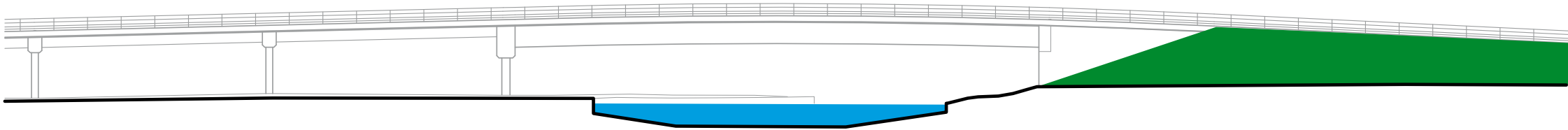




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1 (selected)

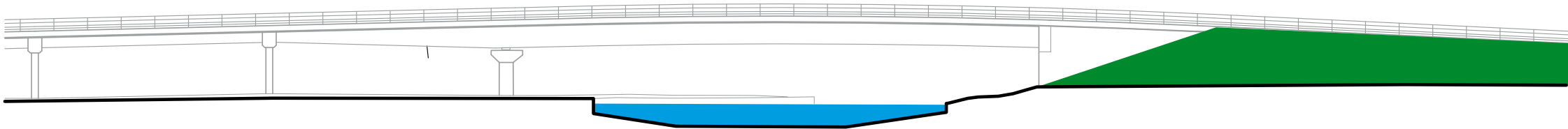
- Shortest steel span
- Simple design
- Significantly lower cost



2 (rejected)

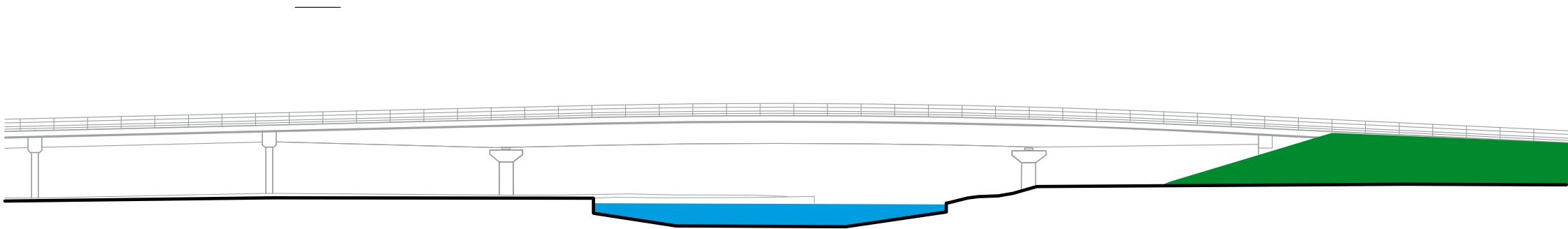
- Wider steel span with off-set support column
- Assymetric bridge design
- Attractive design
- Smoother transition eteen bridge and viaduct structures

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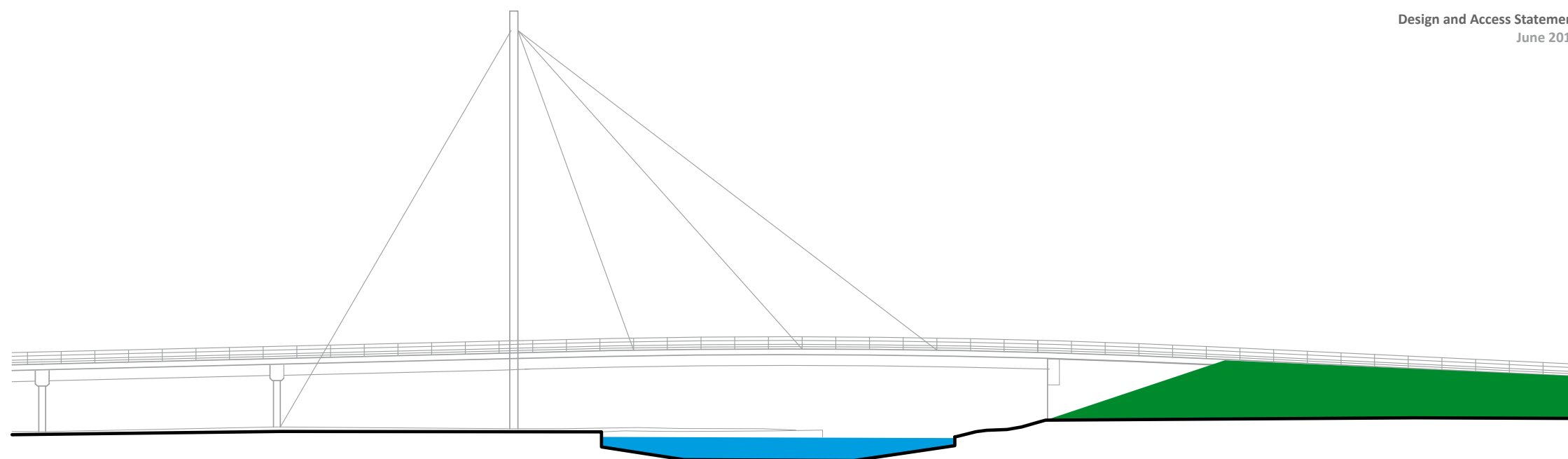
3 (rejected)

- Wider steel span with off-set support column
- Symmetrical bridge design with slimline appearance
- More open views
- Improved views to listed bridge
- Significantly more expensive
- Security/use for shelter beneath additional span



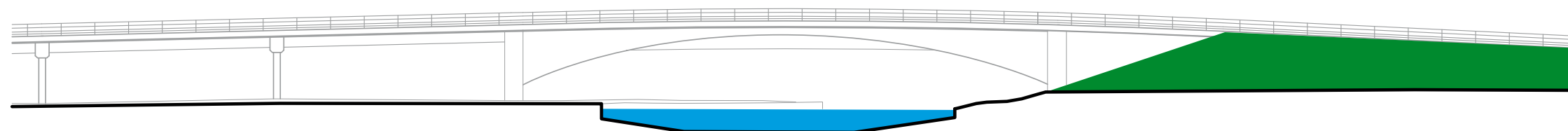
#### 4 (rejected)

- Elegant design with slim appearance maximising open views.
- Short span does not justify cost and complexity of cable stayed structure
- Significantly higher costs
- Visual impact due to height



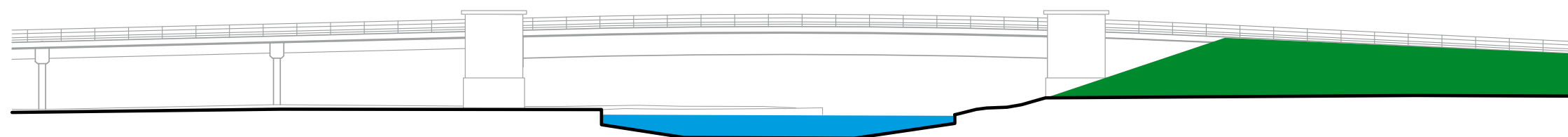
#### 5 (rejected)

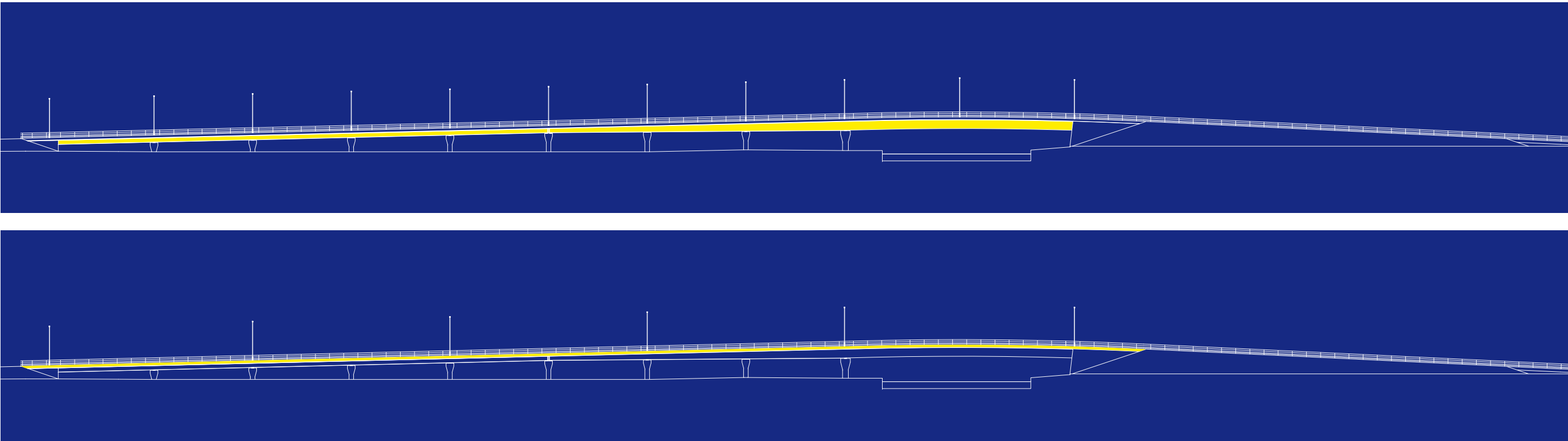
- Concrete panel system partly screens bridge structure behind.
- Describes an elegant curve
- Greater mass results in greater obstruction of views
- Significantly higher cost



#### 6 (rejected)

- Simple balanced appearance with matching abutments.
- Industrial quality echoes adjacent railway bridge
- Less open views
- Greater impact on floodplain and greater flood compensation requirements.





Proportions and scale

- 13.11 Cost envelope and construction constraints has led the design team to propose a well proportioned, neat structure that is basically utilitarian in design, but with pleasing proportions and details. The basic approach is as follows:
- A simple form (minimal visual complexity).
  - Minimal facets and simple shapes to avoid visual clutter.
  - Expressing the essential structural anatomy of the bridge to reveal a simple beauty in the engineered form of the bridge.
  - Accentuating the primary structural elements of the bridge (post and beam) with greater emphasis upon the horizontal elements ( the beam, the bridge and rails).
  - Avoiding embellishment and ornamentation.
  - The deck is thinner (as a proportion of its span).

- The lines (particularly horizontal lines) of the structure are continuous.
- The shapes and dimensions of the structural members reflect the forces acting on them.
- The elements of the bridge are well-related to one another to create a unified form (main River Kennet span, viaduct, abutments and ramps).
- A common palette of materials, colours and details, consistently applied.
- Reducing road furniture, signage etc. to the barest minimum.
- The curving horizontal and vertical alignment allows a more sinuous form.

