

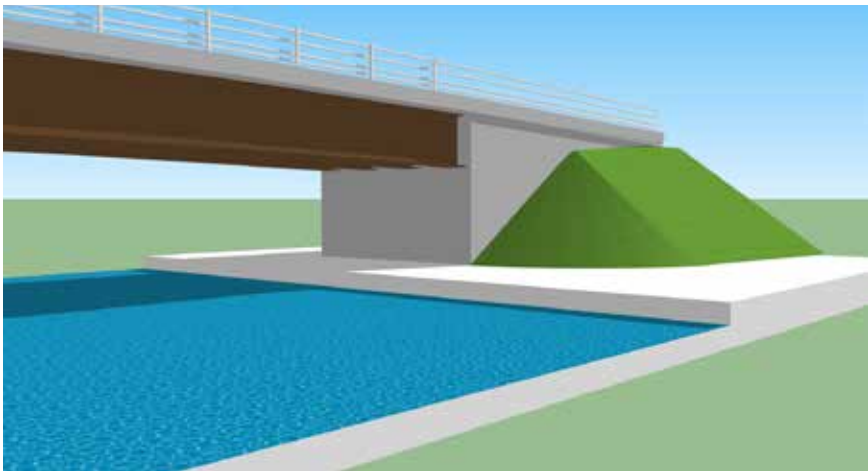


Figure 54. Simple retaining walled abutment (baseline scheme)



Figure 55. Retaining wall with girder extended over the abutment.



Figure 56. Open abutment with earth embankment

17 Abutments

Abutments

- 17.1 Open abutments are often preferable in an open landscape setting as walled abutment structures can block views. A combination of walled and banked abutments is proposed on the eastern ramps with the embankment opening opportunities for planting and screening
- 17.2 The retaining walls of the western bridge abutments will be faced in rock-filled gabion cages.
- 17.3 An open abutment is proposed on the eastern bank of the river at the junction of the main river span with the viaduct structure.
- 17.4 Walled abutments help provide a good fit with surrounding urban built form and bridges, but can heighten the visual effects. The use of walled abutment and embankment minimises effects on The Coal LWS and maximises the retention of trees.

- 17.5 Open abutments to the east contrast with the solid western ramps to create a relatively slender, appearance to the bridge with open views beneath and through the structure.
- 17.6 The deck/ parapet detail continues above and over the abutment allowing the shadow line to reduce the dominance of the abutment; and make the bridge appear longer and more slender.
- 17.7 The parapet railings also extend beyond the abutment walls to reinforce a continuous and sinuous appearance.
- 17.8 The sidewall of the abutment extends up to meet the cantilevered main deck and wraps around the main the girder to create a neat junction.
- 17.9 There is a slight angle to the gabion clad abutments walls that can make the wall appear less dominating, especially next to the footpaths.

Immediate setting

- 17.10 The space around the bridge needs to serve several functions.
 - It is the setting to the bridge / viaduct.
 - It is the foreground in views to the bridge / viaduct and is seen in views from the bridge / viaduct.
 - A 3m strip is also needed for maintenance access to the structure
- 17.11 The structure and it immediate context has been designed so that there is a degree of continuity in the transport corridor and urban river-edge open space.
- 17.12 The space under the viaduct and the bridge has been carefully considered in the concept design phase of the bridge and integrated into the final design of the whole structure.

- 17.13 The design beneath the viaduct has been amended to include the creation of marshy wetland areas and grasses, providing an area for seasonal flooding, and a diverse marshy habitat. The design intention is to allow people to see beneath the viaduct, through to the railway embankment, and discourage public access.
- 17.14 Embankments will be planted.

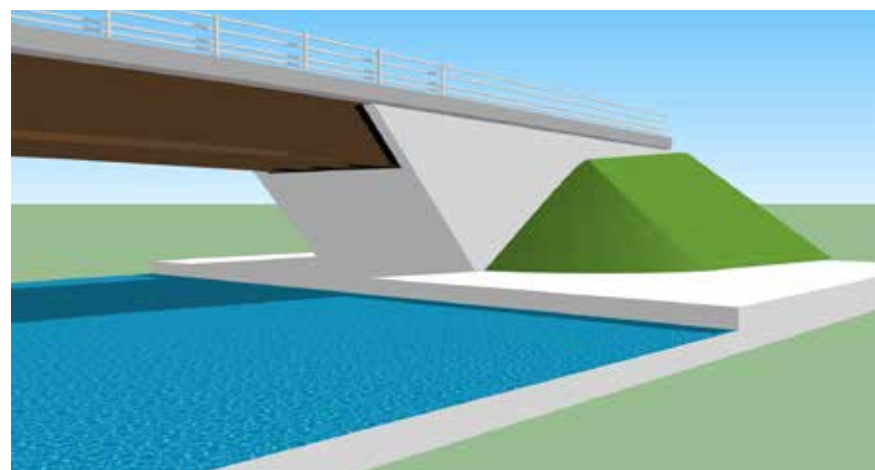


Figure 58. Retaining wall sloping towards the river edge



Figure 59. Retaining wall with sloping abutment walls (preferred scheme)



Figure 60. Retaining wall with column and embankment



Figure 61. Example of a bridge abutment with gabion wall



Figure 57. Elevation/section of proposed scheme viewed from the east bank of the Kennet



Figure 64. Example of flared single column (Image: Stel Construction Info.)



Figure 63. Example of tapered column head



Figure 62. Straight columns (planting indicative)

18 Columns and beams

Girder/beams

- 18.1 The girder cross section is an ‘I’ beam. The vertical as opposed to an angled side to the beam is designed to better catch light and emphasise the shadow of the cantilevered parapet above.
- 18.2 The bridge design has been enhanced by simple but elegant joints in the weathered steel beams at the ends of the spans and along the superstructure to give a continuous horizontal emphasis and ‘blade’ like appearance.
- 18.3 The connection between the shallower viaduct beams and the main tapering and cambered bridge spans has been differentiated with a simple gap. The gap also allows the beams to “breathe” as they expand and contract while the temperature rises and falls.



Figure 65. Tapered column head (planting indicative)

Figure 66. Flared single column (planting indicative)

Bridge span beams

- 18.4 The bridge "I" beams will be formed from weathering steel describing a shallow camber over the River Kennet, that will allow it to mature naturally into the environment. The viaduct columns have been evenly and relatively widely spaced to reduce visual mass and minimise obstruction beneath the structure. There are enough piers to avoid an overly deep beam.
- 18.5 The bearings that transfer the load from weathered steel girders to the pier columns are integrated with the piers rather than designed as a separate, visually unrelated element to avoid additional visual complexity.
- 18.6 The lateral supports are concealed behind and between the 'I' beams to give a continuous linear appearance accentuating the horizontal linear form of the bridge.

- 18.7 Piles and pile caps are needed to support piers in the soft ground. Whilst the pile caps can be formed above ground and create a feature, they also present an aesthetic challenge in that they appear as a heavy base component of the columns.
- 18.8 The piles and caps will therefore be formed completely below ground level to create a clean and crisp appearance with the curved columns travelling directly into the ground.

Surface

- 18.9 The bridge deck and ramp will be segregated into bus, cycle and pedestrian lanes. Kerbs to segregate the bus lanes from the cycle and pedestrian routes.
- 18.10 Kerbs will be precast-formed concrete in light grey.
- 18.11 The cycle and walking routes, together with the carriageway road surface will comprise bituminous bound materials.

Column type

- 18.12 Three types and arrangements of supporting columns were considered:
- Paired straight columns.
 - Pairs of columns with flared capitals.
 - Single, flared columns
- 18.13 These are illustrated in the diagrams above.

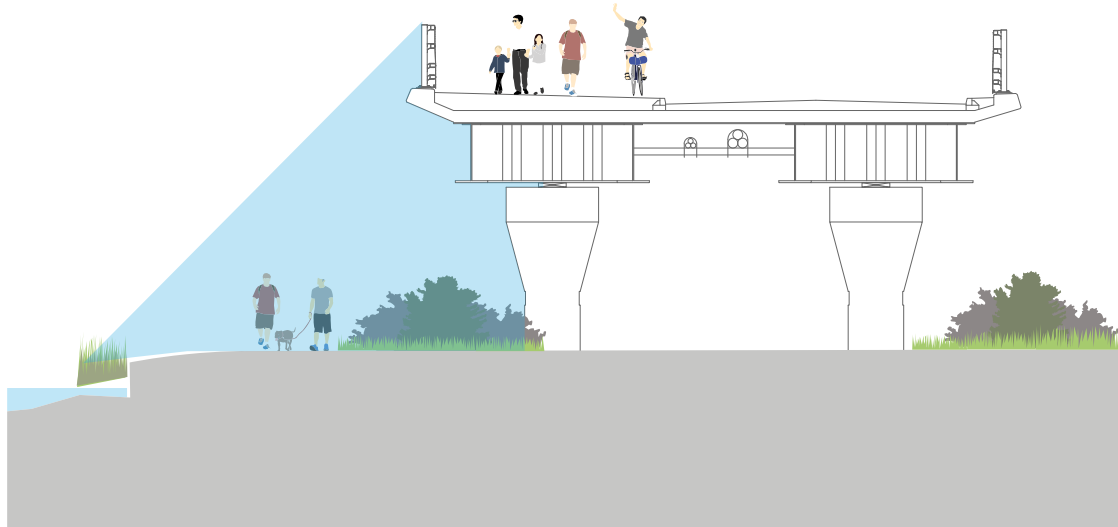


Figure 67. Illustration of the degree of openness along the riverside -original submitted scheme

