

6 URBAN DESIGN, BRIDGE AND LANDSCAPE CONCEPT

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6.1 OVERVIEW

This concept design is the result of an iterative design approach where the project team members from all disciplines have worked collaboratively to achieve a better integration of the project within Windsor. As part of the integrated design approach, this urban design concept has been informing the road and bridge design concept throughout the design and assessment phase of this project. It is intended that this urban design, bridge and landscape concept would continue to influence the development of the Windsor bridge replacement project, should it proceed to detailed design and construction.

This section describes the concept design for the various elements within the study area including Thompson Square, The Terrace and southern foreshore, the bridge and the northern foreshore. It commences with a description of the urban design and landscape concept and a description and illustration of the key elements that have defined the concept. This is followed by a series of plans and sections that illustrates the proposed urban design, bridge and landscape for the project.

This chapter describes the interrelationship between the replacement bridge works and the adjoining areas in the form of an indicative urban design and landscape concept plan. It identifies a series of recommended works that should occur in conjunction with the construction of the bridge and its associated roadworks, within the defined project area. Further potential works outside the project area are also identified in Chapter 8 of this report which provide additional opportunities to better integrate the project into the township of Windsor and particularly Thompson Square.

The detailed design and documentation of these works, both inside and outside the project area would be the subject of comprehensive consultation with a range of stakeholders including State government agencies, Hawkesbury City Council and the community. Particular attention will be given to Thompson Square during these consultations in order to ensure that the best possible outcome is achieved for this highly sensitive place.

A number of design options were considered during this concept design phase for both the replacement bridge and Thompson Square and these options are presented in Appendix C.

The urban design, bridge and landscape concept has been developed based on the objectives and principles described in chapter 5, in order to achieve an integrated concept design for the project. There are a number of key features of the project which are reflected in the urban design, bridge and landscape concept as follows:

- The proposed bridge would be configured to accommodate two lanes of traffic in opposite directions with the capacity to increase to a three lane configuration in the future.
- A shared path for pedestrians and cyclists would be constructed on the upstream side of the bridge providing safer and more accessible connections between the Windsor township and Macquarie Park.
- Traffic signals at the George Street and Bridge Street intersection would facilitate safer vehicular, pedestrian and cyclist movements through the intersection.
- The existing bridge approach road through Thompson Square (Bridge Street) would be removed creating a unified area of parkland within the square.
- The Terrace along the river foreshore would be reconnected providing a continuous link from Windsor Wharf to the upstream parkland areas.
- The unified open space in Thompson Square would provide enhanced physical and visual linkages between George Street and the river foreshore.
- The Thompson Square parkland area and the river foreshore, adjacent to The Terrace, would be designed to facilitate improved access and cater for a wider range of recreational activities.
- The existing northern approach road, between the existing bridge abutment and the Wilberforce Road and Freemans Reach Road intersection, would be removed and redeveloped as parkland which would link into Macquarie Park and create a distinctive entry point to Windsor.
- Revegetation of the southern and northern foreshores would be undertaken, following the construction of a retaining wall and the placement of rock ballast for scour protection of the river bank.

The urban design, bridge and landscape concept is depicted in the plans, elevations and cross sections as illustrated on the following pages of this chapter:

6.2 KEY FEATURES OF THE CONCEPT

HERITAGE VALUES

The heritage values of Thompson Square have been a critical consideration in the concept design for this project as follows:

- The rationalisation of the extent of roadways in Thompson Square by removing the Bridge Street approach road in order to reduce the amount of paved surfaces, and increase the amount of consolidated green space.
- Infilling the existing road cutting in order to partially restore the earlier landform of Thompson Square.
- The historic connection and relationship of the town to the river would be retained and enhanced.

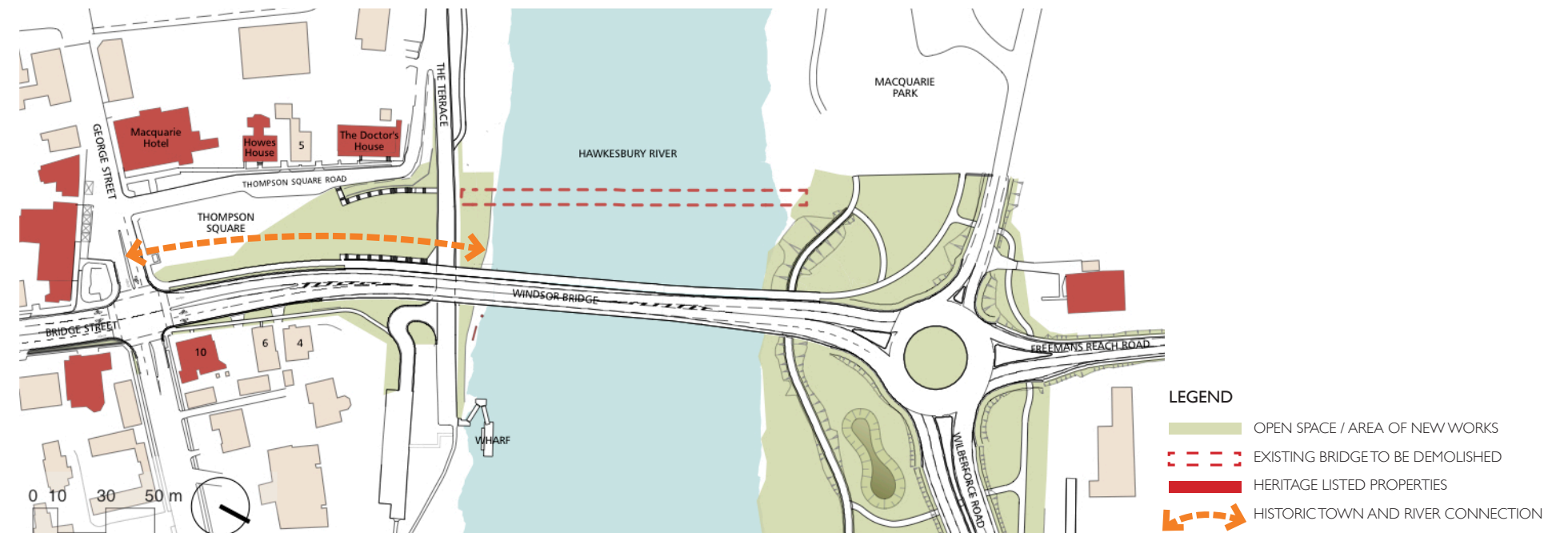


Figure 6.1: Heritage values relating to the project.