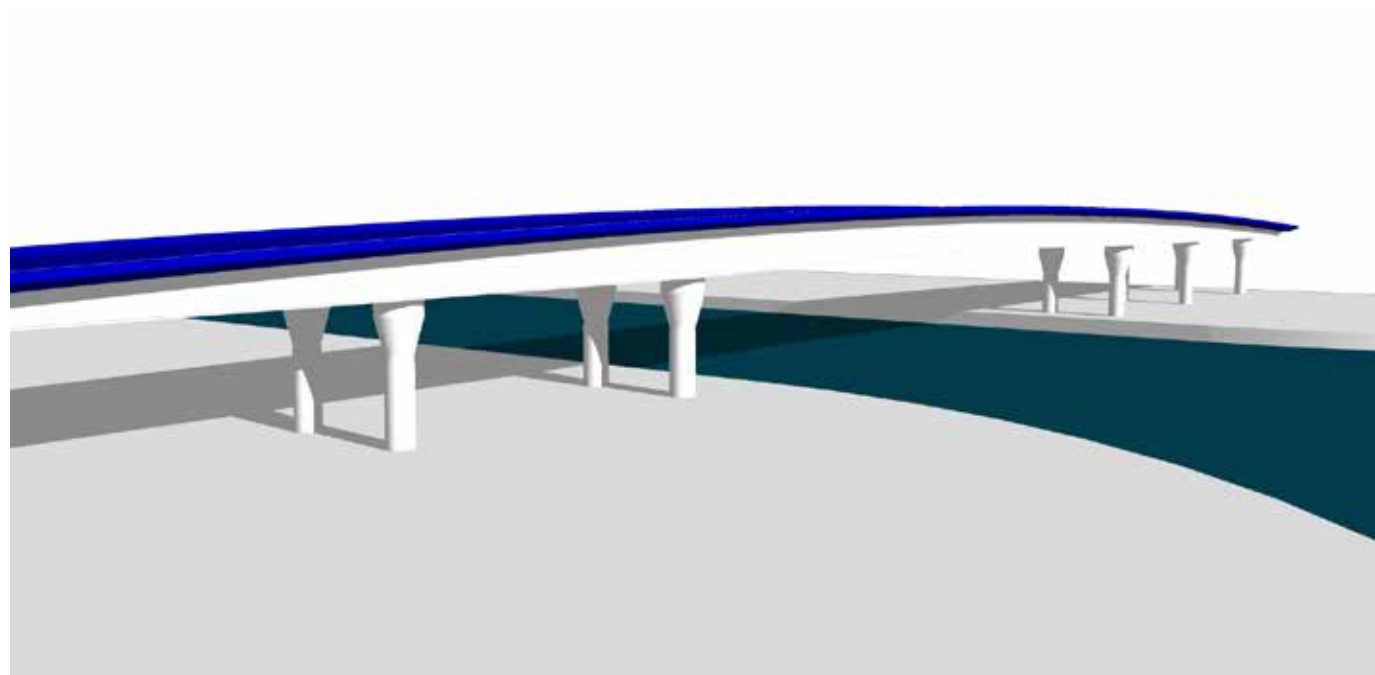
Bridge

- 13.12 Consideration was given to various combinations of bridge forms where the transport route, walkway and cycleway are either fully integrated, arranged in parallel, or entirely separate bridge structures.
- 13.13 A single, integrated bridge was selected on the basis that this minimised land-take, flood zone impacts and overall prominence.

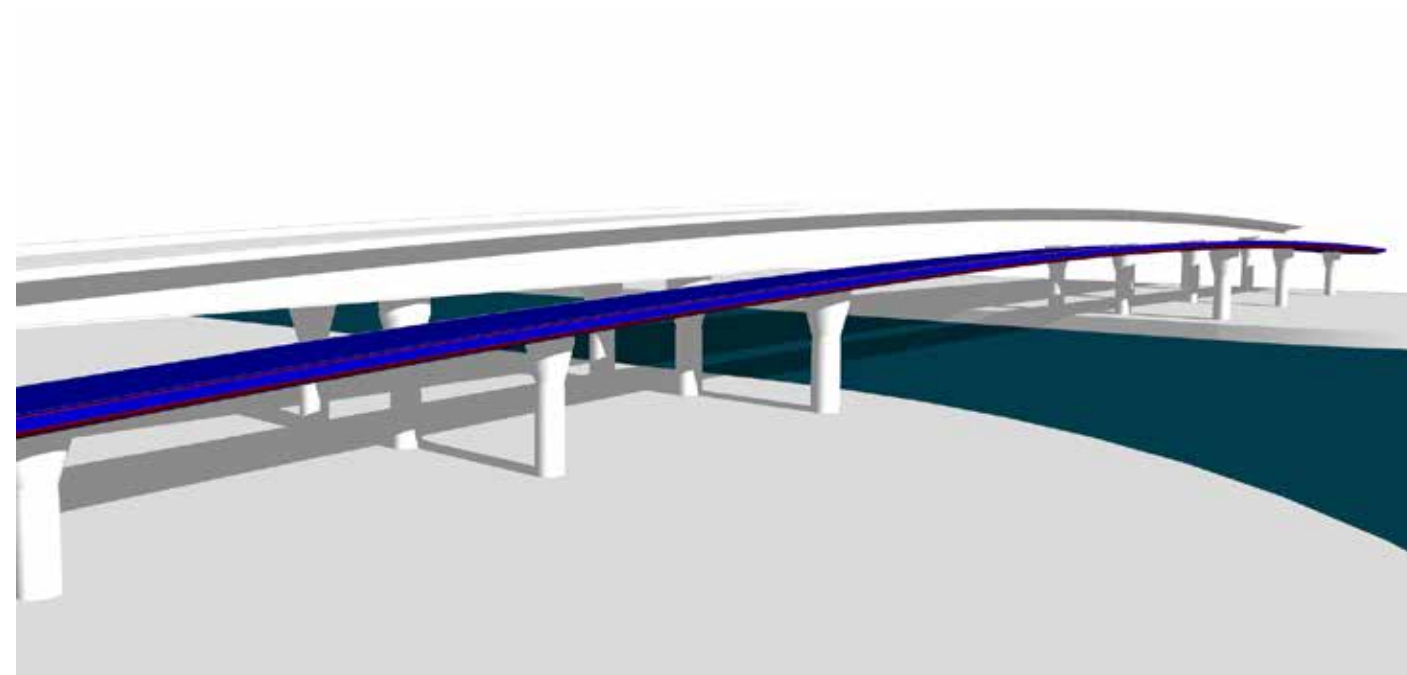
Figure 38. (Above) The weathered steel beam forms a blade like feature that emphasises the horizontal sweep of the new bridge structure

Figure 39. (Below) The in situ concrete deck also describes the sinuous sweep of the new bridge structure

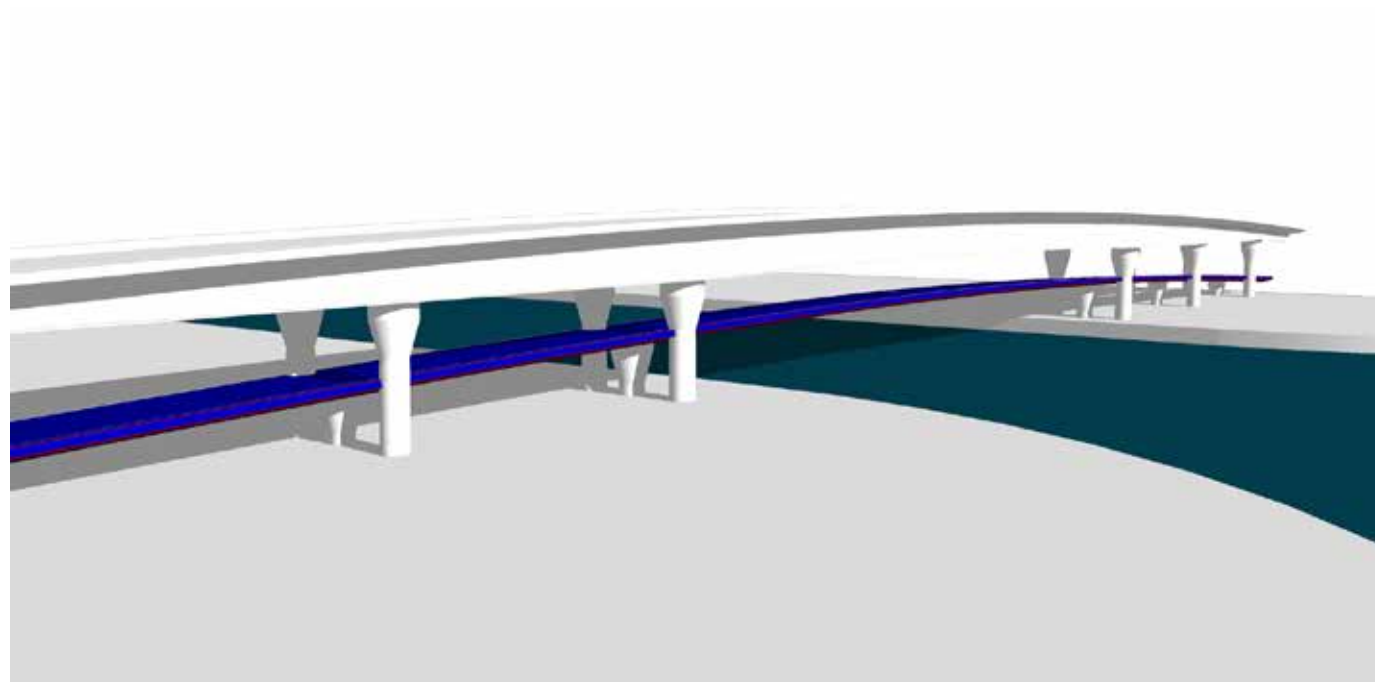
Figure 40. Options for the integration or segregation of the walkway and the cycleway