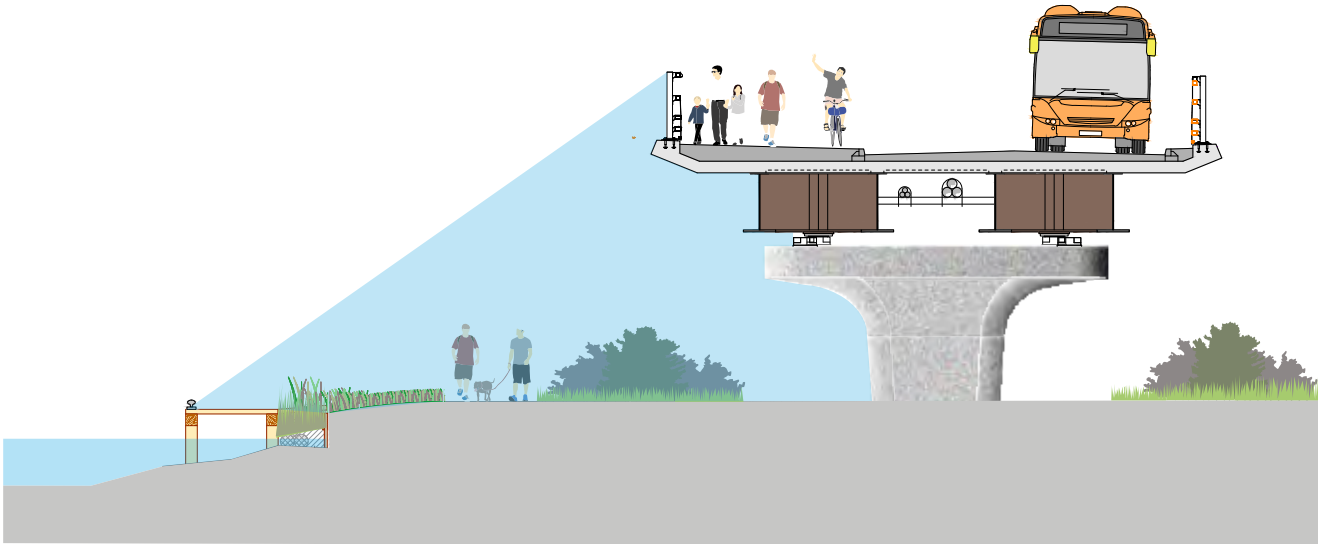


Figure 68. Illustration contrasting the degree of openness along the riverside between the original submitted scheme and proposed submitted scheme



Figure 69. Selected flared single column design

Single columns

- 18.14 The viaduct columns have been changed to a single row of columns in the amended application. This provides the following advantaged:
- A single column creates fewer interruptions in the riverside space.
 - Fewer columns avoids a cluttered appearance and minimises visual obstruction.
 - The single columns pull the structure to the centre line of the route, opening up the riverside space and maximizing direct mid-day light from the south.
 - Single pier units are more simple, reduce the number of elements in the view and allow the superstructure above to become the dominant feature.
 - The main visual column mass is transverse (perpendicular) to the road centreline, presenting the thinnest edge to the side view to emphasise the dominant horizontal element of the girder and deck above.
 - The column shape incorporates curves and ellipses in both plan and elevation providing a softer form.
 - The tapering form adds elegance and interest.
 - The column tapering to a wide top indicates a strong connection between superstructure and pier and a light connection to the ground, rather like a table leg.
 - The taper and flared column capital (headstock) appears elegant and better represents the structural forces acting upon the pier.

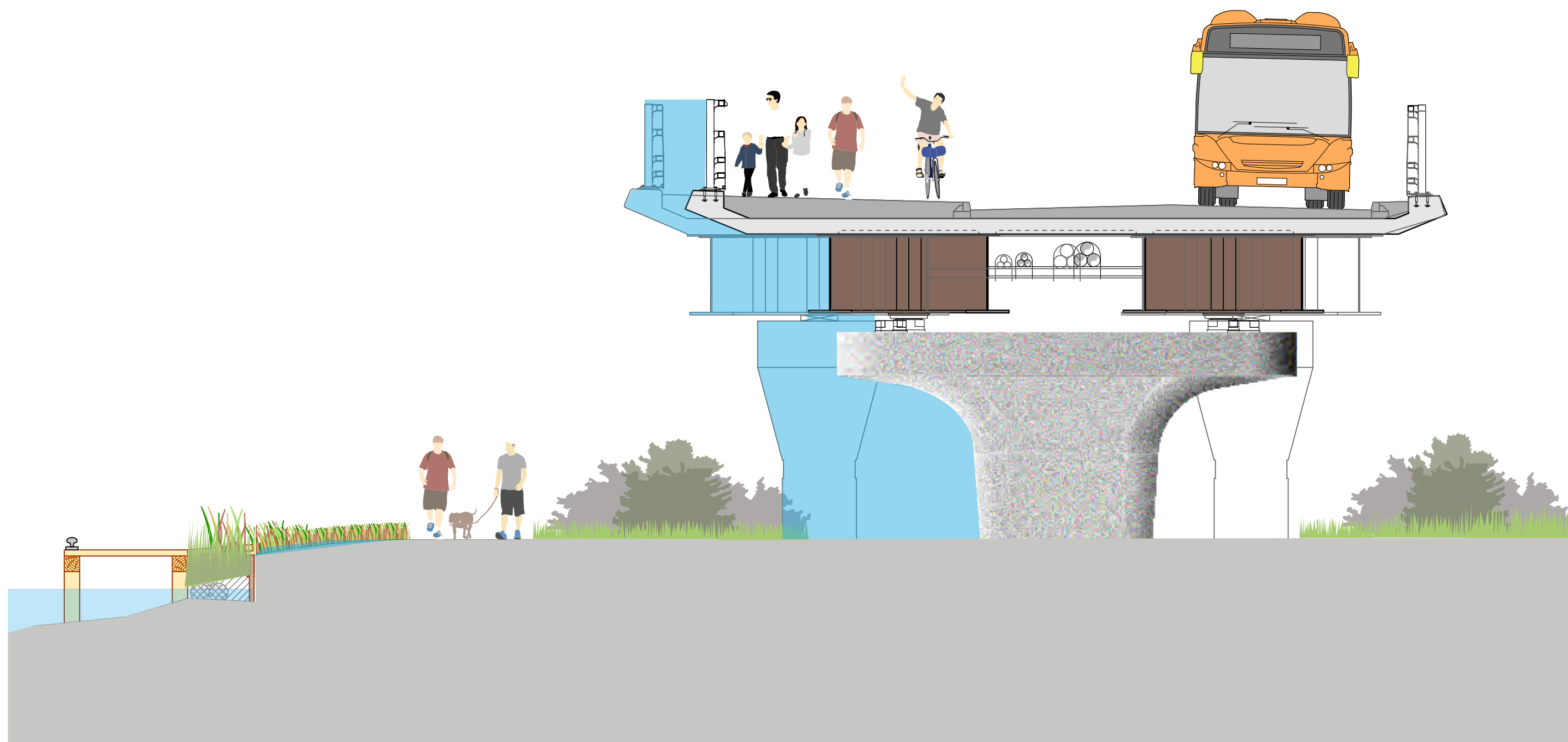


Figure 70. Illustration of the relative degree of openness along the riverside between the original submitted scheme and the proposed revised scheme



Figure 71. Underpass park, Toronto (Toronto Star)



Figure 72. Underpass park, Toronto (Toronto Star)



Figure 73. Playspace at Underpass park, Toronto.



Figure 74. Concept design for Underpass Park, Toronto



Figure 75. Games courts, Underpass park, Toronto



Figure 76. 'Playscape'



Figure 77. Under the Freeway Market, Idaho

19 Undercroft

- 19.1 The design rationale for the bridge is for simple and elegantly engineered structure, not one that is elaborate or decorated.
- 19.2 A number of international examples for the treatment of spaced below road viaducts were considered and illustrated in the photographs opposite.
- 19.3 Whilst railings or fencing enclosing the undercroft may ultimately prove to be necessary (for example to deter anti-social behaviour/rough sleeping), the preferred approach is to leave undercroft open.
- 19.4 The undercroft area will be levelled and scraped to create and planted to form an areas of marshy ground. This will support ecology and habitat creationcreate new marshy habitat whilst also passively deterring anti-social behaviour so avoiding the need for fencing.
- 19.5 The opportunities to introduce other features, such as natural play equipment, are limited by flood constraints.
- 19.6 Where a fence is needed in future, this can be secured by way of a planning condition/ legal agreement and subject to detailed design and further consideration.
- 19.7 Any fence must not present a barrier to wildlife passing through. Animal by-pass features may need to be incorporated.



Figure 78. Collonade Mountain Bike Park, Seattle (Joe Mabel)



Figure 79. Collonade Mountain Bike Park, Seattle (Sage Ross)



Figure 80. Collonade Mountain Bike Park, Seattle (Sage Ross)



Figure 81. SEART Park, Mount Wellington, New Zealand



Figure 82. SEART Park, Mount Wellington, New Zealand



Figure 83. I-93 Lighting Project, Boston Mas.