STRUCTURE AND FORMS

The project would enhance the structure and urban form of Thompson Square as identified in Figure 6.2 and noted as follows:

- The proposed approach road alignment on the eastern edge of Thompson Square would create a strong and more legible rectangular structure to the square where the roadways define the four edges of the central parkland area.
- The redefined rectangular structure of the square would reinforce the urban form provided by the buildings on its perimeter.
- The lower half of Thompson Square with the road cutting infilled, would be regraded to create more even grades across the parkland.
- The existing retaining wall beneath the Doctor's House would form a visual relationship with the proposed bridge abutment, creating a clearly defined and enclosed amphitheatre effect in the intervening space.

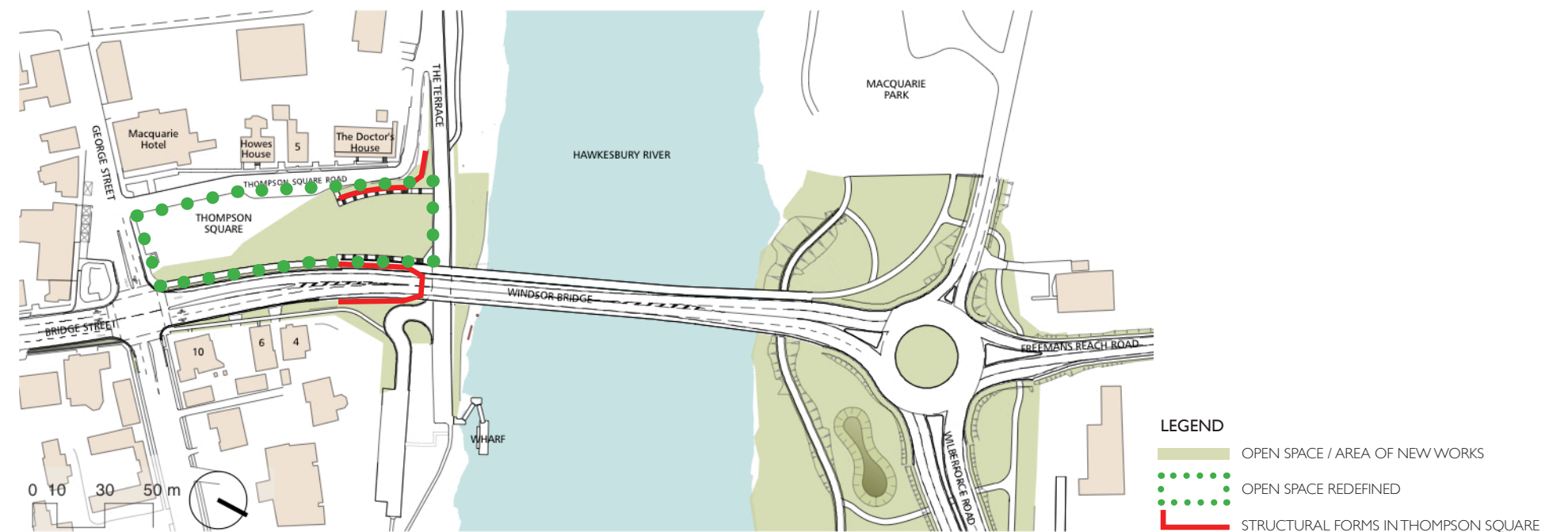
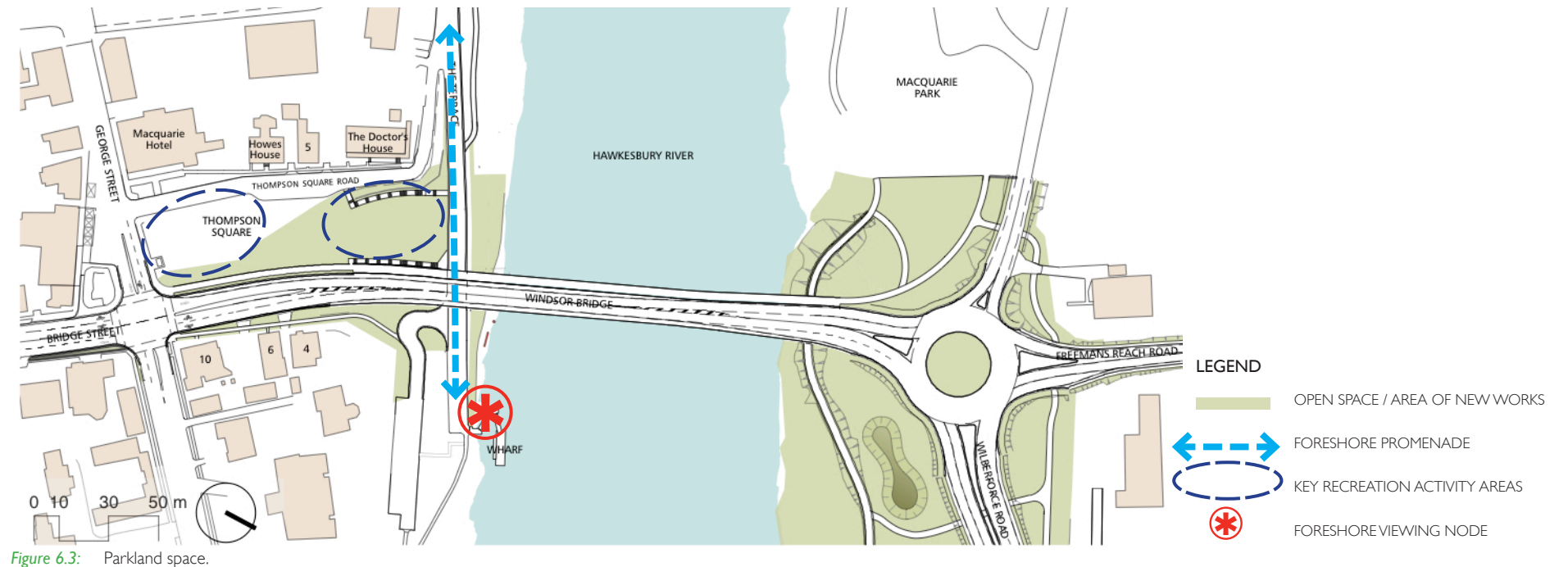


Figure 6.2: Structure and form.

