

Thames Tideway Tunnel  
Thames Water Utilities Limited



# Application for Development Consent

Application Reference Number: WWO10001

## Design and Access Statement

Doc Ref: **7.04**

### Part 1

#### Putney Embankment Foreshore

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

Hard copy available in  
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January 2013

Thames  
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Creating a cleaner, healthier River Thames

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# Section 9

# Putney Embankment Foreshore

## 9.1 Introduction

9.1.1 A worksite is required to connect the Putney Bridge CSO to the main tunnel. The proposed development site is known as Putney Embankment Foreshore, which is located in the London Borough of Wandsworth.

9.1.2 We have agreed with the London Borough of Wandsworth 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 landscape design is indicative, except for the layout of the above-ground structures, which is illustrative.



Figure 9.1: Aerial photograph of the existing Putney Embankment Foreshore site with LLAU indicated

9.2 Existing site context

9.2.1 The site comprises an area of the foreshore of the River Thames and is divided into two sections. The main site is known as the 'Putney Embankment Foreshore CSO' site, which extends from St Mary's Church to the east up to, and including the historic (not listed) Putney Pier to the west. It also includes the area beneath the Grade II listed Putney Bridge, Waterman's Green and the historic public drawdock, known as the Putney public slipway, in the foreshore immediately to the west of the bridge. The secondary site is known as the 'Putney Embankment Temporary Slipway' site, which is situated in the foreshore between Thames Place and Glendarvon Street.

9.2.2 The River Thames is designated as the River Thames and Tidal Tributaries Site of Importance for Nature Conservation and the site itself falls within the Putney Embankment Conservation Area. The site also falls within the Wandsworth Thames Policy Area in the London Borough of Wandsworth's Core Strategy, which supports and protects Putney's special character as an area for river-based recreation and river sports.

9.2.3 The Putney Bridge listing includes a wing wall facing Waterman's Green on the raised edge of Lower Richmond Road. Decorative listed iron bollards are located adjacent to the top of the public slipway.

9.2.4 The site is bounded by the River Thames to the north, east and west. An area of open space known as Waterman's Green, Lower Richmond Road and the Embankment carriageway form the southern boundary of the Putney Embankment CSO site. The Embankment carriageway also forms the southern boundary of the Putney Embankment Temporary Slipway site.

9.2.5 On the northern bank of the River Thames, opposite the site, lie the Grade II\* listed Parish Church of All Saints, the Grade I listed Fulham Palace and the Grade II\* registered Bishop's Park.

9.2.6 There are a number of heritage assets and listed buildings in the vicinity of the site, which contribute to the character and setting of the area. St Mary's Church to the east of the site, also known as the Church of St Mary the Virgin, is Grade II\* listed. Beyond the church lie residential properties and a cinema.

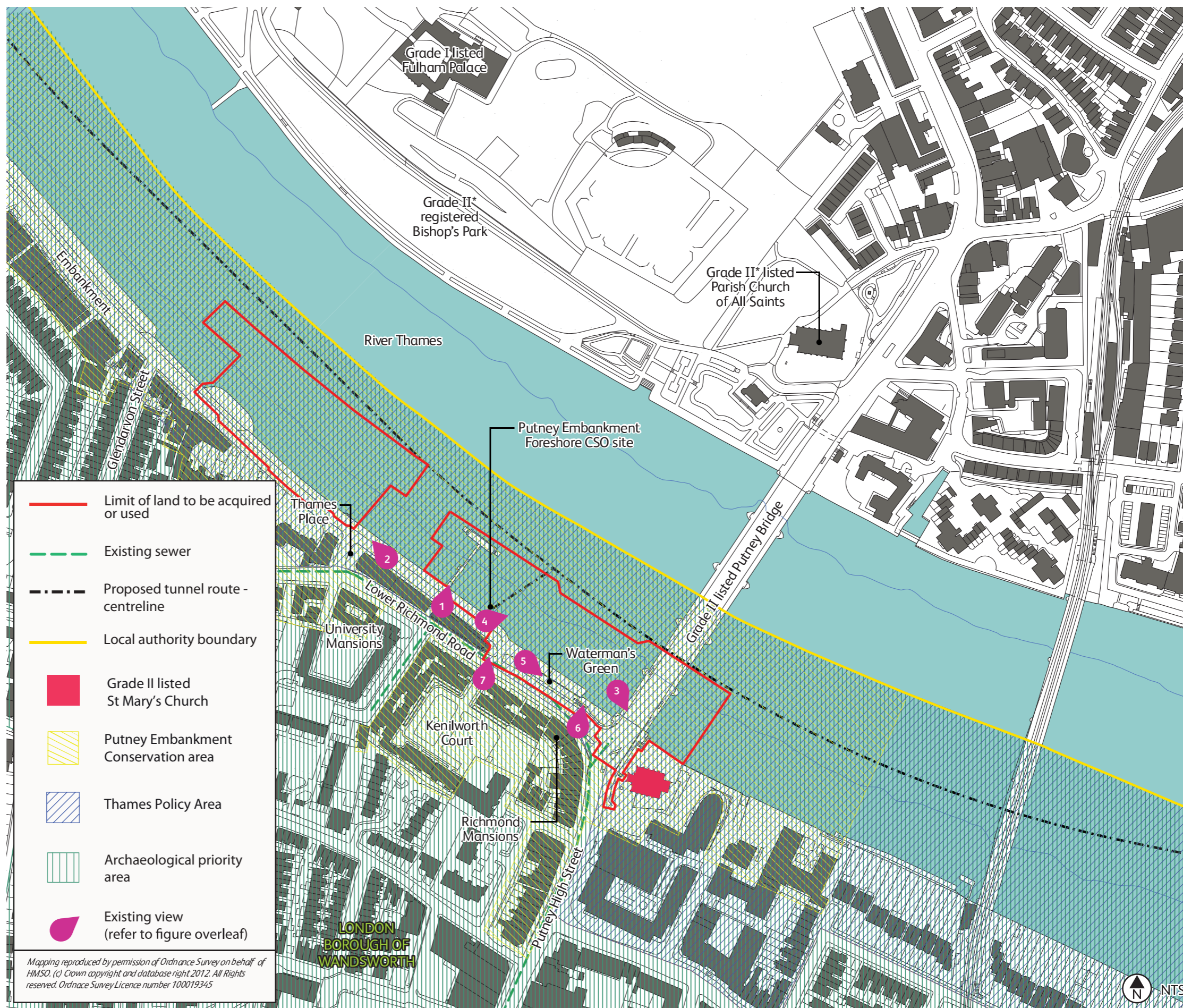


Figure 9.2: Existing site plan



Figure 9.3: Entrance to Putney Pier during a Spring tide



Figure 9.4: Flooding on the Embankment during a Spring tide



Figure 9.5: Putney Bridge CSO



Figure 9.6: Putney Bridge from Lower Richmond Road looking east



Figure 9.7: Waterman's Green



Figure 9.8: Gate to disused WCs and Watermans Green on Lower Richmond Road

9.2.7 The area to the south comprises residential, commercial and retail uses, including Putney town centre. The closest residential properties lie to the south of Lower Richmond Road, including Richmond Mansions, the six-storey blocks of flats of Kenilworth Court and University Mansions. Two residential house boats are moored at Putney Pier. To the southwest of the site is the modern, two-storey Thai Square restaurant and the six-storey Star and Garter public house, which comprises a restaurant, function rooms and staff residences.

9.2.8 The area to the west comprises residential properties, a commercial boat business and rowing clubs.

**Foreshore area**

9.2.9 The area of foreshore exposed at low tide at Putney Embankment Foreshore is easily accessible from the public slipway. The public slipway features brick walls with vertical timber fenders and is paved in granite setts. It has no handrail. The retaining wall around Waterman's Green is mainly brick topped with metal railings; however, it changes to granite close to Putney Bridge.

9.2.10 The river walls to the west of the public slipway curve outwards to sit further into the River Thames. The top of the walls are level with the road above, which runs downhill to the west. Therefore the walls do not form part of the River Thames flood defences. They are constructed of mixed quality concrete and feature a metal handrail

painted blue and white. The handrail breaks around the landward entrance to Putney Pier. This comprises a fixed ramp from the land to a concrete and iron bankseat approximately 14m into the river and an access brow to a floating pontoon.

9.2.11 The Putney Bridge CSO discharges through two low level, cage-like structures set into the abutment of Putney Bridge. The bridge is finished in pale grey granite with expressed joints. The wing walls that extend onto Waterman's Green are constructed in the same stone as the bridge. The stone work at the springing point of the bridge arch above the CSO is highly moulded architrave. An area of stone scour protection sits in the river bed in front of the CSO. Navigation through the bridge arch is restricted due to inadequate water depth and overhead clearance.



Figure 9.9: Parking and listed bollards along the embankment

Existing site access and movement

9.2.12 Vehicle access and egress to and from the site is via Lower Richmond Road and Embankment.

Highways

9.2.13 Lower Richmond Road (B306) has two eastbound lanes and one westbound lane and is subject to a 30mph speed limit. There are no weight restrictions on this road.

9.2.14 Embankment is a narrow road with a 30mph speed limit. The section between the junctions of Lower Richmond Road and Thames Place is one-way (westbound).

9.2.15 The junction between Lower Richmond Road and Embankment is a priority junction. Traffic is permitted to enter Embankment from Lower Richmond Road but is not permitted to exit Embankment onto Lower Richmond Road.

9.2.16 Thames Place is a two-way single carriageway that links Embankment to Lower Richmond Road.

Car parking

9.2.17 On-street parking is provided on both sides of Embankment, which is subject to Controlled Parking Zones.

9.2.18 Parking is also permitted on the eastern end of Embankment on a shared use basis (permit holders and pay and display), which is subject to a maximum stay of four hours within restricted time periods.

9.2.19 On-street parking, also subject to a Controlled Parking Zone, is available on the northern side of Lower Richmond Road to the west of the Embankment/Lower Richmond Road junction.

9.2.20 There is a public multi-storey car park approximately 500m to the south of Putney Bridge at the Exchange Shopping Centre.

9.2.21 There are no dedicated disabled or motorcycle parking bays in the immediate vicinity of the site.

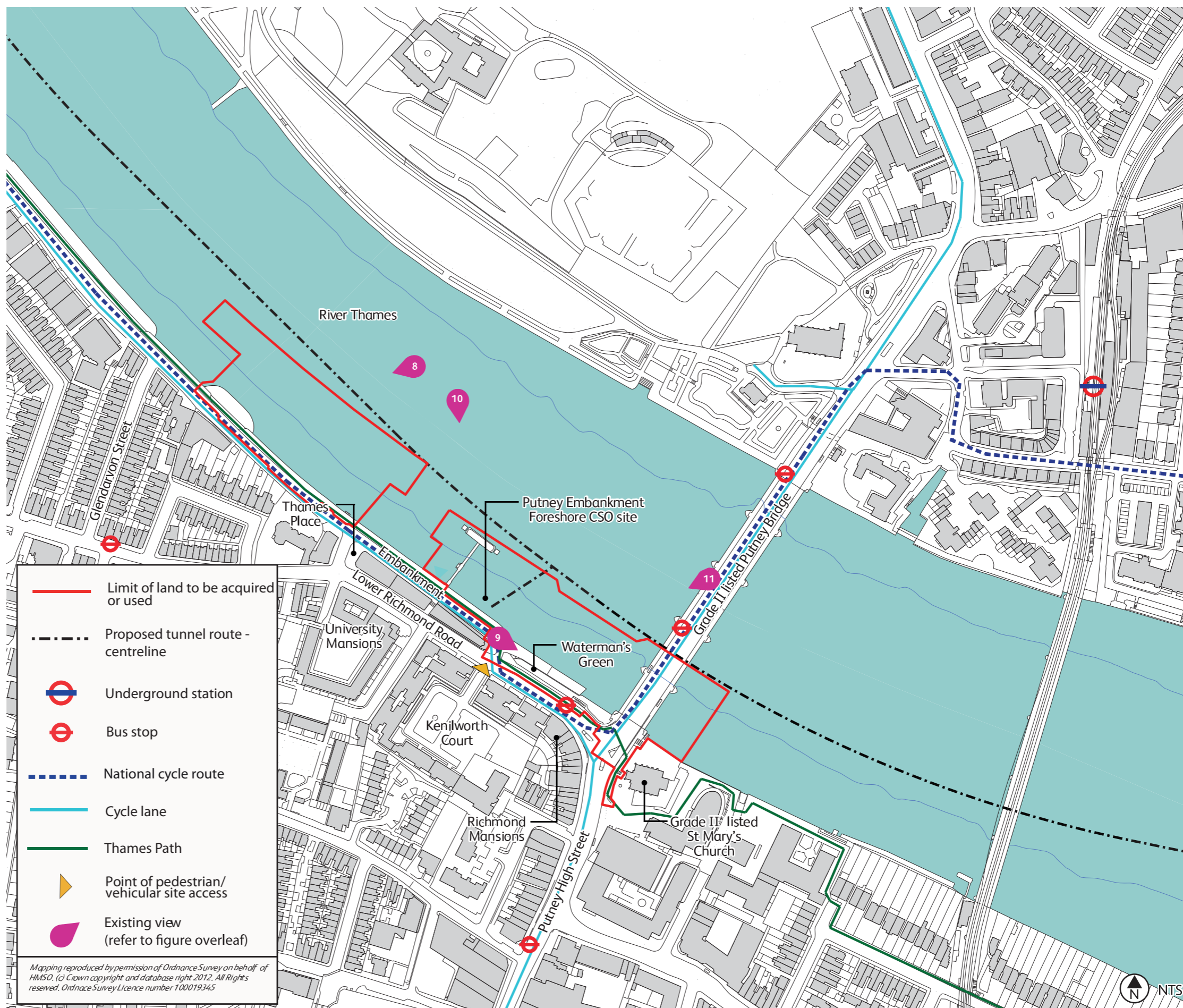


Figure 9.10: Existing site analysis



Figure 9.11: Embankment and boat clubs from the Thames

**Public transport**

9.2.22 A total of 13 daytime bus routes and two night bus routes operate within 640m of the site. These services operate from the following stops:

- a. Putney/St Mary’s Church bus stop on Putney Bridge Approach
- b. Embankment bus stop on Lower Richmond Road.

