

Appendix D - Landscape character and visual impact assessment addendum

MRI 82 - BRIDGE STREET, WINDSOR
**REPLACEMENT OF WINDSOR
BRIDGE**
**LANDSCAPE CHARACTER AND
VISUAL IMPACT ASSESSMENT**
ADDENDUM 01

APRIL 2013



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Introduction

This addendum to the Urban Design and Landscape Concept Report comments on the effects, in terms of landscape character and visual impact assessment, of the proposed changes to the Concept Design as presented in the Environmental Impact Statement (EIS) for the bridge replacement project at Windsor. The changes to be addressed in this report are described below.

Description of Changes

In response to a number of submissions received during the exhibition of the EIS, Roads and Maritime Services (RMS) propose to amend the design to increase the clearance of the new bridge over The Terrace from a minimum of 3.6 metres to a maximum of 4.6 metres to allow large coaches and garbage trucks to directly access Windsor Wharf. Large coach access to Windsor Wharf is required to allow the patrons of the Hawkesbury Paddlewheeler to have easy access to the wharf. Many of the patrons of the Windsor paddle steamer are elderly, disabled and/or have limited mobility and would find it difficult or impossible to access the wharf if existing arrangements were changed and large coaches were restricted to parking in Thompson Square road or Baker Street.

Bridge Height at The Terrace

To provide the additional clearance over The Terrace the height of the southern end of the proposed bridge would be increased. This would result in a one metre higher bridge and abutment at the southern end - and a marginally higher 45 metre section of the southern approach road through Thompson Square between the driveway of No. 4 Bridge Street to the southern abutment. South of the driveway of No. 4 Bridge Street and in front of the heritage listed properties of No. 6 and No. 10 Bridge Street, the height of the southern approach road would remain the same as that presented in the EIS. The road level grade of the bridge would also increase slightly from 1.6% to 1.9%.

Figure 1.1 and Figure 1.2 presents the difference in heights of the modified project in comparison to the project presented in the EIS.

Pier Spacing

The location of the piers would be slightly changed so that they are evenly spaced across the river, supporting equal spans of 31.32 metres along the length of the bridge. The proposed location of the piers are also shown in Figure 1.1. No changes to the abutments are proposed.

Pier Form

Relatively minor amendments to the bridge piers are also proposed. The ovoid pier shape would be replaced by an oval shape to allow hydraulic jacks to be positioned on top of the pier columns at periodic times for bearing replacement. The width would be reduced from 3 metres to 2.5 metres to suit the solid girder shape and the requirement to include a restraint corbel on the inside of the girder related to a change in bearing type from pot to laminated elastomeric bearings.