PARKLAND SPACE

The project would provide for enhancement, expansion and consolidation of open space which would provide:

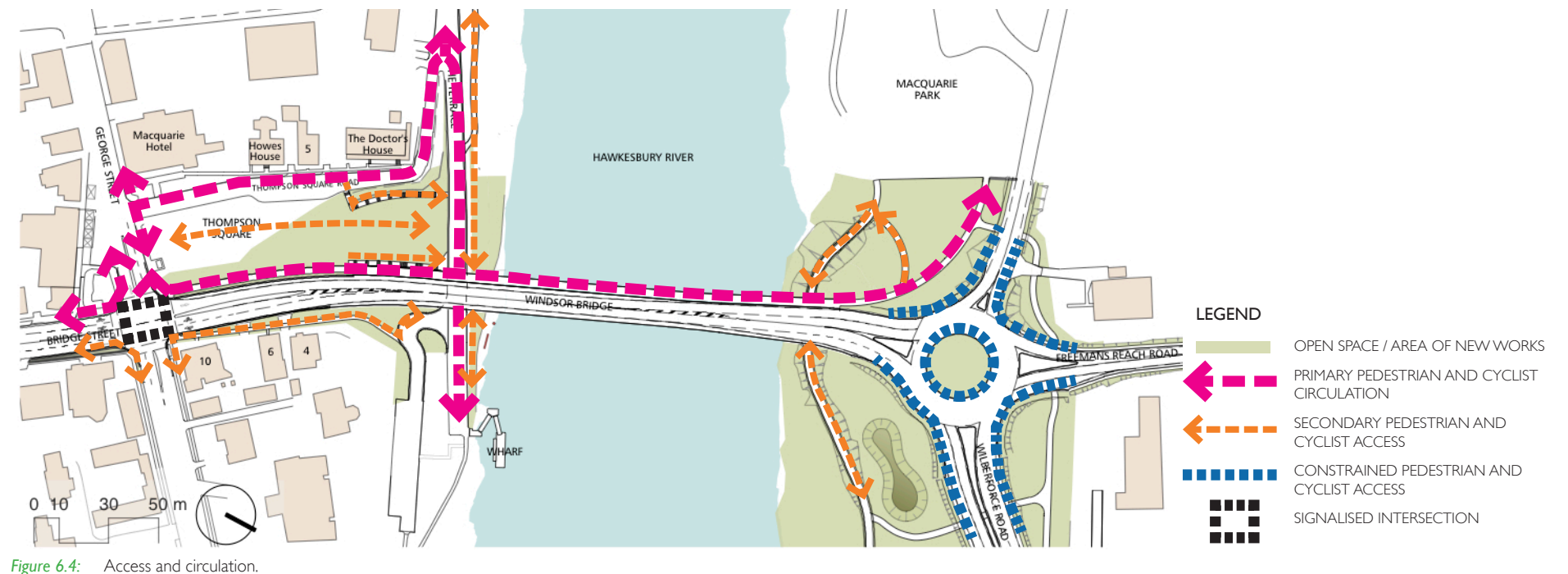
- A continuous green space connection to the river from Thompson Square as well as along both river banks.
- Reinforcement of the successful synergy between the retail businesses on George Street and the parklands.
- Provision of improved amenity for users of the area and potentially increase the range and frequency of uses.
- Provision for two key recreational activity areas within the parklands area of Thompson Square. The upper area adjacent to George Street would provide a large space that is close to the main street retail activities whilst the lower area adjacent to The Terrace would be set below the level of the proposed bridge and approach road and has the potential for activities associated with the river foreshore and the foreshore walking path network upstream of the square.
- Expansion of open space adjacent to Macquarie Park would increase the amount of useable open space and improve the character and entrance to the parkland.



ACCESS AND CIRCULATION

The project would provide access between the township and the northern foreshore which would be more direct and safer for vehicles, pedestrian and cyclists. The key features as illustrated in Figure 6.4 would include:

- Access for people with disabilities to The Terrace via Thompson Square road, and across the proposed bridge to the northern foreshore would be improved.
- The provision of a wide shared path would improve the amenity for pedestrians and cyclists travelling from the town centre across the river to Macquarie Park.
- The provision of a signalised intersection at George Street and Bridge Street would improve pedestrian and cyclist safety at this central location.
- Two sets of stairs, one adjacent to the bridge abutment and the other adjacent to the existing retaining wall under the Doctor's House, would provide access down to The Terrace and river.
- A footpath connection adjacent to Number 10, 6 and 4 which would provide access down to The Terrace and the wharf area.
- The proposed Wilberforce Road and Freemans Reach Road roundabout which would improve vehicular circulation.
- The shared pedestrian and cyclist paths would be separated from the roads in this area, improving safety and amenity for users.
- Two access points to Macquarie Park as well as a grade separated path under the bridge for people travelling north which could potentially connect into a future foreshore path.



