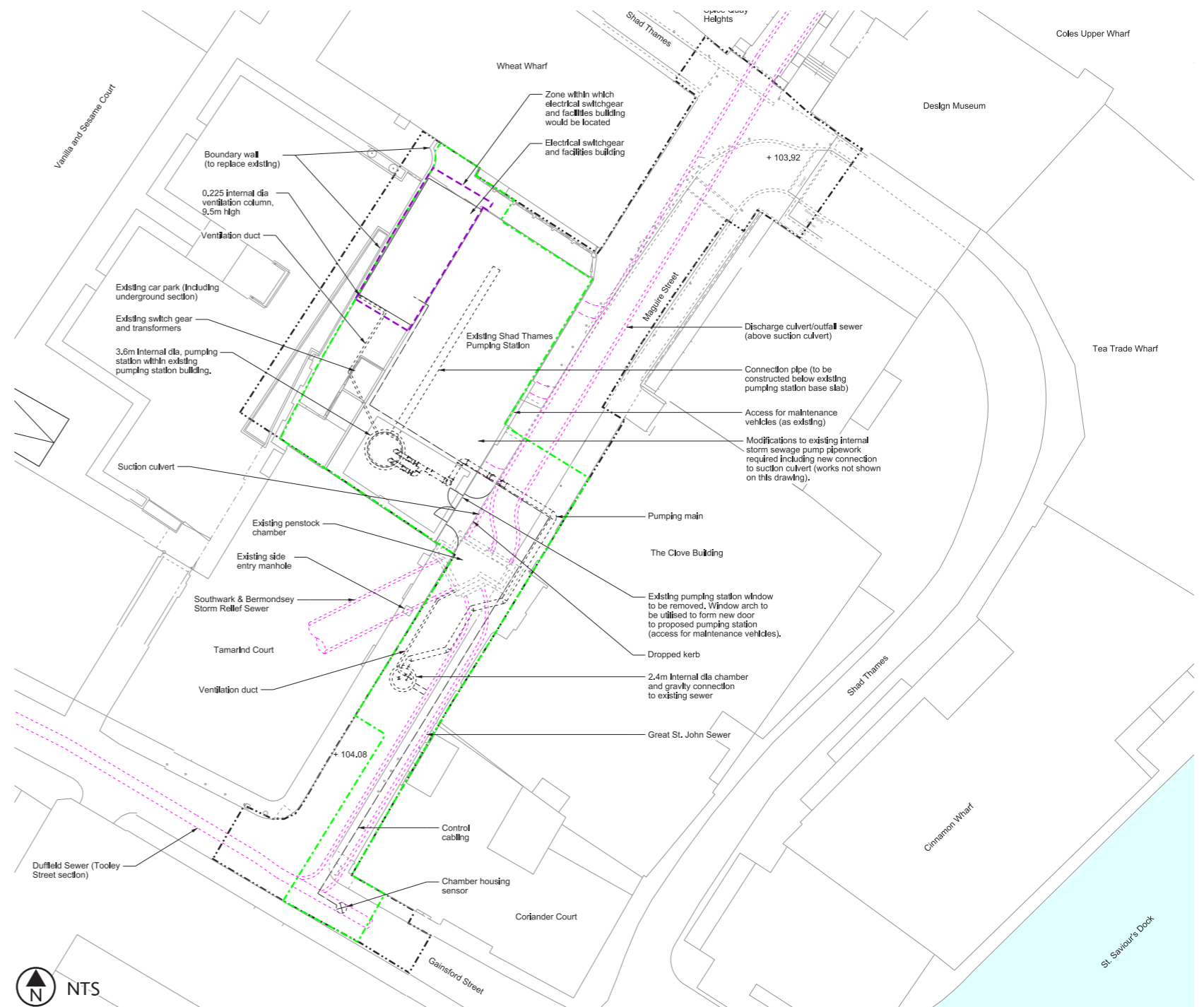


Figure 21.30: Permanent works layout - refer to Permanent works layout in the *Book of Plans*

Switchgear and facilities building

21.4.13 In order to accommodate the new drain down pumping station within the existing pumping station building, some of the electrical switchgear in the building must be relocated and/or replaced. Additional switchgear is also required. The existing facilities building is largely disused; however, it is not large enough to accommodate all the required equipment. Therefore the building would be demolished and a new facilities and switchgear building constructed.