9.2.23 Putney Bridge Underground Station is located approximately 650m to the northeast of the site and serves the District Line.

9.2.24 The closest National Rail station is Putney Station, which is situated approximately 700m to the southeast. It provides services between London Waterloo and Staines.

9.2.25 A Transport for London River Bus operates from Putney Pier to Blackfriars during peak hours on weekdays.

**Cycle routes**

9.2.26 The main cycle route in the area is National Cycle Network Route 4, which runs across Lower Richmond Road and continues off-carriageway along Embankment. This route forms part of the Thames Path, which passes the site. The route continues west along the riverside footpath towards Barnes and east via Putney Bridge and Fulham High Street.

**Pedestrian routes**

9.2.27 Footways are in place on both sides of Embankment to the southeast of Thames Place. An informal pedestrian crossing is located on Embankment to the west of the public slipway, which features dropped kerbs and tactile paving.

9.2.28 Footways are also in place on both sides of Lower Richmond Road. There are pedestrian crossing facilities at the signalised junction of Lower Richmond Road and Putney High Street.

9.2.29 The Thames Path runs along Embankment and continues onto a section of Lower Richmond Road towards Putney Bridge.

**River movement**

9.2.30 A private operator offers a commuter passenger service to Blackfriars from Putney Pier during the Monday to Friday morning and evening peak hours only. The pier is privately owned and operated. Use of the pier is strictly on request only; however, bookings for private vessels as well as for charter and commercial craft are available. Thames Clippers will shortly launch a morning and evening peak service to Central London.

9.2.31 Putney public slipway is used by a variety of river users, including recreational and commercial operators, to launch and recover vessels. The facility is used frequently by Chas Newens Marine (a local boat repairer),

Hurlingham Yacht Club and other independent sailing and leisure users. Thames Executive Charters currently uses the public slipway on a weekly basis and each Wednesday, stores and provisions are loaded onto a barge from the public slipway.

9.2.32 Sailing activities take place on most days around Putney, and race programmes are scheduled most weekends during the summer and winter, and on some evenings in summer, depending on the tide and weather conditions.

9.2.33 There are a large number of rowing clubs on the River Thames, and the most popular area for rowing is upstream of Putney. Due to the large number of rowers and the interaction with other recreational users, the Port of London Authority has provided special rules to make rowing safer in this area. Fourteen rowing clubs operate within the area and other clubs further along the river also operate around Putney.



Figure 9.12: Boat being launched on the draw dock



Figure 9.13: Putney Pier



Figure 9.14: Crowds on the Embankment for the University Boat Race



## Historical context

9.2.34 The site is situated near an ancient ford of the River Thames, which gave rise to a village on the dry ground to the south of the site and along the southbound road, which is now Putney High Street. The church of St Mary the Virgin was built in the 13th century and formed a focal point for the village. The site itself was used as a place to land and moor boats.

9.2.35 A timber bridge was built across the River Thames circa 1730, which led to further expansion of Putney Village, although the land to the south and west of the site remained farmland and gardens.

9.2.36 Lower Richmond Road and Embankment became increasingly built-up from the mid-19th century onwards, when the advent of the railway led to rapid expansion of the town.

9.2.37 The 1880s saw considerable remodelling of the riverside in this area. The listed Putney Bridge designed by Sir Joseph Bazalgette was constructed to the west of the earlier timber structure where there had once been an aqueduct (from 1854). The bridge also incorporated part of Sir Bazalgette's sewerage system, which was implemented

around the same period. Outfalls for excess sewer flows were constructed within the southern abutment of the bridge. Waterman's Green was laid out to the west of Putney Bridge as a narrow strip of green space between Lower Richmond Road and the cobbled public slipway. The slipway was also built alongside the Embankment riverside road and promenade to provide access to the river.

9.2.38 The majority of the present built form of Embankment and Lower Richmond Road arose in the 1890s and 1900s. This includes the four-storey shops that face Putney Bridge and Kenilworth Court, which are faced with striped red brick and stone. Further to the west is an Edwardian hotel, a Victorian pub, several 19th century houses and a series of boathouses that front a concrete slipway along the river.

9.2.39 The concrete and iron riverboat pier probably dates to the early 20th century. In 1989, a mid-20th century petrol station was replaced by the triangular modern building that now houses the Thai Square restaurant. The riverside promenade now features modern paving and benches and is fronted by a plain post-war balustrade.



Figure 9.15: Historic map showing existing Putney Embankment Foreshore site (1896-1898)



Figure 9.16: Photo of former Putney aqueduct circa 1885 © London Borough of Wandsworth



Figure 9.17: Photo of Putney Bridge circa 1900 © London Borough of Wandsworth

## Site analysis: Opportunities and constraints

### The site-specific design opportunities included:

- Create a new area of public realm in the foreshore.
- Enhance the relationship between the site and its historic surroundings.
- Celebrate important local river events.
- Maintain and enhance existing moorings.

### The site-specific design constraints included:

- The Grade II listed Putney Bridge is in close proximity.
- The visual impact of works beneath the shore arch of Putney Bridge must be kept to a minimum.
- The impact on views and the setting of the conservation area must be kept to a minimum.
- The location and alignment of the public drawdock/slipway must be protected.
- The number of permanent structures on Waterman's Green must be kept to a minimum.
- The site is in close proximity to Putney Pier, and commercial and residential premises along Embankment.

9.2.42 Environment Agency policy seeks to minimise encroachment into the river. The project structures must minimise any impact on river flows and reduce the potential for scour. The project structures must be protected from vessel impacts and be finished above flood level.

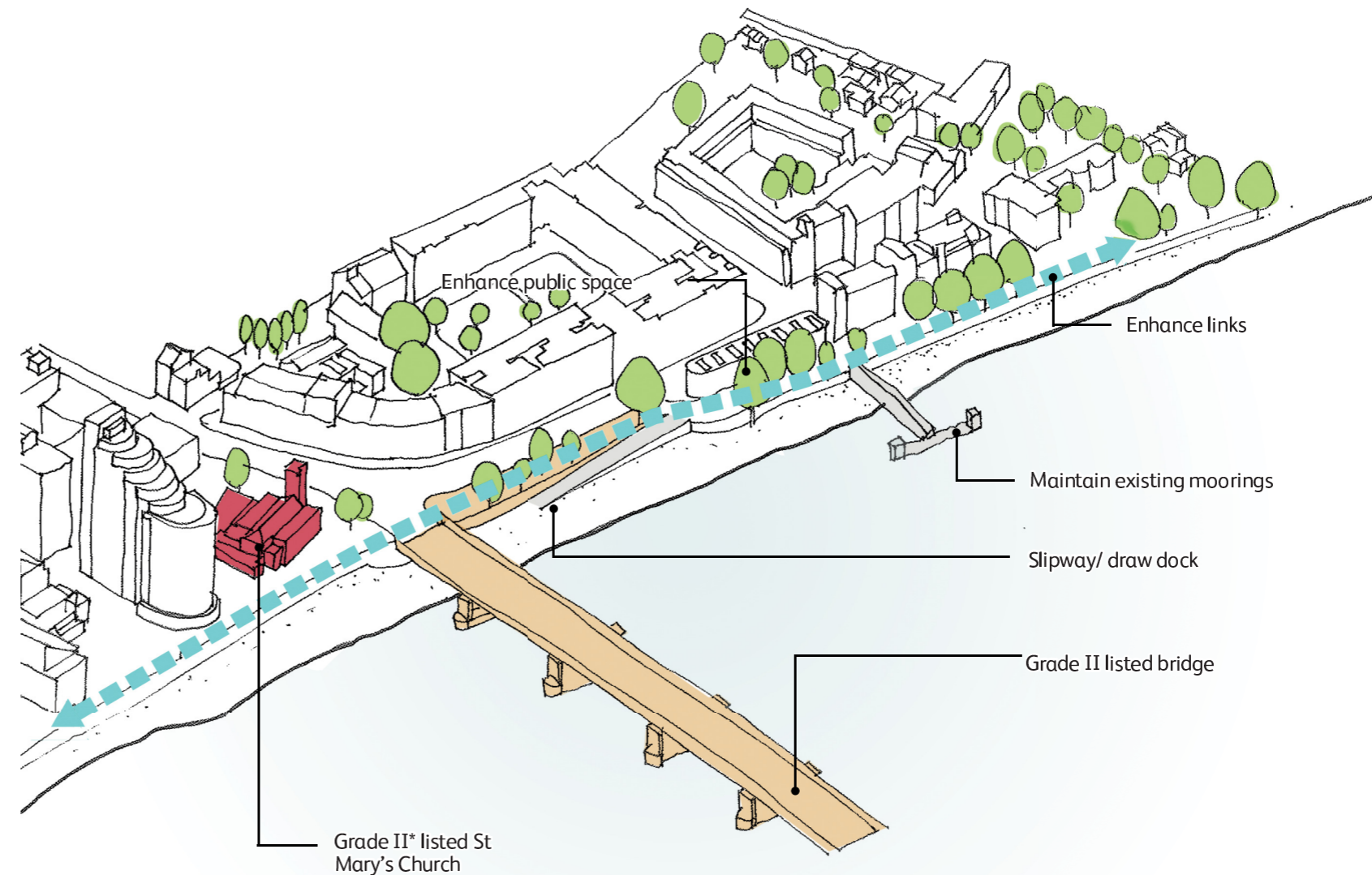


Figure 9.18: Existing site opportunities and constraints sketch

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### 9.3 Design evolution and alternatives

9.3.1 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 Putney Embankment Foreshore was to successfully integrate the CSO foreshore structure and functional components into the historic riparian surroundings.

9.3.2 The design of our proposals at the Putney Embankment Foreshore site was also significantly influenced by an extensive process of stakeholder engagement and design review. In order to ensure design quality, we undertook three rounds of design review hosted by the Design Council CABE. We also held various pre-application meetings with the London Borough of Wandsworth and other strategic stakeholders. More information on our public consultation process is provided in the *Consultation Report*, which accompanies the application.

