

19. Landscape and visual impacts

19.1 Assessment approach

A landscape, urban design and visual assessment was undertaken for the proposed upgrade in July 2006. This study included a review of previous landscape and visual assessments prepared during the route evaluation and selection phase.

A visual assessment identifies locations and zones according to their scenic character, quality and sensitivity to change.

Scenic character is defined by the natural landscape and topography and land use features, such as the built environment and agriculture. Landscape character zones have been identified and are discussed in Section 19.2.1.

Scenic quality is a descriptive measure of visual attributes. There is always a degree of subjectivity inherent in the assessment of scenic quality. A number of studies have used analytical techniques in an attempt to reduce subjectivity and to identify generally agreed criteria that can be applied to the process of landscape evaluation (refer *Visual Survey Methodology*, Jackson Teece Chesterman Willis for the NSW State Pollution Control Commission 1979). For example, water and natural environments, as components of any view, are more highly valued than cultural landscapes or built environments, with industrial buildings being the least preferred type of built environment. The qualities of contrast, variety and harmony, in the way that these components are composed in a view, can also be important.

The visual sensitivity of a character zone is a measure of how important changes to the existing visual environment would be to viewers. Visual sensitivity is dependent on the existing scenic quality and access to views by the community.

Measures proposed to mitigate impacts on visual amenity resulting from the proposed upgrade (see Section 19.4) rely largely on the urban design of structures and embankments and on the landscape design. The Pacific Highway Upgrade Program is guided by objectives that cover development in general, and others that deal with urban design outcomes (NSW Roads and Traffic Authority 2004). The urban design outcomes that have been the focus of this assessment are to:

- Provide a flowing road alignment that is responsive to and integrated with the landscape.
- Provide a well-vegetated, natural road reserve.
- Provide an enjoyable, interesting highway with varied views and vistas of the landscape and pleasant, restful places to stop.
- Value the communities and towns along the road.
- Provide consistency-with-variety in road elements.
- Provide a simple and unobtrusive road design.

The design principles for the proposed upgrade relate to landscape, landform and built elements.

The Urban and Landscape Design Strategy for the proposed upgrade is described and illustrated in Section 6.6.1. The concept and landscape design for interchanges, bridges and other structures, such as the Frederickton levee and noise walls, are also discussed in Section 19.5.

An updated visual assessment of the preferred alignment was prepared in July 2006. The outcomes of the assessment are detailed in the unpublished technical report *Kempsey to Eungai Upgrading the Pacific Highway – Landscape and Urban Design Report* (NSW Roads and Traffic Authority 2006e), and summarised in this Chapter.

19.2 Existing landscape and views

19.2.1 Landscape character zones

There are five landscape character zones along the proposed upgrade:

- The southern ridge (southern end to north of Old Station Road).
- The Macleay River floodplain (north of Old Station Road to north of Frederickton).
- The central ridge (north of Frederickton to north of Kemps Access).
- The Collombatti floodplain (north of Kemps Access to south of Cooks Lane).
- The northern ridge (south of Cooks Lane to the northern end).

The landscape character zones and their scenic character, quality and sensitivity are shown in Figure 19-1.

19.3 Impacts on landscape and views

Construction of the proposed upgrade would be visually obtrusive. Vegetation would be cleared, topsoil removed, embankments and cuttings formed, and bridges and other structures constructed. However the visual impacts of construction would be temporary.

Substantial permanent changes to the local visual character would also occur, as described below and summarised in Figure 19-1. Foreground and middleground views of the proposed upgrade are shown in Figure 19-2.

The proposed upgrade may be seen from various points within the shaded area (visual catchment).

19.3.1 Landscape character zones

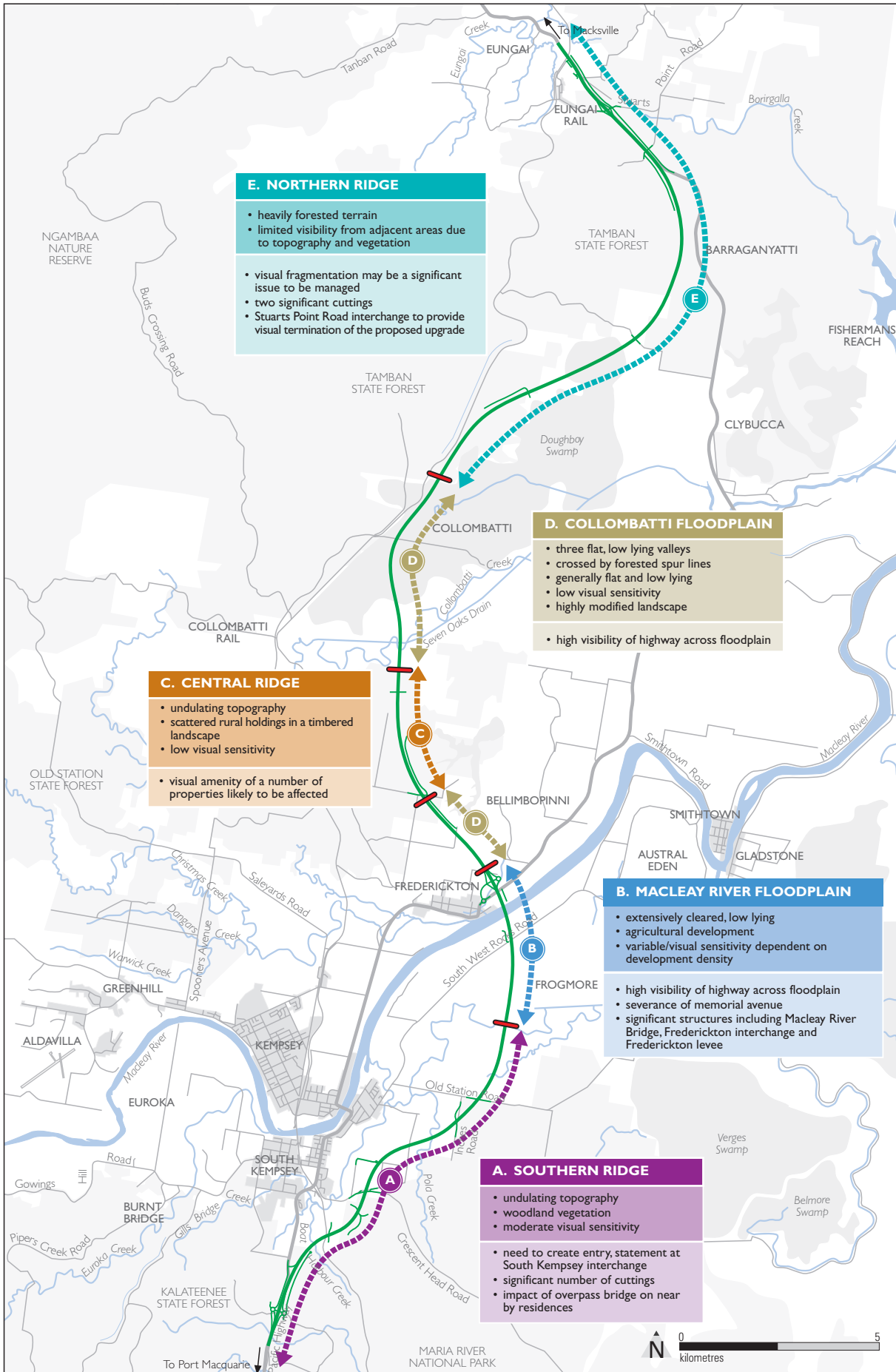
Five landscape character zones were identified as part of the landscape and visual assessment. Each has unique features that distinguish one zone from another. These are outlined below.

