



# Warrell Creek to Urunga Upgrading the Pacific Highway

## ENVIRONMENTAL ASSESSMENT

### VOLUME 1 ENVIRONMENTAL ASSESSMENT

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## 6. Description of the Proposal

*This chapter provides a detailed description of the Proposal, including the main design features. It also describes the key inputs and considerations in the development of the design of the Proposal.*

| Director-General's requirements                                                                                                             | Where addressed in the EA                       |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| A <b>detailed description</b> of the project including:                                                                                     | Section 6.2.4 Requirements for Level of Service |
| ▪ route alignment and corridor width;                                                                                                       | Section 6.4 Description of the Proposal         |
| ▪ design elements (e.g. requirements for LOS, pedestrian and cyclists , rest areas and service centres etc);                                | Section 6.4.1 Route alignment                   |
| ▪ differentiate the limits of the Project with respect to the existing Pacific Highway, including operational/maintenance responsibilities; | Section 6.4.2 Corridor width                    |
| ▪ potential staging;                                                                                                                        | Section 6.5 Design elements                     |
| ▪ ancillary facilities (e.g. compound sites, batching plants etc); and                                                                      | Section 6.5.7 Cyclists and pedestrians          |
| ▪ resourcing (e.g. construction material needs, spoil disposal, natural resource consumption including water).                              | Section 6.5.10 Rest areas and service centres   |
|                                                                                                                                             | Section 7.2 Potential staging                   |
|                                                                                                                                             | Section 7.3 Earthworks and Resources            |
|                                                                                                                                             | Section 7.3.7 Ancillary facilities              |
|                                                                                                                                             | Section 19.4.2 Management measures (waste)      |

### 6.1 Background and key Proposal features

The description of the Proposal is based on the concept design. The concept design has been developed in response to design, community and environmental constraints. Urban design and sustainability principles have shaped the development of the route options, selection of the preferred route and the development of the concept design. Where warranted, the design has been refined in response to the outcomes of this environmental assessment to avoid and/or minimise environmental and social impacts.

The general features of the Proposal are:

- A 42 kilometre motorway style (class M) upgrade comprising of four-lane divided carriageways (two lanes each way), with a wide median allowing for the future addition of a third lane in each direction and a 110 kilometre per hour posted speed limit.
- Controlled access to the upgrade from four new grade separated interchanges and an upgrade to the existing Waterfall Way interchange at Raleigh.
- New major highway bridges across the Nambucca River at Macksville, the Kalang River at Urunga and Warrell Creek.
- Retention of the existing highway as a local access road between Warrell Creek and Urunga.

- Floodplain bridges and culverts across sections of the Gumma floodplain at Macksville and the Kalang floodplain at Urunga.
- Noise barriers and low noise pavements at various locations.
- At residence noise treatments to houses in locations where required.
- Permanent spill containment basins at environmentally significant watercourse crossings.
- Combined fauna underpasses/drainage structures at river and creek crossings and key habitat locations.
- A dedicated fauna underpass structure, combined drainage/underpass structures and a wide vegetated median for overhead fauna movement in sections of the Nambucca and Newry State Forests.
- A major rest area for heavy and light vehicles at the Nambucca interchange.
- Ancillary construction facilities, including compound sites, batching plant sites and stockpile sites.

## 6.2 Influences on the design of the Proposal

The general standard of design for the Proposal is consistent with the Upgrading the Pacific Highway, Upgrading Program beyond 2006: Design Guidelines (RTA 2006) to ensure that there is a consistency of form and quality along the whole Pacific Highway corridor from Hexham to the Queensland border. Other major design influences include environmental opportunities and constraints, requirements for local road and property access connections and diverse issues raised through the community consultation process.

### 6.2.1 Key design standards

The main design standards adopted for the Proposal were:

- Dual carriageway highway with a 110 kilometres per hour design speed for both the horizontal and vertical alignment unless approved otherwise for specific locations by the RTA.
- Curvilinear horizontal alignment with a desirable minimum curve radius of 1200 metres, and an absolute minimum curve radius of 750 metres.
- Desirable vertical grade of 4.5 per cent, with a maximum of six per cent.
- Desirable minimum median width of 12 metres.
- Lane width of 3.5 metres with minimum width of outside shoulder of 2.5 metres and minimum width of median shoulder of 0.5 metres.
- Controlled access conditions.
- Flood immunity has been provided to the highway for the 1 in 100 year flood event.

### 6.2.2 Other influences on the design

The concept design has been developed in accordance with the above key design principles, but has also responded to a range of more specific influences, including:

- Input into design criteria by Nambucca and Bellingen Shire Councils, government agencies, special interest groups and the local community through community liaison groups and special interest meetings, landowner meetings and submissions made to the project team on the route options and the preferred route, as detailed in Chapter 5 – *Community consultation*.
- Provision of connections to the local road network to ensure safe and efficient road access for local communities in the study area.
- A hierarchy for potential impacts which would involve in the first instance avoiding a known potential impact where possible through route selection or refinement. If the impact cannot be avoided it would be managed or mitigated to reduce the impacts to acceptable levels.
- Continued access for local landowners or land managers, especially where landholdings are severed by the Proposal.
- Minimisation of disruption to local and through-traffic during construction.
- Avoidance of geotechnical constraints such as the old municipal tip site identified in Nambucca State Forest.
- An immediate reduction of conflict between local and through-traffic at opening.
- Maximum use of the existing highway road reserve and existing road infrastructure where possible.
- Provision for safe movement of fauna across the proposed highway alignment where fauna movement corridors exist.
- Maintenance of fish passage.
- Avoidance or minimisation of the extent of physical impact on state forests, nature reserves and SEPP 14 wetlands.
- Alignment considerations to minimise the extent of physical impact on Commonwealth listed species *Marsdenia longiloba* within areas of state forest.
- Provision of measures to maintain movement corridors for glider communities within areas of state forest.
- Realignment to avoid a potential item of Aboriginal heritage significance in Section 1 and refinement to reduce potential impacts on Aboriginal heritage sites identified during field investigations and through consultation of the Proposal.
- Alignment considerations to mitigate effects on Aboriginal and non-Aboriginal heritage sites and potential areas of significance, visual amenity and property boundaries where possible.
- Avoidance or minimisation of the extent of physical impact on proposed future urban areas and proposed investigation areas.
- Geotechnical, soil, hydrology and water quality considerations.

### 6.2.3 Urban and landscape design

The following key objectives were developed specifically for the Proposal in accordance with the Pacific Highway Urban Design Framework (RTA 2005c):

- Design the upgraded highway to integrate with immediate context.
- Design for safe, yet convenient, connections to local roads and access to adjacent properties.
- Ensure and enhance visual connections to significant landscape features.
- Integrate the new highway landforms and landscape with adjoining lands where appropriate.
- Provide a positive contribution to landscape.

The landscape plan and urban design features proposed as part of the Proposal are summarised in Section 6.4 of this environmental assessment and are described in detail in Chapter 13 - *Visual amenity and design* and Working paper 2 – *Visual amenity and design*.

### 6.2.4 Requirements for Level of Service

The Level of Service (LoS) of a section of road varies from A (good) to F (poor), depending on the number of lanes, traffic volumes and the frequency of intersection and junctions. The LoS on the Pacific Highway in the study area is currently operating at a LoS of E (at capacity). In 2033 the Pacific Highway without the proposed upgrade between Warrell Creek and Urunga would operate at a LoS of F (poor), unless highway upgrades are implemented. The Proposal would operate at a LoS of A (good) in 2013 and beyond to 2033 calculated using the Austroads Guide to Traffic Engineering Practice Part 2: Roadway Capacity (Austroads 1999).

LoS is discussed in more detail in Chapter 17 – *Traffic and transport*.

## 6.3 Flexibility in design and construction

This environmental assessment is based on the current concept design which has been developed through a number of iterations of the initial functional layout. It addresses and responds to all the constraints and principles identified and established as part of the route development and environmental assessment phases of the Proposal. The concept design is intended to illustrate and describe the sustainable outcomes of a design process that has attempted to balance functional, environmental, social and cost considerations.

- The detailed design would require further investigations to be undertaken, particularly detailed survey, geotechnical and ecological investigations to identify habitats or individual plants to be retained and protected during construction. These further investigations may lead to possible refinement of the design prior to construction.
- The proposed concept design and construction methods suggested in this and the following chapter are presented as a functional solution to the Proposal objectives and constraints. They may be refined by the RTA and its construction contractor within the limits of any conditions imposed and the design constraints,

principles and standards presented in this chapter, and as such, sufficient flexibility and allowance has been provided to allow refinement of design to be consistent with the concept design principles and any conditions of approval.

- The Proposal facilitates the retention of some construction water quality basins for the operation on the new highway.

## 6.4 Description of the Proposal

The concept design of the Proposal, including its horizontal and vertical alignment is shown in **Figure 6-1** to **Figure 6-4**. The overall length of the Proposal is approximately 42 kilometres. The upgrade commences at the northern end of the existing Allgomera deviation of the Pacific Highway, south of Warrell Creek and ends at the existing Waterfall Way interchange to the north. The Proposal has been divided into four geographical sections for assessment purposes which include:

- From the northern end of the existing Allgomera Deviation of the Pacific Highway, south of Warrell Creek, to the northern bank of the Nambucca River, a length of approximately 11 kilometres (Section 1).
- From the northern bank of the Nambucca River to the railway crossing west of Nambucca Heads, a length of approximately 7.5 kilometres (Section 2).
- From the Railway crossing west of Nambucca Heads to Ballards Road, south of Urunga, a length of approximately 11.5 kilometres (Section 3).
- From Ballards Road to the existing Waterfall Way interchange, a length of approximately 12 kilometres (Section 4).

Descriptions of these four sections and accompanying figures are provided in Section 6.4.1.

### 6.4.1 Route alignment

#### 6.4.1.1 Section 1 - Allgomera deviation to Nambucca River

The southernmost section of the Proposal, extending from the northern end of the Allgomera deviation to the northern bank of the Nambucca River, is approximately 11 kilometres long. The proposed Warrell Creek interchange represents the southern limit of the Proposal. Its layout and operations are described in Section 6.4.2. This section of the Proposal would be controlled access (motorway standard upgrade), with no access from the local road network, other than via the interchanges provided. It would be a dual carriageway highway and would deviate from the existing highway just north of the northern end of the Allgomera deviation. It would involve bridging across Upper Warrell Creek and the North Coast Railway Line prior to traversing vegetated land to the east of Cockburn's sawmill.

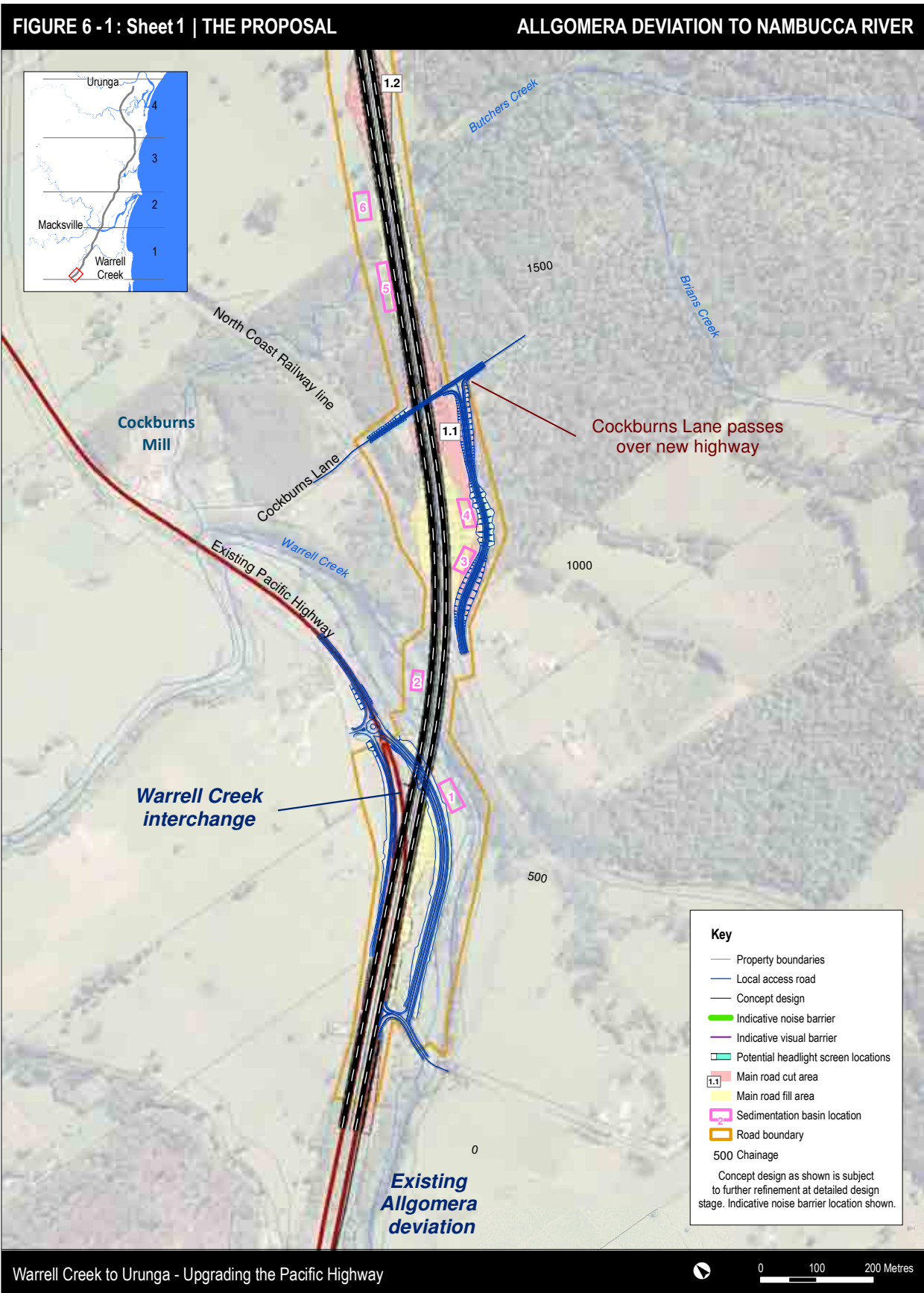
The Proposal would then traverse in a north-easterly direction, avoiding flood prone land and passing as close as practicable to property boundaries to minimise property severance. The Proposal would then veer north, crossing under Rosewood Road and deviating north-east to run parallel with the existing highway. In this area, it would also