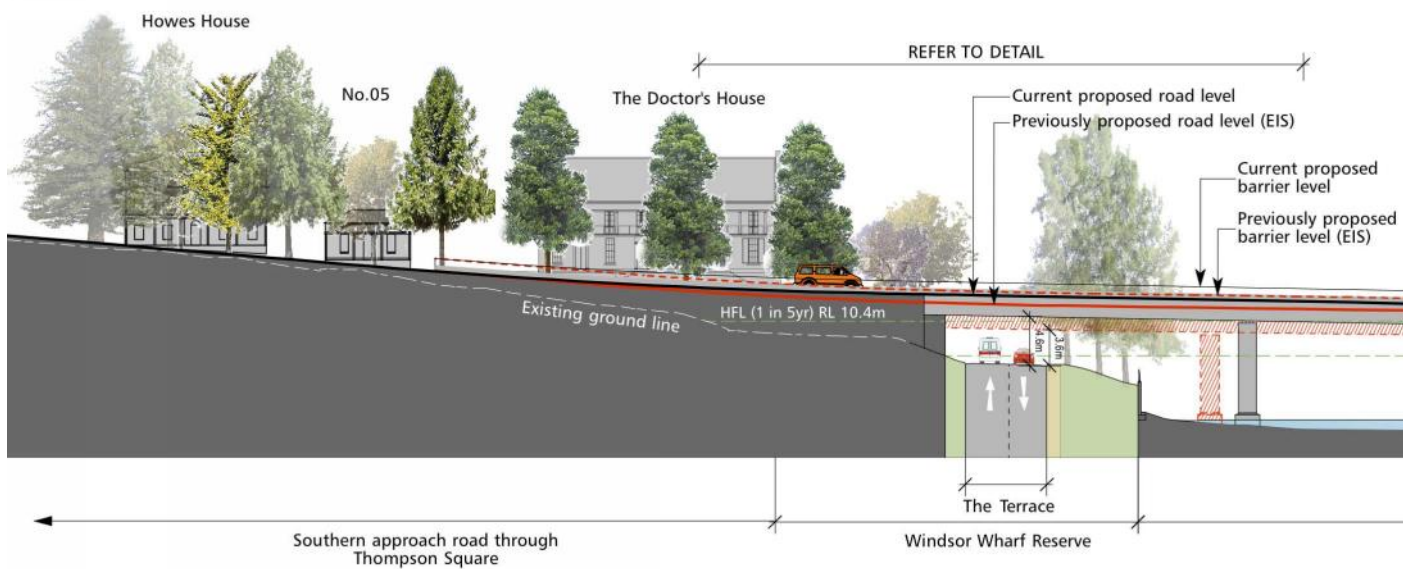


Figure 1.1: Proposed changes to the project. The previous design presented in the EIS is shown in red.

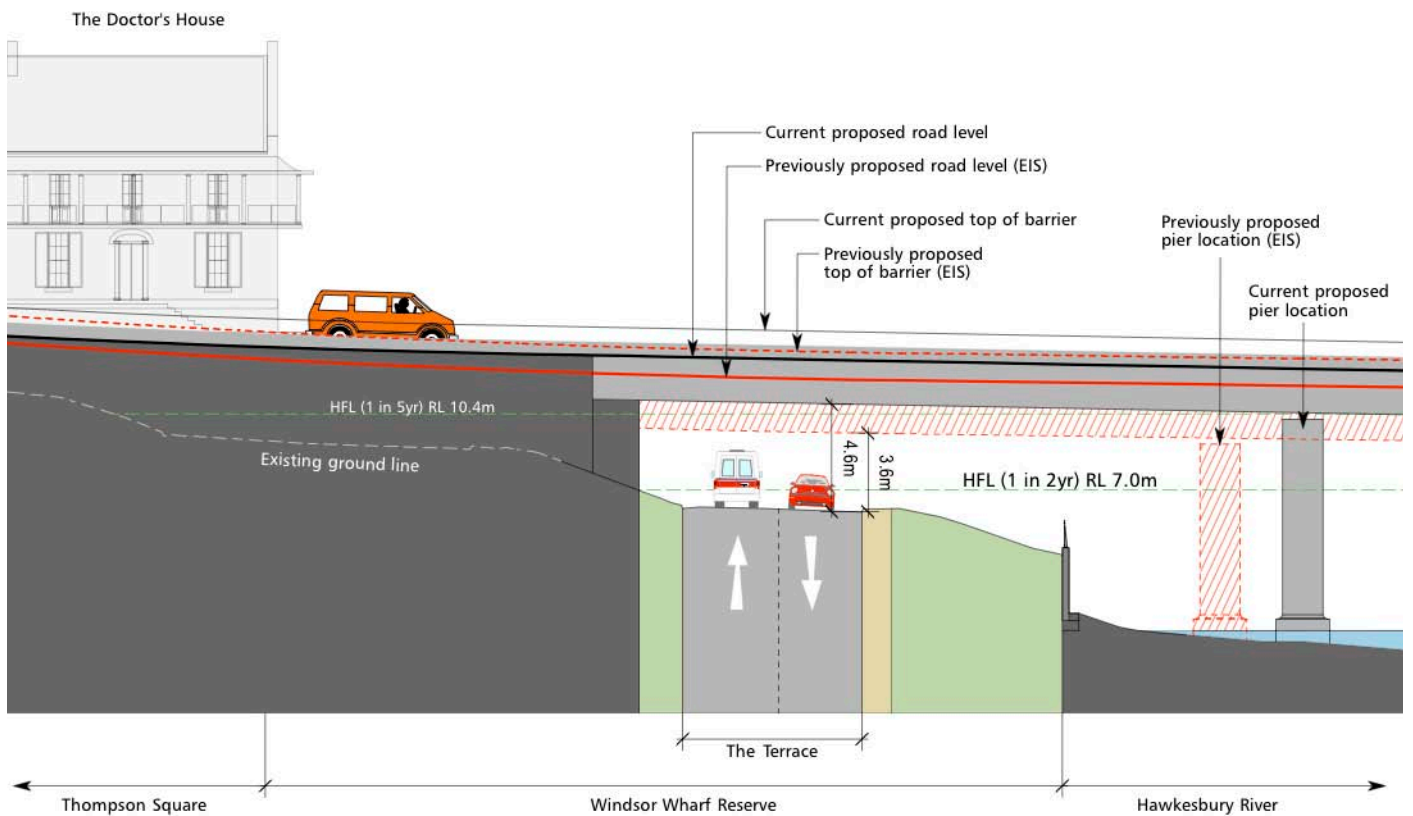
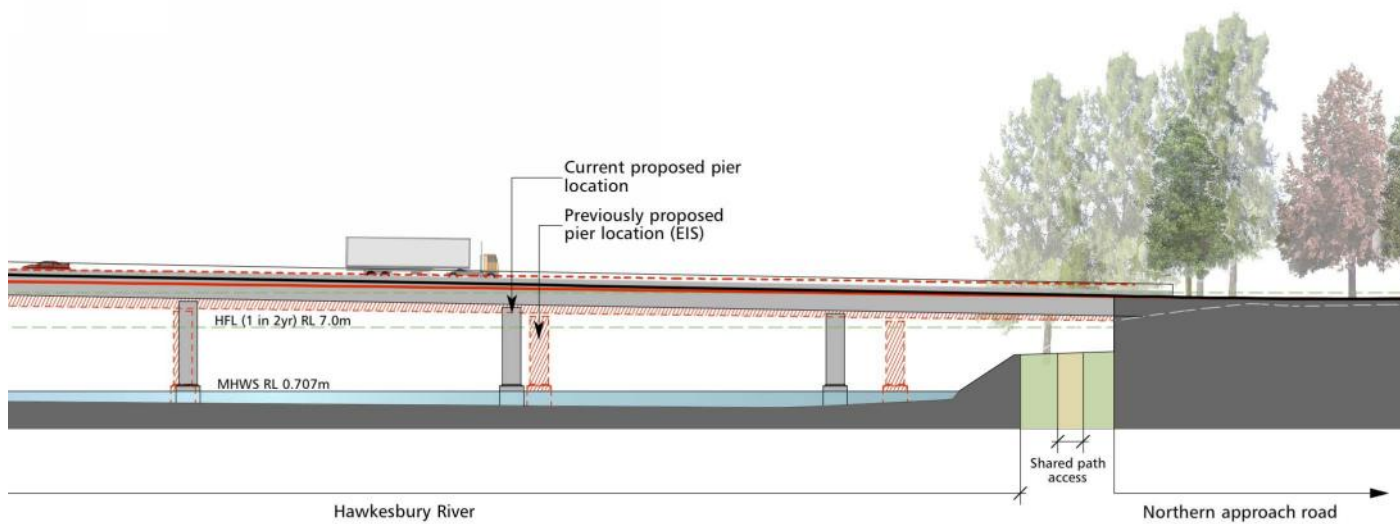