Figure 84. Possible examples of enclosing railings that may be installed in the future to enclose some or all of the viaduct undercroft.

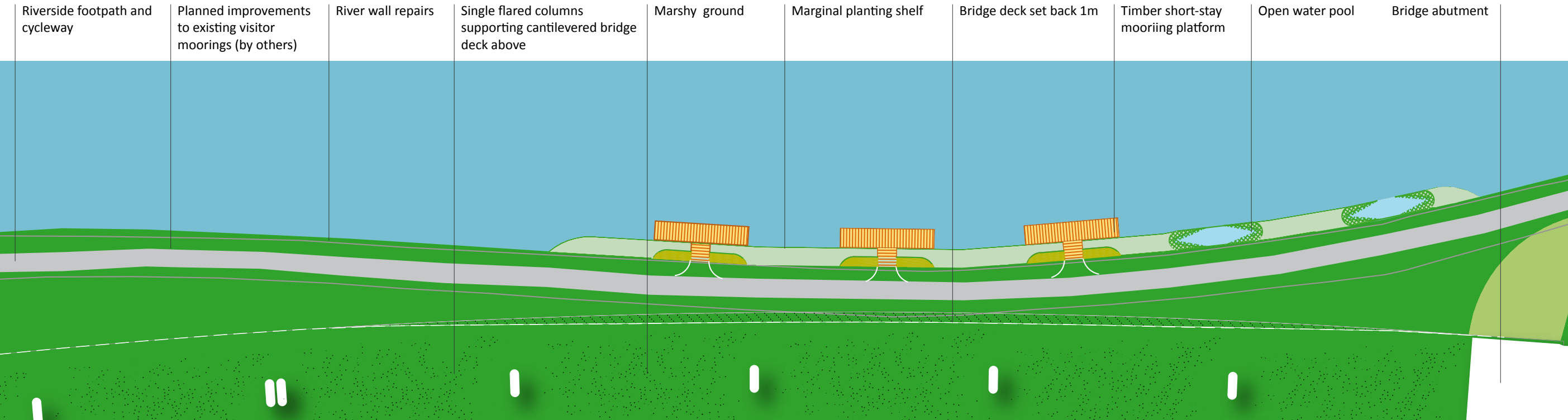


Figure 85. Artists impression of proposed marginal shelf with temporary mooring and open pools (NTS)

20 River Edge

Mooring platforms

- 20.1 Three timber mooring platforms would be provided as part of the riverbank enhancements. These will provide additional short-stay mooring facilities, which are lacking in the area.
- 20.2 The mooring platforms and the new riverbank edge would help to improve the interface of the site with the River Thames and enhance people’s experience of the edge of the River Thames in this location.

River edge wall and marginal shelf

- 20.3 Proposed enhancements include repair to the hard-edged concrete wall at the riverbank and the creation of a new marginal shelf with native marginal species.
- 20.4 Riverside, native, marginal planting will be planted along the newly created marginal shelf area at the edge of the River Thames associated with the new mooring platforms.
- 20.5 Proposed planting species have been updated to be native species suitable for planting within the river corridor. The previously proposed green panels and ‘fedging’ have been removed from the amended proposals.

Undercroft

- 20.6 The design beneath the viaduct has been amended to include the creation of areas of marshy wetland and grasses, providing an area for seasonal flooding, and a diverse marshy habitat. The design intention is to allow people to see beneath the viaduct, through to the railway embankment, and discourage public access.

Existing Moorings

- 20.7 Three timber mooring platforms would be provided as part of the riverbank enhancements (alongside the marginal shelf landscaping improvements). These would be new river elements which will provide additional short stay mooring facilities, which are lacking in the area. The mooring platforms and the new riverbank edge would help to improve the interface of the site with the River Thames and enhance people’s experience of the edge of the River Thames in this location.

Column set-backs

- 20.8 In order to increase the openness for towpath users, the supporting structural elements have been pushed towards the centreline of the viaduct. The steel beams have been pushed further under the viaduct, which in turn is supported by a single wide column that flares at the top to support the beams.

Mosaic

- 20.9 The existing mosaic will be reinstalled into a new area, which is more visible to passers-by.
- 20.10 The existing mosaic will be carefully lifted, repaired and reinstalled into a new area, which is more visible to passers-by. New seating would be provided at the relocated mosaic and near to the location of timber mooring platforms, where enhanced views of the river may be enjoyed.

Seating

- 20.11 New seating would be provided at the relocated mosaic and near to the location of moorings, where enhanced views of the river may be enjoyed.

Information boards

- 20.12 Information, or story, boards are proposed at locations throughout the linear space, which could provide information on the habitat enhancements and the locally occurring Loddon Lily, and to celebrate the confluence of the Thames and Kennet.
- 20.13 There is opportunity for the local community and schools to be involved in the design of the information / story boards, the reinstallation of the mosaic and the planting of Loddon Lily / marsh plant species beneath the viaduct.

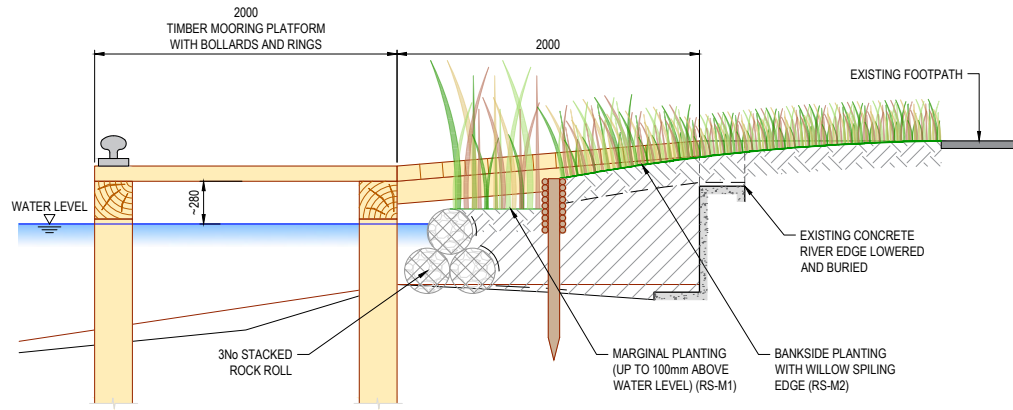


Figure 86. Cross section through proposed timber platform for temporary mooring (NTS)

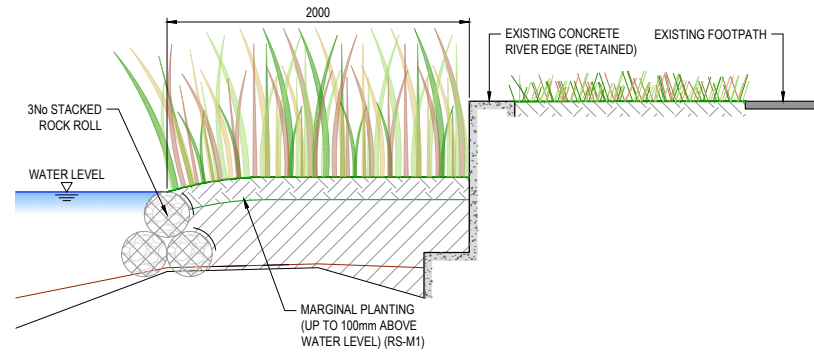


Figure 87. Cross section through proposed marginal planting shelf (NTS)

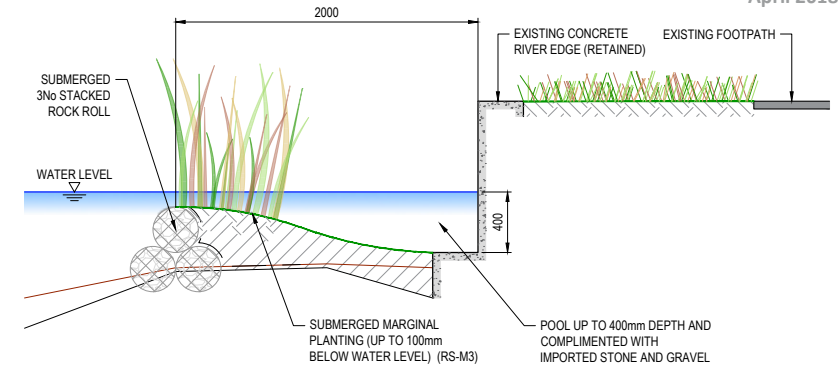


Figure 88. Cross section through proposed open water pool (NTS)

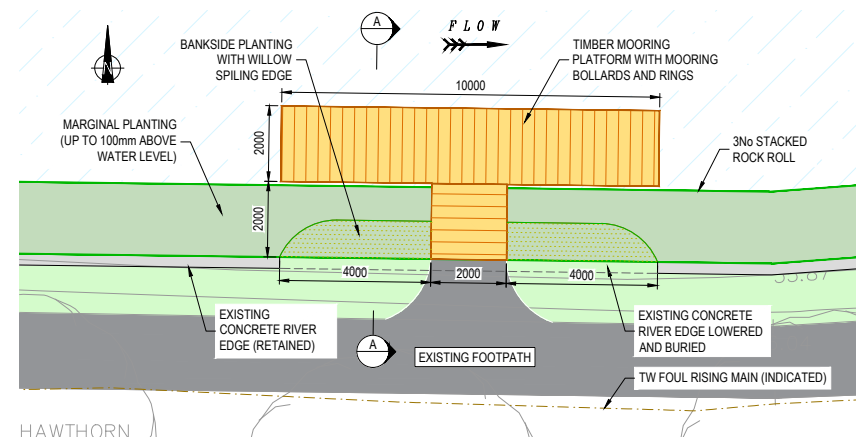


Figure 89. Sketch layout of typical temporary mooring platform (NTS)

