

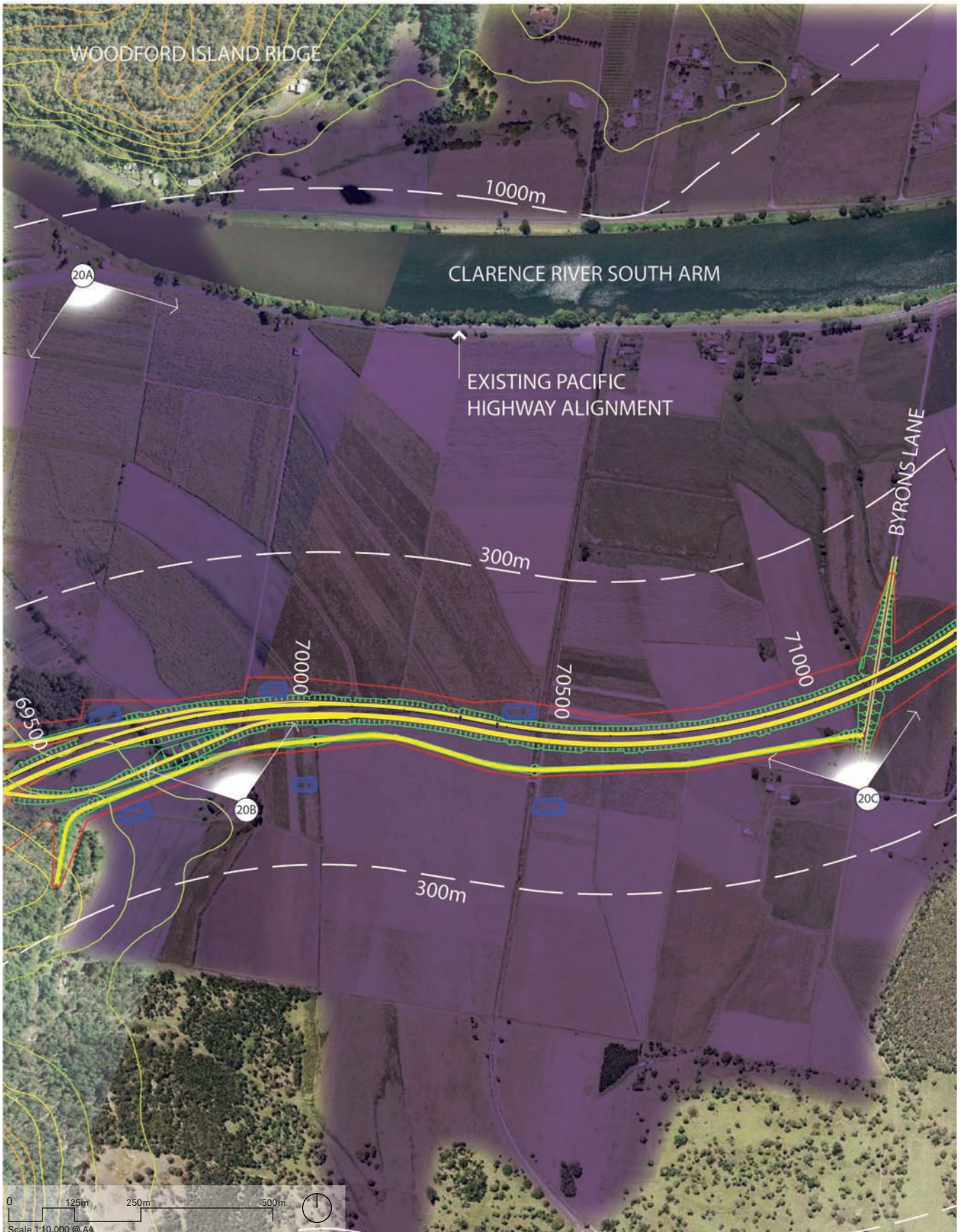
03 _____ Visual impact assessment

3.7_ Section 4_ Tyndale to Maclean

149

- 20A_ Pacific Highway, Tyndale
- 20B_ Cane Fields, Tyndale (North)
- 20C_ Byrons Lane, Tyndale (North)
- 21_ Pacific Highway, South Arm
- 22_ McIntyre's Lane, Green Hill
- 23_ Cameron Hill Estate, Gulmarrad
- 24A_ Ferry Park, Maclean Interchange
- 24B_ Schwonberg Street, Townsend
- 25_ Maclean Lookout, Wharf Street, Maclean

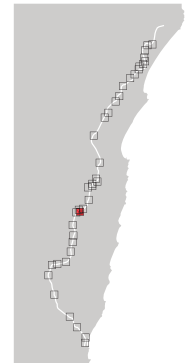
The landscape character assessment assessed the impact of the project on Section 4 to be *moderate*.



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 20



03 Visual impact assessment

3.7.1 Viewpoint 20A, 20B & 20C

Pacific Highway, Tyndale

Section 4: Tyndale to Maclean

Character precinct 17: Low–moderate ability to visually absorb change.

Site description

The project continues on a new alignment to the east of the existing highway across the South Arm River floodplain comprising sugar cane plantations. The landscape is open and the visual catchment extensive. Distant views to prominent hills and ridge lines are evident.

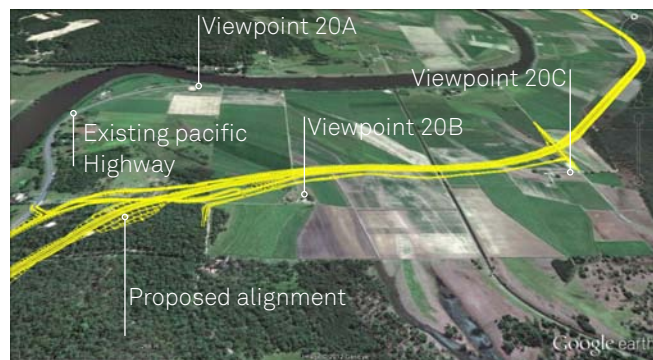
Project description

The project passes over the floodplain on a fill embankment, typically two metres up to four metres. It comprises a new dual carriageway and numerous service roads to connect to the local road network.

Vantage point selection

Viewpoint 20A is considered to represent a typical view of the proposed highway crossing the sugar cane fields on the floodplain as viewed from the existing highway which carries the majority of traffic in the area. Views from a number of local residences on the existing highway would be similar. Viewpoints 20B and 20C specifically address the changed view from two individual residences located on the floodplain away from the existing highway but close to the project.

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
20A Middle ground view	Moderate–low New road infrastructure in an agricultural setting.	Moderate–low This changed view would be visible from a low number of local residences, and a high number of motorists would have fleeting glimpses of this new road corridor.	Moderate–low	<ul style="list-style-type: none"> _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible



Oblique view looking north



Annotated diagrammatic approximation of the project as photographed from viewpoint. 20A_ View south-east, Pacific highway, north of Tyndale. Location: 29°32'27"S 153°09'43"E

03 Visual impact assessment

152

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
20B Foreground view	High Significant new road infrastructure in an agricultural setting. Minor filling and disturbance to pockets of existing vegetation is proposed. The new work would dominate the view from this vantage point.	Moderate Considerable sensitivity for the residents of the adjacent home who will experience repeated and long duration views.	Moderate–high	<ul style="list-style-type: none"> _ Minimise loss of existing vegetation _ Provide screen tree and shrub planting on embankments and between access and service roads in accordance with the landscape concept strategy and to provide a screen to nearby homes _ Prepare detail landscape designs in accordance with the landscape concept strategy



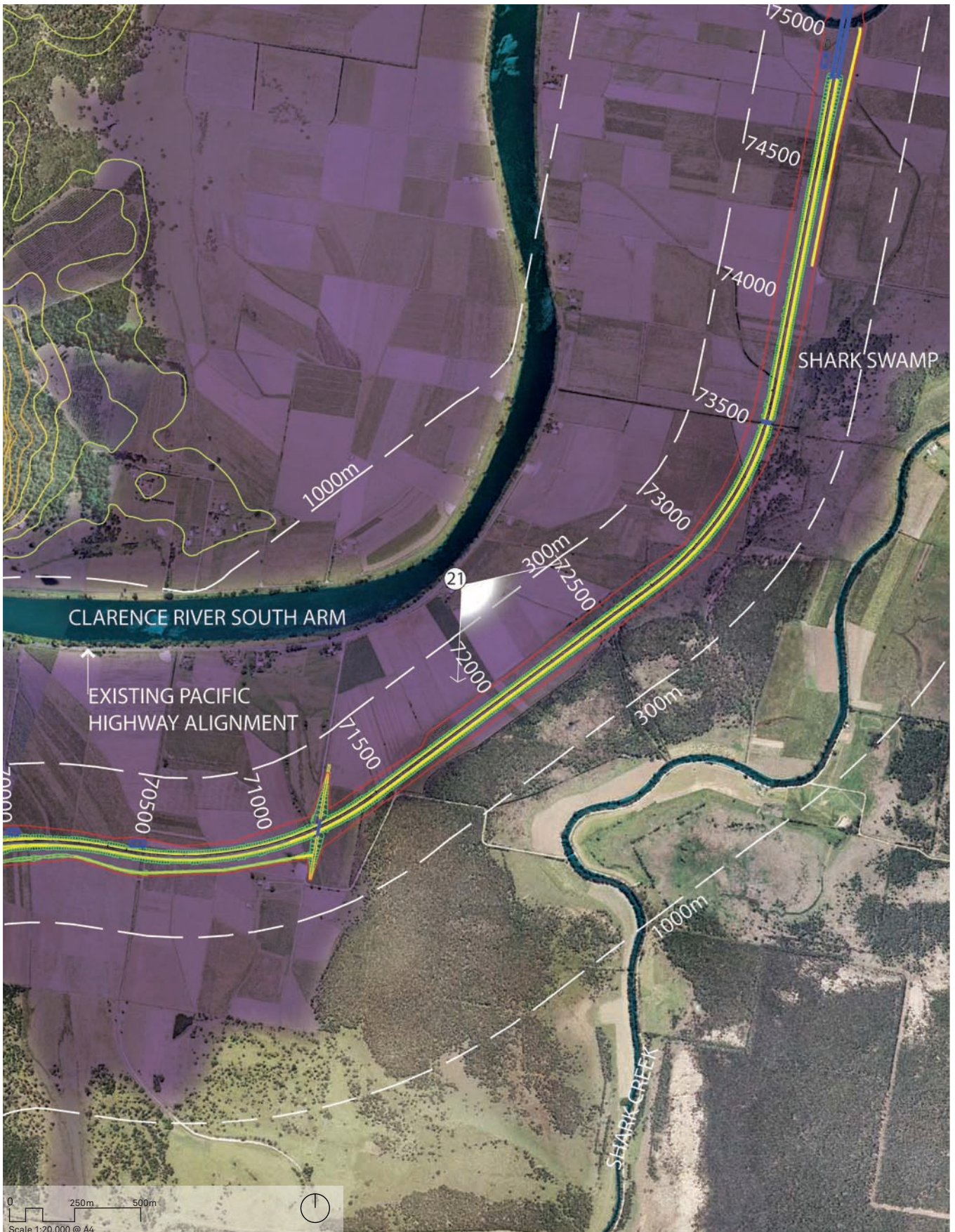
Annotated diagrammatic approximation of the project as photographed from viewpoint. 20B_ View north, sugarcane farm house, north of Tyndale. Location: 29°32'56"S 153°09'52"E

03 Visual impact assessment

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
20C Foreground view	High Significant new road infrastructure in an agricultural setting. Minor filling and disturbance to pockets of existing vegetation is proposed. The new work would dominate the view from this vantage point	Moderate Considerable sensitivity for the residents of the adjacent home who will experience repeated and long duration views.	Moderate–high	<ul style="list-style-type: none"> _ Minimise loss of existing vegetation _ Provide screen tree and shrub planting on embankments and between access and service roads in accordance with the landscape concept strategy and to provide a screen to nearby homes _ Prepare detail landscape designs in accordance with the landscape concept strategy



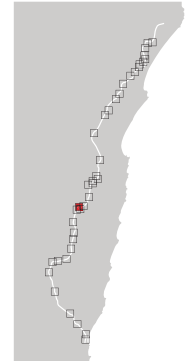
Annotated diagrammatic approximation of the project as photographed from viewpoint. 20C_ View north-west, Byrons Lane, north of Tyndale. Location: 29°32'36"S 153°10'36"E



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 21



03 Visual impact assessment

3.7.2 Viewpoint 21

Pacific Highway, South Arm

Section 4: Tyndale to Maclean

Character precinct 17: Low-moderate ability to visually absorb change.