VIEWS AND VISTAS

The key arrival locations at the intersection of George Street and Bridge Street, and on Wilberforce Road would be retained as part of the project. The key features are noted as:

- Existing key sightlines and viewpoints would be preserved on both sides of the river;
- Some of the visual connections and sightlines throughout Thompson Square, and between the various buildings across the upper areas of the square would be retained or improved. (It is noted that the lower end of the square would however have these sightlines broken by the bridge abutment in the vicinity of The Terrace).
- Sightlines directly down the Thompson Square parkland towards the river and out over the land north of the project area, would be retained and potentially enhanced with the possibility of increasing the extent of the visibility of the river from some locations.
- Views towards Windsor and Thompson Square from the expanded parkland area and proposed pathways on the northern foreshore, would be enhanced, particularly from the pathways near the foreshore.

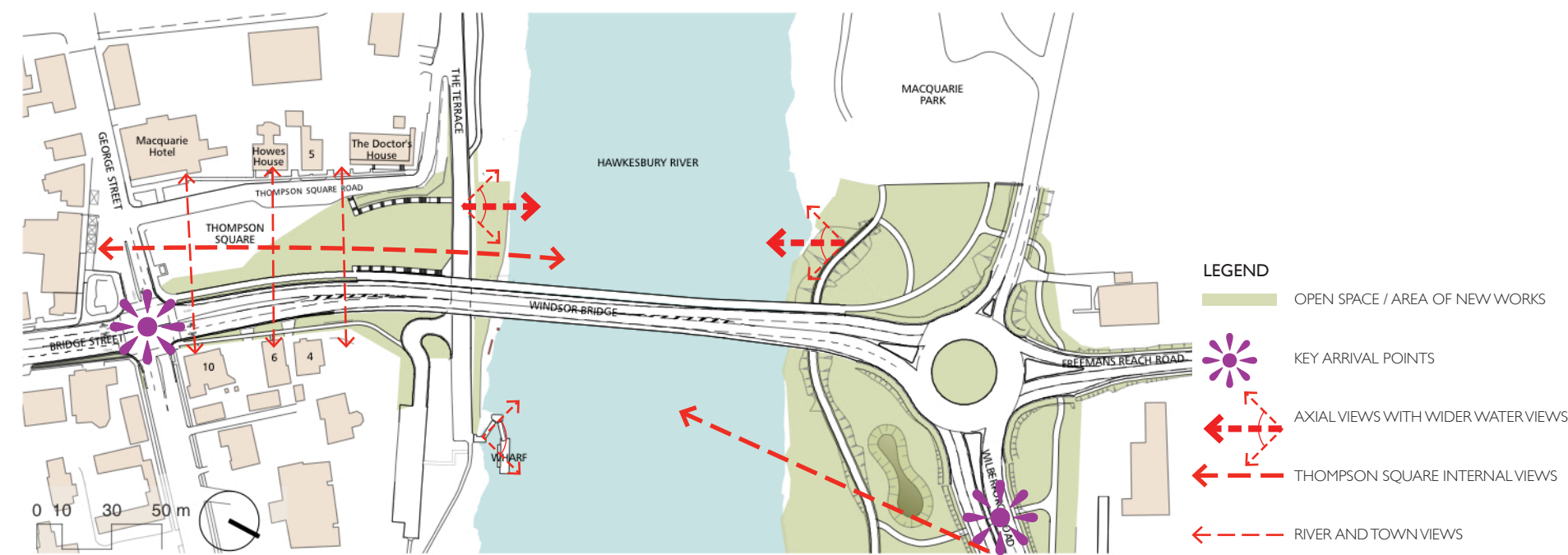


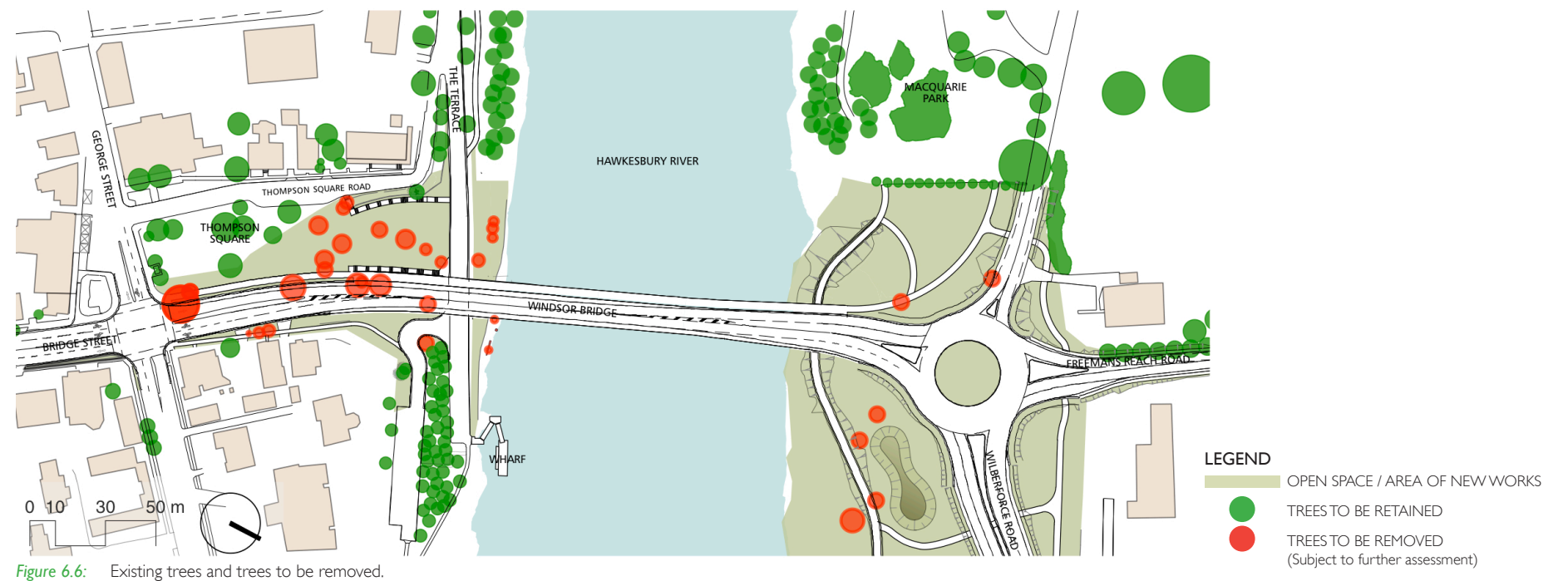
Figure 6.5: Views and vistas.

