# 5. Project description

This chapter and Chapter 6 provide a detailed description of the project.

| DGRs | Where addressed |
|---|---|
| Detailed description | |
| Include a detailed description for the project, including: | Chapters 5, 6 |
| ▪ Route alignment and corridor width. | Sections 5.2, 5.3 |
| ▪ Design elements (eg construction of temporary crossings, bridges, culverts, creek diversions, geotechnical investigations, excavating or reclaiming the bed or banks of any waterways, requirements for level of service (LoS), pedestrian and cyclists facilities etc. | Sections 3.2.1, 5.3, 6.6, 9.5.4 |
| ▪ Potential staging. | Section 6.2.1 |
| ▪ Ancilliary facilities (eg compound site, batching plants etc). | Section 6.6 |
| ▪ Resourcing (eg construction material needs, spoil disposal, natural resource consumption including water). | Section 6.3 |

The chainages referred to throughout this chapter refer to those along the southbound carriageway of the project.

## 5.1 Project overview

The project would include the following key components:

- Approximately 9.5 kilometres of dual carriageway (two lanes in each direction), including 0.5 kilometres along the existing Hume Highway alignment north of Holbrook, seven kilometres along a new alignment to the west of Holbrook and two kilometres along the existing Hume Highway alignment south of Holbrook.
- A grade-separated interchange with Wagga Wagga Road.
- Twin bridges (two lanes each) over Culcairn Road.
- Twin bridges (two lanes each) over Ten Mile Creek.
- A grade-separated interchange with the existing Hume Highway, south of Holbrook (the 'southern interchange').

The alignment and design elements of the project are described in further detail in Section 5.3.

Figure 5-1 provides an overview of the project.