Figure 1.2: Detail section at The Terrace.



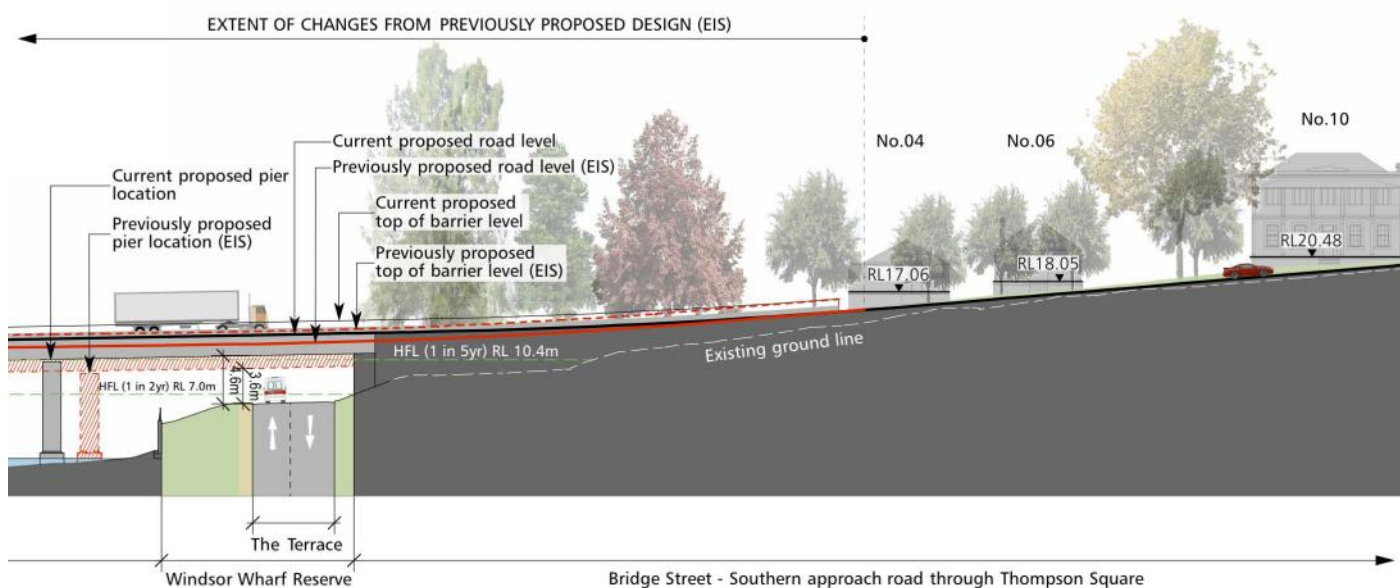


LEGEND

- Previously proposed road level (EIS)
- - - Previously proposed barrier level (EIS)
- ▨ Previously proposed bridge deck and piers (EIS)