Southern ridge

The visual impact of most of the changes to landform within the southern ridge visual character zone would not be visible to those beyond the proposed upgrade. Where views from residences would overlook the road, the visual impact of the proposed upgrade would generally be limited due to distance, the extent of existing or proposed vegetation cover, or the elevation of the road in relation to the viewer.

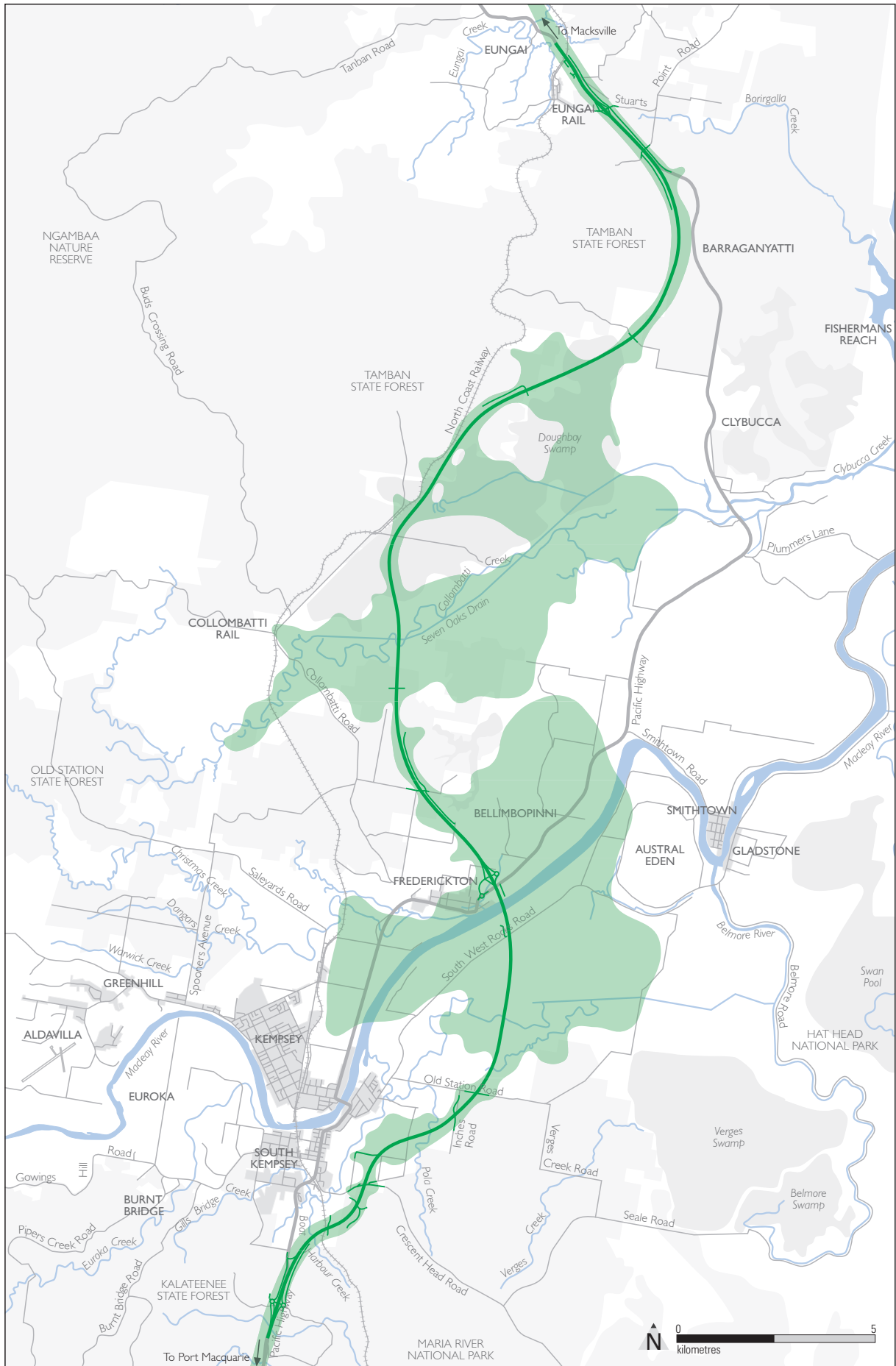
The greatest visual impact in this landscape character zone would occur near the intersection of Crescent Head Road and the proposed upgrade, where the requirements for an overpass would mean that some properties would have their views shortened by the proposed embankment. The visual dominance of the embankments may be exacerbated by the addition of noise walls or mounds in this location.

Figure 19-1 Landscape character zones and visual impacts



— The proposed upgrade ← A → Landscape character zones

Figure 19-2 Visual catchment of the proposed upgrade



— The proposed upgrade
 — Existing Pacific Highway

Visual catchment

Note: Views to the proposed upgrade may be obstructed by vegetation and buildings

Other visual impact issues within this landscape character zone arising from the proposed upgrade include:

- A need to establish an entrance and connection to Kempsey.
- Two large cuttings that would be visible from some residences; one south of Crescent Head Road and another at Inches Road.
- Proximity to residences at Lois Lane; the main views from these residences are to the north-west, which would not be intruded upon.
- The potential of the proposed upgrade near Yableys Lane and Lyall Lane to be visible from higher sections of East Kempsey, at a viewing distance of 1 to 2 kilometres.
- Potential views from residences on Old Station Road, where the proposed upgrade would cross Old Station Road.

