5. urban and landscape design concept

This section is dedicated to the urban and landscape design concept for the proposed upgrade. It involves the following components:

> Urban and Landscape Design Vision, Objectives and Principles

Identifies the Vision, Objectives and Key Design Principles for the proposed upgrade, based on the RTA's *Pacific Highway Urban Design Framework*.

> Urban and Landscape Design Strategic Concept

Developed in response to the existing site conditions and the Vision, Objectives and Principles for the proposed upgrade, it provides the overall strategic direction for the proposed upgrade. The Strategic Concept consists of three equally important components:

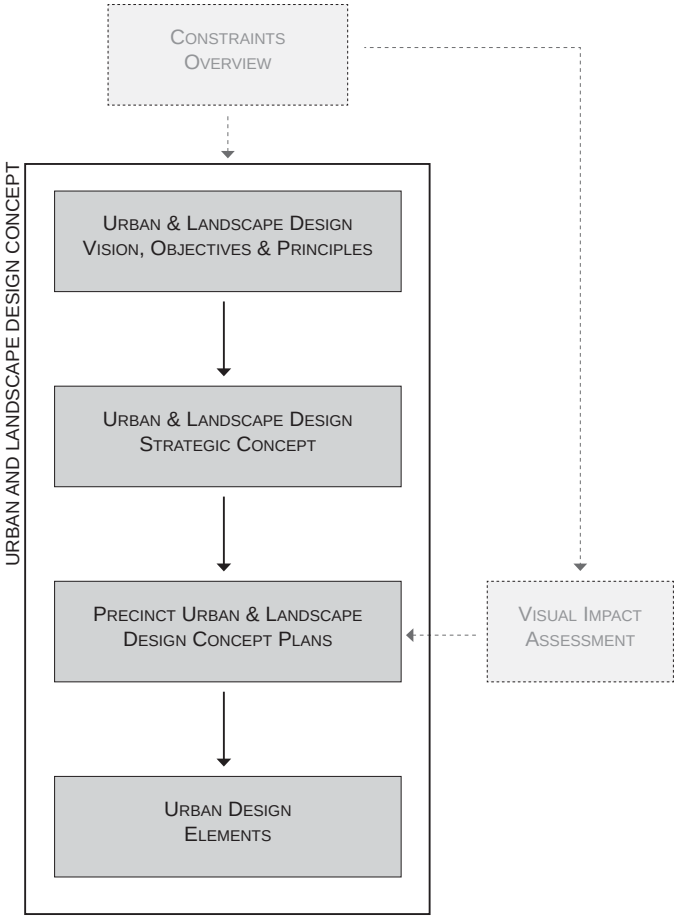
A plan identifying major landmarks and natural features, a plan identifying proposed road infrastructure elements and hierarchy of importance in design terms, and a corridor landscape strategy plan outlining the general approach to landscape works along the proposed upgrade.

> Precinct Urban and Landscape Design Concept Plans

Provide specific design recommendations for each precinct, based on existing site conditions and incorporating the strategic concept. Recommendations further address the findings of the visual assessment, in order to reduce or mitigate the identified visual impact. A discussion of key issues for further design development is included in each precinct.

> Urban Design Elements

Provides a discussion of major road infrastructure elements along the proposed upgrade, including design principles for the detailed design of those elements during future design stages.



The first step in the development of an urban and landscape concept design for the proposed upgrade is the definition of a revised set of urban and landscape design objectives and principles. These build on the urban and landscape design objectives and principles developed for the project in the early stages of route selection, while addressing more detailed urban and landscape design issues identified in the above assessment section.

The context for the development of urban and landscape design principles and objectives, as well as for the proposed upgrade in general has been established in the '*Pacific Highway Urban Design Framework*'. This *Framework* is the unifying document providing urban design guidelines for the large number of upgrade projects along the Pacific Highway.

As highlighted in the *Framework*, the Tintenbar to Ewingsdale portion of the Pacific Highway upgrade is an important section of the overall route between Hexham and Tweed Heads. With much of the Pacific Highway characterised by the mountains and foothills of the Great Dividing Range and the broad rivers and coastal floodplains, the Tintenbar to Ewingsdale section stands out as particularly memorable as one of the few stretches of road from where glimpses of the Pacific Ocean can be seen.

Despite the highly memorable character of the Tintenbar to Ewingsdale section, the overarching objective of the *Pacific Highway Urban Design Framework* is for individual upgrade projects to form an integral component of the Pacific Highway, as the major coastal arterial highway spine from Hexham to Tweed Heads. At the same time, the *Framework* is a broad strategic document and requires interpretation in order to arrive at outcomes that address and suit the particular conditions along the proposed Tintenbar to Ewingsdale upgrade.

According to the *Pacific Highway Urban Design Framework*, the vision for this road is "based on the creation of a scenic highway - a highway that will keep people aware (and perhaps awake) and interested in their surroundings, and create an unfolding panorama of this special part of Australia" (p 24).

Specifically, the vision for the Pacific Highway has been summarised as follows:

"*A sweeping, vegetated highway, providing panoramic views to the Great Dividing Range and the rivers, forests, farmlands, and coastline of the Pacific Ocean. Sensitively designed to fit into the landscape and be unobtrusive. Characterised by simple, attractive road infrastructure (p 24).*"

Based on this vision, the *Pacific Highway Urban Design Framework* provides a series of urban design objectives to inform both the route selection and concept design stages of any upgrades proposed along the Pacific Highway.

These objectives have provided the basis for the development of the urban and landscape design concept for the proposed upgrade of the Pacific Highway between Tintenbar and Ewingsdale, having been weighted and interpreted to suit the particular local conditions of the study area.

The table on the following pages provides an overview of the urban design objectives set out in the *Pacific Highway Urban Design Framework* and of the way they have been interpreted and integrated into the proposed Tintenbar to Ewingsdale Pacific Highway upgrade.