- Current proposed road level
- Current proposed top of barrier level
- ▨ Current proposed bridge deck and piers

SCALE



LEGEND

- Previously proposed road level (EIS)
- - - Previously proposed barrier level (EIS)
- ▨ Previously proposed bridge deck and piers (EIS)

- Current proposed road level
- Current proposed top of barrier level
- ▨ Current proposed bridge deck and piers

SCALE



Figure 1.3: Proposed changes to the project in relation to the buildings on Bridge Street.

Effects of the Changes

The proposed design changes described previously would affect two of the landscape character zones (LCZ) and eight viewpoints previously assessed in the Urban Design and Landscape Concept Report, presented as part of the EIS. The affected LCZ's and viewpoints are highlighted in red on Figure 1.3 and Figure 1.4 and described in more detail below.

LANDSCAPE CHARACTER IMPACT

For the previous assessment, the study area was divided into three LCZ's, corresponding to landscape character types in the area and allowing for a more detailed discussion of the character of each zone. Each zone was then broken down into a number of different character attributes which were described in their existing situation, and as they would be as a result of the project. The magnitude of the proposed works, and the sensitivity of the LCZ to change were then assessed to determine the overall landscape character impact.

The proposed changes to the design would have an affect on LCZ 1:Thompson Square and LCZ 2: Hawkesbury River and River Banks. These changes are described below.

LCZ 1:Thompson Square

The assessment indicates that the proposed design changes would affect the following character attributes within LCZ 1.

Built Form and Heritage

The proposed design changes would add to the vertical scale of the bridge abutments, slightly increasing its physical and visual presence within Thompson Square and when viewed from the buildings along Thompson Square road.

Connectivity and Access

Vehicular connectivity along The Terrace would be enhanced by the allowance of large coaches and garbage trucks to access Windsor Wharf, essentially maintaining the existing access to the wharf. This may result in increased conflict between pedestrians and vehicles on The Terrace.

Public Domain

The physical and visual dominance of the proposal, as reported in the EIS, including the proposed southern approach road to the proposed bridge through Thompson Square and the bridge abutments, would now be marginally higher; slightly increasing their presence on the lower section of Thompson Square. A slightly higher underside to the bridge deck at The Terrace, would slightly improve the spatial experience of the roadway with slightly increased headroom and therefore slightly increased amounts of natural light.

Landscape Character Assessment

The Thompson Square LCZ was previously assessed to have High sensitivity, a High to Moderate magnitude, giving a High landscape character impact. The proposed design changes would not change the sensitivity rating, which would remain High. The slight increase in height of the southern approach road and bridge abutment is offset by minor improvements to public amenity and connectivity along The Terrace, maintaining a High to Moderate magnitude impact. Therefore, the overall landscape character impact would remain High.