Site description

The project continues on a new alignment to the east of the existing highway across the South Arm River floodplain comprising sugar cane plantations with a backdrop of wetland vegetation associated with Shark Swamp. The landscape is open and the visual catchment extensive. Distant views to prominent hills and ridge lines are evident.

Project description

The project passes over the floodplain on a fill embankment, typically two metres up to four metres. It comprises a new dual carriageway. An overpass at Bryons Lane is proposed.

Vantage point selection

This vantage point represents the typical view that would be experienced from a number of local residences located along the existing highway.

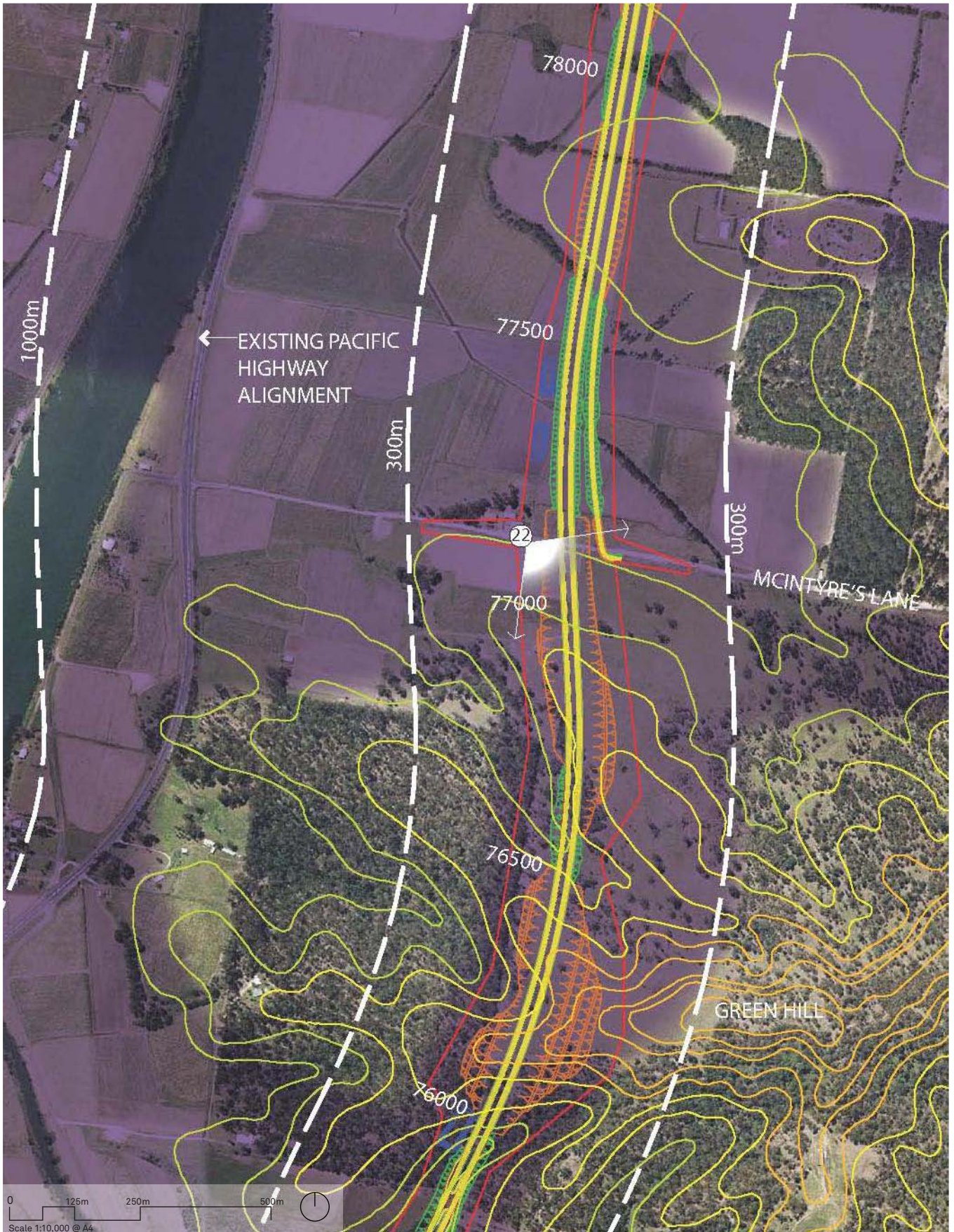
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
21 Middle ground view	Moderate–low New road infrastructure in an agricultural setting.	Moderate–low This changed view would be repeatedly visible from a low number of local residences, and a high number of motorists would have fleeting glimpses of this new road corridor.	Moderate–low	<ul style="list-style-type: none"> _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible



Oblique view looking north



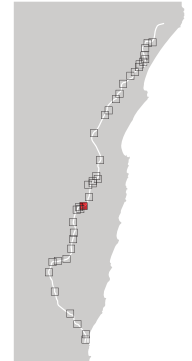
Annotated diagrammatic approximation of the project as photographed from viewpoint 21_ View east-south-east, Pacific highway, South Arm. Location: 29°32'21"S 153°10'57"E



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 22



03 Visual impact assessment

3.7.3 Viewpoint 22

McIntyre's Lane, Green Hill

Section 4: Tyndale to Maclean

Character precinct 22: Moderate ability to visually absorb change.

Site description

Green Hill is a natural elevated landmark considerably narrowing the width of the South Arm floodplain at this point. Much of the hill is forested and it is surrounded by sugar cane plantations and other agricultural activity. The visual catchment opens up to the north and the south of Green Hill.

Project description

The project cuts through Green Hill in a deep cutting in excess of 20 m. Most of the work passes just to the east of remnant forest vegetation and is located away from existing residences publicly accessible roads. The proposed work comprises a new dual carriageway and additional access road connection to McIntyres Lane extending up the Maclean Interchange.

Vantage point selection

The vantage point reveals the cutting in the hillside as the new carriageway passes through Green Hill and is typical of the view that would be experienced by the residence on McIntyres Lane and by local residents using McIntyres Lane. There is no overpass proposed over McIntyres Lane so it is anticipated that traffic in the area would remain low.

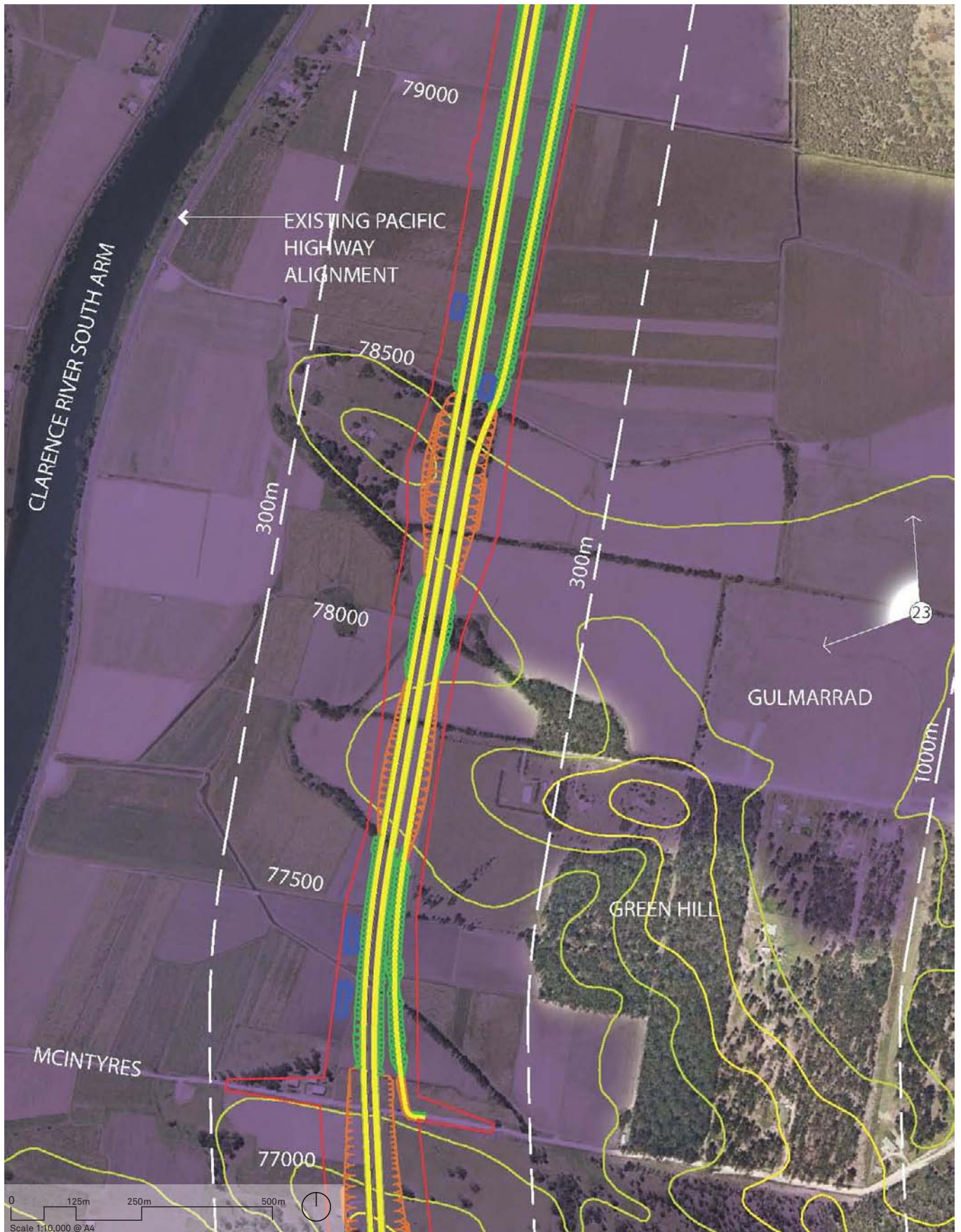
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
22 Foreground view	High–moderate New road infrastructure in a natural setting. Major tree removal and earthworks is proposed. Location of the proposed highway in a cutting reduces its visibility generally from vantage points in the landscape. At times the view would be obscured by sugar plantation vegetation.	Moderate–low Considerable sensitivity for a low number of residents in local homes with direct views to the project, and local residents who would have repeated views to a changed foreground view.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing forest trees _ Lay back and feather top cut batters to blend with natural landform _ Plant local forest trees on cut batters



Oblique view looking north-east



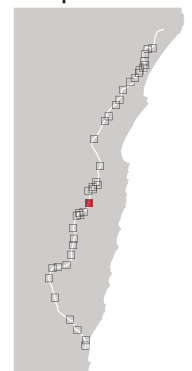
Annotated diagrammatic approximation of the project as photographed from viewpoint 22_ View south-east, McIntyres Lane, Green Hill. Location: 29°30'10"S 153°12'08"E



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 23



03 Visual impact assessment

3.7.4 Viewpoints 23

Cameron Hill Estate, Gulmarrad

Section 4: Tyndale to Maclean

Character precinct 17: Low-moderate ability to visually absorb change.

Site description

The project follows an alignment across low lying sugar cane fields parallel and to the east of the existing highway. The visual catchment is expansive over this flood plain area associated with South Arm creek limited by a prominent ridge line to the west and by Green Hill and scattered patches of existing vegetation to the east. There is a large number of residences in this area along Clyde Essex Drive. Patches of vegetation provide local screening of the project to some of these residences.

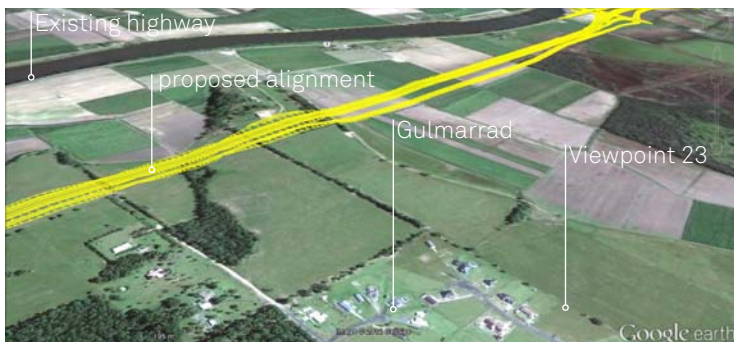
Project description

The project has fill batters up to three metres in height and through some cuttings as it passes through undulating land at the base of Green Hill. A dual carriageway is proposed and an extensive new access road to the east connecting McIntyres Lane to the new Maclean Interchange.