Pacific Highway Urban Design Framework Objective	Discussion and Project Response	Key Urban and Landscape Design Principles
Objective 1: *Provide a flowing road alignment that is responsive and integrated with the landscape.* Applying to road alignment decisions as well as the road design, the alignment should flow and respond to the shape of the landform and patterns of natural and farmed vegetation cover.	Urban and landscape design objectives and principles to address issues of flowing alignment and responsiveness to the shape of the landform were developed during the route selection process for the proposed upgrade and have influenced the development of the concept design for the proposed upgrade. However, this remains an important issue to address during future detailed design stages.	- Shape cuttings to correspond to natural landforms. - Revegetate cuttings and embankments to maintain the character of undulating green hills against the horizon line.
	The natural and farmed vegetation cover along the proposed Tintenbar to Ewingsdale upgrade is one of the major features of the study area, as well as a key factor in the area's highly scenic character. Responding to the existing landscape character is an objective of particular importance for the proposed upgrade.	- Protect significant stands of roadside vegetation. If retention is not possible reinstate plantings in nearby locations. - Design roadside plantings to reflect adjoining landscape and vegetation patterns in order to integrate the road landscape, create a varied sequence of views and enclosure and reduce the linear effect of the upgraded highway. - Design landscape plantings to correspond to existing species.
Objective 2: *Provide a well vegetated, natural road reserve.* A road corridor in the lush forested landscape of the north east coast of NSW should be well-vegetated in the interest of road user enjoyment, landscape integration and biodiversity protection and recovery.	This objective is similar to Objective 1 with regard to the need to integrate the road corridor with the existing landscape character.	- Reduce the visibility of the proposed upgrade from townships, farms and homesteads. - Reduce the visibility of the proposed upgrade from the local road system.
	The revegetation of the road corridor to enhance the natural environment and mitigate against the impacts on existing native stands of vegetation is an important ecological objective.	- Undertake ecological restoration in areas of lowland rainforest and riparian areas where they remain within the road reserve. - Select plant species to maximise wildlife habitat connectivity, particularly under creek crossings.

Pacific Highway Urban Design Framework Objective	Discussion and Project Response	Key Urban and Landscape Design Principles
Objective 3: *Provide an enjoyable interesting highway with varied views and vistas of the landscape and pleasant restful places to stop.* The Pacific Highway is a long road, it takes a considerable time to drive and there is a tendency for drivers to make long duration journeys. Consequently the drive should be an enjoyable and memorable road user experience. This will help shorten the perception of the journey and keep drivers alert.	The provision of an enjoyable and interesting highway experience with varied views and vistas was considered during the route selection process and formed an integral component of route selection. It has further informed the development of the "Urban and Landscape Design Concept" outlined in this working paper. The identified key design principles should guide further design development.	- Maintain and protect key vistas and long-distance views and maximise the potential for views to existing landmarks and other prominent features. - Vary the degree of enclosure and openness along the upgraded highway, to provide visual interest and enjoyment and reduce the potential for driver fatigue. - Maintain a diverse and scenic driving experience along the existing highway alignment.
Objective 4: *Value the communities and towns along the road.* It is important to ensure the road upgrade is considerate of the towns and communities along the route. This can be achieved through sensitive planning of the road alignment to avoid visual and noise impacts. However this is not always possible and in some cases it is of value to have a close relationship between the road and community. [...] It should not be forgotten that the local vernacular of farms, field boundaries, local roads, established businesses and residences is an important cultural aspect of the landscape and the journey.	Issues of noise and visual impact on local towns and communities have been considered during the route selection process. The "Urban and Landscape Design Concept" contained in this working paper further addresses theses issues. Detailed design principles for the design of noise barriers are provided in the section called "Urban Design Elements". Reducing the visual impact of the proposed upgrade is an important aspect of valuing towns and communities along the proposed upgrade who value the high visual quality of the study area. As discussed earlier in this working paper, the area's high scenic and lifestyle values are some of the main reasons people chose to live in and visit the area.	- Preserve the small scale character of the existing highway and other local roads. - Reduce areas of wide uninterrupted areas of pavement. - Reduce the visual effect of the vertical dimension of infrastructure elements associated with the proposed upgrade including bridges, cuttings, embankments and noise barriers.

Pacific Highway Urban Design Framework Objective	Discussion and Project Response	Key Urban and Landscape Design Principles
Objective 5: *Provide consistency-with-variety in road elements.* Where appropriate consistent road design and road furniture will help unify the highway and reduce the perception of clutter. This will allow the road user to better appreciate the passing landscape. It will also make the driving experience simpler and more comfortable. Conversely, a road, which is inspired by the character and distinctiveness of the local context, will add variety to the journey and help keep drivers interested and aware.	A discussion on appropriate road design and road furniture, including design principles, is provided in the section on "Urban Design Elements".	Refer to the section on "Urban Design Principles.
Objective 6: *Provide a simplified and unobtrusive road design.* The road design should be as simple as possible, refined to the basic elements of road and bridge with all other details designed out, simplified or hidden.	Road design formed an integral component of the route selection process for the proposed upgrade. The design of the proposed upgrade represents the result of a collaborative effort of the project team, incorporating engineering and urban design constraints as well as the constraints identified by other specialist consultants on the project team. This objective is further addressed through the recommendations of the "Urban and Landscape Design Concept" which provides detailed design principles for the further development of the road urban design elements to guide the design development stages (refer to "Urban Design Elements"). Simplifying the road design will also make it easier for the motorist to enjoy the surrounding landscape, to appreciate local landmarks and thereby assist in orientation.	- Develop a simple and robust design aesthetic appropriate to highway infrastructure.

Building on the urban and landscape design vision, objectives and principles, an urban and landscape design concept was developed for the proposed Highway upgrade. It consist of a strategic concept plan, precinct urban and landscape design concept plans and recommendations for urban design elements.

The aim of the urban and landscape design concept for the proposed upgrade is to provide a road design outcome that is consistent with the remainder of the Pacific Highway, while making a positive contribution to the landscape through which it passes. In particular, the urban and landscape design concept seeks to reduce the visual impacts associated with the proposed upgrade and to enhance the motorists experience of the journey.

The design of road engineering elements in this context will be of particular importance, as they will determine the degree to which the road is perceived to 'fit' in the surrounding landscape, as well as the degree to which this landscape can be enjoyed by the road user.

While the visual assessment has identified the potential visual effects and associated likely visual impact of the proposed upgrade, the perception of the upgraded highway's visual impact, in particular of the long term visual impact, will be greatly influenced by the design quality of the road elements.

For example, the visual impact of a very large cutting will be very different depending on the treatment of the cutting face, illustrated by the contrast between a successfully revegetated and well maintained cutting face on one hand and a cutting face stabilised with shotcrete on the other. Similarly, the attention given to detail in the design of major structures such as bridges, overbridges, noise walls or tunnel portals will determine the way in which these structures are perceived, and whether they will be seen as making a positive contribution to the landscape, or as detracting from the highly scenic landscape. To this end, a series of recommendations for further consideration in future design development stages has also been developed.

The urban and landscape design strategic concept provides the framework for the development precinct urban and landscape design concept plans in this working paper and for the development of detailed concept designs for the proposed upgrade in the period following the environmental assessment. It does this by setting the overall strategic direction for the proposed upgrade, by identifying the key issues to be considered in the development of detailed designs and by nominating the major elements requiring design input along the route.

