

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Design and Access Statement

Doc Ref: **7.04**

Part 2

Chelsea Embankment Foreshore

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

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January 2013

Thames
Tideway Tunnel 
Creating a cleaner, healthier River Thames

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Section 15

Chelsea Embankment Foreshore

15.1 Introduction

15.1.1 A worksite is required to intercept the existing Ranelagh CSO and to connect to the northern Low Level Sewer No.1 in order to divert combined sewage flows to the main tunnel. The proposed development site is known as Chelsea Embankment Foreshore, which is located in the Royal Borough of Kensington and Chelsea.

15.1.2 Diverting the flow from the northern Low Level Sewer No. 1 at this site, Victoria Embankment Foreshore and Blackfriars Bridge Foreshore would control the flows from ten other CSOs along the northern bank of the River Thames (from Church Street in Chelsea to Essex Street in Westminster). This avoids the need for additional sites at or near these CSOs.

15.1.3 We have agreed with the Royal Borough of Kensington and Chelsea 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 proposed landscape design, however, is indicative.



Figure 15.1: Aerial photograph of the existing Chelsea Embankment Foreshore site with LLAU indicated

15.2 Existing site context

15.2.1 The site itself comprises an area of the foreshore of the River Thames opposite the Bull Ring Gate of the Royal Hospital Chelsea (the 'RHC') South Grounds, sections of the carriageway and pavement of Chelsea Embankment, and a small section of Ranelagh Gardens to connect to the northern Low Level Sewer No.1.

15.2.2 The foreshore site falls within the Thames Conservation Area. It is considered a functional flood plain (Flood Zone 3b). It also falls within the designated Crossrail 2 Safeguarded Zone. The River Thames (including Chelsea Creek) is a Site of Nature Conservation Importance (of Metropolitan importance).

15.2.3 Ranelagh Gardens falls within the Royal Hospital Conservation Area. It is locally designated as a Site of Nature Conservation Importance (Borough II) and as a Grade II registered park and garden.

15.2.4 No trees within or surrounding the site are protected by Tree Preservation Orders, although the mature trees along Chelsea Embankment are indirectly protected by virtue of their position in a conservation area.

15.2.5 The site is bounded to the north by the RHC, the RHC South Grounds, and Ranelagh Gardens. The Lister Hospital and Chelsea Bridge Gardens lie to the northeast of Chelsea Bridge Road and Chelsea Bridge crosses the River Thames to the east. The River Thames surrounds the site to the east, south and west.

15.2.6 The Chelsea Hospital South Front Lawns are locally designated as a Site of Nature Conservation Importance (Borough I) and the Royal Hospital Old Burial Grounds to the north of the site are locally designated as a Site of Nature Conservation Importance (Borough II). The RHC South Grounds (a Grade II registered park and garden) and Ranelagh Gardens are used for major events such as the Royal Horticultural Society's Chelsea Flower Show for several months each year. The grounds are publicly accessible via the Bull Ring Gate or Royal Hospital Road when not occupied by these events. The RHC South Grounds are leased by the Royal Borough of Kensington and Chelsea and offer managed

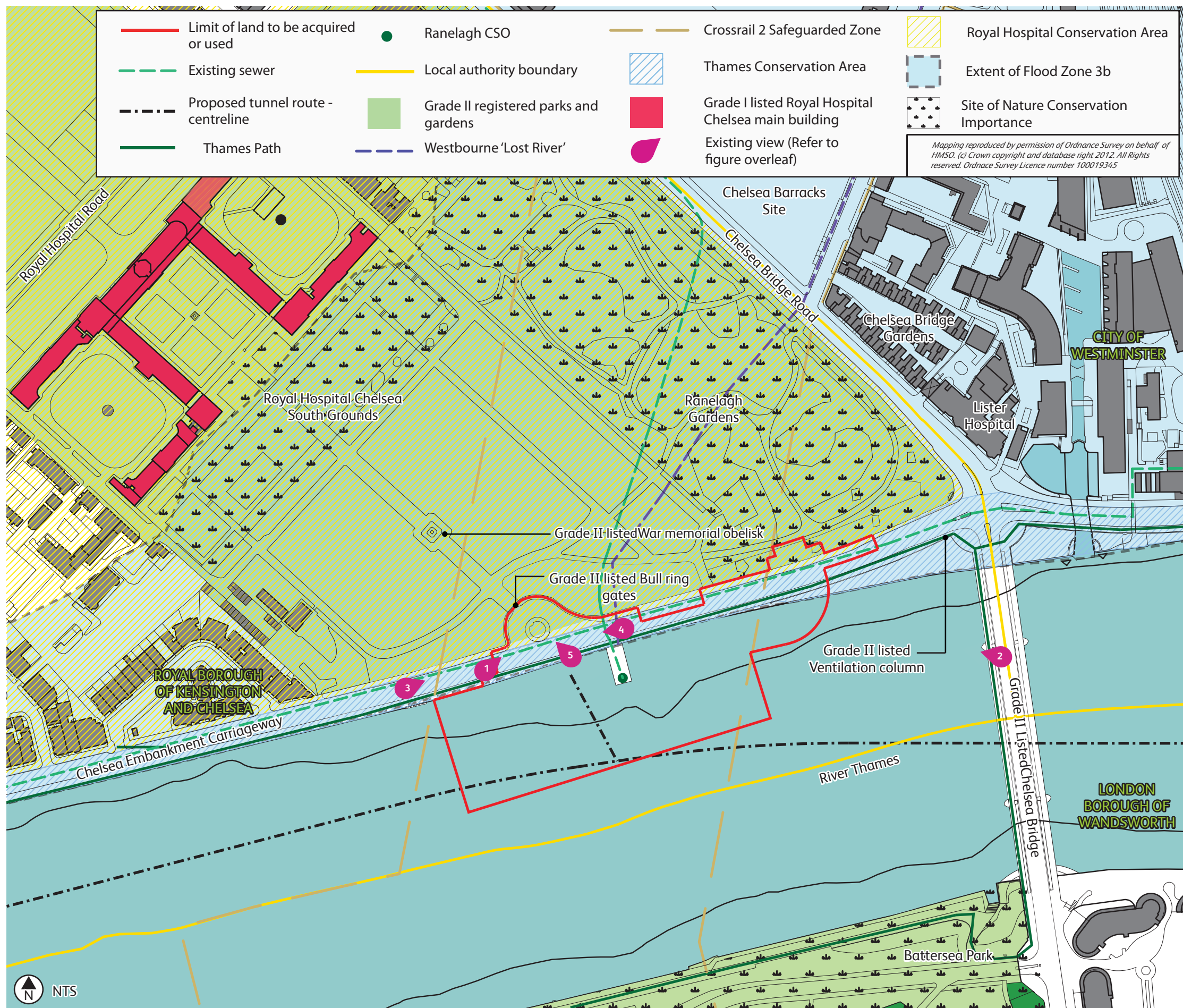


Figure 15.2: Existing site plan



Figure 15.3: Chelsea Embankment during the Chelsea Flower Show 2012

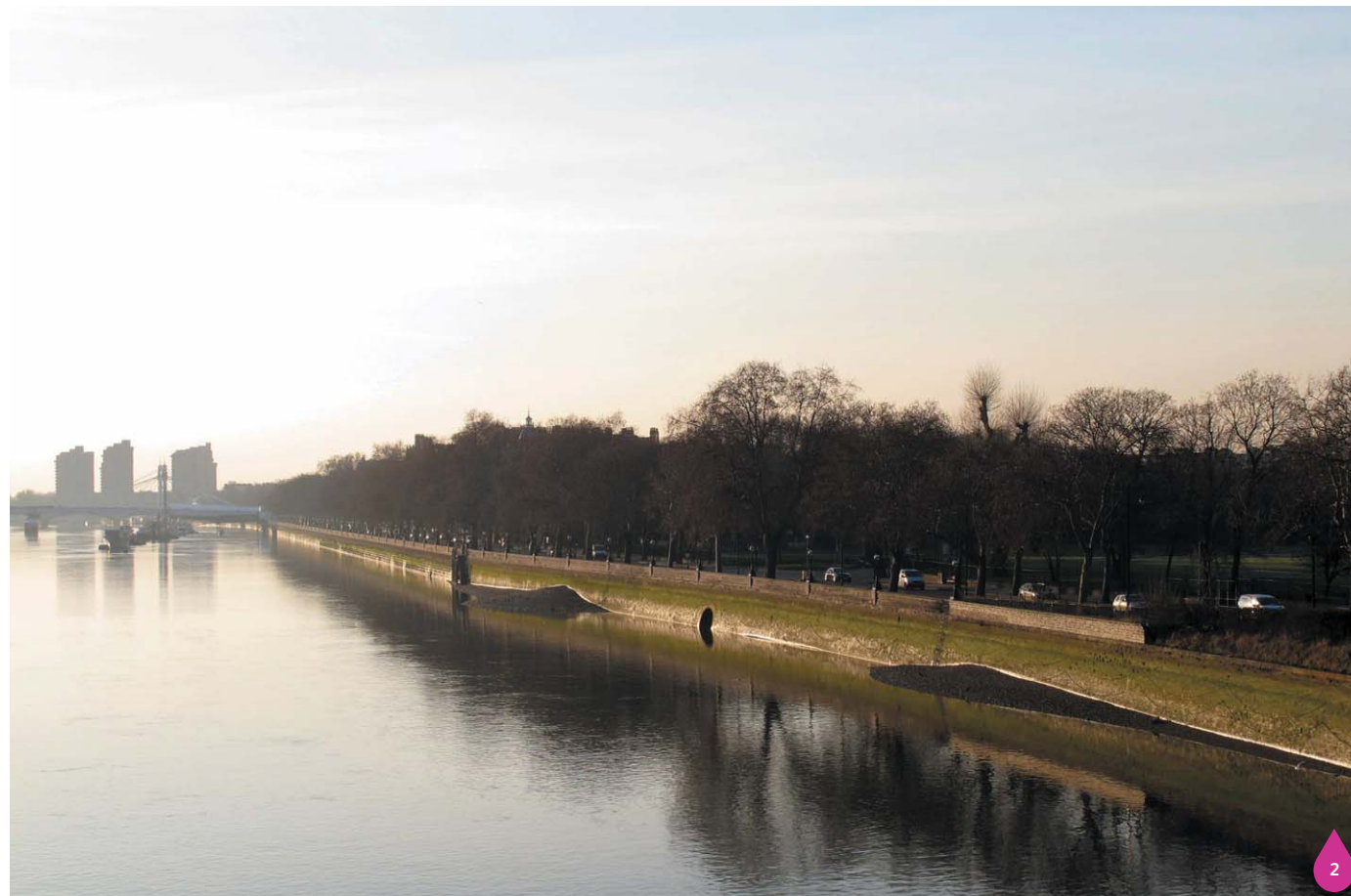


Figure 15.4: Chelsea embankment from Chelsea Bridge showing Ranelagh CSO



Figure 15.5: Chelsea Embankment looking east towards Chelsea Bridge Road



Figure 15.6: Chelsea Embankment looking west



Figure 15.7: Bull Ring Gates from across Chelsea Embankment

football pitches, tennis and netball courts, sports changing facilities and the Chelsea Adventure Playground.

15.2.7 The main RHC building is located approximately 300m north of the site and is Grade I listed. It is occupied by retired soldiers, known as the Chelsea Pensioners. Other listed buildings to the north of the site include the Grade II listed Bull Ring Gate entrance on Chelsea Embankment and the Chillianwala War Memorial obelisk on Monument Walk in the RHC South Grounds.

15.2.8 The Ranelagh Sewer (Main Line) incorporates the River Westbourne – one of London's 'lost rivers'. The Ranelagh Sewer and the Ranelagh and King Scholars Pond Storm Relief Sewer run southwest under Chelsea Bridge Road, through Ranelagh Gardens and the RHC South Grounds, and meet at a chamber just behind the river wall. The Ranelagh CSO discharges through an arched opening in the river wall near the Bull Ring Gate.

15.2.9 To the northeast, a mixed use development of approximately 400 residential units has been approved at the former Chelsea Barracks site. The former barracks lie to the east of Chelsea Bridge Road in the City of Westminster within 500m of the site.

15.2.10 There are a number of Grade II listed structures to the east of the site, including Chelsea Bridge (120m from the site) and a sewer vent in the pavement (35m from the site). Further east across the river in the London Borough of Wandsworth is the Grade II* listed Battersea Power Station, which is due to be re-developed with a mixed use scheme. The power station site was recently purchased by new owners.

15.2.11 Battersea Park lies across the river to the south and is a designated Site of Importance for Nature Conservation. The Nature Area within the park is separately designated as a Local Nature Reserve.

15.2.12 Chelsea Embankment esplanade to the west, from Battersea Bridge to Grosvenor College Stairs (opposite the southwestern corner of the RHC South Grounds) is a Grade II listed structure. The listing includes the embankment wall and 64 cast iron Lion's Foot lamp standards. Approximately 200m to the west of the site are the residential mansion blocks of Embankment Gardens.

Existing site access and movement

15.2.13 There is no existing vehicle access to the foreshore. Grosvenor College Stairs just to the west of the site provides pedestrian access to the foreshore.

Highways

15.2.14 Chelsea Embankment (A3212) is a two-way single carriageway with a 30mph speed limit and is suitable for heavy goods vehicles and other long vehicles. It forms part of the Transport for London Road Network and is a designated Red Route. It links to Chelsea Bridge Road (A3216) and Grosvenor Road (A3212) to the east and Cheyne Walk (A3220) and Cremorne Road (A3220) to the west. Chelsea Bridge Road runs north-south along the eastern boundary of Ranelagh Gardens and over the river. All of these roads form part of the Transport for London Road Network.

Car parking

15.2.15 On-street car parking bays for residents are provided at the Bull Ring Gate and further away from the site at Cheyne Walk, Dilke Street, Embankment Gardens, Paradise Walk, Swan Walk and Tite Street.

15.2.16 There are pay and display parking bays on Chelsea Embankment, Cheyne Walk, Dilke Street and Embankment Gardens. Motorcycle parking bays are located on Cheyne Walk, Embankment Gardens, Swan Walk and Tite Street.

Public transport

15.2.17 The daytime 137, 360 and 452 bus services and the N44 and N137 night bus routes operate within 640m of the site. There is a bus stop in the Bull Ring for the 360 bus route northbound (to South Kensington) where the bus also turns.

15.2.18 The closest National Rail stations to the site are Battersea Park and Queenstown Road on the southern side of the River Thames, approximately 1.1km and 1.4km from the site respectively. Sloane Square Underground Station, which is served by the Circle and District lines, is located approximately 1.1km to the north.