TREE PLANTING

A number of existing trees in Thompson Square and on the northern foreshore would be removed as a part of the project. Most of the trees to be removed in Thompson Square are located in the lower section of the parkland. Most of these trees are exotic species and are of a mature to semi mature age. Some of these trees may have been planted whilst others are likely to be self sown with seed from neighbouring mature specimens. Tree planting as part of the project, as illustrated in Figures 6.6 and 6.7, would include:

- Retention and protection of the more mature and significant specimens which are located in the upper area of the parkland.
- Removal of tree species that are in poor health, reaching senescence or inappropriate for their setting.
- New tree plantings would be installed in the lower section of the parkland after the cutting of Bridge Street would be regraded.
- New plantings would be similar species to those existing in the parklands and would enhance the parkland character, and the visual character and functionality, whilst maximising views to the river.
- The plantings on the northern foreshore are designed to create an open parkland setting which would assist in reducing the scale of the proposed roundabout.
- These new plantings and the associated re-grading of ground levels, would be designed to extend the Macquarie Park character beyond its current boundary to encompass the whole roundabout area as a new piece of public open space.
- Rehabilitation and replanting of the river embankments would be undertaken once the retaining wall and rock has been installed for the river bank scour protection works on both sides of the river. Endemic species suitable for riverine environments, where inundation by flood waters will occur on a relatively frequent basis, would be selected.

NOTE: A tree survey would be carried out during the detailed design phase of the project. Retention of existing trees and other significant vegetation would be maximised wherever possible. All further detailed design of the landscape would be carried out in consultation with the community and Hawkesbury City Council.



6.3 BRIDGE DESIGN

The urban design and architectural design aspects of the engineering design of the proposed project are described below.

PLACEMENT AND SITING

The bridge is predominantly straight in its plan form, but widens as it approaches the northern bank.

The bridge has a consistent vertical incline from north to south, with the capping parapet, balustrading and structural girders reinforcing this angled form. Whilst not horizontal, it is considered that this alignment has an acceptable relationship to the plane of the river below.

The vertical gradients of the southern approach change to a flatter gradient where the bridge moves from the abutment to the span of the bridge. While subtle, it is considered that this makes the experience of crossing the bridge, distinct from that of the approach.

The southern approach to the bridge quite closely follows the historic alignment of Bridge Street, which reinforces that important historical element.

The design speed of the approaches of the bridge have been adjusted to allow the existing ground levels of the Old Bridge Street properties to be retained without adjustment.

CHARACTER

The proposed bridge follows the alignment of the structural profiles that satisfy engineering criteria, without concealment or adornment. This is considered consistent with the robust character of the Hawkesbury River crossing over its history.

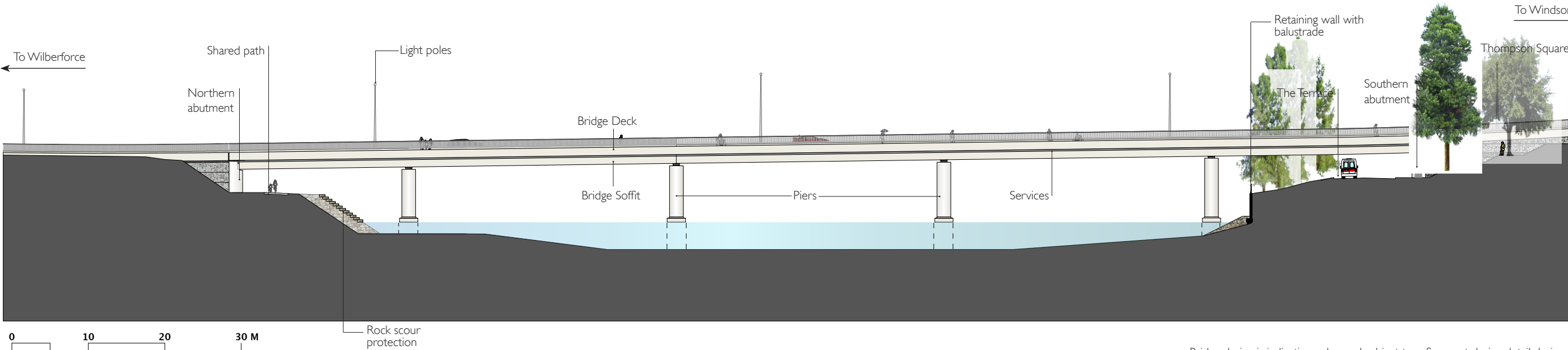


Figure 6.8: Elevation of the proposed bridge looking north east.

Bridge design is indicative only - and subject to refinement during detail design.

A BRIDGE ELEMENTS - DECK

The bridge is predominantly parallel in its plan form, but widens as it approaches northern end to guide the traffic lanes into the northern roundabout.

The bridge deck has a shallow cross fall. It also has a shallow longitudinal fall from south to north to allow for stormwater to drain to a low point on the northern side. This profile gives the bridge a consistent incline as it spans from north to south, that rises against the horizontal plane of the water below.

On the deck of the bridge, the pedestrian/cycle path is raised slightly above the road pavement level, which elevates cyclists and pedestrians and gives them a more comfortable experience.

The traffic barriers that are required are located between the traffic lane and the shared path, which allows for the balustrade on the edge of the bridge to be much finer - which is an important consideration for how the bridge looks from Thompson Square. It is designed to allow the balustrade to collapse into a horizontal position to prevent damage when the bridge is subjected to floodwaters.

B BRIDGE ELEMENTS - DECK SOFFIT

The deck soffit has been profiled as a 'double girder' section which can be seen in the adjacent cross section. This profile gives the underside of the bridge a recessed, rather than flat, profile which gives the bridge a more refined appearance when viewed from below.

Services are surface mounted to the underside of the soffit.