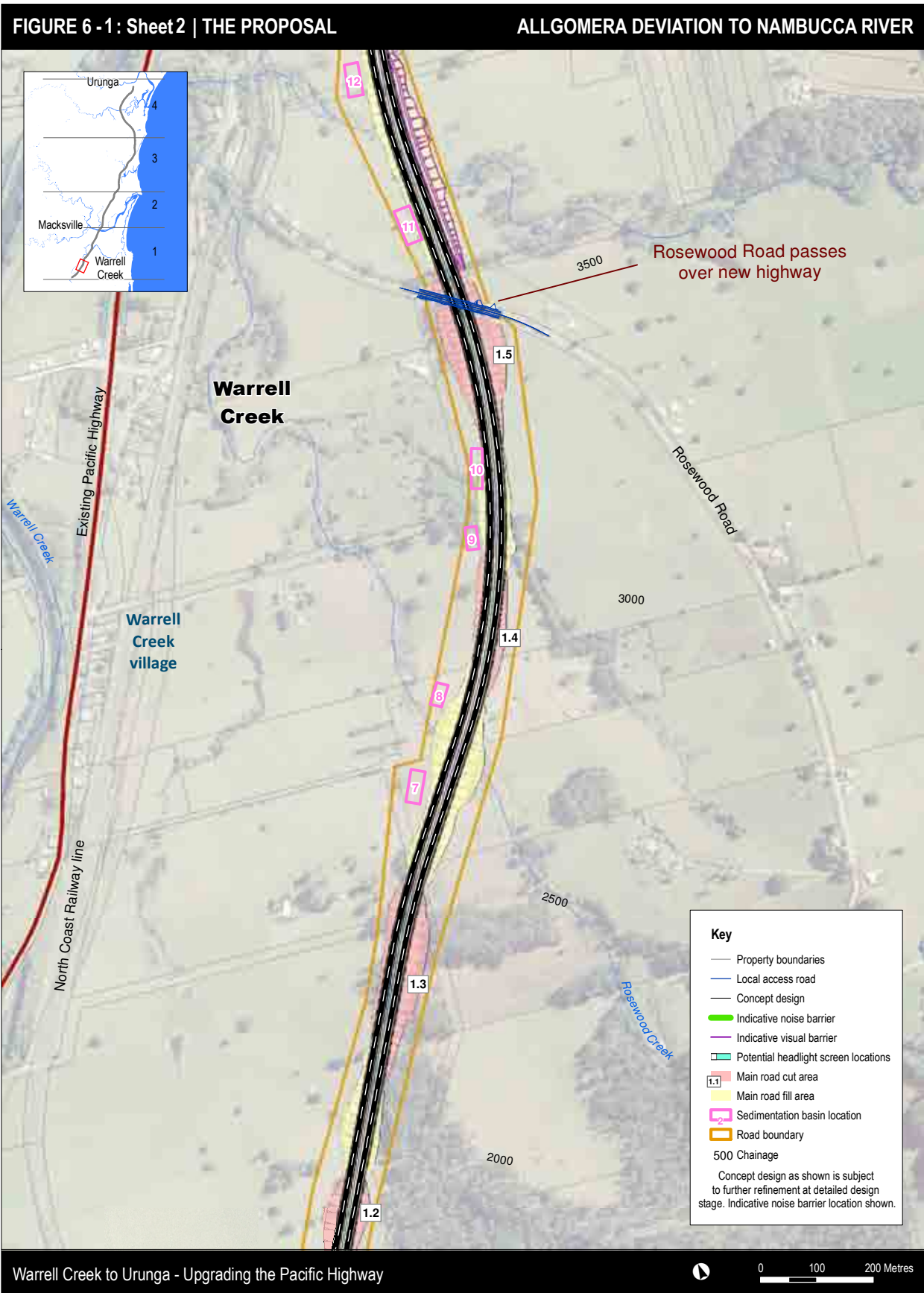
pass under Albert Drive. At this point, the Proposal would be located adjacent to and east of the existing highway, with the existing highway alignment being retained as the local access road.

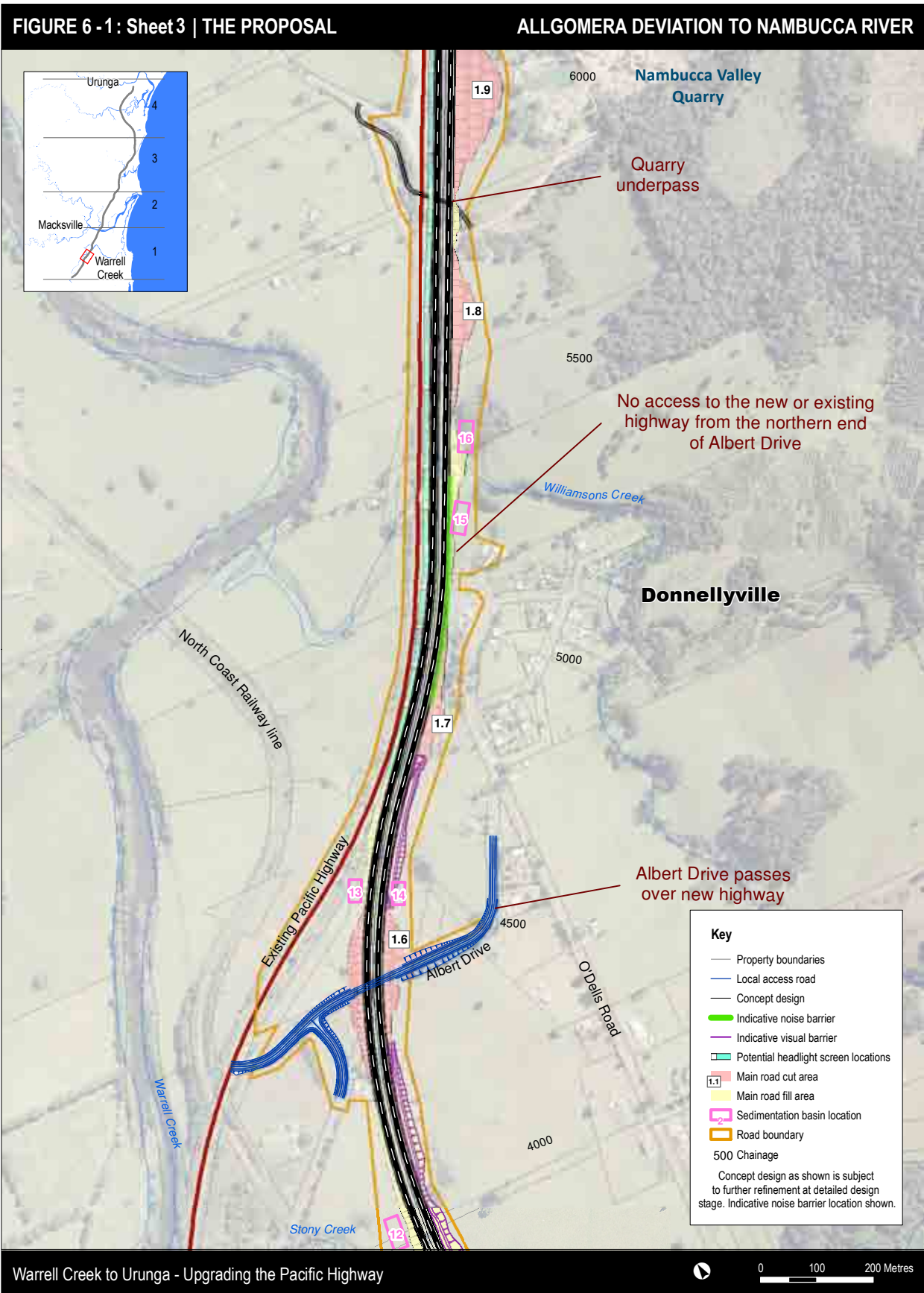
The Proposal would run parallel to the existing highway between Albert Drive and Warrell Creek and then veer north just south of Bald Hill Road, south of Macksville. After crossing under Bald Hill Road, the Proposal would extend north-east through predominantly cleared agricultural floodplain land. It would pass close to SEPP14 wetland No.388 and has been designed to generally avoid adjacent vegetation. The Proposal would cross over River Street on the western side of the Macksville sewage treatment plant and bridge over the Nambucca River immediately downstream of the confluence with Newee Creek. Between the southern end of the Proposal and the Nambucca River, the existing highway would be retained as a two-way local access road on the western side of the new highway.

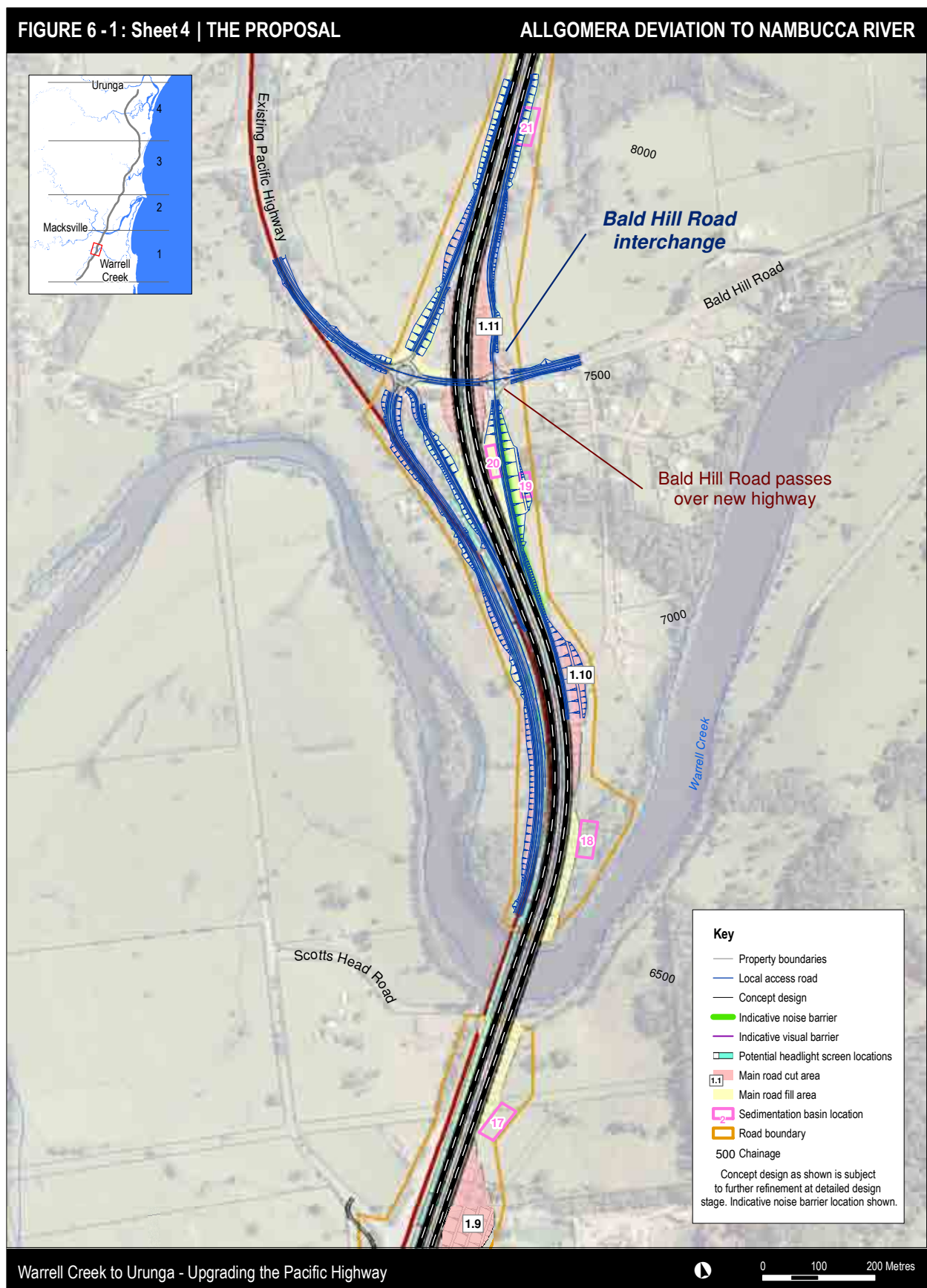
Key features of the design in the Allomera deviation to Nambucca River section can be seen in **Figure 6-1** and include:

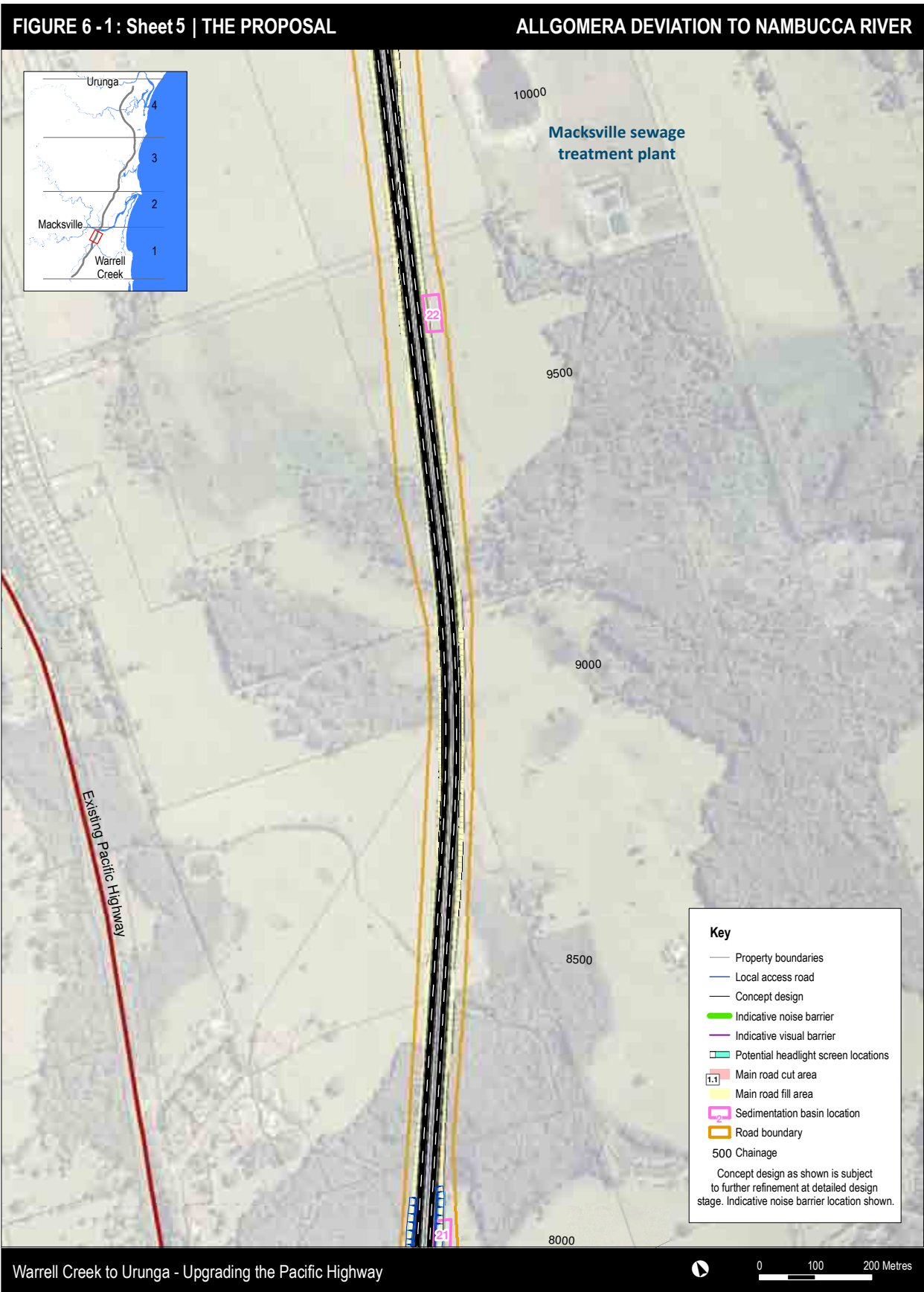
- A grade-separated interchange at the southern end (in the vicinity of Browns Crossing Road) to provide safe entry and exit to and from the Proposal for local traffic accessing the Warrell Creek village and Donnellyville.
- New twin bridges over Upper Warrell Creek and the North Coast Railway Line.
- A bridge would be provided at Cockburns Lane to maintain access between the existing Pacific Highway and properties to the east of the Proposal.
- Realignment of Albert Drive to provide a new bridge across the Proposal and a new intersection onto the existing highway.
- Closure of the northern intersection of Albert Drive and the existing highway to rationalise crossings of the Proposal.
- An underpass connecting the existing Nambucca Valley Quarry on the eastern side of the highway to Scotts Head Road on the western side of the highway to avoid the need for quarry vehicles and other vehicles travelling through Donnellyville to head south.
- New twin bridges to the east of the existing bridge crossing of Warrell Creek.
- A grade-separated interchange at Bald Hill Road. The interchange has been designed to cater for the predicted traffic volumes associated with existing and future development in Macksville, Warrell Creek, Donnellyville and Scotts Head. It provides access on and off the upgrade and also enables local traffic to pass over the upgrade.
- A series of floodplain bridge or culvert structures, integrated with fill embankments, across the Gumma floodplain.
- Fauna underpasses combined with drainage structures across the floodplain and provision of dry fauna passage beneath structures at Warrell Creek and the Nambucca River.
- New, high level twin bridges crossing the Nambucca River approximately 11 metres above water level.