21.4.14 The new building would accommodate the switchgear equipment in separate rooms over two storeys. The toilet facilities for Thames Water staff would be reinstated within the new building. We sought to design a functional and attractive building that would be subservient to the existing pumping station building.

21.4.15 The height and massing of the new building were largely determined by the space required to house the equipment, the location of below-ground structures and the boundaries of the site. We sought to minimise the scale and bulk of the building in order to:

- a. respect the scale of the existing building, which is three storeys high
- b. ensure that the new building does not compete with the pumping station building, which is an attractive stand-alone building with decorative mouldings on the façade
- c. minimise any impact on nearby residential properties, particularly in relation to daylight, sunlight and the visual bulk of the new building
- d. ensure that the new building would not adversely impact on the conservation area or nearby listed buildings..

21.4.16 The new building would be two storeys tall, which is approximately 2m lower than the existing facilities building. The height of the building was determined by the height of the equipment, the minimum clearance required around it and flood risk requirements. The electrical equipment and electrical cabling within the building must be protected from the risk of localised flooding therefore the ground floor level would be raised by approximately 500mm. The building would feature a simple,

flat roof to minimise its height and align it with the parapet of the existing pumping station building.

21.4.17 The main entrance to the new building would be from the alleyway along the northern boundary of the site. Due to the proximity of the residential Wheat Wharf opposite, we reduced the amount of transparent glazing in the northern façade to minimise opportunities for over-looking. Instead we propose to use opaque glass for the staircase and to obscure the windows in the 'set back' area (see below) with horizontal louvers set in front of the glass.

21.4.18 It should be noted, however, that this is an industrial building for the management of waste water infrastructure, which would only be used by Thames Water personnel as part of routine maintenance activities.

21.4.19 The louvers would extend from ground level up in front of the first floor windows to unify to the façade. The design of the southern façade was subject to the functional requirements for installing and removing switchgear; therefore the louvers and glass panels would be removable. Two transformers would be located on the ground floor and the louvers would ensure adequate ventilation. The transformers would be accessed via the courtyard. Large removable glazed panels would be incorporated on the first floor to enable equipment to be lifted out via the courtyard.

21.4.20 A ventilation column is required on the courtyard elevation, which would be a simple pipe terminating just above roof level. A soil pipe vent would also be required on the building, which would terminate on the roof.