The use of light coloured, white concrete to reflect the available light, and to make the underside of the bridge feel less heavy when experienced from below, will be considered.

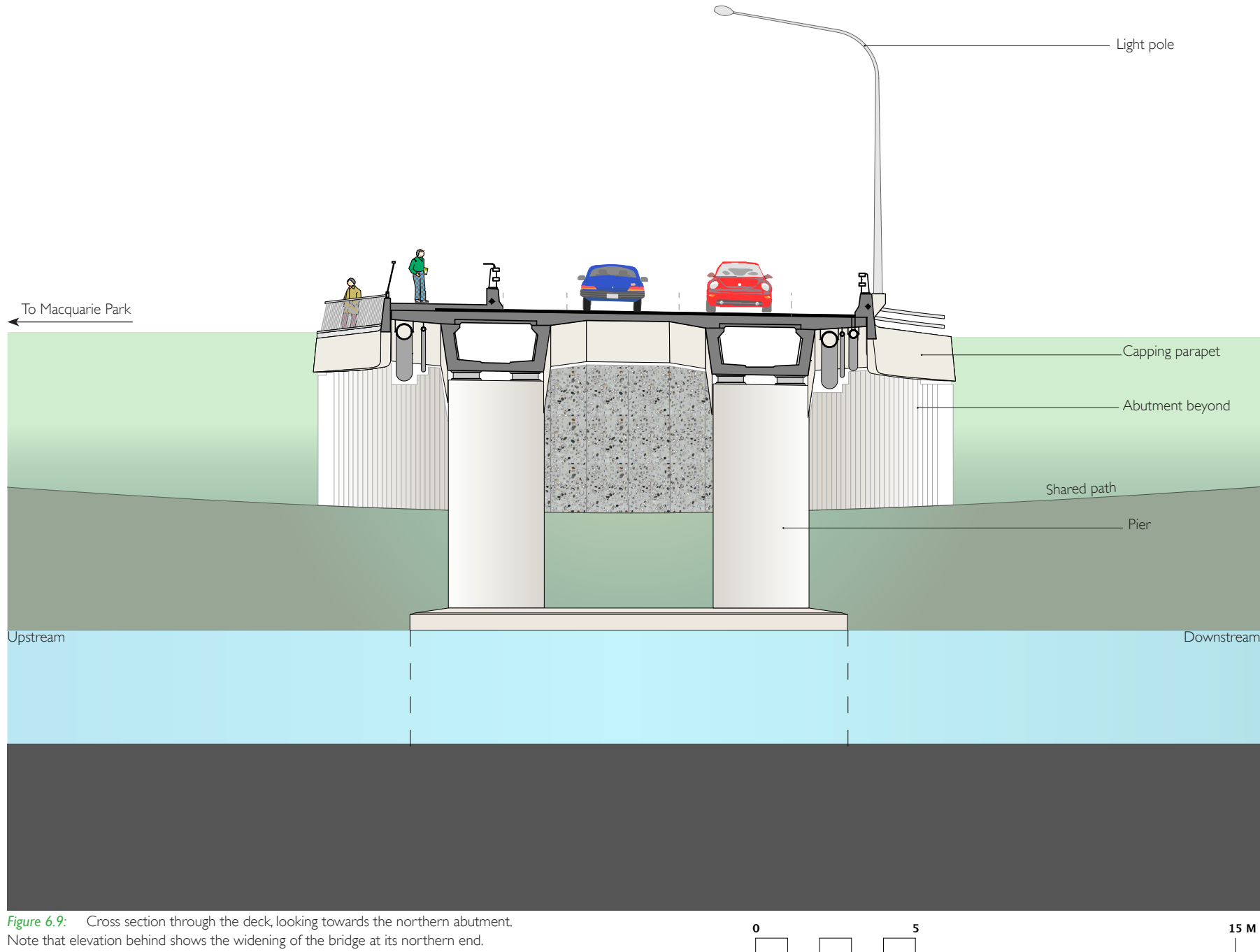


Figure 6.9: Cross section through the deck, looking towards the northern abutment. Note that elevation behind shows the widening of the bridge at its northern end.

0 5 15 M
Bridge design is indicative only - and subject to refinement during detail design.

C BRIDGE ELEMENTS - PIERS

The piers have been designed as a series of paired legs that sit directly below the spanning girders above.

The structural requirements for the piers in terms of the load they carry, and anticipated safety loads in the event of being struck by boats/vessels make the piers quite wide and thick in profile. To reduce the heavy appearance of these elements, the piers have been designed with a curved shape at all four corners. This prevents strong linear shadows, and allows softer, curved shadows on the piers. The piers narrow on the outside edges of the bridge, to ensure that they provide a fine appearance from distant viewpoints.

The use of light coloured, white concrete will be considered as this would reflect the available light and be consistent with the finish of the bridge deck over. The spacing of the piers is wide, and so gives the bridge an open quality when viewed from Thompson Square, the river foreshore and distant viewpoints.

The bridge piers rest on pile caps that are contoured to relate to the curving plan form of the piers above. They sit slightly above the low water mark so that they are always visible to boats and vessels.

The bridge piers are set inboard off the riverbank, and this makes them difficult to access for vandalism and graffiti.