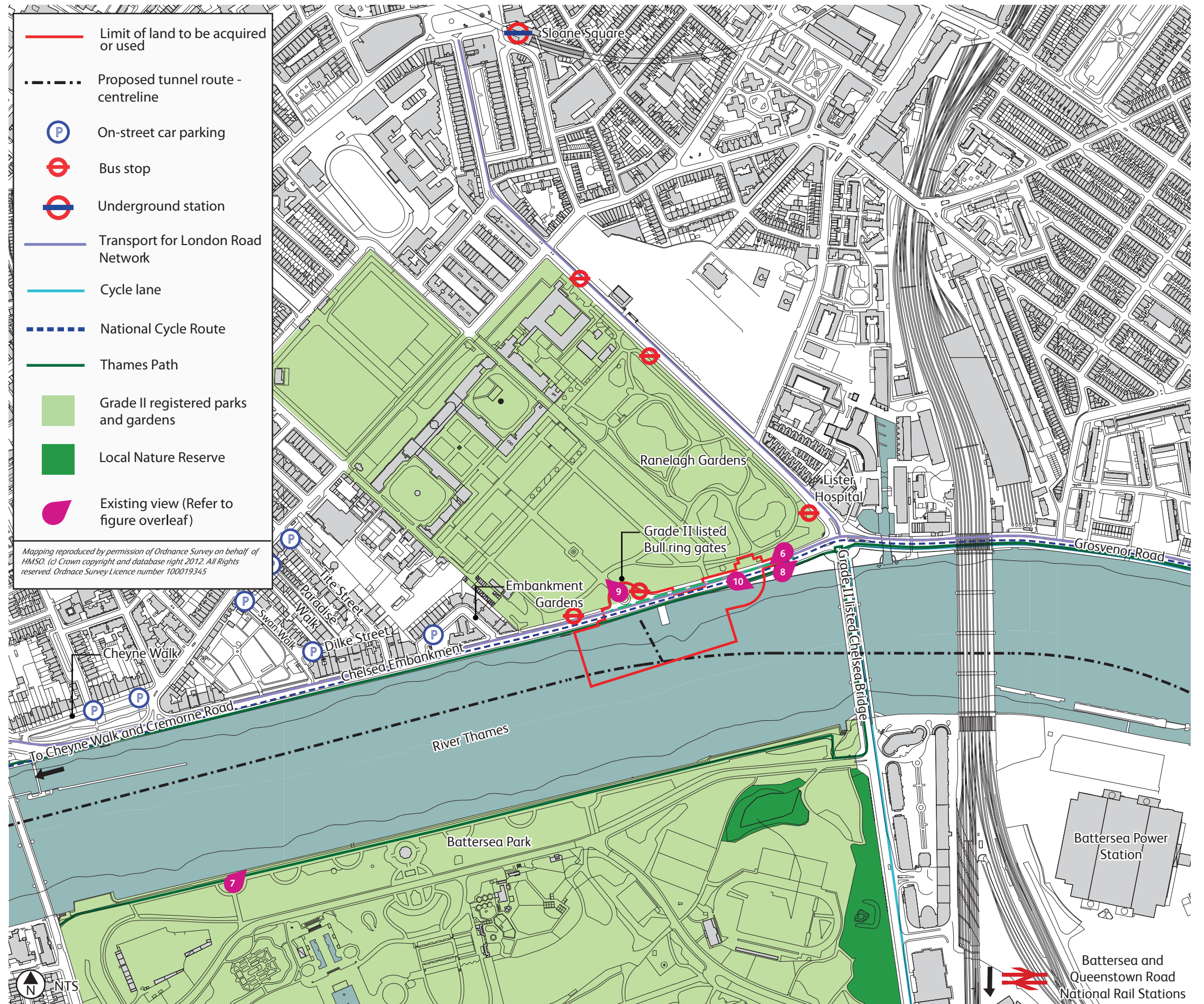


Figure 15.8: Existing site analysis plan



Figure 15.9: Wall junction at western end of Chelsea Embankment Gardens



Figure 15.12: Bull Ring Gates to Royal Hospital Chelsea



Figure 15.10: Chelsea Bridge from Battersea Park



Figure 15.11: Listed sewer vent at Chelsea Embankment

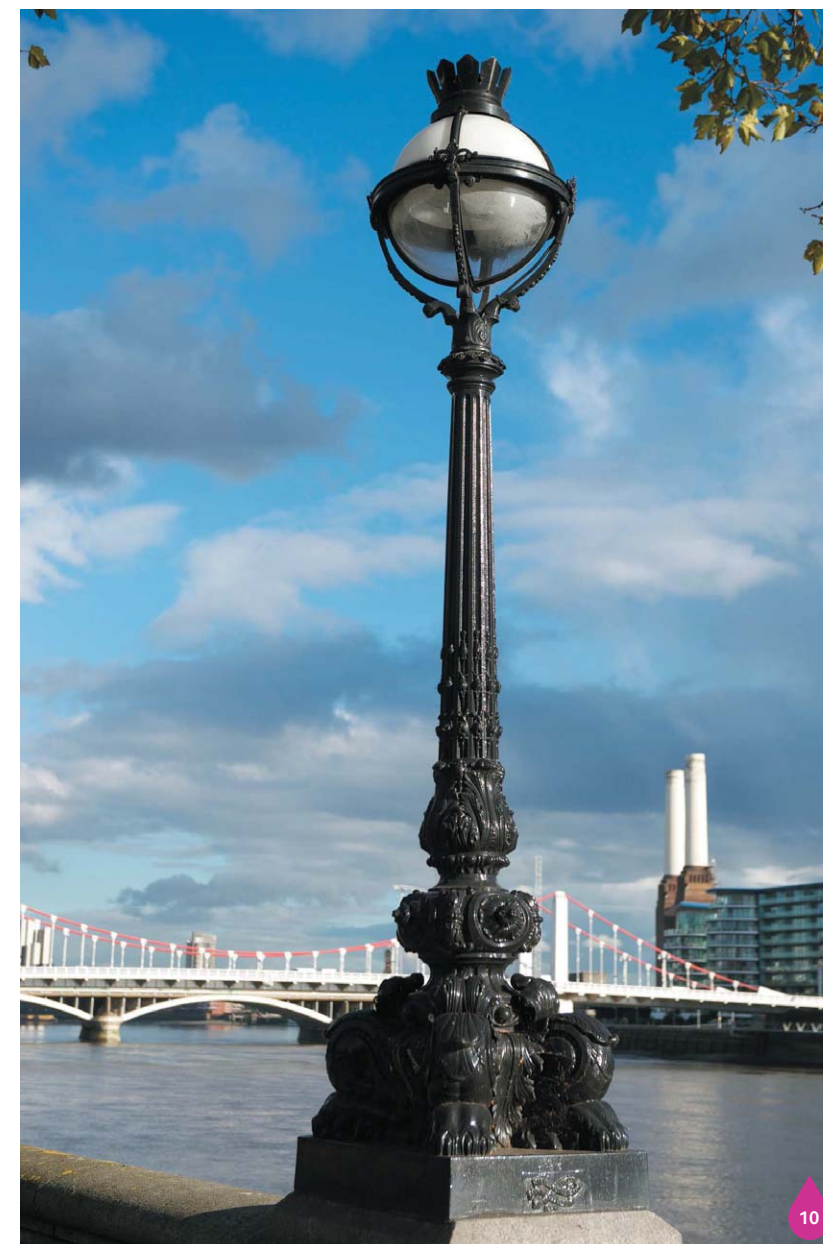


Figure 15.13: 'Lions foot' lamp standard

Cycle routes

15.2.19 The main cycle route in the area is National Cycle Network Route 4 from London to Fishguard. The route runs traffic-free on the pavement along Cheyne Walk, Chelsea Embankment and Grosvenor Road.

15.2.20 Cycle Superhighway Route 8 opened in summer 2011 and runs from Westminster to Wandsworth. It passes across Chelsea Bridge (A3216) 200m to the east of the site and along Grosvenor Road.

15.2.21 The closest Barclays Cycle Hire docking station is located on Grosvenor Road, 200m to the east of the site.

Pedestrian routes

15.2.22 Chelsea Embankment provides a continuous east-west link for pedestrians along the northern bank of the River Thames. It forms part of the Thames Path National Trail, which follows the southern side of Chelsea Embankment.

Historical context

15.2.23 The site was once marshland at the confluence of the rivers Thames and Westbourne. There is evidence of prehistoric activity, including a possible Iron Age ford close to Chelsea Bridge and a battle or deposition of votive offerings in the River Thames. Chelsea hosted a synod in 785 AD and King Alfred the Great held a council there in 899 AD.

15.2.24 Before the 19th century, the River Thames was the main thoroughfare through London. At the end of the medieval period, the wealthy increasingly built houses with landing stages along the river. Chelsea was particularly fashionable from the 16th century onwards and was known as the 'Village of Palaces'.

15.2.25 The RHC was designed by Sir Christopher Wren and built from 1682 to 1702. Like other fashionable buildings, the main frontage faced the River Thames at an oblique angle and met the river where the Westbourne met the Thames at a set of landing stairs flanked by small lodges, or summer houses. These stairs were used by royalty when visiting the RHC by river. Ranelagh Gardens was a separate property that featured a rotunda. The southern end of the gardens incorporated the Chelsea Water Works intakes, pumping station and osier (willow) beds alongside the River Westbourne. The Chelsea Water Works were located adjacent to the site to the east until the 1850s.

15.2.26 In 1854, Thomas Page designed the first part of the Chelsea Embankment: the brick-faced section on either side of Chelsea Bridge and in front of the RHC. The River Westbourne was culverted through the new embankment wall, which was built along the current alignment. A road extended along the bank up to the new Bull Ring Gate and new railings were added to the southern boundary of the RHC grounds.

15.2.27 The first Chelsea suspension bridge was built by Page in 1857. Battersea Park was established opposite by James Pennethorpe and John Gibson for HM Office of Works. Gibson also redesigned the RHC grounds and Ranelagh Gardens.

15.2.28 Before the embankment was constructed in the 1850s, the RHC's grounds terminated with 'water gates' at the river's edge near the outfall of the Ranelagh CSO, slightly east of the historic axis of the RHC created by Monument Walk (the 'Monument Walk axis'), where the River Westbourne (now incorporated into the Ranelagh Sewer Main Line) flowed into the River Thames.

15.2.29 To the west of the site (from Lots Road to Grosvenor College Stairs), Chelsea Embankment was extended and remodelled from 1871 to 1874 as part of Sir Joseph Bazalgette's sewerage scheme. The granite-faced extension formed a straight alignment to Battersea Bridge. Bazalgette's trademark river wall parapet decoration of Lion's Foot lamp standards and Lion's Head medallions was extended to the parapet of the 1850s embankment east of Grosvenor College Stairs, including the section within the site.

15.2.30 Chelsea Bridge was rebuilt between 1934 and 1937. It was the first self-anchored suspension bridge in Britain.

15.2.31 The opposite bank of the River Thames has seen major redevelopment; however, the area surrounding the site on the northern bank of the river changed little in the 20th century.

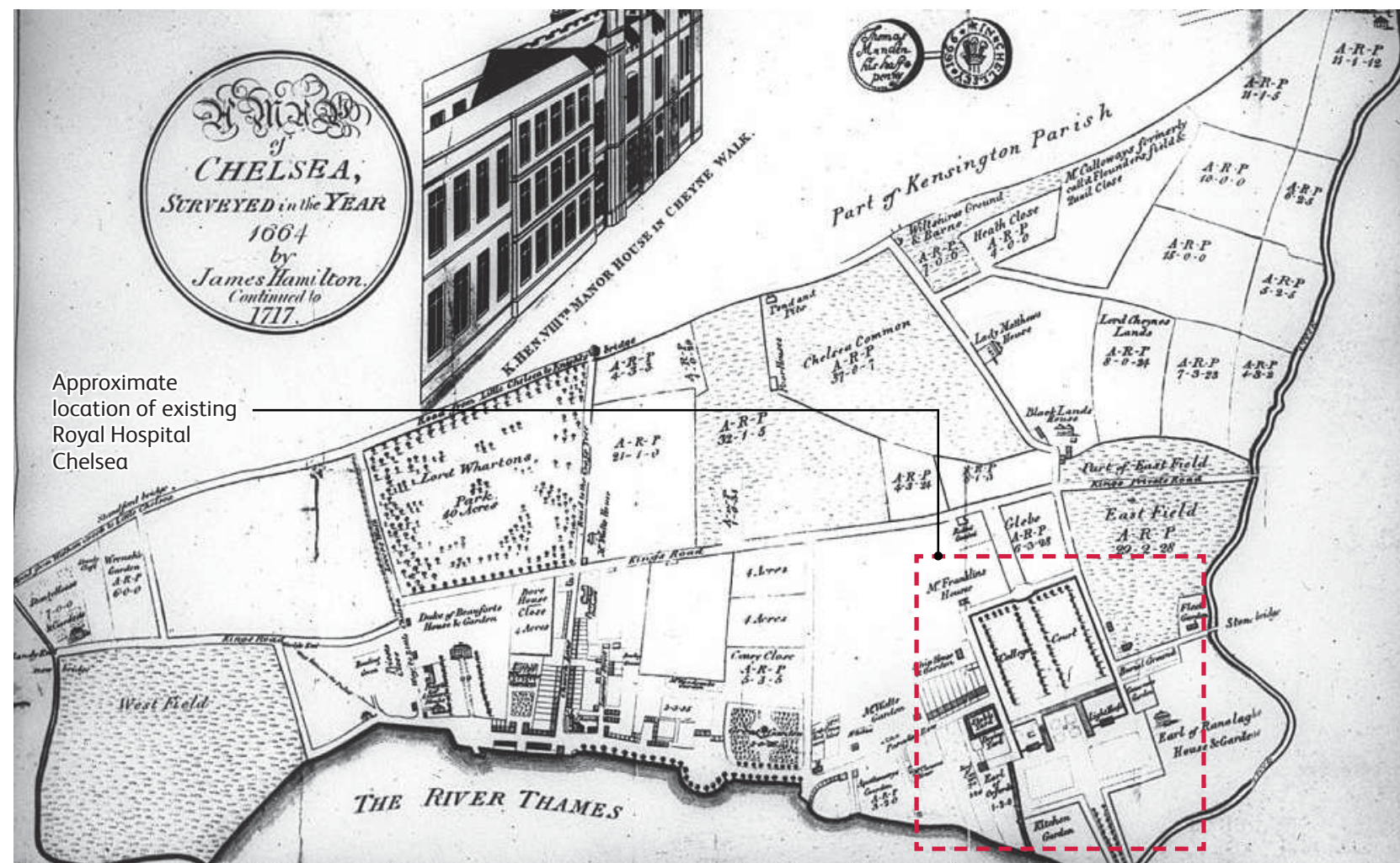
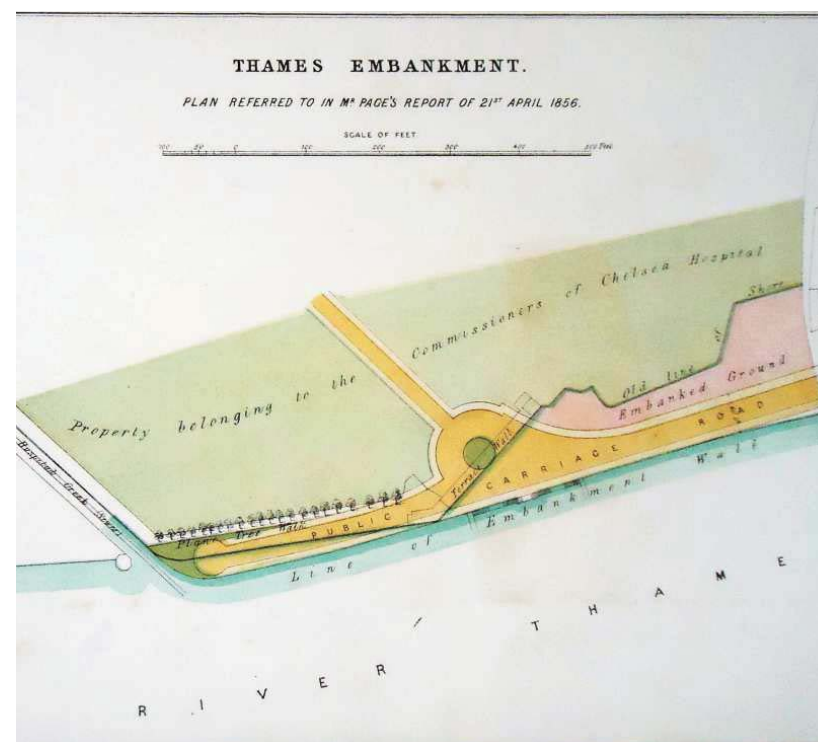


Figure 15.14: Historical map of Chelsea from 1717 © Royal Borough of Kensington and Chelsea.