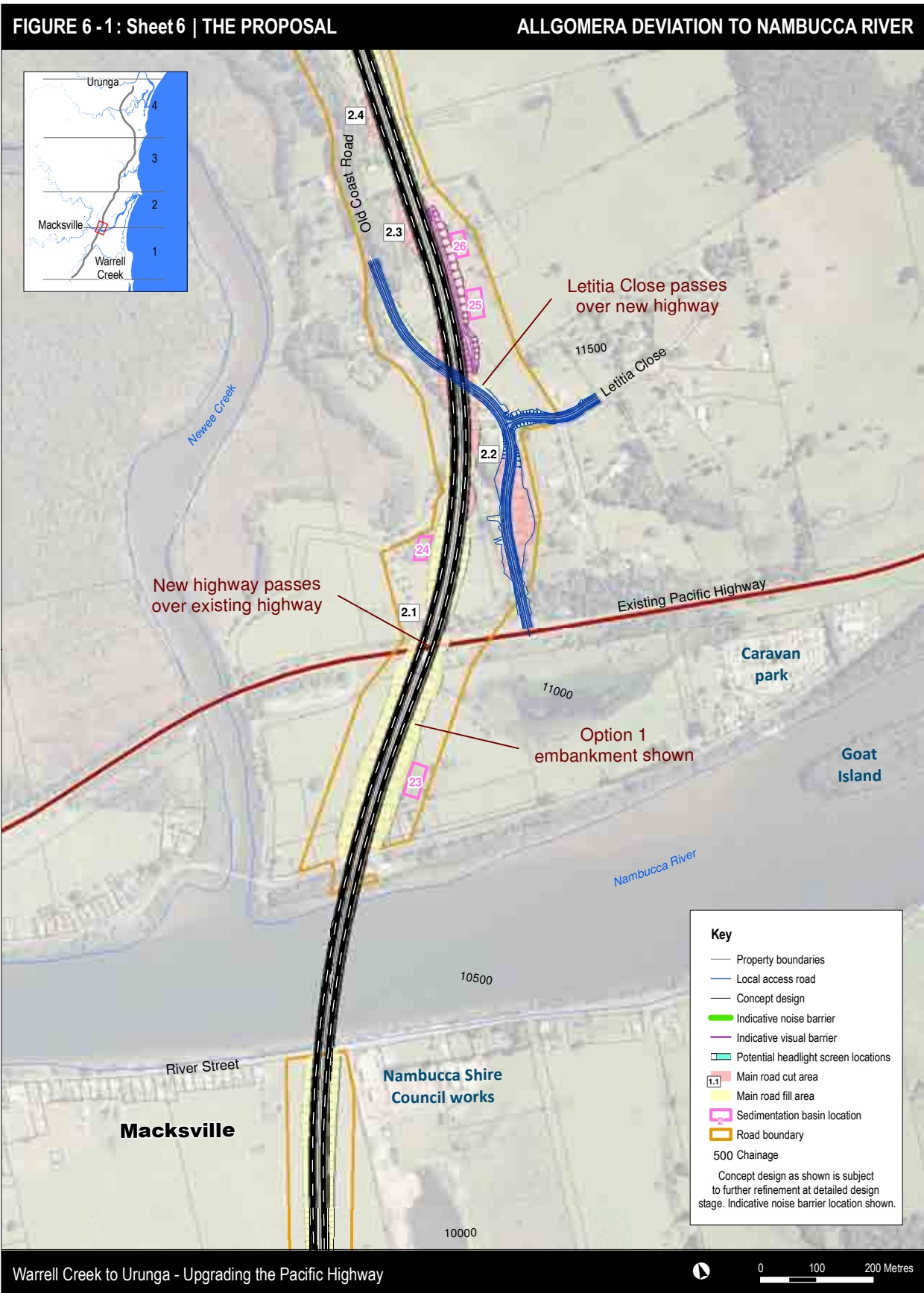












- Indicative locations for low noise pavements at Warrell Creek (approximately 2.3 kilometres in length) and the northern abutment bridge over Warrell Creek to Old Coast Road (approximately 5.15 kilometres in length) (see Chapter 14 – *Noise and vibration* and Working paper 3 – *Noise and vibration*).
- Indicative locations for noise barriers at Albert Drive to Donnellyville (approximately 1.5 kilometres long, approximately 4.5 metres high above pavement level), at Donnellyville (approximately 300 metres long, approximately 4.5 metres high above pavement level) and at the Bald Hill Road interchange (350 metres long, four metres high above pavement level) (see Chapter 14 – *Noise and vibration* and Working paper 3 – *Noise and vibration*).
- Indicative locations for visual mounds constructed from surplus spoil from Rosewood Road to Albert Drive, approximately 570 metres long and up to three to four metres high (above natural surface).

#### 6.4.1.2 Section 2 - Nambucca River to Nambucca Heads

This section of the Proposal extends from the northern bank of the Nambucca River to where the North Coast Railway line crosses the existing highway to the north-west of Nambucca Heads (refer to **Figure 6-2**). As for all sections, the Proposal in this section is a fully controlled access (motorway style) dual carriageway and is approximately 7.5 kilometres long. It largely follows the alignment of Old Coast Road, requiring sections of parallel local access road to be constructed to provide a local access route adjacent to the Proposal.

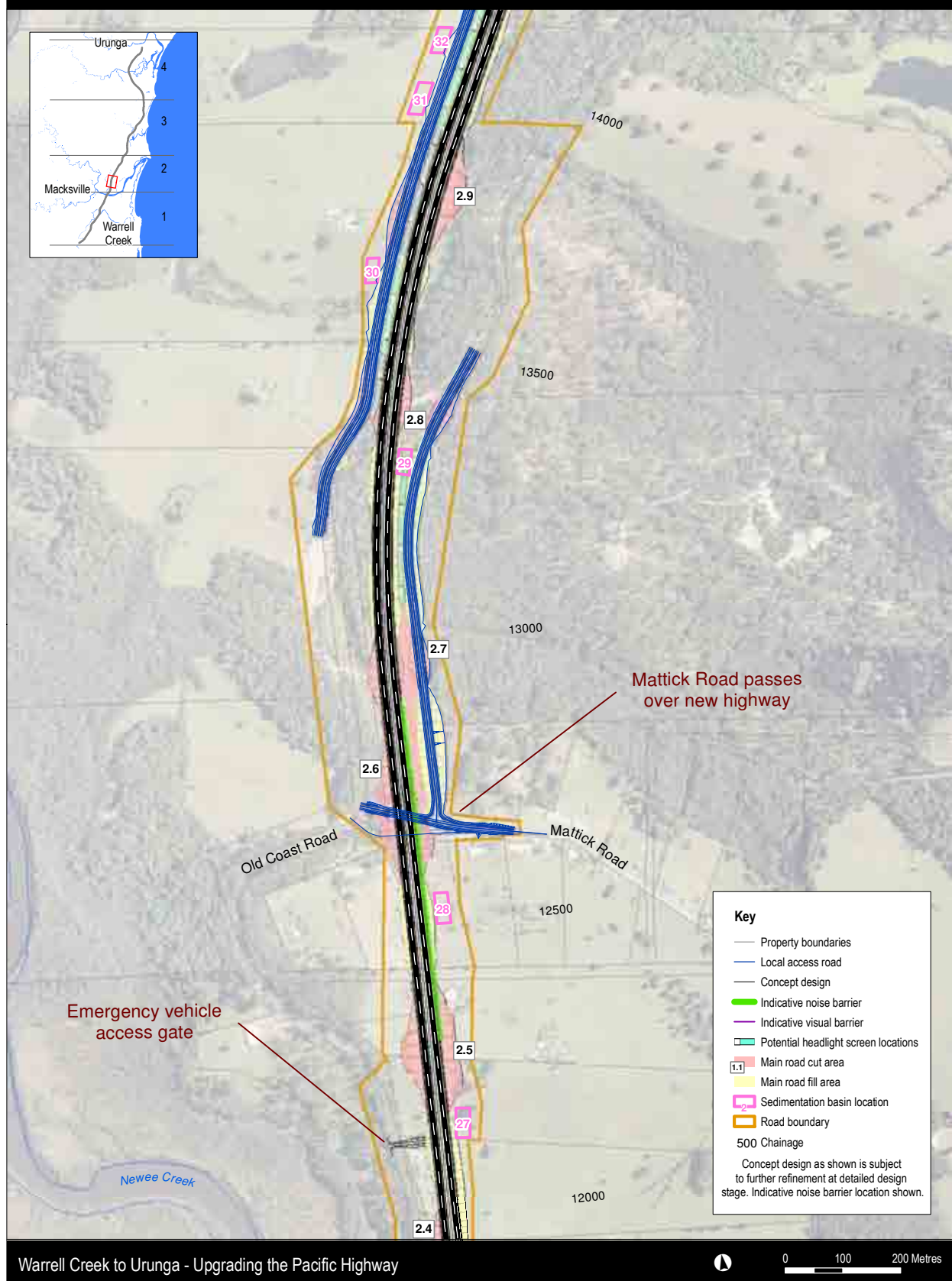
A complex part of the concept design in this section is the elevated roadway from the northern bank of the Nambucca River to the high ground north of the existing highway at Old Coast Road. Two options have been considered for this area; a bridge and an earthworks embankment over the floodplain. There are benefits and disadvantages associated with each option.

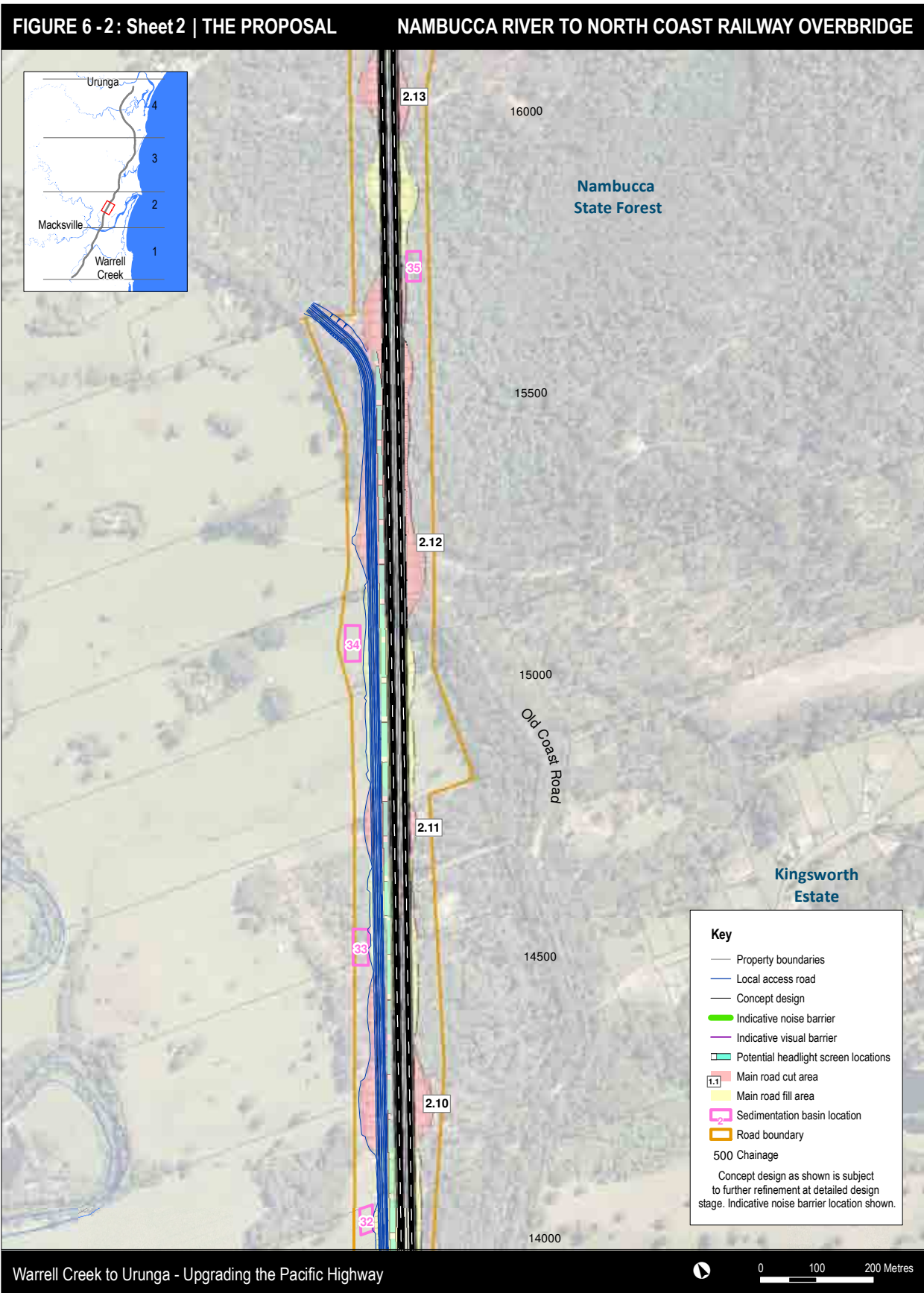
The bridge would have reduced settlement risk, would maintain existing drainage patterns and would have lower ongoing maintenance costs than the embankment option. It would also have lesser property and ecological impacts due to the smaller footprint. The visual impacts of the bridge would be greater as the higher vertical alignment for the southern part of Section 2 would provide fewer opportunities for visual screening. Noise mitigation options would be limited to construction of noise barriers.