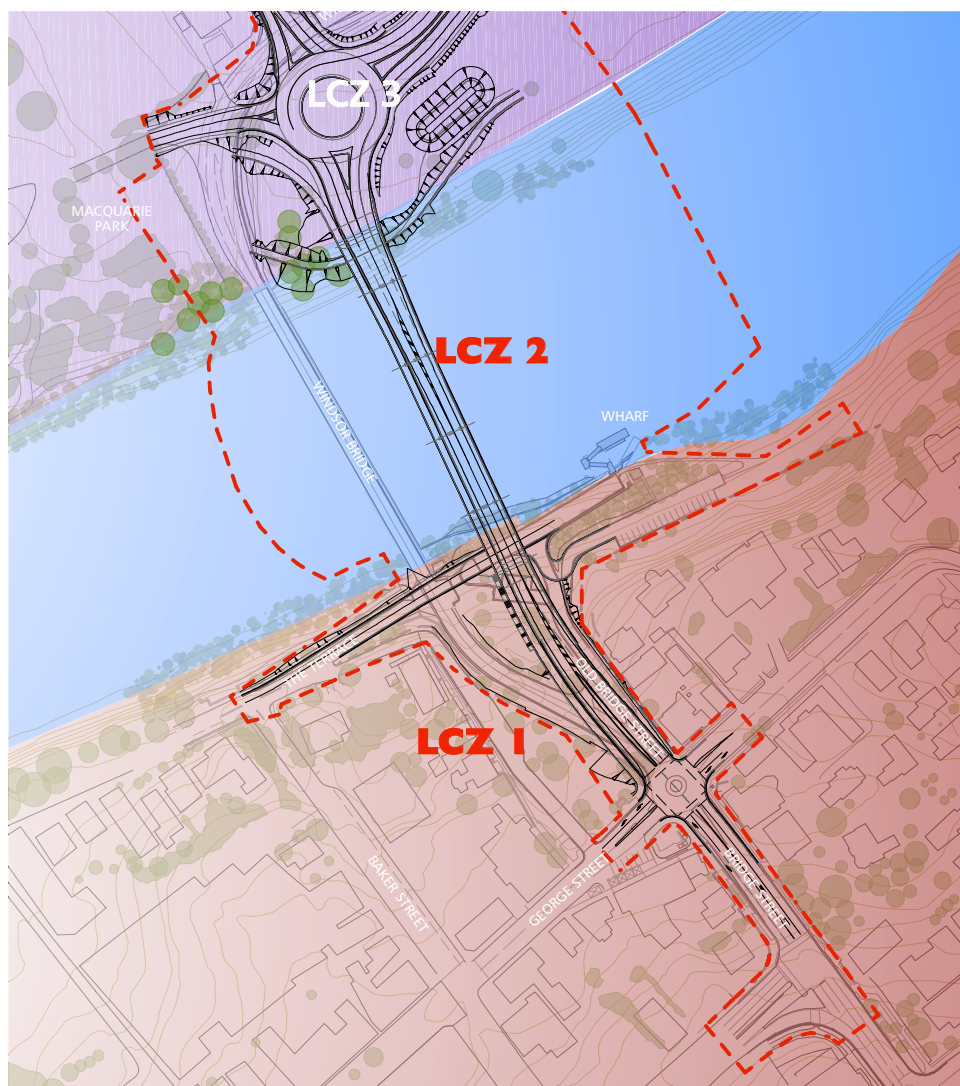
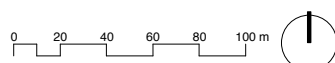


Figure 1.4: Landscape Character Zones, showing thoses affected in red

LEGEND

- - - CONSTRUCTION WORK ZONE
- LCZ 1 - THOMPSON SQUARE
- LCZ2 - HAWKESBURY RIVER AND RIVER BANK
- LCZ3 - WILBERFORCE ROAD AND FREEMANS REACH ROAD INTERSECTION



LCZ 2: Hawkesbury River & River Banks

The assessment indicates that the proposed design changes would affect the following character attribute within LCZ 2.

The Bridge

The proposed design changes would marginally increase the scale and height of the bridge, making it only slightly more dominant in the landscape than the original EIS proposal. The increase in the grade would further skew the plane of the bridge in relation to the river. The proposed increased height of the bridge and the equal spacing of the piers would increase the perception of space along the foreshore and under the bridge at The Terrace. The proposed location and spacing of the piers away from the river bank would also enhance this perception.

Landscape Character Assessment

The Hawkesbury River & River Banks LCZ was previously assessed to have High sensitivity, a High to Moderate magnitude, giving a High landscape character impact. The proposed design changes would not change the sensitivity rating, which would remain High. The increase in height of the bridge and increase in grade would not be considered sufficient to change magnitude rating, which would remain High to Moderate. Therefore, the overall landscape character impact would remain High.

Summary

The proposal assessed in the Urban Design and Landscape Concept Report as part of the EIS were found to have an adverse impact on landscape character. The landscape character assessment indicated a High sensitivity and a High to Moderate magnitude, resulting in a High landscape character impact for both LCZ's. The qualitative assessment of the proposed works described above, suggest that these ratings would not change.

VISUAL IMPACT

The previous study assessed the potential visual impact of the project in relation to eighteen identified key viewpoints within an estimated visual catchment. A desktop assessment suggests that the proposed changes would affect eight of these viewpoints. These are shown in red in Figure 1.4 and include:

- Viewpoint 5;
- Viewpoint 7;
- Viewpoint 8;
- Viewpoint 9;
- Viewpoint 11;
- Viewpoint 12;
- Viewpoint 17;
- Viewpoint 18.

Viewpoint 5

Location: Foreground view from Bridge Street, looking north west.

Description: The viewpoint overlooks the southern approach road to the bridge, which would be only slightly higher than that previously proposed.



