WINDSOR ROAD BRIDGE MODIFICATION ROUSE HILL

URBAN DESIGN AND VISUAL IMPACT ASSESSMENT

STUDIO GL

JANUARY 2014

QUALITY CONTROL:

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LIST OF ABBREVIATIONS

SSI	State Significant Infrastructure
EIS2	Environmental Impact Statement Stage 2 - Stations, Rail Infrastructure and Systems
RMS	Roads and Maritime Services
DA	Development Application

EXECUTIVE SUMMARY

INTRODUCTION

Transport for NSW is seeking a modification to the SSI 5414 Project Approval for the North West Rail Link (NWRL) project. The modification would substitute the approved viaduct across Windsor Road with a clear span cable-stayed rail bridge at the same location. A summary of the changes are described in Table 1 below. The changes increase the height and landmark characteristics of the bridge and will materially change the visual and heritage impacts compared with the project as approved.

This report assesses the visual impacts of the new bridge compared to the approved viaduct and identifies suggested mitigation measures to ensure a successful design outcome.

Summary of changes

Component	Summary of Approved Component (EIS 2)	Proposed Modification
Bridge span	Viaduct or bridge structure between 11m and 14m in width, approximately 15m above ground level with approximately 40m spans across the roadway.	Cable stayed bridge with two towers, a total length of approximately 270 m and three main spans. The indicative width of the bridge deck is similar to the viaduct as approved. Maximum height of the bridge towers above ground level is approximately 45 m
	Permanent piers to be placed in the central median strip of Windsor Road.	No permanent piers are required within the Windsor Road reserve.
	No significant vertical elements over the roadway.	Vertical components (bridge towers) as described above.
	No lighting.	LED (light-emitting diode) lighting within towers for subtle illumination at night.
Integration with viaduct and Rouse Hill Station	No change to viaduct at station, support pylons at regular intervals.	Bridge structure integrated with viaduct at Rouse Hill Station.

Table 1 Summary of approved elements and proposed change

ASSESSMENT

The report considered the visual impact of the proposed bridge on the wider physical and cultural landscape and a summary of the impact assessment can be found in the table below.

View	EIS 2 Visual Assessment	Modification Visual Assessment
Windsor Road looking north	Moderate adverse impact	Considerable improvement (ie **moderate beneficial** impact) as a result of the landmark characteristics of the bridge for the local area.
Rouse Hill Drive looking west	Minor adverse impact	Negligible change (ie **minor adverse** impact), particularly in the context of likely future development of the Rouse Hill Town Centre Northern Precinct and the oblique view towards the bridge from this location.
Schofields Road looking east	Negligible impact	Negligible change (ie **negligible impact**), particularly in the context of likely future development of the Rouse Hill Town Centre Northern Precinct.
Windsor Road looking south	Moderate adverse impact	Considerable improvement (ie **moderate beneficia**l impact) as a result of the landmark characteristics of the bridge for the local area.
Castlebrook Lawn Cemetery and Crematorium looking north	Minor adverse impact	Noticeable reduction as the bridge towers would rise above the trees creating tall structures against the skyline. The changed impact is assessed as **moderate adverse** particularly given the sensitivity of the use of the site.
Rouse Hill House and Farm looking south	Negligible impact	Noticeable reduction in visual amenity as, while the bridge will be seen within the context of future development to the north of the Rouse Hill Town Centre, the towers would rise above the trees creating tall structures against the skyline. The changed impact is assessed as **moderate adverse** particularly given the heritage significance of the site.
Withers Road looking east	N/A	**Negligible** visual impact.

Table 2 Visual modification summary

CONCLUSION

In summary the assessment concludes that the visual impacts of the proposed bridge differ from that of the approved viaduct in EIS2 and that the visual impacts of the proposed bridge are expected to vary from moderate beneficial to moderate adverse.

The report has considered the visual impacts on European Heritage and recommended mitigation measures to reduce the impact. The natural landscape features of the surrounding area and the expected future development around the bridge will restrict views and reduce the visual impacts of the structure.

In conclusion the proposed bridge;

- is likely to become a recognisable structure in the landscape, a marker of the railway in the immediate and wider landscape context,
- will reinforce the Rouse Hill Town Centre and subsequently its importance as a major centre and
- has been designed with consideration of the scale of the structure and its impact on the surrounding area.

1. INTRODUCTION

1.1 PROJECT SUMMARY

Transport for NSW is seeking a modification to the SSI 5414 Project Approval for the North West Rail Link (NWRL) project. The modification would substitute the approved viaduct across Windsor Road with a clear span cable-stayed bridge at the same location. As this increases the height and landmark characteristics of the bridge it will materially change the visual and heritage impacts compared with the project as approved.

This report assesses the visual impacts of the new bridge compared to the approved viaduct and identifies suggested mitigation measures to ensure a successful design outcome.

Approved Viaduct

A rail crossing Windsor Road approximately 14m above the roadway in a viaduct was approved as part of EIS2. The crossing design was expressed as a continuation of the typical viaduct design with supports in the middle of Windsor Road and spans up to 40m. The viaduct appearance was dominated by the horizontal elements of the viaduct structure.

Proposed Bridge

The railway crosses Windsor Road along a curved alignment at the location of the proposed bridge, creating the need for a clear span bridge of over 130m in length. The proposed bridge has a total length, including approaches, of approximately 400m.

Figure 1 – Artists impression of proposed bridge viewed from Windsor Road looking north.
Source: Transport for NSW

The proposed bridge is a cable stayed bridge with two central towers and a central line of cables. The towers would rise to a height of 28m above the deck level and the deck is approximately 14m above ground level making a height to the top of the tower of approximately 42m. The proposed bridge is approximately 270m long, with one central span of 131m and two side spans of 78m and 60m.

The bridge deck would be approximately 3.5m deep and 15m wide. This is wider and deeper than the adjacent viaduct and therefore requires transitions to the standard viaduct. Transitional sections are proposed from the northern side of the Rouse Hill Station and immediately to the west of the proposed bridge.

Summary of changes

Component	Summary of Approved Component (EIS 2)	Proposed Modification
Bridge span	Viaduct or bridge structure between 11m and 14m in width, approximately 15m above ground level with approximately 40m spans across the roadway.	Cable stayed bridge with two towers, a total length of approximately 270 m and three main spans. The indicative width of the bridge deck is similar to the viaduct as approved. Maximum height of the bridge towers above ground level is approximately 45m.
	Permanent piers to be placed in the central median strip of Windsor Road.	No permanent piers are required within the Windsor Road reserve.
	No significant vertical elements over the roadway.	Vertical components (bridge towers) as described above.
	No lighting.	LED (light-emitting diode) lighting within towers for subtle illumination at night.
Integration with viaduct and Rouse Hill Station	No change to viaduct at station, support pylons at regular intervals.	Bridge structure integrated with viaduct at Rouse Hill Station.

Table 3 Summary of approved elements and proposed change

Alternatives considered

The initial concepts for the proposed bridge focussed on a clear span over Windsor Road. The central span would need to be approximately 131m. The total length, including approaches, would be approximately 400m. A key design requirement was to minimise the height of any towers associated with the bridge. The limited land available for the location of bridge piers was also a key consideration.

Several alternative bridge options were considered before selecting a preferred solution. Relevant considerations included cost, safety, constructability, impact on traffic and visual amenity impacts.