The embankment option was investigated with and without wick drains. In terms of operational performance, long term consolidation of the soft soils on the floodplain is likely to result in differential settlement between the bridge and the earth embankment and reduce the driver experience. The embankment option has a larger footprint which may increase property impacts. Further, the residual settlement would result in higher ongoing maintenance costs across the floodplain. There are greater opportunities for screening across the floodplain with an embankment through growth of vegetation on the fill batter, and as such, the embankment would have beneficial outcomes in terms of visual screening. Noise mitigation options for an embankment include a mound or a barrier, however consideration is required to flow paths during large flood events.

FIGURE 6 -2: Sheet 1 | THE PROPOSAL

NAMBUCCA RIVER TO NORTH COAST RAILWAY OVERBRIDGE





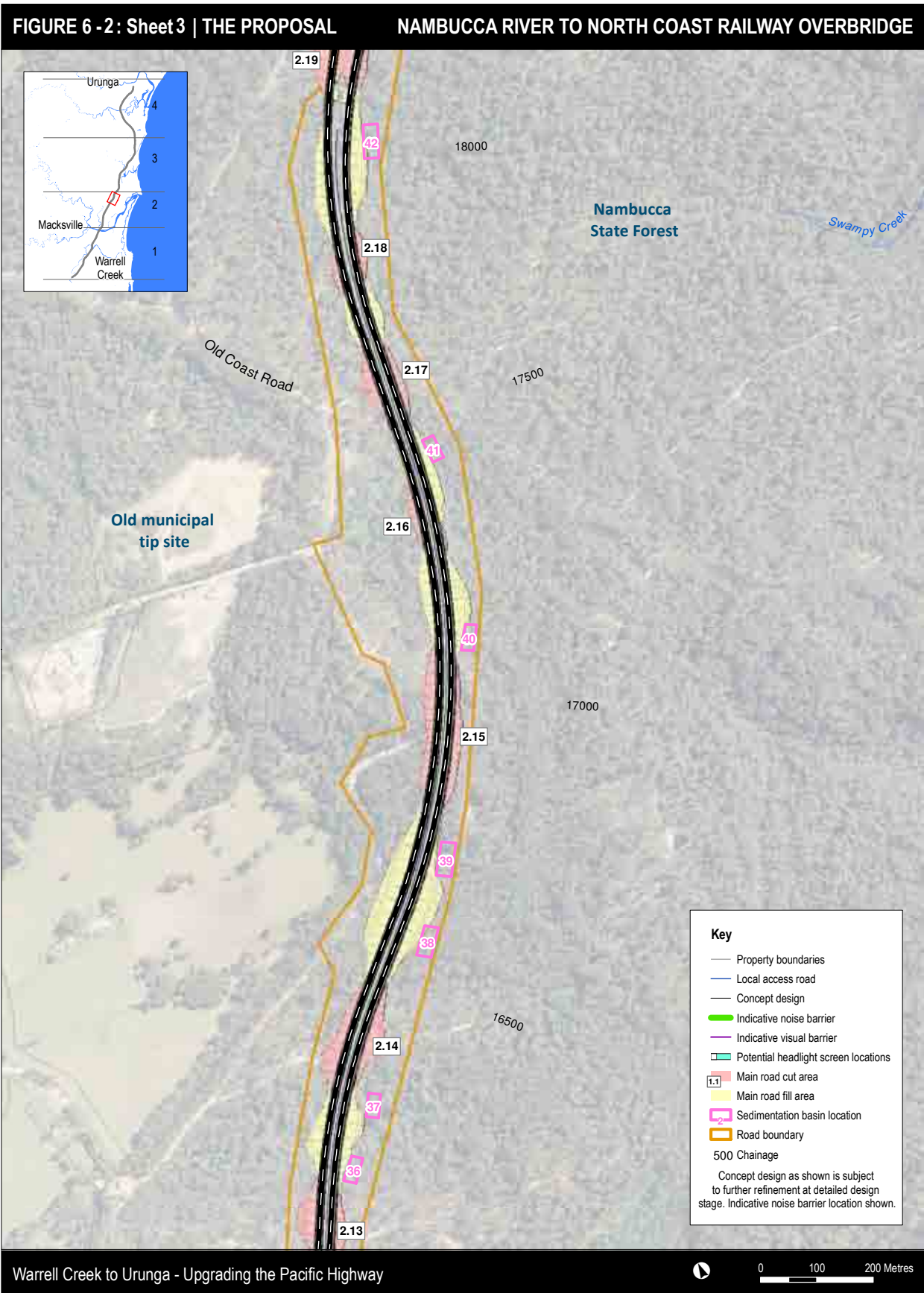
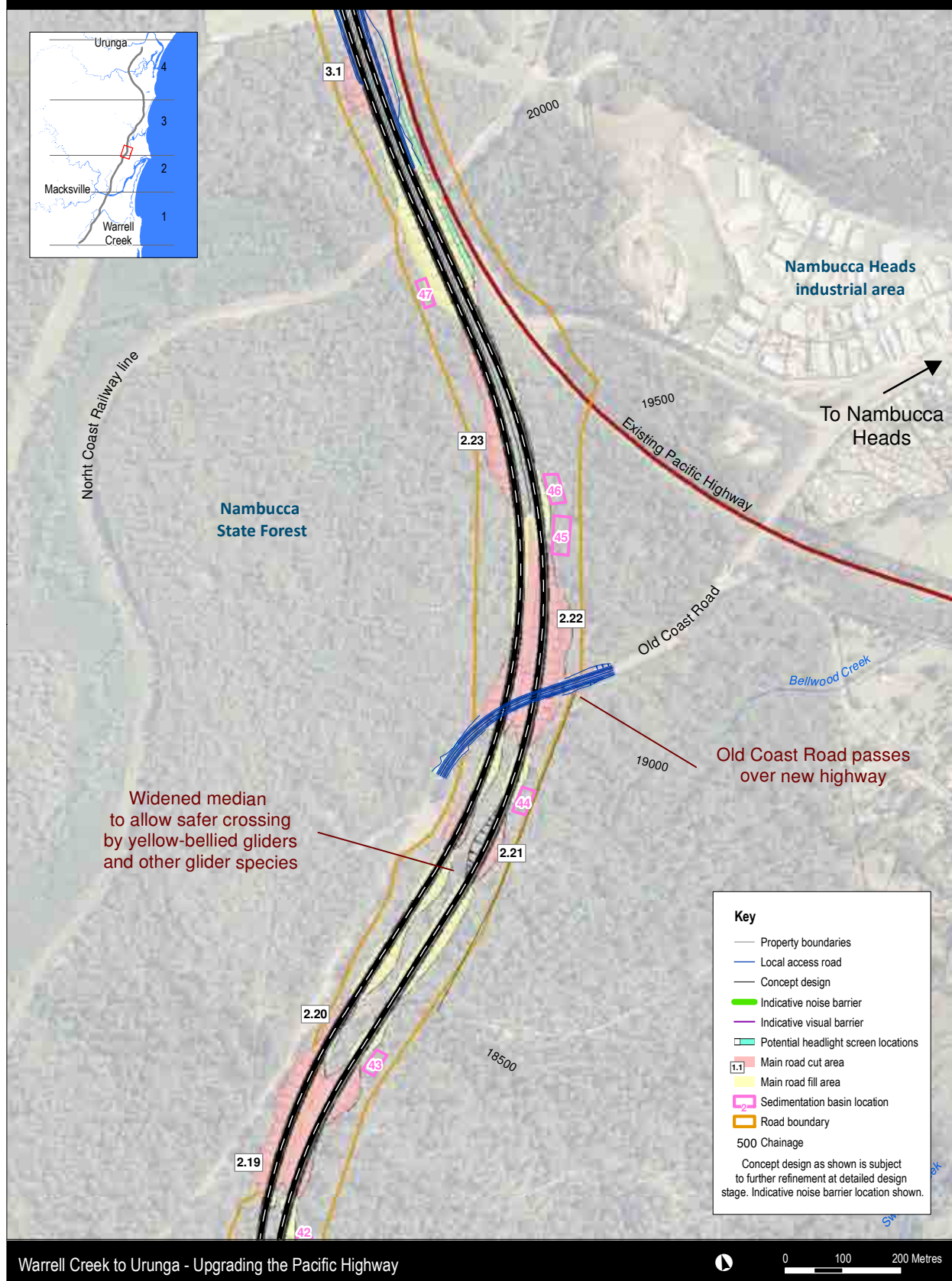


FIGURE 6 -2: Sheet 4 | THE PROPOSAL

NAMBUCCA RIVER TO NORTH COAST RAILWAY OVERBRIDGE



Drainage across the embankment would be facilitated by cross drainage culverts to achieve the overall design objectives. However, the lower overall vertical alignment and potential impedance to flow has the potential to exacerbate future climate change impacts (if any) which may occur in the area.

The embankment option would be cheaper to construct than the bridge option and is likely to achieve the project/design objectives at a lesser cost than the bridge option. There is also the greater potential to achieve a cut / fill balance with the embankment option. The embankment option would have a larger footprint and as such has been used as the base case for the concept design.

Both options are considered feasible for construction, and have similar impacts. Therefore, to maintain flexibility for an innovative and cost effective solution, approval is being sought for either option with a final decision to be made regarding the option to be adopted as part of the detailed design stage.

Key features of the Nambucca River to Nambucca Heads section include:

- Continuing north from the proposed high level bridge crossing over the Nambucca River, bridging over the existing highway just to the west of its existing Pacific Highway and Old Coast Road intersection.
- Locating the alignment on the eastern side of the ridgeline in the southern section to provide greater protection for the Newee Creek wetland (SEPP 14 wetland No. 383) from potential runoff from the Proposal. At this stage, an earthen embankment is proposed for the crossing of the floodplain north of Nambucca River, however, as detailed above there is flexibility to allow for creation of a bridge in this location during the detailed design phase.
- Provision of a new overbridge for Old Coast Road to cross over the upgrade in the vicinity of Letitia Close.
- Provision of a padlocked gate for emergency vehicle access onto the Proposal from Old Coast Road approximately 500 metres south of Mattick Road.
- Provision of a new overbridge at Mattick Road and an access road on the eastern side of the Proposal to provide access into the state forest.
- Widened medians in the northern part of the section to retain mature vegetation to facilitate the safer movement of yellow-bellied gliders across/over the upgrade and to retain individual plants of threatened species *Marsdenia longiloba* a Commonwealth 'vulnerable' listed species.
- Fauna underpasses combined with drainage structures through the state forest area to maintain east-west fauna movement.
- Noise barrier at Mattick Road, approximately 575 metres long and 4.5 metres high above pavement level.
- Visual mounds at Letitia Close (300 metres long, up to two metres high above natural surface).

#### 6.4.1.3 Section 3 - Nambucca Heads to Ballards Road

North of the crossing of the North Coast Railway Line, the Proposal traverses parallel to, and just to the west of the existing highway. The Proposal would involve the construction of a new, controlled access dual carriageway to the west of the existing highway up to the Ballards Road interchange, a length of approximately 11.5 kilometres. The existing highway would be utilised as a local access road. Details of the Proposal in this section are shown in **Figure 6-3**.

The Proposal in this section includes the Nambucca Heads interchange. This would be a full interchange which includes provision for a light and heavy vehicle rest area. The interchange was located to provide access into the proposed commercial/industrial area to the west of the Proposal at Boggy Creek.

Key features of the Nambucca Heads to Ballards Road section include:

- New twin bridges over the North Coast Railway Line.
- The Nambucca Heads interchange and rest area. The rest area would be for light and heavy vehicles. Access to the rest area for both northbound and southbound traffic would be via the interchange.
- New bridges over Boggy Creek that would also provide for fauna movement under the Proposal.
- New twin bridges over Cow Creek as well as a new bridge on the existing highway, which needs to be relocated at this location.
- New twin bridges over Deep Creek, adjacent to and west of the existing highway bridge crossing that would also provide for fauna movement under the Proposal.
- Rationalisation of crossings of the Proposal with the provision of an underpass for Valla Road and an overbridge at East West Road to connect with the existing Pacific Highway. This would include construction of local access roads to maintain property access.
- Realignment and construction of a 2.5 kilometres section of Old Coast Road on the western side of the upgrade to provide local access.
- Utilisation of the existing highway as a local access road.
- Combined drainage structures and fauna underpasses approximately 500 metres south of East West Road and in the vicinity of Oyster Creek to enable fauna movement between west of the highway and the SEPP 14 wetland areas east of the highway.
- Indicative location for low noise pavement at Valla Beach approximately 1.7 kilometres in length.