Vantage point selection

This vantage point is considered to typically represent the view of the project that might be experienced from some local residences and local streets in this area

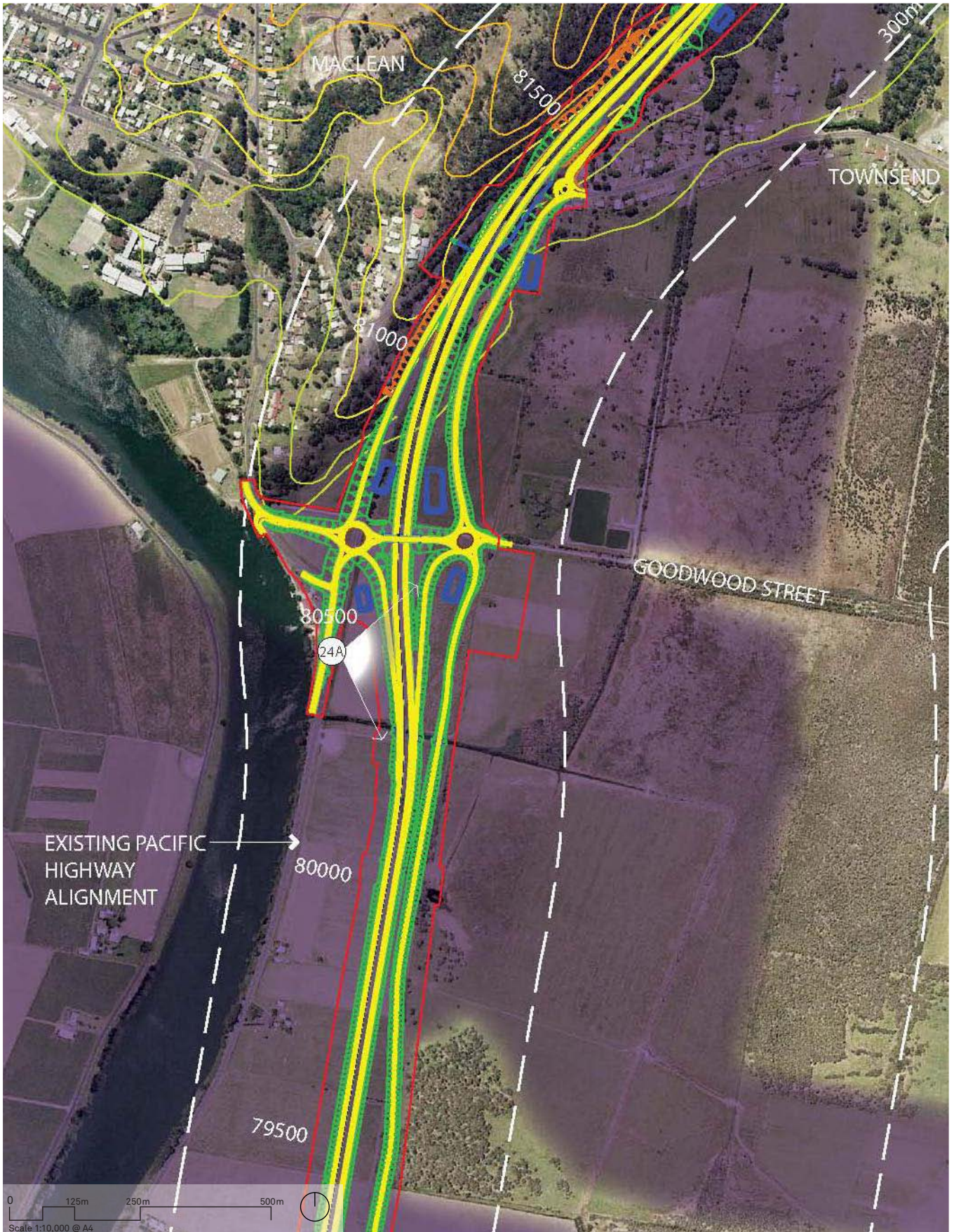
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
23 Middle ground view	Moderate–low New road infrastructure in an agricultural setting would affect a portion of the middle ground view. Major tree removal and earthworks is proposed causing removal of existing vegetation. Location of the proposed highway in a cutting reduces its visibility from some vantage points in the landscape.	Moderate This changed view would be available to a low number of local residents and from the local road network.	Moderate–low	<ul style="list-style-type: none"> _Provide screen planting using local species on cut/fill embankments to screen the project to views from Gulmarrad _Reinstate existing riparian vegetation where possible



Oblique view looking north-west



Annotated diagrammatic approximation of the project as photographed from viewpoint 23_ View north west, Cameron Hill Estate, Gulmarrad. Location: 29°29'40"S 153°12'37"E

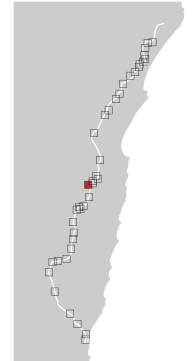


Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Bridge
- Existing Pacific Highway Upgrade alignment
- Waterways

- Distance from road centreline (300m / 1000m)
- Visual Envelope
- Photo Location
- Contours at 10m interval

Viewpoint 24



03 Visual impact assessment

3.7.5 Viewpoint 24A

Ferry Park, Interchange at Maclean

Section 4: Tyndale to Maclean

Character precinct 22: Moderate ability to visually absorb change.

Character precinct 24: High ability to visually absorb change.

Site description

The township of Maclean marks the northernmost extent of the South Arm floodplain which is dominated by sugar cane plantations. The project follows an alignment to the east of the existing highway and the Maclean township below the prominent Maclean Pinnacle. Much of the township of Maclean is not visible from the highway. To the south of Goodwood Street the visual catchment area is open and expansive. To the north the visual catchment area is restricted by existing vegetation and the Maclean Pinnacle.

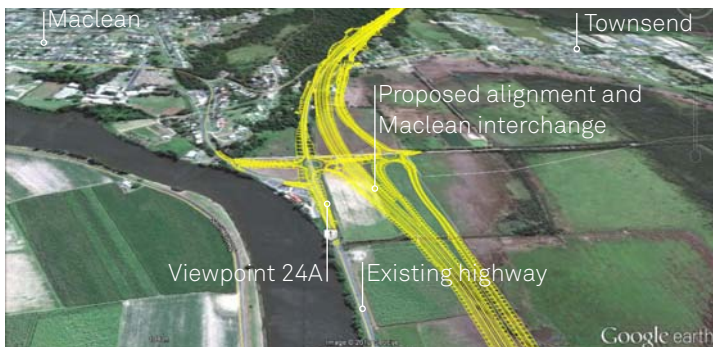
Project description

A major interchange is proposed at Maclean providing access west to Maclean and east to the townships of Townsend and Gulmarrad. The work provides a new dual carriageway over the floodplain as well as on/off ramps and access roads connecting to two new elevated roundabouts at either side of the new overpass. All new work is located on fill batters typically three metres in height along the highway and up to 11 m for the new roundabouts and overpass. The view also shows the highway passing over the floodplain on the approach to the interchange.

Vantage point selection

This vantage point addresses the impact of the major interchange proposed at Maclean, and represents the typical view of the proposed highway travelling to the east of the existing highway over the floodplain.

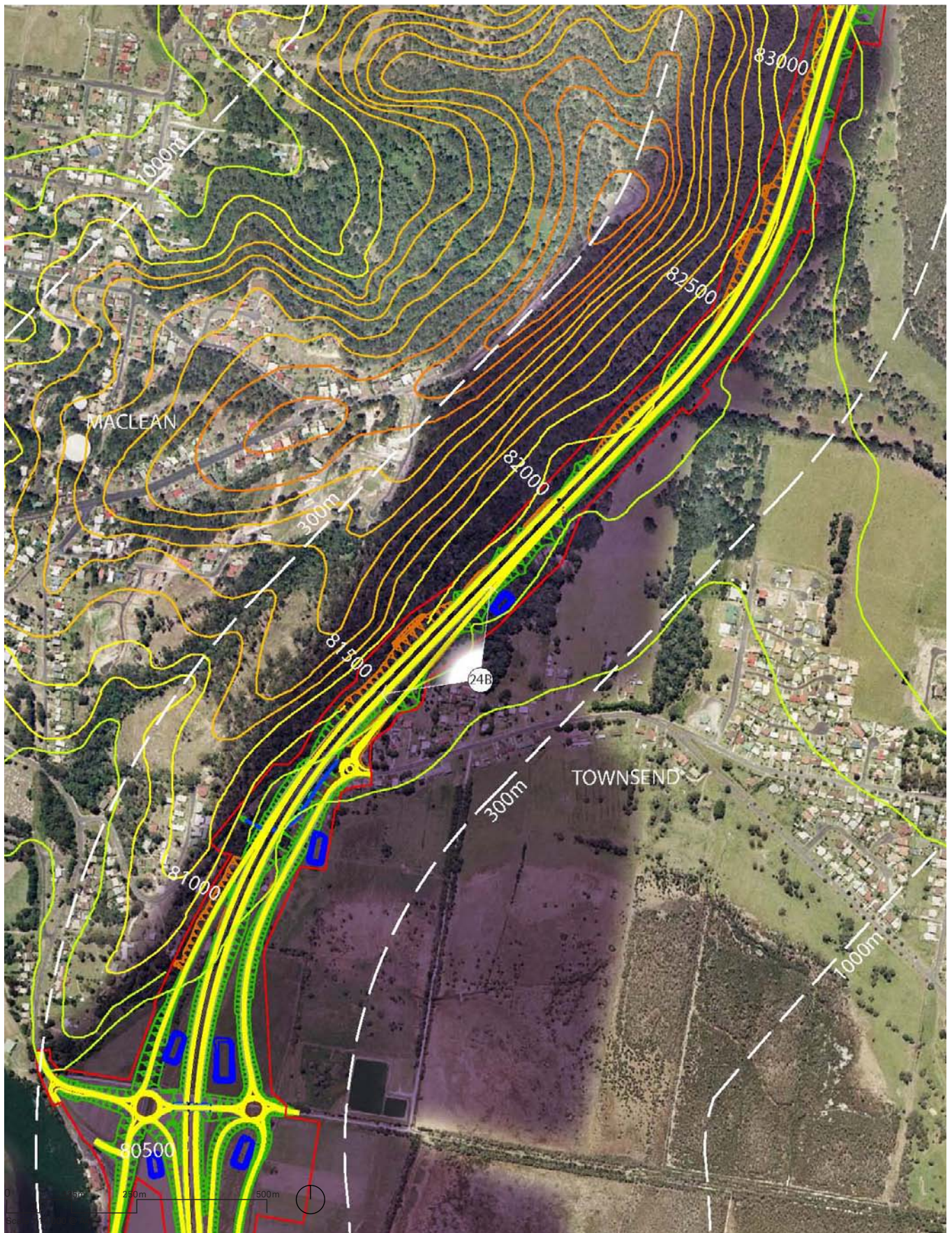
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
24A	<p>High</p> <p>Major new infrastructure in an existing agricultural landscape, however the new infrastructure is typical of infrastructure already in place at this location.</p>	<p>Moderate</p> <p>A high number of local people and visitors would have repeated access to the changed view from the local road network.</p>	<p>Moderate-high</p>	<ul style="list-style-type: none"> _Provide landmark tree planting to highlight to entry to Maclean from the exiting highway. In accordance with the concept design. _Consider additional fill between highway service roads to minimise the excessive height of embankments



Oblique view looking north



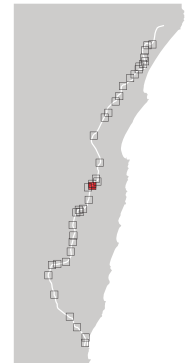
Annotated diagrammatic approximation of the project as photographed from viewpoint. 24A_ View east, Ferry Park, Maclean. Location: 29°28'23"S 153°12'18"E



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 24B



03 Visual impact assessment

3.7.6 Viewpoint 24B

Schwonberg Street, Townsend

Section 4: Tyndale to Maclean

Character Precinct 24: High ability to visually absorb change.