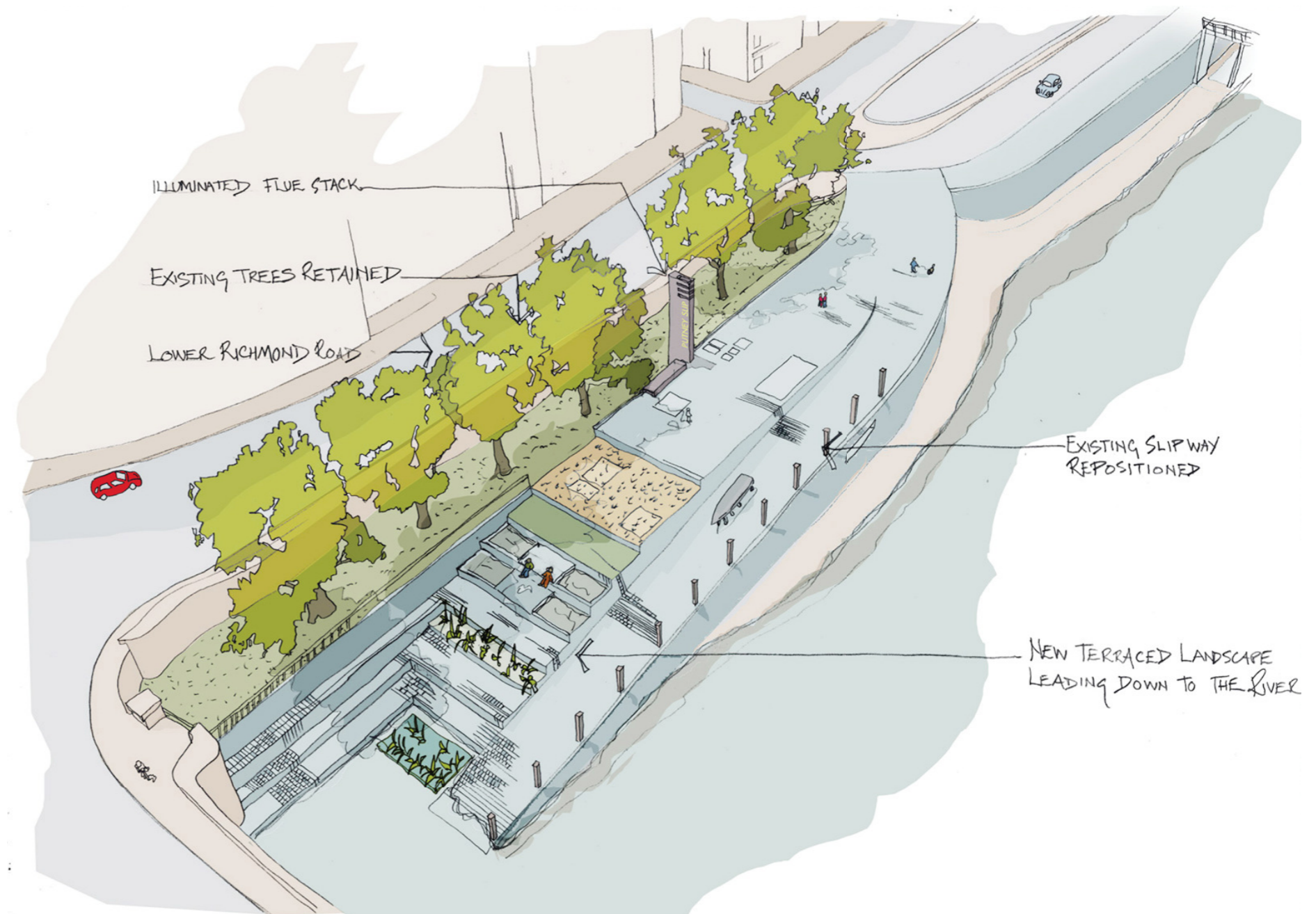


Figure 9.19: Design development diagram

October 2010

## Phase one consultation

9.3.3 At phase one consultation, our preferred site was known as Putney Bridge Foreshore. The proposed permanent works comprised a new terraced foreshore structure over the CSO drop shaft and below-ground works located adjacent to the public slipway; an extended section of river wall; a realigned replacement public slipway; a ventilation column on the foreshore structure; and a kiosk positioned on Waterman's Green.

9.3.4 Feedback from stakeholders in relation to the permanent design included concerns regarding:

- the potential impact on views and existing heritage
- the proximity to the listed Putney Bridge and the effect on its setting
- the potential impact on the public slipway
- the potential impact on the natural environment and encroachment into the River Thames.

9.3.5 Having considered the consultation feedback and various engineering requirements, we still considered Putney Bridge Foreshore to be the most appropriate site to intercept the Putney Bridge CSO. However, we recognised the need to address concerns regarding the proximity of the permanent works to historic features. We also noted the preference to retain Putney public slipway in its current form and alignment.

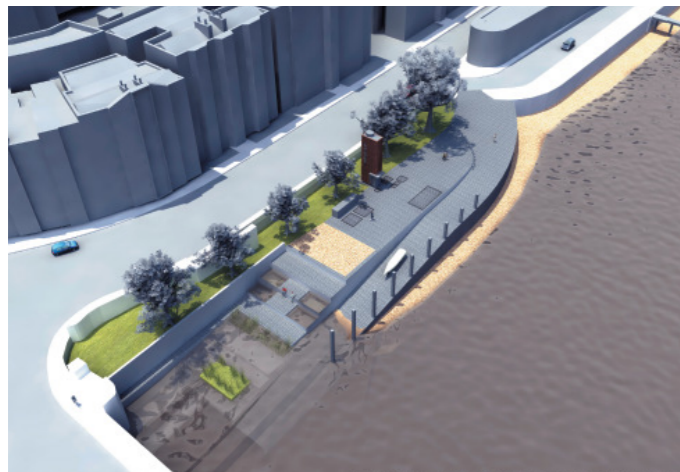


Figure 9.20: Proposed view from phase one consultation

## Design development

9.3.6 After phase one consultation, we explored the following design considerations:

- removing the proposed terracing on the foreshore structure to minimise encroachment into the river.
- reducing the effects on the public slipway and providing a temporary slipway during construction
- minimising the impact of construction and the permanent works on Waterman's Green
- re-designing the interception chamber beneath the arch of Putney Bridge.

April 2011

## CABE sketch review

9.3.7 We held a sketch review based on our initial assessment and sketched ideas for the site with the Design Council CABE in April 2011. The concept sketches set out the use of the site, the layout of the below-ground infrastructure, vehicular access/egress, and a 3D visual design concept. We presented indications of materials and lighting, as well as study images of sculptural ventilation columns.

9.3.8 The Design Council CABE panel welcomed the decision to site the new permanent foreshore structure upstream of Putney Bridge in order to retain Putney public slipway, which is an important heritage feature in the area.

9.3.9 The panel noted that it is important for the design of the permanent works to reflect the simplicity and quality of the setting with a simple, orthogonal geometry. It recommended considering the design and materials of the area of public realm carefully in order to create an inclusive and accessible environment.

9.3.10 The panel discouraged trying to conceal the ventilation column on the foreshore structure and recommended that its position, height and design should create a feature to signpost and promote the project. It also recommended keeping the design of the interception chamber beneath Putney Bridge simple and the profile as low as possible in order to preserve views of the bridge arch.



Figure 9.21: Proposed view from CABE sketch review

June 2011

## CABE scheme review

9.3.11 In response to the sketch review, we made some revisions to the design, such as squaring off the edges of the foreshore structure to reflect the geometry of Putney Bridge, the public slipway and Embankment. We then held a more detailed scheme review with the Design Council CABE in June 2011.

9.3.12 The panel reiterated a number of its comments from the sketch review and provided the following new feedback:

- The permanent foreshore structure has the potential to extend the public realm for informal use.
- The form of the structure should be further refined to enhance the setting in visual and functional terms.
- The design team should test more formal designs for the southern edge of the structure to take account of views from Putney Bridge, and explore designs for the northern edge to address its relationship with Lower Richmond Road.
- The panel supports the low key design and proposed materials for the interception chamber beneath Putney Bridge.



Figure 9.22: Proposed view from CABE scheme review

February 2012

Phase two consultation

Design development

9.3.13 The key design-related concerns raised at phase two consultation included:

- a. The foreshore structure appears unsympathetic to the alignment and character of the river/embankment.
- b. The foreshore structure has an uncomfortable relationship with Putney public slipway.
- c. The large size of the foreshore structure does not fit with the Victorian frontages of nearby buildings.
- d. The ventilation columns are too high.
- e. The size of the permanent structures should be reduced.
- f. The proposals should use high quality materials and finishes.

9.3.14 The London Borough of Wandsworth also made a number of specific design-related comments as follows:

- a. The proposed foreshore structure would juxtapose a metre high wall with Putney public slipway, which creates a visually intrusive and uncomfortable relationship between the two.

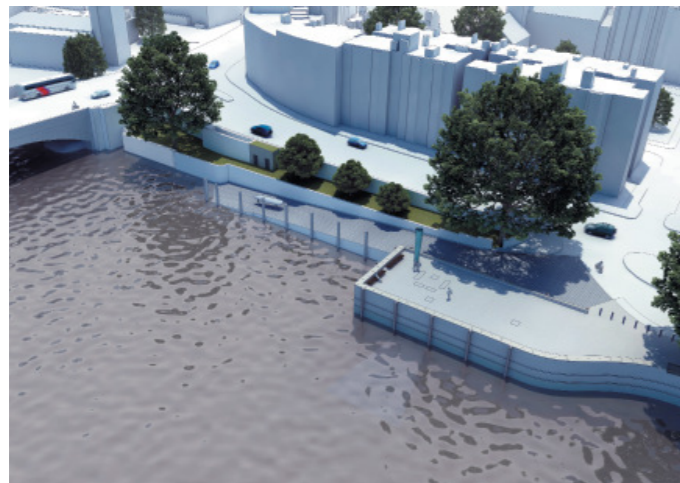


Figure 9.23: Proposed view from phase two consultation

b. The projection of the foreshore structure may inhibit tidal flows and accumulate debris.

c. The space created by the foreshore structure is an opportunity to extend the public riverside walkway and give it a function.

d. The foreshore structure should be a place for the public to enjoy the riverside and an operator should be awarded a license to put out tables and chairs.

e. In addition to celebrating the University Boat Race, the structure could include a vessel mooring to add vitality to the river frontage.

f. The proposed positions of the electrical and control kiosk on Waterman's Green and the ventilation column on the abutment wall of Putney Bridge should be reconsidered. The kiosk could be located inside one of the adjacent vaults.

g. The ventilation kiosk should make a positive contribution to the site and could incorporate interpretative panels that describe the history of the area.

h. The materials for the river wall and the surface of the foreshore structure require detailed consideration and should complement the historic character of the area.



Figure 9.24: Proposed view from phase two consultation

9.3.15 In order to address comments raised at phase two consultation, we studied the possibility of moving the foreshore structure westwards thereby avoiding the "awkward juxtaposition" with the public slipway. The move westward was constrained by ground level. As the foreshore structure needs to be protected by flood defences, and Thames Water requires level access for maintenance vehicles, we determined that it must be accessed from the high point in the road near the entrance to the public slipway.

9.3.16 Given the distance of the proposed new location for the foreshore structure from Waterman's Green, we proposed to position a small additional kiosk on the western end of the structure. The new location of the CSO drop shaft meant that the foreshore structure would sit on the start line of the University Boat Race and the finishing line of many other rowing races on the River Thames. We explored several shapes for the structure and decided to mark the start/finish line with a simple platform structure that references the clear geometry of Putney Bridge and Pier.

9.3.17 We also considered ways in which to improve mooring against the foreshore structure such as setting the handrail back from the front face and including gates and mooring bollards. Finally, we explored the feasibility of moving the Putney Pier landing onto the foreshore structure.

9.3.18 We prepared preliminary proposals for discussion with the London Borough of Wandsworth. In view of the council's response, we then undertook a round of targeted consultation on the revised design and location.

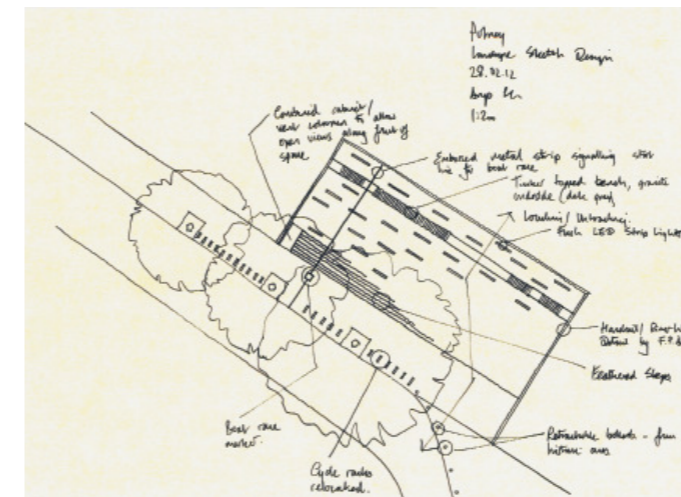


Figure 9.25: Diagram during design development

June 2012

## Targeted consultation

9.3.19 In June 2012 we undertook a targeted consultation in relation to our relocated site, known as Putney Embankment Foreshore, to seek the views of the local community on the proposed changes.

9.3.20 The key design-related comments at targeted consultation included:

- The revised proposal is an improvement in terms of the effect on the historic environment, specifically Putney Bridge. It no longer interferes with Putney public slipway.
- The revised proposal provides better access to the foreshore structure from Embankment.
- The proposals for the electrical and control kiosks are generally an improvement from phase two consultation; however the location and size of the kiosks remain a concern.
- The new area of public realm and the introduction of a metal strip to mark the University Boat Race stone are welcomed.
- The simple, orthogonal geometry of the design of the foreshore structure is welcomed; however, it should be further refined to enhance its setting and the character of the area in both visual and functional terms.