Figures 15.15 and 15.16: Studies for the construction of Chelsea Embankment showing the line of the previous river wall and proposals to provide steps down to the river at 'the axis'

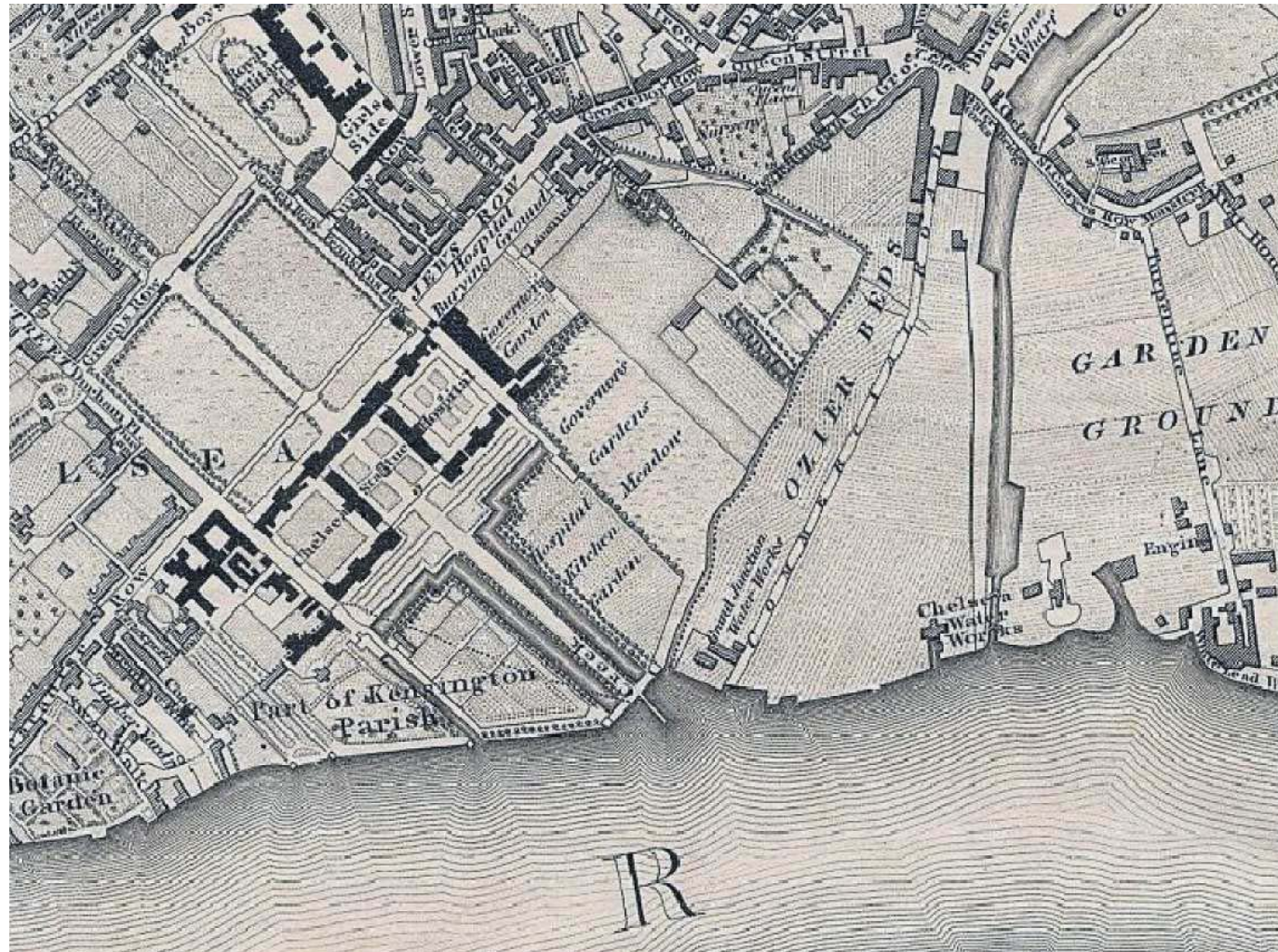


Figure 15.17: Greenwood map of 1827 (not to scale) showing river confluence prior to construction of Chelsea Embankment © The Company of Watermen and Lightermen of the River Thames



Figure 15.18: 18th century painting showing the Royal Hospital Chelsea and its watergates © The Company of Watermen and Lightermen of the River Thames

Site analysis: Opportunities and constraints

The site-specific design opportunities included:

- Open up views between the River Thames and the RHC.
- Exploit the south-facing aspect of the site to create a new high-quality area of public realm that provides opportunities to sit and enjoy the views over the River Thames away from the road and cycleway. Currently, no seating is provided along the length of Chelsea Embankment.
- Help to indirectly control flows from ten other CSOs along the northern bank of the River Thames.
- Reinstate the link between the RHC and the River Thames, which was lost when the river frontage was infilled and realigned during construction of the Victorian Chelsea Embankment.

The site-specific design constraints included:

- It is a very sensitive site surrounded by designated heritage assets.
- Townscape views of the uninterrupted stretch of the embankment and views from Chelsea Bridge and Battersea Park must be protected where possible.
- The Bull Ring Gate vehicular and pedestrian entrance to the RHC South Grounds is used during temporary events.
- Tree loss must be kept to a minimum.
- The site falls within the Crossrail 2 safeguarded zone, which runs northeast to southwest through Ranelagh Gardens, the RHC South Grounds and the Bull Ring.
- 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 structures must also be protected from vessel impacts.
- The site is in close proximity to sensitive receptors, including the Lister Hospital, the RHC, Chelsea Adventure Playground, and residential properties.

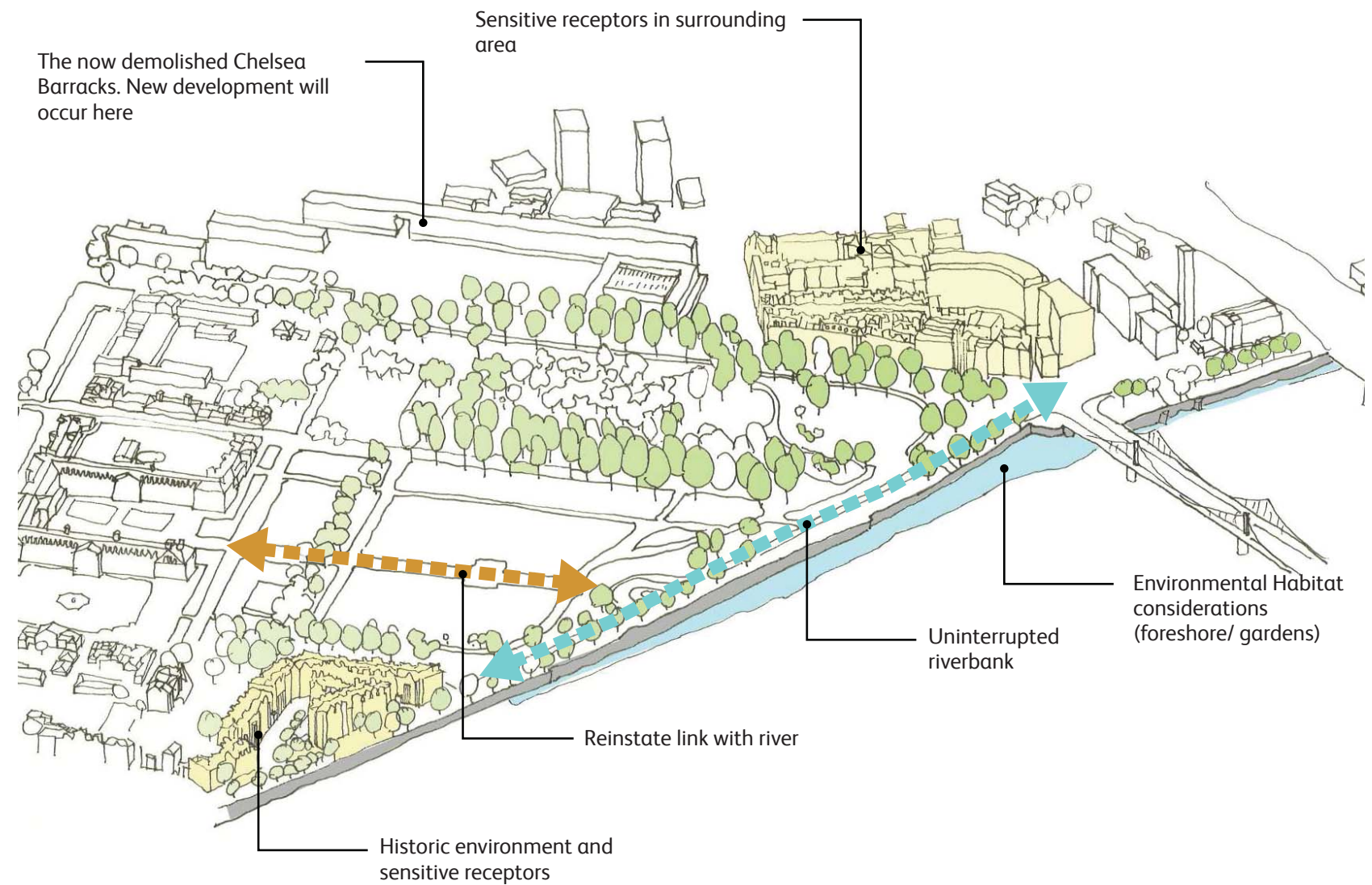


Figure 15.19: Existing site opportunities and constraints sketch

15.3 Design evolution and alternatives

15.3.1 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 Chelsea Embankment Foreshore was to successfully integrate the works into a sensitive and historic area guided by local plan policies. There will be further opportunities for design development before the proposals are finalised and constructed.

15.3.2 The design of our proposals at Chelsea Embankment Foreshore was significantly influenced by an extensive process of stakeholder engagement and design review. In order to ensure design quality, we undertook two rounds of review hosted by the Design Council CABI. We also held various pre-application meetings with the Royal Borough of Kensington and Chelsea 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)

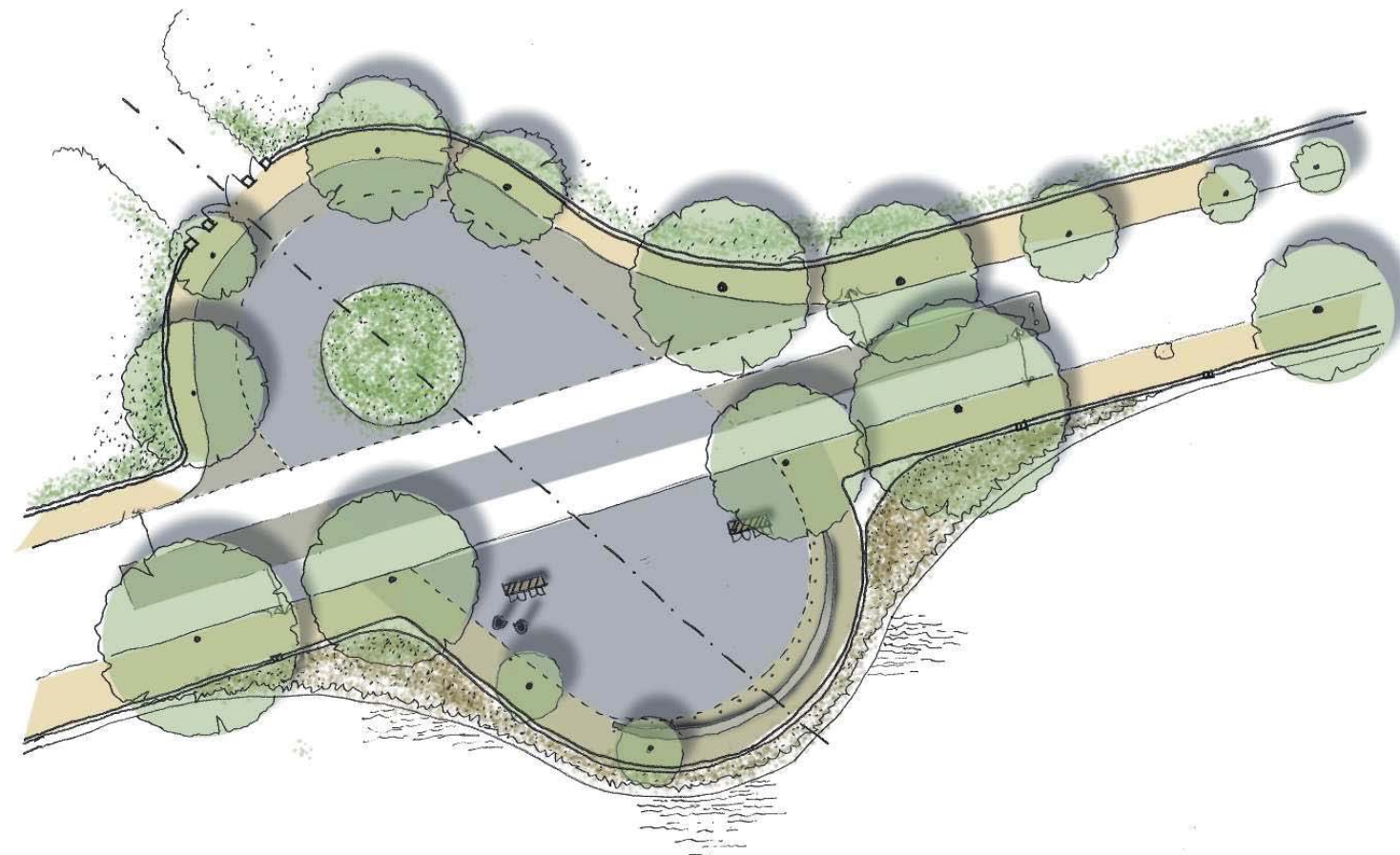


Figure 15.20: Design development sketch showing the historic axis

October 2010

April 2011

Phase one consultation

Design development

CABE sketch review

15.3.3 The location of the proposed site was determined by the position of the outfall of the Ranelagh CSO, which lies slightly to the east of the Monument Walk axis. The site presented at phase one consultation, known as Chelsea Embankment Foreshore (west of Chelsea Bridge), comprised three parts. There were two areas in the foreshore linked by a culvert: the first area included an interception chamber for the Ranelagh CSO; the second area included a larger landscaped structure near the western edge of Chelsea Bridge Gardens that enclosed an 18m internal diameter CSO drop shaft and ventilation equipment. The third area comprised an overflow weir chamber on the northern Low Level Sewer No. 1 beneath Chelsea Embankment.