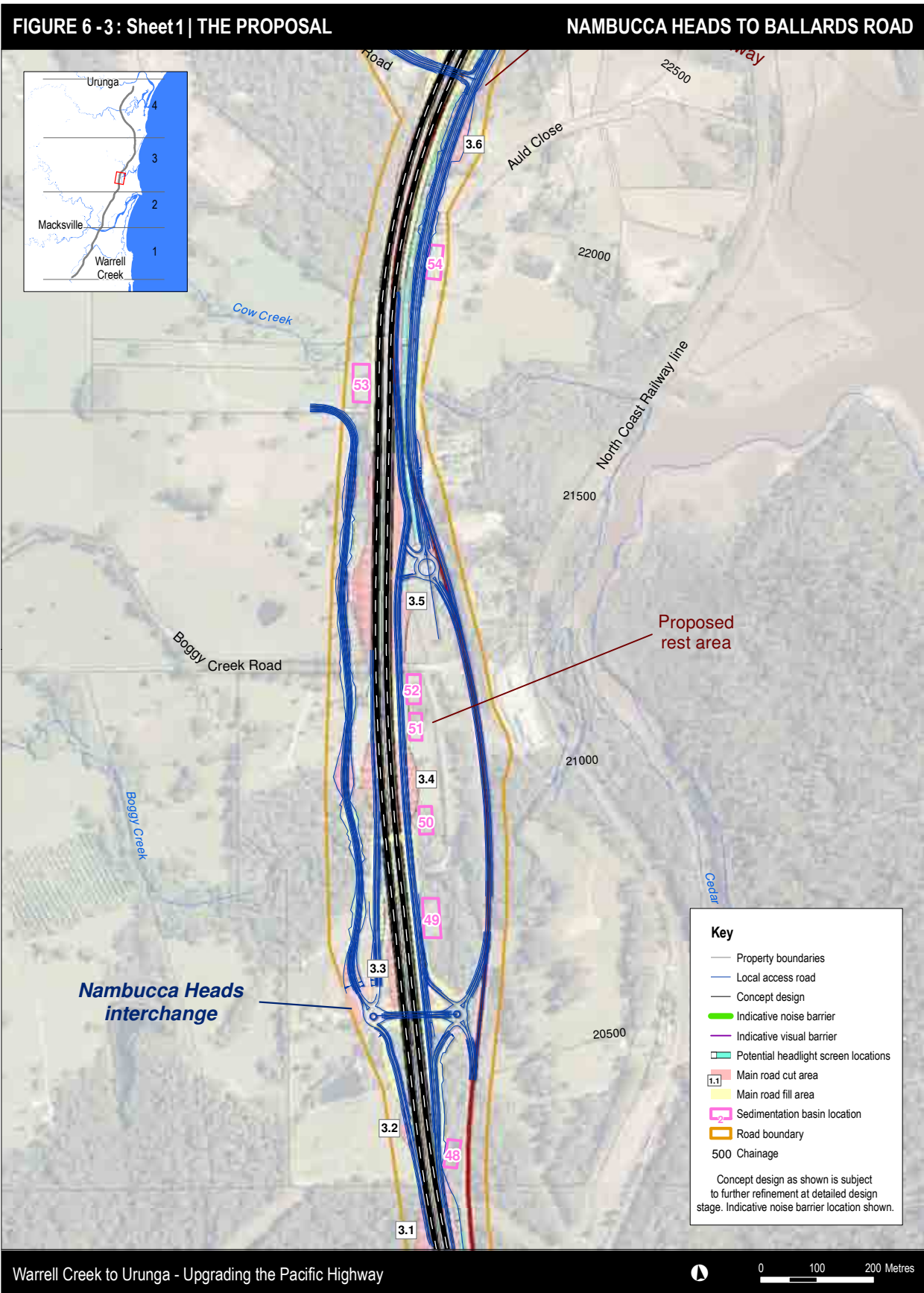
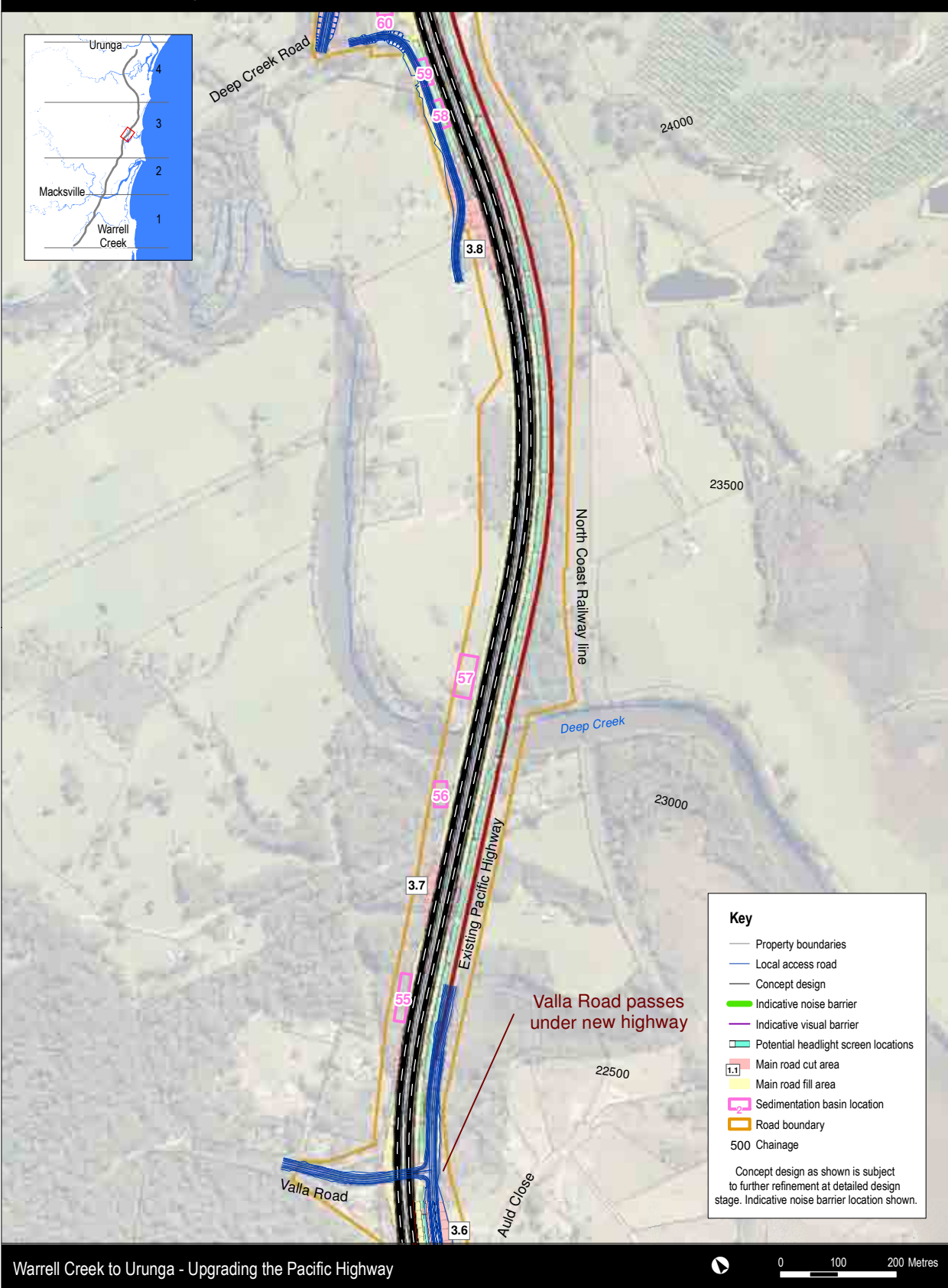
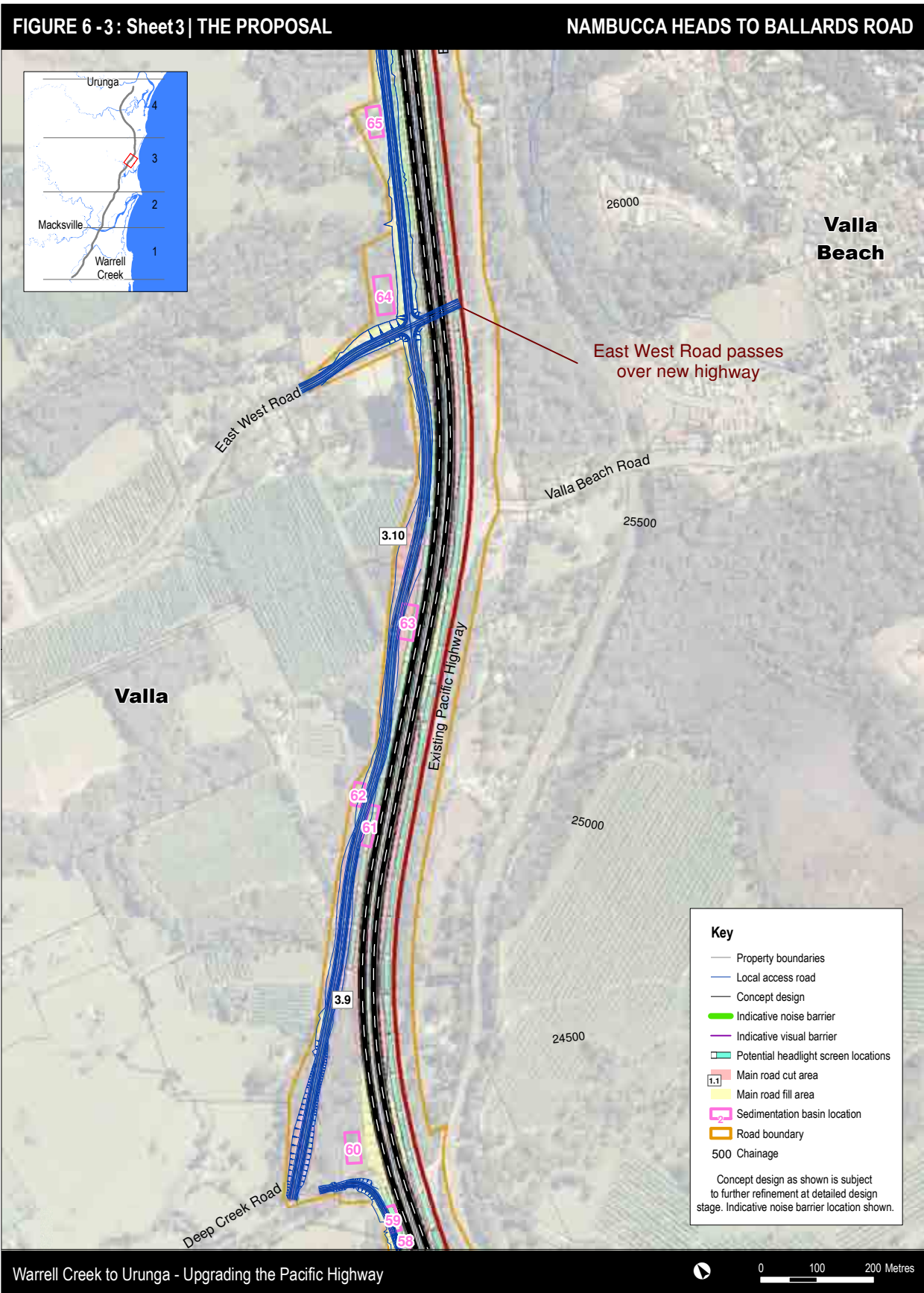
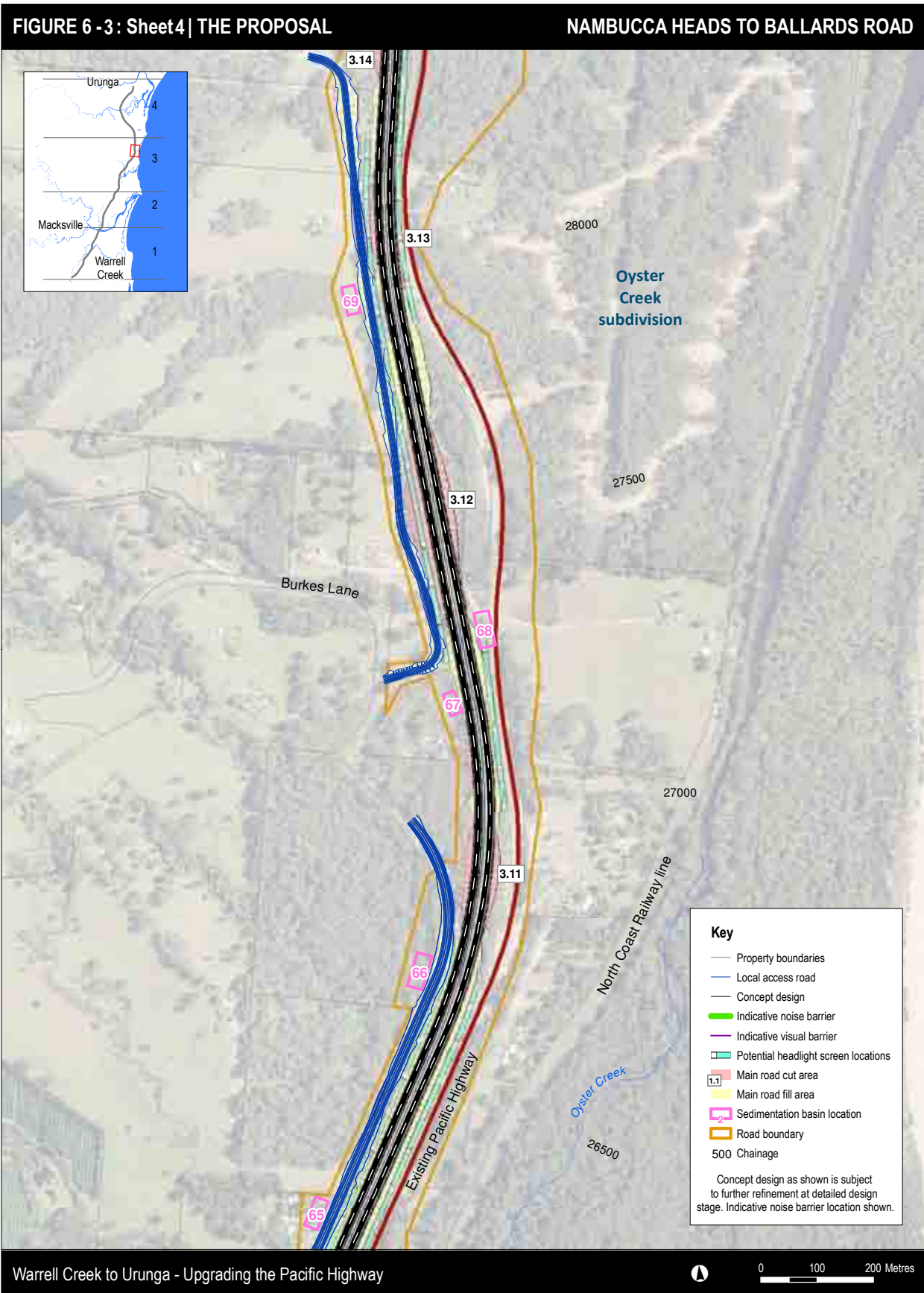