Figure 9.26: Proposed view from targeted consultation

f. Further thought should be given to the design of the steps down to the pavement at the western end of the foreshore structure to ensure accessibility for all users.

g. The permanent design should integrate Putney Pier, Embankment and the foreshore structure into a 'Masterplan' for the area.

h. The design of the foreshore structure should feature curved corners that follow the shape of the river bank in order to protect existing timber fenders and Putney public slipway.

i. The design and location of the ventilation columns should be amended to make them as aesthetically pleasing and inconspicuous as possible.

j. The design team should consider incorporating public art into the design of the permanent structures such as the ventilation column on the foreshore structure.

9.3.21 Following targeted consultation, we continued to liaise with representatives of the London Borough of Wandsworth and other stakeholders to develop the design and design principles in order to accommodate their aspirations for the site.

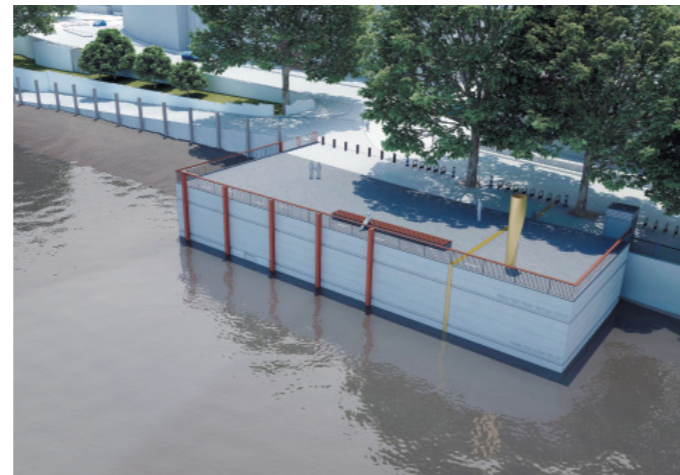


Figure 9.27: Rendering from targeted consultation

## Design changes post Section 48 publicity

9.3.22 We continued to liaise with local amenity groups, residents and businesses. In response to these conversations we made a number of small but significant amendments to refine the design, including:

- curving the outermost corners of the foreshore structure to reduce scour and facilitate river navigation
- applying timber cladding to the short elevations of the foreshore structure to minimise the effects on both vessels and the structure in the event of a conflict
- redesigning the mooring facilities on the foreshore structure to discourage long-term mooring and the position of moored vessels near the CSO
- omitting one of the alternative zones for the ventilation column on Putney Bridge.



Figure 9.28: Proposed view from Section 48 publicity

### 9.4 Proposed design

9.4.1 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

9.4.2 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, the ventilation columns, and the electrical and control kiosks.

9.4.3 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.

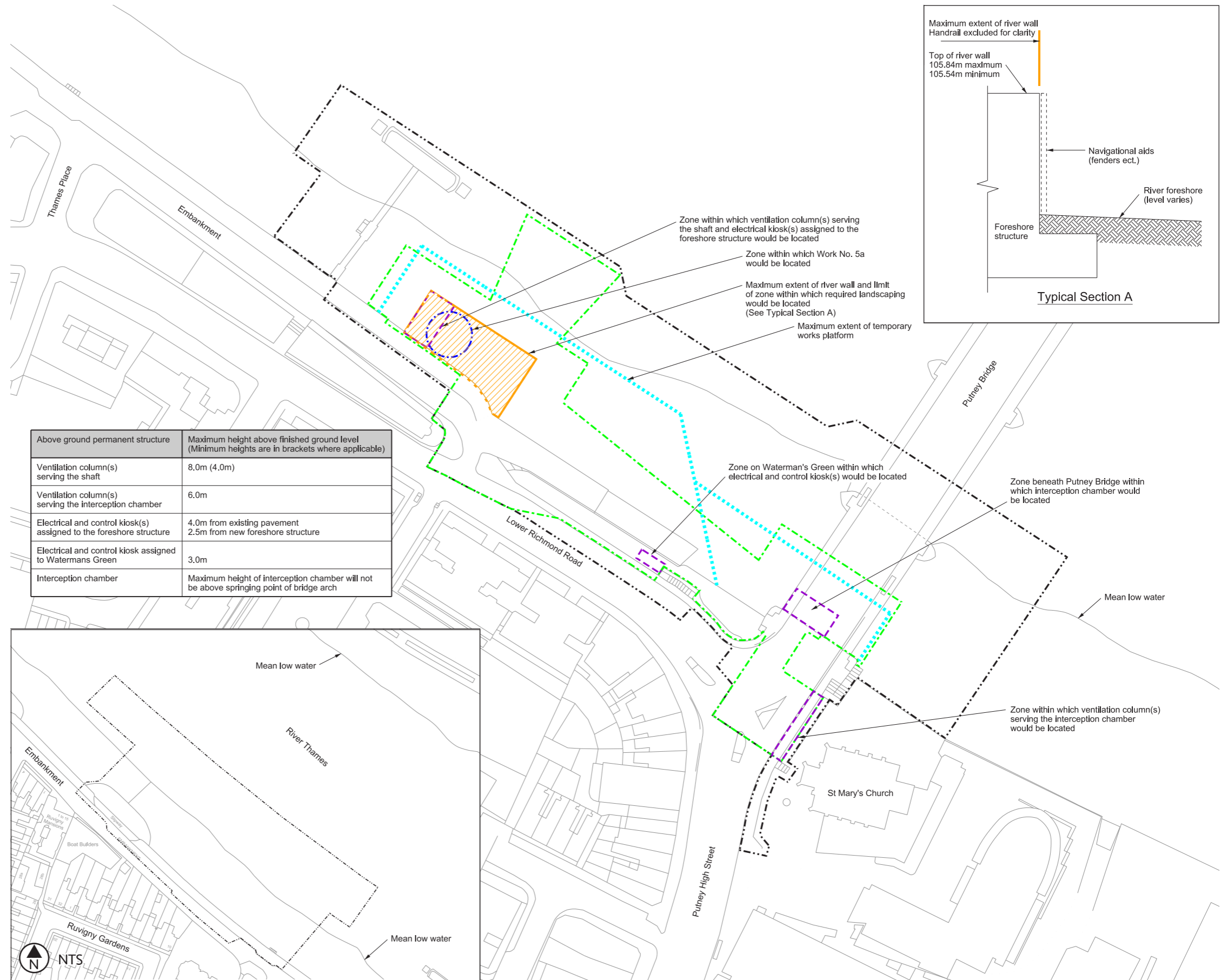


Figure 9.29: Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*



### Design objectives

9.4.4 The proposed foreshore structure would create an area of public realm. The main driver behind the development of the indicative designs was to explore ways in which the structure could fit in with and contribute positively to its riparian environment. In addition, we sought to respect the need to maintain views of important heritage assets and to conserve and, where appropriate, enhance the character and setting of these assets and the surrounding historic environment, in support of *Core Strategy* Policy IS3 and the London Borough of Wandsworth's *Development Management Policies Document* Policy DMS1, which promote good quality design and townscape. Our other main objectives included:

a. Shape and position and the foreshore structure to contribute positively to the setting of Putney Bridge, the Embankment, and Putney public slipway. Further, modulate the shape of the CSO interception structure to respect the springing point of the arches of Putney Bridge.

b. Create a visual connection to the University Boat Race stone and celebrate the tradition of river races on this stretch of the River Thames.

c. Create a simple, elegant and clutter-free space that has a fitting stature for the context of the site and the flexibility to be used in a number of ways.

d. Ensure that the design respects the functional character of this stretch of the River Thames by accommodating the navigational and mooring needs of boat users. We also had regard to *Core Strategy* Policy PL9, which supports and protects the facilities and activities that contribute to the embankment area's special river recreational character.

e. Reconcile the level differences between the Embankment and the foreshore structure in a simple, accessible way.

### Use and programme

9.4.5 The new foreshore structure would form a flexible open space that could accommodate different uses. For the majority of the year, we anticipate that it would be used as an incidental viewing and seating space for pedestrians passing along the Embankment – a stopping point on the Thames Path.

9.4.6 It is designed to cater to a range of potential future needs, including temporary art exhibitions, stalls, or additional outdoor seating for local businesses. The space would enable more people to enjoy the riverside.

9.4.7 On race days people spill out from local bars, restaurants and boat clubs onto Putney Embankment to watch the events. The proposed public realm could provide a focal point for the start/end of races and an additional viewing area for this busy and popular stretch of embankment.

9.4.8 The foreshore structure may also be used as a lay-by mooring for vessels.



Figure 9.30: Proposed landscape plan

## Detailed Description

9.4.9 The main elements of the design are the works to Putney Bridge, including the CSO interception structure; the foreshore structure; and the works to Waterman's Green.

### Foreshore Structure

9.4.10 The foreshore structure would form a new area of public realm in the foreshore that would be accessible from Embankment. Temporary/removable street furniture, such as tables and chairs, could be placed on the structure. These items could not be permanently fixed in order to enable Thames Water maintenance access.

9.4.11 The position of the foreshore structure is constrained by the position of proposed and existing below-ground infrastructure. The CSO drop shaft and associated chambers and culverts would be laid out within the structure in accordance with the engineering requirements. The structure would be surrounded by a new section of river wall.

9.4.12 The simple orthogonal shape of the foreshore structure was designed to:

- a. clearly mark the end of Putney Embankment
- b. mark the start/end point of river races with a projecting platform
- c. reference the geometry of other projecting structures such as Putney Bridge and Pier.

9.4.13 The foreshore structure must have a level surface above flood defence level for access and operational reasons. Therefore the surface would sit level with the highest point of Embankment at its eastern end in order to equal the flood defence level and provide vehicular access for operational purposes. Embankment then falls to the west, and there would be a level difference of approximately 1.1m between the surface and the footpath at the western end of the structure.

9.4.14 We introduced long linear steps from the footpath to the structure to mediate the level difference for pedestrians. The handrail around the foreshore structure would stand over 2m higher than the footpath on Embankment at the western end of the structure. The stone clad electrical and control

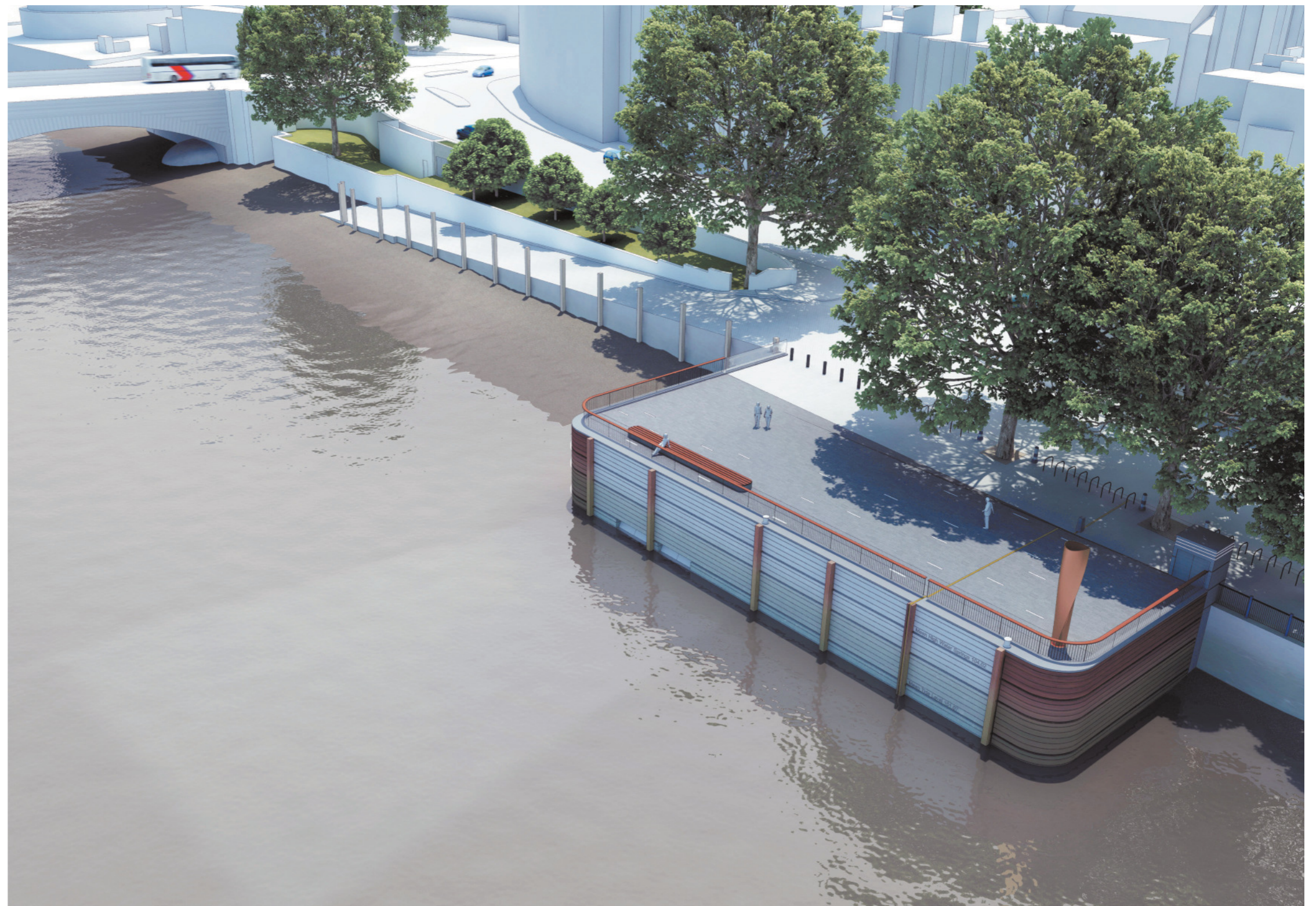


Figure 9.31: Proposed view of foreshore structure

kiosk would sit at this junction to help mediate the level differences and mask the termination of the steps and the proposed and existing handrails. We extended the height of the kiosk to discourage climbing.