15.3.4 Phase one consultation responses from stakeholders included concerns regarding:

- a. the impact on the historic area, including the listed buildings and structures
- b. the impact on habitats and aquatic ecology on the River Thames foreshore.

15.3.5 Having considered all the comments received, new information from Crossrail 2 and the engineering requirements, we considered that Chelsea Embankment Foreshore remained the most appropriate site. However, we recognised that the location and layout of the site needed to address concerns regarding the historic character and amenity of the area.



Figure 15.21: Proposed view from phase one consultation

15.3.6 We also explored the following design changes:

- a. reducing the diameter of the CSO drop shaft from 18m to approximately 12m as a result of engineering design development
- b. combining the foreshore projections enclosing the CSO drop shaft and interception chamber
- c. introducing more ventilation columns of a smaller size
- d. introducing terraced landscaping to reconcile the levels between the lower section of the river wall around the foreshore structure and the carriageway of Chelsea Embankment as it rises up to meet Chelsea Bridge.

15.3.7 Following phase one consultation, English Heritage expressed concerns regarding the use of the foreshore and stated that a site within the existing maintenance yard in Ranelagh Gardens would be more suitable, so as to reduce the impact on the clean sweep of the embankment wall.



Figure 15.22: Design development sketch proposal

15.3.8 We held a review based on an initial site assessment and sketched ideas for the site with the Design Council CABE in April 2011. The sketch options were based on the Chelsea Embankment Foreshore site (west of Chelsea Bridge) and provided options for combining the foreshore structures and rectifying the levels between Chelsea Embankment as it rises up to meet Chelsea Bridge. One option presented was for a combined CSO drop shaft and interception structure in front of the Bull Ring Gate. However, we were not certain that this was a feasible option due to the Crossrail safeguarding. Other options included minimising the CSO interception structure and including a pier on the shaft site or creating a linked space between the two structures via a floating garden.

15.3.9 The Design Council CABE stated that the design team needed to be fully satisfied that all possible locations had been explored before arriving at the preferred site, including a site within Ranelagh Gardens, which would avoid breaking the long stretch of river wall.

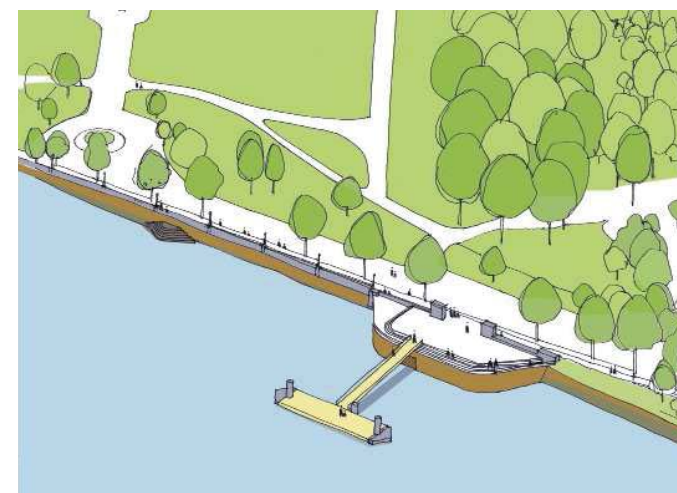


Figure 15.23: Sketch proposal from Design Council CABE sketch review for larger combined structure with jetty

15.3.10 The panel considered that a low key, potentially elongated foreshore structure would be most suitable, should the Chelsea Embankment Foreshore (west of Chelsea Bridge) site be taken forward. However, it did not consider a new pier appropriate at this location given the proximity of Ranelagh Gardens and the difficulty of crossing Chelsea Embankment.

15.3.11 The panel noted that if the design team wished to mark the lost River Westbourne, it should be done in an understated way.

15.3.12 The panel suggested that the design should consider views of the RHC from across the River Thames, views of the embankment from the RHC grounds, and views from the elevated approach from Chelsea Bridge. It requested the design team to explore a stepped landscaping treatment on the sloping bank beside the bridge and use the levels to integrate the permanent works into the setting.

15.3.13 Finally, the panel suggested that the surface of the foreshore structure could have a different finish to the surrounding river wall. The surface materials could contrast with the existing treatment on the embankment in order to distinguish the structure.

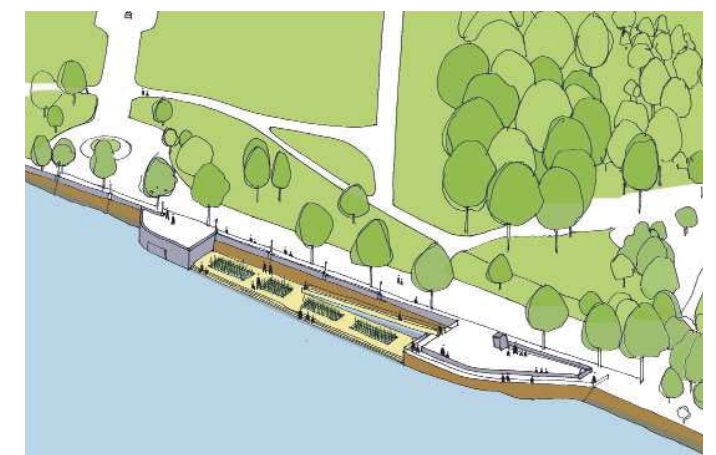


Figure 15.24: Sketch proposal from Design Council CABE sketch review for twin structures and floating gardens

Design development

June 2011
CABE scheme review

15.3.14 At this time, we enquired with Crossrail regarding locating our CSO drop shaft within its safeguarded area. This would enable a single structure in the foreshore at the outfall of the Ranelagh CSO. The single structure option also opened up the possibility of using the axis created by Monument Walk to re-create the relationship between the RHC, the River Thames and the lost River Westbourne. In addition we reviewed whether it was possible to locate our works in Ranelagh Gardens instead of within the foreshore to address the concerns of English Heritage regarding the potential impact of the structure on the clean sweep of the embankment wall.

15.3.15 We preferred the single structure option on the Monument Walk axis as it would reduce the overall footprint of the project structures in the foreshore and provide the opportunity for a more positive design. It would also incorporate the historic relationship between the RHC and the River Westbourne, and provide a strong townscape and visual link between the two. We believed

that the proposed location responded positively to the historic context and setting of the Grade I listed RHC (in line with the Royal Borough of Kensington and Chelsea's Core Strategy Policy CL3) and the importance of the project to modern London and the River Thames.

15.3.16 We prepared new studies of an orthogonal foreshore structure projecting into the river aligned with the Monument Walk axis. We determined that low-level stepped intertidal terraces on the downstream side of the structure could conceal the diversion of the Ranelagh CSO. However, we considered that the orthogonal arrangement of the foreshore structure in our studies from various viewpoints around the River Thames looked somewhat incongruous with the clean sweep of the existing river wall. We then discussed these proposals with the local authority. We also produced a sketch design and construction layout for the shortlisted site in Ranelagh Gardens for discussion with stakeholders.

15.3.17 We presented a more detailed scheme to the Design Council CABE in June 2011, which further developed the design of a single foreshore structure located in front of the Bull Ring Gate on the Monument Walk axis.

15.3.18 The panel noted that the location of the structure would provide a new space from which to appreciate views of the RHC. It considered that the proposed electrical and control kiosks would highlight the space and frame the view of the hospital.

15.3.19 However, the panel also expressed the following concern:

"While the idea of a single public space that carries across the highway to join with the Royal Hospital 'Bull ring' is appealing, in reality it will never be experienced in this way. However, we would encourage the design team to pursue the adoption of a raised table with TFL to help reduce traffic speeds in this location. A consistency of surface materials will be equally important to achieve. A formal approach to tree planting could further assist, helping to define not only the limits of this new space but also where pedestrian crossings should best be located [Letter dated 11 July 2011]."



Figure 15.25: Design development sketch proposal for 'axial' design

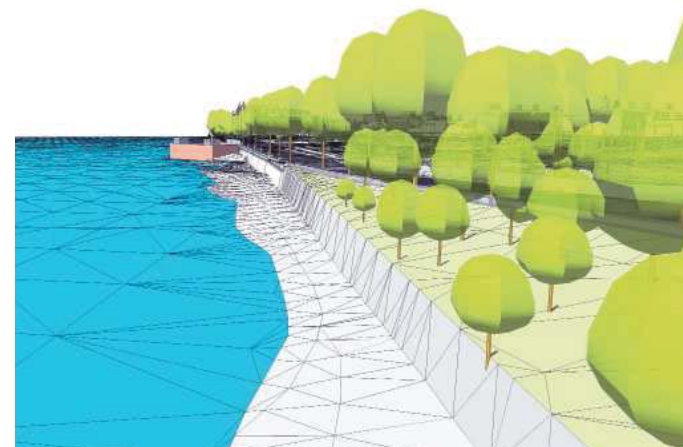


Figure 15.26: Design development study of 'orthogonal' foreshore structure

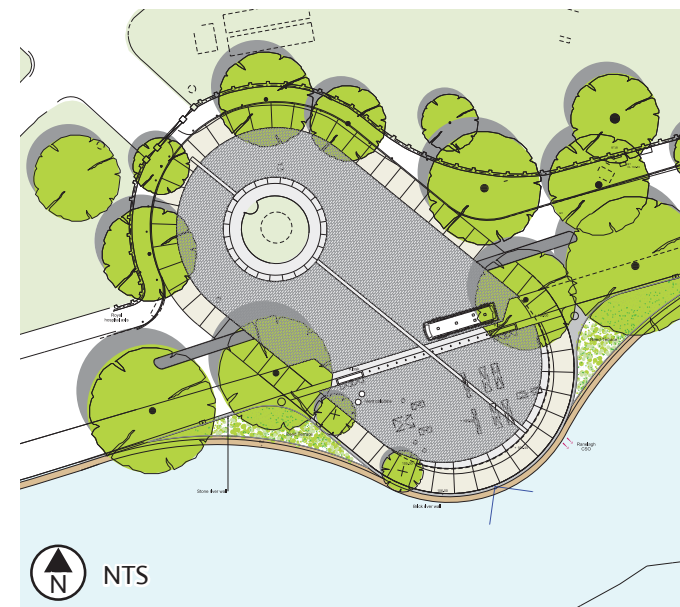


Figure 15.27: Proposed plan from Design Council CABE scheme review for a single surface treatment of the Bull Ring gate and foreshore structure

November 2011

Phase two consultation

15.3.20 At phase two consultation, we presented our new preferred site Chelsea Embankment Foreshore (opposite Bull Ring Gate) comprising the single foreshore structure in front of the Bull Ring Gate enclosing the CSO drop shaft and construction works and some permanent operational structures in a small area of Ranelagh Gardens. Two shortlisted sites were also presented, one within Ranelagh Gardens and Chelsea Embankment Foreshore (west of Chelsea Bridge).

15.3.21 The consideration of Ranelagh Gardens and Chelsea Embankment Foreshore involved engagement with English Heritage, the Royal Horticultural Society and the RHC in relation to arrangements for the Chelsea Flower Show, the area that would be required for the works, and the amenity and permanent appearance of the gardens. English Heritage's suggested site in the existing maintenance yard was determined to be unfeasible due to its size and distance from the existing sewer, which would increase the impacts on the gardens.

15.3.22 Around this time we received a letter (dated 3 November 2011) from Crossrail 2 confirming that it would not object to the construction of the CSO drop shaft in the foreshore within its safeguarded zone. In addition, further geological information identified that the connection tunnel would be located partly within the Lambeth Group – a highly variable and potentially unstable geological formation. This would increase health and safety impacts as a result of constructing a longer connection tunnel to the Ranelagh Gardens site.

15.3.23 The preferred arrangement opposite Bull Ring Gate provided the opportunity to enhance the setting of the RHC and its grounds by connecting it with the River Thames along the line of Monument Walk, in line with Core Strategy policies CL3 and CL4. It also enabled us to propose to construct the new section of river wall around the foreshore structure in a sweeping curve to minimise the effect on river views and the setting of the Thames Conservation Area, in line with the Royal Borough of Kensington and Chelsea's saved (UDP) Development Plan Policies CD1, CD8, CD9 and CD63.

15.3.24 The key design-related comments raised by the Royal Borough of Kensington and Chelsea at phase two consultation included:

- a. The council welcomes the new design of the informal public space. The design celebrates the axial alignment of the RHC and its gardens. However, this must be weighed against the disruption of the characteristic linearity of the embankment wall and the foreshore.
- b. The quality and future maintenance scheme of the foreshore structure are very important and further details are required to ensure a positive outcome.
- c. The intertidal reed terraces on the foreshore structure could provide added visual interest.
- d. The new space is uneventful rather than understated. The visual impact of the electrical and control kiosks should be minimised further. They should be interesting bespoke structures or else relocated below ground.
- e. The council strongly supports the idea of the ventilation columns as the project's 'signature' structure.
- f. Resurfacing the Bull Ring would be a welcome improvement and the use of granite setts or a similar high quality paving material should be retained in subsequent design phases.
- g. The council does not support the proposed treatment of the site as a single surface as this could encourage misuse of the new public open space as a vehicle drop-off area. New pedestrian refuges would be welcome in order to ease access across Chelsea Embankment, but care is needed in order to prevent street clutter.
- h. The council acknowledges the loss of trees; however, the impact on the avenue of trees along Chelsea Embankment would be fairly limited. The potential impact on the trees in Ranelagh Gardens is less clear.
- i. The council concurs with English Heritage's view that the foreshore structure must be exceptional.