Options that were considered and dismissed in preference to the preferred option included:

- Alternative cable stayed bridge designs that would have twin towers on either side of the road reserve (four in total) and cables on the outer sides of the bridge.
- Alternative cable stayed bridge designs with a single tower. These design options were not preferred because the tower would be required to be significantly higher than the preferred option.
- Designs featuring a suspended arch with cables supporting each side of the deck. These design options were not preferred because of the resulting height of the central arch.
- A balanced cantilever bridge, being a bridge where the bridge deck would be supported by piers rather than towers with cables or the like. This type of bridge design would require very large piers and a significantly deeper deck structure at the piers and was not preferred because of the visual bulk.

The preferred cable supported bridge design was considered to have the following benefits over the other options:

- Elegant architectural solution
- Greater flexibility for aesthetics
- Reduced traffic and services impacts
- Potential to be an iconic structure (landmark qualities)

Variations on the preferred design concept were also considered. The design featuring centrally located towers with a central line of cables was selected as the skewed alignment creates oblique views and the design would ensure the least cluttered appearance.

Director General's Requirements

The EIS Stage 2 – Stations, Rail Infrastructure and Systems identified a number of Director General's Requirements (DGR's), Conditions of Approval and Statement of Commitments relevant to urban design and visual amenity. The relevant DGR's, Conditions of Approval and Statement of Commitments identified in Chapter 13 European Heritage and Chapter 16 Visual Amenity are noted in the table below. Sections relevant to the Windsor Road Bridge have been highlighted in blue.

DGR's	Description	Addressed
Director-General's Requirements	Potential visual and cultural landscape impacts on historic heritage items.	See 3.2 Visual Impact Assessment

Urban Design considerations

The RMS Centre for Urban Design released a revised publication on Bridge Aesthetics in July 2012[1]. This document highlights the importance of bridge structures in the landscape and identifies guidelines to assist in creating bridges that are aesthetically pleasing. It notes that the form of the bridge has a significant role in the creation of the overall visual impact and encourages designers to consider the following when arranging the parts of the bridge and how they relate to each other:

- Proportion
- Symmetry and asymmetry
- Order and rhythm
- Simplicity
- Unity of design
- Consistency
- Detailing

1 Centre for Urban Design: *Bridge Aesthetics: Design Guideline to improve the appearance of bridges in NSW.* Published by Roads and Maritime Services in July 2012

This publication notes that a bridge in an urban setting needs to be considered as a piece of the built environment and suggest design considerations which could help to deliver this including:

- Creating a landmark structure which complements or contrasts with its visual catchment.
- Maximising views from the bridge of the local urban setting.
- Maximising views through the bridge from the urban setting.
- Minimising adverse visual impacts.
- Designing a well proportioned, neat and pleasing structure.
- Respecting locally valued structures and their curtilages.
- Complementing local styles and materials.
- Ensuring the spaces under the bridge are not dark, degraded and unsafe.

The document also includes a number of aesthetic principles applicable to rail bridges:

- A railway bridge should express its purpose and easily recognised as such.
- Railway bridges, in accommodating the heavy weight of trains, should generally appear strong and substantial.
- Railway bridges need to be stiffer than road bridges for stability in terms of deck vibration and shock loading which generally rules out suspended structures.
- Constraints on the vertical and horizontal alignment of the railway, create flatter straighter structures than road bridges.
- Railway bridges necessarily have a heavier appearance in their design with deeper girders, bulkier columns, and shorter spans.
- Consequently close attention needs to be given to their proportion and refinement.

2. CONTEXT

2.1 BUILT AND NATURAL ENVIRONMENT

Landscape and topography

The proposed bridge is located in an area of Sydney known as the Cumberland Plain, a wide open area with low undulating hills which spans between the Blue Mountains and the Hawkesbury-Nepean River in the west, Wisemans Ferry to the north and Kellyville and Castle Hill in the east.

Views across the Cumberland Plain mainly occur from the higher land surrounding the plain. Views are possible from ridge line roads including Old Northern Road, located on the hills to the east of the plain. Views across the plain also occur along roads that descend from higher land down onto the plain including Bannerman Road to the east and Bells Line of Road to the west, however these views are typically filtered by residential development and large trees. Within the Cumberland Plain localised high points provide regional views to the distant Blue Mountain ranges to the north west and west and the lower Beaumont Hills to the east.

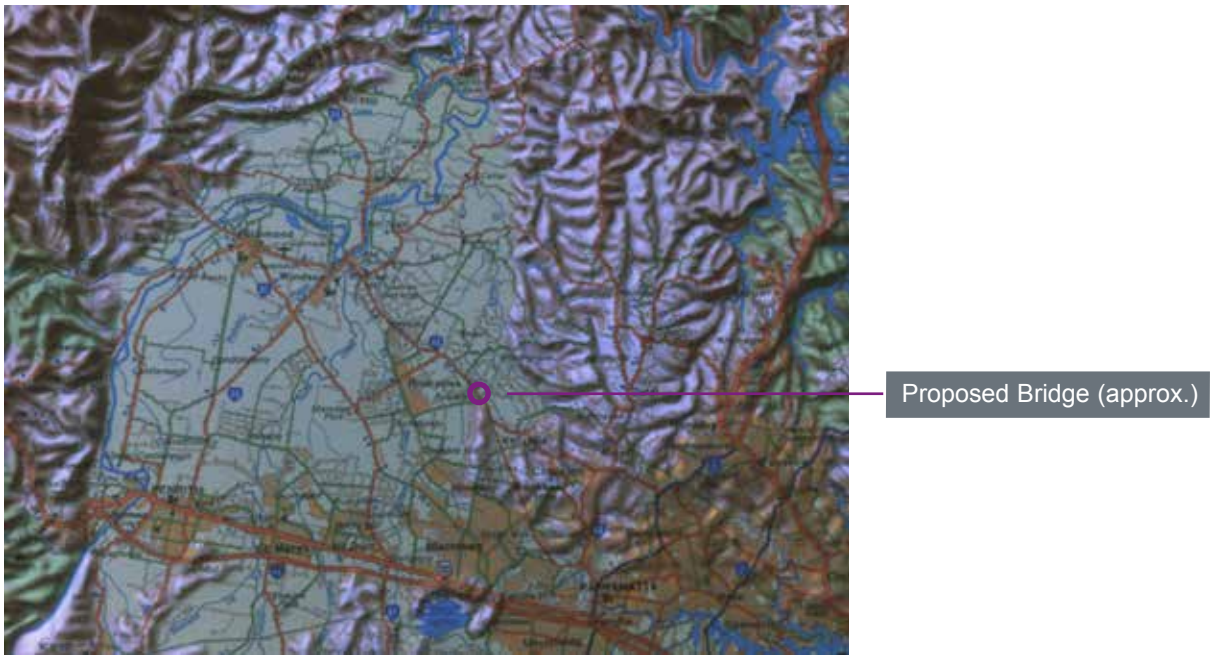

Figure 2 – Map showing Cumberland Plain and approximate location of proposed bridge. This three dimensional topographical map has an exaggerated vertical scale which highlights surrounding higher land. The approximate location of the proposed bridge is shown as a purple circle.

Source: Photo of part of a topographical map of Sydney and Environs by Geo Maps Company with approximate location of bridge added by Studio GL.

Around the proposed bridge the urban landscape character is a mix of low density residential, medium density commercial development, bushland reserve and rural lots. The surrounding area is undergoing rapid change with new residential and commercial development being planned and under construction. Native vegetation has tended to remain along creek lines and within areas of steeper land.