Visual Impact Assessment

Viewpoint 5 was previously assessed to have High sensitivity and a Moderate magnitude, giving a High to Moderate visual impact. The proposed works would not change the sensitivity rating, which would remain High. The changes would not be sufficient to increase the magnitude rating as the changes, viewed from this location and angle, would be minor and the majority of the works would be obscured by the existing buildings and vegetation along the north eastern side of Bridge Street. Therefore the visual impact rating would remain High to Moderate.

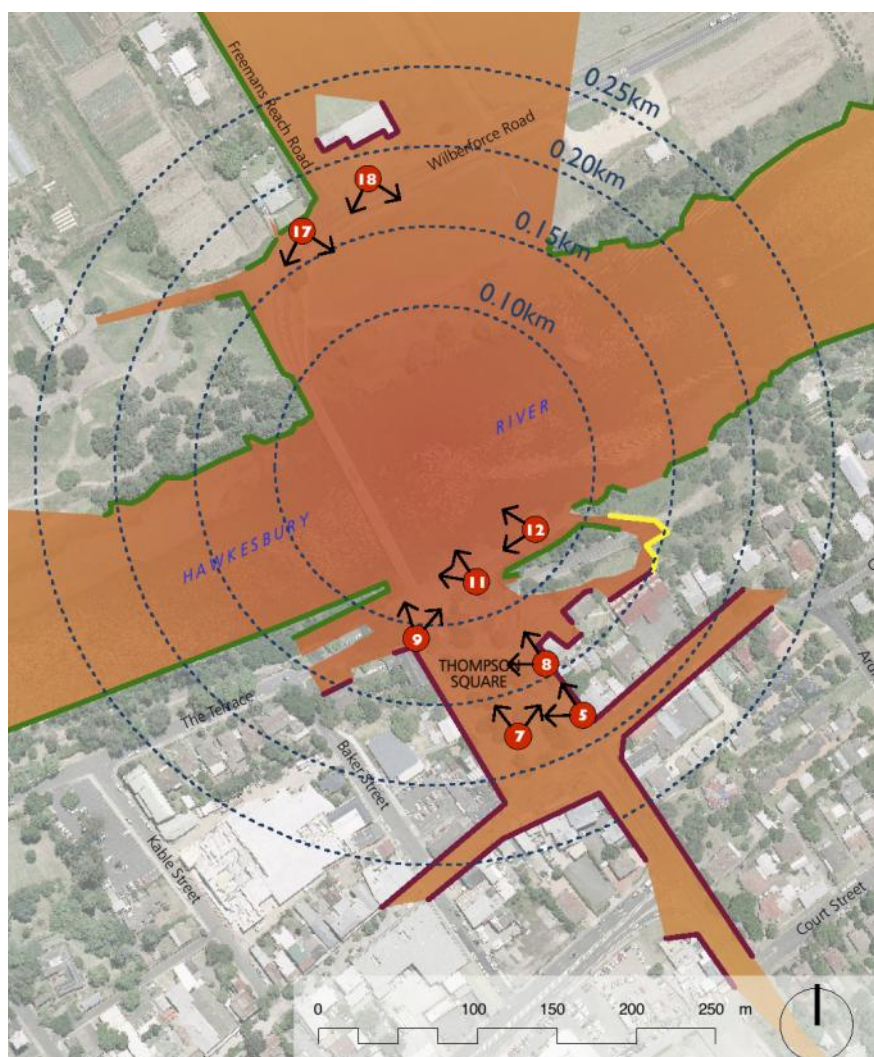


Figure 1.5: The Visual Envelope Map (VEM) and location of affected view points at a local scale (in red).

LEGEND

-  PROXIMITY TO PROJECT WORKS
-  AFFECTED VIEWPOINTS
-  CATCHMENT CONSTRAINED BY VEGETATION
-  CATCHMENT CONSTRAINED BY TOPOGRAPHY
-  CATCHMENT CONSTRAINED BY BUILDINGS
-  DISTANCES

Viewpoint 7

Location: Foreground view from Thompson Square, looking north.

Description: The viewpoint overlooks the southern approach road to the bridge and the bridge itself. The marginally increased height of the bridge abutments would be slightly more prominent from this viewpoint, and may obscure mid distance views to the water marginally more than the proposal presented in the EIS.



Visual Impact Assessment

Viewpoint 7 was previously assessed to have High sensitivity and a High to Moderate magnitude, giving a High visual impact. The proposed works would not change the sensitivity rating, which would remain High. The changes would not be sufficient to increase the magnitude rating as the changes in the foreground would be minor and the viewers perception of the changes would be reduced due to the distance and angle of the view to the abutments, and because of the roads downhill grade. Therefore the visual impact rating would remain High.