Figure 15.28: Proposed view from phase two consultation

Design development

15.3.25 English Heritage raised concerns regarding the setting of the RHC, the possibility of a lay-over area for coaches and the vulnerability of the metal finishes on the proposed electrical and control kiosks to theft. It also requested a specific commitment from Thames Water regarding the ownership, management and use of the site. It stated that it considered that the permanent impacts would be greater at the foreshore site and that it would prefer the gardens site.

15.3.26 The Design Council CABE submitted its comments from the scheme review as a formal response to phase two consultation.

15.3.27 Following phase two consultation, we provided evidence to English Heritage concerning the health and safety impacts of tunneling through the Lambeth Group and explained that there would be opportunities for input into the design of the permanent foreshore structure. Therefore we continued to liaise with the Royal Borough of Kensington and Chelsea planning and design officers and English Heritage to develop the design and design principles to accommodate their aspirations for the new area of public realm on the foreshore structure.



Figure 15.29: Design development study model showing how pedestrian access to lower level could be achieved

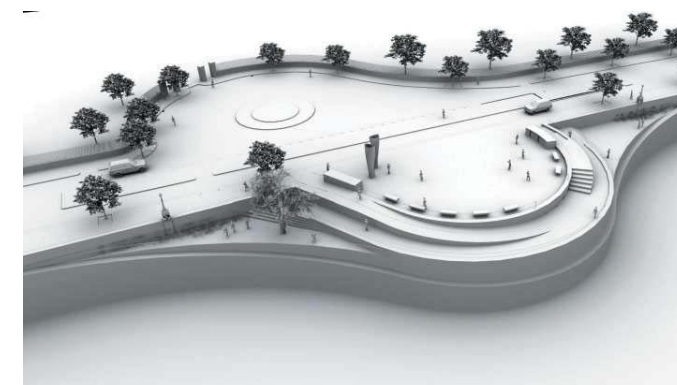


Figure 15.30: Design development study model showing how pedestrian access to lower level could be achieved

15.3.28 In order to demonstrate alternative proposals that could work within the zones for the permanent works defined on the site works parameter plan, we produced a sketch of an alternative design that included a floodable area of public realm. This alternative design remains an option that could be agreed with the Royal Borough of Kensington and Chelsea and English Heritage at a later stage.

July 2012

Section 48 publicity

15.3.29 In response to phase two consultation, we made a number of minor amendments to refine and simplify the design and reinforce the design objectives as follows:

- a. We reduced the proposed paved area in the Bull Ring and omitted the pedestrian refuges in order to reduce visual clutter and for highway safety reasons. We adopted a more modern and graphic paving layout.
- b. We incorporated the electrical and control kiosks into the parapet of the river wall to reduce visual clutter.
- c. We replaced the circular grass and flower bed in the Bull Ring to reinforce the link between the Bull Ring and the foreshore structure.

15.3.30 The Royal Borough of Kensington and Chelsea response included the following new design-related comments:

- a. The council strongly supports the notion of the ventilation columns as the project's signature structure encourages the design team to re-cast the structures as public art or to incorporate public art.
- b. The use of granite setts is a key feature of the design and must be retained in subsequent design phases to ensure the quality of the scheme. The unit size, colour and patterned layout need finessing.
- c. The adjacent footpaths on Chelsea Embankment should be resurfaced with York Stone to complement the quality of the materials used for the new public space on the foreshore structure, particularly around the entrance to the RHC Gardens.
- d. Information is needed on the design of the new side gates for the utility services entrance to Ranelagh Gardens to ensure that it complements the existing garden wall.
- e. The proposed intertidal reed beds would provide added visual interest and soften the incursion of the foreshore structure into the River Thames at low-tide, although this contribution is limited.
- f. The design and location of the access ladders to the foreshore structure need to be clarified in order to minimise any visual clutter.

g. The council welcomes the fact that the scheme architects have sought to design a new public space that is low key and celebrates the axial alignment of the RHC and its gardens. However, this must be weighed against the disruption to the characteristic linearity of the embankment wall and the foreshore.

15.3.31 English Heritage dropped its objection to the use of Chelsea Embankment Foreshore and asked to be included in any further discussions with the Royal Borough of Kensington and Chelsea in relation to the design of the site.

15.3.32 There were no further significant design developments at this site following Section 48 publicity.



Figure 15.31: Proposed view from Section 48 publicity

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15.4 Proposed design

13.4.1 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

15.4.2 The Site works parameter plan defines the zones in which the proposed works would be carried out. The plan also indicates the maximum and minimum height of the proposed above-ground structures.

15.4.3 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..

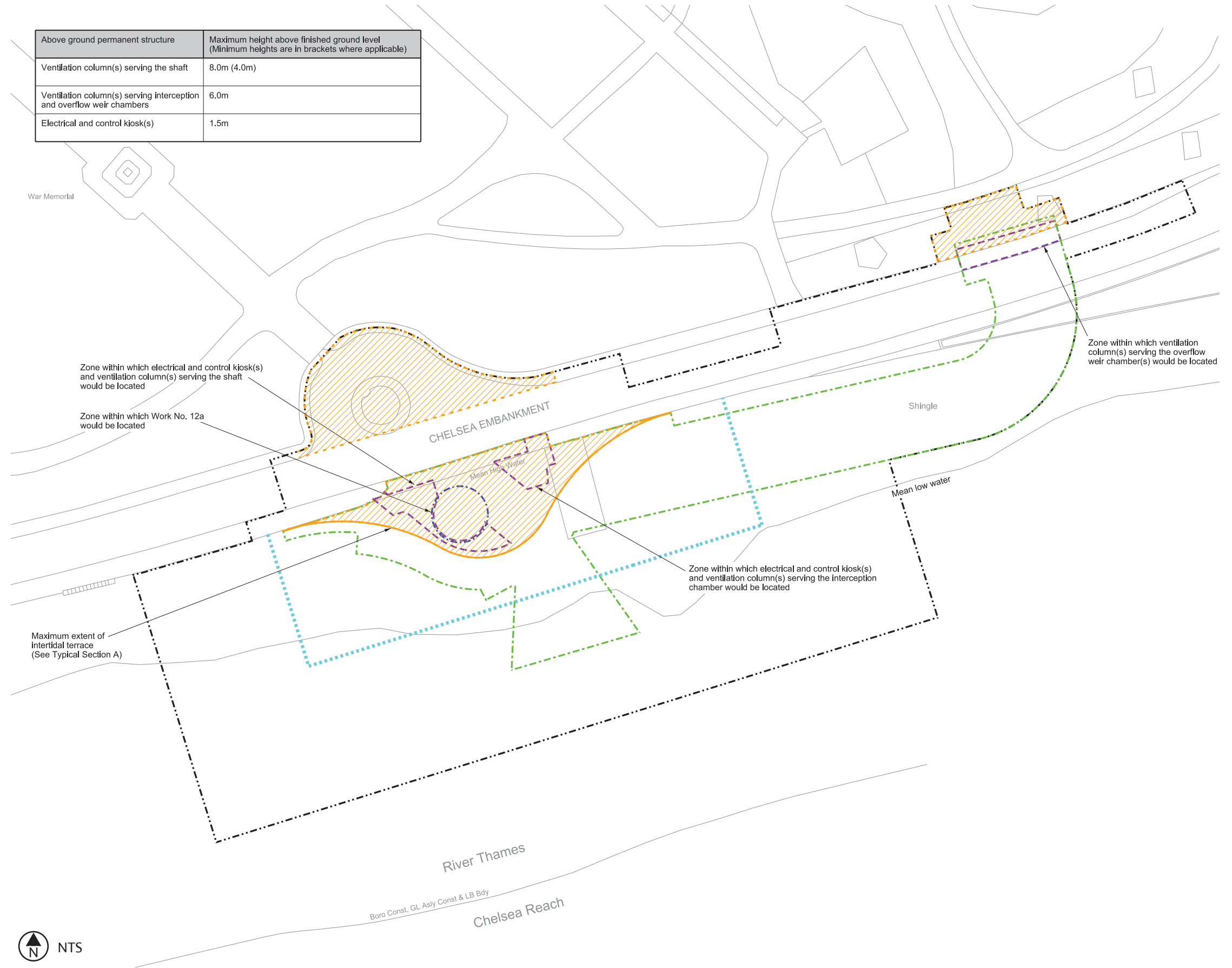


Figure 15.32: Site works parameter plan - refer to Site works parameter plan in the *Book of Plans*

Design objectives

15.4.4 The proposed foreshore structure would create new land, which would be used as an area of public realm. The main driver behind the development of the illustrative designs for this site was to explore ways in which the structure could integrate with and contribute positively to its riparian environment. Our main objectives included:

- a. Position the foreshore structure where it could contribute positively to the setting of the embankment, Chelsea Bridge, the RHC and Ranelagh Gardens.
- b. Create a visual link and open up views between the RHC and the riverfront through the careful selection of materials and a striking paving pattern, which would visually unify the Bull Ring and the foreshore structure. This objective reflects *Core Strategy* Policies CL3, CL4, CE2 and saved UDP Policy CD8.
- c. Create a clutter-free, simple and elegant space with a fitting stature for the context of the site.
- d. Blend the foreshore structure, particularly the new section of river wall into its existing context through sensitive detailing and selection of materials.



Figure 15.33: Proposed view of foreshore structure



Figure 15.34: Proposed landscape reinstatement works over the connection to the northern Low Level Sewer No 1 - refer to Proposed landscape plan sheet 2 of 2 in the *Book of Plans*

Use and programme

15.4.5 A predominantly open site here could be used flexibly and would cater to a range of potential future needs. The new space would be south-facing and its proximity to the open spaces of the River Thames would make it an attractive place for informal relaxation and enjoyment of the surroundings for pedestrians passing along Chelsea Embankment – a stopping point on the Thames Path.

15.4.6 It would be a convenient pedestrian assembly point during major events at the RHC and Ranelagh Gardens. The proposed public realm could also provide an ancillary space to complement the Chelsea Flower Show and other events.

15.4.7 Other year-round potential uses could include temporary art exhibitions or stalls. Users of Battersea Park might also walk across Chelsea Bridge to enjoy the range of views and the vista of the Royal Hospital. A signpost or board could describe local attractions, such as the RHC and the Physic Garden. These uses would be compatible with *Core Strategy Policy CT1* and *UDP Policy CD9*.

Connection to the northern Low Level Sewer No.1 in Ranelagh Gardens

15.4.8 In order to connect to the northern Low Level Sewer No. 1, which runs under the carriageway of Chelsea Embankment, it is necessary to divert certain utilities into Ranelagh Gardens. This would involve the temporary removal of a short section of the boundary wall, railings and several trees. On completion of the works the area would be reinstated in keeping with the Grade II registered park and garden and the footpath and carriageway of Chelsea Embankment.

15.4.9 The brick dwarf wall and piers would be reconstructed to match the existing. The railings above the wall would be reinstated with a new access gate to match the existing railings to enable utility companies to access their diverted assets for maintenance purposes.

Foreshore structure and works to the Bull Ring

15.4.10 A foreshore structure is required to enclose the CSO drop shaft, CSO interception chamber, valve chambers and the new CSO outfall. The structure would form an area of public realm at pavement level with a lower terraced area flowing around its river-facing sides.

15.4.11 The aim of the design at pavement level was to reinstate the link between the RHC and the River Thames, which was lost when the river frontage was in-filled during construction of the Chelsea Embankment. In addition, we sought to open up views between the two along the axis formed by Monument Walk. The busy road along Chelsea Embankment interrupts the historic connection of the RHC with the river frontage. We explored a single surface/table top approach in order to reunite the RHC with the River Thames; however, we considered that this approach was not feasible in view of the traffic speeds that must be accommodated safely on a Transport for London Road Network road. Therefore we proposed to use shapes and paving materials to make a purely visual connection.

15.4.12 The shape of the area of public realm on the foreshore structure was designed to reflect the 'oval' shape of the Bull Ring. We propose to strengthen the link between the Bull Ring and the foreshore structure by realigning the kerb lines within the Bull Ring. Sharper corners would direct the eye to the link between the parapet walls around the foreshore structure without the need for the banded paving design proposed at phase two consultation. The curved shape is also reminiscent of various carriage-turning areas that project into the River Thames along the Hammersmith stretch of the river.

15.4.13 The realignment of the kerbs was subject to a computerised vehicle tracking analysis. In particular, we modelled the paths of buses pulling into the bus stop in the Bull Ring and large lorries entering/exiting the Bull Ring Gate. The tracking showed that these manoeuvres would be possible once the kerbs are realigned and the car parking spaces reinstated. The paving treatment of the Bull Ring would be confined to the kerb realignment and works within the carriageway. There would be no physical impact on the listed Bull Ring Gate. The construction



Figure 15.35: Proposed view of foreshore structure along 'axis'



Figure 15.36: Proposed view of foreshore structure from Chelsea Bridge



Figure 15.37: Proposed view of foreshore structure and ventilation columns

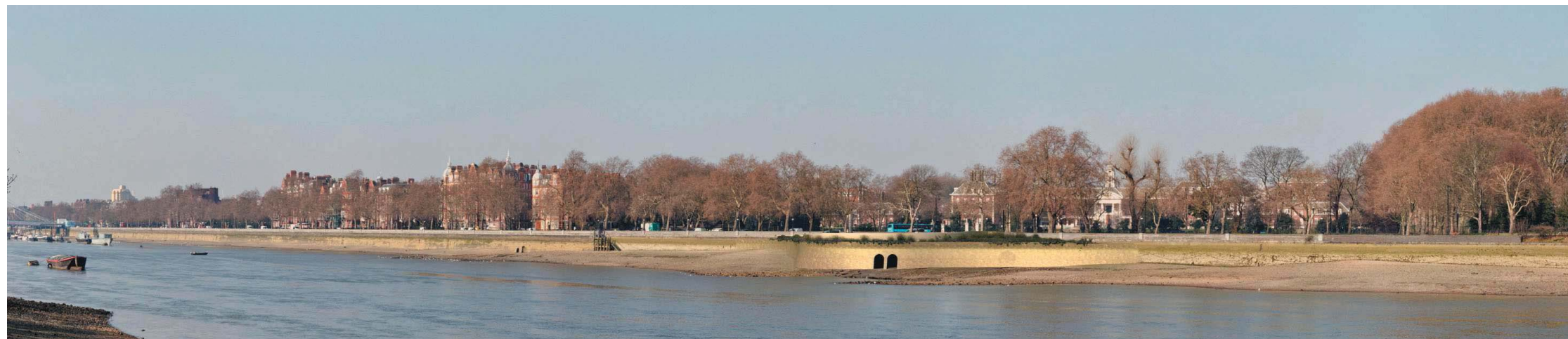


Figure 15.38: Proposed view of foreshore structure from across river

programme could accommodate the needs of users of the RHC grounds and would seek to minimise any suspension of parking bays.