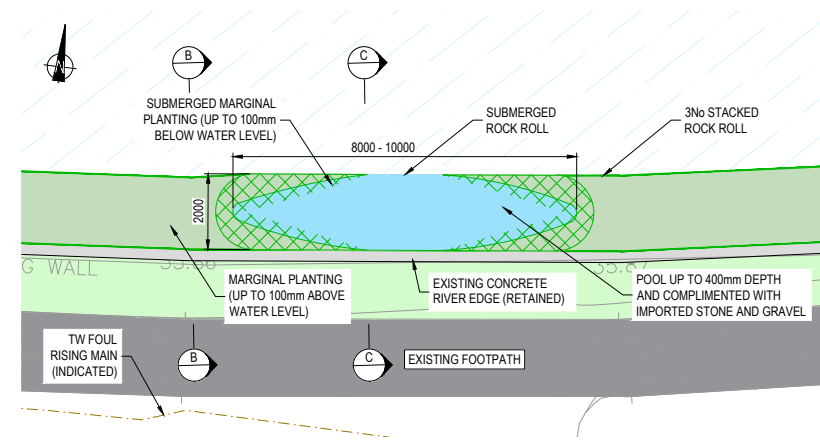


Figure 90. Sketch layout of typical open water pool (NTS)

Off-set viaduct alignment

- 20.14 The viaduct has been narrowed by 1m for a short section east of the River Kennet to provide additional width between the viaduct structure and the towpath and river.
- 20.15 This includes narrow foundations for the SSE cable to be located north of structure.

Trees

- 20.16 The Willow tree east of the Kennet Mouth (T88) will now be retained
- 20.17 Proposed new tree planting has been positioned taking into account services and maintenance access, including the SSE cable which lies to the north of the viaduct foundations.

National trails and cycle routes

- 20.18 The Thames Path National Trail and National Cycle Routes will continue on their existing routes through the site on completion of the scheme.



Figure 91. Examples of marginal planting

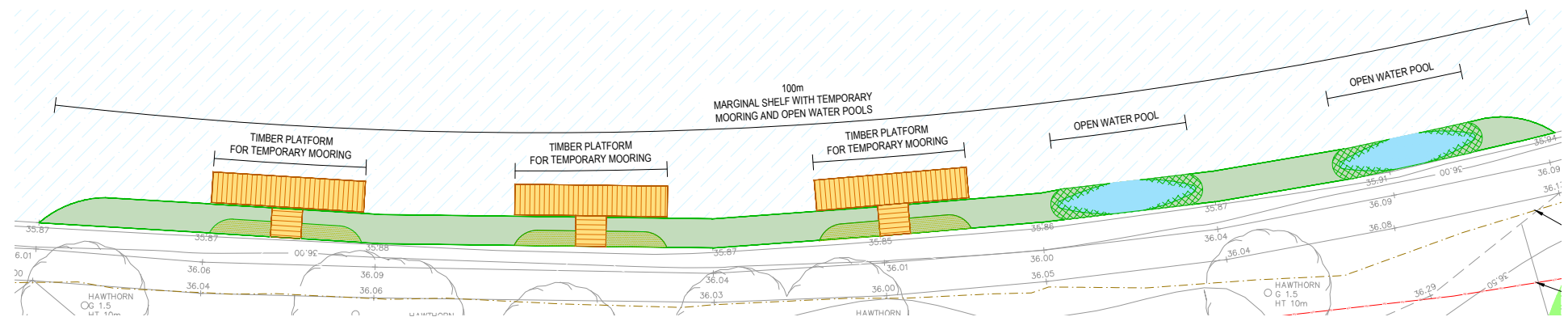


Figure 92. River edge dimensions (NTS)

21 Colours, materials and finishes

- Colour**

21.1 The use of colour has been carefully considered and specified to enhance and mark the bridge, whilst reflecting the sustainable material choices made in the design.

21.2 The surrounding landscape tones are greens and browns combined with darker water tones. These are generally subdued, recessive tones.

21.3 Many of the surrounding built forms (rail gantry's, electricity pylons gasometers etc.) are prominent, but grey-toned, often set against and blending with the skyline.

21.4 The choice of colour is designed to cause the bridge to both relate to its setting and to partly contrast with it. A mainly neutral palette of greys and off-whites is designed to create a calm and unified appearance whilst minimising overall prominence. Contrasting weathered steel elements are designed to respond to the landscape and the adjacent historic dark red brick bridge structures.

21.5 These broad colour bands (water, brown/ green, grey, sky) have influenced the selection and grading of colours applied to the bridge and viaduct structures.
- 21.6 The structure, where it is visible in local views, rises above the bands of water and green.

21.7 Columns are set back away from the outer edges of the structure so that they are within the shadow of the main deck and are designed to be low-mass, darker grey in tone and therefore recessive.

21.8 A strong horizontal band of weathered steel traverses the entire length of the structure as a unifying structural element. Where it is visible between trees, this will read as a bold blade of deep brown/red sweeping across the landscape.

21.9 The cantilevered light grey in situ concrete deck and painted light grey steel parapets railings have been selected for the bridge deck/parapet/rails in order to blend with the adjacent grey structures and the sky and to provide a good contrast with the richer/ darker-toned/shadowed elements below.



Figure 94. Balustrade rail with mesh infill



Figure 93. Example of weathering steel finish



Figure 95. Example of gabion wall



Figure 96. Example of gabion wall junction with concrete deck



Figure 97. Example of gabion clad abutment at junction with weathering steel beam

Materials

21.10 The main materials are as follows:

- Weathered steel beams/girders
- In situ concrete deck
- Metal parapet
- In situ concrete columns
- Road surfaces
- Gabion walls to abutments
- Galvanised metal trim
- Fencing

In situ concrete deck

- 21.11 Concrete surfaces close to traffic and accessible to the public have a higher class finish.
- 21.12 The appearance of the bridge can be affected by the quality of the concrete finish. A high quality concrete mix and finish is specified.
- 21.13 Highly visible bridge elements such as the abutments are specified with a smooth and uniform texture and appearance with formwork to leave no stains on the concrete to give a controlled, high quality finish.
- 21.14 A minimum 50% GGBS concrete mix is specified to give a light grey/creamy colour. Ground granulated blast furnace slag is off-white in colour and substantially lighter than Portland cement. This whiter colour is also seen in concrete made with GGBS, especially at addition rates of 50% cent and above.
- 21.15 The more aesthetically pleasing appearance of GGBS concrete can help soften the visual impact of large structures such as bridges and retaining walls.

21.16 GGBS is a cement replacement that has properties that enable it to be used as a replacement for Ordinary Portland Cement (OPC) in concrete – OPC is energy intensive to manufacture and less sustainable. GGBS is a waste product obtained from smelting iron ore. The specified concrete mix therefore incorporates the sustainable recycling of waste material.

Weathering steel beams/girders

- 21.17 Weathering steel was developed to eliminate the need for painting. It forms a stable rust-like appearance if exposed to the weather.
- 21.18 Initially, weathering steel has a dark yellow appearance. This is followed by a gradual change in colour of the protective rust to a stabilised dark brown/red. This process occurs over a one to two year period when exposed to the outside environment.
- 21.19 The main bridge and viaduct is supported by a largely continuous flanged 'I' beam. Halfway along the combined bridge and viaduct there is a gap Where beams don't abut, to allow for thermal expansion, this detail is reflected below in twin back-to-back columns. this is covered by a weathering steel strip..
- 21.20 The visible I Beams (on the outer face) are gently cambered over the main bridge span, horizontally curved in plan at the river face, and gradually taper in depth from the deeper bridge span to the shallower viaduct.

21.21 Steel is the most recycled material in the world and recycled steel is used in the manufacture of all new steel. In the European steel industry as a whole, recycled scrap steel accounts for 56% of total steel making. Scrap steel is valuable so whenever it can be recovered it is, therefore specifying a higher recycled content does not stimulate further recycling. The use of weathering steel eliminates the chemicals needed for paint which typically has a high volatile organic compound (VOC) content in order to be durable in an external environment. Therefore the material choice is highly sustainable.



Figure 98. Example of gabion clad abutment at junction with concrete deck



Figure 99. Example of weathering steel beam meeting abutment



Figure 100. Example of gabion clad abutment at junction with concrete deck



Figure 101. Example of railing with horizontal rails emphasizing curving form of viaduct

Metal parapet railings

- 21.22 The parapet railings must act to contain vehicles and are therefore necessarily a robust design.
- 21.23 The railings will be light grey painted with a comparatively simple post and rail form. A metal mesh is attached to the rails to prevent people climbing up.