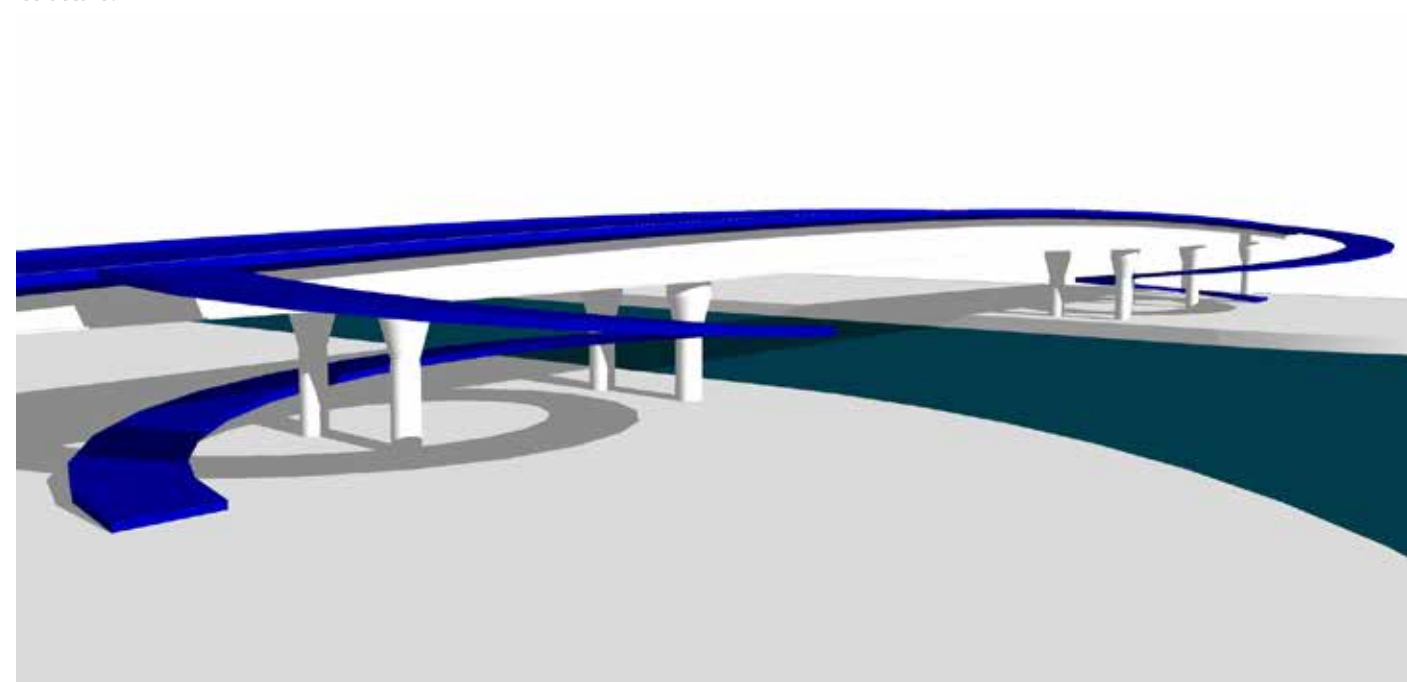
The walkway and cycleway is fully integrated with the main bridge deck. This option has the lowest overall bulk and visual prominence with lower flood zone impacts. The single integrated bridge represents the simplest and most sinuous bridge form.



The walkway and cycleway forms a separate parallel bridge structure that requires a shallower beam, so that the bridge can be set lower than the transport route without impinging on views through to the railway bridge. This option results in a bulkier and more prominent structure.

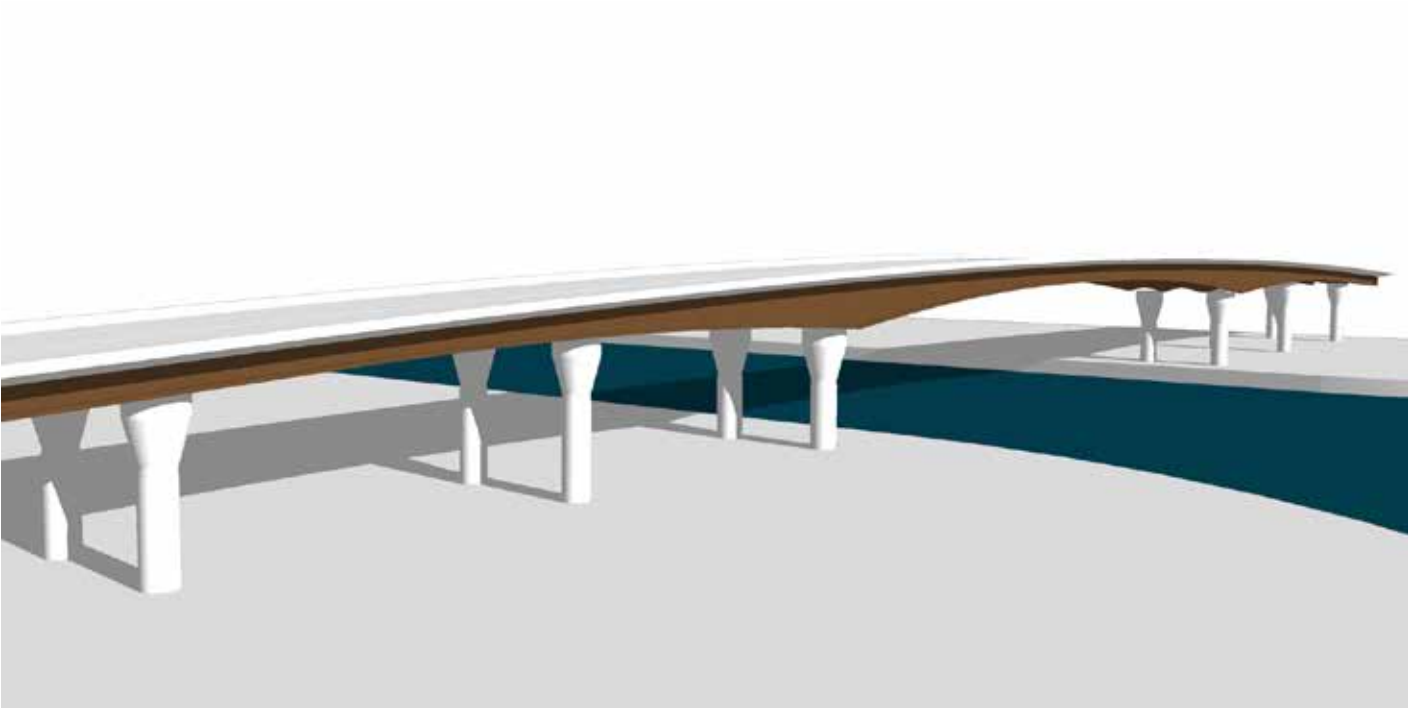


The walkway and cycleway are placed in parallel and below the main transport route bridge. This option must either impinge upon river navigation and the riverside path below, or result in a taller and more prominent structure that will be more bulky and out of scale with the adjacent listed rail bridge.

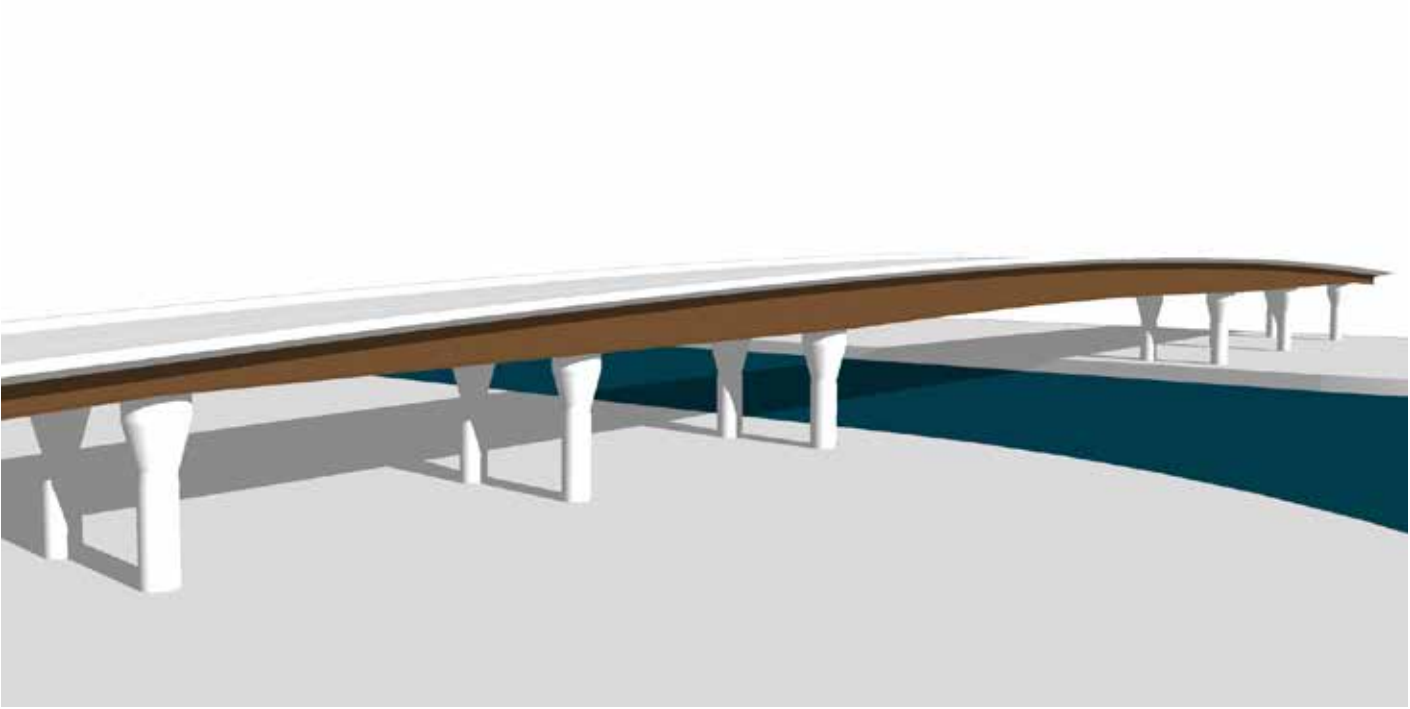


The walkway and cycleway is combined with the main bridge span with ramps on either side connecting more directly with the riverside path. These may be helical (as shown) in-line, or switch-back ramps. This option results in a more prominent structure, increases flood zone impacts, and results in a greater loss of mature trees.

Figure 41. Bridge girder forms (shown diagrammatically)



Tapering depth steel girder with open abutments. The bending moment permits a shallower girder at the apex of the bridge.



Deep, gently cambered girder to main river span tapering to the east and west.



Tapering depth steel girder with retained embankment of west side.



Girders of different depths (baseline scheme) with gently cambered main river span.



Deep, gently cambered girder to main river span tapering to the east and west with part enclosed abutment to the west.