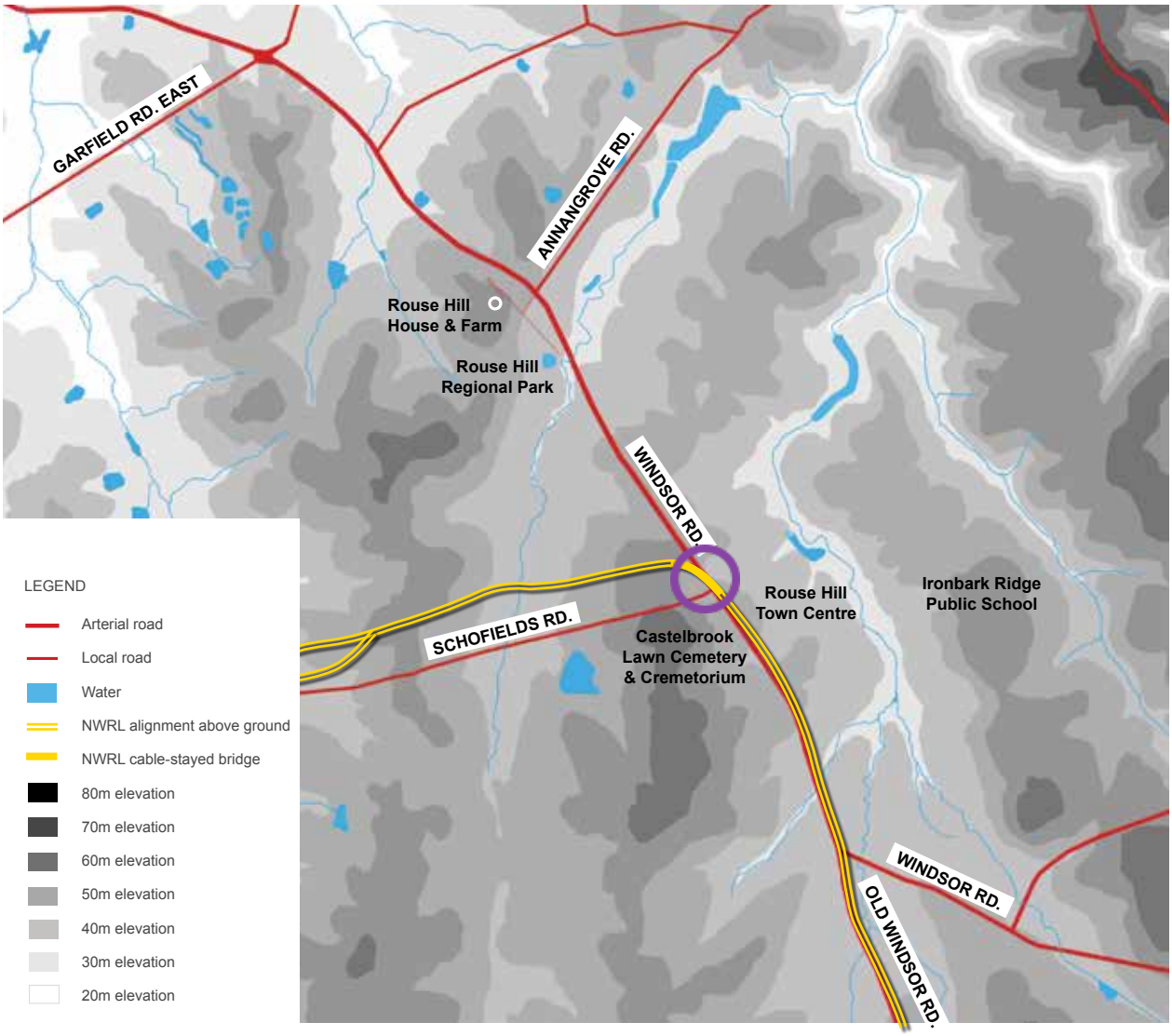

Figure 3 – Map showing local topography around the proposed bridge

The approximate location of the proposed bridge is shown as a purple circle. Source: Studio GL

The proposed bridge crosses Windsor Road, just north of the intersection of Windsor Road with Schofields Road and Rouse Hill Drive. The location of this crossing is shown in Figure 3. Local landmarks close to this intersection include the Rouse Hill Town Centre to the east and the Castlebrook Lawn Cemetery and Crematorium which is located on higher land to the west and provides a green backdrop to the Rouse Hill Town Centre. Rouse Hill House and Farm are located on a small hill near the intersection with Annangrove Road, approximately 2km north of the proposed bridge.

Although located on the Cumberland Plain, the area around the proposed station is gently undulating. It varies from an elevation of 40m above sea level around the Rouse Hill Town Centre to 60m above around the Rouse Hill House and 70m above around the Castlebrook Lawn Cemetery and Crematorium. This undulating landform, combined with established trees in the area, will obscure views of the bridge especially from the west, north west and south east.

To the east of the proposed bridge lies Bruce Purser Reserve, Rouse Hill High School and the Ironbark Ridge Public School which have a clear view across Caddies Creek to the Rouse Hill Town Centre and the proposed bridge. Future development of the Northern Precinct are likely to obscure views of the proposed bridge from this area.

Built Form and land use

The proposed bridge occurs north of the existing Rouse Hill Town Centre, adjacent to the Northern Precinct (see Figure 4 below where the approximate location of the bridge has been shown as a circle). The key land uses in the immediate vicinity of the proposed bridge are;

- The Rouse Hill Town Centre (B4 Mixed Use) to the east
- The Cemetery and Crematorium (SP1 Special Uses) to the south west
- Large lot residential to the west (zoned R3 for future medium density residential on part of the Area 20 development)
- Rouse Hill Regional Park to the north west