Site description

The township of Townsend is tucked below the alignment of the existing highway which passes to the west and north of a small settlement of suburban homes. A dense screen of existing roadside and embankment vegetation provides visual screening between the existing highway and nearby homes fronting to Schwonberg and Jubilee Streets.

Project description

The existing highway carriageway would be duplicated on the west side, and a new service road providing connection to a new roundabout at Jubilee Road and further to Goodwood Road would be provided on the east side. The proposed work would cause removal of substantial existing roadside vegetation which will negatively impact on views from existing homes from the vicinity of this vantage point.

Vantage point selection

This vantage point addresses the typical view that might be experienced from homes fronting onto Schwonberg and Jubilee Streets in Townsend.

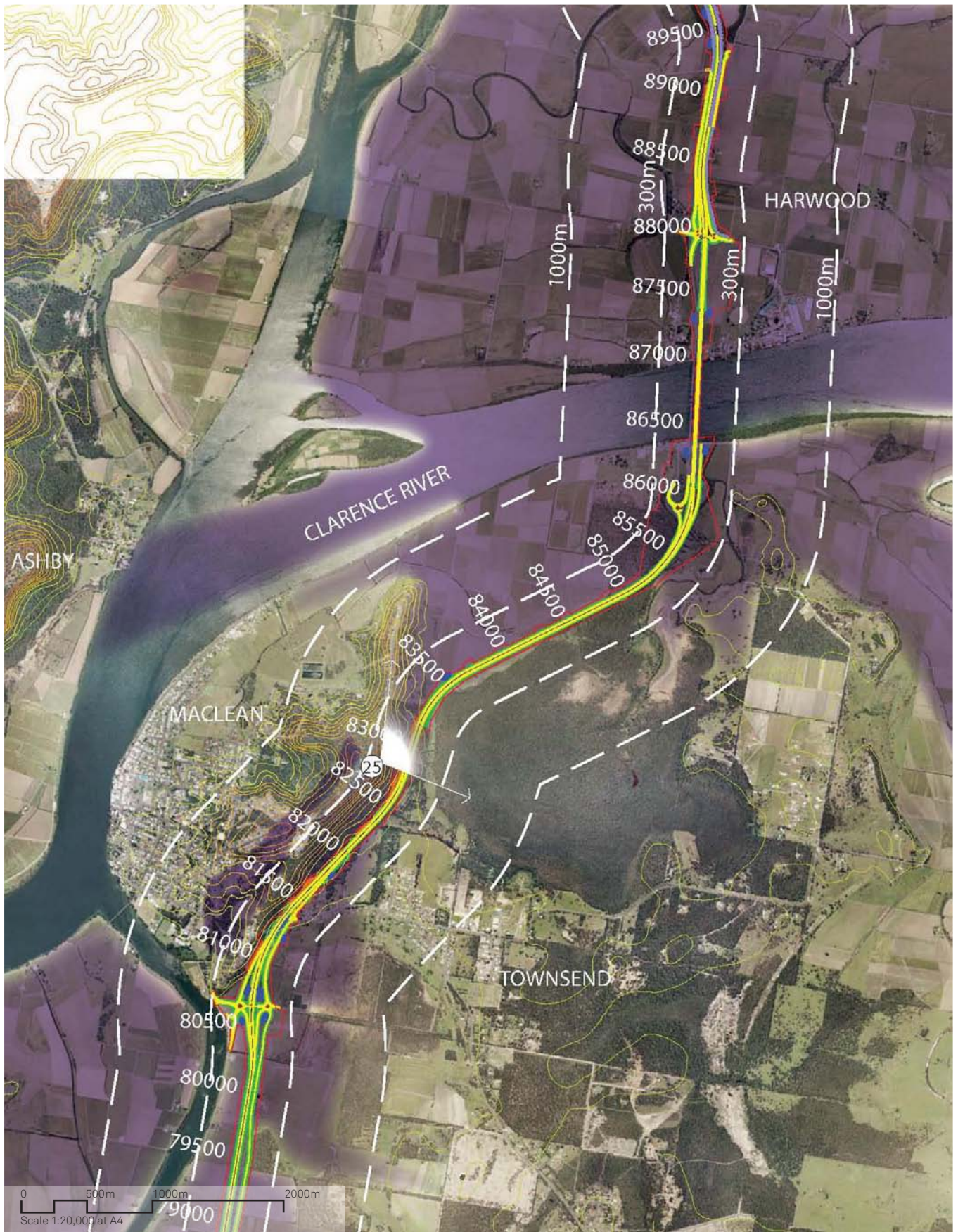
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
24B Foreground view	Moderate Duplicated highway infrastructure at the base of the prominent Maclean Pinnacle and above the small township of Townsend. the new infrastructure is typical of infrastructure already in place at this location	Moderate Considerable sensitivity for a low number of residents at locations along Schwonberg and Jubilee Streets who will have long duration and/or repeated access to a changed foreground view because of removal of existing roadside screen vegetation.	Moderate–high	– Replace existing roadside screen vegetation to provide a screen between the highway and local homes along Schwonberg and Jubilee Streets



Oblique view looking north



Annotated diagrammatic approximation of the project as photographed from viewpoint. 24B_ View west, Schwonberg Street, Townsend. Location: 29°27'51"S 153°12'45"E

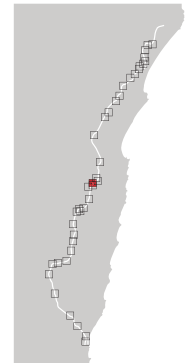


Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Bridge
- Existing Pacific Highway Upgrade alignment
- Waterways

- Distance from road centreline (300m / 1000m)
- Visual Envelope
- Photo Location
- Contours at 10m interval

Viewpoint 25



03 Visual impact assessment

3.7.7 Viewpoint 25

Maclean Lookout, Wharf Street, Maclean

Section 5_Maclean to Iluka Road

Character precinct 25: Moderate ability to visually absorb change.

Site description

The project follows the alignment of the existing highway directly at the base of the prominent Maclean Pinnacle. Much of the upgrade is screened by topography and vegetation from this vantage point at a public look out. A view of the elevated southern highway approach and the new high level Bridge over the Clarence River would be prominent from this location in the distance.

Project description

A new dual carriageway is proposed to the east of the existing highway pavement located on a low embankment rising to the south to join to the proposed bridge over the Clarence River. Embankments at this point would be around eight metres in height.

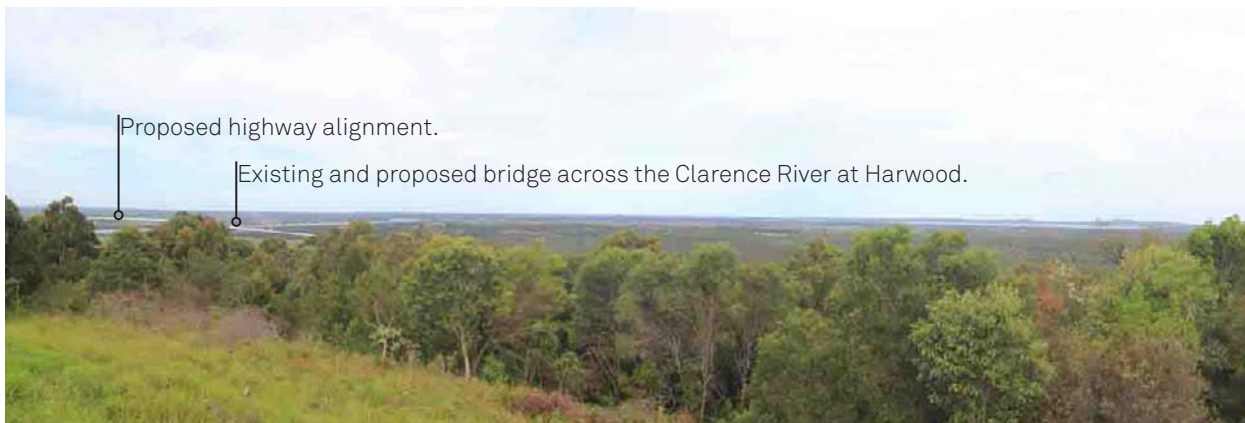
Vantage point selection

This vantage point addresses the proposed interchange at North Harwood.

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
25 Distant view (to the bridge)	Low Major new infrastructure is proposed at the proposed bridge over the Clarence River but at considerable distance so the change only affects a small portion of the view.	High The Maclean lookout is a popular destination for panoramic views over the area.	Moderate	<ul style="list-style-type: none"> _Minimise loss of existing forest trees _Provide landmark tree planting to highlight entry to Harwood in accordance with the concept design



Oblique view looking north-east



Annotated diagrammatic approximation of the project as photographed from viewpoint 25_ View east, Maclean Lookout, Wharf Road, Maclean. Location: 29°27'18"S 153°12'56"E

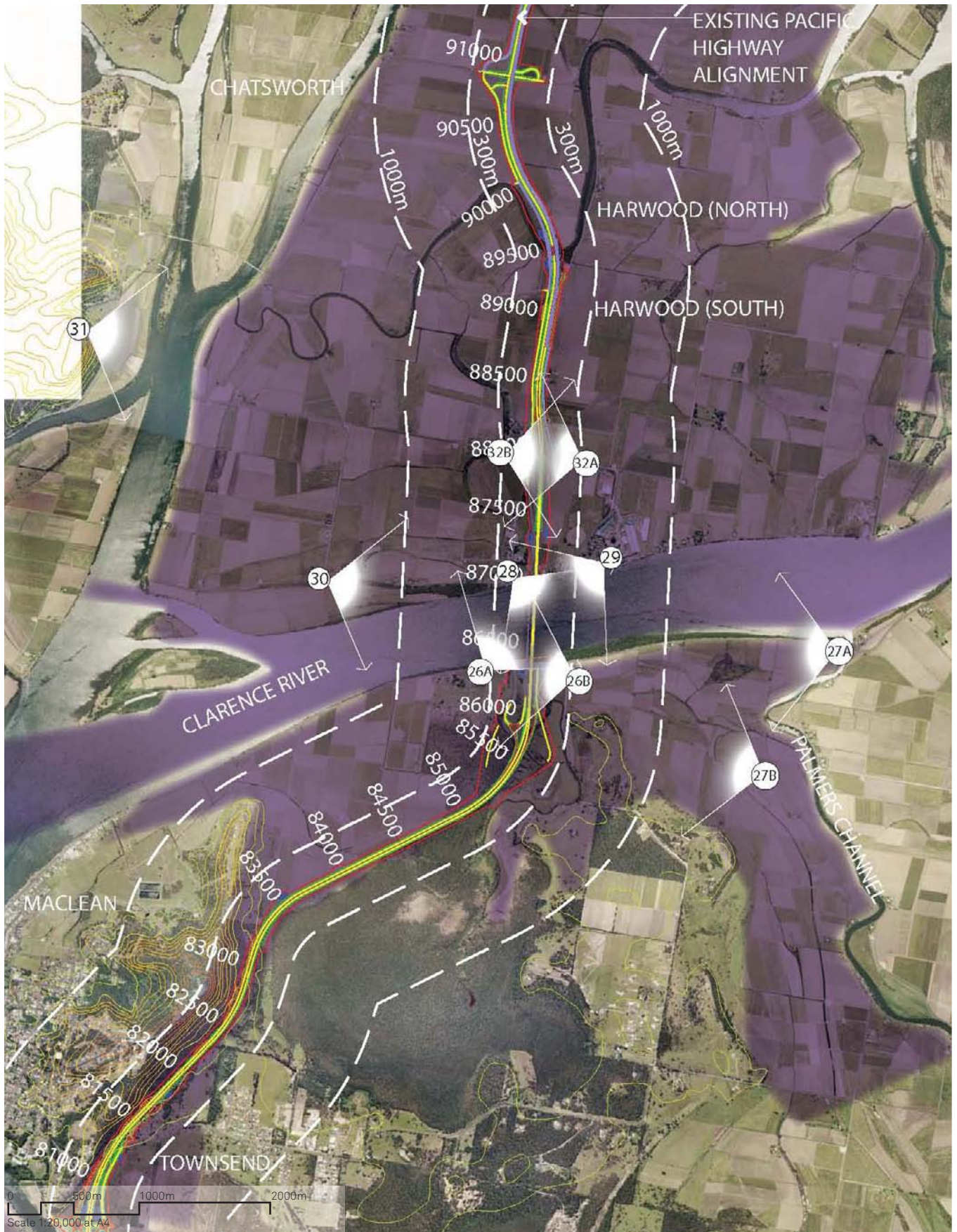
03 _____ Visual impact assessment

3.8_ Section 5_ Maclean to Iluka Road

167

26A_ Yamba Road, Harwood
26B_ Yamba Road, Harwood
27A_ Palmers Channel bridge, Yamba Road, Harwood
27B_ South Bank Road, Palmers Channel
28_ Public Jetty, Clarence River, Harwood
29_ End Harwood Road, Harwood
30_ Corner Cannons Lane & River Street, Harwood
31_ Ashby Heights
32A_ Watts Lane (East)
32B_ Watts Lane (West)
33_ North Arm Drive
34_ Fischers Lane, Iluka
35_ Gargetts Lane, Iluka
36A_ Old Pacific Highway, Iluka
36B_ Pacific Highway, Iluka

The landscape character assessment assessed the impact of the project on Section 5 to be *moderate*.