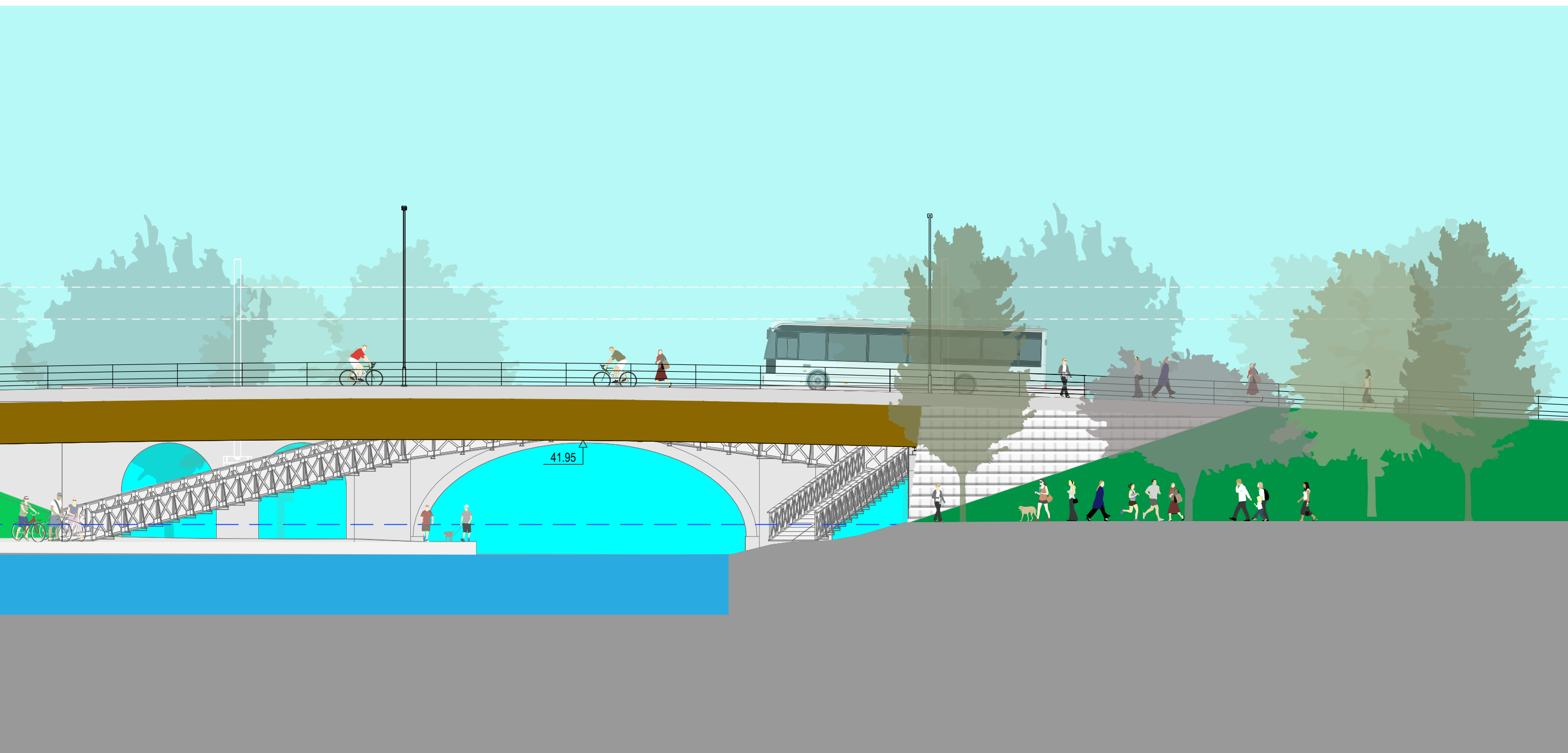


Deep, gently cambered girder to main river span tapering to the east with full enclosed abutment to the west (preferred approach).

## 14 Selected bridge form



Figure 42. Selected bridge form



# 15 Viaduct

| Parapet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Soffit design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>15.1</div> <div>The outer face of the parapet or deck is considered to be one of the most important aesthetic elements of the bridge. Along with the railings, it is the highest element and therefore more in long distance views.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>15.5</div> <div>The underside of the bridge and viaduct will be visible in local views from the towpaths and from the south at the River Kennet, beneath the listed railway bridge looking north towards the Thames.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <div>15.2</div> <div>The bridge deck and parapet will be in situ concrete that allows the profile to be modelled to some extent.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <div>15.6</div> <div>The design intent is to create clean uncluttered surfaces, neat connections, and simple layout of girders to avoid visual complexity and make the structure elegant</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <div>15.3</div> <div>The edge detail of in situ concrete will be formed with a slim faceted profile. A number of options were considered. The junction between each cast element will be formed simply and cleanly in order to ensure that the edge has a sinuous appearance. This will follow and serve to emphasise the sinuous line of the route, the widening and narrowing carriageway width, and the rising and falling levels.</div>                                                                                                                                                                                                                                                                                                              | <div>15.7</div> <div>The use of horizontally curved steel girders combined with the rising and falling gradient of the route creates a elegant, sinuous appearance when viewed obliquely from below on the towpath and national cycle route.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <div>15.4</div> <div>The following principles have determined the parapet design.<ul style="list-style-type: none"><li>The deck edge is designed to appear as a continuous, sinuous, and uninterrupted face, extending the full length of the bridge with a generous overlap of the abutments.</li><li>A continuous neat, sharp edge defines the edge against the weathered steel girder below and the cantilever creates a deep shadow that further accentuates and expresses the form.</li><li>The deck edge is slender and thin in contrast with the girder below.</li><li>The bottom half is a single face with the top face angled towards the road, to channel rainwater onto the bridge, minimising staining of the outside face.</li></ul></div> | <div>15.8</div> <div>The uprights and fixing brackets and horizontal bars will be white painted galvanised mild steel.</div> <div>15.9</div> <div>The necessary infill element between horizontal rails will be galvanised wire mesh fixed on the road side in order to ensure the main emphasis in views to the bridge is formed of the horizontal rails. The mesh will also deter people from climbing up the rails.</div> <div>15.10</div> <div>Bridge users will experience a greater sense of openness and feel less enclosed than with rail systems where the bars are aligned vertically.</div> <div>15.11</div> <div>The horizontal rails are relatively thin in cross section and spaced sufficiently apart to allow sky to be seen through in views from the riverside.</div> |

- 15.12

The design of the bridge parapet railing can influence views to and from the bridge; and also influences the apparent mass and depth of the structure overall and the slender appearance.
- 15.13

Views through the parapet structure have been maximised by specifying an open rail design that is as slender as possible (as opposed to a full height solid concrete or steel parapet). The rails are painted light grey to reduce their prominence when seen against the sky.
- 15.14

A four-rail barrier is specified that gives a strong horizontal emphasis with a neat and simple connection.

- Mesh

15.15

A mesh screen needs to be attached to inner face of the parapet railing. This is to deter people from climbing up the railings or jumping from the bridge, and can prevent window-blown litter flying off the structure.
- 15.16

The fine mesh coloured light grey is designed not to detract from the aesthetics of the bridge and the fixings when viewed close-up and designed to appear integrated with the whole design, rather than added on.

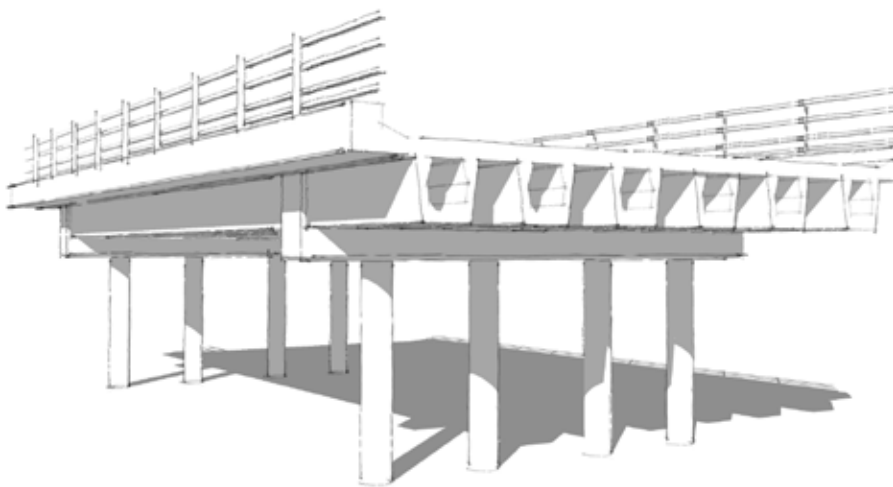


Figure 44. Baseline viaduct with concrete girder, four column support and square edge soffit



Figure 43. Example of sinuous form



Figure 45. Example of simply detailed soffit

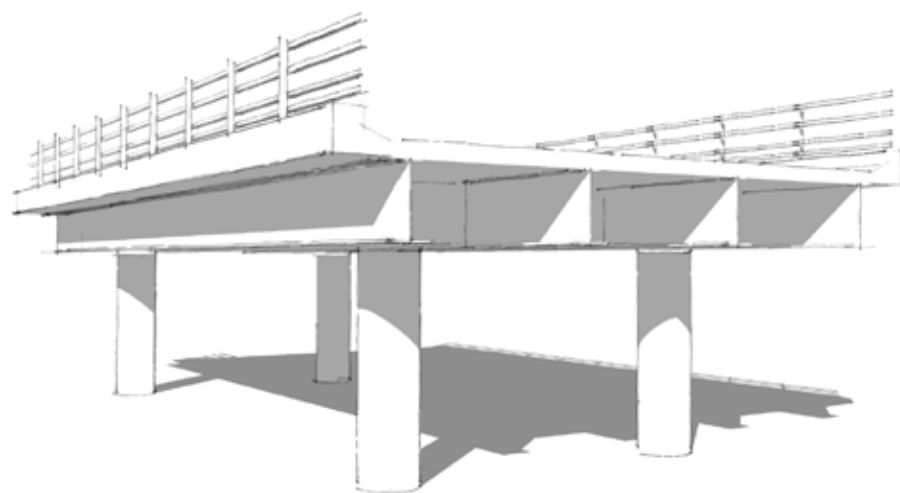


Figure 46. Steel girder with two supporting columns

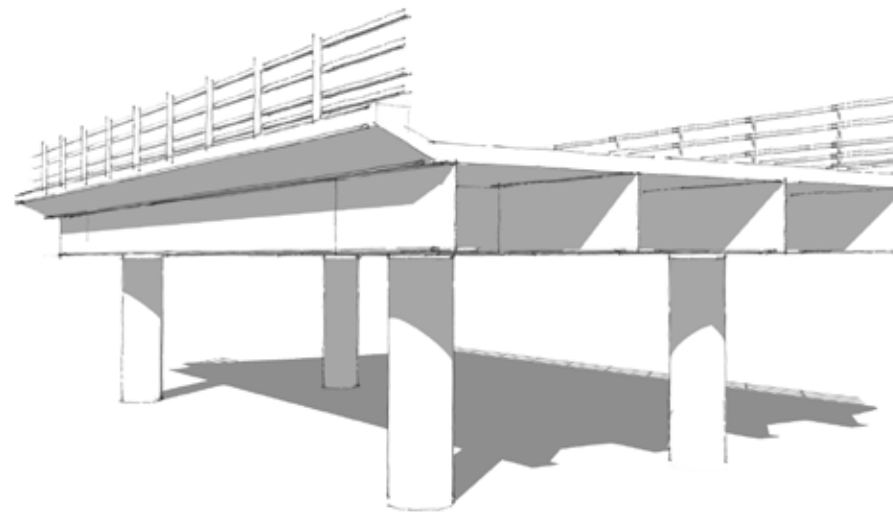


Figure 47. Steel girder with tapered soffit and deeper projection

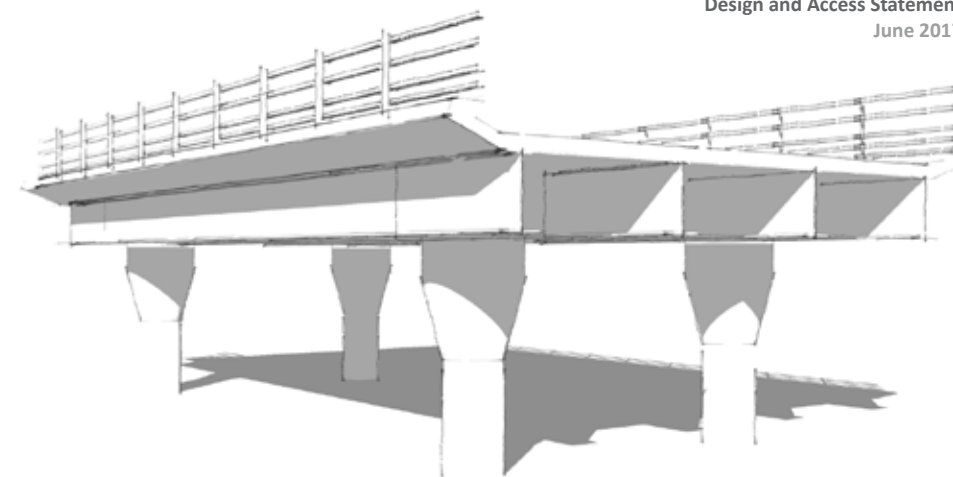


Figure 48. Steel girder with tapered and projecting soffit and tapered concrete columns