In situ concrete columns

- 21.24 The columns have a tapering based and curved and flared capital form, rather than being simple circular or rectangular columns tubes. As noted earlier, there will be of a darker grey concrete so that they are more recessive.
- 21.25 This will be achieved by using Pulverised Fuel Ash (PFA) as a cement replacement. PFA is a waste product obtained from coal-fired power stations and millions of tonnes are stockpiled within the UK. Therefore the specified mix is another sustainable material choice.

Route surfaces

- 21.26 The surface of the carriageway, footway and cycleway will be asphalt.

Gabion walls

- 21.27 Gabion walls are proposed to clad the bridge abutments and other retaining structures.
- 21.28 The galvanised steel cages will be filled with a light grey stone mix.
- 21.29 The walls will incorporate bird nesting boxes.

Galvanised metal trim

- 21.30 The gabion walls will be finished with a galvanise metal trip where it joins with the main bridge deck structure and girders.
- 21.31 The trim will be formed so as to create a shadow gap in longer distance views.
- 21.32 The strips will be fitted with neat bolted connections.

Fencing

- 21.33 The scheme has been designed with the potential for future perimeter fencing below the viaduct if required to further deter anti social behaviour . The design of fencing would be agreed at a later date if required.

Sustainability and materials

- 21.34 Fuller details on the approach to sustainability are set out in the Environmental Statement Chapter 9, Sustainability.
- 21.35 The embodied carbon of the proposed development has been reduced by the specification of materials with low environmental impacts over their life-cycles including the incorporation of scrap and waste products.
- 21.36 As much as reasonably achievable, materials used will be responsibly and sustainably sourced by the principal contractor (for example, by using schemes compliant with BES 6001).
- 21.37 Where appropriate and financially viable, locally sourced materials will be favoured to reduce the environmental impact of transporting materials.

22 Public realm

Approach

- 22.1 The public realm in the area of the new route comprises footpaths, footbridges, grassland, woodland and the river edges.
- 22.2 The overall approach is to maintain existing footpath connections and bridges and to maintain the relationship with the river.
- 22.3 The new route will provide a new higher level footpath and cycleway that will connect into the existing path network to the east and west.
- 22.4 There will be creation of new habitat and provision of new tree and shrub planting adjacent to the viaduct.
- 22.5 The wide bridge span at the Kennet Mouth is designed to maintain an open feel beneath it and maintain views to and through the adjacent bridges. This will also make it easy to see the footpath ahead.
- 22.6 Where existing footpaths through The Coal LWS are affected by the new route, alternative routes are proposed nearby that still offer direct connections.
- 22.7 The Horseshoe bridge will be retained, maintaining connections.

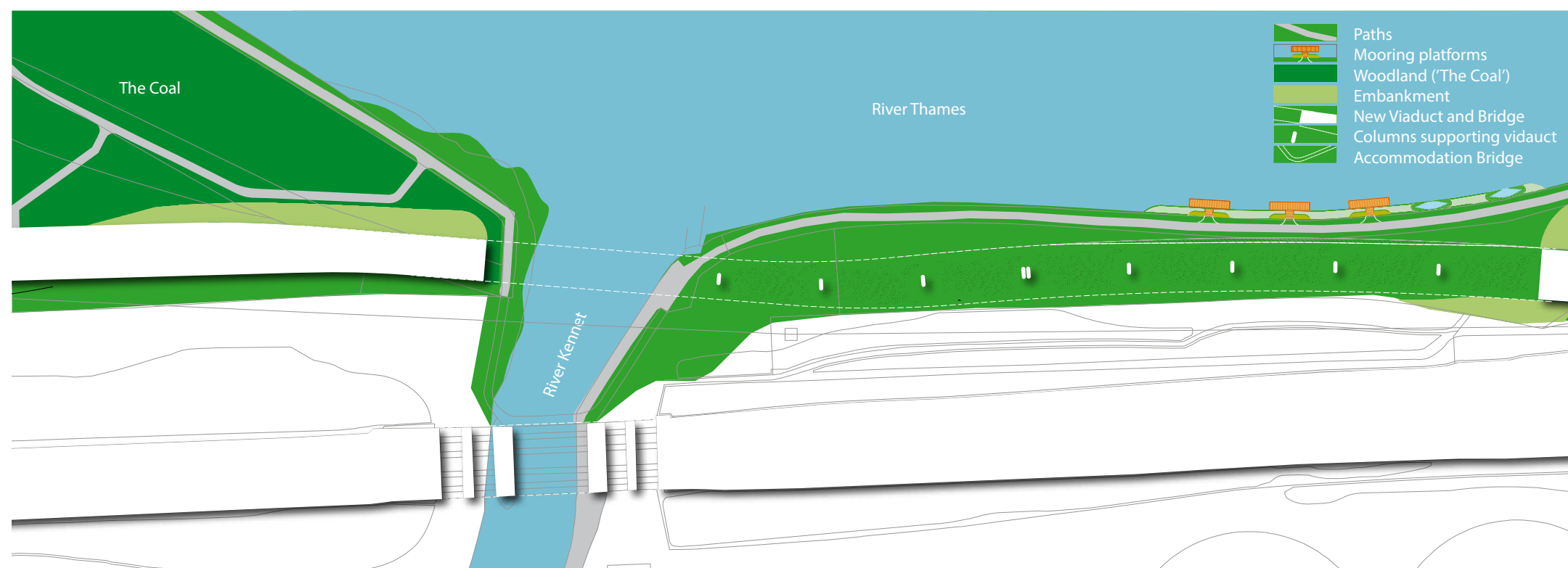


Figure 102. Public realm plan

23 Access and movement



Figure 103. Walking and cycling access

23.1 The new route provides a number of benefits over existing provision (which are explained in more detail in the Transport Statement and Transport Statement Addendum):

Wider Benefits

- Delivers a fundamental element of the wider sustainable transport strategy for Reading and the Thames Valley, enabling a public transport corridor on the Reading – Wokingham – Bracknell corridor and in north Reading linked to the proposed Third Thames crossing;
- Meets the policy/infrastructure requirements in Reading and Wokingham’s Local Plans to enable the planned levels of economic growth and housing delivery; and
- Increases public transport accessibility and affordability, resulting in improved social equality and decreased levels of isolation for the most vulnerable in society.

Walking and Cycling

- Provides a faster route option and enhanced user experience for people walking and cycling from the A4 London Road/A3290 roundabout to Reading Railway Station and town centre offering:
 - lighting and low gradient,
 - adjacent to low trafficked carriageway offering regular natural surveillance from regular bus services,
 - alternative crossing of the River Kennet Mouth for towpath users to avoid the stepped Horseshoe Bridge,
 - alternative route to avoid flood risk areas;
- Promotes healthy living, well-being and active lifestyles by providing enhanced opportunities for walking and cycling;