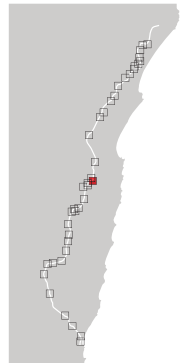


Viewpoint 26A, 26B, 27A, 27B, 28, 29, 30, 31 32A & 32B

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Bridge
- Existing Pacific Highway Upgrade alignment
- Waterways

- Distance from road centreline (300m / 1000m)
- Visual Envelope
- Photo Location
- Contours at 10m interval



03 Visual impact assessment

3.8.1 Viewpoints 26A, 26B, 27A, 27B, 28, 29, 30, 31, 32A & 32B

Clarence River Bridge and Interchanges at Harwood

Section 5: Maclean to Iluka

Character precinct 27: Low-moderate ability to visually absorb change

Character precinct 29: Low-moderate ability to visually absorb change

Site description

The project follows the alignment of the existing highway across the Clarence River and through the town of Harwood. The highway traverses cleared and vegetated land on the approaches to the town in both directions, including areas of threatened ecological communities (EEC). Removal of patches of forest vegetation would be required to the south of the river. The Harwood town ship comprises a number of local heritage sites including heritage buildings, the Harwood bridge, a war memorial, old tram tracks, some trees, and the Harwood Heritage Conservation Zone which demonstrates the development and decline of the town through its association with the Harwood Sugar Mill.

Project description

Duplication of the bridge at Harwood across the Clarence River is proposed to the east of the existing bridge. The deck height of the new bridge would be substantially higher than the existing bridge, reaching to about 12 m below the top of the recognisable existing lift span towers. The existing towers are visible from a number of locations around the town of Harwood for a distance of several kilometres and the new bridge would, similarly, have a considerable visual catchment area.

Two new interchanges are proposed at the approaches to the river, one on each side. The interchange to the south comprises a dual carriageway bridge approach on a low 1.5–2.0 m embankment. A new northbound off ramp, roundabout, and southbound on-ramp connection to the existing local road system are proposed. To the north the project duplicates to the east of the existing highway to the major interchange at Watts Lane. This comprises new dual carriageway on two to three metres fill embankments and a considerably elevated local road overpass (nine metres), two new roundabouts and ramp access to the local road system.

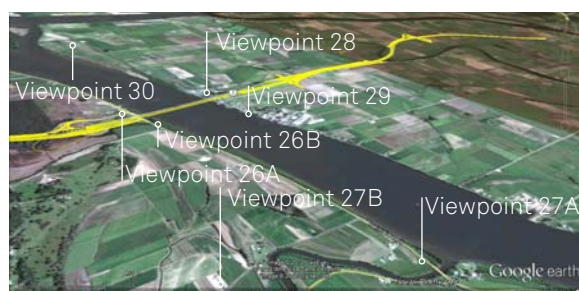
Vantage point selection

These vantage points were selected to represent views of the major new bridge crossing over the Clarence River and the major interchanges at Harwood South and Harwood North. The vantage points are selected locations on the main public roads, areas representing groups of existing homes as well as distant vantage points which take in the bridge crossing and interchange locations.

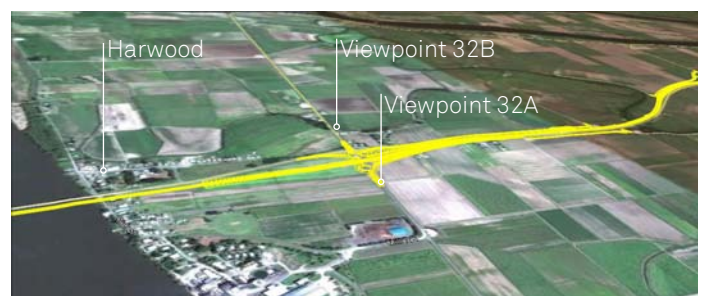
Bridge over Clarence River design

The current design proposal for the Harwood bridge comprises a simple box girder structure. This design forms the basis of the visual assessment and the annotated diagrammatic representations of the bridge presented in this section. For two of the vantage points (28 and 29) more detailed visualisations of the proposed structure have been prepared to most fully address the anticipated visual impact in Harwood. A fully rendered photomontage version has also been prepared as viewed from the same two locations (refer to section 4.7).

Two alternative bridge designs are also under consideration. These include a balanced cantilever and cable stayed option. If one of these designs is selected the visual impact assessment in Harwood would need to be updated. Visualisations of all three bridge options are provided for information (refer pages 176-178).



Oblique view looking north-west



Oblique view looking west

03 Visual impact assessment

170

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
26A Foreground view	Moderate-low Major new elevated bridge infrastructure would be visible but existing vegetation screens much of it in this view.	Moderate-high Considerable sensitivity around the local heritage listed existing Harwood bridge. Many local residents and motorists will have repeated access to this view.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing screen/riparian trees _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the deck. If necessary use transparent barriers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4)



Annotated diagrammatic approximation of the project as photographed from viewpoint 26A_ View north-east near the public boat ramp, Yamba Road, South Harwood. Location: 29°26'0"S 153°14'18"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
26B Ultimate stage. Middle ground view	High-moderate Major new bridge infrastructure and fill embankments would dominate this foreground to middle ground view	Moderate-high Considerable sensitivity around the local heritage listed existing Harwood bridge. Sensitivity for residents of a few homes with long duration views and lower sensitivity for local people generally who will have short term repeated visual access to the changed view	Moderate-high	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation as much as possible _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4) _ Provide screen planting to the new elevated approach road embankment in accordance with the concept design

03 Visual impact assessment



Annotated diagrammatic approximation of the project as photographed from viewpoint 26B_ View west along Yamba Road, Harwood (South). Location: 29°25'58"S 153°14'31"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
27A Distant view	Low A distant view of the elevated new bridge would be possible but it would only impact a small portion of the overall landscape view.	Moderate A moderate number of local people would have long duration or repeated access to the changed view.	Moderate -Low	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4)



Annotated diagrammatic approximation of the project as photographed from viewpoint 27A_ View north-west near Palmers Channel Bridge, Yamba Road, Harwood. Location: 29°25'54"S 153°15'51"E

03 Visual impact assessment

172

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
27B Distant View	Low A distant view of the new elevated bridge would intercept the horizon in this view however it impacts only a small portion of the view.	Moderate Considerable sensitivity for a low number of residents and local people who will have long duration and/or repeated access to a changed foreground view	Moderate –Low	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation as much as possible _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4)



Annotated diagrammatic approximation of the project as photographed from viewpoint 26A_ View north-west, South Bank Road, Palmer Channel. Location: 29°26'22"S 153°15'34"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
28 Foreground view	High Major new elevated bridge infrastructure at an existing bridge crossing.	High Considerable sensitivity around the local heritage listed existing Harwood bridge. Many local residents would have repeated access to this changed view in a highly scenic setting.	High	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Align new bridge piers with existing bridge piers. _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4).



Annotated diagrammatic approximation of the project as photographed from viewpoint 28_ View south-east from a public jetty on the Clarence River, Harwood. Location: 29°25'39"S 153°14'21"E

03 Visual impact assessment

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
29 Middle ground view	High Major new elevated bridge infrastructure at an existing bridge crossing.	High Considerable sensitivity around the local heritage listed existing Harwood bridge and Harwood Heritage Conservation Area. Many local residents would have repeated access to this changed view in a highly scenic setting.	High	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Align new bridge piers with existing bridge piers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4)



Annotated diagrammatic approximation of the project as photographed from viewpoint 29_ View south-west, end of Harwood Road, Harwood. Location: 29°25'37"S 153°14'37"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
30 Distant view	Low A distant view of the new elevated bridge structure would be possible but it would only impact a small portion of the overall landscape view.	Low A low number of local residents/ motorists would have repeated access to this changed view.	Low	<ul style="list-style-type: none"> _ Minimise the loss of existing riparian vegetation _ Minimise the depth of the bridge deck _ Avoid adding acoustic barriers above the bridge deck. If this is necessary use transparent barriers _ Provide a high quality bridge design in accordance with the Bridge Aesthetic Guideline, Centre for Urban Design, RMS: 2012 _ Refer to specific landscape and urban design strategies (Chapter 4)



Annotated diagrammatic approximation of the project as photographed from viewpoint Photo 30_ Right: View east from the intersection of Cannons Lane and River Street, Harwood, Left: Zoom of the bridge across the Clarence River from same location. Location: 29°25'38"S 153°13'29"E

03 Visual impact assessment

174

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
31 Distance view	Low Distant view of infrastructure upgrade in an agricultural setting.	Low A low number of people/ motorists would have long duration or repeated access to this changed view.	Low	<ul style="list-style-type: none"> _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible _ Reinstate riparian vegetation where possible



Annotated diagrammatic representation of the project as photographed from viewpoint 31_ Murrayville Road, Ashby Heights. Location: 29°24'21"S 153°12'34"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
32A Interim Foreground View	High–moderate Major new elevated overpass and considerable disturbance to the existing agricultural landscape.	High–moderate Considerable sensitivity for a low number of residents with a changed foreground view in this location	Moderate –high	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible

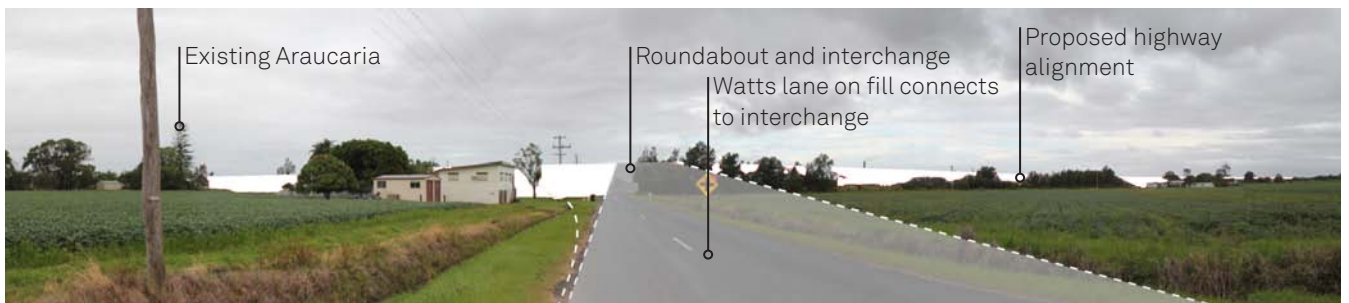
Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
32A Ultimate Foreground view	High–moderate A new service road is proposed at this interchange to achieve class M standard.	High–moderate Considerable sensitivity for a low number of residents with a changed foreground view in this location.	Moderate –high	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible

03 Visual impact assessment



Annotated diagrammatic approximation of the project as photographed from viewpoint 32_ Watts Lane (East), Harwood. Location: 29°25'09" S 153°14'35" E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
32B Foreground view	High Considerable disturbance to the existing agricultural landscape with the addition of a new highway overpass, associated roundabouts and service roads. The considerable elevation of the overpass (9m) makes it highly prominent in the flat floodplain landscape. New embankments are squeezed around existing homes located at the intersection.	Moderate Considerable sensitivity for residents of a few homes with long duration views. Many motorists on the highway with fleeting views of the change.	Moderate –high	<ul style="list-style-type: none"> _ Provide screen tree and shrub planting on embankments and between access and service roads in accordance with the landscape concept strategy and to provide a dense screen to nearby homes _ Highlight the highway and overpass routes with formal tree planting _ Prepare detail landscape design in accordance with the landscape concept strategy _ Consider filling between service roads and highway to reduce height of embankments _ Retain existing Araucaria which is prominent in the existing landscape