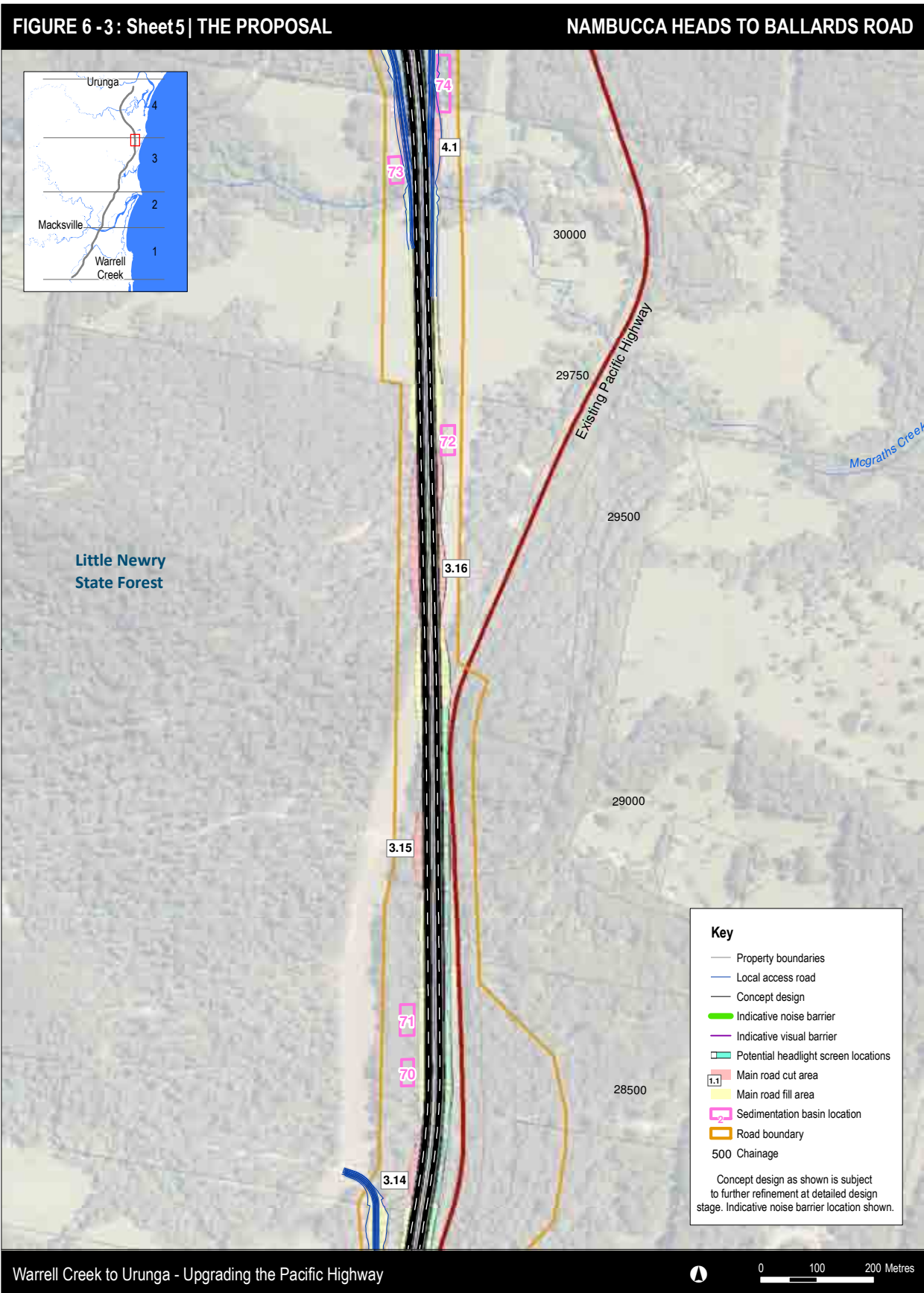
FIGURE 6 -3: Sheet2| THE PROPOSAL

NAMBUCCA HEADS TO BALLARDS ROAD









#### 6.4.1.4 Section 4 - Ballards Road to Waterfall Way

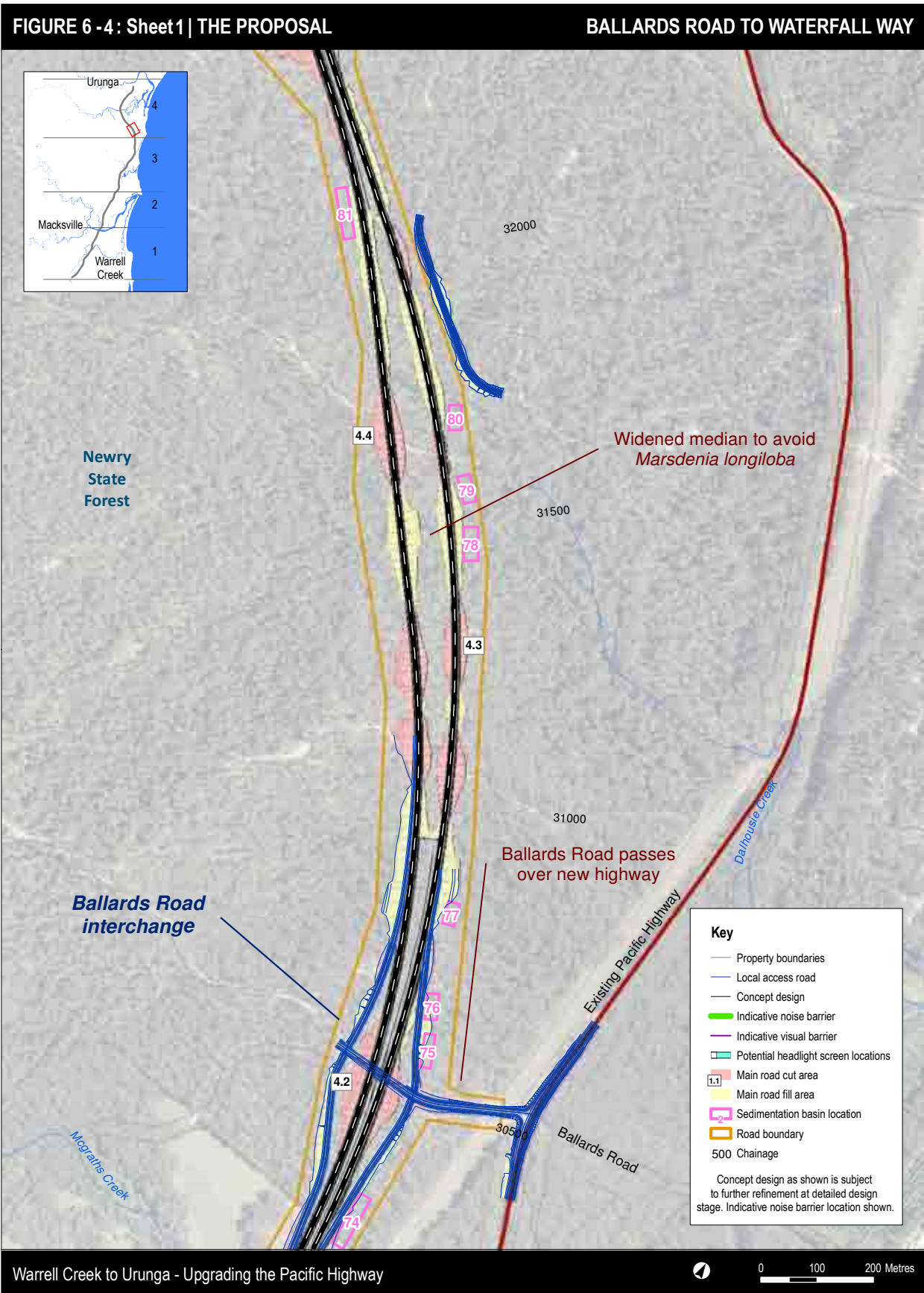
From the proposed Ballards Road interchange, the Proposal deviates from the existing highway and reconnects with the Pacific Highway in the vicinity of the existing Waterfall Way interchange at Raleigh, north of Urunga. The Proposal would require construction of approximately 12 kilometres of new controlled access dual carriageway (refer to **Figure 6-4**). A new grade-separated interchange is proposed at Ballards Road to:

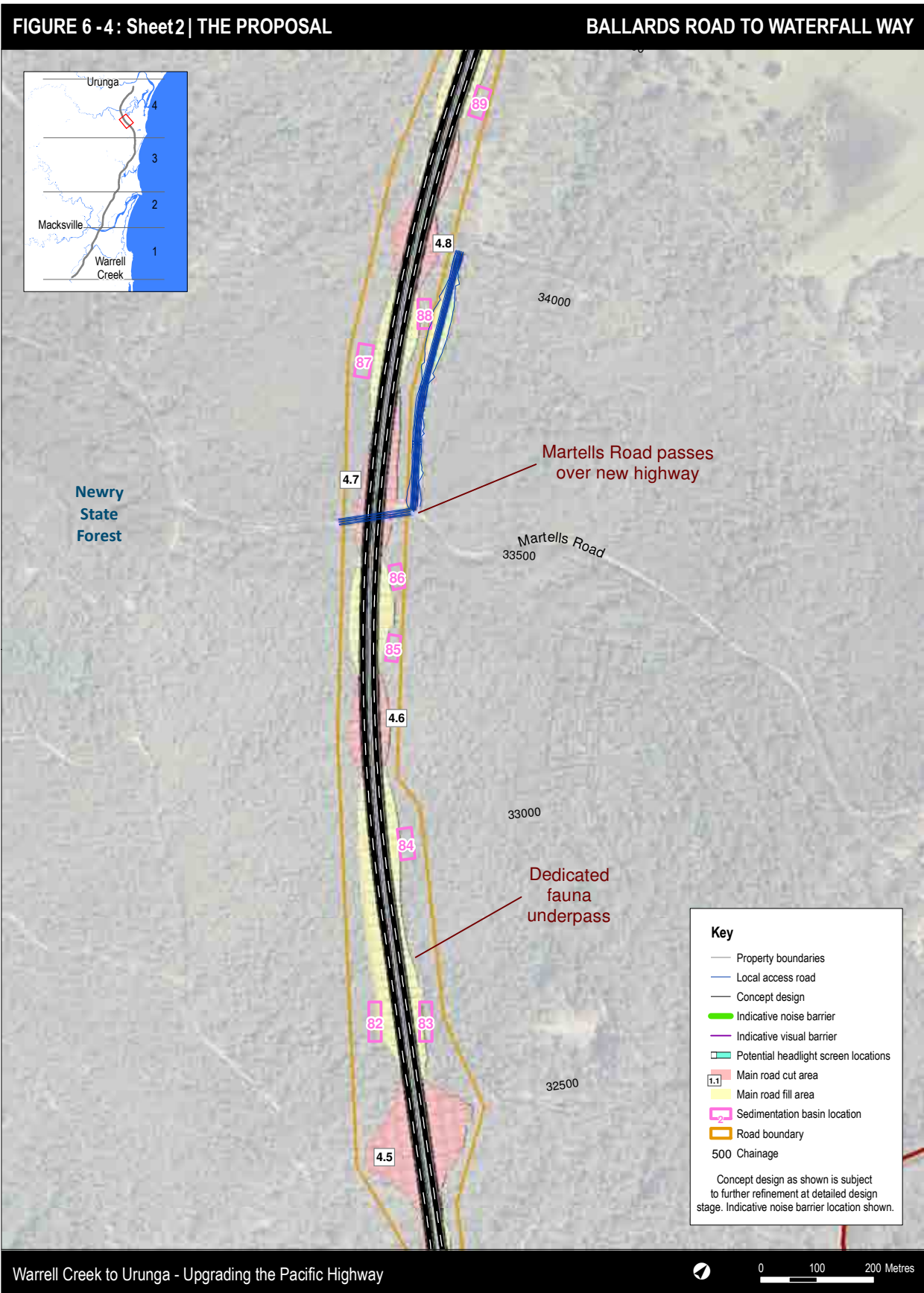
- Provide efficient access to the upgrade for emergency services
- Provide efficient access to and from Urunga.
- Provide improved access to Urunga from the south.
- Service the growing community of Valla Beach.

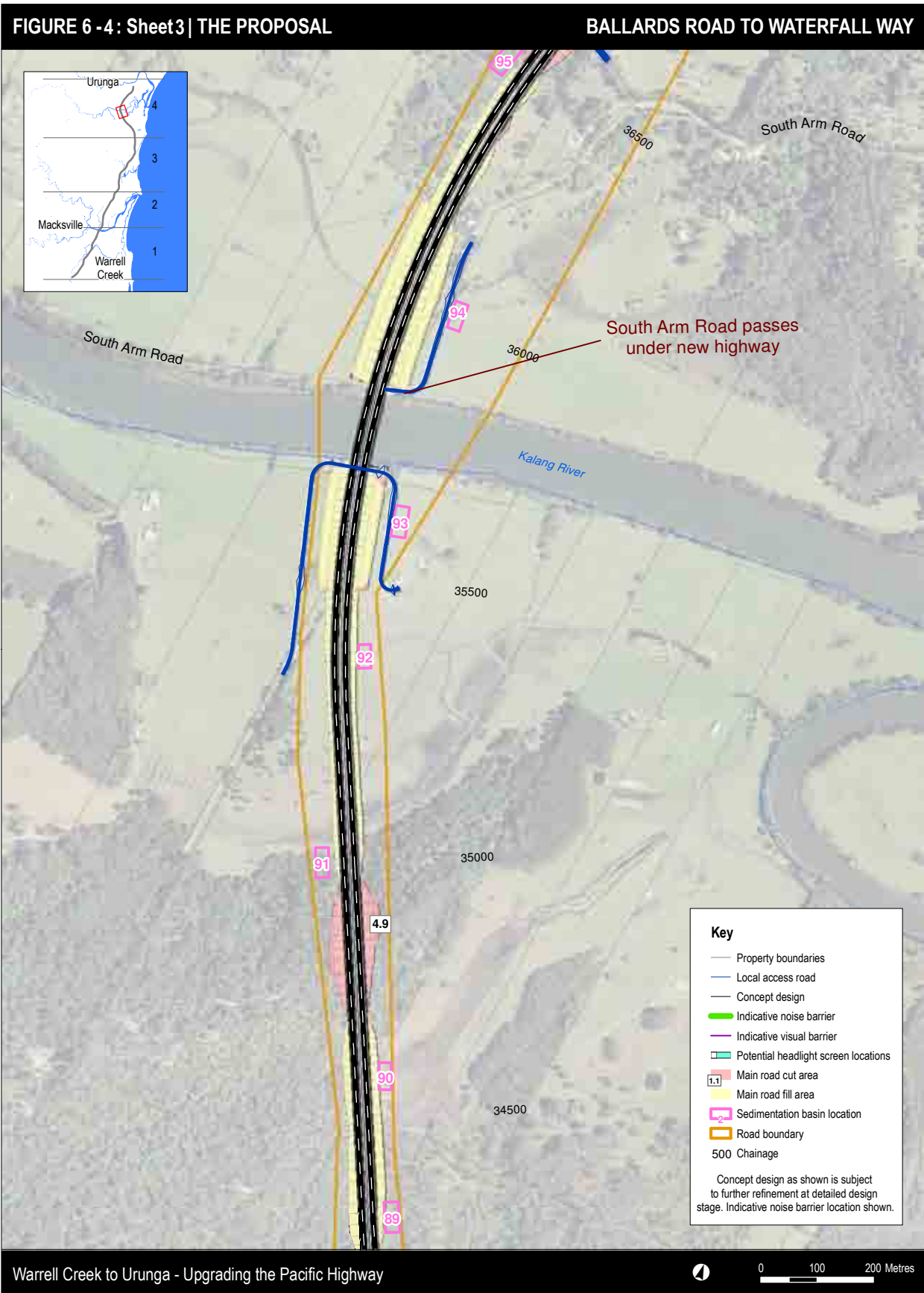
From the Ballards Road interchange, the Proposal would veer north-west through the Little Newry State Forest, prior to crossing the Kalang River approximately 2.7 kilometres west of the existing Pacific Highway. The Proposal then traverses rural and rural residential lands, west of SEPP14 wetland No. 351 at Urunga and then veers north-east, past the Raleigh industrial area, prior to connecting with the existing Waterfall Way interchange at Raleigh.