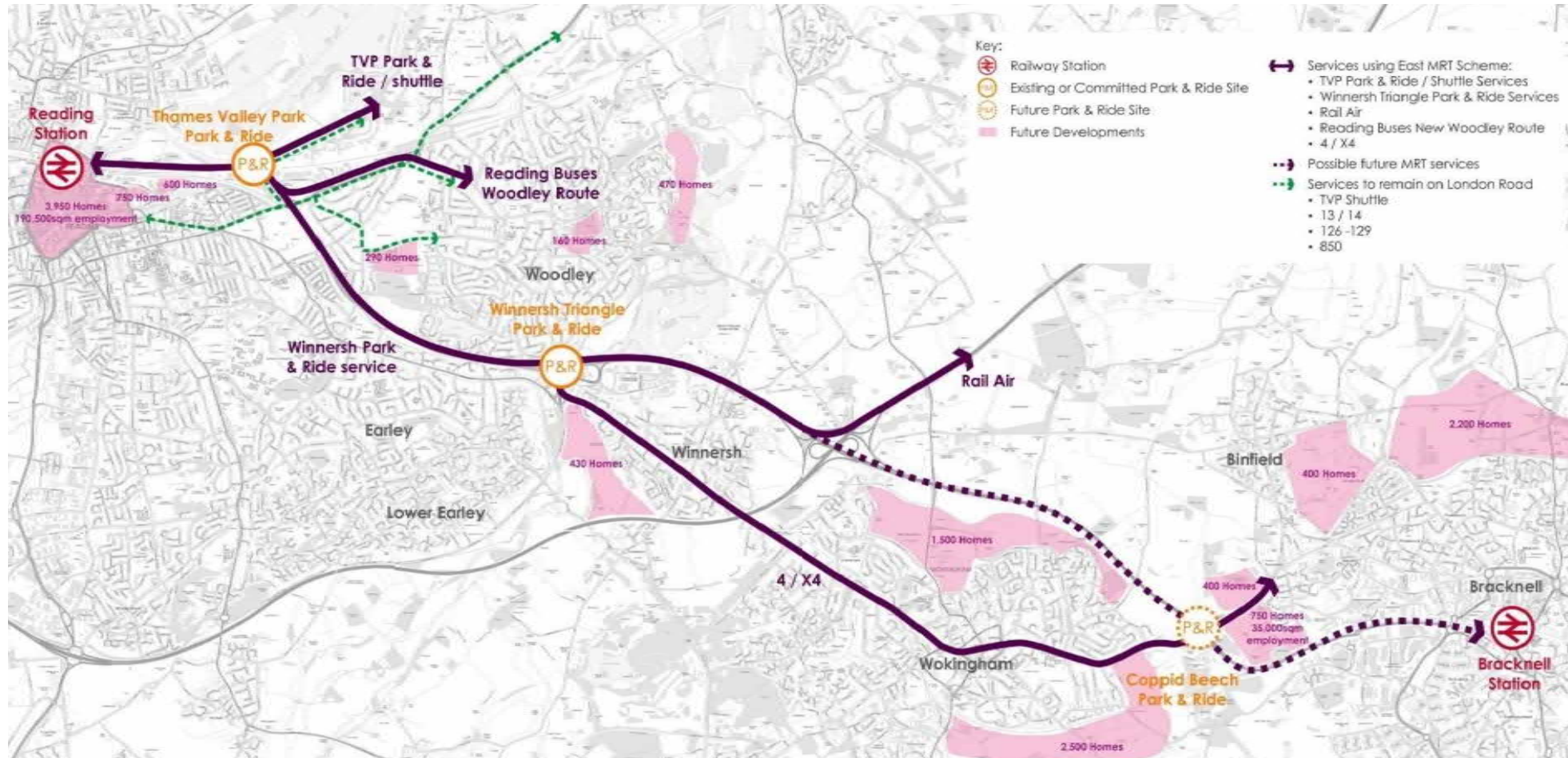


Figure 104. Bus services that could use the route

- Increases levels in cycling of 114 new trips/day, (based on work to inform the Business Case, specifically, cycling increases based on timesaving and improved facilities utilising DfT TAG UNIT A5.1).
- Improves pedestrian and cyclist safety through the provision of a fast track and dedicated cycle and pedestrian route directly into the centre of Reading; and
- Connects the cycle hire schemes at Thames Valley Park to the central areas of Reading.

Public Transport

- Increases public transport patronage by up to 15% (based on the demand modelling undertaken to inform the Business Case)
- Significantly increases capacity for accessing (and leaving) Reading town centre and Reading Railway Station;
- Significantly improves public transport connectivity between Reading and Wokingham Boroughs;
- Provides opportunity to facilitate future bus services east of Reading towards Wokingham and Bracknell and the potential TVP P&R at Coppid Beech; and
- Reduces journey times and improves reliability for public transport services using the East MRT Scheme.

Highway

- Eases forecast congestion and rat-running in the eastern parts of Reading;
- Accommodates two right turning buses at the proposed East MRT Scheme and Napier Road junction which is predicted to operate well within capacity causing minimal to no delays to traffic accessing and egressing Tesco;
- Causes minimal delays to existing traffic at the Napier Road approach to Reading Bridge roundabout due to off-site improvements; and
- Accommodates bus movements at the Thames Valley Park Drive / A3290 roundabout.



Figure 105. Landscape strategy plan

24 Landscape

Existing Landscape Context

- 24.1 The site is located on low lying landform, adjacent to the southern bank of the River Thames, that runs to the north of the site. The confluence between the River Kennet and the River Thames, falls roughly within the middle of the site. To the south, the Great Western Main Line Railway is raised on an embankment.
- 24.2 Overall, the site has a sense of enclosure and a sense of being part of the River Thames corridor through the urban area, with few views out to adjacent areas. Its character is of urban open space and river-edge. There are strong influences from the railway and infrastructure corridor to the south of the site boundary, with views of the railway, moving trains, gantries and overhead cables; which counteracts the calmer and more attractive River Thames to the north of the tow path.

- 24.3 A Public Right of Way (PRoW), the Thames Path National Trail and National Cycle Routes 4 and 5 (Thames Valley) pass through the site, on the route of the towpath adjacent to the River Thames. National Cycle Route 4 turns southwards off from the River Thames towpath and follows the alignment of the River Kennet.
- 24.4 Broad-leaved woodland is present in the western section of the site, which lies within a Local Wildlife Site (LWS). There are also scattered trees, and some areas of dense scattered scrub, throughout the site. A number of individual and group Tree Preservation Orders (TPOs) and a woodland TPO cover trees within the western part of the site, along the River Thames, within the LWS and within the Tesco carpark.
- 24.5 There are no TPOs upon the eastern part of site within the Borough of Wokingham.

Landscape Design Principles

- 24.6 The proposed East Reading MRT will comprise a fast-track public transport, pedestrian and cycle route. It will connect the A3290 at Thames Valley Park, to Napier Road, Reading town centre and the railway station, with part of the route raised on bridge and viaduct.
- 24.7 To the north of the proposed East MRT route, the existing section of Thames Path and National Cycle Route will remain at ground level, following the towpath of the River Thames. In contrast to the swift conveyance of the East MRT route, the landscape strategy seeks to create a place around the existing pedestrian and cycle path, and acknowledge this existing linear corridor as an alternative, 'slow' leisure route.



24.8 The design intention, for a leisure route with low key intervention landscape design approach, pays respect to the time layers of the River Thames and engineered crossings of the Kennet Mouth. The proposed East MRT creates a 21st Century bridge, viaduct and transport route, the engineering detail of which is visible from the towpath, and seen in juxtaposition to the slower, more leisurely route of the towpath.

24.9 The landscape strategy is based on the principle of retaining existing trees and areas of habitat, as far as possible, and supplementing these with new native tree planting and integrated ecological enhancement, including repair and enhancement of the hard-edged, concrete wall, riverbank and the creation of a new marginal shelf with native marginal species. It seeks to provide low key interventions, suited to the river edge and urban, linear, open space context of the site, which would enhance the experience of current leisure activities, and provide reason for pausing and resting within the area.

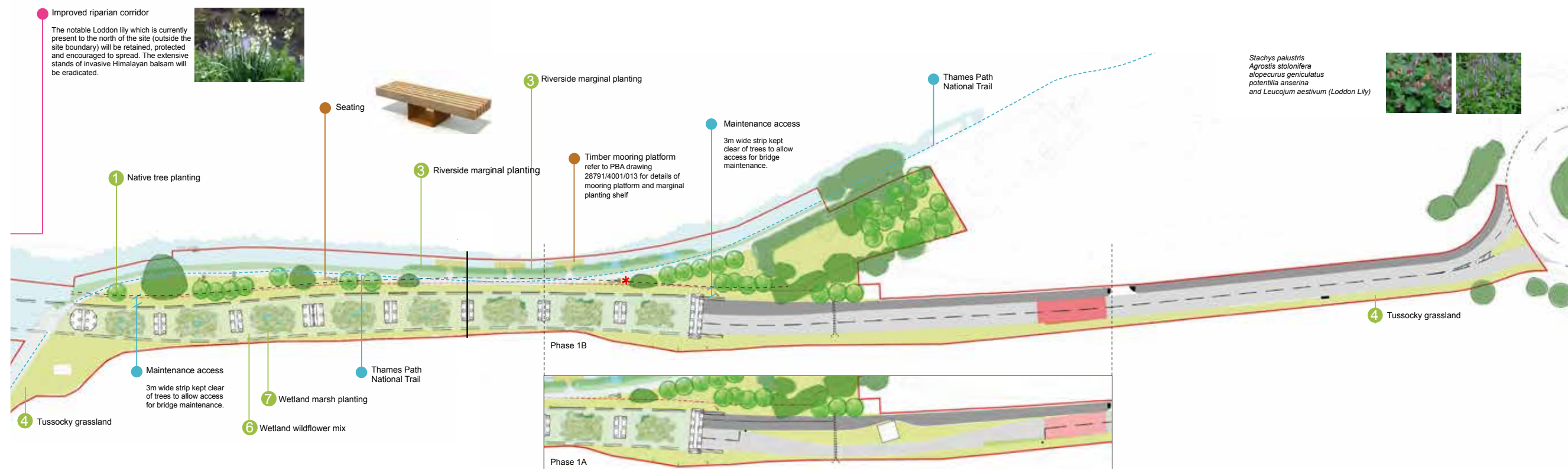
24.10 The overall aims of the landscape strategy are therefore to:

- Enhance the experience of using the Thames Path and National Cycle Route through the site;
- Improve the interface of the site with the River Thames;
- Provide landscape and ecological mitigation and enhancement; and
- Create pocket places, for stopping and sitting, and for community uses



Figure 106. Mosaic artwork to be relocated and restored

A collage of eight photographs showing various plant parts: red willow branches, golden reeds, red berries on green leaves, red berries on a branch, white hydrangea flowers, green willow leaves, and a tree trunk with peeling bark.



New areas of habitat

- 24.14 Seed mixtures will be used to create swathes of grassland. A tussocky grassland mixture will be used, to the north and south of the East MRT route, in dry areas. Wildflower grassland will also be included upon the embankment to the west of the Kennet Mouth, and on the verge between the East MRT route and the Tesco access road. Wetland wildflower and grasses will be used beneath the viaduct, where a series of wetland marsh areas are proposed.
- 24.15 Group planting of native trees and shrubs is proposed, and native hedgerows will provide boundary treatments, where appropriate.
- 24.16 Riverside, native, marginal planting will be planted along the newly created marginal shelf at the edge of the River Thames, associated with the new mooring platforms. The existing concrete retaining wall is kept throughout with the proposed enhancements immediately in front and which provide native riparian habitat for the varying levels of water at the river margin. Where possible, sections of the existing concrete retaining wall will be reduced in height and buried to create a more naturalistic bank profile. As well as providing ecological enhancements, this will provide a positive enhancement of the site and river edge's landscape and visual amenity.
- 24.17 Beneath the viaduct, areas of marshy wetland and grasses will be created, providing an area for seasonal flooding, and a diverse marshy habitat, which includes the locally-occurring Loddon Lily which grows in swampy or damp soil. The design intention is to allow people to see beneath the viaduct, through to the railway embankment, and discourage public access beneath the viaduct.