Annotated diagrammatic approximation of the project as photographed from viewpoint 32B_ Watts Lane (West), Harwood. Location: 29°25'07" S 153°14'21" E

03 Visual impact assessment

176



Harwood Bridge_box girder design option.
Visualisation from viewpoint 28



Harwood Bridge_box girder design option.
Visualisation from viewpoint 29

03 Visual impact assessment



Harwood Bridge_balanced cantilever design option.
Visualisation from viewpoint 28



Harwood Bridge_balanced cantilever design option.
Visualisation from viewpoint 29

03 Visual impact assessment

178



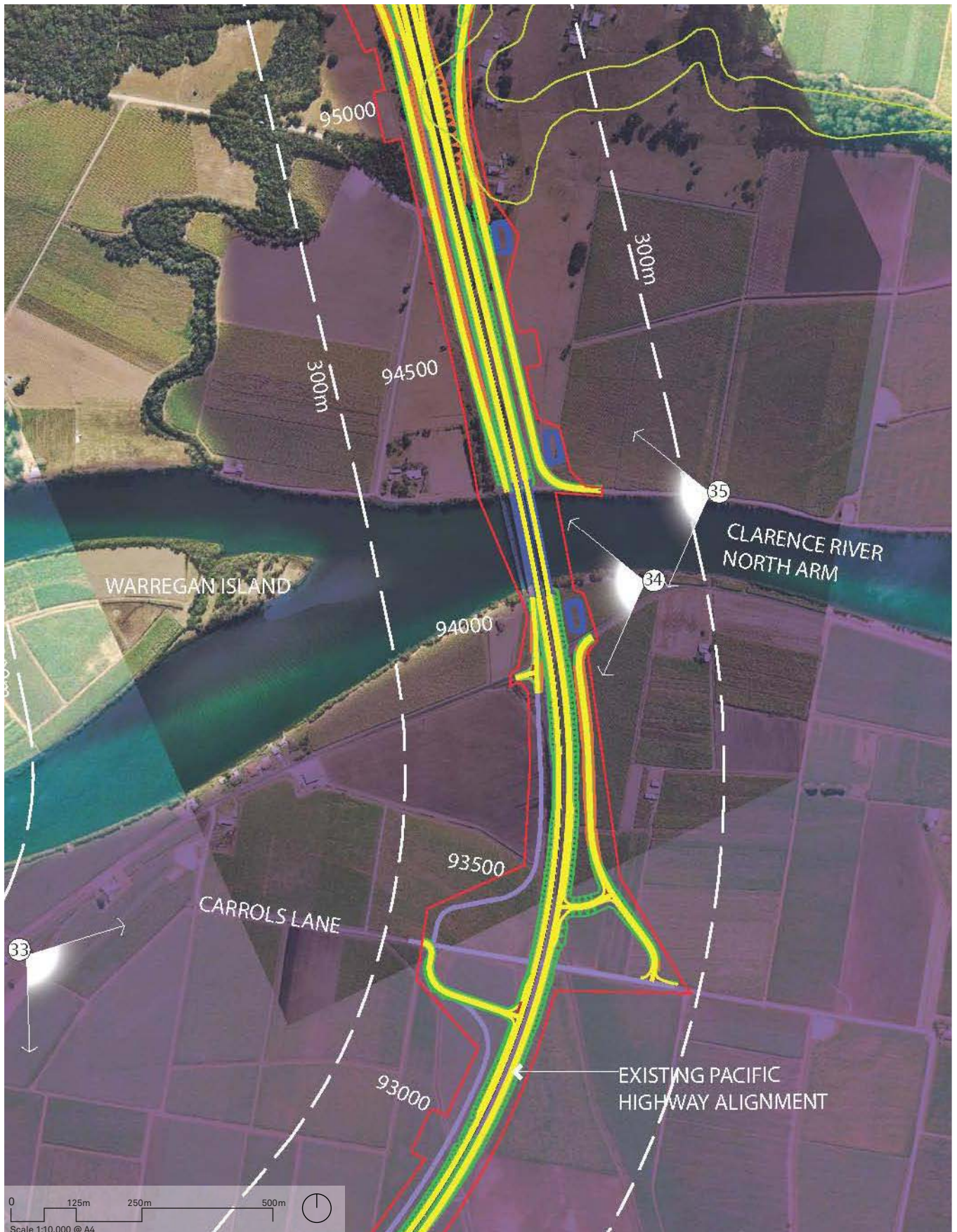
Harwood Bridge_cable stayed design option.
Visualisation from viewpoint 28



Harwood Bridge_cable stayed design option.
Visualisation from viewpoint 29

03_____Visual impact assessment

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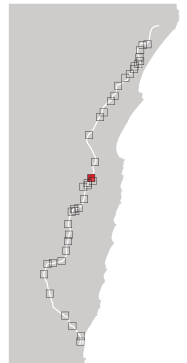


Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Bridge
- Existing Pacific Highway Upgrade alignment
- Waterways

- Distance from road centreline (300m / 1000m)
- Visual Envelope
- Photo Location
- Contours at 10m interval

Viewpoint 33,34 &35



03 Visual impact assessment

3.8.2 Viewpoints 33, 34 & 35

Clarence River North Arm Crossing

Section 5_Maclean to Iluka Road

Character precinct 27: Low-moderate ability to visually absorb change

Site description

The project follows the alignment of the existing highway across the Clarence River North Arm. The highway traverses cleared sugar cane fields and open pastureland in an open floodplain landscape. Native tree vegetation is sparse, comprising lines of trees and shrubs following the river banks of the Clarence River North Arm and patches of trees around isolated homesteads. The existing dual bridges over the Clarence River North Arm (the bridge at Mororo) would be supplemented with a third new crossing to the east at the same elevation as the existing bridge infrastructure.

Project description

Interim option

Duplication to the east of the existing highway carriageway is proposed south of the river. The new carriageway and upgraded existing carriageway would be located on low fill embankments up to about two metres in height. New connections to the existing local road network are proposed. To the north of the river access lanes on both sides of the highway present a four carriageway corridor connecting to the Iluka Road interchange. An elevated overpass at Iluka Road connects to two elevated roundabouts connecting on/off ramps to the proposed highway and access roads to the local road network. A major elevated overpass at Carroll's Lane (10m) and an additional access road to the west connecting to the local road network.

Ultimate option

An additional service road is to be provided on the western side of the highway running south.

Vantage point selection

These vantage points were selected to typically represent views of the project crossing the Clarence River North Arm floodplain through extensive areas of sugar cane plantation. The vantage points are selected locations on the main public roads in the area and adjacent to housing areas.



Oblique view looking west

03 Visual impact assessment

182

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
33 Interim option. Middle ground view.	Moderate-high Highway upgrade and interchange is located on a low embankment traversing the floodplain at considerable distance from this viewpoint. A new elevated overpass and associated access roads are proposed at a considerable distance from this viewpoint.	Moderate-low This changed view would be repeatedly visible from a low number of local residences and from local streets.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant dense low grasses/ground covers on fill batters _ Reinstatement agricultural land where possible _ Reinstatement riparian vegetation where possible

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
33 Ultimate Stage. Middle ground view	Moderate An additional service road is proposed on a low embankment	Moderate-low This changed view would be repeatedly visible from a low number of local residences and from local streets.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant dense low grasses/ground covers on fill batters _ Reinstatement agricultural land where possible _ Reinstatement riparian vegetation where possible



Annotated diagrammatic approximation of the project as photographed from viewpoint 33_ View east from North Arm Drive, Chatswood. Location: 29°22'19"S 153°14'37"E

03 Visual impact assessment

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
34 Foreground view	Low _The project is located on a low embankment within existing infrastructure corridor from a middle ground vantage point. Views of the proposed bridge structure are generally screened by riparian vegetation.	Low This changed view would be repeatedly visible from a low number of local residences and from local streets.	Low	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible _ Reinstate riparian vegetation where possible

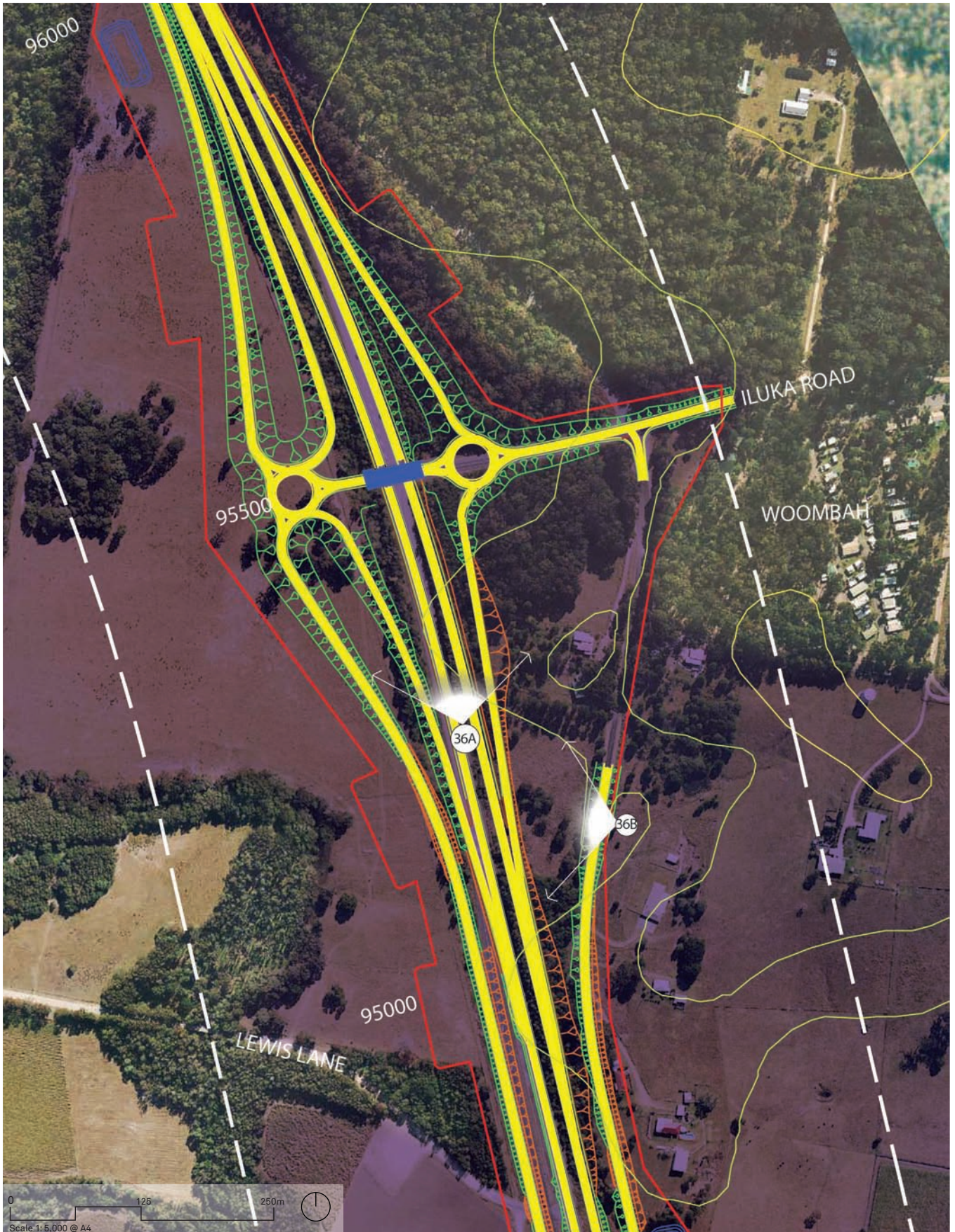


Annotated diagrammatic approximation of the project as photographed from viewpoint 34_ View west from Fischers Lane Iluka. Location: 29°22'01"S 153°15'14"E

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
35 Middle ground view	Low New bridge infrastructure at an existing bridge crossing comprising a similar character and scale to the existing development in a scenic river location.	Moderate-low This changed view in a scenic setting would be repeatedly visible from a low number of local residences and from local streets.	Moderate-low	<ul style="list-style-type: none"> _ Minimise loss of existing trees. _ Plant dense low grasses/ ground covers on fill batters _ Reinstate agricultural land where possible _ Reinstate riparian vegetation where possible _ Minimise the depth of the bridge deck



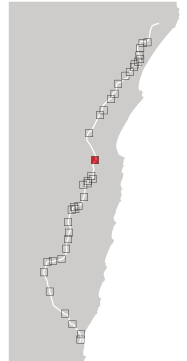
Annotated diagrammatic approximation of the project as photographed from viewpoint 35_ View west from Gargetts Lane, Iluka. Location: 29°21'56"S 153°15'17"E



Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 36A & 36B



03 Visual impact assessment

3.8.3 Viewpoint 36A & 36B

Iluka Interchange

Section 5_Maclean to Iluka Road

Character precinct 31: Moderate ability to visually absorb change

Site description

The Iluka Road Interchange marks a transition in the landscape from the Clarence River floodplain to a long stretch of forested highway to the north. The area around the interchange at Iluka Road comprises cleared areas containing sugar cane fields and a dense backdrop of forested slopes.