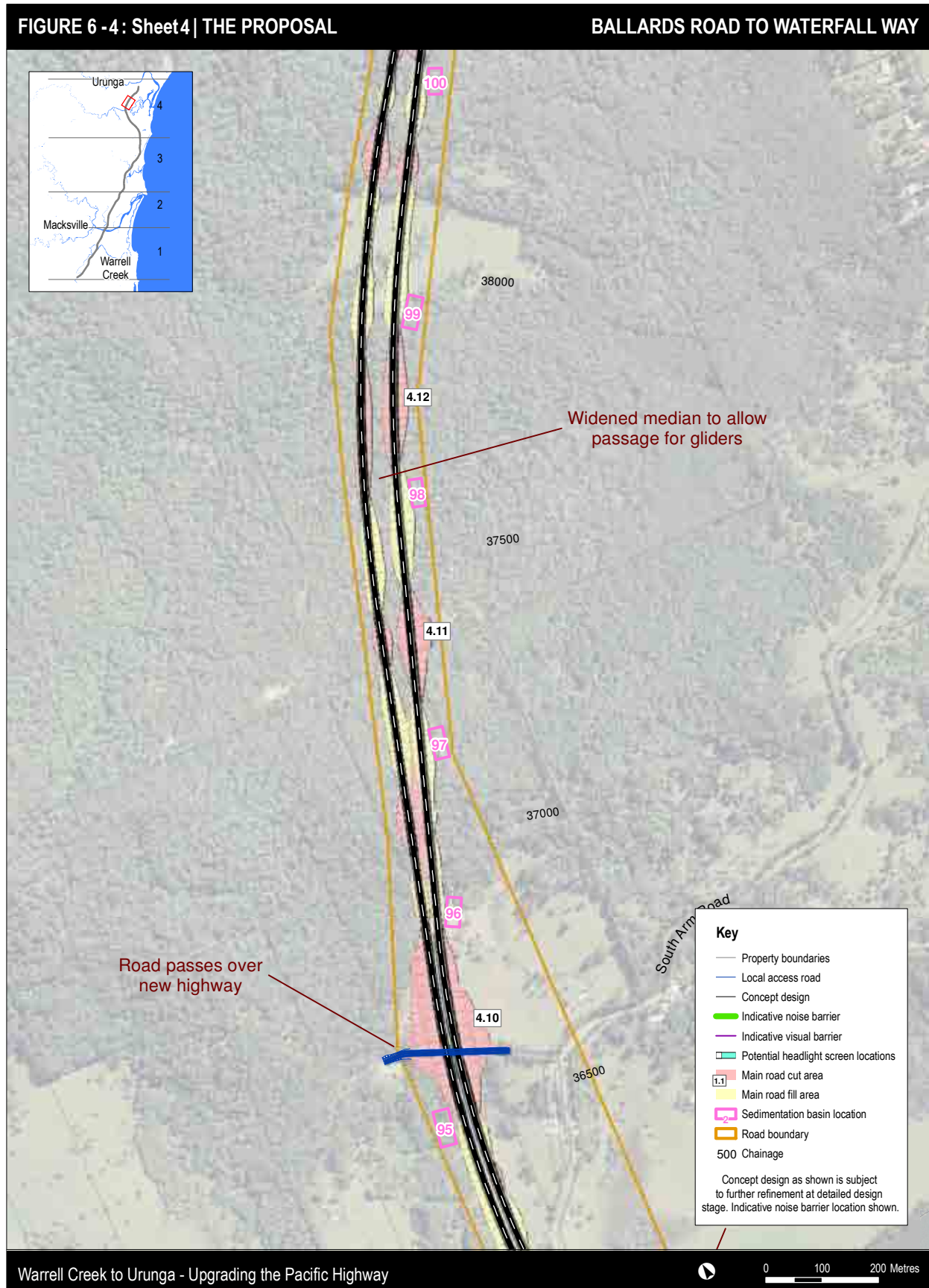
Key features of the Ballards Road to the existing Waterfall Way section include:

- The Ballards Road interchange that would provide improved access to Urunga from the south and to service the growing community of Valla Beach.
- Widened medians are proposed through sections of the Newry State Forest to avoid *Marsdenia longiloba* (Slender Marsdenia) and north of the state forest to retain mature vegetation to facilitate the safer movement of yellow-bellied gliders and other glider species across/over the upgrade.
- Two substantial cuttings of approximately 20 metres in depth; one south and one north of the Kalang River.
- New local road access overbridge at Martells Road to maintain access to remote rural properties.
- Indicative location for low noise pavement at Ridgewood Drive to the existing Waterfall Way interchange, approximately 2.2 kilometres in length.
- Dedicated fauna underpass at chainage 32755, approximately 600 metres south of Martells Road in a DECCW regional fauna movement corridor.
- Dedicated fauna movement structure that has been positioned in a known fauna movement corridor within Newry State Forest.
- Indicative location for visual mound at Ridgewood Drive (approximately 100 metres long, up to approximately four metres high above natural surface).
- A series of combined fauna underpass/drainage structures through the section.
- A floodplain bridge or culvert south of the Kalang River.
- A high level twin bridge crossing of the Kalang River. The bridge also needs to clear South Arm Road on the northern side of the Kalang River, resulting in a bridge height of approximately 12 metres above water level.









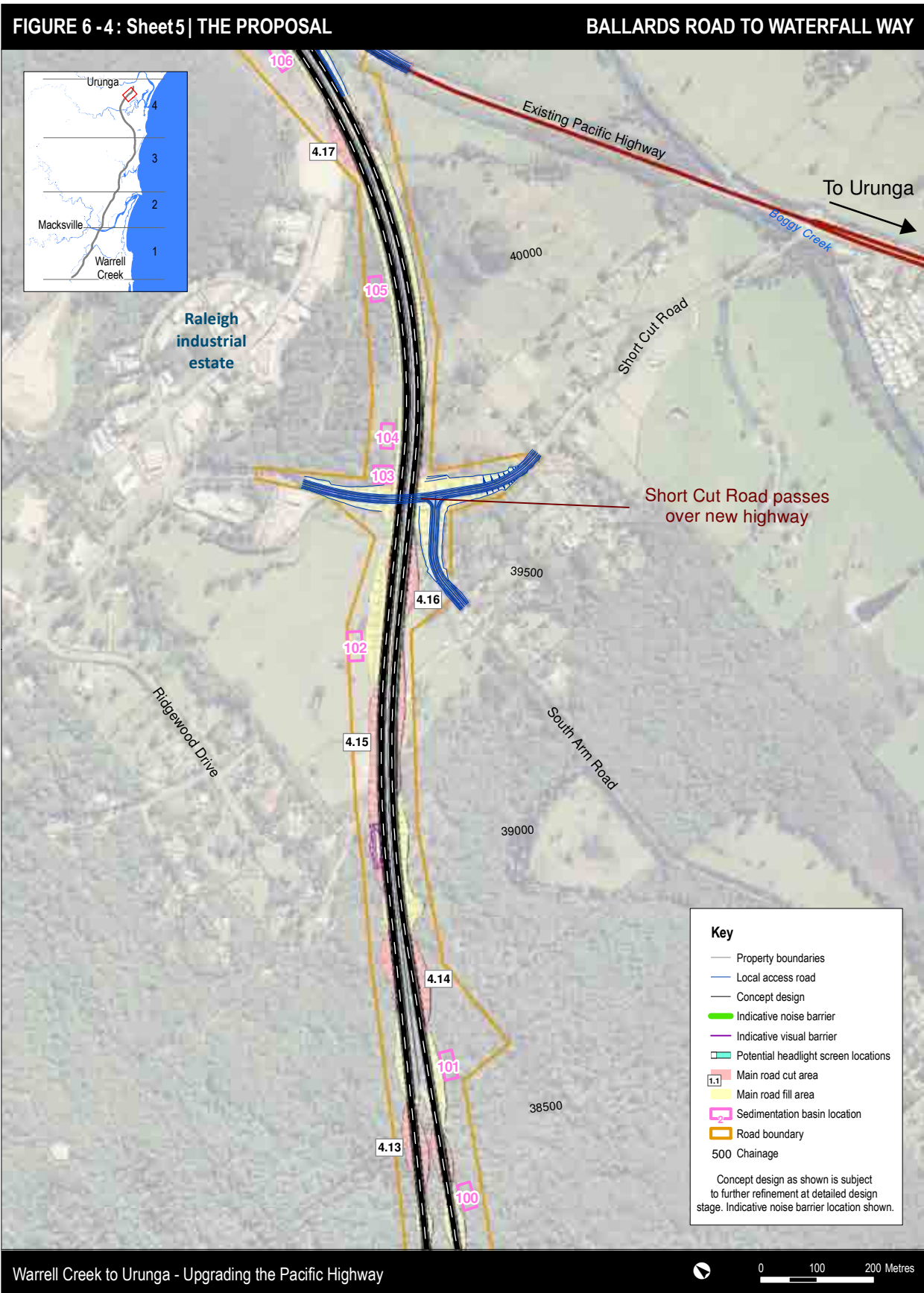
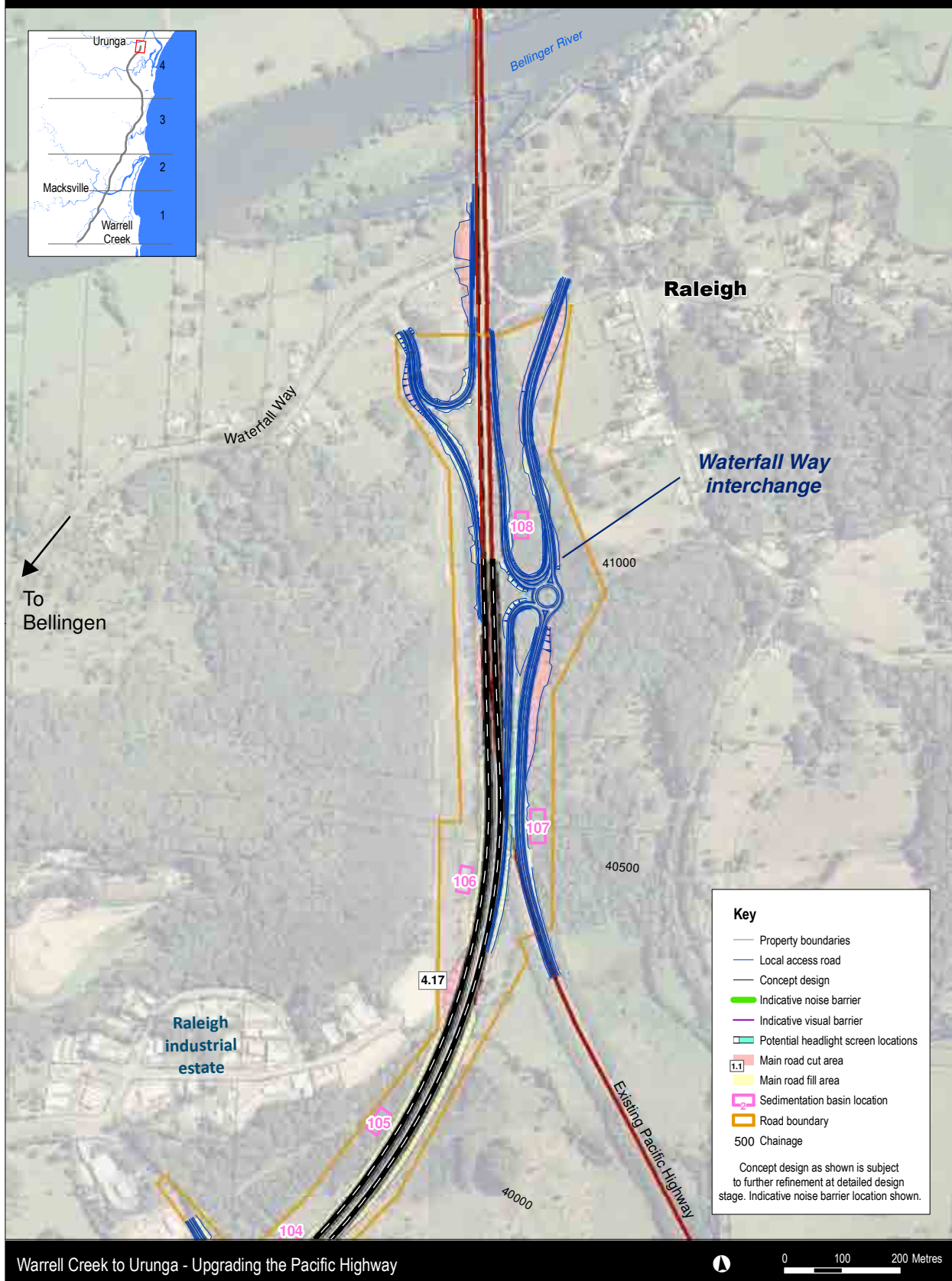


FIGURE 6 - 4: Sheet6 | THE PROPOSAL

BALLARDS ROAD TO WATERFALL WAY



- Provision of an overbridge to enable Short Cut Road to cross over the Proposal.
- Realignment of the South Arm Road and Short Cut Road intersection to enable the raising of Short Cut Road over the upgrade.
- Refinement of the existing Waterfall Way interchange to allow access to Urunga from the north and improve road safety by providing greater vehicle storage capacity on off-ramps and avoid queuing back into high speed traffic. The modifications to the ramps are also consistent with the required design standards for a motorway style upgrade.

#### 6.4.2 Corridor width

The corridor width of the Proposal is variable. Generally, the corridor width is approximately 80 to 100 metres wide in low-lying floodplain areas and widens up to 250 metres in areas of major cuttings, and approximately 150 to 200 metres throughout areas of the state forest where the median has been widened to facilitate fauna movement over the Proposal. In most cases, the corridor is widest at the proposed interchange locations to accommodate interchange ramps and overbridges.

#### 6.4.3 Access, interchange and local roads

##### Warrell Creek interchange

Northbound traffic using the Allomera deviation would be able to use the proposed Warrell Creek interchange northbound off-ramp to connect with the existing highway to access the Warrell Creek village and Donnellyville. Traffic from those villages heading south could use the new access road under the upgrade and connect to Browns Crossing Road where a southbound on-ramp would be provided to facilitate safer access to the southbound dual carriageway.