Planting constraints

- 24.18 Proposed tree planting has been positioned taking into account services and maintenance access, including the SSE cable which lies to the north of the viaduct foundations.
- 24.19 This enables replacement tree planting to take place free from services and utilities constraints to the north of the structure and in the area used by people. New tree planting will be planted at a minimum 2m offset from the SSE cable.
- 24.20 In order to accommodate maintenance access for the MRT viaduct, a 3m wide strip to the north is kept clear of trees above ground, however this area may contribute to the rooting zone of the trees.

Figure 109. Riverside marginal planting





Figure 110. Loddon Lily planting in marsh areas



Figure 111. Example of tussocky Grassland- a swathe of grassland between the river and the bridge, tolerant of partially shaded conditions, containing a mixture of wild flowers and grasses,



Figure 112. Example of wildflower grassland- a mixture of wild flowers and grasses.

Landscape elements		Access		Additional wildlife features					
24.21	New seating would be provided at the relocated mosaic, near to the location of moorings, where enhanced views of the river may be enjoyed.	24.24	Three timber mooring platforms would be provided as part of the riverbank enhancements (alongside the marginal shelf landscaping improvements). These would be new river elements which will provide additional short stay mooring facilities, which are lacking in the area. The mooring platforms and the new riverbank edge would help to improve the interface of the site with the River Thames and enhance people’s experience of the edge of the River Thames in this location.	24.26	The Thames Path National Trail and National Cycle Routes will continue on their existing routes through the site on completion of the scheme.	24.28	Night scented species - Nectar-rich plant species that are attractive to night-flying insects are included within planting scheme to enhance foraging opportunities for bats.	24.31	Hibernacula - Features suitable for use by hibernating reptiles and amphibians, and also of value to invertebrates, will be created. These will comprise deadwood features and rubble piles, and utilise trees and materials removed from the site to facilitate works.
24.22	Information, or story, boards are proposed at locations throughout the linear space, which could provide information on the habitat enhancements and the locally occurring Loddon Lily, and to celebrate the confluence of the Thames and Kennet.		24.27	A new footpath link will connect the MRT route to the Thames Path, through the Coal Woodland. This will be routed through gaps and where a Category U tree is to be removed, to minimise the impact on existing trees	24.29	Reptile / amphibian tunnels and guide walls - Tunnels and guide walls installed to provide north-south habitat connectivity across the site. These allow reptiles and amphibians to cross beneath the MRT, minimising the risk of mortality from attempts to cross the carriageway.			
24.23	There is opportunity for the local community and schools to be involved in the design of the information / story boards, the reinstallation of the mosaic and the planting of Loddon Lily / marsh plant species beneath the viaduct.		24.25	In addition, the existing moorings between Kennet Mouth and the proposed new riverbank works are on land in 3rd party ownership (Wokingham Borough Council and Reading University). The existing moorings at Kennet Mouth are planned to be enhanced/ repaired by a third party, separate to this planning application, to full functionality (a section of the existing river wall in this location has partially failed).	24.30	Bird and bat boxes - Attached to suitable mature and semi-mature trees, primarily within the LWS. These will target species of local importance identified to be present on site and within the local area.			



Figure 113. Examples of riverside marginal planting



Figure 114. Examples of information, or story, boards proposed at locations throughout the linear space



Figure 115. There is opportunity for the local community and schools to be involved in the design of the landscape elements



Figure 116. Loddon Lily / marsh plant species to be planted beneath the viaduct.



25 Lighting, signals and signage

Lighting Design		Proposals	
25.1	A preliminary lighting design and lighting assessment accompany this application.	25.6	Lighting columns have been avoided completely along the bridge/viaduct section.
25.2	The lighting scheme proposed for the new bridge has been designed taking into account a number of different factors that have influenced both the luminaire selection and also the positioning of luminaires.	25.7	Lighting columns and luminaires where specified are the smallest units required for adopted highways with the minimum number required for a compliant design.
25.3	The main factors, both functional and aesthetic, which influence the lighting scheme, are: - Route and bridge users: functional lighting - Visual impact (light intrusion, glare and sky glow). - Security of bridge users. - Energy consumption and maintenance. - Relevant national guidance, including impacts on bats.	25.8	Lighting levels have been set at a minimum level according to highway safety and amenity requirements. This approach minimises both the number of columns and the amount of light spill upon and around the structure.
Feature lighting		25.9	Care has been taken to prepare a lighting design for the bridge which firstly meets the appropriate design standards, but also has low running costs and is maintainable in terms of, access, component supply and replacement. Luminaires have LED light sources which have low energy consumption and a service life in excess of 50,000 hours. There are two forms of lighting proposed
25.4	The use of feature lighting was considered to highlight features of the bridge in the landscape, to create reflectivity over water, and to give the bridge and its curtilage prominence at night. This approach was rejected on ecological impact grounds.	Parapet rail lighting	
25.5	In addition to general amenity lighting, wider opportunities to illuminate the bridge structure in order to create a more dramatic night-time presence have been considered, but rejected in this sensitive setting.	25.10	The column lighting proposed within the existing planning submission will be replaced low level LED linear lighting to be installed along the northern parapet of the structure, facing southwards (i.e. away from the River Thames) to light the pedestrian / cycle way only. This will minimise the levels of light spill from the structure on to surrounding habitat.
		Column lighting	
		25.11	Column lighting in line with both RBC and WBC specification, is proposed in all other sections of the East MRT.
		25.12	Mid-hinged columns will be installed to reduce maintenance requirements.



Figure 117. Bridge deck lighting concept (DW Windsor Garda LED Rail Lighting, copyright DW Windsor)



Figure 118. Bridge deck lighting concept (DW Windsor Garda LED Rail Lighting, copyright DW Windsor)

Tesco		Tesco/Napier Road Junction		East MRT	
External lighting has been designed to replicate the existing car parking strategy to complement the existing car park lighting.	25.18	This section of highway is currently illuminated by High Pressure Sodium (SON) columns.	25.21	The initial (180 m) stretch of the bus carriageway from Napier Road towards the new bridge crossing will be lit to a BS EN 13201-2:2015 C3 Class. This is to allow for bus drivers’ eyes to acclimatise to lighting required for the proposed pedestrian (zebra) crossing located east of the Napier Road junction.	
Lighting will illuminate the realigned access road into the Tesco car park including the realigned parking bays. This design will maintain consistency between the proposed lighting levels with the existing conditions.	25.19	New lighting columns will be mounted along the proposed road junction at a height of 6 m as specified within the RBC Street Lighting Specification at the back of footway or within the verge where there is no footway (Columns to be installed will be hot dipped galvanised according to BS EN ISO 1461). New luminaires for the street lighting design of the junction are proposed to be Holophane VMAX luminaires. Existing luminaires located along the junction that are not currently LED will be replaced with Holophane VMAXs.	25.22	The height of new columns along the East MRT conflict area will be 6 m as specified within the RBC Street Lighting Specification. Columns will be installed along the back of the footway and cycleway of the East MRT or within the verge where no footway is proposed. The columns will be hot dipped galvanised according to BS EN ISO 1461. New luminaires for the street lighting design of the conflict area are proposed to be Holophane VMAX luminaires.	
The height of columns for the Tesco car park design are proposed to be 6 m. All new luminaires are proposed to be Holophane VMAX while the existing Abacus Orion luminaires will be retained in the car park.					
Beam orientation will face into the access road and new car parking bays to reduce the amount of intrusion into the surrounding environment.	25.20	Shields will be installed to limit light intrusion into the residential area to the west.			
To reduce the impact of the car park lighting on the MRT footway and cycleway and other light sensitive areas, light shields can be attached to the luminaires			25.23	Beam orientation will be focused towards the route to reduce the amount of light intrusion into the surroundings.	
			25.24	Shields are proposed on the luminaires to mitigate light intrusion into the surrounding areas.	