There are several components to the urban and landscape design strategic concept:

> Major Landmarks and Natural Features.

> Proposed Road Infrastructure Elements.

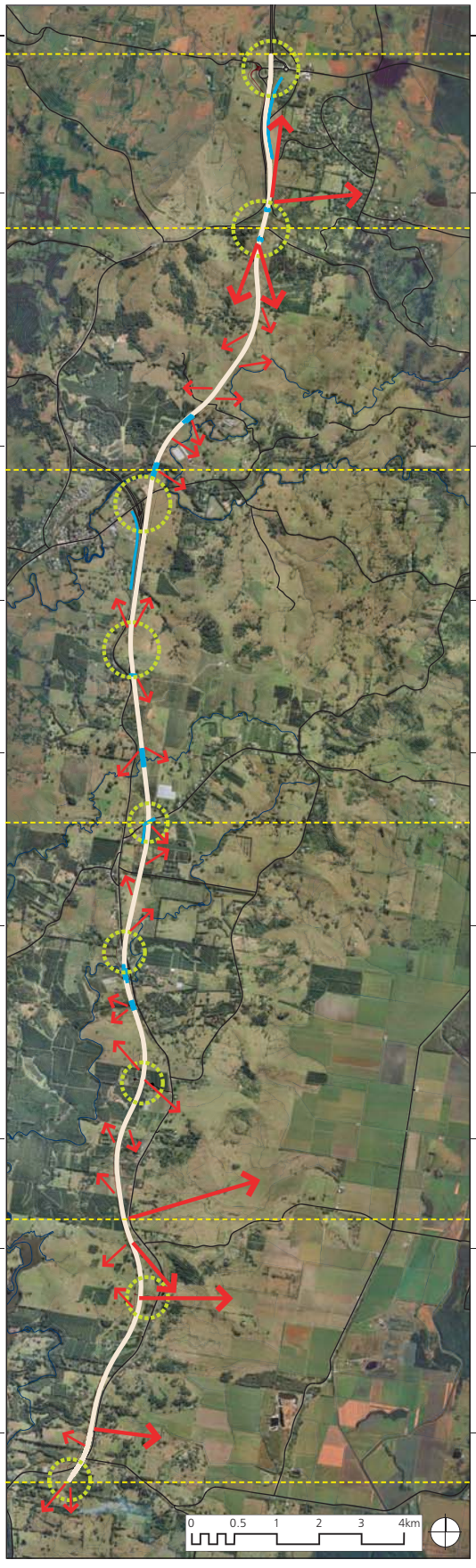
> Corridor Landscape Strategy.

MAJOR LANDMARKS

Landmarks (refer to Illustration 64) will be key natural features along the route, which are likely to be the particularly memorable moments on the journey. They include major topographic features such as prominent ridge lines or floodplains, as well as areas that offer panoramic views of the surrounding countryside. Major landmarks also include features which will be important to local road users, residents and other viewers which would see them from beyond the road reservation. An example would be the Emigrant Creek crossing where the upgraded highway would pass over the existing highway alignment which would be retained as the main local road link and tourist route.

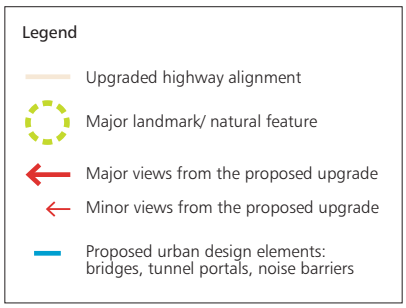
As memorable key points along the route, the design of structures and elements associated with the upgraded highway around those landmarks will be important in influencing the experience and perception of the visual character of the proposed upgrade. They therefore warrant a high level of attention and design resolution in the detail design stages of the proposed upgrade, to achieve an outcome of high visual and urban design quality consistent with the importance of the landmark. More detailed information on landmarks is provided in the relevant precinct concept plans.

Landmark	Importance	Design Response / Strategy
EWINGSDALE COASTAL VALLEY	Entry/ arrival to Byron Bay and approach to Bangalow tablelands	Reflect and heighten the sense of arrival through enhanced landscape treatment of the interchange. Maintain open views between the Ewingsdale spur, Coolamon Scenic Drive and the coastal lowland.
ST HELENA RIDGE	The ridge forms the threshold between two distinct landscapes: Byron/ the coastal hinterland and the elevated plateau/ tablelands. The prominent scenic escarpment, combined with valley and rare ocean and Cape Byron views provides an important landmark experience.	Design road infrastructure elements to remain subservient to the natural landscape. Enhance the sense of drama afforded by sudden extensive views to the ocean and into the Tinderbox valley when emerging from the tunnel. Design landscape treatments to maintain views.
BYRON CREEK CROSSING AND FLOODPLAIN	Arrival to Bangalow - the major township along the route. Road, rail and creek junction point.	Design road infrastructure elements such as bridges to enhance awareness of this important junction point. Design interchange landscape treatments to reflect the importance of the township.
ARUNDEL RIDGE	Major local high point - the proposed large cutting will create a landmark against the skyline. Important valley views mark the approach to Bangalow.	Treat cutting faces to soften the cutting outline against the skyline. Retain the open views to the north and associated sense of arrival on the approach to Bangalow.
BROKEN HEAD RIDGE	Major local ridge line. Its significant elevation permits extensive views both to the north and south. The proposed deep cutting and associated overbridge will be important elements against the skyline.	Design the overbridge to reflect the importance of the ridge in terms of the experience of both motorists on the proposed upgrade and local road users and residents. Treat cutting faces to soften the cutting outline against the skyline.
EMIGRANT CREEK VALLEY AND CROSSING	Crossing point of the existing highway, the proposed upgrade and Emigrant Creek - the major watercourse. The enclosed and vegetated valley provides a major point of contrast to the gently rolling open countryside of the plateau.	Maintain the enclosed character of the valley around the creek crossing. Reflect the importance and high degree of visibility of the crossing point through attention to detail in bridge design and aesthetic.
IVY LANE INTERCHANGE	The Ivy Lane interchange is the gateway to the macadamia "heartland".	Design interchange landscape treatments to reflect the arrival in the heartland of macadamia production and the productive agricultural lands on the elevated plateau.
KNOCKROW ESCARPMENT	Route exposed along the high point of the ridge. Open views across valleys and towards the Pacific Ocean - one of the few sections of the Pacific Highway where the ocean can be seen.	Maximise the potential to experience ocean views.
ROSS LANE ESCARPMENT	Entry point/ threshold between Ballina/ the coastal hinterland and the elevated plateau.	Landscape treatment to the Ross Lane interchange to reflect its "gateway" effect in the ascent/ descent of the elevated plateau.