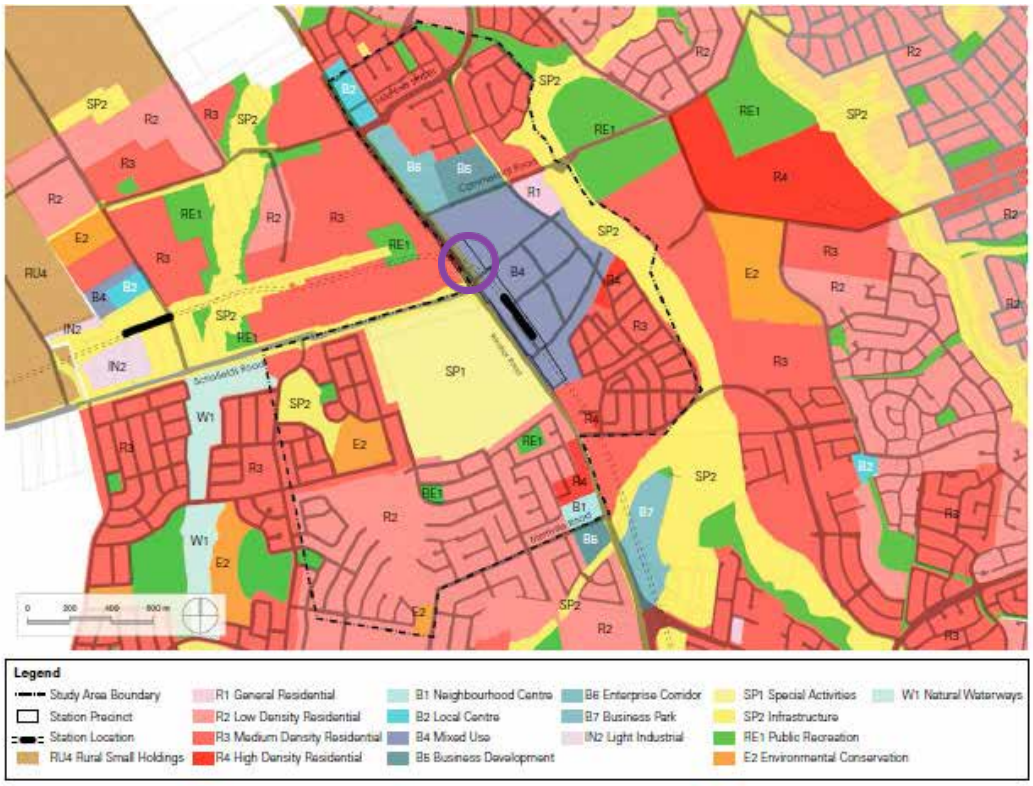

Figure 4 – Land use within the Rouse Hill Study Area

Source: Rouse Hill Station Draft Structure Plan March 2013 with the approximate location of the proposed bridge shown as a purple circle by Studio GL

Typical built form in the local area is of one and two storey residential dwellings while the Rouse Hill Town Centre is comprised of a mix of retail, commercial, residential and civic buildings. The majority of built form within the town centre is two to four (2-4) storeys in height. However, there are also a number of residential apartment buildings that are five to eight (5-8) storeys in height. The Rouse Hill Town Centre is comprised of two parts, the Town Centre Core (existing) and the Northern Precinct (as yet unbuilt).

Building heights

To assess the visual impact of the bridge it is necessary to consider not only the current situation and surrounding built form but also the likely future context as defined by the current planning controls for the area.

As can be seen in the diagram below the maximum building heights in the immediate vicinity of the proposed bridge vary from 16m-18m (approximately 5 storeys) to the west, to 25m (approximately 8 storeys) to the north east and 36m (approximately 11 storeys) to the south east. There is no maximum height indicated for the crematorium to the south west however the use of this site is not expected to change.

Figure 5 – Typical built form in the area around the proposed bridge

Source Studio GL

Figure 6 –Buildings in the Rouse Hill Town Centre

Source Studio GL

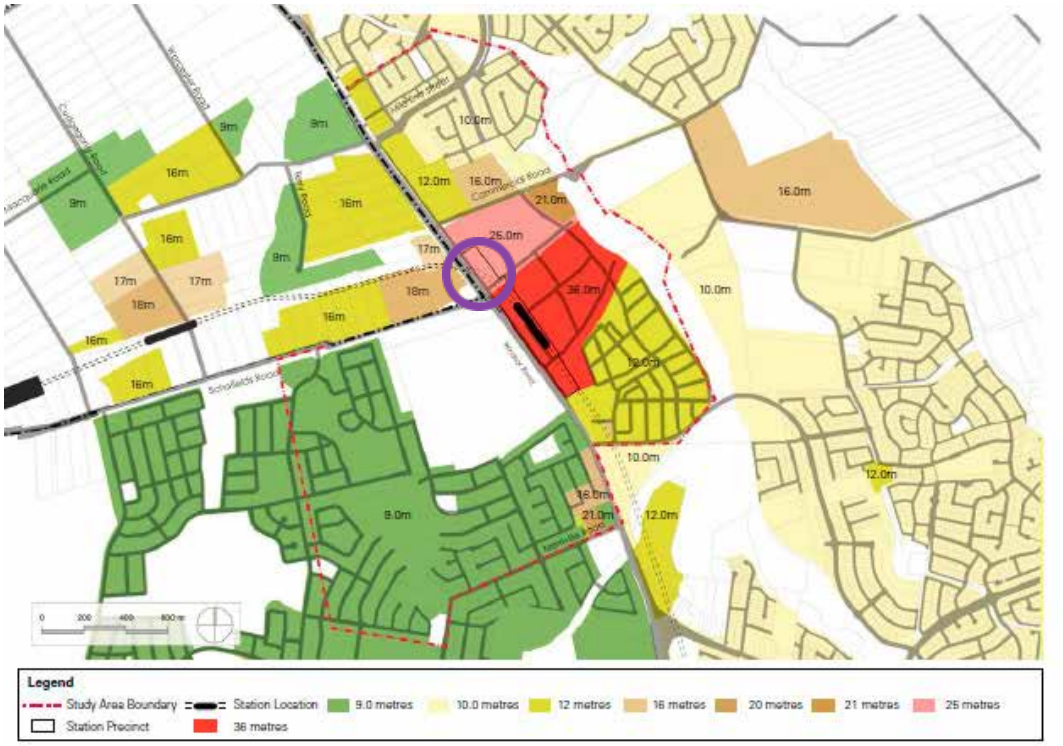

Figure 7 – Building Heights within the Rouse Hill and Cudgegong Road Study Areas

Source Image combined by Studio GL from heights plans in Rouse Hill Station Draft Structure Plan March 2013 and Cudgegong Road Station Structure Plan September 2013 with the approximate location of the proposed bridge is shown as a purple circle by Studio GL.

Rouse Hill Town Centre - Northern Precinct

An understanding of the potential height of buildings within the Northern Precinct also requires consideration as the proposed bridge is unlikely to be viewed in the context of undeveloped land (the existing condition) but in the context of buildings of significant height and bulk.

A Development Application (DA) was lodged for the Northern Precinct Plan (DA 354-2013) in September 2012. While a decision is still pending on this DA it illustrates some of the aspirations for this area. The maximum building heights plan (see Figure 8) identifies a maximum building height of 32m along Windsor Road and Commercial Road. The Building Envelopes submitted as part of the same DA indicate a maximum RL of 72.5 along Windsor Road which equate to a building approximately 22m or eight storeys in height.

The context of the Northern Precinct may change in the future as a planning proposal to remove height limits under the Hills LEP 2012 for the Rouse Hill Town Centre and the Northern Frame was approved through the LEP Gateway Process on 4 October 2013.