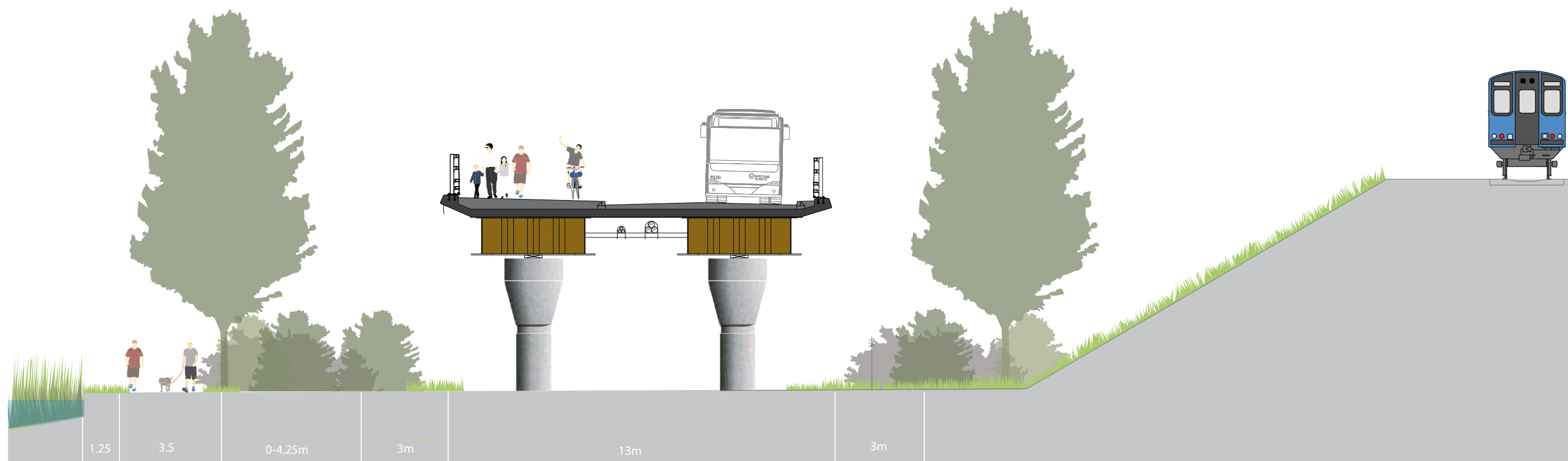


Figure 49. Riverside cross section

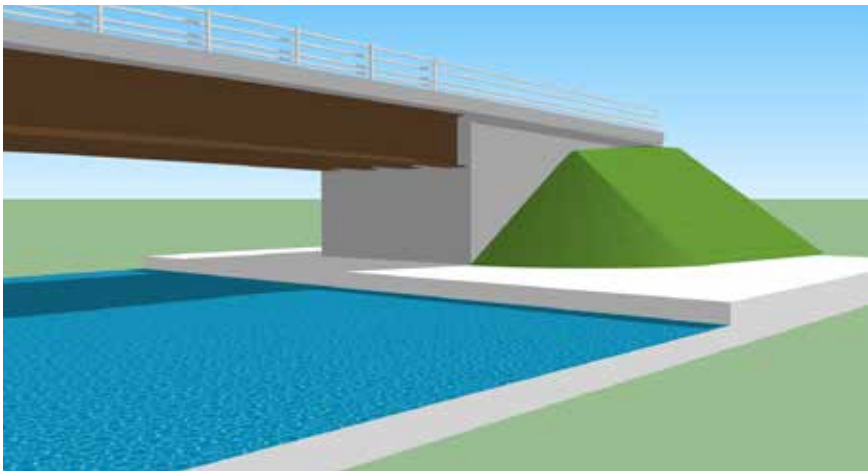


Figure 50. Simple retaining walled abutment (baseline scheme)



Figure 51. Retaining wall with girder extended over the abutment.



Figure 52. Open abutment with earth embankment

# 16 Abutments

## Abutments

- 16.1 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
- 16.2 The retaining walls of the western bridge abutments will be face in rock-filled gabian cages.
- 16.3 An open abutment is proposed on the eastern bank of the river at the junction of the main river span with the viaduct structure.
- 16.4 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.

- 16.5 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.
- 16.6 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.
- 16.7 The railings also extend beyond the abutment walls to reinforce a continuous and sinuous appearance.
- 16.8 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.
- 16.9 There is a slight angle to the abutments walls that can make the wall appear less dominating, especially next to the footpaths.

## Immediate setting

- 16.10 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
- 16.11 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.
- 16.12 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. Boundary fencing is proposed set below and slightly in from the edge and therefore largely in shadow. The aim is to deter and prevent the appearance of dead or dying plants and eroded rubbish-strewn surfaces.

- 16.13 The spaces below the structure will tend to be very dry with deep shade where plants are unlikely to survive. Plants have been located to the outside of the space with shade and water tolerant plants specified.
- 16.14 The creation of a varied habitat from light to a dry and shady rocky habitat, connecting and benefiting local biodiversity has been integrated.
- 16.15 Where plants will not thrive, the approach will be a mix of hard paving in some parts and gravel/hogging.
- 16.16 Embankments will be planted.

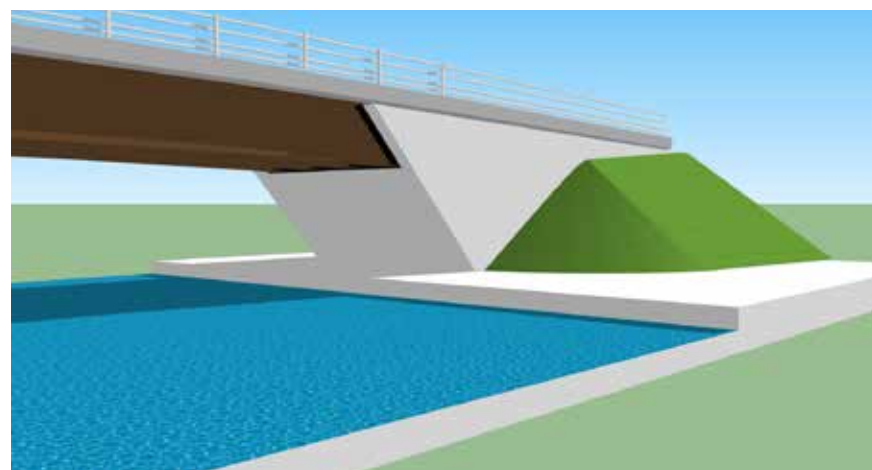


Figure 54. Retaining wall sloping towards the river edge



Figure 55. Retaining wall with sloping abutment walls (preferred scheme)