PRECINCT 1
PRECINCT 2
PRECINCT 3
PRECINCT 4
PRECINCT 5

Illustration 64:
Urban and Landscape Design Strategic Concept: Major Landmarks and Natural Features along the proposed upgrade



Legend for Illustration 64: Major Landmarks and Natural Features along the proposed upgrade

ROAD INFRASTRUCTURE ELEMENTS

Road Infrastructure Elements are the major items of road infrastructure associated with the proposed upgrade, both along the upgraded highway and in connection with the local road system. They include elements such as interchanges, major cuttings, bridges, tunnel portals, noise barriers and local access roads (refer to Illustration 65).

Generally, it is these elements that will form the more highly visible components of the upgraded highway, being exposed to both motorists and to viewers in surrounding areas. Design resolution of the road infrastructure elements is important as they define the junction points between the upgraded highway and the landscape beyond the immediate road corridor. Further, a number of these elements coincide with major landmarks along the route and are therefore likely to be particularly memorable.

In contrast, detailed design components such as safety barriers would not be perceptible by viewers from surrounding areas, being generally small in scale. While their design resolution would be important from the point of view of the motorists experience of the upgrade, it would have less influence on the way the upgrade would be perceived by viewers in surrounding areas.

The Urban and Landscape Design Strategic Concept has identified a hierarchy of road infrastructure elements, based on their location and the relative importance of that location, based on the number of viewers likely to see the works, the visual and landscape setting, the identified visual effect and associated visual impact, and the potential for landscape planting or other mitigation measures to reduce the potential visual impact of the road infrastructure element. In addition, the proposed hierarchy emphasises the balance between the key considerations of design aesthetic and upfront costs.

1) Design 'Priority One' Element
The combination of a landmark location, the large size of the structure, the high degree of visual exposure and limited potential for screening or landscaping to reduce the visual effect, warrant an approach whereby the design aesthetic and integration of the structure with the surrounding landscape is the key consideration.

2) Design 'Priority Two' Element
The size of the structure, the moderate degree of visual exposure and the limited potential for screening, combine to warrant a moderate level of design detail, with an even balance between design aesthetic and cost effectiveness.

3) Design 'Priority Three' Element
The relatively low number of viewers and the potential to mitigate the visual effect of the structure with landscape planting permit a more purely functional design, giving priority to cost-effective design.

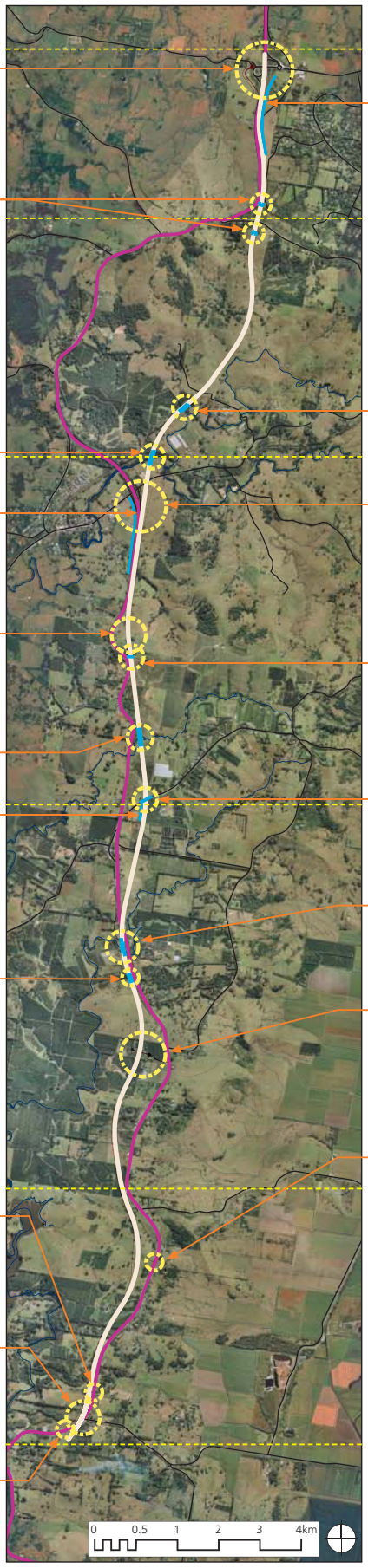
A more detailed discussion of the design principles for major road infrastructure elements including for bridges, tunnel portals and noise walls are provided in the section 'Urban Design Elements' and in the relevant precinct concept plans.

CORRIDOR LANDSCAPE STRATEGY

The Corridor Landscape Strategy provides an approach to the planting and other landscape treatments within the road corridor (refer to Illustration 66). The Strategy has been developed based on the existing pattern of planting/ vegetation and open landscapes in the area. Consistent with the '*Pacific Highway Urban Design Framework*', the Corridor Landscape Strategy aims to augment existing vegetation patterns to provide an interesting and varied road user experience consisting of opening and enclosed views, as well as to minimise the visual contrast between the upgraded highway corridor and the surrounding rural landscape. An important aspect of the strategy is to augment and upgrade identified lowland rainforest, riparian zones and wildlife corridors with the protection of existing vegetation and planting additional areas with indigenous species.

However, it is important to note that the Corridor Landscape Strategy was developed at a large-scale, strategic level and therefore provides a general guide or principle to be followed in highway landscaping works. Future design development and associated detail site investigation may determine that exceptions to the Strategy are warranted in certain locations along the route, such as to emphasise (or conceal) particular features, views or conditions in areas along the proposed upgrade.

* Notes:
1. All chainages are approximate.
2. "Planting" refers to the final outcome and not to any particular technique during construction: it includes both individual plantings and large-scale revegetation works.



Ewingsdale interchange
Design landscape treatments to reduce the visual effect of the road infrastructure and to create a sense of arrival at the famous destination of Byron Bay.

Tunnel Portals
'Priority One' elements. Carefully design tunnel portals and approaches to integrate the structure with the natural landform.
Utilise materials and treatments of high aesthetic standard and proven performance over time.

Byron Creek Bridge
'Priority One' bridge

'Clover Hill Noise Barrier
'Priority One' element. Design the barrier to be visually unobtrusive and concealed by landscape planting on both sides to maintain the rural landscape character

Major Cutting through 'Arundel'
'Priority One' element. Design cutting angles, benches and landscape treatments to reduce the effect of the cutting against the skyline.

Skinners Creek Bridge
'Priority Three' bridge

Newrybar Public School Noise Mound
'Priority Two' element. Design the mound to integrate with the natural land form, vegetation patterns and the cutting under Broken Head Road.