The views of the road user would be largely confined and dominated by landscaped road verges and cuttings. There would be glimpses of existing forested areas and open country associated with the Pola Creek floodplain. The large rock cuttings would be a dominant visual feature within this character zone.

Macleay River floodplain

The proposed Macleay River bridge and the associated embankments would have a significant visual impact due to the physical size of the structures and access of views from Frederickton, South West Rocks Road and residences on the floodplain. The proposed upgrade would be approximately 6 metres above ground level. Where constant batter slopes are used for fill embankments, the strong geometric form created may not relate to the character of the floodplain.

The culverts and embankments on the floodplain would be a prominent visual feature due to the contrast between the bulk of the structures and the flatness of the floodplain, and the long views that are currently available. The culverts and embankments would be approximately 1,400 metres from South West Rocks Road near Red Hill Lane, becoming closer and more prominent as the proposed upgrade approaches South West Rocks Road and Frederickton.

Road users would be provided extensive views across the floodplain and to the hills and vegetated areas beyond. These views would be expected to be of high scenic quality and a distinctive part of the driver experience.

The Ferry Lane memorial avenue is located within this landscape character zone. The avenue would be crossed by the proposed upgrade on a fill embankment. This would result in the visual and physical separation of the avenue from South West Rocks Road travelling south.

The Macleay River bridge and Frederickton interchange are both major features of the proposed upgrade that would be constructed within the main visual corridor of the Macleay River. A small ridge near the eastern entrance to Frederickton currently represents a significant landscape element defining the entrance to the town from the north. This ridge would be affected by the proposed bridge and embankment.

A flood levee is proposed to protect the flood-prone areas of Frederickton. The structure of the levee has been developed in consultation with local landholders. It is proposed to be a mix of wall and embankment and is described in detail in Section 6.2. The levee would sever the views from these properties to the river and the floodplain beyond.

Central ridge

Views from properties near Mill Lane, Seashore Lane, Raymonds Lane and Kemps Access would be affected by the proposed upgrade. It would be expected that changes to views

would be offset by the undulating terrain and the forests and woodlands that exist in this landscape character zone. Earthworks and dense plantings of shrubs and trees would mitigate visual impacts.

Views for road users would be dominated by landscaped roadsides with glimpses of adjacent forested areas and cleared land and low cuttings.

Collombatti floodplain

Views from up to four residences would potentially overlook the proposed upgrade. The views would be partially or completely obscured by the undulating landforms and the native vegetation. One residence that would have views of the Collombatti Creek floodplain and proposed upgrade would be approximately 1 kilometre from the proposed alignment.

Road users would experience views that would vary in an approximately rhythmic pattern of timbered areas, including tall timbers, cuttings through timbered and cleared ridges and open views of valleys and watercourses. The scenic quality for road users would be moderate to high.

Northern ridge

Impacts on the scenic quality and character in this zone would be limited due to the low population and opportunities to view the proposed upgrade. The view distances are very limited by existing native forests and undulating topography. Views would be most prominent where the proposed upgrade corresponds with an existing road, like Cooks Lane, Nirvana Way and Barraganyatti Hut Road.

The proposed upgrade would be able to be viewed from approximately four residences within this zone. However, these views would be partially obscured by existing native vegetation, landscaping and the topography.

Two significant cuttings would be located in this landscape character zone. These cuttings would open views to Mount Yarrhapinni to the north. The depth of these cuttings would be 28 metres for the cutting south of Crescent Head Road and 16 metres for the cutting at Inches Road. In addition, a cutting between station 26900 and 33700 would be a maximum of 17 metres deep.

The proposed upgrade requires the construction of two service roads south of the Stuarts Point Road interchange, to the east and to the west of the existing highway. These would provide a link to a number of small holdings, Nirvana Way and Barraganyatti Hut Road. The two service roads, in combination with the new highway, would fragment the existing forest and comprise a large area of infrastructure that would contrast visually with the surrounding native forests. This would be visible for road users of the proposed upgrade, and of the adjacent service roads.

The Stuarts Point Road interchange would provide a visual termination of the proposed upgrade. The bridge at this interchange would cross from a highpoint in the east and would require a fill embankment in the west due to the natural fall of the topography.

An additional service road is proposed between the Stuarts Point Road interchange and the North Coast Railway to provide access to and from three properties along the western edge of the proposed upgrade. This service road would be constructed close to the proposed upgrade, resulting in limited opportunities to screen or limit the impact of the proposed upgrade. The visual impacts of the service roads would be offset by their location at different levels to the main carriageway.

19.4 Management of impacts

An Urban and Landscape Design Plan would be developed and implemented to minimise the visual impacts of the proposed upgrade in each landscape character zone. The Plan would be consistent with the Urban and Landscape Design Strategy and the Urban and Landscape Concept Plan described in Sections 6.6.1 and 19.5 respectively. The mitigation measures specific to particular sections of the proposed upgrade or to structures (such as the Macleay River bridge) are discussed below.

19.4.1 Landscape character zones

Southern ridge

The visual impacts of the embankment associated with the overpass at the intersection of the proposed upgrade and Crescent Head Road would be minimised as far as practicable by locating the road as far as possible from houses and establishing a landscaped buffer between the proposed upgrade and viewers. Landscaped earth mounds would be considered for visual and noise shielding where practicable. An example of a noise barrier is illustrated in Figure 16-15.

Macleay River floodplain

The batter slope of the embankments across the floodplain would be varied where practicable to minimise their visual impact.

The design of the proposed upgrade should limit the fragmentation of the Macleay River floodplain. All proposed structures in this area, including the Macleay River bridge and Frederickton interchange, would be simple, elegant and unobtrusive in order to minimise their visual impact.

Central ridge

Dense planting of native vegetation including shrubs and trees would mitigate the visual impacts of the proposed upgrade through this section.

Collombatti floodplain

The use of simple, low-profile bridge structures combined with flat batters (typically 1V:4H for batters less than 2.5 metres high) would assist the integration of the proposed upgrade with the existing visual environment of the floodplain.

Appropriate screen planting would be used at the rest area to screen views from nearby properties, and screen properties from travellers using the rest area facilities.