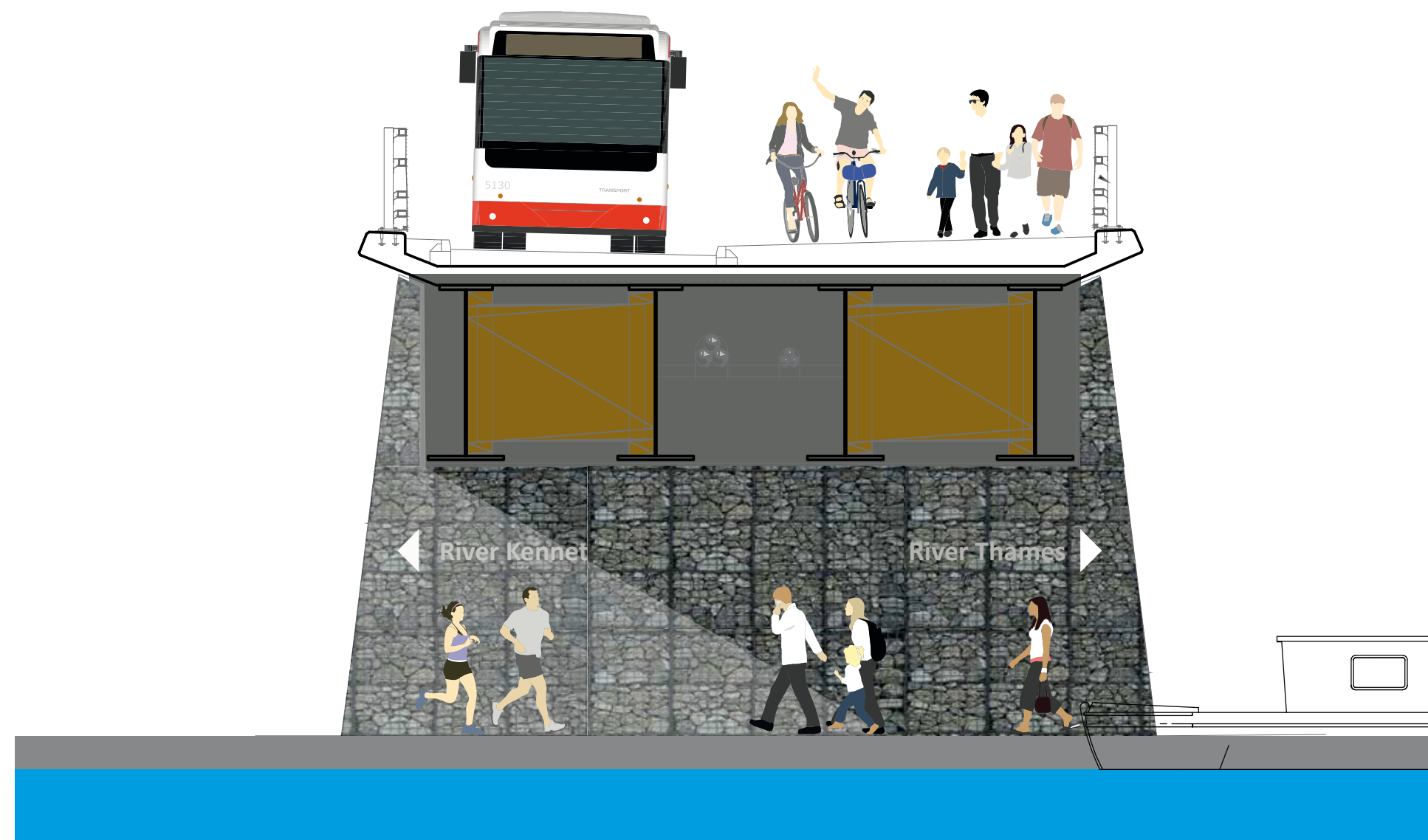


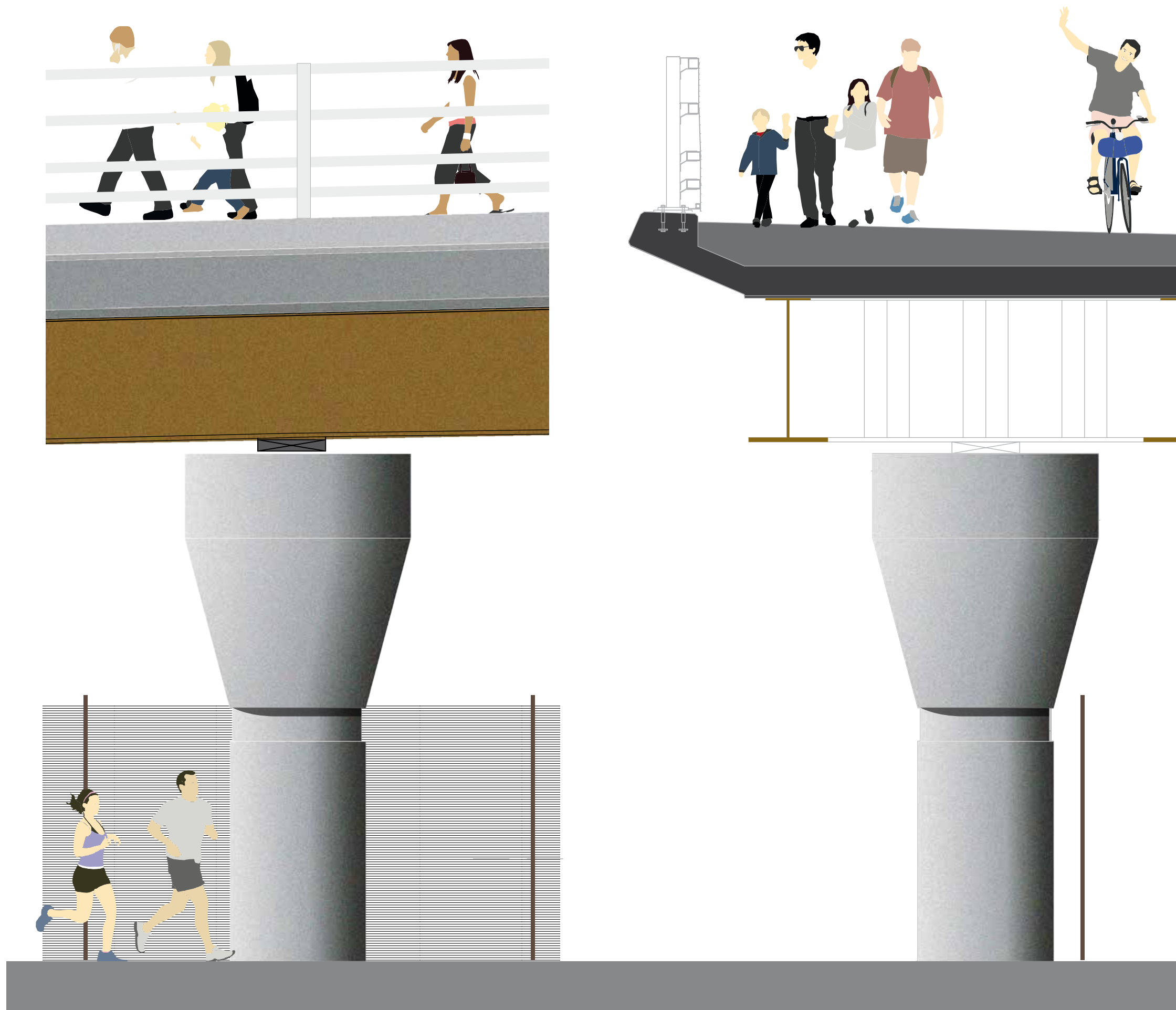
Figure 53. Elevation/section of proposed scheme viewed from the north (Thames Riverside)

# 17 Columns and beams



Figure 56. Example of tapered column head

| Girder/beams      |                                                                                                                                                                                                                           | Surface | Columns                                                                                                                                                                                                                                                                                                                      |       |                                                                                                                                                                                                                                                        |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17.1              | 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.                              | 17.5    | The bridge deck and ramp will be segregated into bus, cycle and pedestrian lanes. Each mode will be designated by materials changes and slight shifts in grade.                                                                                                                                                              | 17.9  | The viaduct columns have been evenly and relatively widely spaced to reduce visual mass and minimise obstruction beneath the structure.                                                                                                                |
| 17.2              | 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. | 17.6    | The cycle and walking routes will be rounded gravel. This surface provides a robust surface with considerable control over colour, and finish, including applied patterns. The surfacing provides good slip resistance. The cycle route will contain a red mix and the walking route will contain a light and dark grey mix. | 17.10 | Fewer columns avoids a cluttered appearance and minimises visual obstruction, whilst providing enough piers to avoid an overly deep beam.                                                                                                              |
| 17.3              | The connection between the shallower viaduct beams and the main cambered bridge spans has been differentiated (SEE OPTIONS).                                                                                              | 17.7    | Kerbs will be pre-formed concrete in light grey.                                                                                                                                                                                                                                                                             | 17.11 | The bearers 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.                                |
| Bridge span beams |                                                                                                                                                                                                                           | 17.8    | The road surface will comprise ‘bitmac’ with a high stone content.                                                                                                                                                                                                                                                           | 17.12 | 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.                                                                                      |
| 17.4              | The bridge “I” beams will be formed from weathering steel describing a shallow camber, which, will allow it to mature naturally into the environment.                                                                     |         |                                                                                                                                                                                                                                                                                                                              | 17.13 | Piles and pile caps are needed to support piers in the soft ground. Whilst the caps are sometimes formed above ground and can create a feature, they also present an aesthetic challenge in that they appear as a heavy base component of the columns. |
|                   |                                                                                                                                                                                                                           |         |                                                                                                                                                                                                                                                                                                                              | 17.14 | The piles and caps will be formed completely below ground level to create a clean and crisp appearance with the circular columns travelling directly into the ground.                                                                                  |



# 18 Colour, materials and finishes



Figure 57. Example of railing with horizontal rails emphasizing curving form of viaduct

| Colour |                                                                                                                                                                                                                                                                                                                                                                                                     | Materials |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | In situ concrete deck |                                                                                                                                                                                                                                                                                                                    | Weathering steel beams/girders |                                                                                                                                                                                                                                                            |       |                                                                                                                                      |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------|
| 18.1   | The use of colour has been carefully considered and specified to enhance and mark the bridge.                                                                                                                                                                                                                                                                                                       | 18.5      | These broad colour bands (water, brown/ green, grey, sky) have influenced the selection and grading of colours applied to the bridge and viaduct structures. <ul style="list-style-type: none"><li>The structure, where it is visible in local views, rises above the bands of water and green.</li><li>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.</li><li>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.</li><li>The cantilevered light grey in situ concrete deck and painted light grey steel 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.</li></ul> | 18.6                  | The main materials are as follows: <ul style="list-style-type: none"><li>Weathered steel beams/girders</li><li>In situ concrete deck</li><li>Metal guard railings</li><li>In situ concrete columns</li><li>Road surfaces</li><li>Gabian walls to abutments</li><li>Galvanised metal trim</li><li>Fencing</li></ul> | 18.7                           | Concrete surfaces close to traffic and accessible to the public have a higher class finish.                                                                                                                                                                | 18.13 | Weathering steel was developed to eliminate the need for painting. It forms a stable rust-like appearance if exposed to the weather. |
| 18.2   | The surrounding landscape tones are greens and browns combined with darker water tones. These are generally subdued, recessive tones.                                                                                                                                                                                                                                                               |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18.8                  | The appearance of the bridge can be affected by the quality of the concrete finish. A high quality concrete mix and finish is specified.                                                                                                                                                                           | 18.14                          | 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. |       |                                                                                                                                      |
| 18.3   | 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.                                                                                                                                                                                                                             |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18.9                  | Steel shuttering and pre-cast factory made elements are specified for highly visible bridge elements such as the abutments to ensure a controlled, high quality finish.                                                                                                                                            | 18.15                          | The main bridge and viaduct is supported by a largely continuous flanged 'I' beam. Where beams don't abut, to allow for thermal expansion, this is covered by a weathering steel strip.                                                                    |       |                                                                                                                                      |
| 18.4   | 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 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. |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18.10                 | 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.       | 18.16                          | 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.                                   |       |                                                                                                                                      |
|        |                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18.11                 | The more aesthetically pleasing appearance of GGBS concrete can help soften the visual impact of large structures such as bridges and retaining walls.                                                                                                                                                             |                                |                                                                                                                                                                                                                                                            |       |                                                                                                                                      |
|        |                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18.12                 | 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 form smelting iron ore.                                                 |                                |                                                                                                                                                                                                                                                            |       |                                                                                                                                      |



Figure 59. Balustrade rail with mesh infill



#### Metal parapet railings

- 18.17 The guard railing must act to contain vehicles and is therefore necessarily a robust design.
- 18.18 The railings will be light grey painted with a comparatively simple post and rail form.
- 18.19 A metal mesh is attached to the rails to prevent people climbing up. In some installations the mesh extends from the bottom to the top rail. However, in this case, the top rail is to provide adequate height for cyclists and the mesh will finish at the rail second from the top in order to create a more open aspect. The mesh will be finished with a continuous galvanised metal strip.