'Yarrenbool Place' Bridge & Access Roads
'Priority Two' bridge

Off-ramp T-intersection
Design the intersection as a low key element consistent with the rural road character of the existing highway alignment, while maximising the sense of arrival.

Ross Lane interchange
Design landscape treatments to reduce the visual effect of the road infrastructure and to create a sense of arrival on the elevated plateau.

Local Road Intersection
Design the intersection as a low key element consistent with the rural road character of the existing highway alignment.

Ewingsdale Noise Mound
'Priority One' element. Design the mound to integrate with the natural landscape of the Ewingsdale spur and densely vegetate the mound and both sides to provide a visual buffer to Ewingsdale and to retain the dominance of the scenic landscape.

Tinderbox Tributary Bridge
'Priority Three' bridge

Bangalow interchange
Design landscape treatments to reduce the visual effect of large areas of hard pavement on the approach to the intersection and to create a sense of anticipation and arrival.

'Picadilly Park' access Overbridge
'Priority One' bridge - integrate bridge design and cutting treatment

Broken Head Road Overbridge
'Priority One' bridge - integrate bridge design and cutting treatment

Emigrant Creek Bridge
'Priority One' bridge

Ivy Lane interchange
Design landscape treatments to reduce the visual effect of the road infrastructure and to create a sense of arrival in the 'heartland' of macadamia production.

Local Access Road T-intersection
Design the intersection as a low key element consistent with the rural road character of the existing highway alignment.

Legend
- Important design element along the proposed upgrade: interchanges, intersections, major cuttings
- Alignment of the proposed upgrade
- Existing highway alignment
- Proposed urban design elements: noise barriers, bridges, tunnel portals

PRECINCT 1
PRECINCT 2
PRECINCT 3
PRECINCT 4
PRECINCT 5

Illustration 65:
Urban and Landscape Design Strategic Concept: Road Infrastructure Elements

PRECINCT 1

PRECINCT 2

PRECINCT 3

PRECINCT 4

PRECINCT 5

Chainage 150,200 - 150,600
Protect and complement the vegetated character of the St Helena ridge line, in particular maximise planting around the tunnel portals to reduce their visibility.

Chainage 147,000 - 147, 900
Restrict major planting to the western side of the road reservation. Design all plantings to maximise opportunities for views into the Byron and Tinderbox Creek floodplain.

Chainage 145,700 - 146,500
Restrict large plantings to the western side and to the softening of the noise barrier. Design plantings to allow views towards the east.

Chainage 144,900 - 145,400
Design plantings to be consistent with the open landscape character along the Highway and to maximise opportunities for views into the surrounding countryside.

Chainage 143,400 - 144,100
Design plantings to complement existing vegetation on the western side and to maintain views to the east.

Chainage 139,900 - 140,600
Design plantings to be consistent with the open landscape character along the Highway and maximise opportunities for views into the surrounding countryside.

Chainage 138,500 - 139,000
Design landscape plantings to complement surrounding agricultural plantations and to enhance the experience of travelling through an enclosed/ heavily vegetated landscape.

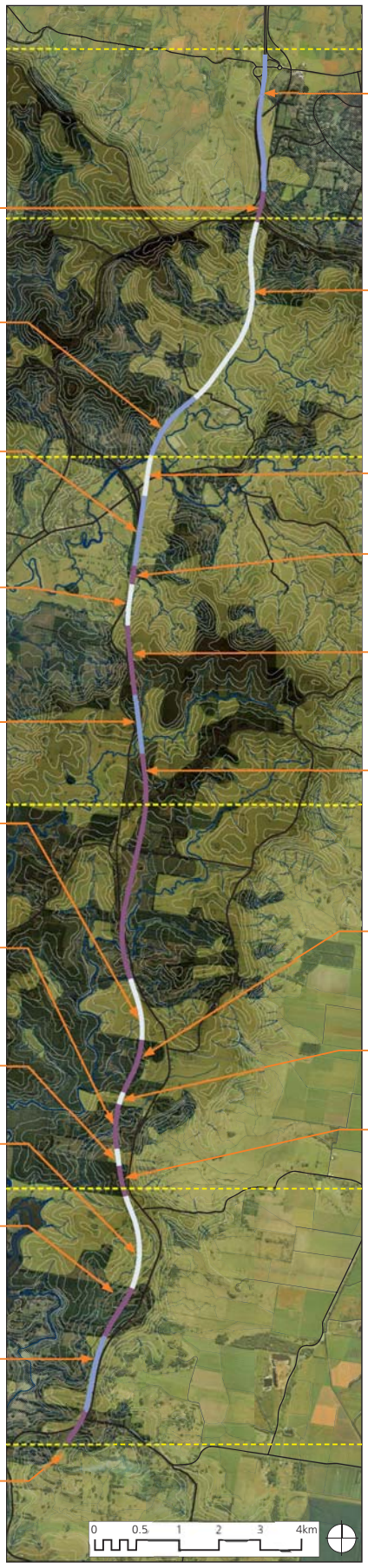
Chainage 138,300 - 138,500
Limit the height of roadside landscaping to maximise views.

Chainage 136,800 - 137,900
Limit the height of roadside landscaping to maximise views, in particular ocean views.

Chainage 136,100 - 136,800
Design landscape planting to complement surrounding agricultural plantations and to enhance the experience of travelling through an enclosed/ heavily vegetated landscape.

Chainage 135,200 - 136,100
Design landscape planting to complement existing vegetation on the western side and to maximise views towards the east/ the Pacific Ocean.

Chainage 134,400 - 135,200
Design landscape planting to complement existing vegetation and to reduce the visual effect of the cutting through the ridge.



Chainage 150,600 - 152,250
Design plantings to maximise opportunities for views, restricting large plantings to soften the appearance of the noise mound and to provide a visual buffer to Ewingsdale.

Chainage 147, 900 - 150,200
Design plantings to be consistent with the open landscape character along the Highway and maximise opportunities for views into the surrounding countryside.

Chainage 146,500 - 147,000
Design Highway landscaping works to maximise views across the open floodpain

Chainage 145,400 - 145,700
Use landscape planting to reinforce the heavily vegetated and enclosed character of the creek crossing.

Chainage 144,100 - 144,900
Complement existing vegetation to provide an enclosed experience along the upgraded highway and to soften the impact of the cutting against the skyline.

Chainage 140,600 - 143,400
Design landscape plantings to complement surrounding agricultural plantations, while allowing views across the productive landscape where landform permits. Reinforce the dense planted character around the Emigrant Creek crossing.