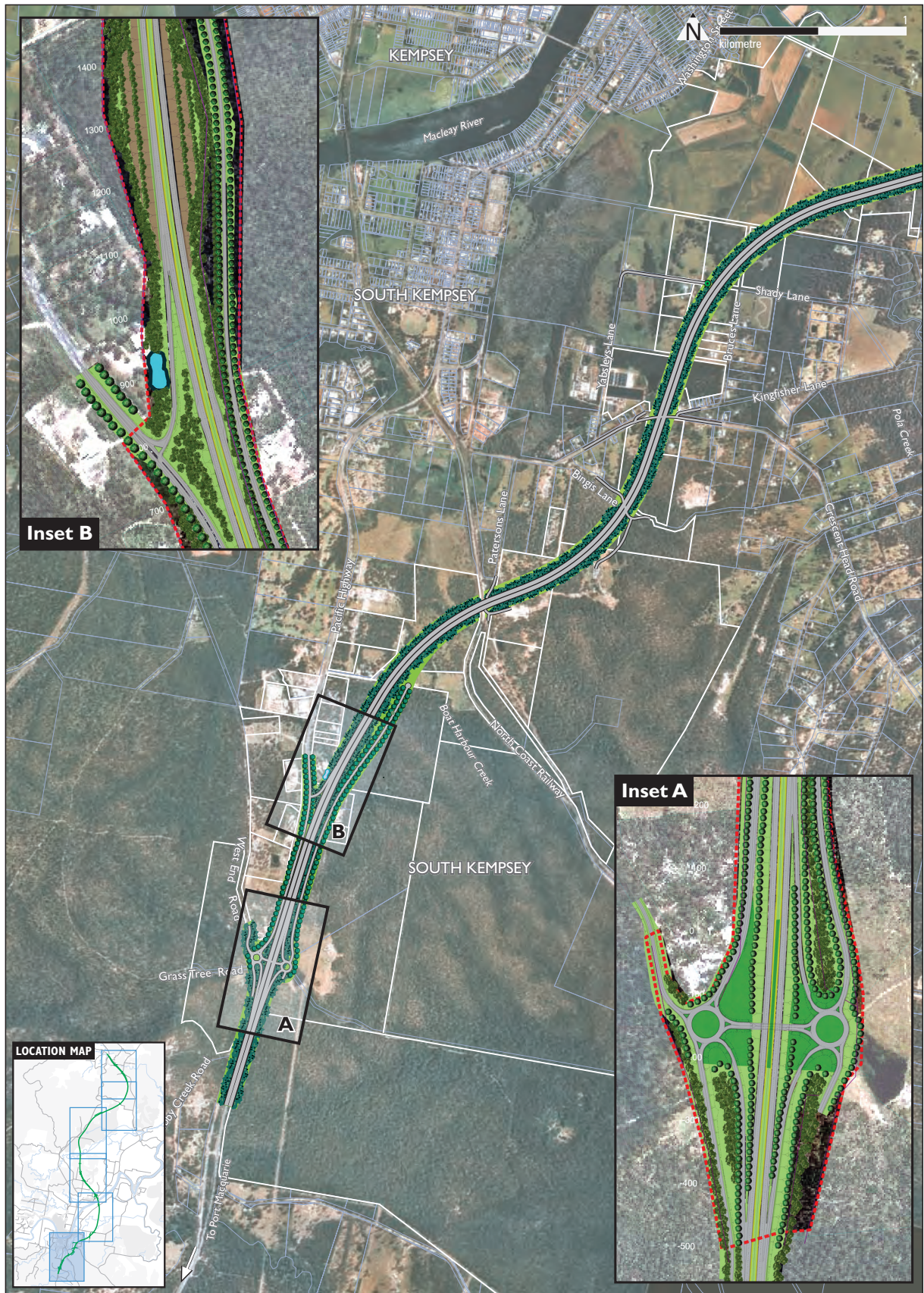
Northern ridge

The visual impact of the service roads and the main carriageway in close proximity would be mitigated by landscaping using native vegetation.

19.5 Urban and landscape concept plan

An urban and landscape concept plan has been derived from the urban and landscape design strategy to illustrate the key landscape proposals, thus providing a greater level of detail. The landscape concept plan is shown in Figures 19-3a to 19-3f.