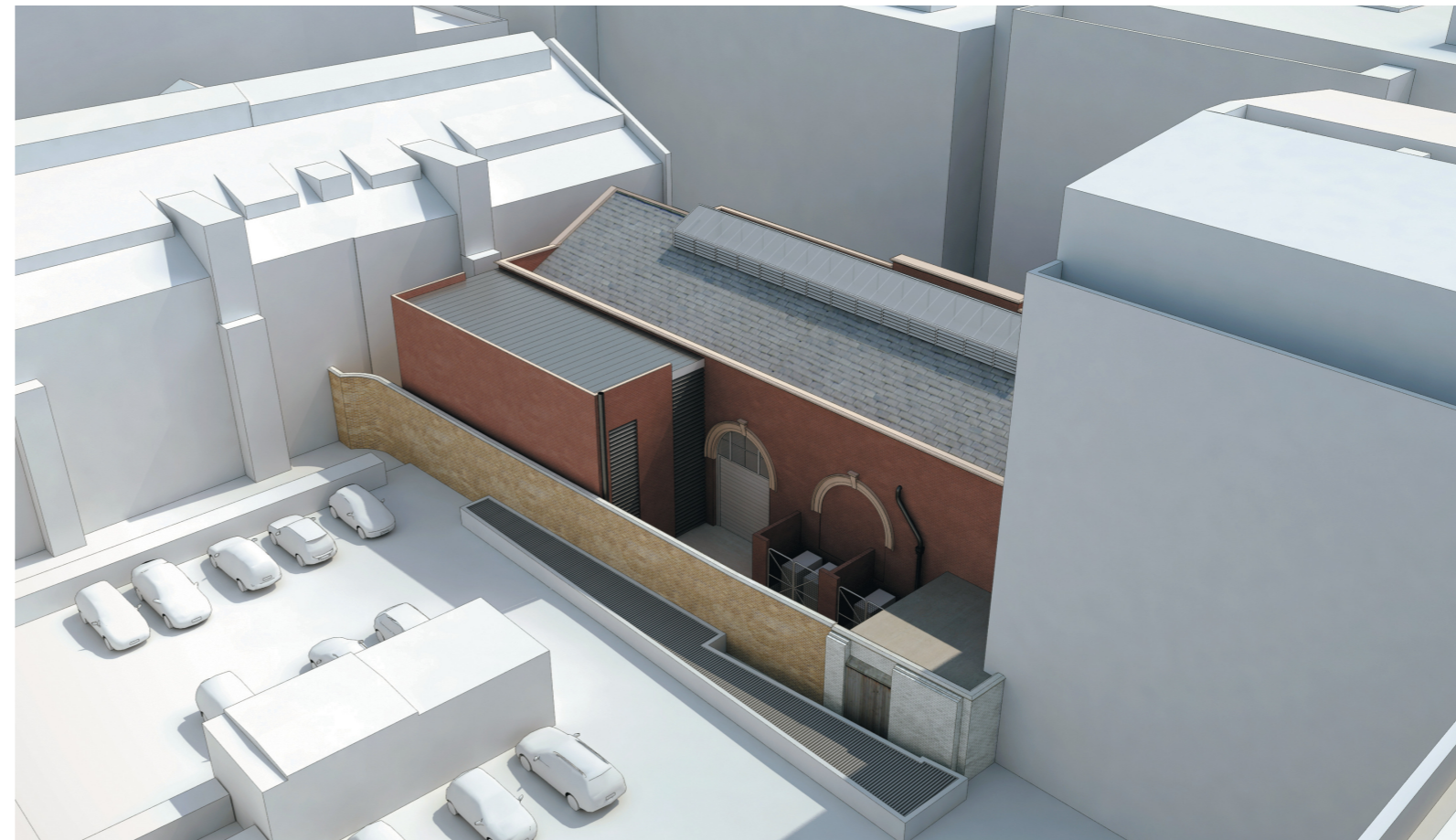


Figure 21.31: Aerial view of proposal



Figure 21.32: Photomontage from Vanilla and Sesame courtyards

Landscaping and appearance

21.4.21 The proposed palette for the new switchgear and facilities building comprises durable, low maintenance and high quality materials. We propose to use traditional materials in a modern way. The layout sought to communicate that, despite its domestic scale, the new building would be functional rather than residential. We are investigating modular off-site construction methods to limit the duration and extent of the proposed construction works.

21.4.22 In order to ensure that the new building would not compete with the existing pumping station building a “recess” of the northern and southern facades is proposed at the junction with the existing building to create a sense of separation. The new building would feature metal cladding, glass and louvers and the roof line would be lowered to emphasise the break with existing building. The main doors and windows would be positioned within the recesses.

21.4.23 We determined that brick would be an appropriate material for the remainder of the façades to complement the existing pumping station building. We conducted studies on the type of brick and agreed with the London Borough of Southwark that a red brick would be most appropriate.

21.4.24 We propose to incorporate a metal standing seam roof on the new switchgear and facilities building. This is a high quality, low maintenance and durable material that would oxidise to tie in with the dark colouring of the existing adjacent slate roof.