Chainage 139,200 - 139,900
Design landscape plantings to complement surrounding agricultural plantations and to enhance the experience of travelling through an enclosed/ heavily vegetated landscape.

Chainage 139,000 - 139,200
Limit the height of roadside landscaping to maximise views

Chainage 137,900 - 138,300
Provide landscape planting along the upgraded highway to complement surrounding agricultural plantations, while allowing views across the productive landscape where landform permits

Legend

Heavily vegetated, visually enclosed areas

Corridor planting works to correspond to the existing pattern of vegetation/ open and enclosed landscapes:

- Sections of proposed upgrade through heavily vegetated landscapes
- Sections of proposed upgrade characterised by vegetated landscapes to one side and open landscapes to the other
- Sections of proposed upgrade through predominantly open landscapes/ areas with little vegetation cover

Illustration 66:
Urban and Landscape Design Strategic Concept: Corridor Landscape Strategy

URBAN AND LANDSCAPE DESIGN CONCEPT - PRECINCT 1: KNOCKROW

ROSS LANE TO MARTINS LANE, CHAINAGE 134,750 TO 138,000

SUMMARY OF ISSUES

As discussed in the "Visual Assessment" section of this working paper, the main urban and landscape design and visual issues in the Knockrow precinct are the large scale of the infrastructure at the Ross Lane interchange, the increase in amount of hard pavement through the parallel location of the proposed upgrade, the existing highway and local access roads, and the severing and loss of roadside vegetation, including macadamia plantations along the existing highway.

From the point of view of the motorist and the driving experience along the proposed upgrade, maximising opportunities for views into the surrounding countryside and in particular towards the Pacific Ocean will be a key consideration for this precinct. As highlighted earlier in this working paper, the Tintenbar to Ewingsdale section of the Pacific Highway is one of the areas from where the Pacific Ocean can be seen and the Knockrow precinct is one of the most important precincts in this regard. Important views have been identified in Illustration 67 and include views towards the Pacific Ocean, as well as views into more open pasture landscapes north-west of Knockrow, and views into the Sandy Flat floodplain south of Ross Lane.

In terms of how the proposed upgrade will be perceived by local residents and visitors to the area, views from the local road system and the visual relationship between the existing highway and the proposed upgrade are important factors and have been addressed by the urban and landscape design concept plan.

KEY AREAS FOR DETAIL DESIGN

In precinct 1, the key areas for further design investigation, resolution and development include:

> Vertically independent carriageways

Investigating the potential for independent vertical grading of the two carriageways, in order to reduce the motorway character of the proposed upgrade while also potentially reducing the amount of earthworks required. The section of the proposed upgrade south of Ivy Lane seems particularly suited for this (chainage 137,200 in precinct 1 to chainage 139,700).

> Protect the character of the existing highway

The retention and protection of existing roadside vegetation along the existing highway will be an important factor in minimising the degree of visual change in the precinct, and in protecting the attractive driving experience along this route, for both locals and visitors to the area. Detail design and construction works should therefore aim to maximise the retention of this vegetation and where this is not possible, reinstate vegetation following completion of the works. Reinstated vegetation should be of sufficiently established size to compensate for the loss of roadside vegetation in the short term.

> Reduce the visual impact of parallel areas of hard pavement

Reducing the amount of hard pavement visible from any one area or viewpoint will assist in reducing the dominance of the hard engineering structure of the proposed upgrade. Maximising landscaping opportunities between separate carriageways (including the upgraded highway, on- and off-ramps, local access roads and the existing highway) will ensure the landscape remains the most important visual element. Further, road design development should seek to minimise hard paved areas as much as possible, in particular in instances such as where hard pavement would only be required in the case of future road widening or the provision of additional traffic movements at intersections. In verges, consideration should also be given to the use of alternative materials and/ or textures that reduce the width of the uniform driving surface.

> Severed plantations

As previously discussed, macadamia plantations are a defining feature of the area's visual and landscape character. The retention of stands of macadamia trees should therefore be maximised as much as possible. The issue arises where existing plantations are being severed by the proposed upgrade, leaving isolated stands of established trees that are nevertheless not directly affected by the construction of the proposed upgrade. Retaining such stands of trees is especially important within a context of aiming to reduce the degree of visual change in parts of the landscape not directly affected by the construction of the proposed upgrade. An example would be the severed plantations in "Deenford Plantations" (property 30), in Knockrow.

While the issue of residual lands and their future uses is addressed in a separate working paper, continuing discussions with affected and neighbouring land business owners would be important from a visual point of view, in order to maximise the degree to which the existing visual landscape character can be retained.

URBAN AND LANDSCAPE DESIGN CONCEPT PLAN AND SPECIFIC RECOMMENDATIONS

Building on the identified key areas for detail design and the strategic principles outlined in the urban and landscape design strategic concept, Illustration 84 provides a more detailed concept plan for precinct 1. It identifies a series of specific urban and landscape design measures for the precinct, which have been developed in response to the urban design objectives and principles for the proposed upgrade, and to mitigate the identified visual impacts. The plan further identifies important views to be retained and protected, in order to enhance the experience of the motorist on both the existing and the upgraded highway.