Figure 19-3a Landscape concept design

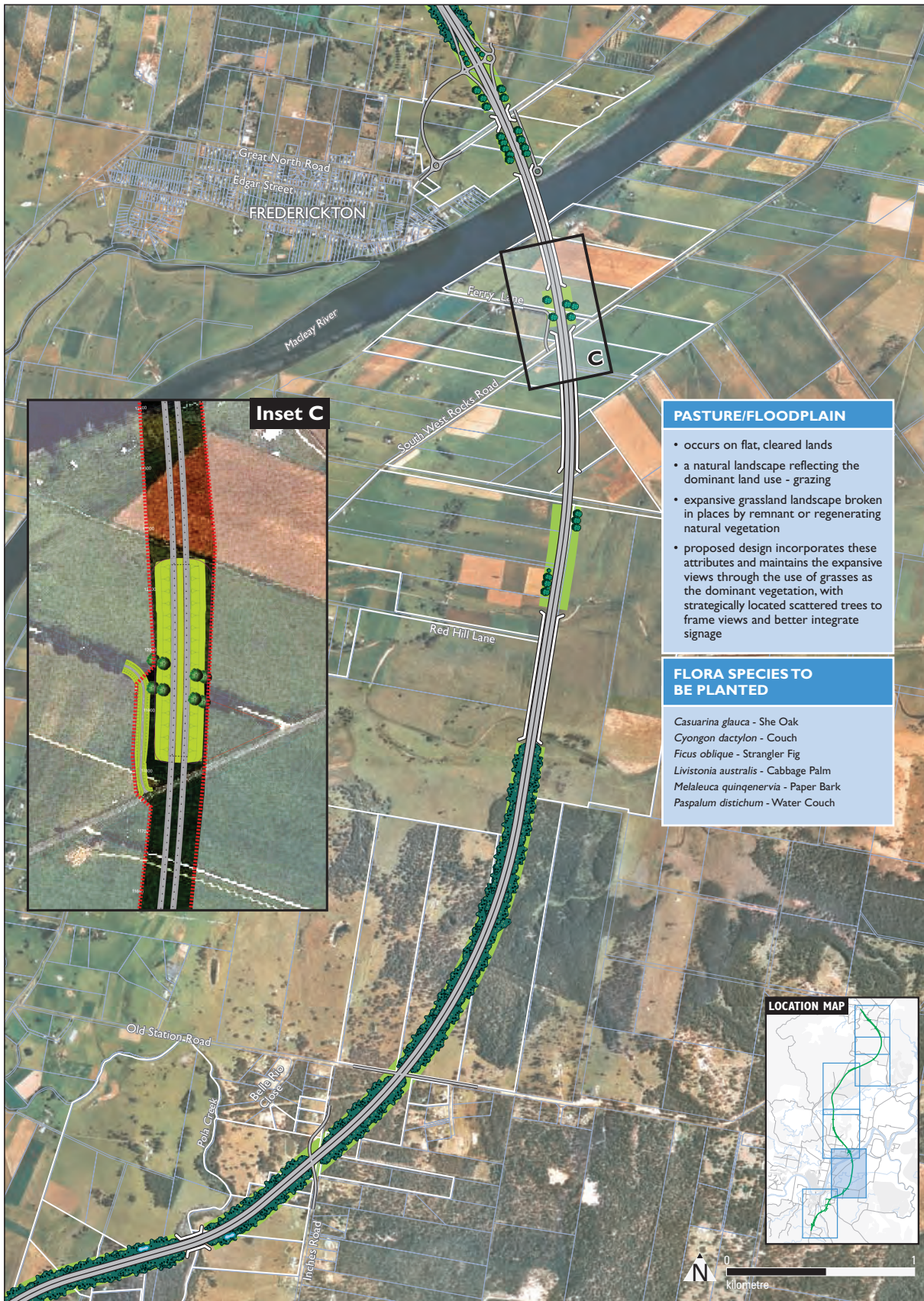


▬ The proposed upgrade

☪ Sedimentation basin

Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

Figure 19-3b Landscape concept design



PASTURE/FLOODPLAIN

- occurs on flat, cleared lands
- a natural landscape reflecting the dominant land use - grazing
- expansive grassland landscape broken in places by remnant or regenerating natural vegetation
- proposed design incorporates these attributes and maintains the expansive views through the use of grasses as the dominant vegetation, with strategically located scattered trees to frame views and better integrate signage

FLORA SPECIES TO BE PLANTED

- Casuarina glauca* - She Oak
- Cyongon dactylon* - Couch
- Ficus oblique* - Strangler Fig
- Livistonia australis* - Cabbage Palm
- Melaleuca quinquenervia* - Paper Bark
- Paspalum distichum* - Water Couch