9.4.15 The University Boat Race stone sits on Embankment adjacent to the position of the proposed structure. A corresponding stone on the other side of the river is used to line up the start of the boat race 'by eye'. This visual connection would be lost when the foreshore structure is constructed in front of the stone. We therefore propose to include a metal strip in the paving that would run from the original University Boat Race stone across the foreshore structure and vertically down the river wall. The handrail would break around the strip to increase its prominence. The strip could be engraved with the names of winners of the boat race.

9.4.16 In order to maximise the flexibility of the space on the foreshore structure, we minimised the amount of street furniture, which could compromise future uses as a mooring or to host market stalls. Seating would be provided in the form of a simple timber bench parallel to and set back from the handrail.

9.4.17 We propose to reconfigure the existing cycle parking underneath the line of London Plane trees on Embankment to the west of the foreshore structure. The listed bollards on the slipway would need to be moved to facilitate maintenance access. The bollards would be spaced out along the edge of the footpath between the trees and the new bicycle parking.

### Works to Putney Bridge

9.4.18 Our main objective in designing the CSO interception structure was to create an interesting but discreet form that would not detract from the bridge. Much of the interception structure would sit below the level of the foreshore; however a curved cover is required to sit over the existing CSO openings to capture flows. We developed a domed, elliptical shape for the cover to reference the curves of the bridge arches and the bullnose moulding on the springing point of the abutment.

9.4.19 The curved cover would be set below the springing point of the bridge and back from the eastern and western elevations. Some of the existing stone mouldings would need to be carefully cut back at the junction with the new structure to form a neat joint.

9.4.20 The CSO interception structure needs to be sufficiently resilient to withstand the demanding riparian environment. In order to minimise the size of the structure, it would be constructed with concrete, which is a strong, self-supporting material. The concrete aggregate would be colour-matched to complement Putney Bridge and feature a high quality fairfaced finish.

9.4.21 A small ventilation column is required to serve the interception structure. The connection to the existing sewer would be made via the brick vaults that run under Putney Bridge towards Putney High Street. We consulted on two possible locations for the ventilation column in the footway of the eastern or western side of the bridge. Following further design development, we selected the eastern side of the bridge as the western side would require a greater amount of invasive drilling through the listed bridge.

9.4.22 For more information on the impact of the CSO interception structure and the ventilation column on the listed bridge see the *Heritage Statement*.



Figure 9.32: Proposed view of ventilation column in front of Grade II\* listed St Mary's church



Figure 9.33: Proposed panoramic view from Putney Bridge

### Works to Waterman's Green

9.4.23 There is an existing recess in the wing wall of Putney Bridge to the west of the staircase that links Embankment to the disused public conveniences on Waterman's Green. We propose to position the main electrical and control kiosk in this recess to minimise the impact on the green.

9.4.24 During design development we explored the possibility of locating the necessary equipment in the existing vaults beneath Lower Richmond Road. However, this would effectively preclude the use of the selected vault for commercial development sought by the local authority to 'activate' Waterman's Green.

9.4.25 In order to tie the kiosk in with its surroundings, it would be the same height as the wing wall and feature the same stone finish and matching architraves. In order to facilitate movement around Waterman's Green, the front face of the kiosk would be set back by approximately 500mm. An existing Holly tree would need to be removed in order to construct the kiosk, and would be replaced in the vicinity. The required doors and grills in the kiosk would be combined into a single louvered opening. The metal louvres would be painted in a colour that would be agreed at a later stage.

9.4.26 The kiosk would feature a planted brown roof. The brown roof would improve biodiversity, contribute to the attenuation of storm water, and make the structure attractive when viewed from above on Lower Richmond Road.

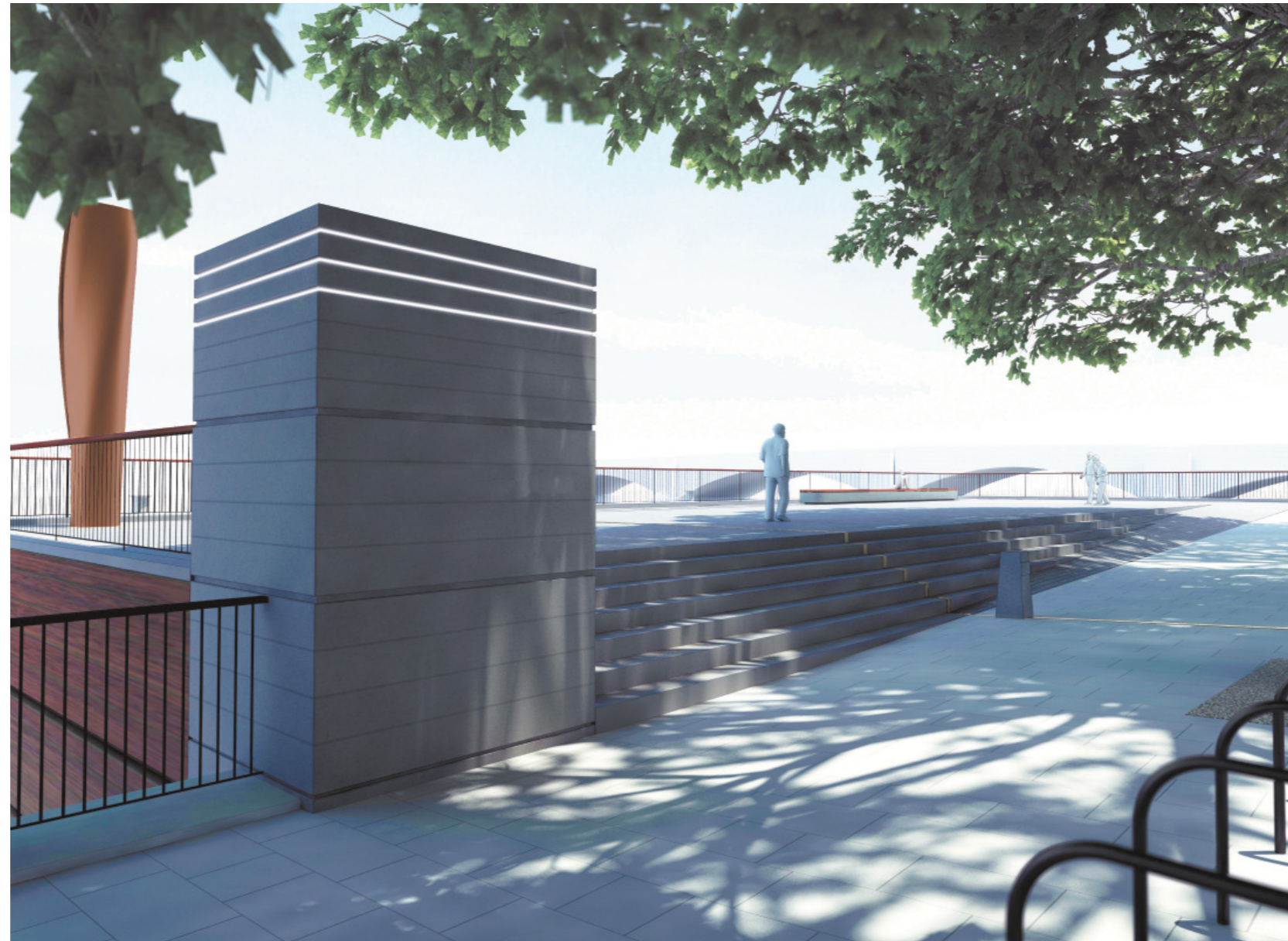


Figure 9.34: Proposed view of foreshore structure from the embankment



Figure 9.35: University Boat Race stone

### Historical interpretation

9.4.27 We intend to develop a full historical interpretation strategy, which would have particular relevance to this site. There is considerable scope to include interpretive material to inform passers-by of its history.

9.4.28 The form and location of the permanent structures were developed to celebrate the history of boating in the area. The signature ventilation column and the electrical and control kiosk on the foreshore structure are designed to be inscribed with site-specific information and the proposed brass strip in the paving could feature information on the various rowing races.

### Integration of the functional components

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

- a CSO drop shaft
- a connection tunnel
- a CSO interception chamber
- a connection culvert
- CSO overflow structures and a protective foreshore apron
- an air treatment chamber
- associated hydraulic structures, culverts, pipes and ducts.

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

- the foreshore structure surrounded by a new section of river wall
- one ventilation column to serve the CSO drop shaft
- one signature ventilation column to serve the CSO interception chamber
- two electrical and control kiosks
- a raised CSO interception chamber.

### CSO and associated structures

9.4.31 The CSO drop shaft would be approximately 6m in internal diameter and would be connected to the main tunnel by a short connection tunnel. The shaft would be enclosed by the foreshore structure to the west of the historic slipway along with the associated chambers and structures.

9.4.32 The raised CSO interception chamber would sit under the southern shore arch of Putney Bridge. The maximum height of the chamber would not be above the springing point of the arch. It would be connected to the CSO drop shaft via a connection culvert beneath the foreshore.