15.4.14 We selected a strong graphic paving layout that immediately links the Bull Ring and the foreshore structure together visually. The floral curves of the illustrative pattern reference the Chelsea Flower Show. The curves also serve to disguise the fact that the oval surface of the foreshore structure would not perfectly align with the Monument Walk axis due to existing constraints. The final pattern would be agreed at a later stage.

15.4.15 We propose to further emphasise the link between the Bull Ring and the foreshore structure with a lozenge-shaped area of paving on either side that would be broken across the Chelsea Embankment carriageway. The paved area would be flush with the surface on the foreshore side and raised on the Bull Ring side to replicate the traffic function of the circular grass and flower bed in the Bull Ring.

15.4.16 Additional tree planting on the foreshore structure and the Bull Ring would give a vertical dimension to the space and reinforce the idea that this is a unified space or 'room' along the embankment. We propose to break the line of London Plane trees along the embankment around the area by not replacing one tree on the Monument Walk axis. This would open up views from the RHC along Monument Walk to the River Thames and help to re-establish the link between the two. At the time of writing the tree we proposed to omit had already been removed by others, although it is possible that it would be replaced before the project works commence.

15.4.17 Seating could be provided in the form of a simple stone bench parallel to but set back from the new parapet wall. The bench would break around the Monument Walk axis.

15.4.18 The lower terraces and new section of river wall would serve two purposes. Firstly, they would conceal the Ranelagh CSO interception chamber, which would sit below the design flood level in order to reduce encroachment into the foreshore. Secondly, the sweeping curved shape of the wall would help to blend the projecting structure into the existing river wall and reduce the apparent height of the projection.

Layout and massing of the river wall and intertidal terraces

15.4.19 The intertidal terraces on the new section of river wall would perform several important functions. The location of the terraces was determined by the location of the existing Ranelagh CSO and our design objective to reinstate the link between the RHC and the River Thames, reflect the shape of the Bull Ring, and create a smooth transition between the existing river wall and the foreshore structure.

15.4.20 Flow from the existing CSO would be diverted into a CSO interception chamber via a low-level connection culvert, which enabled us to maintain the 'oval' geometry of the area of public realm at street level. Terraces planted with native intertidal riverine species could be constructed over the top of the low level culvert. Similar terracing on the upstream side of the foreshore structure would make it symmetrical around the Monument Walk axis, which is appropriate to the location.

15.4.21 In addition to 'hiding' the connection culvert, the terraces would blend the foreshore structure into the long sweep of the river wall in this location. The new brick section of river wall would match the brickwork of the existing wall and be keyed into it with sweeping curves that would make it difficult to distinguish the join between the old and the new. It would appear as if the stone parapet wall around the oval area of public realm 'pushes' or 'peels' out the brick wall below.

15.4.22 In order to reinforce this illusion, the wall up to the intertidal terraces would be at the same height as the existing brick river wall. The terraces would in fact be too high to be inundated with water from above as with true intertidal habitat; however, the height is a compromise between the needs of aquatic ecology and the historic environment and townscape.

15.4.23 The planting in the riparian zone is also consistent with the treatment of Chelsea Embankment Gardens on either side of the abutment of Chelsea Bridge.

Navigational issues

15.4.24 The foreshore structure would sit approximately 40m outside of the authorised navigation channel in the River Thames and therefore would not significantly impact on navigation for large boat users.

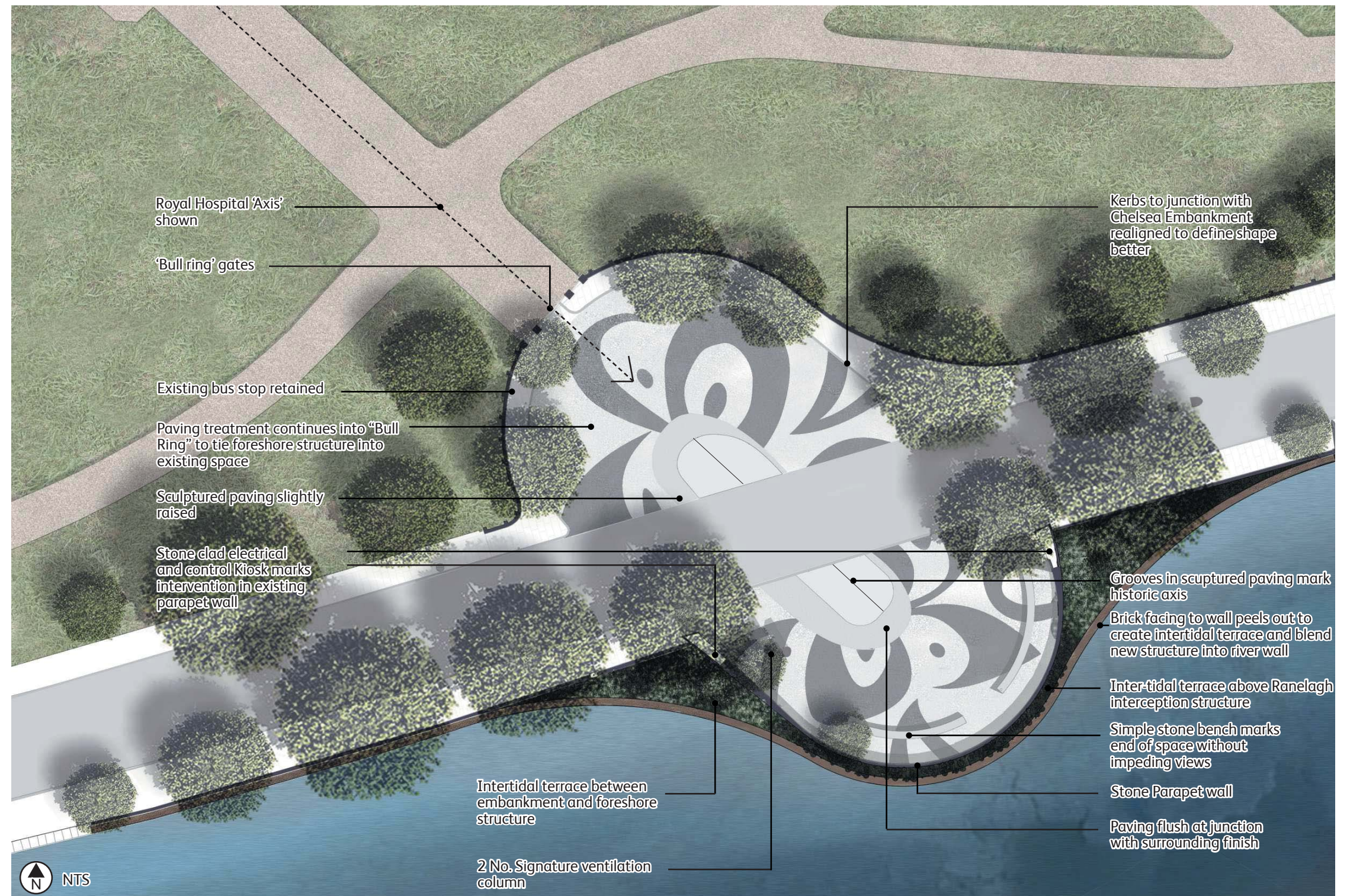


Figure 15.39: Proposed landscape plan

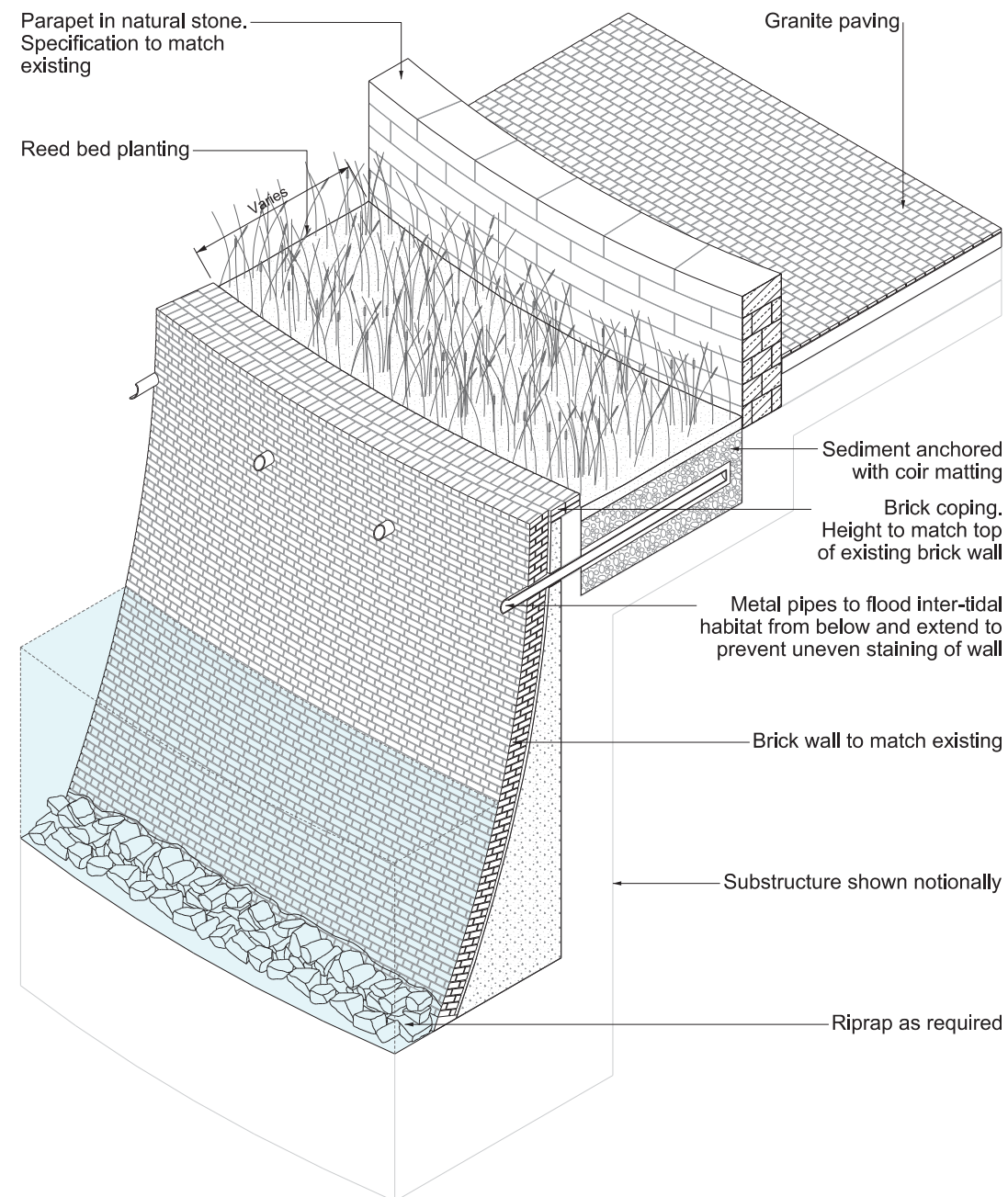


Figure 15.40: Proposed isometric section of foreshore structure (not to scale) - refer to Typical river wall design intent in the Book of plans



Figure 15.41: Example of 'rip rap scour protection'

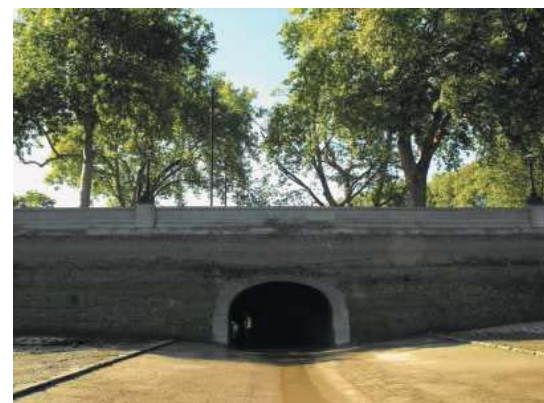


Figure 15.42: Existing Ranelagh CSO and apron



Figure 15.43: River wall showing Parish Boundary marker

15.4.25 The mean low water line lies approximately 20m from the existing river wall and at low tide a large area of the foreshore is exposed. As a result, the structure would only affect small boat users at high tide.

15.4.26 As part of our design development process, we investigated whether there was a need for a passenger jetty off the structure. No such need was identified and we noted that, given the distance from the structure to the low water line, the jetty would need to extend a long way into the river. Our proposals do not preclude the future construction of a jetty by others.

River walls

15.4.27 The foreshore structure was designed to blend into its context. The surrounding new section of river wall was designed to mimic the cross-section and materials of the existing wall. The existing wall comprises a lower brick section of wall topped by a stone parapet. The brick wall features a curved batter to help reduce wash from passing river traffic. The parapet is a continuation of the parapet on the listed section of the river wall to the west.

15.4.28 In order to blend the foreshore structure into the lower brick section of the wall, the new wall would simply 'peel' out of the existing alignment and continue at the same height around the structure. The new section of wall would be topped by a brick coping to strengthen the continuation of the line of the wall. The foreshore structure would be topped by a stone parapet; however, rather than following the alignment of the lower brick section of wall, it would be aligned to create a new oval area of public realm at street level that would reflect the shape of the Bull Ring.

15.4.29 The new section of wall would form part of the flood defences along this stretch of the River Thames and would stand at 106m Above Tunnel Datum (ATD), which is the same height as the existing parapet and higher than the statutory flood defence level of 105.41m ATD. The parapet would stand 1.1m above the local ground level, which is an appropriate height for a safe balustrade that anticipates the required raise of the flood defence walls to meet the Thames Estuary 2100 flood defence levels.

15.4.30 We assume that in future the flood walls along Chelsea Embankment will be raised to meet the Environment Agency's requirements. We have anticipated this by specifying that the structural design for the stone parapet could be raised to 106.35m ATD by the year 2100. The parapet would then stand approximately 1.45m above the local ground level.

15.4.31 An existing marker for the parish boundary is inscribed into the stone of the river wall. The location of the parish boundary was historically influenced by the location of the River Westbourne. The marker would be obscured by the foreshore structure. We therefore propose to inscribe a similar parish boundary marker on the new stone parapet to recognise its historical significance.