▬▬▬ The proposed upgrade

○ Sedimentation basin

Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

Figure 19-3c Landscape concept design

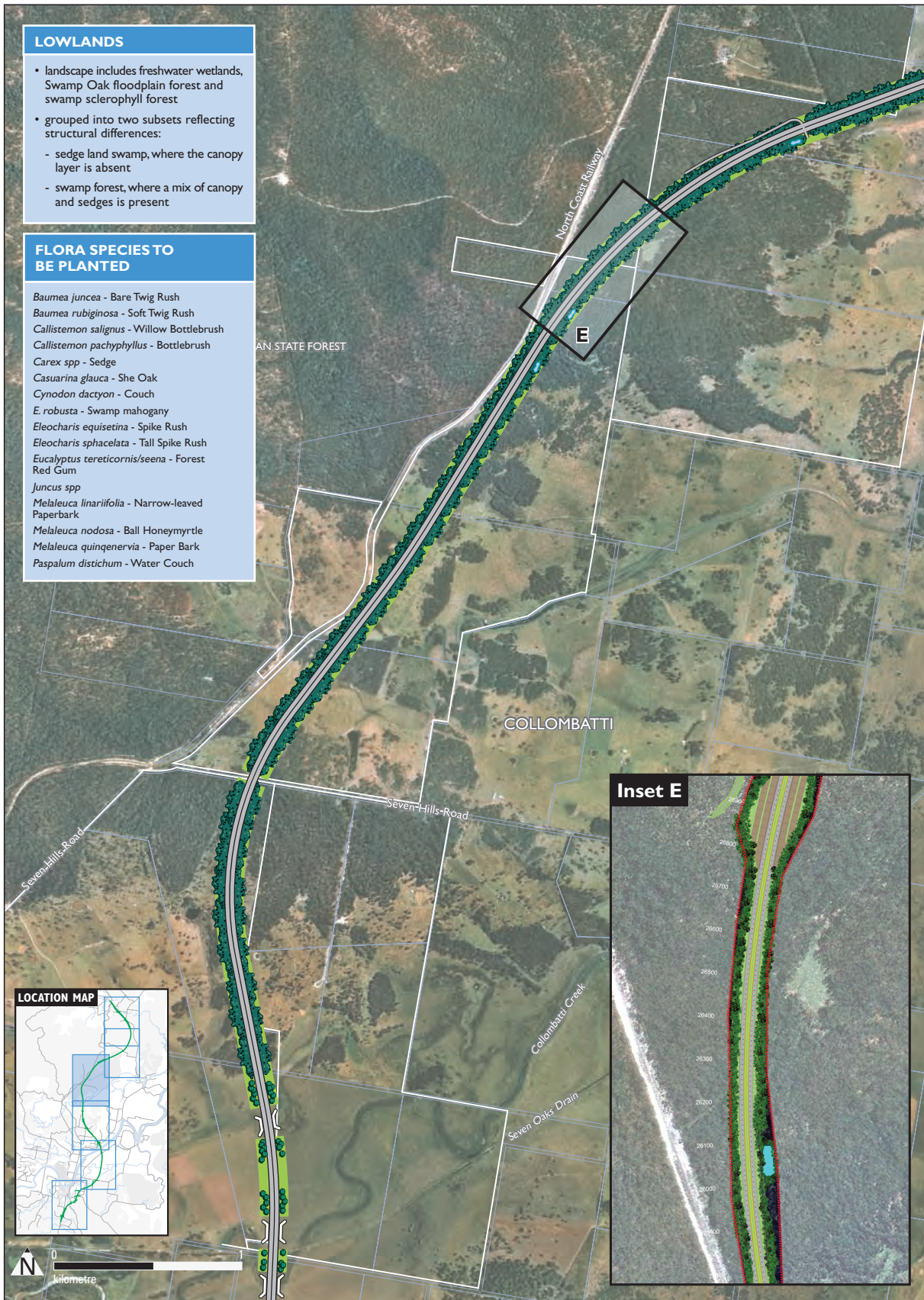


— The proposed upgrade

— Sedimentation basin

Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

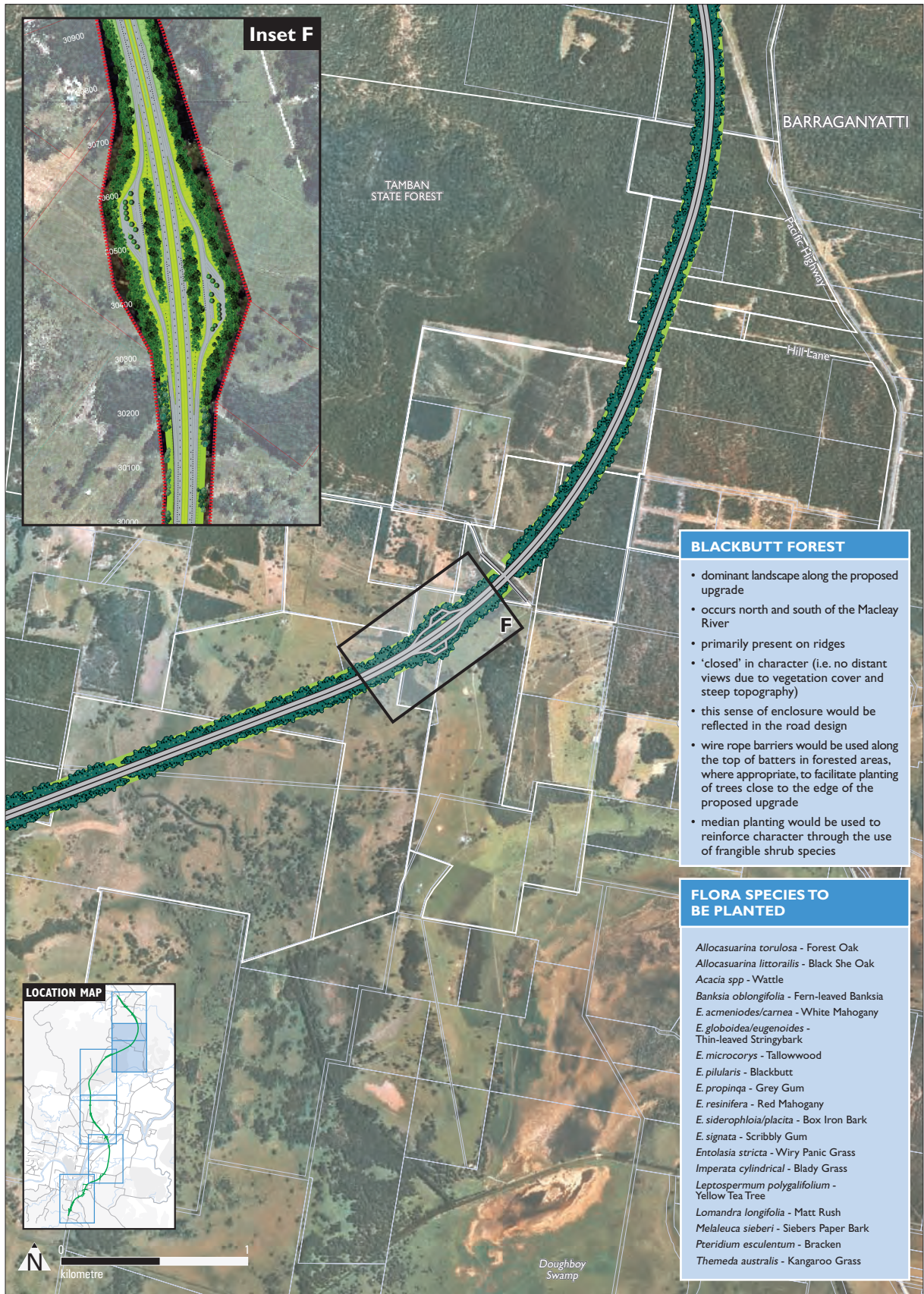
Figure 19-3d Landscape concept design



The proposed upgrade
 Sedimentation basin
 Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

Figure 19.3d Landscape concept design

Figure 19-3e Landscape concept design



BLACKBUTT FOREST

- dominant landscape along the proposed upgrade
- occurs north and south of the Macleay River
- primarily present on ridges
- 'closed' in character (i.e. no distant views due to vegetation cover and steep topography)
- this sense of enclosure would be reflected in the road design
- wire rope barriers would be used along the top of batters in forested areas, where appropriate, to facilitate planting of trees close to the edge of the proposed upgrade
- median planting would be used to reinforce character through the use of frangible shrub species

FLORA SPECIES TO BE PLANTED

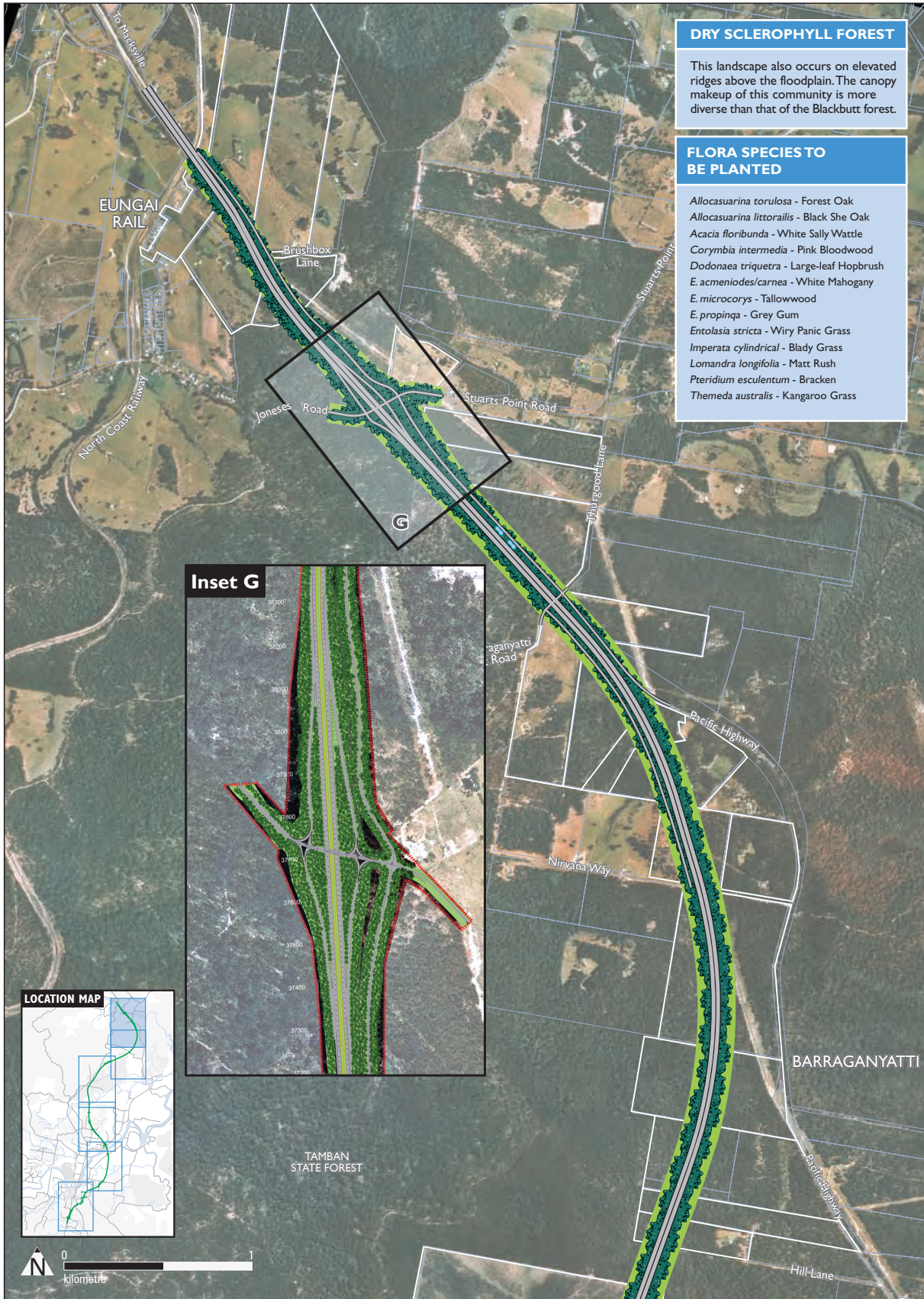
Allocasuarina torulosa - Forest Oak
Allocasuarina littoralis - Black She Oak
Acacia spp - Wattle
Banksia oblongifolia - Fern-leaved Banksia
E. acmeniodes/carnea - White Mahogany
E. globoides/eugenoides - Thin-leaved Stringybark
E. microcorys - Tallowwood
E. pilularis - Blackbutt
E. propinqua - Grey Gum
E. resinifera - Red Mahogany
E. siderophloia/placita - Box Iron Bark
E. signata - Scribbly Gum
Entolasia stricta - Wiry Panic Grass
Imperata cylindrical - Blady Grass
Leptospermum polygalifolium - Yellow Tea Tree
Lomandra longifolia - Matt Rush
Melaleuca sieberi - Siebers Paper Bark
Pteridium esculentum - Bracken
Themeda australis - Kangaroo Grass