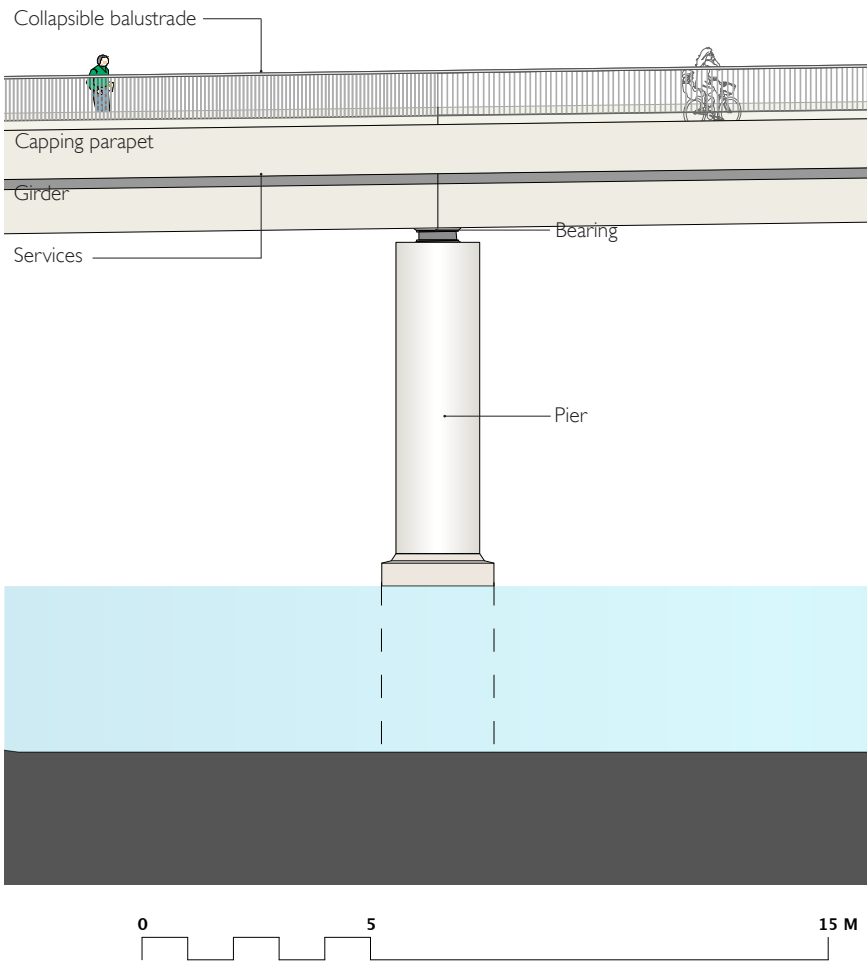


Figure 6.10: Detail of piers in elevation as viewed from the west.

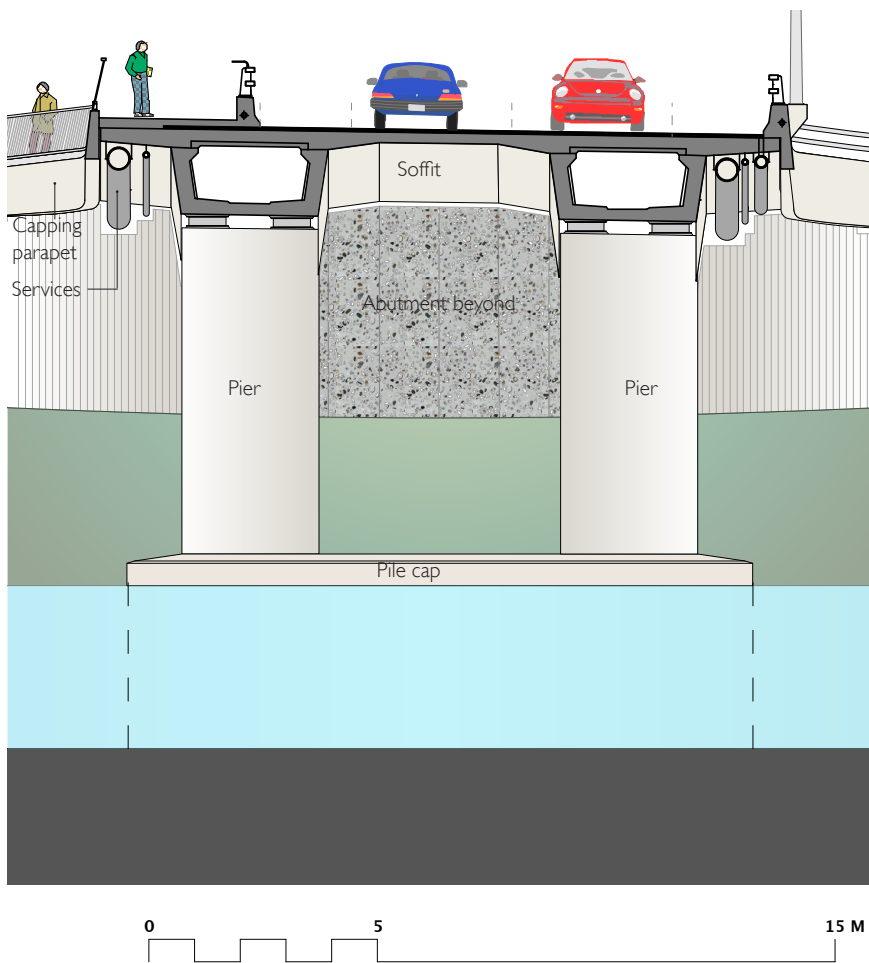


Figure 6.11: Detail of paired piers in cross section as viewed towards the northern abutment. Note that bridge elevation shows curved profile to the north.

Bridge design is indicative only - and subject to refinement during detailed design.

D BRIDGE ELEMENTS - ABUTMENTS

The edges of each abutment are formed as a pair of off form concrete faces that match the alignment and curving form of the inside edge of the bridge piers.

These concrete faces are extended to run to the outside edges of each abutment. These dimensions vary on each side of the river. The curved profiles of the concrete faces also respond to the movement of pedestrians around the corner of the abutments on the Thompson Square side, by smoothing off the corner, rather than making a sharp edge.

The concrete faces are textured with inset ridges that disrupt the planar surface to make it a less attractive target for graffiti, and give strongly modelled shadowing to the surface when the sunlight reaches the abutment walls.

A series precast concrete infill panels between the off form concrete faces and along the sides of the abutments. Consideration should be give for these infill walls to be enlivened with shell aggregates that evoke connections to the material discovered during archaeological investigations for the adjacent wharf structure. Varying densities of lustrous shell material (mother of pearl, oyster shell, mussel shell or similar) could interpret the differing intensity of the flooding events at particular heights along the wall. The reflectivity of the material is intended to catch any sunlight that penetrates into the shaded areas beside the walls and below the bridge.