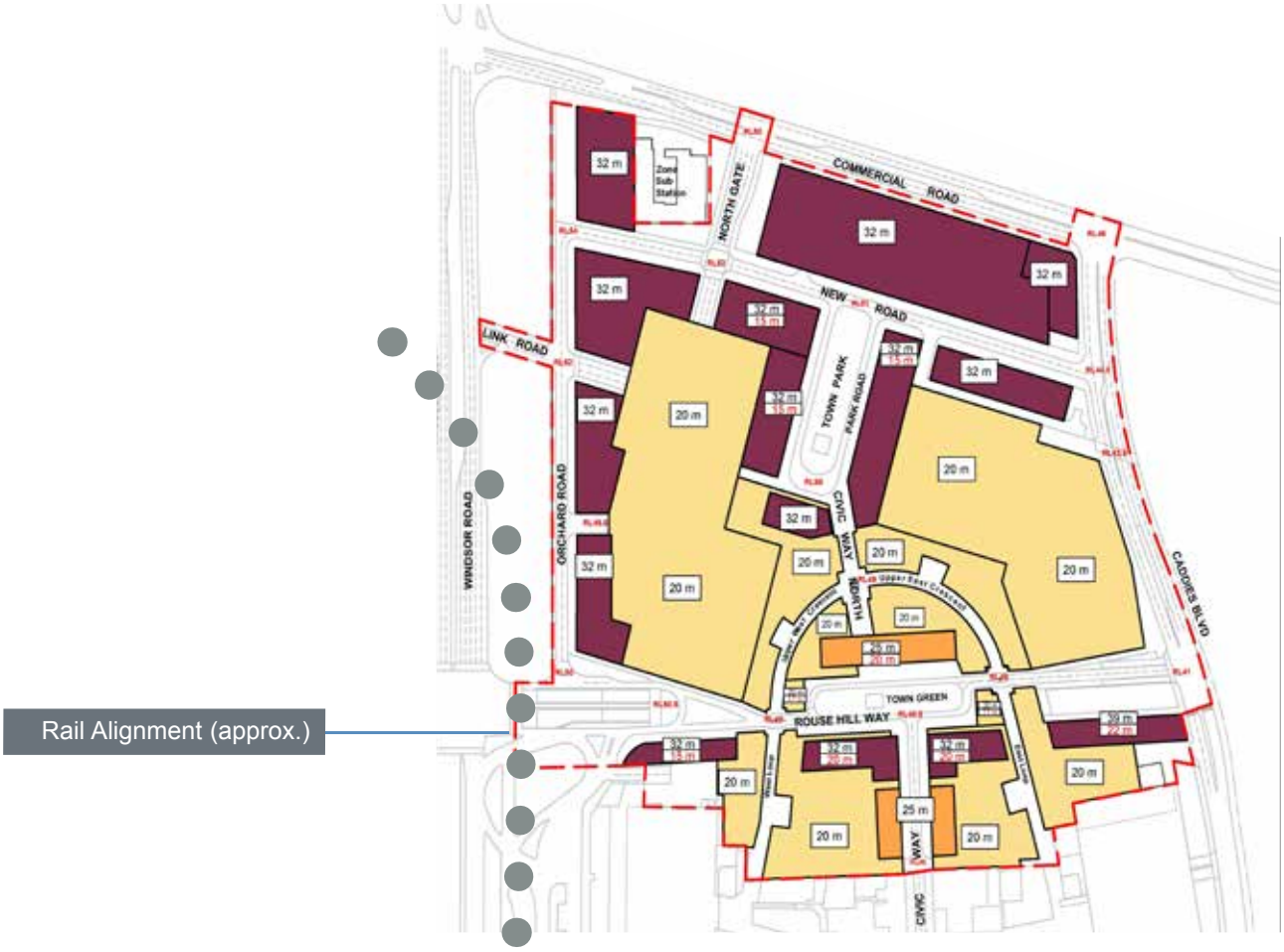

Figure 8 – Maximum Building Heights Plan

An approximate location of the rail alignment has been added in grey. Source: The Northern Precinct Plan DA 354-2013 September 2012 with approximate location of rail alignment added by Studio GL

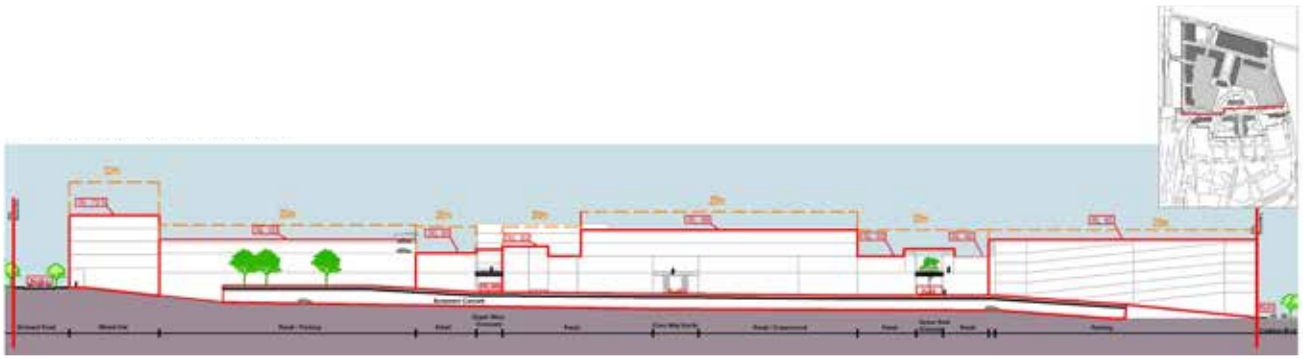

Figure 9 –Proposed Section 5 Rouse Hill Way north

Source The Northern Precinct Plan DA 354-2013 September 2012

2.2 HERITAGE

The Rouse Hill House and Farm to the north of the proposed bridge is listed on the state heritage register. The register identifies the house as one of the most significant houses of the Macquarie period (1810-1822) and notes the garden could be Australia's oldest surviving colonial garden. Rouse Hill House and Farm is managed by the Historic Houses Trust (Sydney Living Museums).

The house and grounds are located on elevated land and views to and from this elevated site are considered an important part of the setting of the property. There are views from the house west toward the Blue Mountains, east to Windsor Road and south back towards the proposed bridge at a distance of approximately 2km.

Figure 10 – Rouse Hill House from the east
Source Studio GL

As part of the NWRL EIS Stage 2 a European Heritage Report was prepared by Godden Mackay Logan (GML). The GML report assessed the impacts on European heritage from the construction and operation of the stations and rail infrastructure. This report noted the key heritage items in the vicinity of the Windsor Road Viaduct were the Royal Oak Inn (now Mean Fiddler Hotel) and the Rouse Hill House and Farm. The potential impacts were identified as follows:

- Removal of trees in views south along Windsor Road from the hotel could result in an impact on the visual setting of the former Royal Oak Inn. However, the trees to be removed are a substantial distance from the hotel, and therefore this impact is considered neutral, as assessed in EIS 1 (major civil construction).
- Due to the topography of the area and the existing vegetation on either side of the proposed construction site, it is considered that no heritage items in the vicinity of the construction site would be impacted by the proposed construction works or operations.
- Analysis of the topography of the land that lies between Rouse Hill House and Rouse Hill Town Centre suggests that the potential impact of the NWRL upon the Rouse Hill House property or its extended visual curtilage would be very low. The property lies approximately 1.5 km to the north of the Cudgegong Road Station site, and is further away (about 2 km distant) from the Tallawong Stabling Facility construction site. The Rouse Hill Estate is separated from these two construction sites by an undulating landscape including forested areas. It is considered therefore that the Cudgegong Station and Tallawong Stabling Facility construction works and operations would barely be visible from the Rouse Hill Estate, and that the possibility of these works resulting in any appreciable negative heritage impacts upon this historic property and its curtilage would be very low.

This is consistent with the earlier GML report for the North West Growth Centre: Area 20 Precinct (November 2010) which noted that the visual curtilage around the house and views of broad expanses of pastoral landscape is considered important for the estate's rural setting. In particular it noted that future development, and in particular future residential subdivision to the south and south west, will need to recognise and protect the significance of the setting.

Due to the existing vegetation and landform, views from Rouse Hill House and Farm to the south have limited visibility of the eight storey apartment building at the Rouse Hill Town Centre. The Rouse Hill Station is also unlikely to be visible from these locations (views shown in red in the diagram below). However, it is expected that the top of the towers of the proposed bridge would be visible looking south from parts of the garden and around the outbuildings (views shown in orange in Figure 11).