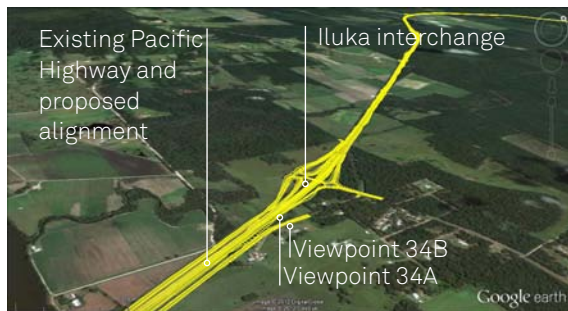
Project description

The major interchange at Iluka Road comprises a dual carriageway upgrade as well as on/off ramps connecting to two new elevated roundabouts. The work is largely located on low cuttings and embankments with higher embankments accommodating the ramps and roundabouts above the highway. The work is in vicinity of a number of existing homes which would experience a considerably changed view

Vantage point selection

This vantage point addresses the major Iluka Interchange and typically represents the changed view experience from a number of existing homes.

Viewpoint	Magnitude	Sensitivity	Impact	Recommendations
36A Foreground view.	High–moderate A major upgrade of existing infrastructure and new elevated overpass is proposed.	Moderate–low This changed view would be available to motorists using the highway.	Moderate	<ul style="list-style-type: none"> _Provide new screen and forest planting along the alignment of the project (including on/off ramps) in accordance with the concept design _Revegetate between the interchange at Iluka Road and existing homes located on the east side in accordance with the concept design



Oblique view looking north-west



Annotated diagrammatic approximation of the project as photographed from viewpoint 36A_ View north on the existing highway, Iluka. Location: 29°19'45"S 153°16'46"E

03 Visual impact assessment

186

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
36B Foreground view.	High Loss of roadside vegetation would open up views of the upgrade to local residents in close proximity to development. Major additional road infrastructure and elevated overpass is proposed. Some screening from existing vegetation is possible and will reduce the magnitude rating if retained.	High This changed view would be repeatedly visible to a moderate number of local residents from their homes and from local streets.	High	<ul style="list-style-type: none"> _ Retain existing vegetation wherever possible to provide a natural screen to the project _ Provide new screen and forest planting along the alignment of the new upgrade (including all service roads) in accordance with the concept design _ Revegetate between the interchange at Iluka Road and existing homes located on the east side in accordance with the concept design



Annotated diagrammatic approximation of the project as photographed from viewpoint 36B_View west from the Old Pacific Highway, Iluka. Location: 29°21'20"S 153°14'54"E

03_____ Visual impact assessment

3.9_ Section 6_ Iluka Road to Devil's Pulpit upgrade

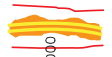








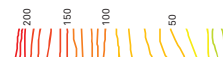
187

36C_ Typical road widening in the forest, Tabbimoble CH 104,400

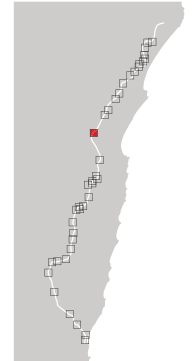
The landscape character assessment assessed the impact of the project on Section 6 to be *low*.



Legend

-  Alignment and boundary with chainages
-  Areas of cut
-  Areas of fill
-  Bridge
-  Existing Pacific Highway Upgrade alignment
-  Waterways
-  Distance from road centreline (300m / 1000m)
-  Visual Envelope
-  Photo Location
-  Contours at 10m interval

Viewpoint 36C



03 Visual impact assessment

3.9.1 Viewpoint 36C

Typical road widening in the forest, Tabbimoble CH 104,400

Section 6: Iluka Road to Devil's Pulpit

Character Precinct 32: Moderate ability to visually absorb change.

Site description

The proposed highway upgrade follows the alignment of the existing highway travelling through the forested area of Bundjalung National Park. Scattered rural properties are located in small clearings along the existing highway and other minor roads in the area. There are no existing homes in the vicinity of this vantage point

Project description

Interim option

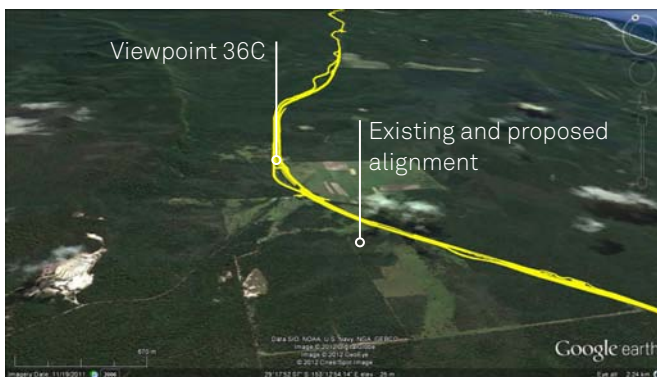
The proposed highway upgrade duplicates the existing highway carriageway to the east. The proposed work would cause removal of existing forest vegetation. Low fill batters are required. All new work is typically accommodated within, and screened by, open woodland vegetation.

Ultimate option

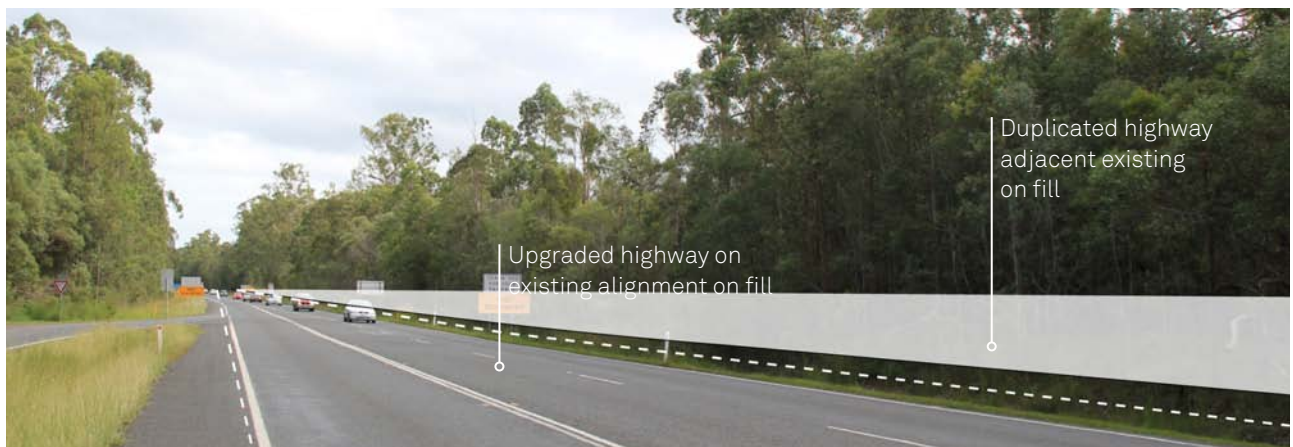
New service roads either side of the dual carriageway are proposed. These will require additional removal of forest vegetation creating a wider corridor through the forest

Vantage point selection

This vantage point is a typical view of the highway duplication where it follows the existing highway alignment through open forest vegetation. The view addresses the impact of the work as it would affect motorists.



Oblique view looking north-east



Annotated diagrammatic approximation of the project as photographed from viewpoint 36C_View south along the existing Pacific Highway, Ch104,400. Location: 29°17'04"S 153°12'52"E

03 _____ Visual impact assessment

190

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
36C Interim stage Foreground view	Low Considerable disturbance to the existing native woodland, however the new infrastructure is typical of infrastructure already in place at this location.	Low The development is generally well screened by existing forest vegetation and mostly visible only to motorists using the highway.	Low	_ Plant local forest trees on fill batters _ Reinstatement of the forest edge where applicable

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
36C Ultimate stage Foreground view	Low Considerable additional disturbance to the existing native woodland creates a much wider corridor through the forest, however the new infrastructure is typical of infrastructure already in place at this location.	Low The development is generally well screened by existing forest vegetation and mostly visible only to motorists using the highway.	Low	_ Plant local forest trees on fill batters _ Reinstatement of the forest edge where applicable

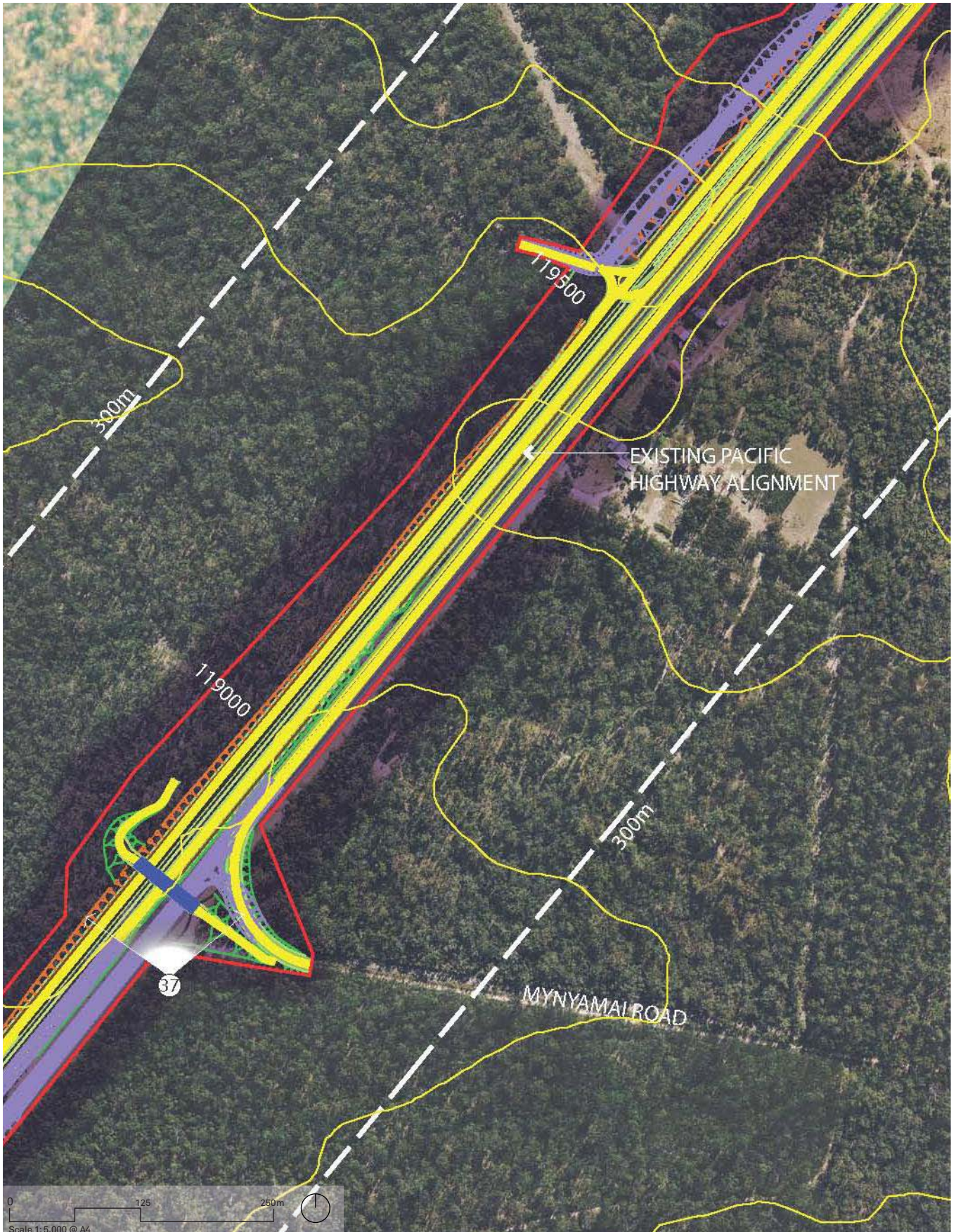
03_____ Visual impact assessment

3.10_ Section 7_ Devil's Pulpit upgrade to Trustums Hill

191

37_ Cnr Minyumai Road, Pacific Highway
38_ Swan Bay - New Italy Road, New Italy

The landscape character assessment assessed the impact of the project on Section 7 to be **low**.