#### In situ concrete columns

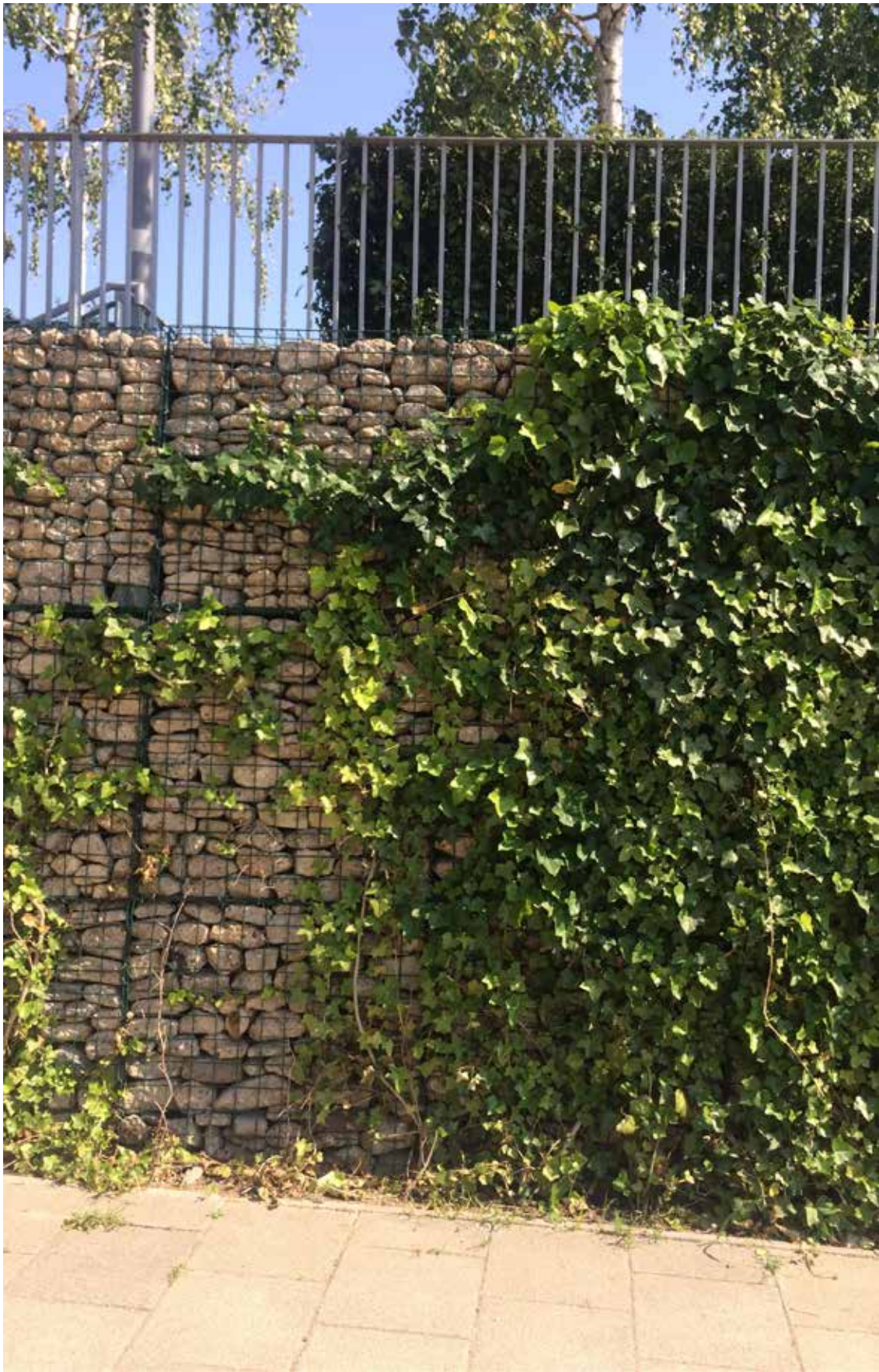
- 18.20 The columns have a flared capital form, rather than simple tubes. As noted earlier, will be of a darker grey concrete so that they are more recessive.
- 18.21 This will be achieved by using Pulverised Fuel Ash (PFA) as a cement replacement. PFA is a waste product obtained from coal-fired power stations.

#### Route surfaces

- 18.22 The surface of the footway and cycleway will be asphalt.



Figure 58. Example of weathering steel finish



**Gabion walls**

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

**Galvanised metal trim**

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

**Fencing**

- 18.29 Perimeter fencing is designed to deter anti social behaviour in the spaces below the viaduct.
- 18.30 A simple metal mesh is proposed in a brown or green finish in order to blend into the background.
- 18.31 The fence is positioned immediately behind the columns facing the river side where they will be largely in shadow.

**Sustainability and materials**

- 18.32 Fuller details on the approach to sustainability are set out in the Environmental Statement Chapter 9, Sustainability.
- 18.33 The embodied carbon of the proposed development will be reduced by the use of materials with low environmental impacts over their life-cycles.
- 18.34 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).
- 18.35 Where appropriate and financially viable, locally sourced materials will be favoured to reduce the environmental impact of transporting materials.



# 19 Access and movement

| Walking and cycling |                                                                                                                                                                                                                                                       | Benefits |                                                                                                                   |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------|
| 19.1                | The East MRT will provide a fast track and dedicated cycle and pedestrian route directly into the centre of Reading and the station from the A4, to the east of Reading.                                                                              | 19.7     | The new route provides a number of benefits over existing provision. It is:                                       |
| 19.2                | It will also connect Thames Valley Park with Reading town centre and station.                                                                                                                                                                         |          | <ul style="list-style-type: none"><li>• High quality.</li></ul>                                                   |
| 19.3                | The scheme provides a direct link between Ready Bike Cycle Hire schemes located at the station and at TVP.                                                                                                                                            |          | <ul style="list-style-type: none"><li>• Fast and direct.</li></ul>                                                |
| 19.4                | The East MRT scheme provides an alternative crossing of the River Kennet for towpath users, avoiding the stepped Horseshoe bridge.                                                                                                                    |          | <ul style="list-style-type: none"><li>• Lit.</li></ul>                                                            |
| 19.5                | The connections at either end of the scheme provide a seamless link with existing walk and cycle infrastructure. The scheme connects into existing walking and cycling routes and local areas providing a high-quality alternative to current routes. |          | <ul style="list-style-type: none"><li>• Step-free.</li></ul>                                                      |
| 19.6                | The scheme will also improves pedestrian and cyclist safety through the provision of a fast track, lit and dedicated cycle and pedestrian route directly to the centre of Reading.                                                                    |          | <ul style="list-style-type: none"><li>• Avoids areas of flood risk.</li></ul>                                     |
|                     |                                                                                                                                                                                                                                                       |          | <ul style="list-style-type: none"><li>• Benefits from natural surveillance of the regular bus services.</li></ul> |



Figure 60. Walking and cycling access

## 20 Public realm

### Approach

- 20.1 The public realm in the area of the new route comprises footpaths, footbridges, open scrub land, woodland and the river edges.
- 20.2 The overall approach is to maintain existing footpath connections and bridges and to maintain the relationship with the river.
- 20.3 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.
- 20.4 The riverside path adjacent to the viaduct will still have generous planted strips on either side. The planted strips will be wider in some places and narrower in others.
- 20.5 The wide bridge span 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.
- 20.6 Where existing footpaths through the Coal woodland are affected by the new route, alternative routes are proposed nearby that still offer direct connections.
- 20.7 The Horseshoe bridge will be retained, maintaining connections.
- 20.8 The area beneath the viaduct will need to be partly fenced in order to deter antisocial behaviour beneath. This will also make it feel safe to walk along the riverside path. The proposed fence is set back as far as possible below the viaduct in order to maintain the open feel. The fence will be a high quality metal mesh that will maintain views through it.



Figure 61. Public realm plan



Figure 62. Landscape strategy plan

# 21 Landscape

## Existing landscape context

- 21.1 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.
- 21.2 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.

- 21.3 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.
- 21.4 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 small area of acid grassland is located in the western area of the site, near to Napier Road and the nearby retail superstore.
- 21.5 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. There are no TPOs upon the eastern part of site within the Borough of Wokingham.

## Landscape design principles

- 21.6 The proposed East Reading MRT will provide an efficient commuter route, comprising 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.
- 21.7 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 reinforce this existing connection as an alternative, 'slow' leisure route.



- 21.8 The design intention, for a slow leisure route and low key intervention landscape design approach, pays respect to the time layers of transportation routes along this stretch of the 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.
- 21.9 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. It seeks to provide low key interventions, suited to the river edge and urban open space context of the site, which would promote the existing leisure activities, and encourage pausing and resting within the area.

- 21.10 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.

**Planting strategy**

- 21.11 The planting strategy comprises a combination of managing and supplementing existing areas of trees and vegetation, creating new areas of habitat, and providing structural and feature planting.

**Existing habitat**

- 21.12 Broadleaved woodland within the Local Wildlife Site will be managed to include selective removal of non-native species, and the additional planting of native trees and understorey species.
- 21.13 The area of acid grassland at the western end of the site will be managed, and its extent sought to be increased. Scattered planting of acid tolerant tree species will create a glade.



Figure 63. Extract from the trees and shrub planting palette

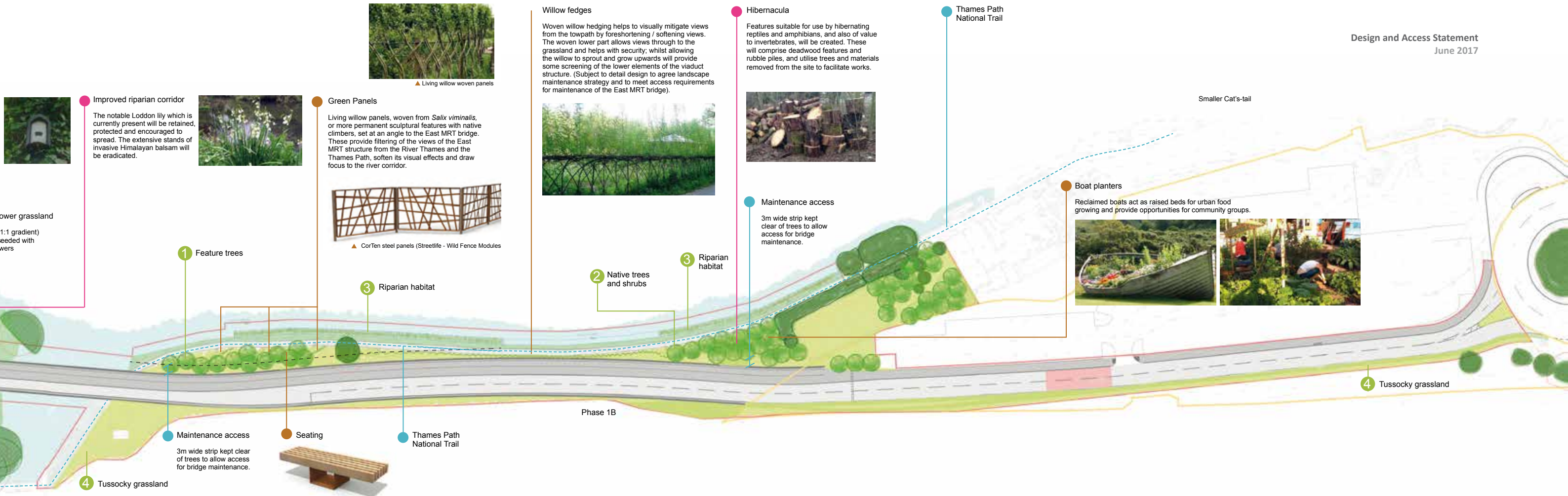


New areas of habitat

- 21.14 Seed mixtures will be used to create swathes of grassland, providing connectivity across the site. A tussocky grassland mixture will be used for the majority of the site, to the north and south of the East MRT route. 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.
- 21.15 Copses of native trees and shrubs will be created, particularly in the east of the site, and native hedgerows will provide boundary treatments, where appropriate.
- 21.16 Rafts or coir rolls will be installed along the edge of the River Thames in front of the existing hard engineered retaining wall, to create a strip of new riparian habitat, suitable for softening the current hard river edge. Species will be selected to complement the existing riparian habitat located to the west of the Kennet. Gaps will be provided where there are moorings or pontoons, maintaining access for boats to the river.