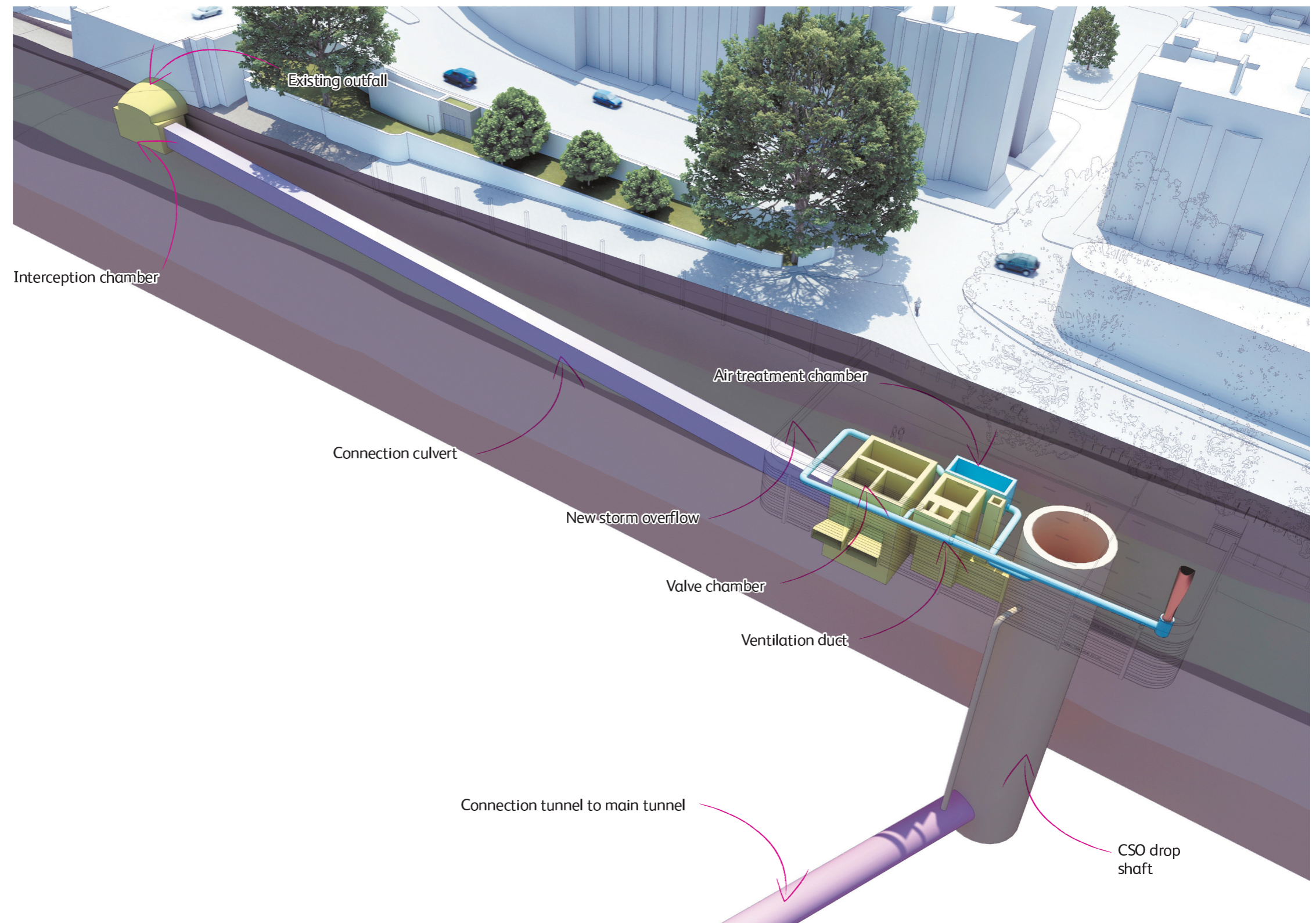


Figure 9.36: Proposed functional components diagram: below ground view

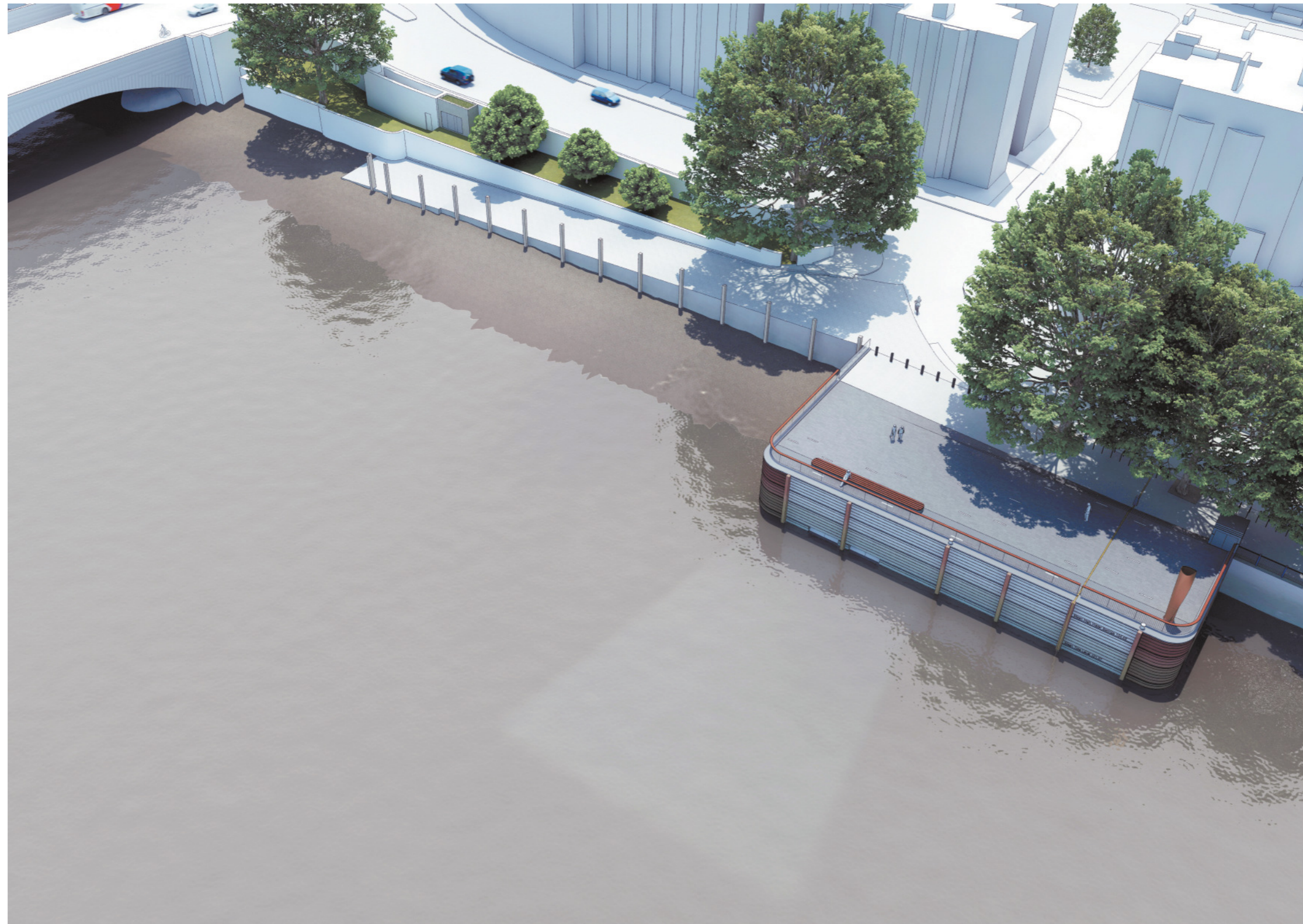


Figure 9.37: Proposed functional components diagram: above ground view

### Ventilation columns

9.4.33 The number and size of the ventilation columns is determined by the air management requirements for the site. At Putney Embankment Foreshore, we propose to include one ventilation column to serve the CSO drop shaft. It would be located on the northwestern corner of the foreshore structure and stand between 4m to 8m high. This column would feature the project's 'signature' design. We also propose to include a column to serve the CSO interception chamber. It would be located adjacent the southeastern corner of Putney Bridge and stand a maximum of 6m high.

### Electrical and control kiosks

9.4.34 We propose to include two electrical and control kiosks at this site. The first would sit on the southwestern corner of the foreshore structure. It would stand approximately 4m above the footpath on Embankment and approximately 2.5m above the surface of the structure. The second kiosk would stand approximately 3m high and would sit on Waterman's Green adjacent to the staircase adjacent to the disused toilets.

### Areas of hardstanding

9.4.35 Areas of hardstanding would be included to facilitate maintenance vehicle access and incorporate ground-level access covers to the below-ground infrastructure. The access covers would be incorporated on the surface of the foreshore structure.

In river structure

Navigational issues

9.4.36 The foreshore structure sits approximately 58m outside of the authorised navigation channel in the River Thames. Therefore we do not expect that the structure would significantly impact on general river navigation for large boat users.

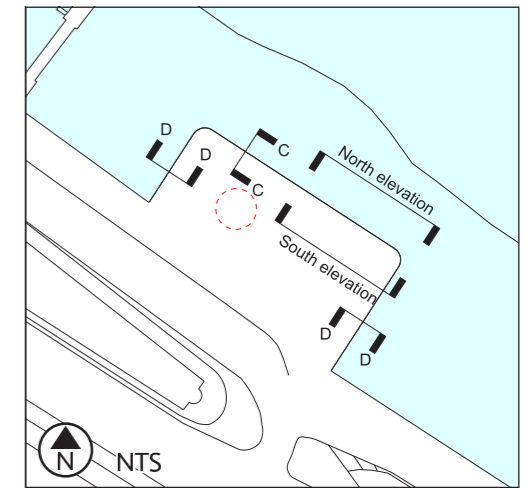
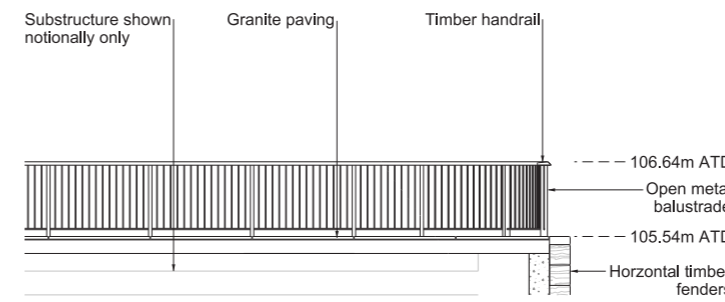
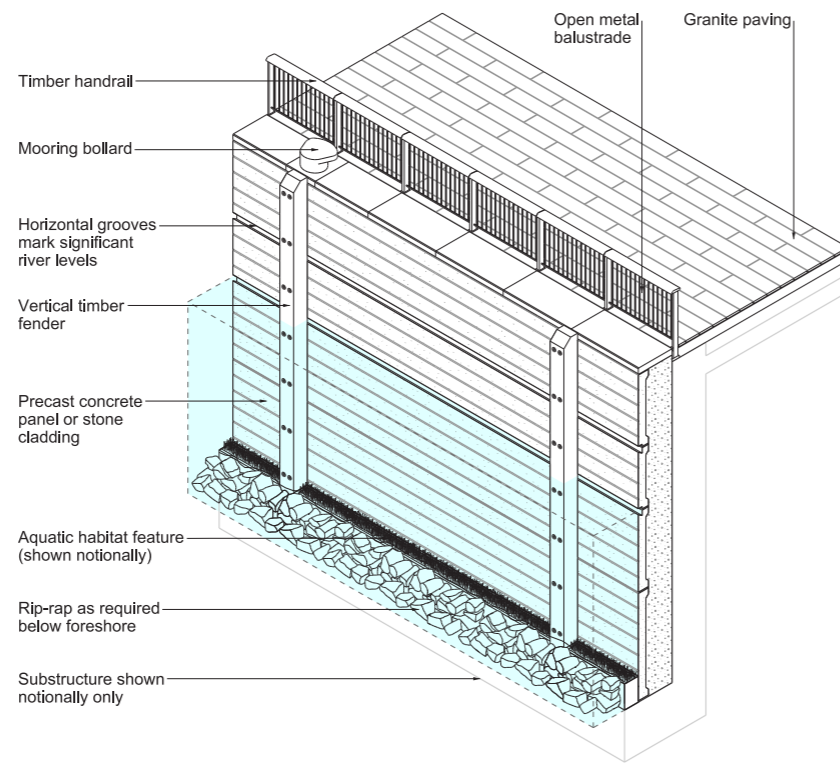
9.4.37 The mean low water line lies approximately 12m from the river wall and at low tide a large area of the foreshore is exposed. As a result the structure would only affect smaller boats at high tide. However, we anticipate that the impact would be minimal as small boat users are already discouraged from passing between the river wall and the bankseat to Putney Pier.

9.4.38 We anticipate that mooring at Putney Pier and the slipway would be largely unaffected by the structure. The corners of the short ends of the foreshore structure would be curved and feature timber cladding to limit damage in the event that boats moored to or sailing away from the slipway collide with the foreshore structure.