CSO

15.4.32 The existing CSO is housed in an arch-shaped opening in the river wall and the associated flap valves are recessed into the wall. Providing a single large new CSO outfall similar to the existing would look incongruous with the size and curved shape of the foreshore structure, especially in views along the river from Chelsea Bridge. Therefore we propose to provide two smaller three-pointed arches in the wall of the foreshore structure.

15.4.33 The river wall at the outfall location sits at an angle of approximately 45 degrees to the River Thames. Setting the flap valves back into the wall enables them to discharge perpendicular to the river, which is important for their functioning and continued maintenance. The recessed flap valves would require additional surface-level access covers for maintenance purposes.

Apron and scour protection

15.4.34 The Ranelagh CSO's existing scour protection apron would be broken out once the flow is diverted. A new apron would be formed in front of the new CSO using rip-rap under a layer of foreshore sediments.

15.4.35 Scour protection may also be required at the base of the river walls, which would also be created with rip-rap. The maximum extent of this work is defined on the site works parameter plan as the zone in which all the permanent structures would be located.

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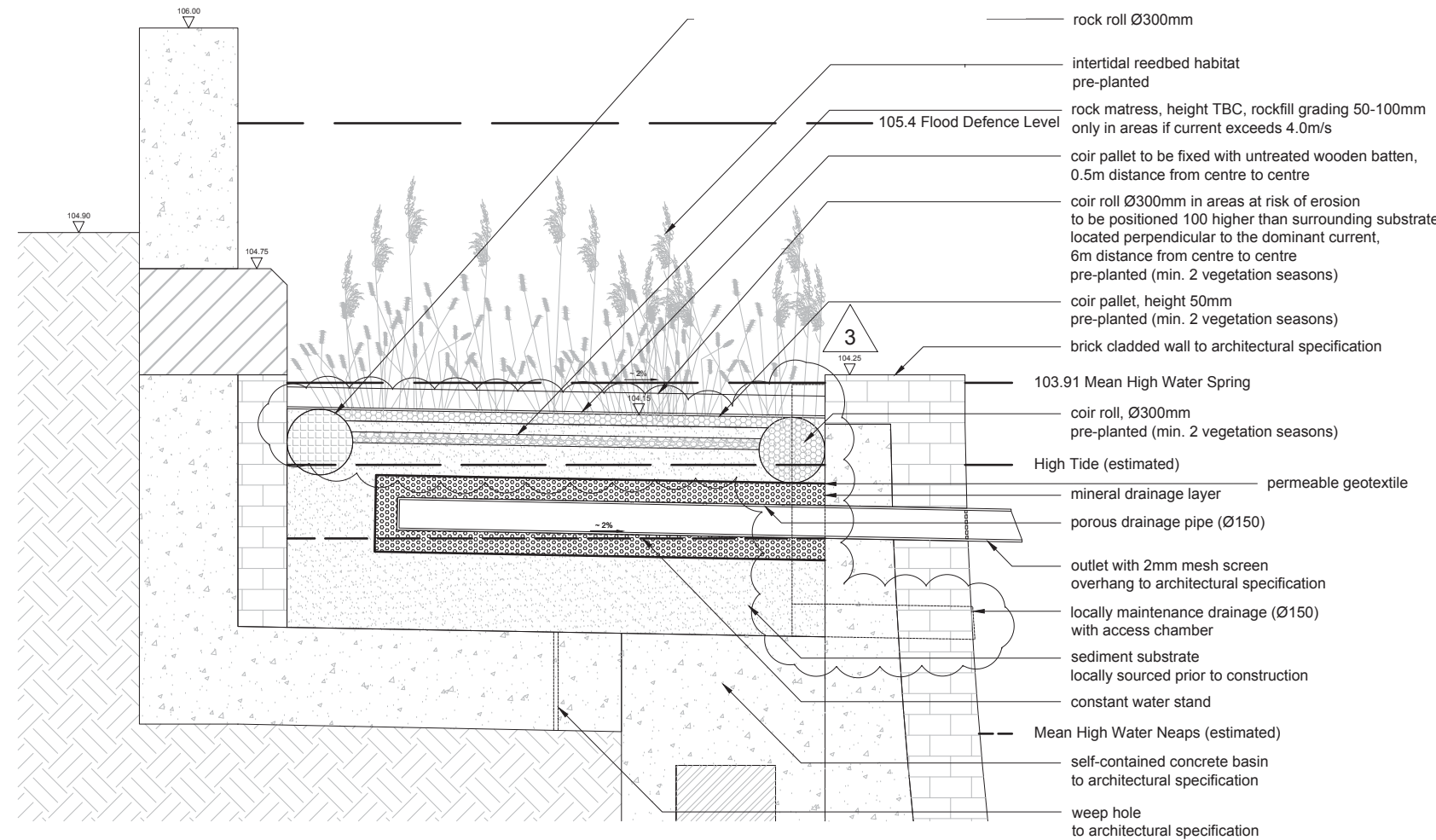


Figure 15.44: Proposed section through terrace (not to scale)



Figure 15.45: Terrace planting - Aster tripolium



Figure 15.46: Terrace planting - Bolboschoenus maritimus



Figure 15.47: Terrace planting - Plantago maritima



Figure 15.48: Terrace planting - Puccinellia distans



Figure 15.49: Terrace planting - Juncus gerardii



Figure 15.50: Terrace planting - Juncus maritimus



Figure 15.51: Terrace planting - Phragmites australis

Ecological design of the intertidal terraces

15.4.36 The design of the intertidal terraces consists of self-contained basins integrated into the new section of river wall between the lower brick section and the stone parapet. We consider that an intertidal reed bed habitat would be the most likely to successfully establish since it would only require periodic, short-term inundation to maintain an appropriate environment. The reed beds provide an opportunity to enhance the Site of Nature Conservation Importance and would comply with Core Strategy Policy CE4.

15.4.37 The basins would feature perforated pipes running from the river to the rear of the basins approximately 400mm above the base of the basin and angled down towards the river at an approximate gradient of 1:7 to facilitate drainage when the tide recedes. We propose to include a layer of gravel protected with a geotextile around the inlet pipe to ensure free movement of water and to separate the pipe from the sediment in the basins. The gravel layer would help to reduce the build-up of stagnant water; however, it would also retain up to 400mm of water after each tide. The whole terrace would be filled with sediment substrate, which would be sourced locally prior to construction, including sediment removed from the River Thames at the site of the interception structure.

15.4.38 Coir pallets planted with locally-sourced native reed bed species pre-grown for a minimum of two vegetation seasons would be introduced to the top of the sediment substrate. Pre-planted coir rolls held in place with untreated wooden battens would provide added protection against erosion. In areas susceptible to erosion, additional rock mattresses and rock rolls would be introduced to protect the sediments.

15.4.39 Regular litter removal would be essential to the establishment and growth of the planting and the visual appearance of the site. Every five to ten years, the vegetation around the inlet pipes would need to be partially cleared back to prevent blockages. Vegetation development would need to be regularly monitored; we anticipate that two site visits per season by an ecologist would be adequate. Some species would need to be controlled by cutting them back at the base of the stem and others replanted. Monitoring would need to continue for at least five years following planting.

Historical interpretation

15.4.40 The form and location of the design were developed to underpin the interesting history of the area. 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 the history of the site and the River Thames, in line with Core Strategy Policy CR5.

Integration of the functional components

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

- a. a CSO drop shaft
- b. a connection tunnel
- c. a CSO interception chamber
- d. an overflow weir chamber
- e. connection culverts
- f. valve chambers
- g. an air treatment chamber
- h. CSO overflow structures and a protective foreshore apron
- i. associated hydraulic structures, culverts, pipes and ducts.

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

- a. the foreshore structure surrounded by a new section of river wall
- b. two signature ventilation columns on the foreshore structure
- c. one ventilation column on the southern footpath of Chelsea Embankment
- d. one ventilation column on the northern footpath of Chelsea Embankment
- e. two electrical and control kiosks.

15.4.43 The CSO drop shaft would be approximately 12m in internal diameter. It would be connected to the main tunnel via a short connection tunnel.

15.4.44 The overflow weir chamber would sit on the line of the existing northern Low Level Sewer No. 1 adjacent to Ranelagh Gardens. It would be connected to the CSO drop shaft via the connection culvert.

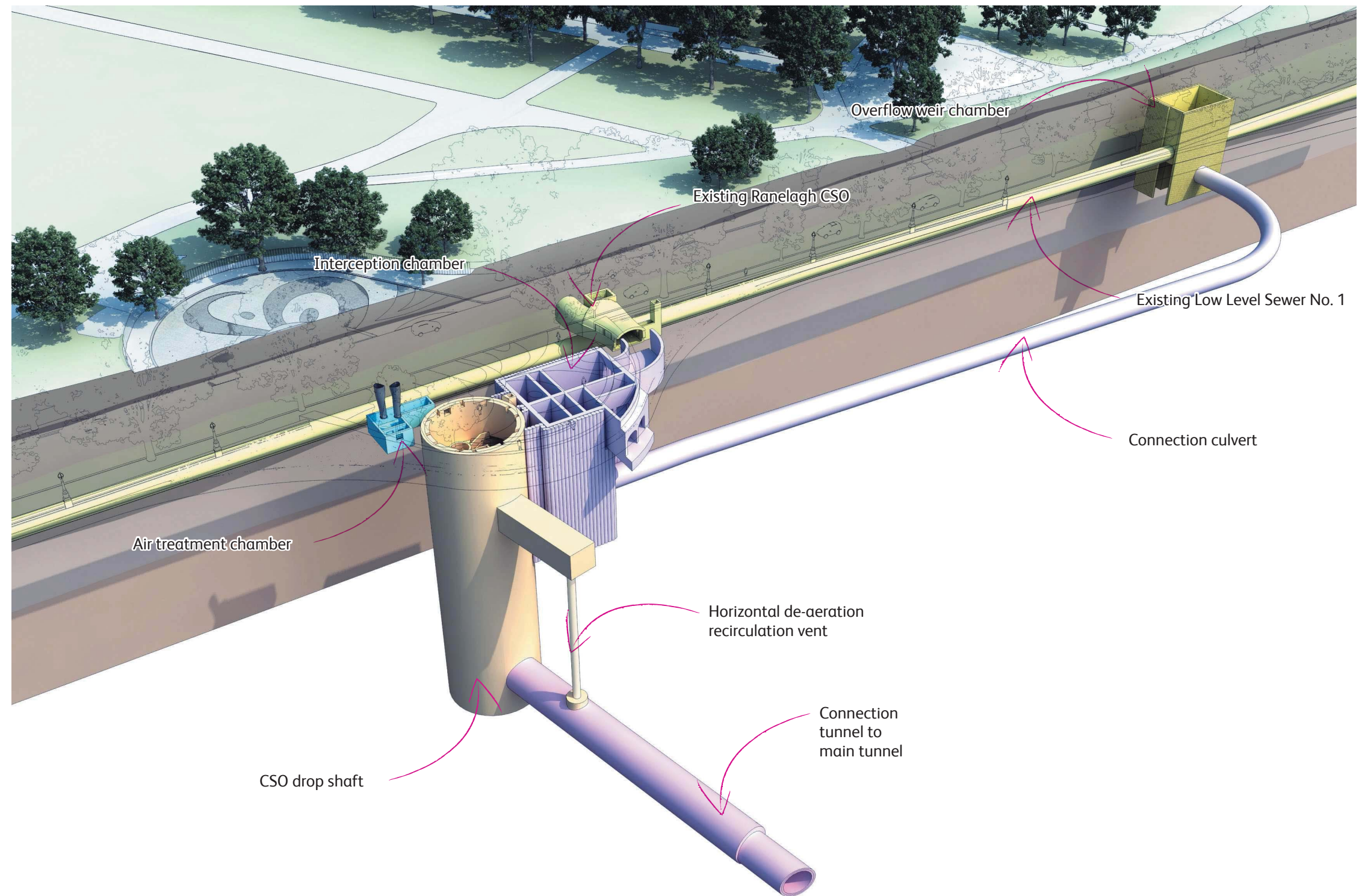


Figure 15.52: Proposed functional components diagram: below ground view



Figure 15.53: Proposed functional components diagram: above ground view

Ventilation columns

15.4.45 The number and size of the ventilation columns is determined by the air management requirements for the site. We propose to incorporate two ventilation columns on the foreshore structure to serve the CSO drop shaft and associated below-ground passive filter chamber. The columns would be minimum 4m to maximum 8m high and feature the project's 'signature' design. We also propose two smaller diameter 6m high columns: one to serve the CSO interception chamber on the southern footpath next to the proposed foreshore structure; and the other to serve the overflow weir chamber of the northern Low Level Sewer No.1 on the northern footpath next to Ranelagh Gardens.

15.4.46 There is scope to position the ventilation columns in various locations around the site, as indicated by the purple polygon on the site works parameter plan. The columns would be positioned to minimise any obstruction of movement or views and could incorporate interpretive historical material.

Electrical and control kiosks

15.4.47 In order to limit visual clutter, we divided the electrical and control equipment between two kiosks that would sit at either end of the stone parapet in a new section of river wall. The wall would rise and thicken at the ends to accommodate the required depth and height of the kiosks.

15.4.48 The kiosks would be clad in natural stone faced with brick to match the parapet. They would mark the new intervention in the Victorian river wall in a modern and elegant way and allude to Wren's lost summer houses.

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

Lighting design

15.4.50 We developed an illustrative lighting design in line with the high level design objectives for the site to illustrate how the permanent works might appear at night. At present there is not much light beyond the river wall; Chelsea Embankment is lit with a strong band of lighting from the Lion's Foot lamp standards and street lamps in contrast with the dark river wall and foliage of the London Plane trees in views along the river. Chelsea and Albert Bridges are attractively lit and frame this section of the River Thames providing an important night time feature along this dark section of the river

15.4.51 We considered it important to respect the line and spacing of the Lion's Foot lamp standards along the embankment. The standards form the 'outer edge' of the lighting on the embankment and we considered that any lighting beyond them towards the river should be subtle and understated in order to maintain views and avoid any effect on aquatic ecology.

15.4.52 All the proposed LED lighting fixtures on the foreshore structure would sit at low level and be incorporated into the seating area and river wall. The lighting would be both decorative and functional. It would provide just enough light to create a safe environment that would not encourage antisocial behaviour.

15.4.53 The base of the signature ventilation columns would be highlighted with a low level collar of LED lights, which would wash the base of the columns with a subtle light.

15.4.54 In addition to the lighting on the foreshore structure, we would reinstate highway column lighting on the Chelsea Embankment Red Route. At present, one existing column falls within the Monument Walk axis and would need to be relocated while ensuring that the spacing between the columns remains regular.