Figure 11 – Diagram of Rouse Hill House showing views around the house.
Source: Google maps (2014) with overlay of viewpoints by Studio GL

Figure 12 –View along old Windsor Road alignment looking south (No1)

The proposed bridge would be unlikely to be visible from this location. Source: Studio GL

Figure 13 –View to the north and Blue Mountains from next to the house. (No2)

This view is looking away from the proposed bridge. Source: Studio GL

Figure 14 –View from the front of Rouse Hill House looking south. (No3)

The proposed bridge would be unlikely to be visible from this location. Source Studio GL

Figure 15 –View from the garden, south of Rouse Hill House looking south. (No4)

The proposed bridge would be unlikely to be visible from this location. Source Studio GL

Figure 16 –View from the garden, south of Rouse Hill House looking south. (No5)

The proposed bridge would be unlikely to be visible from this location. Source: Studio GL

Figure 17 –View from the garden, south of Rouse Hill House looking south. (No6)

The towers of the proposed bridge are likely to be visible from this location in the vicinity of the arrow. Source: Studio GL

Figure 18 –View from the garden, south of Rouse Hill House looking south. (No7).

The towers of the proposed bridge are likely to be visible from this location in the vicinity of the arrow. Source: Studio GL

Figure 19 –View from the garden, south of Rouse Hill House looking south. (No8)

The towers of the proposed bridge are likely to be visible from this location in the vicinity of the arrow. Source: Studio GL

Figure 20 –View from the paddock to the south of the outbuildings looking south. (No9)

From this high part of the site there is a wide open view to the south. The towers of the proposed bridge are likely to be visible from this location in the vicinity of the arrow. As this is close to outbuildings and has the most expansive views to the site, this view is the one selected later in the report to assess visual impact.

Source Studio GL

The photos show that the views from the house and garden to the south towards the proposed bridge vary in character with a number of views obscured and filtered by structures, trees and the surrounding topography.

The proposed bridge would be clearly visible from the paddocks to the south west of the house. From these locations development to the south west including The Rouse Hill Village Centre, residential housing and one of the apartment buildings at the Rouse Hill Town Centre can be clearly seen beyond the small hill. The view selected for the visual impact assessment (View location 9) has an open view to the south. From this location the bridge towers would be in close proximity to each other and to other buildings in the town centre and would rise well above the tree line and the hills behind creating a noticeable structure against the skyline.

3. VISUAL AMENITY

3.1 METHODOLOGY

EIS Stage 2

The approved NWRL EIS Stage 2 – Stations, Rail Infrastructure and Systems established a methodology for assessing visual impact, which is based on the level of visual modification created by the NWRL and the sensitivity of the viewer. These two levels were then combined to determine a level of likely visual impact.

To ensure consistency this report has adopted the NWRL methodology. The viewpoints are slightly different as the impacts of a taller structure will be seen more widely in the surrounding landscape.

Visual Modification

The visual modification was defined as the change to the landscape that may occur as a result of development from a given viewpoint. The visual modification is described as the extent of change and identifies elements which are removed or added, changed in scale, form, shape, pattern, colour and texture, and compatibility of new elements with the existing landscape.

It was noted that visual modification can result in an improvement or reduction in visual amenity. The terminology used to describe the level of visual modification is listed below

Visual Modification	Description
Considerable reduction or improvement in visual amenity	Substantial part of the view is altered
Noticeable reduction or improvement in visual amenity	Alteration to the view is clearly visible
No perceived reduction or improvement in visual amenity	Either the development is not visible, or if it is, the change in the view is generally unlikely to be perceived by viewers

Table 4 Visual modification levels

Source: Table 16.2 EIS Stage 2 Stations, Rail Infrastructure and Systems

Visual Sensitivity

The visual sensitivity of a view was defined by the nature of the view and its duration. A higher visual sensitivity was given to views which would be seen for longer, by a higher numbers of potential viewers and where visual amenity was important to viewers. The context of the view, from those of national importance through to neighbourhood importance, and the distance from the views were also used to determine the visual sensitivity level. The terminology used to describe the level of visual sensitivity can be seen below.

Visual Sensitivity	Description
National	Heavily experienced view to a national icon, e.g. view to Sydney Opera House from Circular Quay or Lady Macquarie's Chair, view to Parliament House Canberra along Anzac Parade.
State	Heavily experienced view to a feature or landscape that is iconic to the State, e.g. Viewpoint to the Three Sisters at Echo Point in the Blue Mountains National Park.
Regional	Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space. e.g. Rouse Hill House & Farm.
Local	High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users. e.g. expansive urban or bushland views from residential areas or local open space.
Neighbourhood	Views where visual amenity is not particularly important, such as lesser quality views briefly glimpsed from roads.

Table 5 –Visual Sensitivity levels

Source: Table 16.3 EIS Stage 2 Stations, Rail Infrastructure and Systems

Visual Impact

A consistent assessment was developed specifically for this project to evaluate visual impact and can be seen below. This assessment has been used to evaluate the visual impact of the proposed bridge.

	National visual sensitivity	State level visual sensitivity	Regional visual sensitivity	Local visual sensitivity	Neighbourhood sensitivity
Considerable reduction	Major adverse	Major adverse	High adverse	Moderate adverse	Minor adverse
Noticeable reduction	Major adverse	High adverse	Moderate adverse	Minor adverse	Negligible
No perceived reduction or improvement	Negligible	Negligible	Negligible	Negligible	Negligible
Noticeable improvement	Major beneficial	High beneficial	Moderate beneficial	Minor beneficial	Negligible
Considerable improvement	Major beneficial	Major beneficial	High beneficial	Moderate beneficial	Minor beneficial

Table 6 Visual impact significance levels

Source: Table 16.3 EIS Stage 2 Stations, Rail Infrastructure and Systems

3.2 VISUAL IMPACT ASSESSMENT

View Point Locations

Viewpoints were located after desktop analysis and groundtruthing during site visits to the local area. Views 1-4 were selected after considering the local topography and the alignment of key roads in the immediate location of the proposed bridge. View 5 was selected as it is from open space and public facilities (schools) in close proximity to the proposed bridge. View 6 was selected due the state significance of the heritage item in this location.

The final view was selected after site inspection and a study of the topographical maps of the area. This showed that mid range and long distance views of the area are most likely to occur from the eastern side of the bridge. View 7 was selected as a representative view from the area east of the site.