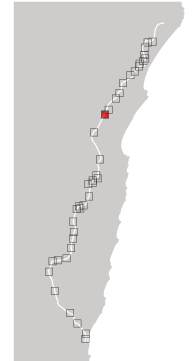


Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Bridge
- Existing Pacific Highway Upgrade alignment
- Waterways

- Distance from road centreline (300m / 1000m)
- Visual Envelope
- Photo Location
- Contours at 10m interval

Viewpoint 37



03 Visual impact assessment

3.10.1 Viewpoint 37

Tabbimoble Swamp Nature Reserve

193

Section 7_ Devils Pulpit upgrade to Trustoms Hill

Character precinct 36: Moderate ability to visually absorb change

Site description

The project continues to approximately follow the existing highway alignment through densely vegetated elevated country to the west of the Tabbimoble Swamp Nature Reserve.

This is a highly valued natural landscape comprising high conservation value old growth forest listed on the State Heritage Register.

Project description

Interim option

The project comprises a new carriageway to the west of the existing highway as far as Minyumai Road located on a minor bench in the locally undulating landscape. Continuing north a new dual carriageway is proposed. A new access road access to Minyumai Road and a new fauna overpass would be provided. Major removal of existing forest vegetation would be required but most of the work would be enclosed in the existing forest landscape.

Ultimate option

The class M upgrade would provide a new carriageway between the existing highway and the new class A work. Minor additional work is proposed to re-link the existing highway sections and to provide a new service road north of Cypress Road on the western side.

Vantage point locations

This vantage point addresses proposed minor connections with the existing local road network at Minyumai Road. There are no existing residences in the vicinity of this vantage point.



Oblique view looking north



Annotated diagrammatic approximation of the project as photographed from viewpoint 37_ View north, intersection Minyumai Road and Pacific Highway. Location: 29°10'09"S 153°16'59"E

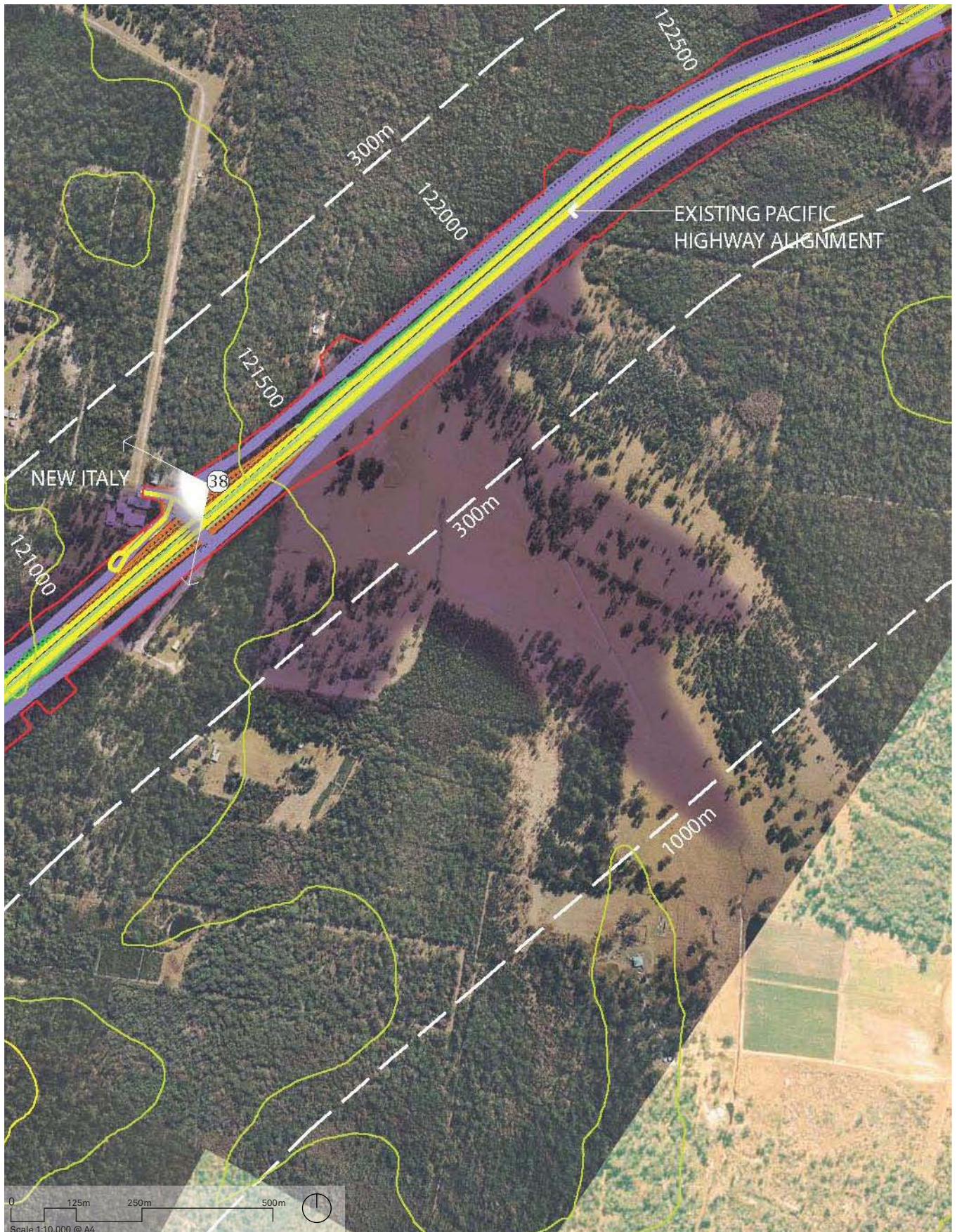
03 _____ Visual impact assessment

194

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
37 Interim stage. Foreground view.	High–moderate New road infrastructure in a natural setting. Disturbance to the existing woodland vegetation is anticipated	Low This changed view would be available to a low number of people using the local road network.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant local forest trees on cut/fill batters _ Reinstate local forest vegetation where applicable

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
37 Ultimate stage. Foreground view.	High–moderate Additional new road infrastructure in a natural setting. Additional disturbance to the existing woodland vegetation is anticipated	Low This changed view would be available to a low number of people using the local road network.	Moderate	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant local forest trees on cut/fill batters _ Reinstate local forest vegetation where applicable

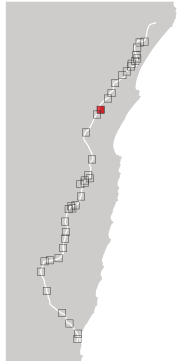
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Legend

- | | | | |
|--|--|--|--|
| | Alignment and boundary with chainages | | Distance from road centreline (300m / 1000m) |
| | Areas of cut | | Visual Envelope |
| | Areas of fill | | Photo Location |
| | Bridge | | Contours at 10m interval |
| | Existing Pacific Highway Upgrade alignment | | |
| | Waterways | | |

Viewpoint 38



03 Visual impact assessment

3.10.2 Viewpoint 38

Little Italy

Section 7_ Devils Pulpit upgrade to Trustoms Hill

Character precinct 37: High ability to visually absorb change

Site description

The project continues to follow the existing highway alignment through a forest landscape past the New Italy Settlement. The New Italy Settlement, nestled in the existing forest landscape, is an historic cultural landmark commemorating the tenacity, forbearance and technical skills of a group of migrant Australian settlers. The site now comprises a museum, hall, restaurant, caretakers building, and several monuments. The site has high cultural and historical value and is listed on the State Heritage Register.

Project description

Interim option

The new upgrade comprises duplication on the western side of the existing highway alternately on fill batters up to 3.5 m and through cuttings at the Swan Bay New Italy junction up to 4.5 m.

Ultimate option

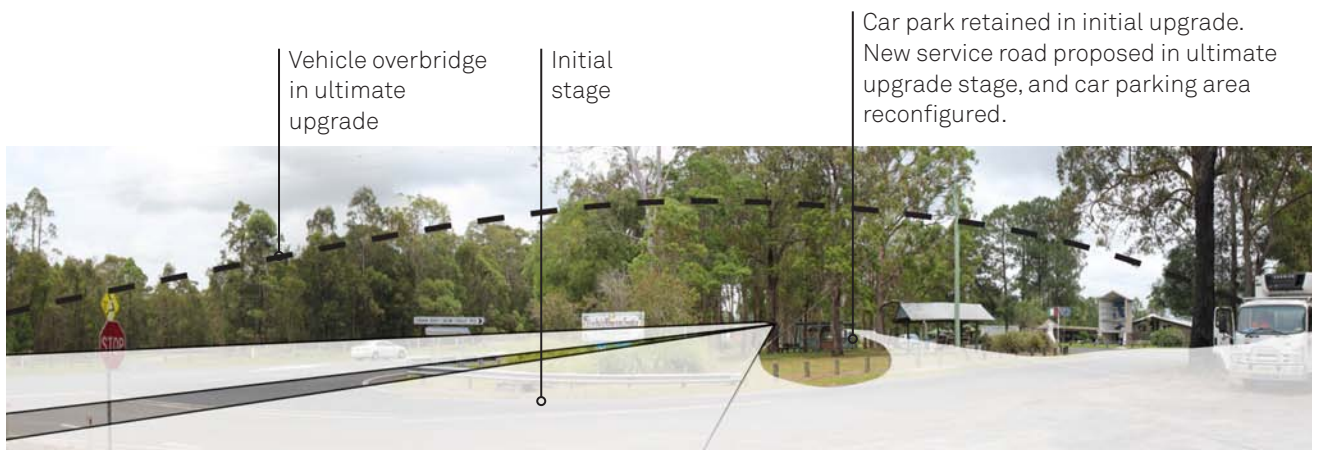
The class M upgrade would see the introduction of extensive service roads both sides of the highway from just south of the Swan Bay New Italy intersection to Whites Road in the north, a distance of about 2 km. A new overpass at Swan Bay New Italy is also proposed. This work would result in considerable additional forest clearing. The existing car park at New Italy would be adjusted to accommodate the new western access road.

Vantage point locations

This vantage point addresses the proposed interchange at New Italy and the impact of the project at this sensitive heritage site.



Oblique view looking north-east



Annotated diagrammatic approximation of the project as photographed from viewpoint 38_ View south-west, Swan Bay - New Italy Road, New Italy. Location: 29°09'11"S 153°17'58"E

03 _____ Visual impact assessment

198

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
38 Interim stage. Foreground view	Moderate New infrastructure introduced to the existing setting The new work is typical of infrastructure already in place but represents a major change in scale.	High This site has high sensitivity because of its heritage and cultural status. It is a tourist destination which attracts public visitation.	Moderate –high	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant local woodland/forest trees on cut/fill batters _ Reinstate local forest vegetation where applicable

Viewpoint	Magnitude	Sensitivity	Impact	Management Measures
38 Ultimate stage. Foreground view	High New infrastructure introduced to the existing setting The new work is typical of infrastructure already in place but represents a major change in scale	High This site has high sensitivity because of its heritage and cultural status. It is a tourist destination which attracts public visitation.	High	<ul style="list-style-type: none"> _ Minimise loss of existing trees _ Plant local woodland/forest trees on cut/fill batters _ Reinstate local forest vegetation where applicable