Figure 21.34: Robust materials - louvres



Figure 21.35: Robust materials - red brick



Figure 21.33: Existing front entrance and side door

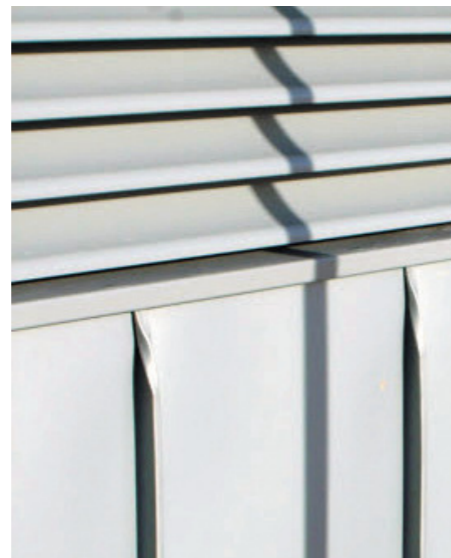


Figure 21.36: Robust materials - metal standing seam roof

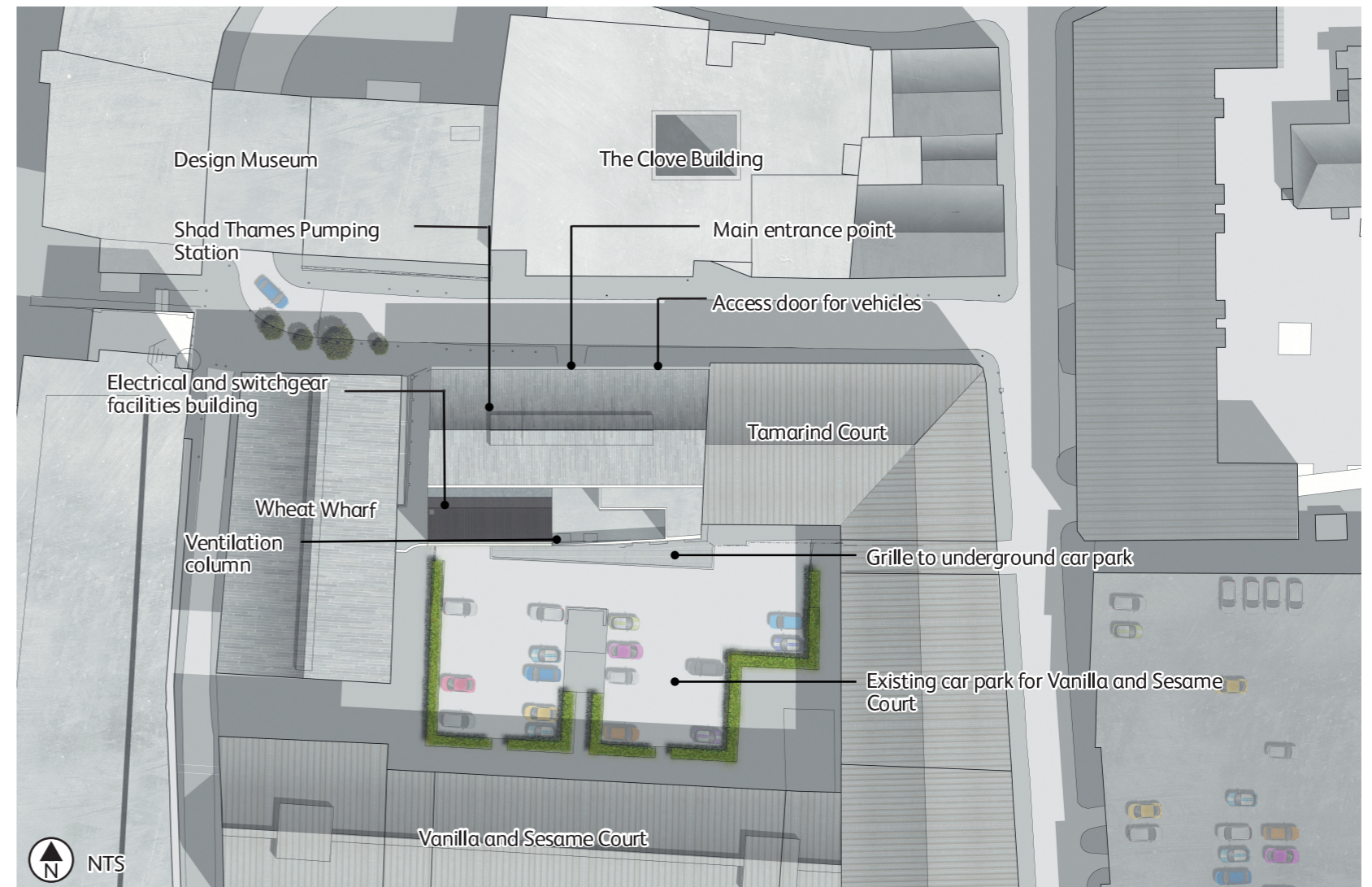


Figure 21.37: Proposed landscape plan

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21.5 Access and movement

21.5.1 The pedestrian footways along Maguire Street would be reinstated as existing and comply with relevant standards.

21.5.2 The site would remain inaccessible to the public and subject to Thames Water's health and safety requirements in relation to access and movement.

Thames Water access requirements

21.5.3 Vehicle access to the pumping station building would be via the existing and new accesses on Maguire Street. Pedestrian access would be via the existing gated alleyway between Shad Thames Pumping Station and Wheat Wharf and through the new facilities and switchgear building.