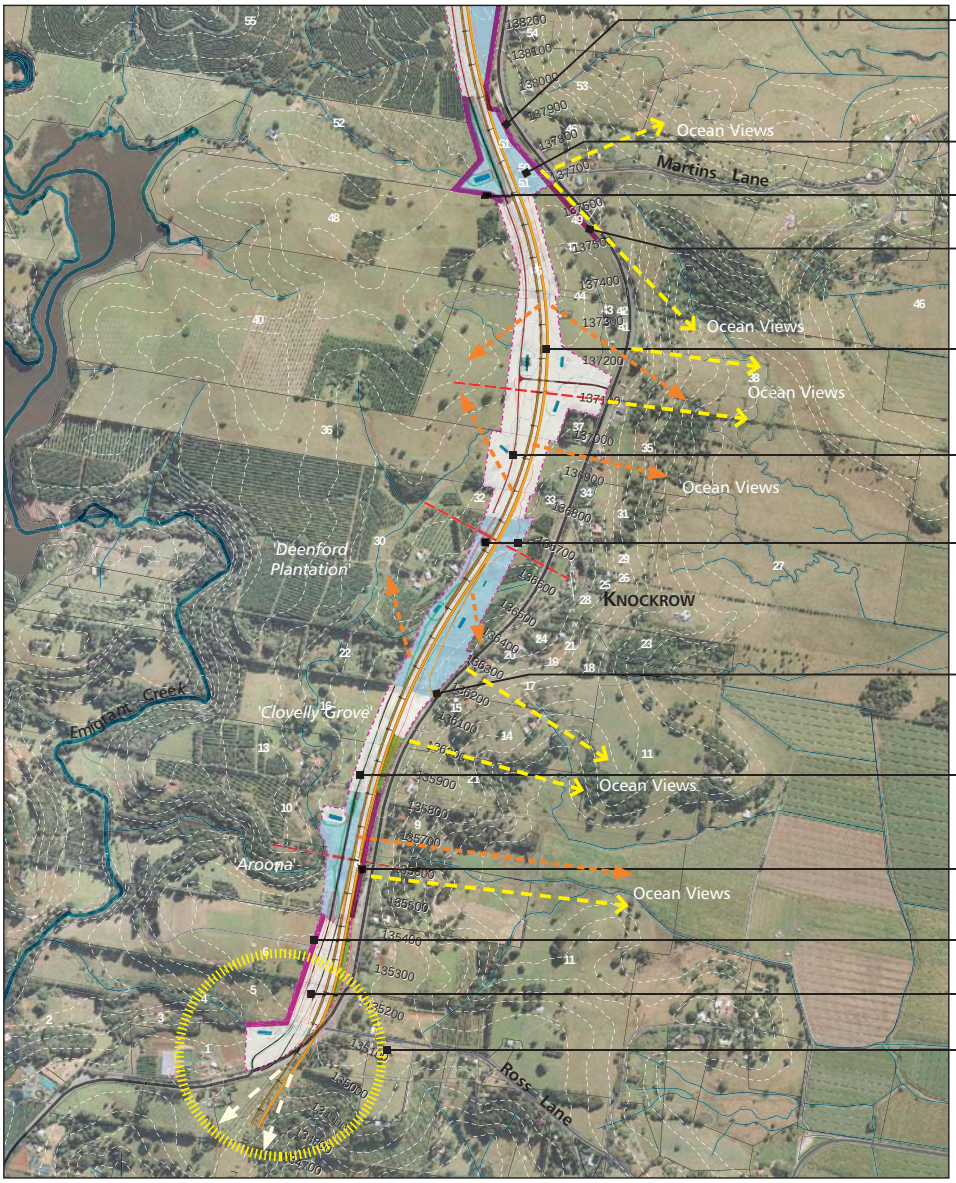
The cross sections on the following page (Illustrations 68 to 70) further illustrate the three-dimensional urban and landscape design treatments at a number of important locations within the precinct.

Specific recommendations to mitigate the potential visual impact of the proposed upgrade and to be investigated at a detailed level in the next design stages are:

1. Design the new intersections between the existing highway and both local access roads (chainage 134,900 and 137,120 approximately) and the southbound off-ramp (Chainage 136,120) to be of a small scale consistent with other local road intersections along the existing highway alignment.
2. Use tree planting along local access roads to create the character of a country lane or avenue while allowing filtered views of the surrounding countryside (chainage 134,900 - 138,130, chainage 136,720 - 138,000).
3. Provide landscape planting of trees and shrubs between the existing and proposed highway, to reduce the visual prominence of the upgrade, in particular where it is situated on fill (Chainage 134,900 - 135,350, Chainage 135,950 - 136,150 and Chainage 137,700 - 138,000).
4. Plant between the many parallel roadways around the Ross Lane interchange to reduce the scale of the infrastructure visible from any one view point (chainage 134,900 - 135,500).
5. As much as possible, provide separate cuttings for individual roadways at the Ross Lane interchange, to reduce the amount of pavement that can be seen from any one of these roads (chainage 135,100 - 135,500).
6. In areas where the upgraded highway is located in cuttings, maintain open views from properties across the upgraded highway and towards the Pacific Ocean (Chainage 135,150 - 135,400 and 137,300 - 137,600).
7. Maintain the low character of road-side planting along the eastern side of the existing highway to maintain/ enhance Ocean Views, in particular around Martins Lane (chainage 135,200 - 136,400, chainage 136,800 - 138,000).
8. Use planting to minimise the prominence of the upgraded highway at the end of local access roads and driveways (Chainage 135,400 - 135,600).
9. Use planting between the upgraded highway and local access roads to reduce the extent to which the upgraded highway would be able to be viewed, and to break up the expanse of paving visible from the existing highway alignment (chainage 135,500 - 138,130, chainage 136,720 - 138,000).
10. Provide open views from the upgraded highway towards the Pacific Ocean (Chainage 135,550 - 135,900 and Chainage 136,800 - 137,300).
11. Protect the hedge and avenue of trees along the existing highway alignment at 'Clovelly Grove' (Chainage 135,600 - 135,800 approximately).
12. Plant trees and shrubs on the western side of the existing highway to reduce the visual prominence of the proposed upgrade and to direct views towards the east and the Pacific Ocean (Chainage 137,500 - 137,700).
13. Retain and protect avenue/ tree planting along the existing highway, north of Martins Lane West (Chainage 137,700 - 137,950).
14. Retain and protect macadamia plantations between the existing highway and the proposed Upgraded, to maintain the visual diversity along the existing highway (Chainage 137,700 - 137,950).
15. Revegetate cuttings and embankments throughout the precinct, to soften and reduce their visual effect. A list of locally appropriate species is provided in Appendix 1.

* Notes:

1. All chainages are approximate.
2. "Planting" refers to the final outcome and not to any particular technique during construction: it includes both individual plantings and large-scale revegetation works.



Maintain and protect existing avenue planting along the existing highway alignment

Retain and protect existing macadamia plantation

Reinstate avenue planting along new property frontage/ boundary

Tree planting to reduce the visual prominence of the upgraded highway and direct views from the existing highway to the east

Maximise views to the surrounding open landscape and towards the Pacific Ocean by limiting planting to low species which would stabilise and soften embankments

Avenue planting along the new local access road to provide amenity while allowing filtered views

Tree planting in cutting to complement the treed landscape of surrounding plantations

Provide special tree planting to mark the arrival point at the intersection of the southbound off-ramp with the existing highway alignment

Provide tree planting along local access roads to create the feeling of a country lane and provide amenity while allowing for filtered views

Maintain or reinstate hedge and avenue planting along the existing highway alignment

Reinstate avenue planting along new property frontage/boundary

Visually separate roadways by locating them in separate cuttings

Ross Lane interchange. Define an individual planting scheme to mark the arrival on the elevated plateau and maximise planting/revegetation works to visually separate individual carriageways (subject to safety requirements and sight lines)