Viewpoint 8

Location: Foreground and mid distance view from Bridge Street, looking north west.

Description: The slightly raised southern approach road and raised bridge abutments and deck would slightly increase the visual dominance of the structure from this location and may obscure views of the river marginally more than the proposal presented in the EIS.



Visual Impact Assessment

Viewpoint 8 was previously assessed to have High sensitivity and a High magnitude, giving a High visual impact. The proposed works would not change the sensitivity rating, which would remain High. The changes would not be sufficient to increase the magnitude rating as the viewers perception of the changes would be reduced due to the location of the view along the downhill grade of the road. Views to the bridge deck would also be partly obscured by the existing building on Bridge Street. Therefore the visual impact rating would remain High.

Viewpoint 9

Location: This is a foreground and mid distance view from Thompson Square, adjacent to the Doctor's House, looking north.

Description: This viewpoint overlooks the river and the changes to the proposal presented in the EIS would be noticeable from this location.



Visual Impact Assessment

Viewpoint 9 was previously assessed to have High sensitivity and a High magnitude, giving a High visual impact. The proposed works would not change the sensitivity rating, which would remain High. The increase in height would be noticeable from this view due to its direction looking straight across at the works. This is slightly moderated by the distance from the viewpoint to the works and the angle of the view, maintaining a High magnitude rating. Therefore, the visual impact rating would remain High.

Viewpoint 11

Location: Foreground view from the small carpark near The Terrace, looking north west.

Description: This viewpoint is located under the replacement bridge. The increased height of the bridge would reduce the sense of enclosure under the bridge along this section of The Terrace, and would slightly open the view over the river.



Visual Impact Assessment

Viewpoint 11 was previously assessed to have High sensitivity and a High magnitude, giving a High visual impact. The proposed works would not change the sensitivity rating, which would remain High. The outlook from this location would be slightly improved due to the increased height of the underside of the bridge and the location of the southern bridge pier further from the river bank, though this would not be considered sufficient to reduce the magnitude rating which would remain High. Therefore, the visual impact rating would remain High.

Viewpoint 12

Location: Foreground view from Windsor Wharf, looking south west.

Description: This viewpoint provides extensive views along the river towards the existing bridge. The increased height of the bridge and abutments would be noticeable on the already prominent structure.



Visual Impact Assessment

Viewpoint 12 was previously assessed to have High sensitivity and a High magnitude, giving a High visual impact. The proposed works would not change the sensitivity rating, which would remain High. The increased height of the bridge would be noticeable from this viewpoint, which looks directly across to, and is in close proximity to, the proposed works, and may be sufficient to increase the magnitude rating. However, the magnitude rating is already High. Therefore, the visual impact rating would remain High.

Viewpoint 17

Location: Foreground view from Wilberforce Road, west of Freemans Reach Road, looking south.

Description: This viewpoint looks towards Windsor and the bridge replacement works. The increased height of the bridge would be visible from this location, although not substantially different to the previous proposal.



Visual Impact Assessment

Viewpoint 17 was previously assessed to have High to Moderate sensitivity and a High to Moderate magnitude, giving a High to Moderate visual impact. The proposed works would not change the sensitivity rating, which would remain High to Moderate. The changes would not be sufficient to increase the High to Moderate magnitude rating as they would be minor from this view due to the distance from the proposed works and the direction of the view along the roadway reducing the perceptible difference. Therefore, the visual impact rating would remain High to Moderate.

Viewpoint 18

Location: Foreground view from Wilberforce Road, east of Freemans Reach Road, looking south.

Description: This viewpoint looks towards Windsor and the bridge replacement works. The increased height of the bridge would be visible from this location.



Visual Impact Assessment

Viewpoint 18 was previously assessed to have Moderate sensitivity and a High to Moderate magnitude, giving a High to Moderate visual impact. The proposed works would not change the sensitivity rating, which would remain Moderate. The changes would not be sufficient to increase the High to Moderate magnitude rating as they would be minor from this view due to the distance from the proposed works and the direction of the view along the roadway reducing the perceptible difference. Therefore, the visual impact rating would remain High to Moderate.

Summary

The visual impact assessment of the proposal presented in the EIS indicated a mix of ratings from High impact through to Low impact. Of the viewpoints assessed as part of this addendum, five previously had High visual impact and three had High to Moderate visual impact. Overall, the changes to the works would not increase the existing impact ratings. The five viewpoints with a High visual impact would be affected the most, however, the works would not be sufficient to increase ratings due to the direction of views generally reducing the perceptible scale of the works. The three viewpoints with a High to Moderate visual impact would be slightly affected, although not enough to change the overall visual impact rating due to distance and the percentage of the works view.