21.5.4 Vehicular access to the new drain down pumping station infrastructure would be via the access and doors on Maguire Street.

21.5.5 Access to the below-ground chambers in Maguire Street and Gainsford Street would be via access covers finished at street level. Traffic management measures and temporary road closure may be necessary during inspections.

21.5.6 Once the project is operational, it is anticipated that Thames Water personnel would need to access the pumping station building 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.

21.5.7 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.

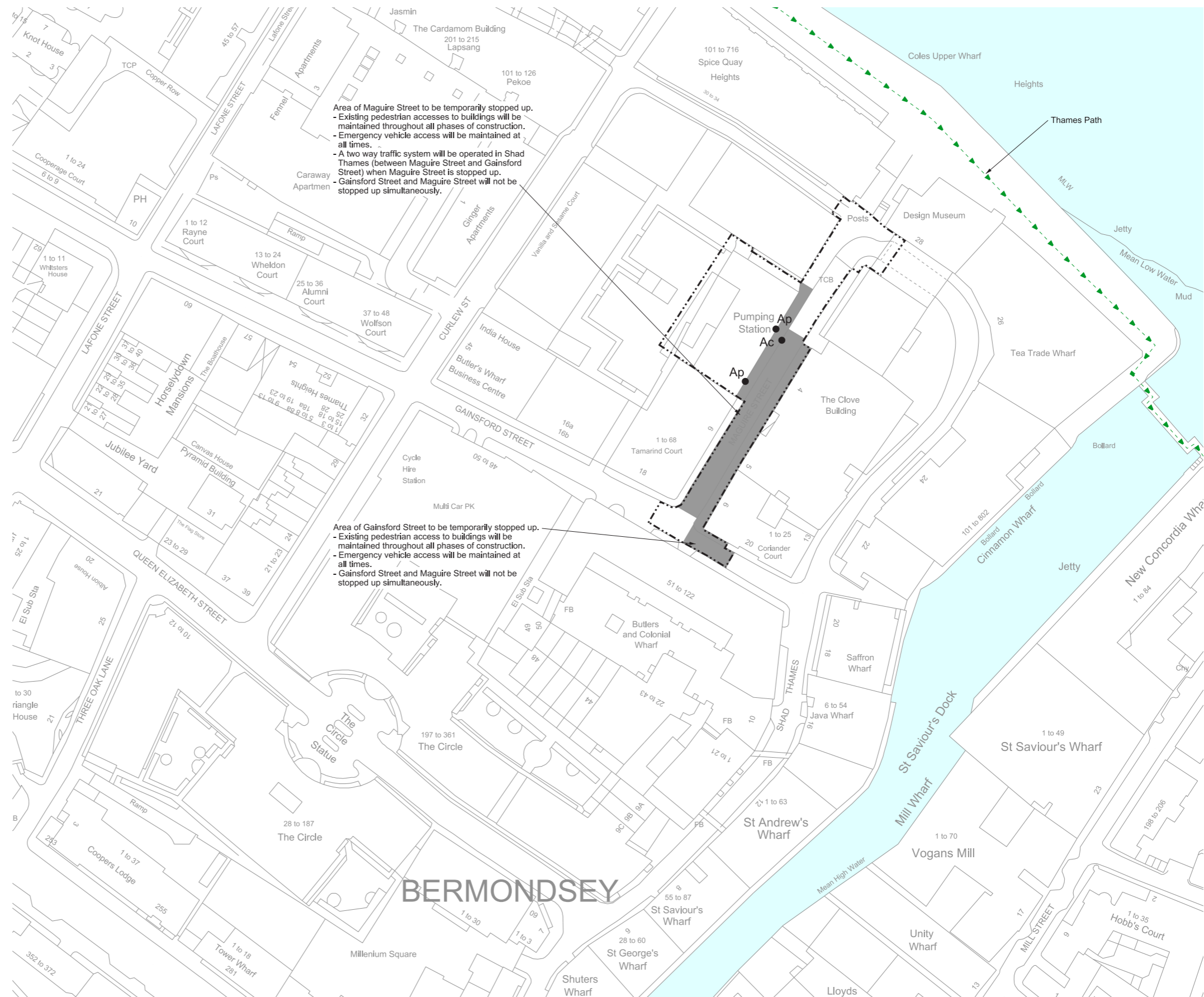


Figure 21.38: Access plan - refer to the Access plan in the *Book of Plans*

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