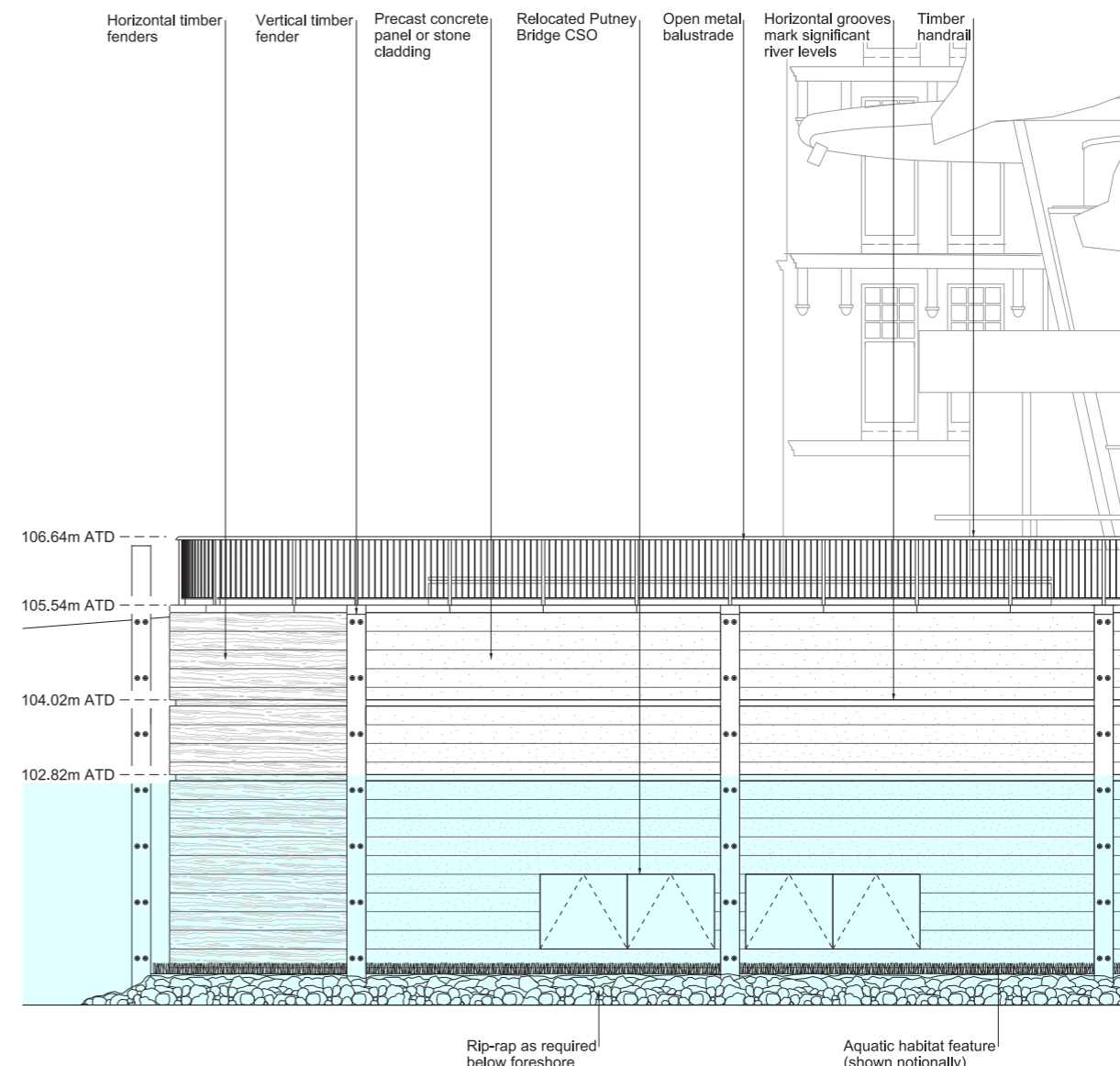
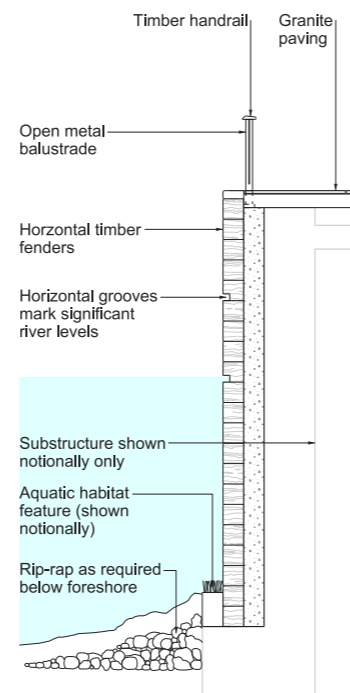
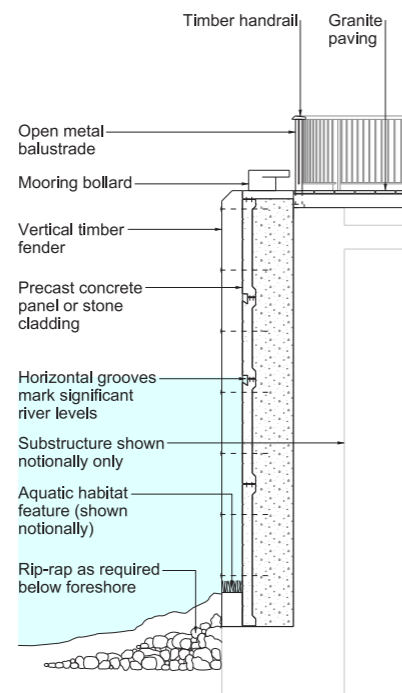
9.4.39 In order to facilitate the use of Putney Embankment by boat users, we propose to include a short-term lay-by mooring on the foreshore structure. Navigational aids would be provided to encourage boats to moor on the upstream end of the structure away from the CSO discharge.

9.4.40 The new foreshore structure may have localised impacts on the pattern of deposition on this stretch of the foreshore. Shingle banks and river debris may accumulate in the inward corners between the structure and the public slipway and the river wall.

9.4.41 The historic public slipway would be reinstated following construction.



Isometric



Section CC

Section DD

North elevation

Figure 9.38: Proposed river wall (not to scale) - refer to Typical river wall design intent sheet in the Book of Plans

### River walls

9.4.42 Given the variety of the river wall finishes on this stretch of the River Thames, we had a number of options for the cladding of the new section of river wall. The end elevations of the new wall would be clad in timber for navigational reasons. The timber would wrap around the curved corners of the foreshore structure where it would terminate in a vertical fender.

9.4.43 On the long elevation of the new wall, we selected a granite block finish to reference the materials of Putney Bridge. Horizontal grooves would be engraved into the stone to mark pertinent tide levels. The stone would be protected from abrasion from moored ships by vertical timber fenders similar to those on the public slipway. The metal strip running over the foreshore structure and down the new wall from the University Boat Race stone would be set into one of the fenders.

9.4.44 A simple lightweight metal guarding with a timber handrail would sit on top of the wall. It would be set back on the long elevation to provide space for users of the lay-by mooring to secure their vessels. The handrail will be suitable for leaning. A small area of glass guarding would be positioned at the junction with the slipway. This would create a visual distinction between the line of the new and existing river walls and maximise views along Embankment to the bridge.

9.4.45 The new wall would not form part of the flood defences along this stretch of the river as the flood defence line is set further back. How Putney Embankment will be modified to meet the Environment Agency's Thames Estuary 2100 flood defence requirements has not been determined. The structural design of the parapet would be developed so that it could be raised around the foreshore structure in the future if required.

### CSOs

9.4.46 The relocated Putney Bridge CSO would discharge through low level flap valves on the long elevation of the foreshore structure. Vessels would be prohibited from mooring adjacent to the CSO and signage would be provided. However, we increased the size of the CSO outfall to reduce the velocity of the discharge and minimise the risk of the flows affecting moored or passing boats. Furthermore, a fender would be positioned between the flap valves to prevent them colliding with moored vessels.

### Apron and scour protection

9.4.47 The existing scour protection apron to the Putney Bridge CSO would be broken out once the flow is diverted. A new apron would be formed in front of the new CSO using rip-rap beneath a layer of foreshore sediments. Scour protection using rip-rap may also be required at the base of the river walls and around the CSO interception chamber. The finished level of any apron or scour protection would be beneath the final level of the foreshore. The apron or scour protection would appear to be natural and would promote aquatic ecology. The maximum extent of the apron is defined on the Site works parameter plan.

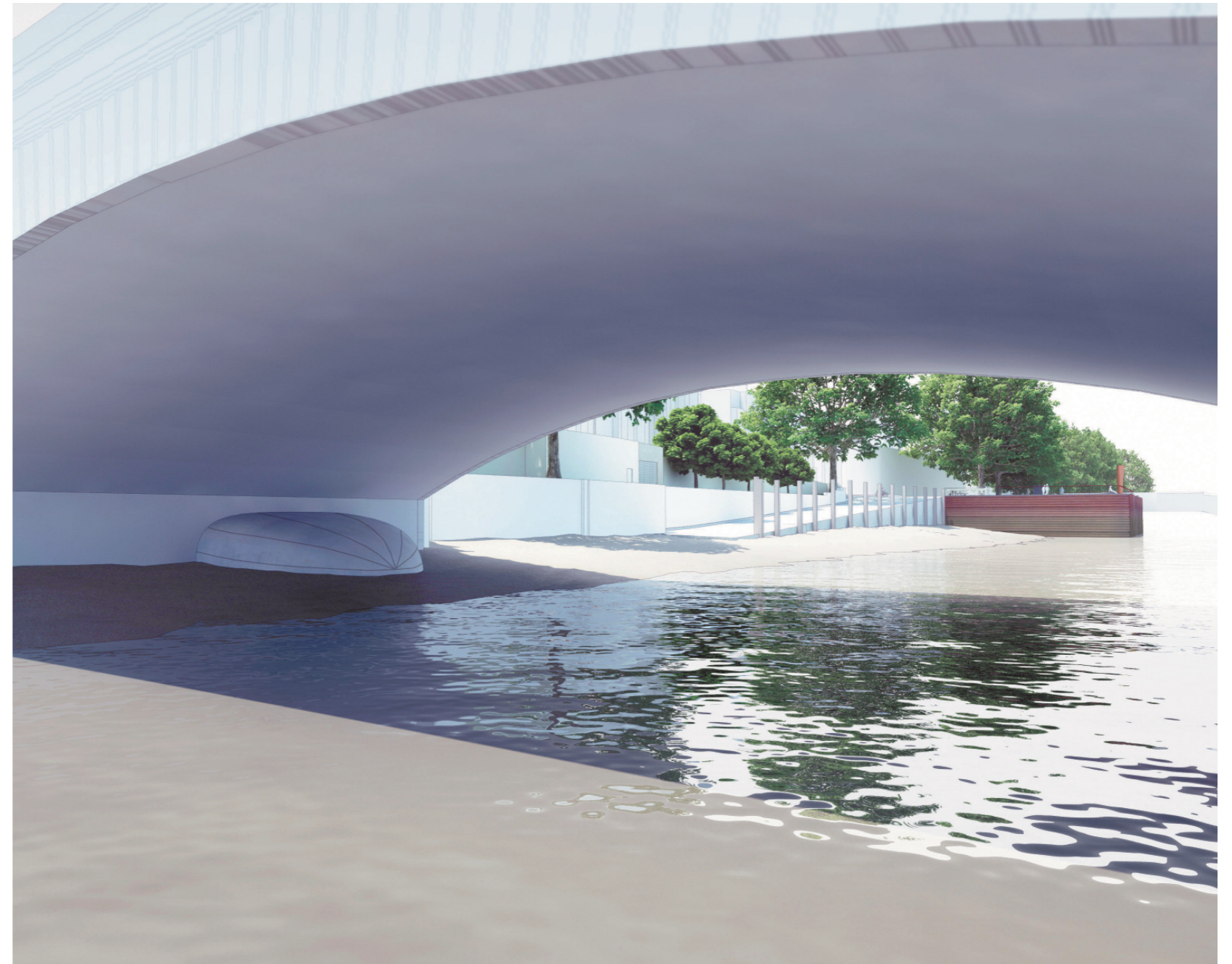


Figure 9.39: Proposed view of CSO interception structure below Putney Bridge

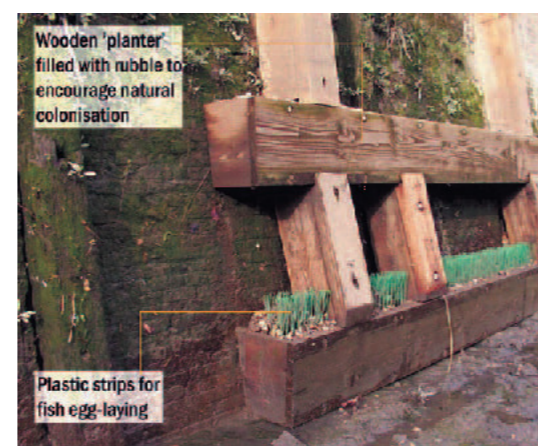


Figure 9.40: Example of aquatic habitat feature



Figure 9.41: Example of 'rip rap'



## Lighting design

9.4.48 Low level lighting would be incorporated within the permanent structures to limit visual clutter. Light would be provided on the foreshore structure by linear in-ground luminaires parallel to the granite paving and benches. The lights would also be set into the steps up to the foreshore structure to promote safety and mark the junction with Embankment.

9.4.49 The base of the signature ventilation columns would be highlighted with a collar of low level LEDs, which would wash the bottom of the columns with a subtle light. There is also an opportunity to include lighting on the electrical and control kiosk on the foreshore structure.

9.4.50 No light would be directed towards Putney Bridge, or the River Thames itself, so as not to adversely affect residents and migratory wildlife.