Key Viewpoints

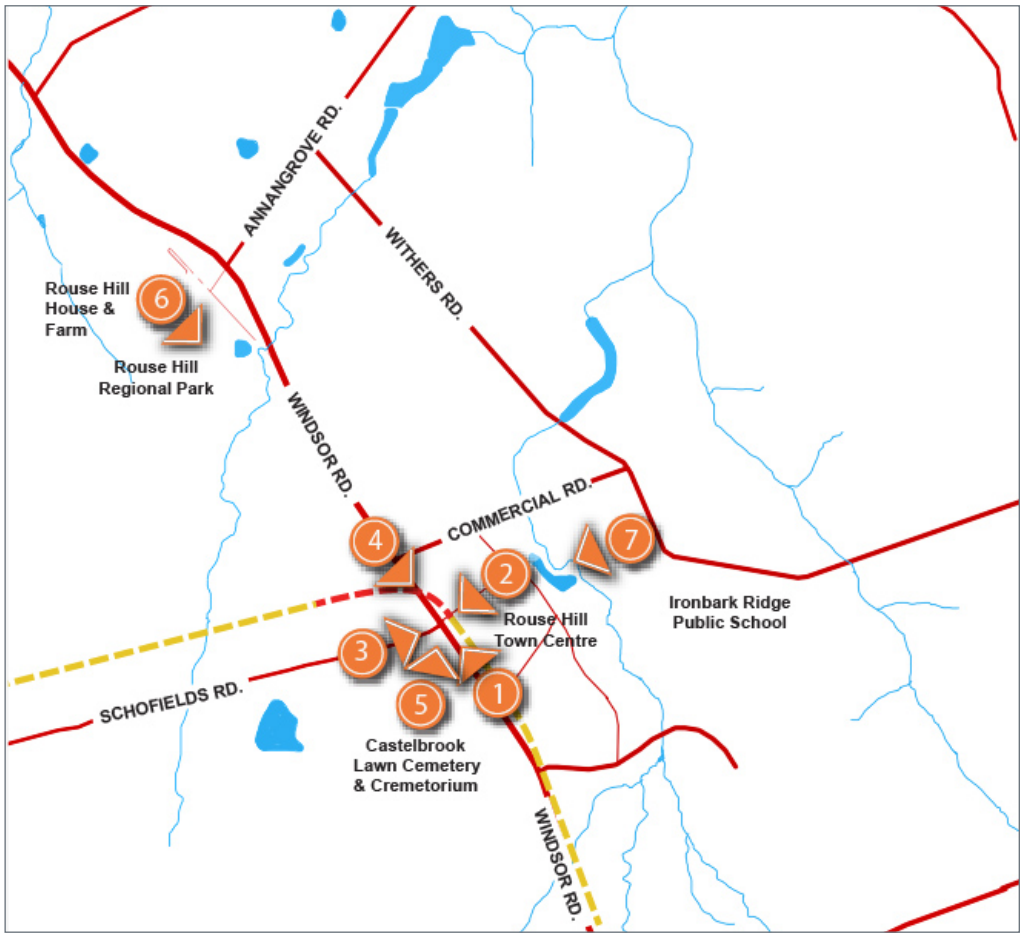

Figure 21 – Plan view showing location of viewpoints

Source: Studio GL

Figure 23 – View 1 - Along Windsor Road (looking north) *Source: Studio GL*

Figure 22 – Location of View 1
Source: Studio GL

Viewpoint 1

From Windsor Road traveling north, north of the intersection with White Hart Drive and close to the Rouse Hill Town Centre.

Site description

This section of Windsor Road is slightly undulating and this view will occur just over a small rise looking down towards the bridge. On the left of this view the land rises up to the Castlebrook Lawn Cemetery and Crematorium.

Viewpoint selection

The viewpoint is from a vehicle along Windsor Road. Windsor Road is one of the oldest and most significant routes in the local area. The road carries high volumes of traffic.

Viewpoint	Visual Modification	Visual sensitivity	Impact
1 Foreground view from a major route	Considerable Improvement	Local	Moderate Beneficial
	The bridge would dominate the views along the road to the north. The diagonal alignment of the bridge would reduce the impact as part of the view would be experienced beside the bridge.	The view would be seen from vehicles using Windsor Road.	This view would be seen by many creating an iconic landmark for the local area.

Figure 25 –View 2 - Along Rouse Hill Drive (looking west) *Source: Studio GL*

Figure 24 – Location of View 2
Source: Studio GL

Viewpoint 2

From Rouse Hill Drive looking west across Windsor Road and up Schofields Road.

Site description

This section of Rouse Hill Drive lies between the existing Rouse Hill Town Centre and the future Northern Precinct. The road is climbing slightly. Views under the viaduct will be of Schofields Road. On the left of this view the land rises up to the Cemetery

Viewpoint selection

The viewpoint is from within the expanded town centre which is likely to have a high number of pedestrians using the centre and vehicles accessing parking areas.

Viewpoint	Visual Modification	Visual sensitivity	Impact
2 Foreground	Noticeable Reduction	Neighbourhood	Minor Adverse
	The bridge structure would be wider and deeper than the approved viaduct. However, this is unlikely to be noticeable. The most recent available plans for the Northern Precinct propose narrowing this road and building 3 to 5 storey development along its length, which will restrict views of the bridge.	The view would be seen by pedestrians using the centre and vehicles accessing the basement parking. The focus of these trips will be buildings within the centre with views of the bridge likely to only be glimpses in passing.	Development of the Northern Precinct of the town centre will dominate views from this location resulting in a minor adverse impact.

Figure 27 –View 3 - Along Schofields Road (looking east) *Source: Studio GL*

Figure 26 – Location of View 3
Source: Studio GL

Viewpoint 3

From Schofields Road looking east across Windsor Road towards the Rouse Hill Town Centre.

Site description

This section of Schofields Road occurs just after a small rise and is falling toward Windsor Road. Part of the southern side of the road is in a cutting and the alignment of the road is skewed towards the existing town centre and away from the proposed bridge.

Viewpoint selection

The viewpoint is from a vehicle as Schofields Road is a key local road linking Rouse Hill with Schofields to the west.

Viewpoint	Visual Modification	Visual sensitivity	Impact
3 Foreground view from a local route	Negligible	Neighbourhood	Negligible
	The bridge structure would be wider and deeper than the approved viaduct. However, this is unlikely to be noticeable. The road alignment will focus views away from the bridge, which would be viewed with a backdrop of development within the Northern Precinct of the town centre.	The view would be seen by users of Schofields Road traveling east. Views of the bridge would likely be only glimpses in passing of the towers and viaduct through the trees.	Development of the Northern Precinct and along the north side of the road will dominate views from this location creating a negligible impact.

Figure 29 –View 4 - Along Windsor Road (looking south) *Source: Studio GL*

Figure 28 – Location of View 4
Source: Studio GL

Viewpoint 4

From Windsor Road traveling south, north of the intersection with Rouse Hill Drive and close to the Mean Fiddler Hotel.

Site description

This section of Windsor Road is slightly undulating and this view of the bridge would occur just over a small rise looking down towards the town centre. The heavily landscaped median will restrict views of the western side of the bridge and the western tower.

Viewpoint selection

The viewpoint is from a vehicle along Windsor Road. Windsor Road is one of the oldest and most significant routes in the local area. The road carries high volumes of traffic.

Viewpoint	Visual Modification	Visual sensitivity	Impact
4 Foreground view from a local route	Considerable Improvement	Local	Moderate Beneficial
	The bridge would dominate the views along the road to the south. The diagonal alignment of the bridge would reduce the impact as part of the view would be experienced beside the bridge.	The view would be seen by vehicles using Windsor Road.	This view would be seen by many creating an iconic landmark for the local area.

Figure 31 –View 5 - From the cemetery (looking northeast). *Source: Studio GL*

Figure 30 – Location of View 5
Source: Studio GL

Viewpoint 5

From the Castlebrook Lawn Cemetery and Crematorium looking north across Windsor Road towards the Northern Precinct of the Rouse Hill Town Centre.

Site description

The cemetery is located on rising land to the west of Windsor Road. Much of the site is cleared with mown lawns and small shrubs and views towards the town centre to the north and east. A chapel is located on the southern side of the site.

Viewpoint selection

The viewpoint is from a pedestrian viewpoint visiting or working at the cemetery and crematorium.