Illustration 67:
Urban and landscape design concept plan for precinct 1

Legend

- Proposed Highway upgrade: carriageways, on- and off-ramps
- New and modified local access roads
- Proposed road corridor acquisition boundary
- Property ID number
- Extent of proposed fill embankments
- Extent of proposed cuttings
- Proposed sedimentation basin
- Existing Pacific Highway alignment
- Existing local roads and driveways
- Views from the existing highway
- Views from the proposed upgrade
- Cross section location
- Proposed avenue or special purpose planting
- Planting and/or revegetation includes tree cover to complement surrounding planting patterns and provide an enclosed driving experience
- Planting and/or revegetation works with limited tree cover to allow for filtered views of the surrounding landscape
- Revegetation works limited to low planting or turfing as required to stabilise embankments and cuttings, and to allow open views into the surrounding countryside

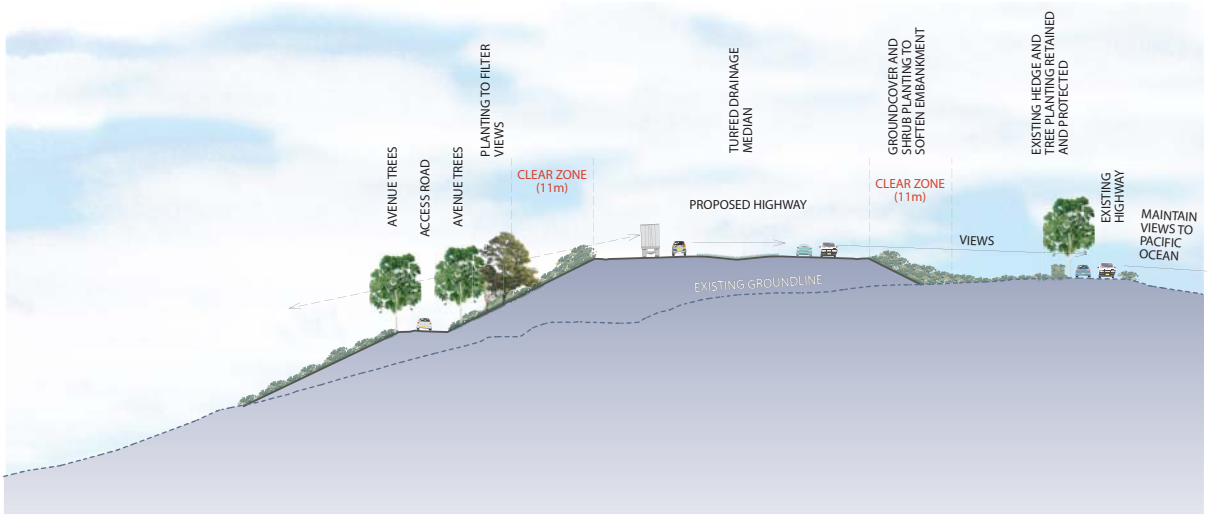


Illustration 68: Cross section at chainage 135,600

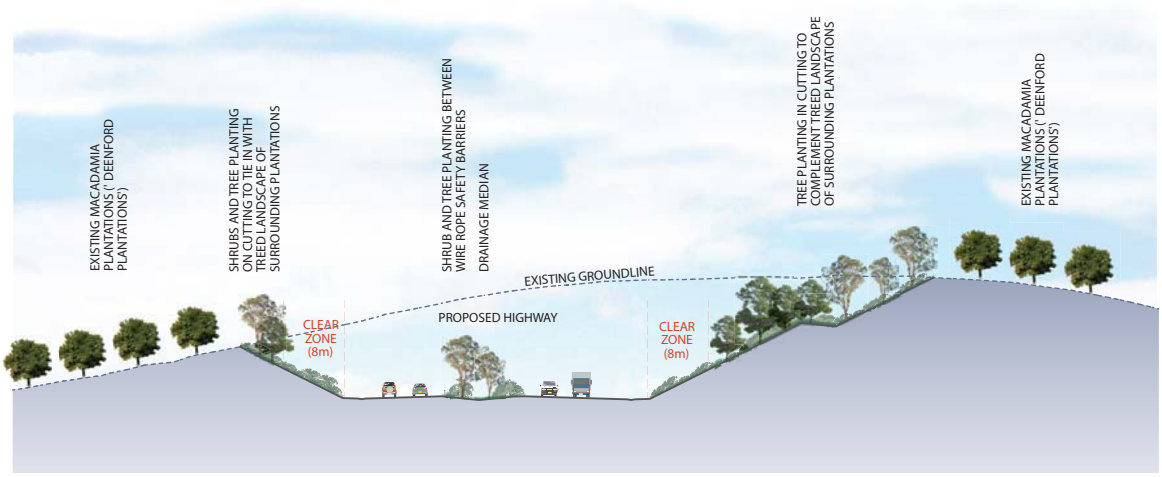


Illustration 69: Cross section at chainage 136,650

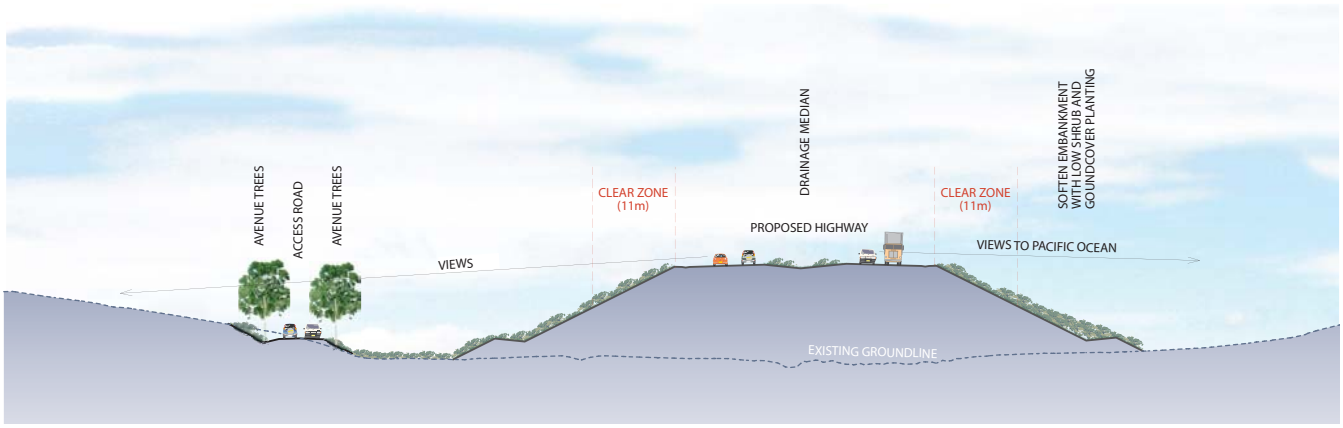


Illustration 70: Cross section at chainage 137,100