Southbound vehicles on the Proposal wanting to access Warrell Creek village would either exit at the proposed Bald Hill Road interchange or at the existing Pacific Highway at Allomera at the southbound off-ramp at Browns Crossing Road, which would connect with the new two-way access road under the upgrade. Traffic would then reconnect with the existing highway to travel into Warrell Creek village. Northbound traffic from Warrell Creek village and Donnellyville would access the Proposal at the Bald Hill Road interchange (see **Figure 6-5**).



Figure 6-5 Schematic of the Warrell Creek interchange

### Bald Hill Road interchange

Access to Macksville from the north and south is at the proposed Bald Hill Road interchange. Northbound and southbound on and off ramps are provided at the interchange. This provides access to Scotts Head and Macksville as well as Donnellyville and Warrell Creek from the north and access onto the Proposal from Warrell Creek for northbound traffic.

The interchange would provide for all traffic movements, with intersections such as roundabouts proposed to the west and east of the main highway carriageways to connect to Bald Hill Road and the existing highway. The western intersection would provide access from the northbound off-ramp, access to and from Macksville, Donnellyville and Warrell Creek, the northbound on-ramp and the interchange bridge. The eastern intersection would provide access from the southbound off-ramp, the southbound on-ramp, and the interchange bridge and Bald Hill Road (see **Figure 6-6**).

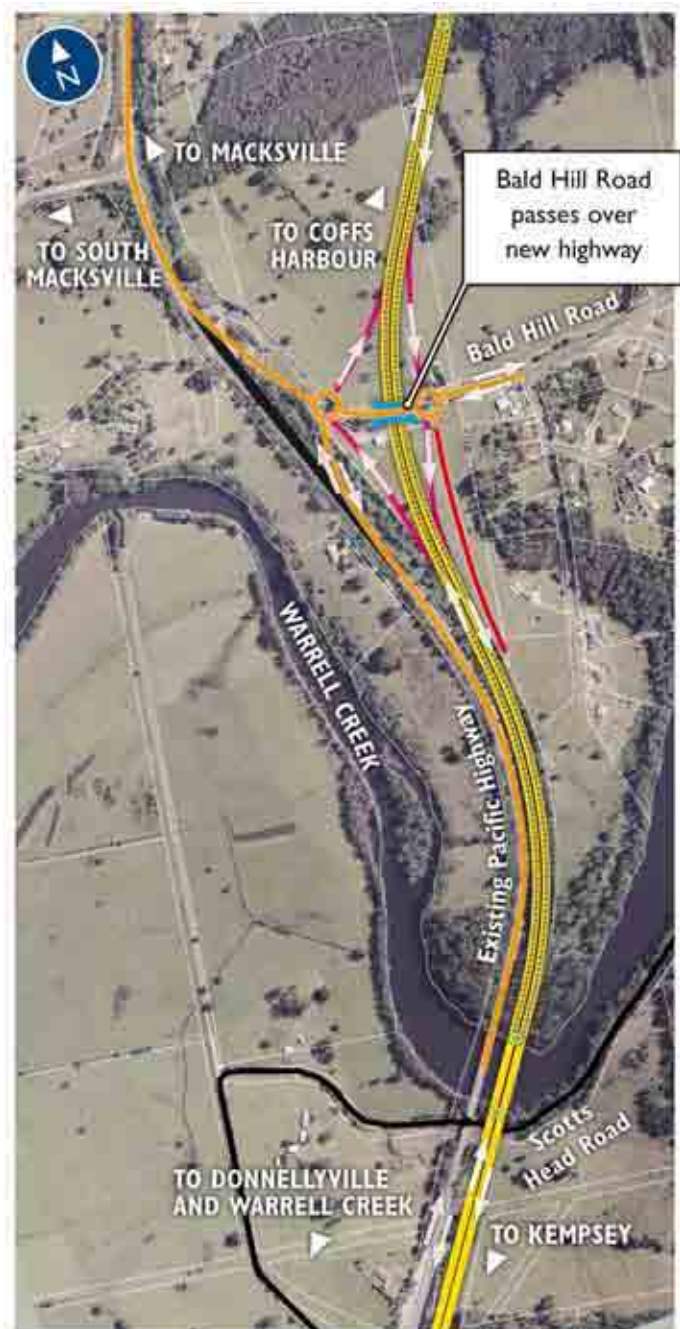


Figure 6-6 Schematic of the Bald Hill Road interchange

### Nambucca Heads interchange

The proposed interchange would provide for all traffic movements to and from the Proposal. The proposed interchange, to the north-west of Nambucca Heads, provides access to Nambucca Heads, Bowraville, Valla, Valla Beach and adjacent areas.

The interchange has been located and designed in consultation with Nambucca Shire Council to support future land use plans and provide efficient access to and from the proposed Boggy Creek industrial/commercial area. It allows for full access onto and from the upgrade as well as providing a connection between the existing highway and the proposed industrial subdivision to the west. The area between the existing Pacific Highway and the upgrade has also been identified as a rest area and future heavy vehicle trailer exchange facility (see **Figure 6-7**).

### Ballards Road interchange

Following consultation with the Urunga Chamber of Commerce, members of the Valla Beach community and emergency services in Urunga, an interchange was added to the concept design for the Proposal in June 2008 at Ballards Road, where the upgrade heads north-west away from the existing highway. The interchange would provide for all traffic movements, with access from the existing highway being at Ballards Road. The interchange would provide access for southbound traffic from Urunga onto the upgrade and also for northbound traffic from the growing area of Valla Beach (see **Figure 6-7**).



Figure 6-7 Schematic of the Nambucca Heads interchange

### Refinements to the existing Waterfall Way interchange

The Waterfall Way interchange provides access to the township of Urunga from the north as well as Raleigh and Bellingen. The layout of the interchange would be reconfigured to ensure sufficient acceleration and deceleration is provided on all ramps. A service road east of the upgrade would provide a connection between Waterfall Way and the existing Pacific Highway. The Waterfall Way interchange would improve road safety by providing greater vehicle storage capacity on off-ramps and avoid queuing back into high speed traffic (see **Figure 6-8**).

### Existing Pacific Highway (including operational/maintenance responsibilities)

The existing Pacific Highway would be retained and would serve as a local access road, providing direct access for local traffic into Warrell Creek, Macksville CBD, Bellwood and Urunga (as outlined in **Table 6-1**). The existing highway would connect with the Proposal at the five grade separated interchanges, as discussed earlier in Section 6.4.3.

Operational and maintenance responsibilities would be determined in consultation with the relevant road authorities.

### Local access roads

To improve road safety and maintain the continuity of Bellingen and Nambucca Shire Council's local road network, a number of separate local access roads have also been incorporated into the Proposal to separate local and through-traffic and to remove the need for local traffic to access the Proposal for movement within the study area. This local access road network would allow travel within the study area in a lower speed environment which would be more amenable to pedestrian, cyclist and bus traffic. There would be a complete grade-separation of all cross highway movements. **Table 6-1** provides an overview of the proposed local access road network along the Proposal.

Where required, local access roads would pass over or under the Proposal. Although there would be some lengths of newly constructed local access roads the existing road infrastructure is to be included in the access road scheme where possible.

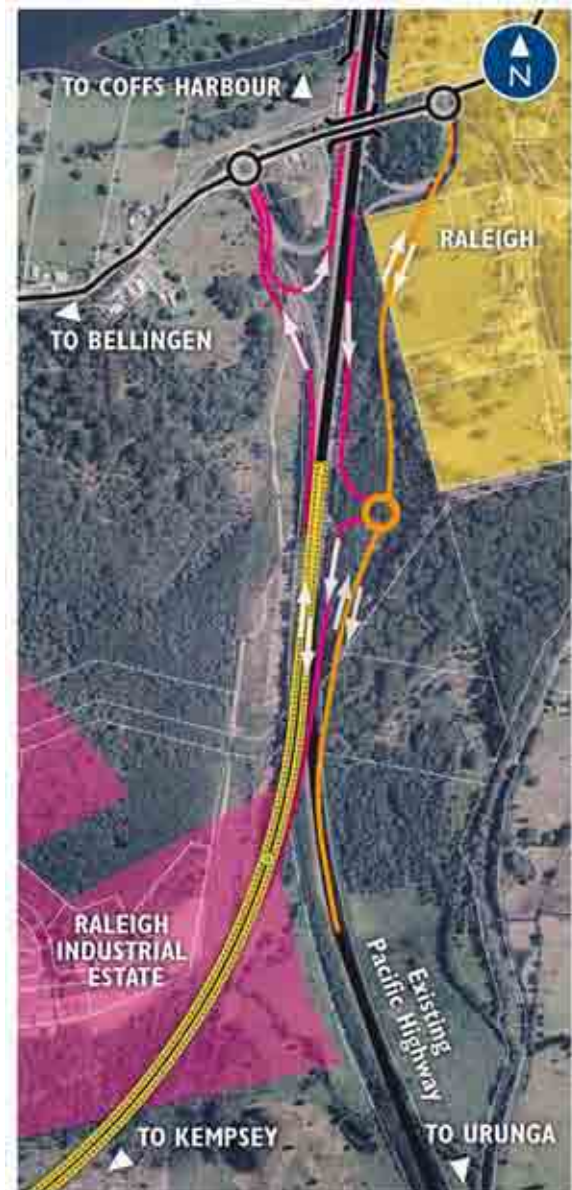


Figure 6-8 Schematic of the proposed refinements to the existing Waterfall Way interchange

All access to the Proposal would be at the proposed grade-separated interchanges and no other direct access to properties or local roads would be available. Local traffic would have the choice of accessing the highway at these access points or continuing along the local access road network.

A local access road working group was established to seek community input regarding possible refinements to existing local access roads in the section of the Proposal between the Nambucca and Ballards Road interchanges. The project team met with the working group initially to obtain thoughts and ideas in relation to the location of new local access roads, and then reported back to the group with the design outcomes that considered input from the initial meeting. The design outcomes were on balance supported by the group. Consequently, a number of new local access roads have been incorporated into the Proposal.

Table 6-1 Local access road strategy

| Local access road location                              | Local access road strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warrell Creek interchange to Scotts Head Road.          | The existing highway through the township of Warrell Creek would be maintained as a local access road. Access to and from the upgrade from Warrell Creek and Donnellyville would be from the Bald Hill Road interchange or the interchange south of Warrell Creek. Over-bridges across the Proposal would be provided for local access east of the saw mill on Cockburns Lane, at Rosewood Road and at Albert Drive to prevent local severance between the Warrell Creek and Donnellyville communities. An underpass would be provided for the local quarry access, connecting to the existing highway on the western side of the upgrade via Scotts Head Road. Access to Scotts Head would be unchanged with vehicles using the existing Scotts Head Road intersection. Local access roads would be constructed south of Cockburns Lane and at Albert Drive across the upgrade.                                                            |
| Scotts Head to the Nambucca River                       | The Proposal would run parallel to, and on the eastern side of, the existing highway. The existing bridge over Warrell Creek would be retained for local traffic, along with much of the existing highway pavement north of Warrell Creek. Local traffic from Macksville would utilise this road to access Warrell Creek and Donnellyville.<br><br>Motorists heading further north than Macksville could use the Bald Hill Road interchange to access the Proposal with northbound on-ramps provided. Likewise, those heading further south than Warrell Creek could access the Proposal at this location using the southbound onramps. Northbound and southbound off-ramps are also provided for motorists on the Proposal wanting to access the local road network. A local access road would be constructed between the northern approach of the existing highway bridge over Warrell Creek and the proposed bald Hill Road interchange. |
| Nambucca River to Nambucca interchange                  | Access into Macksville from the north would be via the Nambucca Heads interchange. Following consultation with local emergency services, an emergency service access would be provided between Old Coast Road and Mattick Road. Bridges for local access are provided across the Proposal where it crosses the existing highway and Old Coast Road, Letitia Close and Mattick Road. These changes, along with the realignment of some sections of Old Coast Road north of Mattick Road, would enable local access to be maintained in this area. A local access road to provide access into the state forest north of Mattick Road has also been included.<br><br>Additionally, the existing highway would be maintained as a connector/local access road between Macksville and Nambucca Heads.                                                                                                                                            |
| Nambucca Heads interchange to Ballards Road interchange | The Nambucca Heads Interchange provides access to Nambucca Heads, Bowraville, Valla, Valla Beach and Macksville from the north. Through this section, local access is maintained east of the upgrade via the existing highway. West of the upgrade, local access is provided across the upgrade via an underpass at Valla Road and an overpass at East West Road. A new local access road connects Deep Creek Road and Burkes Lane to the East West Road overbridge, also providing access to the state forest in the north and various properties west of the Proposal. The existing Pacific Highway would be realigned to the east between Cow Creek and Boggy Creek to avoid an important Aboriginal site on the western side of the existing highway.                                                                                                                                                                                   |
| Ballards Road interchange to Kalang River               | Access is provided to the existing Pacific Highway at the Ballards Road interchange giving access to Urunga from the south and Valla Beach from the north. A minor access is realigned at Dalhousie Creek and an over-bridge is provided at Martells Road to maintain property access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Local access road location                | Local access road strategy                                                                                                                                                                                                                                                             |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kalang River to Waterfall Way interchange | An overbridge is provided for a severed property access road approximately 1 km north of the Kalang River crossing and an overbridge is provided at Short Cut Road to maintain local access. The Waterfall Way interchange has been modified to allow access to Urunga from the north. |

## 6.5 Design elements

As noted in Section 6.2, all components of the Proposal would be designed to be consistent with the Upgrading the Pacific Highway, Upgrading Program beyond 2006: Design Guidelines (RTA 2006). These guidelines provide minimum geometric standards and treatments in relation to cut and fill batters, bridge widths, typical pavement designs, drainage and water quality requirements, and roadside furniture details. The various design components, specific to the concept design for the Proposal, are outlined in the following sections.

### 6.5.1 Carriageways

The Proposal consists of two carriageways, each comprising two 3.5 metre traffic lanes, a 2.5 metre left-hand (outer) shoulder and 0.5 metre right-hand (inner) shoulder. The minimum width of the median separating the carriageways would be generally 12 metres and would generally be depressed to facilitate drainage. The 12 metre wide median would also provide sufficient width to upgrade the Proposal to six lanes if required in the future. The median would be landscaped to assist in reducing headlight glare across the carriageways. Typical cross-sections of the Proposal have been prepared and are provided in **Figure 6-9** and **Figure 6-10** to **Figure 6-19**.

Where possible, a minimum separation of 25 metres between local roads and the carriageways of the Proposal has been provided to allow for landscaped headlight screening. In areas where this is impractical, the requirement for headlight screening and methods to accomplish this would be developed as part of the detailed design. Medians would be revegetated to reduce headlight glare and to break up the hard paved carriageways of the Proposal. Sight distance curves would be considered in the placement of median planting.

**FIGURE 6-9 | LOCATION OF TYPICAL CROSS SECTIONS OF THE UPGRADED HIGHWAY**