▬ The proposed upgrade

☞ Sedimentation basin

Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

Figure 19-3f Landscape concept design



▬▬▬ The proposed upgrade

○ Sedimentation basin

Note: This landscape zone occurs in various locations along the proposed upgrade. Landscape design would be subject to refinement during detailed design.

Interchange concepts

The three proposed interchanges would each have a distinct character.

The South Kempsey interchange is the point where a decision to detour to Kempsey would be made by northbound motorists. The interchange would be marked by an overpass and flanked by on and off ramps. In order to portray some of the cultural character of Kempsey it is proposed that *Toona australis* (Red Cedar) is used as the feature tree, reflecting Kempsey's image as a Cedar town (refer Figure 6-4). The road leading from the interchange to Kempsey (existing Pacific Highway) would also be lined with *Toona australis*. A service road would be constructed on the north-eastern side of the interchange, providing access to future industrial land. The road would be lined with *Eucalyptus pilularis* as an avenue tree. Beyond this, the forest landscape would be reinstated.

The Frederickton interchange marks the end of the Macleay River floodplain crossing and would be located on a ridge. It would also be used as an access point to Kempsey for southbound motorists. Landscaping would correspond with existing clusters of Brushbox (*Lophostemon confertus*) and fig trees. New embankments would be rounded to integrate with existing topography. The service road connecting the interchange with Frederickton would follow the back of the ridgeline before dropping into a valley. In this area, landscaping would reinforce existing clusters of trees, particularly in the vicinity of Frederickton Public School and Frederickton Golf Course where additional screening is required.

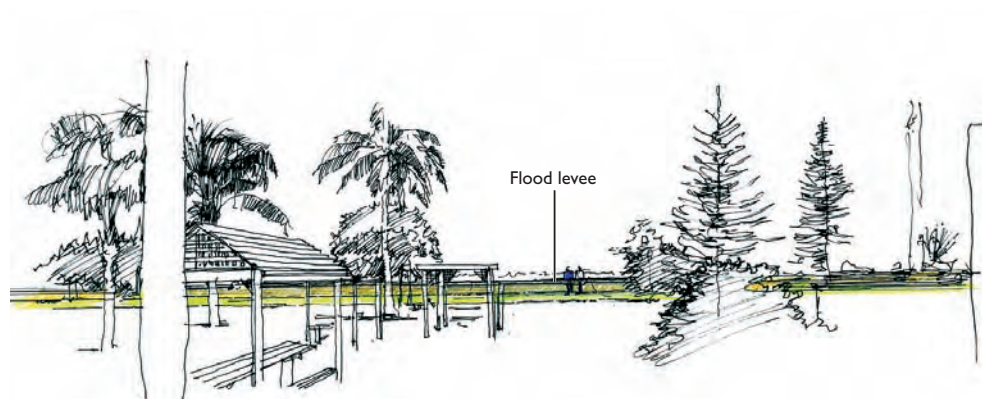
The Stuarts Point Road interchange is located at the northern end of the corridor and would be surrounded by dense forest. It is proposed to plant dense stands of *Eucalyptus pilularis* to define the interchange and associated on and off-ramps.

Frederickton levee

The form of the Frederickton levee would respond to existing site constraints. In some locations an earth bank would be used; in other locations, where space is limited, an in situ concrete wall would be used. Where in situ concrete walls are used, the wall would be located to ensure that fill grading behind the wall would enable access to views of the Macleay River from affected properties where possible. The design of the proposed levee would minimise impacts on the visual environment and views across the Macleay River as well as the heritage values of the draft Frederickton conservation area.

To reduce the visual impact of the flood levee, endemic vegetation would be planted along the river bank and integrated with existing native vegetation as shown in Figure 19-4.

Figure 19-4 Perspective drawing of Frederickton levee from Macleay River Hotel



Other landscape treatments

The proposal is for a rural highway. Therefore, the landscape response would reflect the natural and cultural environment through which the proposed upgrade passes. The landscape design for the proposed upgrade focuses on revegetation and integration. The implementation of the design would involve direct seeding and planting methods, with all seed and plant material sourced locally.

The proposed planting palettes to be used in landscaping treatments include:

- Pasture / floodplain.
- Lowlands.
- Blackbutt forest.
- Dry sclerophyll forest.