On the steps adjacent lower Thompson Square (see adjacent elevation), it is proposed that the years of particular flooding events are recorded on the face of the treads - so that users can relate the height of each step to the flooding that has occurred over time.

The height of the highest ever recorded flood level is so tall that it is well above the stair. The concept design shows this marked by a small white light on a pole at the top of the stairs.

E BRIDGE ELEMENTS - LIGHTING

The lighting engineering design for the bridge involves predominantly 9 metres tall pole lighting at varying intervals along the bridge and the approaches.

The placement and height of the poles provides adequate lighting levels to the bridge and the approaches as required to current standards and codes.

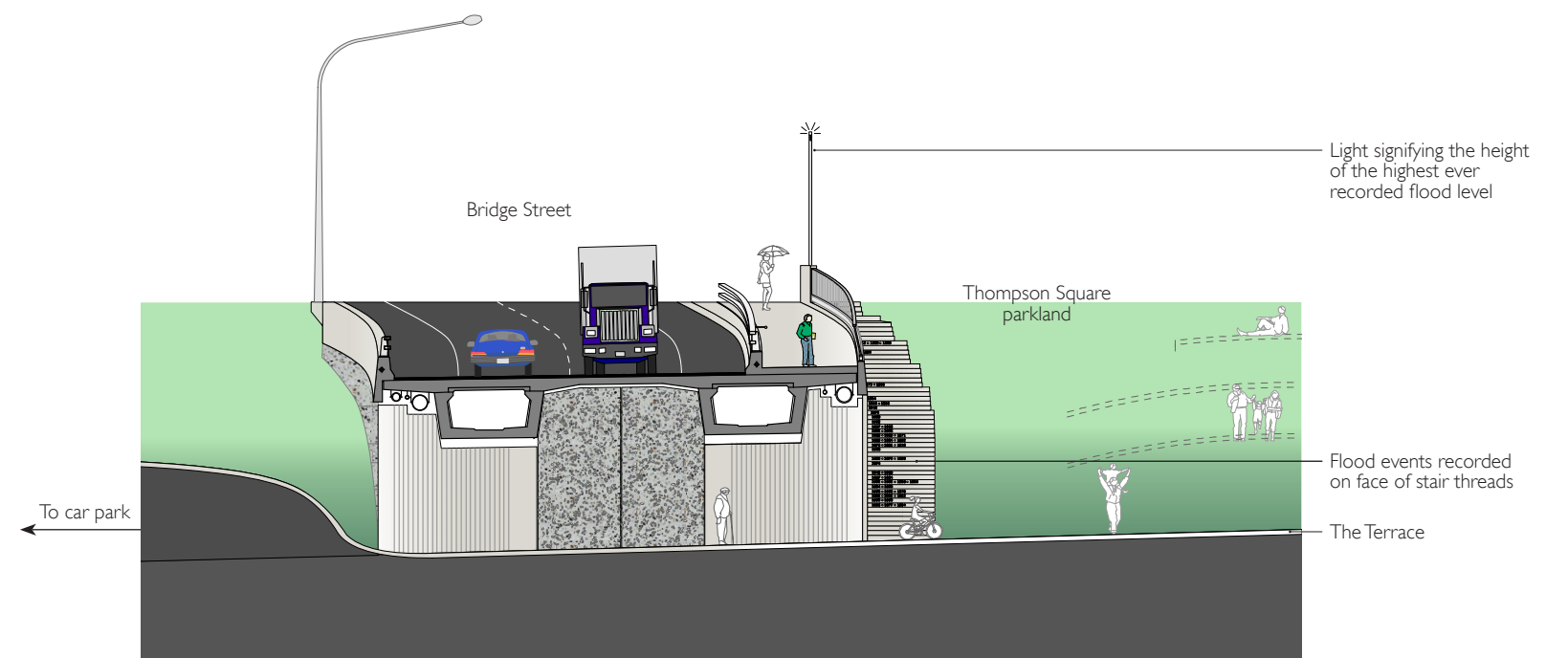


Figure 6.12: Elevation of southern abutment - facing Thompson Square open space.

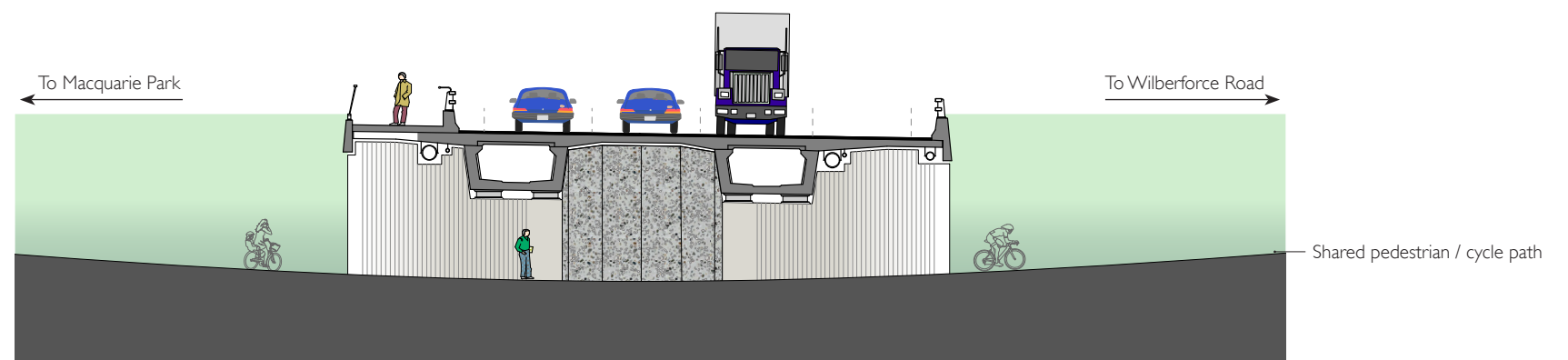


Figure 6.13: Elevation of northern abutment - facing Wilberforce Road.

0 5 15 M
Bridge design is indicative only - and subject to refinement during detailed design.