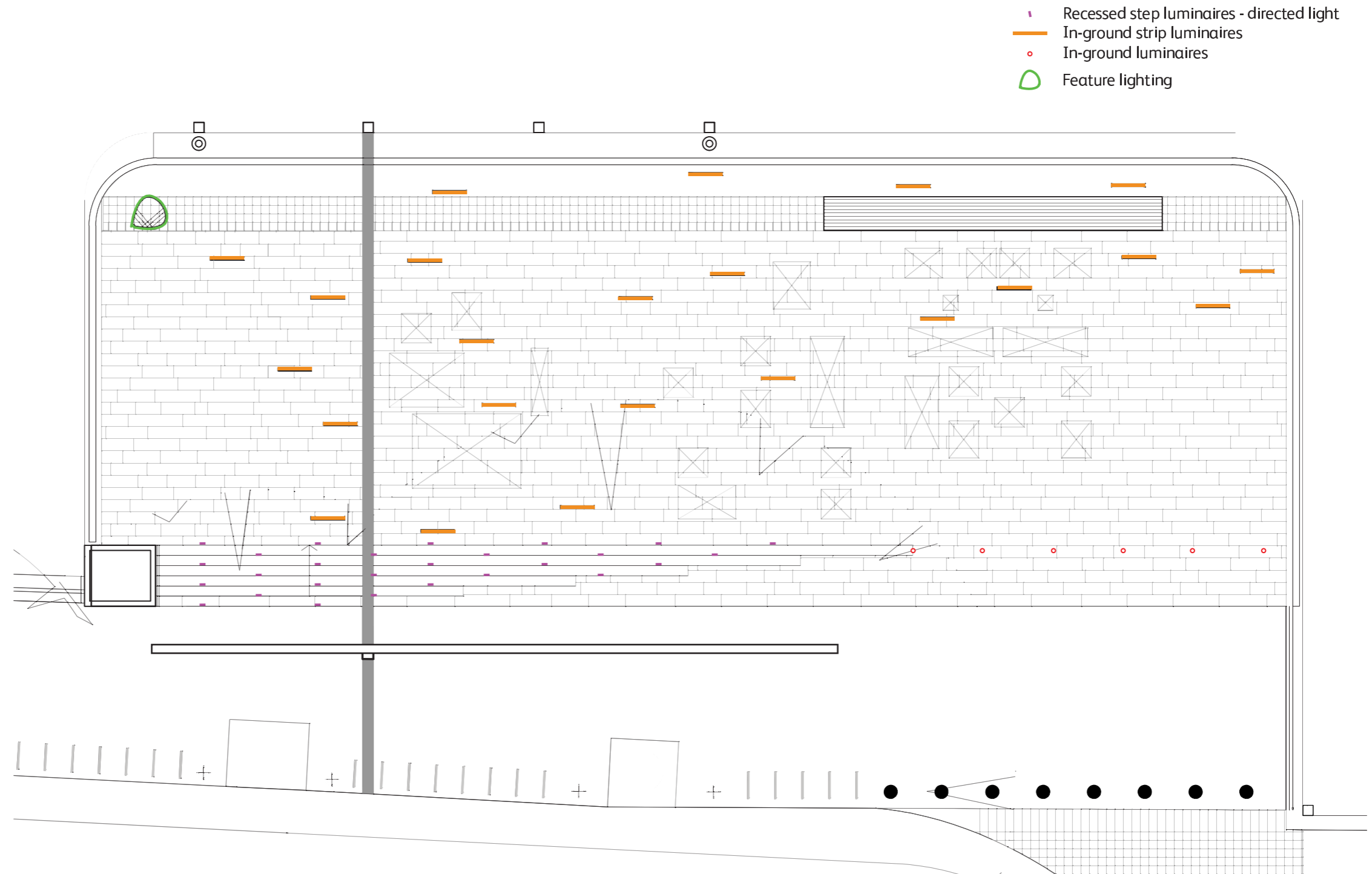


Figure 9.42: Illustrative lighting scheme

Landscaping and appearance

Hard landscape palette

9.4.51 The proposed hard landscape materials and furniture palette comprises traditional, high quality materials that would be used in a contemporary manner. Hard surface materials would be robust, fit-for purpose, and appropriate to the setting to ensure long-term quality. The palette includes:

- a. granite plank paving on the foreshore structure reminiscent of the wooden decking on jetty structures, with a feature band of smaller format setts on the line between the bench and the ventilation column.
- b. granite for the new river wall to match the existing bridge wall with contemporary detailing but without corncing
- c. a long bench with clean, simple lines made from sustainably-sourced timber
- d. bespoke balustrades with metal uprights and a timber handrail designed for leaning against
- e. glass guarding to maximise views of Putney Bridge at the end of Embankment
- f. new granite setts at the top of the slipway to match the existing
- g. new drop-down bollards to restrict vehicle access to the foreshore structure
- h. enhanced bicycle parking.

Soft Landscape Palette

- a. The electrical and control kiosks would feature planted brown roofs.

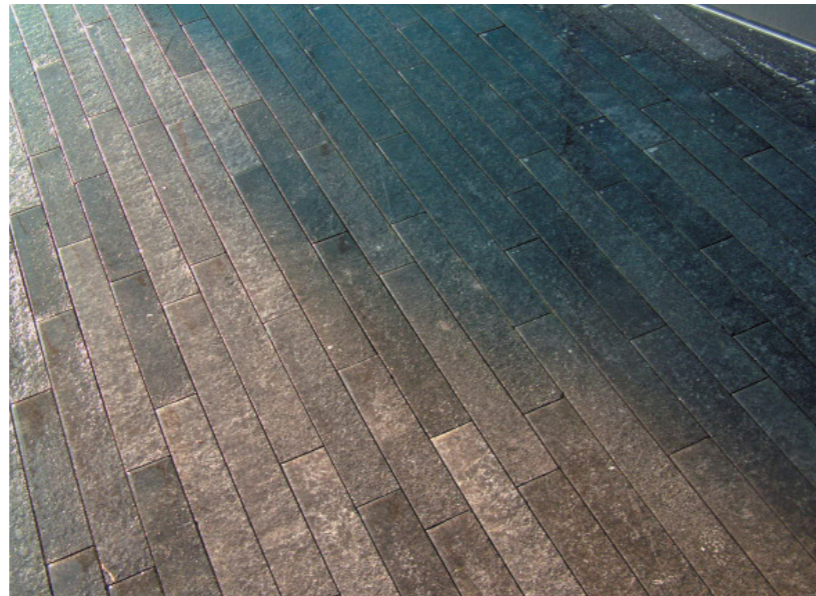


Figure 9.43: Example of granite paving



Figure 9.46: Example of timber bench



Figure 9.48: Example of pavers with metal inserts



Figure 9.44: Example of cobbled-stone paving

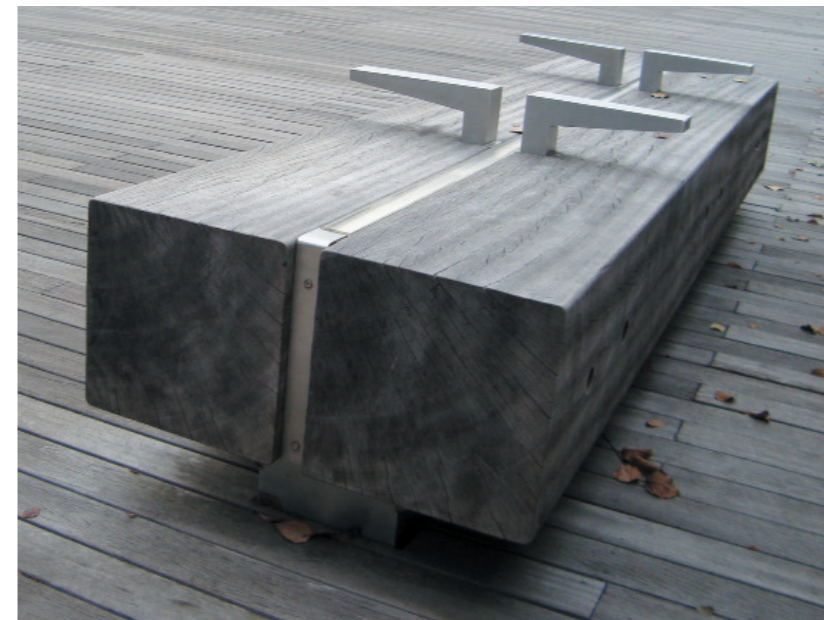


Figure 9.47: Example of timber bench

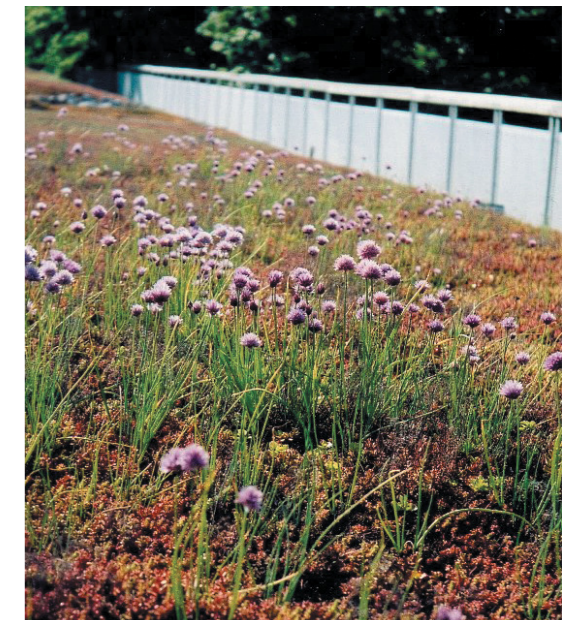


Figure 9.49: Example of planted brown roof



Figure 9.45: Example of granite and cobble intersection

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Access and movement

9.4.52 The Thames Path would be completely reinstated as existing following construction.

9.4.53 The structure would be level with Embankment at the eastern end to enable operational vehicle access. The site is broadly flat except for the steps to mediate the level difference between the embankment and the western end of the foreshore structure, which would include a handrail. In line with project-wide aspirations and good practice, landscaping treatments and materials would ensure that pedestrian routes meet the best standards of accessibility.

Thames Water access requirements

9.4.54 Permanent vehicular access to the site would be via Lower Richmond Road and Embankment. We propose to create a new permanent access off Embankment.

9.4.55 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.

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

9.4.57 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.

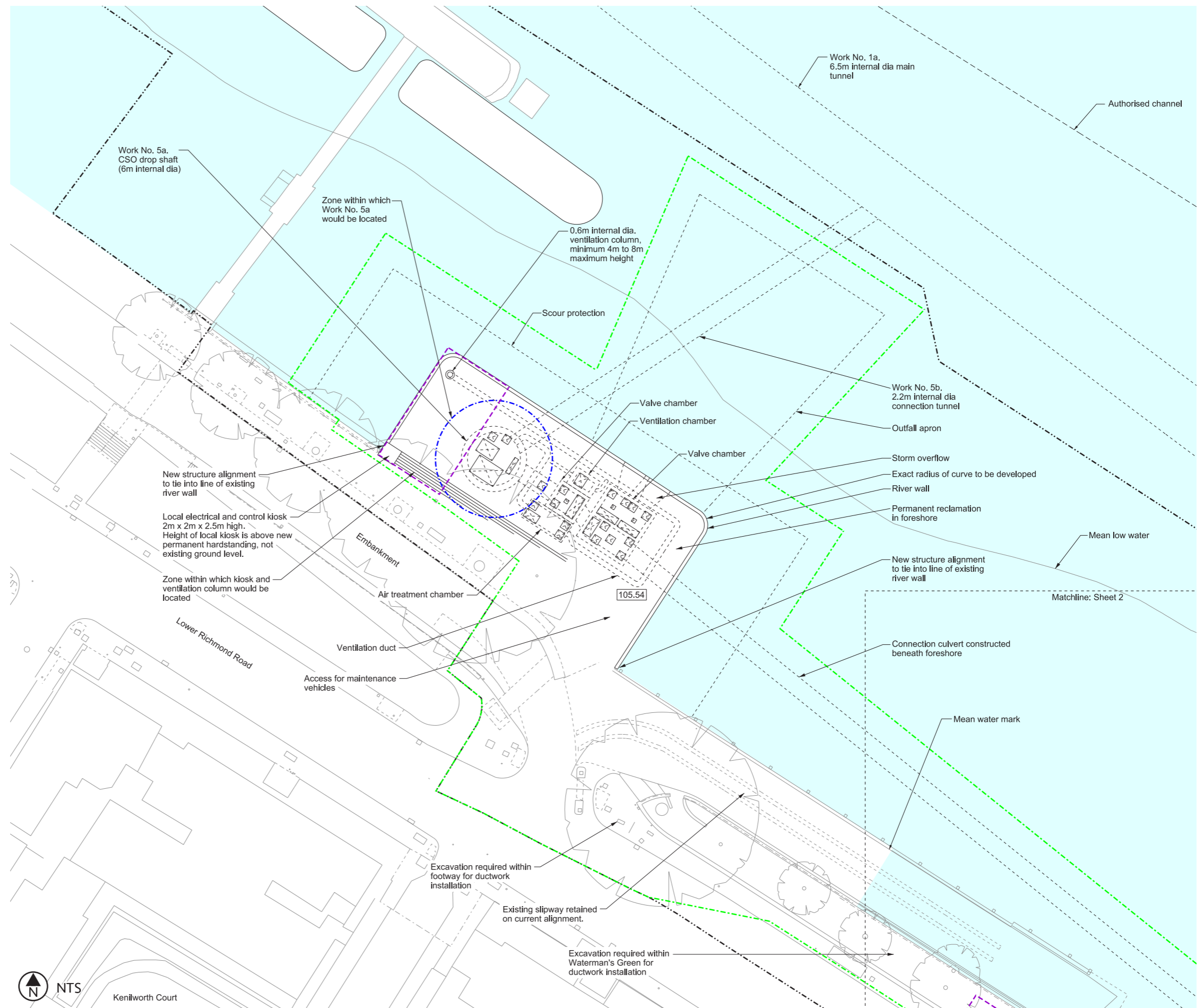


Figure 9.50: Permanent works layout - refer to Permanent works layout in the *Book of Plans*

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