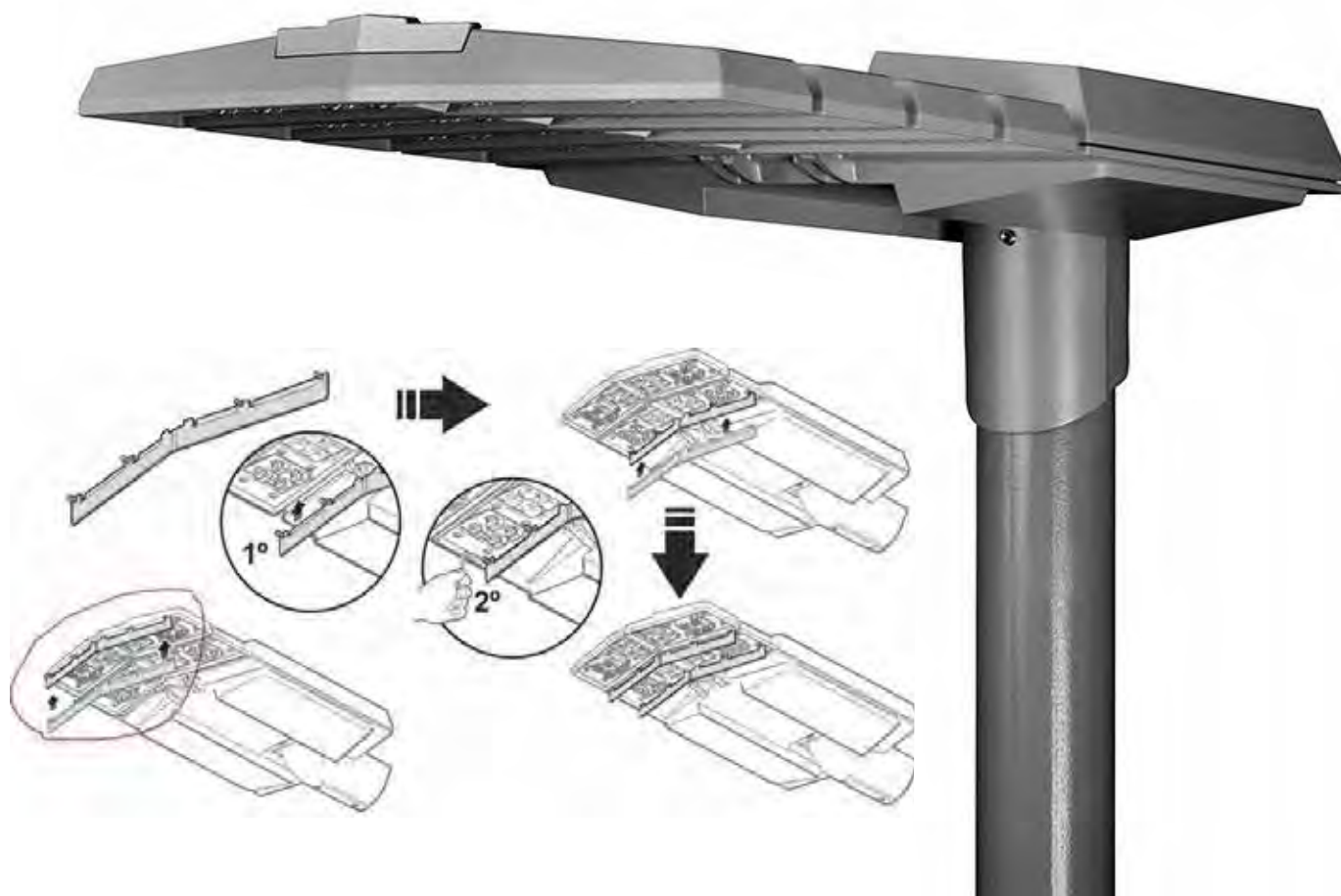


Figure 119. Column lighting luminaires (Holophane VMAX) and details of light shields on all luminaires to mitigate light spill into the surrounding area (inset)

Section	Napier Road Junction	East MRT Pedestrian Crossing	East MRT Footway/Cycleway	East MRT Bridge/Viaduct	Tescos
Lighting Columns	Light Grey Galvanised Steel Column	Light Grey Galvanised Steel Column Mid-hinged	Light Grey Galvanised Steel Column Mid-hinged	Parapet lighting	To be advised by Tescos
Height	6m	6m	6m	1.5-1.5m	6m
Lantern	Holophane VMAX	Holophane VMAX	Holophane VMAX	LED rail (DW Windsor Garda Anti-Climb attached to the top rail of the bridge parapet.	Holophane VMAX
Luminaires	VMX044 V1 LED	VMX044 V1 LED	VMX014 V1 LED	VMX014 V1 LED	VMX164 V8 LED

Figure 120. Lighting strategy extract

East MRT west (RBC) footway and cycleway

- 25.25 This will be illuminated with column mounted LED luminaires, proposed as Holophane VMAX luminaires. The height of new columns along the proposed footway and cycleway will be 6 m as specified within the RBC Street Lighting Specification. Columns to be installed along the back of the footway and cycleway and hot dipped galvanised according to BS EN ISO 1461.
- 25.26 Beam orientation will face towards the footway and cycleway as to reduce light intrusion to the surroundings. Shields are proposed on the luminaires to mitigate light intrusion into the surrounding areas.
- 25.27 The lighting design for all of the East MRT footway and cycleway sections has been designed to a BS EN 13201-2:2015 P5 Class. A P5 class is a pedestrian class to support safe and secure access for pedestrians.

Bridge/viaduct footway and cycleway

- 25.28 The footway and cycleway travelling the length of the bridge and viaduct will be illuminated with a LED rail, proposed as DW Windsor Garda Anti-Climb which will be attached to the top rail of the bridge parapet. The height of the LED rail along the bridge/viaduct section will be between 1.4 m and 1.5 m.
- 25.29 The LED modules within the LED rail will face towards the footway and cycleway as to reduce light intrusion to the surroundings. This is to minimise the impact on the surrounding area.

East MRT -east (WBC) footway and cycleway

- 25.30 The east section of the footway and cycleway extends from the end of the bridge/viaduct section to the proposed access of the proposed Thames Valley Park & Ride. This will be illuminated with column mounted LED luminaires, proposed as Holophane VMAX luminaires similar to the East MRT east footway and cycleway section. The height of new columns along the proposed footway and cycleway will be 6 m as specified within the WBC Street Lighting Specification. Columns to be installed along the back of the footway and cycleway and adhere to the WBC Street Lighting Specification.
- 25.31 Beam orientation will face towards the footway and cycleway as to reduce light intrusion to the surroundings.
- 25.32 Shields are proposed on the luminaires to mitigate light intrusion into the surrounding areas.

Ecology and lighting

- 25.33 The lighting strategy has been designed to take in to account ecology and visual constraints. Measures include:
- 25.34 Implementation of an ecologically informed lighting strategy once the scheme is operational. This will include measures such as:
- Lighting along the northern extent of the bridge and viaduct only; and
 - Providing directional lighting to face away from the more sensitive areas (including The Coal LWS, Kennet Mouth and Kings Meadow East LWS and Henley Road Pit LWS).
- Signage**
- 25.35 No large signs or gantry signs will be placed on the main bridge/viaduct structure in order to minimise adverse visual impact.

Bus route enforcement

- 25.36 The entrance to the route will be defined with a section of coloured surface and 'bus only' signs to raise awareness that entry is prohibited for all vehicles except public service vehicles.
- 25.37 Enforcement cameras will be installed to deter private vehicles using the route. Once the scheme is operational, if these methods of control fail to deter private vehicles from using the East MRT Scheme, rising bollards will be installed to physically prevent the use of the route, and allow those with responders and/or registered vehicles. These cameras will be used to enforce any low emissions zone in the future.
- Bridge signals design**
- 25.38 Shuttle working will operate with a signal/indicator system to allow bus progress between the stop lines 190m apart.

26 Construction

Construction sequence		Deliveries	Vehicle Routes	Construction Environmental Management Plan					
26.1	It is anticipated that, subject to planning approval, construction of East Reading Mass Rapid Transit will commence in July 2019 with completion expected in Spring 2022. Some seasonal site clearance may need to commence earlier in 2019.	26.3	The embankment is expected to have the most significant impact on construction traffic due to the volumes of fill material being imported on site.	26.4	Deliveries will be limited to off-peak periods to avoid disruption in peak periods 09:30 – 16:30.	26.8	Construction vehicles accessing the eastern section of the site will be routed from the M4 in the south of Reading via the A3290.	26.11	Environmental effects arising during the construction phase of the proposed development will be controlled through the implementation of a Construction Environmental Management Plan (CEMP).
26.2	The main construction activities/phases comprise: • Service diversions (gas pipes and electricity cables). • Flood plain compensation measures. • Construction access and haul roads • Piling. • Pile caps, abutments, retaining walls, pier construction and drainage works. • Western embankment and associated supporting structures construction. • Surface water drainage systems. • Assembling main bridge and viaduct beams involving 600t+ installation crane. • Bridge and viaduct deck concrete pouring. • Road construction and finishing (including parapets and lighting). • Landscaping and ecological mitigation	26.5	Space will be provided within the site to accommodate delivery vehicles so that they are not obstructing the public highway. There will be various points for unloading and storing materials on the site.	26.9	Vehicles accessing the western section of the site will be routed from the M4 via the A33 and Vastern Road to Napier Road.		Parking	26.12	The CEMP will be agreed with WBC and RBC prior to commencement of construction.
		26.6	Typical working hours will be between 0800 and 1800 hrs. Monday to Friday, and 0800 and 1300 hrs. on Saturdays.	26.10	Adequate on-site parking will be provided for all operatives and staff; and vehicle sharing and use of public transport amongst operatives and site management will be encouraged.	26.13	The CEMP will outline the arrangements and management practices to adopt in order to minimise the environmental effects of construction.	26.14	The CEMP will outline the following transport-specific details: • Site Logistics; • Working Hours; • Maintaining Access; • General Site layout, including accesses and routes; • Construction traffic; and • Designated access routes.
		26.7	Construction vehicles would not access the Site outside these hours, unless agreed in advance with the Council. It would be the contractor’s aim to manage the majority of lorry access between 0900 and 1600 to avoid peak traffic flows in the town centre to reach Napier Road.						