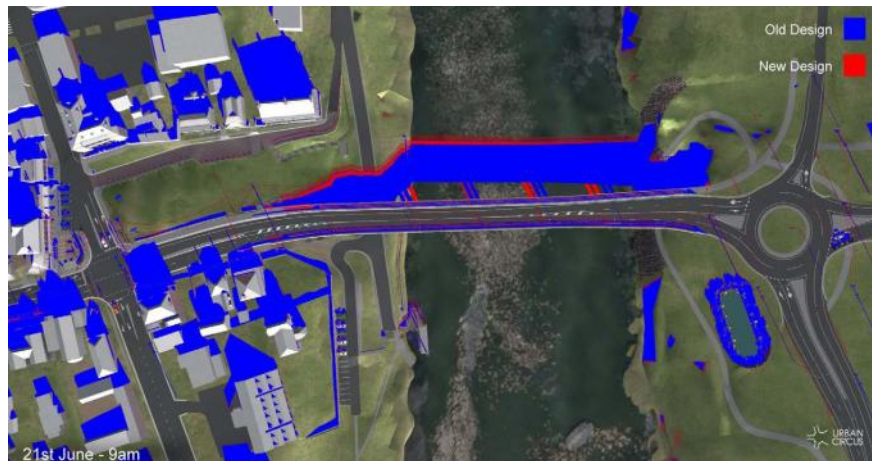
Overshadowing

Additional shadow diagrams have been prepared by Urban Circus (Figures 1.5 and 1.6), using a computer model of the study area and incorporating the changes to the Concept Design. They show the shadows of the design presented in the EIS in blue, and the shadows of the proposed changes indicated in red. The diagrams depict the shadows cast by the bridge during the winter solstice (21 June) and the summer solstice (21 December) at three times of day; 9am, 12pm and 3pm.

The changes to the design would not greatly add to the existing overshadowing effects of the bridge. Generally, the shadow extent would remain similar; its footprint would move south. The most noticeable change would be in the early morning in winter to the lower section of Thompson Square, where the approach road on the alignment of Old Bridge Street becomes elevated on a fill embankment as it approaches the abutment, the river foreshore and the river itself. The section of The Terrace directly beneath the replacement bridge would receive slightly more sunlight due to the increased height of the bridge and the location of the piers further away from the foreshore.

The additional overshadowing caused by the increase in height of the southern approach road embankment and bridge would only slightly further affect user's experiences within the lower section of Thompson Square, and would continue to be unlikely to impact on activities occurring on the river.

21st JUNE



9am



12pm



3pm

Figure 1.6: Shadow cast by the replacement bridge on 21st June.

21st December



Figure 1.7: Shadow cast by the replacement bridge on 21st December.

Mitigation

During the Concept Design phase of the project, to lessen the visual impact of the proposed works and to help integrate the replacement bridge into the landscape, a number of mitigation measures were incorporated into the design. Further mitigation measures were identified to be considered during the Detailed Design phase and to be implemented during construction.

Mitigation measures implemented during the Concept Design included:

- 50km/hr design speed to keep bridge level as low as possible;
- Incrementally launched bridge type to minimise number of piers and minimise bulk of the bridge;
- Curved formed bridge piers for a finer appearance. The slight change in shape would not affect the streamlined appearance of the piers;
- Placement and design of abutments to improve access along the river foreshore;
- Direct access through and around Thompson Square provided by infilling existing Bridge Street cutting;
- Siting the southern approach road as close as possible to existing levels to maximise the retention of views across the upper area of Thompson Square.

Due to the proposed changes, a number of mitigation measures mentioned in the Urban Design and Landscape Concept Report for consideration during the Detailed Design phase of the project may be considered. These included:

- Further design refinement of The Terrace and foreshore area to achieve a high quality public space and avoid conflict between vehicles and pedestrians;
- Consider locations of new tree plantings to facilitate direct views to the river and screen the replacement bridge and embankment where possible.

Conclusion

The changes to the design of the bridge replacement at Windsor would have minimal impact to the landscape character and visual impact to those already described in the Urban Design and Landscape Concept Report. The raised height of the bridge, southern approach road and abutment slightly increase the scale of the structure and result in a small increase in overshadowing to Thompson Square on winter mornings. These changes would not be considered sufficient to affect the visual impact ratings given in the Urban Design and Landscape Concept Report.

Despite the minimal impact of the proposed changes, consideration should be given to incorporate appropriate mitigation measures during the Detailed Design phase of the project.