Viewpoint	Visual Modification	Visual sensitivity	Impact
5 Foreground view from a public open space and view point.	Considerable Reduction	Local	Moderate Adverse
	In addition to the viaduct, services buildings and station building the bridge towers would rise above the trees creating a noticeable structure against the skyline.	The view would be seen by visitors to the cemetery and crematorium.	This location is particularly sensitive due to its use and given the noticeable reduction in amenity there would be a moderate adverse visual impact.

Figure 33 –View 6 - from a paddock of Rouse Hill House (looking south)
The arrow shows the approximate location of the proposed bridge. Source: Studio GL

Figure 32 – Location of View 6
Source: Studio GL

Viewpoint 6

From Rouse Hill House and Farm, a Historic Houses Trust property and one of the oldest and most significant houses in the area.

Site description

Rouse Hill House and Farm is located on a small hill. The southern side of the hill slopes down across Rouse Hill Regional Park and Second Ponds Creek providing open views to the south and east. Much of this part of the estate is cleared with mown paddocks, rural fences and outbuildings.

Viewpoint selection

The viewpoint is from a pedestrian viewpoint visiting or working at the Rouse Hill House and Farm. This is the widest view available from the area around the site (see Context 2.1)

Viewpoint	Visual Modification	Visual sensitivity	Impact
6 Long distance view from a regionally significant heritage item	Noticeable reduction	Regional	Moderate Adverse
	Although 2.5km away, viewed in the context of other tall buildings and screened by trees and topography, the bridge towers would rise above the tree line and the hills beyond creating a noticeable structure against the skyline.	The view would be seen by visitors to the Rouse Hill House and Farm.	This location is particularly sensitive due to its heritage significance. As there would be a noticeable modification there would be a moderate adverse visual impact.

Figure 35 –View 7- from Withers Road (looking west). The view is across Rouse Hill High School
Source: Studio GL

Figure 34 – Location of View 7
Source: Studio GL

Viewpoint 7

From the Withers Road looking west across Rouse Hill High School towards the Northern Precinct of the Rouse Hill Town Centre.

Site description

The school is located on land that rises up from Caddies Creek to Withers Road. The topography of the area provides views from Withers Road, the Rouse Hill High School, the Ironbark Ridge Public School and parts of Bruce Purser Reserve with views across the northern precinct of the town centre to the proposed bridge.

Viewpoint selection

The viewpoint is from a pedestrian viewpoint visiting or working at the schools or oval.

Viewpoint	Visual Modification	Visual sensitivity	Impact
7 Mid range view from a public open space and schools	Negligible	Local	Negligible
	The tops of the bridge towers may be visible above the buildings in the northern precinct of the town centre.	The view would be seen by visitors and users of the schools and public open space.	This location is not particularly sensitive and development of the northern precinct of the town centre will dominate views from this location creating a negligible impact.

4. CONCLUSION

4.1 VISUAL IMPACT

The report has considered the visual impacts of the proposed bridge on the wider physical and cultural landscape. At their currently proposed height (of approximately 45m) glimpses of the towers would be seen from the wider local area, a prominent reminder of the presence of the new rapid transit infrastructure.

The bridge is located in an area surrounded by undulating topography and established trees. These features would restrict views of the bridge and reduce the visual impact of its height. Furthermore, the scale of the proposed bridge was considered and options were explored during the design development to minimise the visual impact on the surrounding area.

Around the immediate context, the bridge will create a local landmark where it crosses Windsor Road. As this occurs at the Rouse Hill Town Centre it will reinforce the town centre, a reasonable outcome given the importance of the centre to the local area. A review of the current land use and proposals indicates the town centre is expected to expand with an increased number of taller buildings. Taller development in the immediate context of the bridge would reduce the contrast between the bridge and its surrounding context and reduce its long term visual impact.

It is expected that the visual impact of the proposed bridge would change from the **minor adverse i**mpact of the viaduct to **moderate beneficial** impact for the bridge for views traveling north and south along Windsor Road as the bridge will create a prominent marker for the area. It is expected impact on views will remain **negligible** along Schofields Road and **minor adverse** along Rouse Hill Drive where development, landscape and natural topography will screen views of the bridge. The bridge is expected to continue to have a **moderate adverse** impact on views from the Lawn Cemetery and Crematorium as vegetation could only be expected to screen lower portions of the structure.

It is expected that the impact on views from Rouse Hill House and Farm will increase from negligible to **moderate adverse** as the tops of the towers would be visible from the gardens and paddocks to the south of the house. Fortunately the main access to the house is from the north and existing landscape and built features in the immediate vicinity of the house screen a number of the views to the south. The impact on views from the paddocks to the south is helped by local topography and in particular the small treed hill between the house and the bridge which would screen the lower part of the towers. Further recommendations to mitigate this impact have been identified below.

Impact on wider regional views is expected to be **negligible** as the tops of the towers would be seen as small structures in a wider landscape.

View	EIS 2 Visual Assessment	Modification Visual Assessment
Windsor Road looking north	Moderate adverse impact	Considerable improvement (ie **moderate beneficial** impact) as a result of the landmark characteristics of the bridge for the local area.
Rouse Hill Drive looking west	Minor adverse impact	Negligible change (ie **minor adverse** impact), particularly in the context of likely future development of the Rouse Hill Town Centre Northern Precinct and the oblique view towards the bridge from this location.
Schofields Road looking east	Negligible impact	Negligible change (ie **negligible impact**), particularly in the context of likely future development of the Rouse Hill Town Centre Northern Precinct.
Windsor Road looking south	Moderate adverse impact	Considerable improvement (ie **moderate beneficial** impact) as a result of the landmark characteristics of the bridge for the local area.
Castlebrook Lawn Cemetery and Crematorium looking north	Minor adverse impact	Noticeable reduction as the bridge towers would rise above the trees creating tall structures against the skyline. The changed impact is assessed as **moderate adverse** particularly given the sensitivity of the use of the site.
Rouse Hill House and Farm looking south	Negligible impact	Noticeable reduction in visual amenity as, while the bridge will be seen within the context of future development to the north of the Rouse Hill Town Centre, the towers would rise above the trees creating tall structures against the skyline. The changed impact is assessed as **moderate adverse** particularly given the heritage significance of the site.
Withers Road looking east	N/A	**Negligible** visual impact.

Table 7 Visual modification summary

4.2 MITIGATION

As a local landmark, the proportions and architectural elegance of the structure have a greater importance than smaller less visually prominent elements of the railway. A number of options have been considered to minimise the visual impact of the bridge and to ensure that the bridge structure is elegant and with a high quality architectural expression.

The following mitigation measures would further improve its visual impact if:

- The detailed design process for the Windsor Road Bridge would consider opportunities to review the proportions of the bridge towers to ensure a proportionally elegant structure.
- The Windsor Road Bridge towers would be light and neutral in colour to minimise the contrast where they would be seen against the sky.

4.3 SUMMARY

In summary the assessment concludes that the visual impacts of the proposed bridge differ from that of the approved viaduct in EIS2 and that the visual impacts of the proposed bridge are expected to vary from moderate beneficial to moderate adverse.

The report has considered the visual impacts on European Heritage and recommended mitigation measures to reduce the impact. The natural landscape features of the surrounding area and the expected future development around the bridge will restrict views and reduce the visual impacts of the structure.

In conclusion the proposed bridge;

- is likely to become a recognisable structure in the landscape, a marker of the railway in the immediate and wider landscape context,
- will reinforce the Rouse Hill Town Centre and subsequently its importance as a major centre and
- has been designed with consideration of the scale of the structure and its impact on the surrounding area.