Structural / feature planting

- 21.17 Green panels will be positioned within the area to the east of the Kennet Mouth. These will comprise living willow panels, woven from *Salix viminalis*, or more permanent sculptural features with native climbers, set at an angle to MRT bridge. These provide filtering of the views of the MRT structure from the River Thames and the Thames Path, soften its visual effects and draw focus to the river corridor.
- 21.18 To the east of these panels, a willow fedge will be created. This woven willow hedging helps to visually mitigate views from the towpath by foreshortening / softening views, and drawing the eye to either the river corridor or up to the engineered detail of the viaduct. The woven lower part allows views through to the grassland and helps with security; whilst allowing the willow to sprout and grow upwards will provide some screening of the lower elements of the viaduct structure and undercroft fencing.
- 21.19 Feature trees, such as the Paperbark Maple, Walnut and Cherry, will be planted in small groups to provide focal points, and mark thresholds within the site.



### Planting constraints

- 21.20 Proposed tree planting has been positioned taking into account services and maintenance access.
- 21.21 Services and utilities have been re-routed to the narrow corridor to the south of the proposed East MRT route. 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.
- 21.22 In order to accommodate maintenance access for the MRT bridge, 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 64. Artist's impression of the riverside path adjacent to the new route



| Landscape elements |                                                                                                                                                             | Access | Additional wildlife features                                                                                                                                                                                           |       |                                                                                                                                                                                                                                                                                     |       |                                                                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21.23              | New seating will be provided at suitable points within the site, for example amongst the area of green panels, and where views of the river may be enjoyed. | 21.25  | The Thames Path National Trail and National Cycle Routes will continue on their existing routes through the site on completion of the scheme.                                                                          | 21.27 | 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.                                                                                                       | 21.30 | 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. |
| 21.24              | Reclaimed boats will be incorporated within the scheme to act as raised beds for urban food growing and provide opportunities for community groups.         | 21.26  | 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 Category U trees are to be removed, to minimise the impact on existing trees. | 21.28 | 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. |       |                                                                                                                                                                                                                                                                         |
|                    |                                                                                                                                                             |        |                                                                                                                                                                                                                        | 21.29 | Bird and bat boxes - Attached to suitable mature and semi-mature trees, primarily within the Local Wildlife Site. These will target species of local importance identified to be present on site and within the local area.                                                         |       |                                                                                                                                                                                                                                                                         |



# 22 Lighting, signals and signage

| Lighting Design |                                                                                                                                                                                                                                                                                                                                                                                                                                | Proposals |                                                                                                                                                                                                                                                                                                                                                         | Feature lighting |                                                                                                                                                                                                                                                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22.1            | A preliminary lighting design and lighting assessment accompany this application.                                                                                                                                                                                                                                                                                                                                              | 22.4      | The following responses are proposed <ul style="list-style-type: none"><li>Use of smaller height columns and the use of luminaires with dimmer light outputs'</li><li>New luminaires and columns in accordance with RBC Street Lighting Specification – use of Holophane V-Max luminaire'</li><li>Align with columns of the bridge structure.</li></ul> | 22.7             | 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.        |
| 22.2            | The lighting scheme proposed for the new bridge has been designed taking into account a number of different factors which have influenced both the luminaire selection and also the positioning of luminaires.                                                                                                                                                                                                                 |           |                                                                                                                                                                                                                                                                                                                                                         | 22.8             | The impacts of illuminating the bridge within the environment in which it is to be located have been evaluated, but rejected.                                                                                                                                                                                                                            |
| 22.3            | The main factors, both functional and aesthetic, which influence the lighting scheme, are: <ul style="list-style-type: none"><li>Route and bridge users: functional lighting</li><li>Visual impact (light intrusion, glare and sky glow)</li><li>Security of bridge users above and footpath users below.</li><li>Energy consumption and maintenance.</li><li>Relevant national guidance, including impacts on bats.</li></ul> | 22.5      | Footway / cycleway approaches will be lit via conventional column mounted luminaires in keeping with existing lighting schemes, current standards and the application of low energy solutions providing directional light minimising light spill.                                                                                                       | 22.9             | Lighting structures (columns, luminaries etc.) have been minimized or avoided completely. Where they are necessary, they have designed as part of the bridge with supports elegantly designed and well detailed. The light columns relate to the main bridge elements in terms of position and form and correspond with the rhythm of columns and spans. |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                | 22.6      | Mid-hinged columns will be installed to reduce the maintenance requirements.                                                                                                                                                                                                                                                                            | 22.10            | Columns will be silver/grey painted.                                                                                                                                                                                                                                                                                                                     |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                                                                                                                                                                         | 22.11            | 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 cast upon and around the structure.                                                                                                                                    |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                                                                                                                                                                         | 22.12            | 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.                                                                                               |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                                                                                                                                                                         | 22.13            | 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.                                                                                                                                     |



Figure 65. Bridge deck lighting concept (Holophane V-Maz)

| 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 | Light Grey continuously Tapered/Conical shape Column Mid-hinged | To be advised by Tescos |
| Height           | 6m                                 | 6m                                            | 6m                                            | 6m                                                              | 6m                      |
| Lantern          | Holophane VMAX                     | Holophane VMAX                                | Holophane VMAX                                | Holophane VMAX                                                  | Holophane VMAX          |
| Luminaires       | VMX044 V1 LED                      | VMX044 V1 LED                                 | VMX014 V1 LED                                 | VMX014 V1 LED                                                   | VMX164 V8 LED           |

Figure 66. Lighting strategy

Ecology and lighting

- 22.14 A comprehensive Ecological Mitigation and Management Strategy includes measures in relation to ecology including
- Implementation of an ecologically informed lighting strategy once the scheme is operational. This will include measures such as:
  - Lighting columns along the northern extent of the bridge and viaduct only;
  - Lighting columns to provide directional lighting to face away from the more sensitive areas (including The Coal, Kennetmouth and Kings Meadow East LWS and Henley Road Pit LWS); and
  - Inclusion of a shield on the back of lighting columns to further reduce any light backspill. Where there are areas which light spills along the southern side of the viaduct, front light shields will also be installed.

Signage

- 22.15 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**
- 22.16 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.
- 22.17 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

- 22.18 Shuttle working will operate with a signal/indicator system to allow bus progress between the stop lines 190m apart.

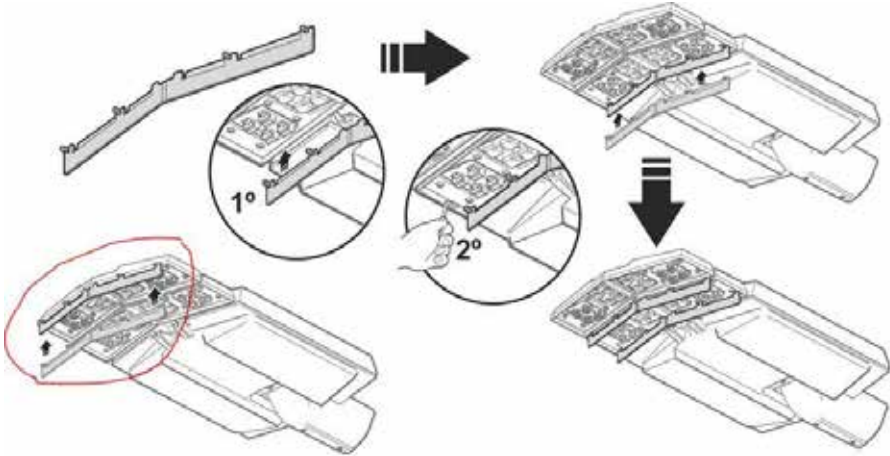


Figure 67. Details of light shields on all luminaires to mitigate light spill into the surrounding area

## 23 Construction

| Construction sequence |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      | Deliveries                                                                                                                                                                                                                                                                                                                                                                                    | Vehicle Routes | Construction Environmental Management Plan                                                                                                                                                                 |       |                                                                                                                                          |       |                                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23.1                  | It is anticipated that 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 23.3 | The embankment is expected to have the most significant impact on construction traffic due to the volumes of fill material being imported on site.                                                                                                                                                                                                                                            | 23.5           | Deliveries will be limited to off-peak periods to avoid disruption in peak periods 09:30 – 16:30.                                                                                                          | 23.8  | Construction vehicles accessing the eastern section of the site will be routed from the M4 in the south of Reading via the A3290.        | 23.11 | Environmental effects arising during the construction phase of the proposed development will be controlled through the implementation of a Construction Environmental Management Plan (CEMP).                                                                                                                      |
| 23.2                  | The main construction activities/phases comprise: <ul style="list-style-type: none"><li>Service diversions (gas pipes and electricity cables).</li><li>Flood plain compensation measures.</li><li>Construction access and haul roads</li><li>Piling.</li><li>Pile caps, abutments, retaining walls, pier construction and drainage works.</li><li>Western embankment and associated supporting structures construction.</li><li>Surface water drainage systems.</li><li>Assembling main bridge and viaduct beams involving 600t+ installation crane.</li><li>Bridge and viaduct deck concrete pouring.</li><li>Road construction and finishing.</li><li>Landscaping and ecological mitigation</li></ul> | 23.4 | The bridge deck construction is expected to commence once embankment construction has been completed.                                                                                                                                                                                                                                                                                         | 23.6           | 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. | 23.9  | Vehicles accessing the western section of the site will be routed from the M4 via the A33 and Vastern Road to Napier Road.               | 23.12 | The CEMP will be agreed with WBC and RBC prior to commencement of construction.                                                                                                                                                                                                                                    |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      | <b>Working hours</b>                                                                                                                                                                                                                                                                                                                                                                          | 23.10          | 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.                         | 23.13 | The CEMP will outline the arrangements and management practices to adopt in order to minimise the environmental effects of construction. | 23.14 | The CEMP will outline the following transport-specific details: <ul style="list-style-type: none"><li>Site Logistics;</li><li>Working Hours;</li><li>Maintaining Access;</li><li>General Site layout, including accesses and routes;</li><li>Construction traffic; and</li><li>Designated access routes.</li></ul> |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 23.7 | Typical working hours will be between 0800 and1800hrs Monday to Friday, and 0800 and 1300hrs on Saturdays. 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. |                |                                                                                                                                                                                                            |       |                                                                                                                                          |       |                                                                                                                                                                                                                                                                                                                    |