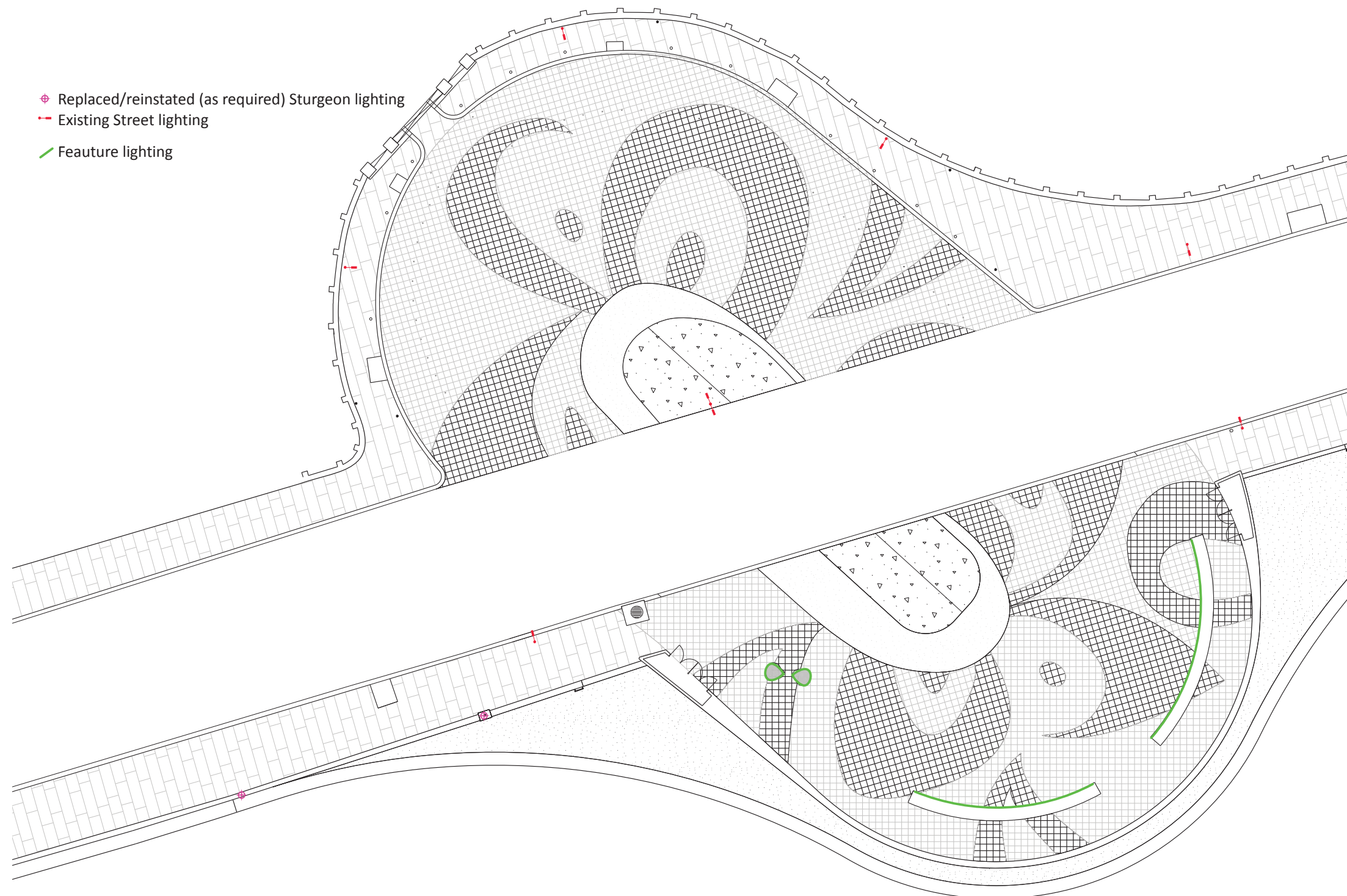


Figure 15.54: Proposed lighting scheme



Figure 15.55: Lighting incorporated into seating

Landscaping and appearance

15.4.55 The main character areas of the landscape design are Ranelagh Gardens, the new public space on the foreshore structure, the Bull Ring and the intertidal terraces.

15.4.56 Proposed planting around the diversion works in Ranelagh Gardens would consist of native species. The planting would reinstate the thick green southern boundary of the gardens with Chelsea Embankment.

15.4.57 The trees removed in the footpath of Chelsea Embankment would be replaced with new semi-mature London Plane trees in slightly reconfigured locations around the new low level interception chamber. The surfacing of the footpath and carriageway would be reinstated with materials to match the existing.

15.4.58 We propose to break the line of London Plane trees along the embankment around the new foreshore area by not replacing one tree on the Monument Walk axis (this tree had been felled at the time of writing). This would open up and enable views from the RHC along Monument Walk to the river and help re-establish the link between them.

Hard landscape palette

15.4.59 The proposed hard landscape materials and furniture palette uses traditional high quality materials in a contemporary manner and acknowledges *Core Strategy* Policies CL1, CL2 and CL4. The hard surface materials would be fit-for-purpose and appropriate to the setting in order to ensure long-term quality.

a. Light/silver grey and dark grey flamed granite setts would be used to define the floral paving pattern to visually unify the Bull Ring and the foreshore structure.

b. The granite parapet wall would match the existing wall with contemporary detailing and no corncing.

c. A large, robust, curved granite bench with clean, simple lines would blend into the public realm. It would provide seating while ensuring that the space remains uncluttered and fits the historic context of the site.

d. Where possible, reclaimed bricks would be re-used to construct the new brick section of the river wall. They would be supplemented where necessary supplement with new brick. New bricks could be stained to ensure that they tie in with the existing as far as possible.

e. Granite kerb stones would be used to tie in with the existing and to maintain the quality of the materials in the historic environment.

Soft landscape palette

f. We propose to use Yew, a native evergreen, to reinstate the boundary planting within Ranelagh Gardens that would be removed due to the temporary relocation of utilities. Yew is shade-tolerant and ties in with the existing planting in the area.

g. We propose to plant two semi-mature trees: one *Platanus x hispanica* (London Plane) within the Bull Ring and one *Acer platanoides* 'Schwedleri' (Norway Maple) on the foreshore structure to reinforce the oval shape of the proposed area of public realm.

h. Three further semi-mature *Platanus x hispanica* (London Plane) would be planted along the Chelsea Embankment footpath to replace trees that would be removed to accommodate the low level interception works.

i. The intertidal reed beds would be planted with *Phragmites australis*, *Typha angustifolia* and *Sparganium angustifolium*.

j. Stable riverside tree planting species such as the *Salix babylonica* (Weeping Willow).

15.4.60 Contrasting colours and textures of materials would be selected for people with visual impairments. However, the design palette must also respect the historic surroundings.



Figure 15.56: Underlights to bench



Figure 15.57: Enscription in stone

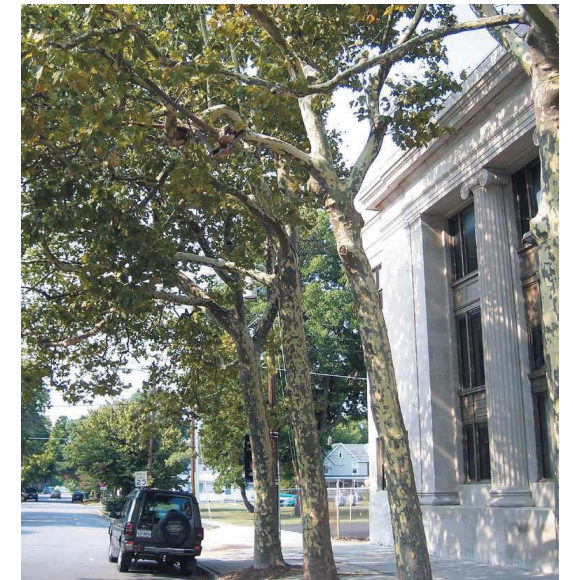


Figure 15.58: Line of London Plane trees



Figure 15.59: Two tone cobbled sets



Figure 15.60: Paving and tarmac



Figure 15.61: Weeping Willow Tree



Figure 15.62: London Plane tree



Figure 15.63: Sculptural bench



Figure 15.64: Paving with graphic pattern

15.5 Access and movement

15.5.1 Vehicle access to the site would be directly from Chelsea Embankment, near the junction with Chelsea Bridge Road.

15.5.2 We understand that a scheduled Transport for London bus service may be introduced along Chelsea Embankment. This service, in conjunction with other development proposals in the wider area, such as the Lots Road Power Station development, would increase accessibility to the site.

15.5.3 The proposed new area of public realm would provide an opportunity for pedestrians to enjoy the historic setting of the RHC and the River Thames, in line with Core Strategy CT1. The Thames Path would be fully reinstated along the southern pavement of Chelsea Embankment.

15.5.4 The illustrative designs of the new area of public realm would comply with the Disability Discrimination Act, except for the intertidal terraces surrounding the foreshore structure. The terraces would not be publicly accessible and it is not possible to provide disabled access without changing the nature of the design.

15.5.5 The intertidal terraces would need to be accessible from the embankment for maintenance purposes. Fixed ladders would be installed on the river-facing side of the river wall. A small, portable step ladder would be required to surmount the stone parapet to reach the fixed ladders. Fixing bolts for a fall restraint system may also be necessary if a portable ground anchor is considered insufficient. No access equipment would be visible above the line of the stone parapet so as not to encourage public access to the terraces.

Thames Water access requirements

15.5.6 Access to the foreshore structure would be via Chelsea Embankment between the mature trees. A crane would be positioned on the foreshore structure and maintenance vans and cranes would park on the kerb.

15.5.7 The northern Low Level Sewer No. 1 overflow weir chamber would be located beneath the eastbound carriageway and footpath of Chelsea Embankment. Equipment for maintenance and inspection purposes would be positioned on the footpath, which

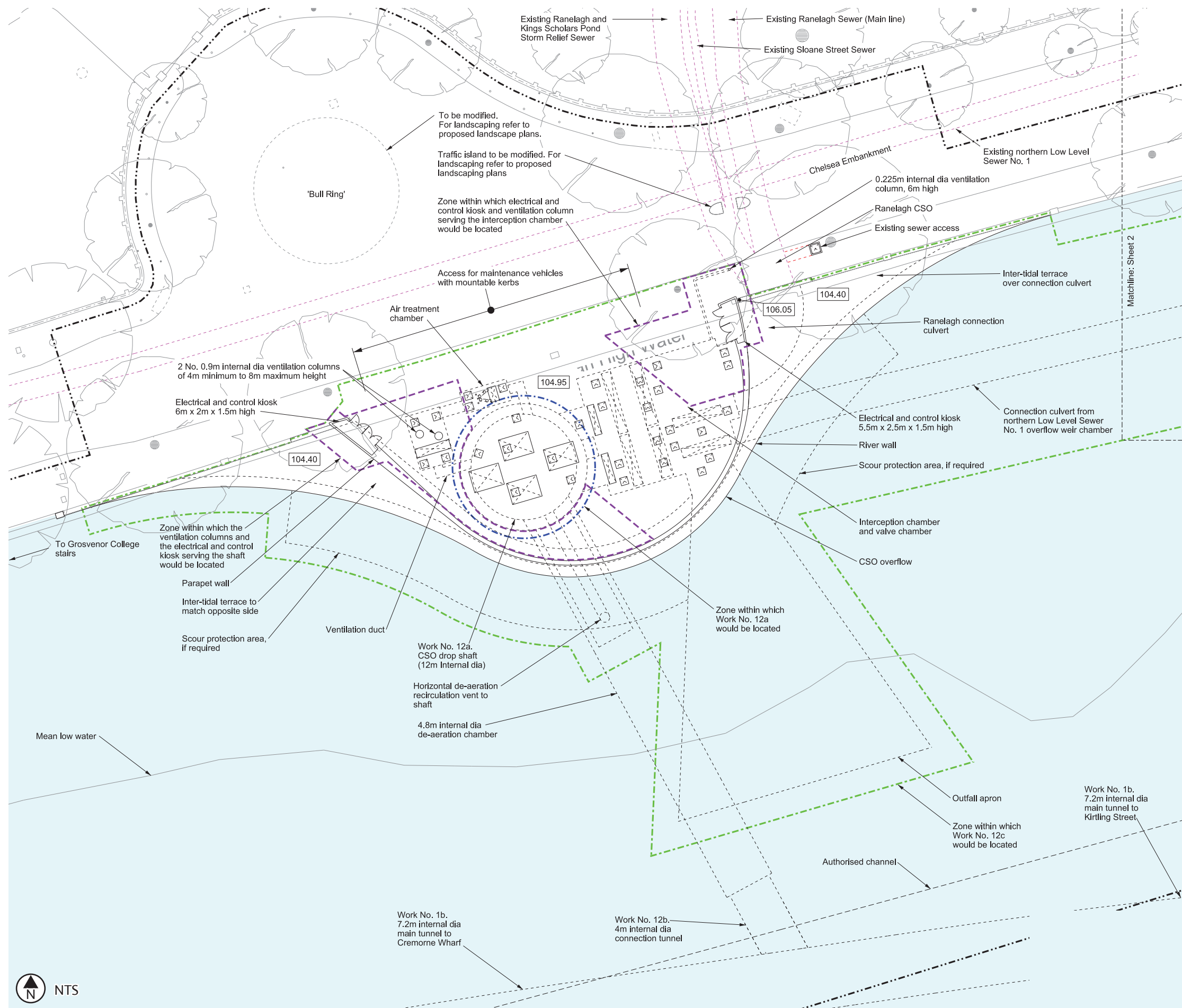


Figure 15.65: Proposed foreshore structure - refer to Permanent works layout sheet 1 of 2 in the Book of Plans

would be temporarily closed and diverted. Several chamber covers that would be accessed infrequently would be positioned in the carriageway for functional reasons. Traffic management would be required to enable access.

15.5.8 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.

15.5.9 It is anticipated that a major internal inspection of the tunnel system and underground structures would be required once every ten years. This process would likely involve a small team of inspection staff and support crew and two mobile cranes to lower the team into the CSO drop shaft. A larger crane could also be positioned on the Chelsea Embankment footpath and the foreshore structure. The footpath would need to be temporarily closed and diverted. Other maintenance vehicles could park at the Bull Ring. The inspection would be carried out during normal working hours and would likely take several weeks.

15.5.10 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.

15.5.11 An access gate would be provided in the Ranelagh Gardens boundary fence to allow utility companies to access and maintain utilities diverted through a short stretch of the gardens directly from the highway.



Figure 15.66: Proposed northern Low Level Sewer No.1 connection - refer to Permanent works layout sheet 2 of 2 in the *Book of Plans*

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