The occurrence and character of these treatments would reflect the existing land use and topography of the areas that the proposed upgrade passes through. By highlighting the character attributes of each zone, it would be possible to instil in the road character a sense of being part of the broader landscape and a sense of progression that would be absent if a uniform treatment was applied.

Planting in the Blackbutt and dry sclerophyll forests would need to consider the implications of fauna adjacent to the road, in particular Koala, phascogale and Glossy Black-cockatoo activity. Generally, species identified as feed trees should not be planted close to the proposed upgrade. When planted, feed species like these would be placed outside of fauna fences. The landscapes associated with the above planting palettes and the species mix for each are detailed in Figure 19-3a to 19-3f.

An example of landscaping treatments at a local road overpass (Crescent Head Road) is provided in Figure 19-5.

Figure 19-5 Perspective drawing of Crescent Head Road overpass and landscape concept

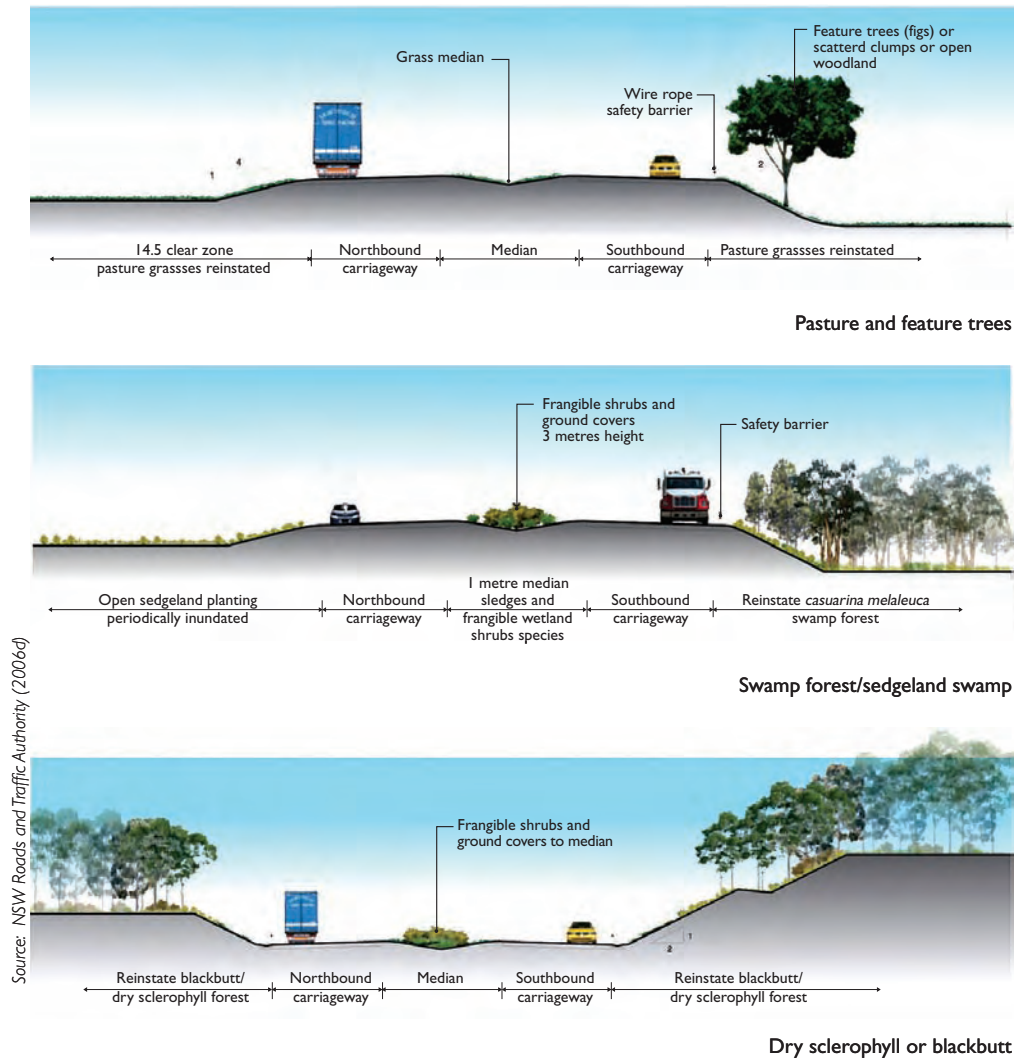


Rest areas would not be planted with Blackbutt, as these trees have a high potential to drop limbs during high winds.

The main landscape treatments for the proposed upgrade are shown on the plan (Figures 19-3a to 19-3f) and cross-sections (Figure 19-6).

The landscape concept plan, including planting species and layout, would be further refined during the detailed design phase of the project.

Figure 19-6 Landscape concept plan – sections



19.5.1 Summary of management measures

Standard and project-specific mitigation and management techniques for visual impacts and landscaping arising from the construction and operation of the proposed upgrade are included in the draft Statement of Commitments for the proposed upgrade in Appendix D and are summarised below.

- Prepare, seek approval for and implement an Urban Design and Landscape Plan before Construction commences. The Plan will present an integrated urban design for the Activity, applying design principles established in the Environmental Assessment. The Plan will include design treatments for:
 - Location and identification of existing vegetation and proposed landscaped areas.
 - Built elements including retaining walls, bridges and noise walls.
 - Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings.
 - Fixtures such as seating, lighting, fencing and signs.
- The Plan will also include:
 - Graphics for key elements such as sections, sketches, perspective views.
 - A schedule of species to be used in landscaping. The derivation of the schedule will be explained including its relationship with the Activity's ecological studies.
 - Details of the timing and progressive implementation of landscape works considering related environmental controls such as erosion and sedimentation controls and drainage.
- Procedures and methods to monitor and maintain landscaped or rehabilitated areas both inside and outside the Activity.
- The landscaping plans for the proposed upgrade will consider the retention of existing views and vistas from the highway having regard to road user safety requirements.
- Disturbed areas will be progressively revegetated using plant species of local provenance selected in consultation with a qualified landscape officer.
- Cuttings and embankments will be graded out wherever feasible to reflect and best fit the characteristics of the local landform.
- Implement any required remedial measures to maintain landscaping works to the design standard established in the Urban Design and Landscape Report.
- Monitor and maintain landscape or rehabilitation works which, following Construction, are not the responsibility of the RTA for a period of three years following completion of any landscaping stage or as otherwise identified in the Urban Design and Landscape Report.