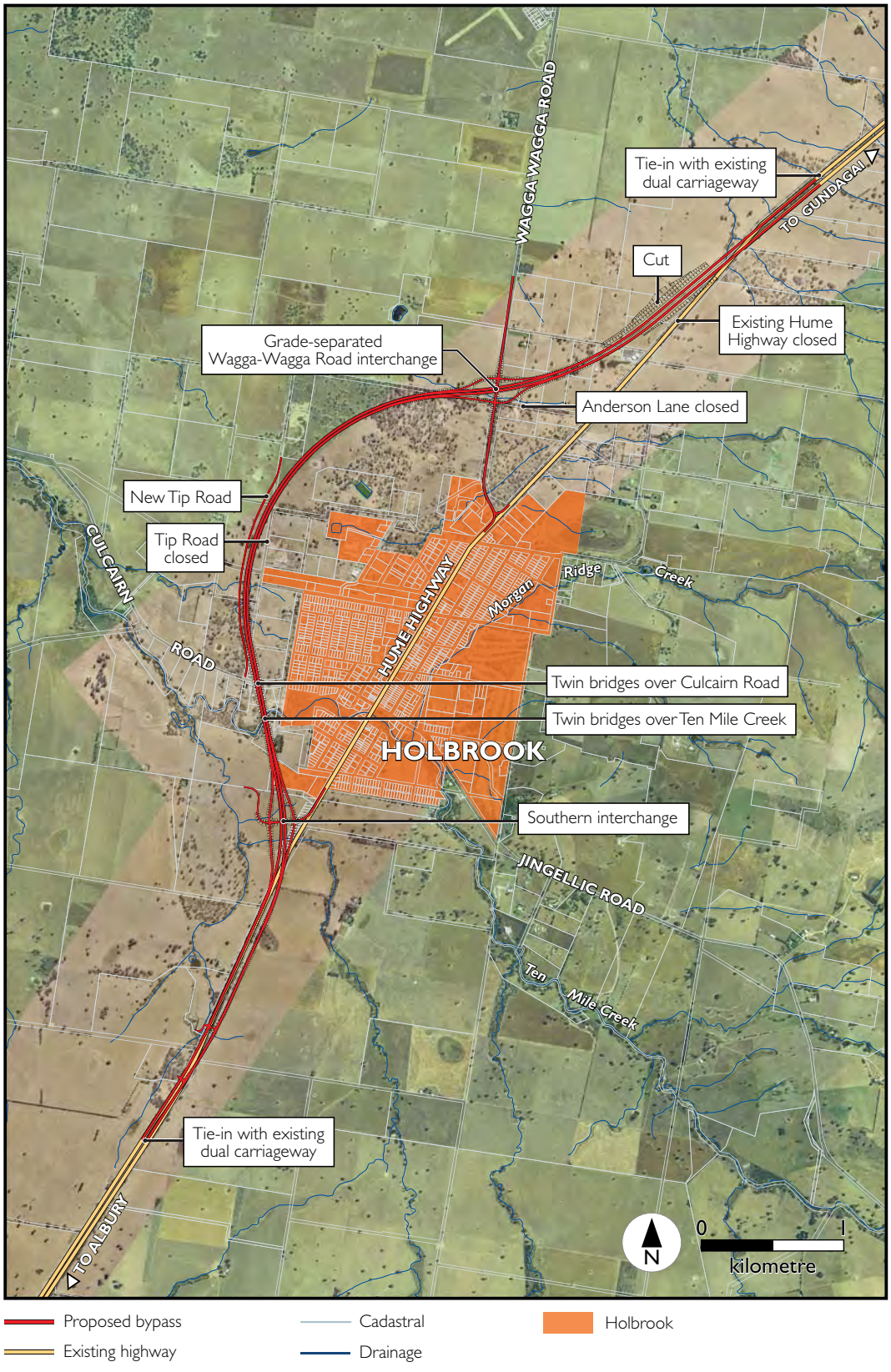


Figure 5-1 **Overview of the project**

## 5.2 Design criteria

### 5.2.1 Design parameters

Table 5-1 summarises the key design parameters for the project.

Table 5-1 Summary of key design parameters

| Design parameter | Recommended criteria |
|---|---|
| Design speed | ▪ 110 kilometres per hour horizontal alignment.<br>▪ 110 kilometres per hour vertical alignment. |
| Sight distance | ▪ 110 kilometres per hour sight stopping distance (2.5 second reaction time). |
| Horizontal alignment | ▪ 1000 metres minimum desirable radius. |
| Grade | ▪ 4.5 per cent desirable maximum.<br>▪ 6 per cent absolute maximum. |
| Cross section (mainline typical) | ▪ Basic configuration of dual carriageways, with new carriageways providing two travel lanes in each direction.<br>▪ Traffic lane width:<br>▸ 3.5 metres.<br>▪ Outside (verge) shoulder width:<br>▸ 2.5 metres (where barrier is required there would be a 3.0 metre offset from the edge of trafficable lane).<br>▪ Inside (median) shoulder width:<br>▸ 1.0 metre (where barrier is required there would be a 2.0 metre offset from the edge of trafficable lane).<br>▪ Median width:<br>▸ Generally provide a 12.0 metre depressed median with landscaping. Consideration to be given to the provision of safety barriers at critical locations.<br>▸ Consider a 5.0 metre median with safety barriers and landscaping at locations where this design provides a major cost saving (eg deep cuts) and where sight lines permit.<br>▪ All median breaks and crossovers with at-grade intersections should accommodate turning of an articulated vehicle of up to 26 metres long (ie a B-double). |
| Interchanges and road crossings | ▪ Major junctions/intersections of main roads with the project would be grade separated. |
| Cuttings/embankments | ▪ Batter slopes would generally be 2H:1V to 3H:1V depending on material type and with consideration given to flatter fill batters, where appropriate, for control of soil erosion. |
| Road reserve corridor widths | ▪ Generally, to provide a minimum 10 metre width from tops of cuts and toes of fills to Controlled Access Road boundary. |
| Property access | ▪ Access control would apply on all sections of work when new boundaries are being established. On these sections, the number of access points would be kept to a minimum.<br>▪ The design criteria of private property access to the project would be determined during the detailed design (and in accordance with relevant standards). |

| Design parameter | Recommended criteria |
|---|---|
| Regional roads | ▪ Design as per RTA *Road Design Guide* for Regional Roads. |
| Bridges | ▪ Width and clearance heights as per the Austroads *Bridge Design Guide*.<br>▪ Loading as per the Austroads *Bridge Design Guide*.<br>▪ Design life: 100 years<br>▪ Bridge over Ten Mile Creek to span waterway. |
| Pavement | ▪ Design life:<br>▸ Dual carriageway and ramps — 40 years. |
| Signposting | ▪ Signposting to follow the format provided in the RTA's *Guide Signposting* (RTA 2007a) and *Tourist Signposting Manual* (RTA 2009a). |

### 5.2.2 Urban design objectives

The *Hume Highway Urban Design Framework, Preston (WM7) to Albury* (RTA 2009b) identifies six overall urban design objectives for the highway. These objectives seek to highlight the positive characteristics of the surrounding area while minimising any potential negative impacts. The six objectives, which have been adopted for this project, are as follows:

- Objective 1: A highway that flows with the landscape — provide a flowing highway alignment that is responsive to, and best fits with, the landscape.
- Objective 2: A safe and memorable drive through NSW — provide a safe, enjoyable and memorable motoring experience that engages with the landscape of NSW, and makes best use of views and vistas.
- Objective 3: Well vegetated and responsive to natural systems — provide a well-vegetated, natural road corridor that protects and enhances the natural systems and ecology of the corridor.
- Objective 4: Town bypasses as an integral part of the towns' planning — create new town bypasses as an integral part of the towns' planning, clearly defining the relationship to each town for the motorist.
- Objective 5: Respond to the communities, history and culture — respect and respond to the communities along the corridor, and the historically and culturally significant aspects of the corridor.
- Objective 6: A simple and unified palette of details, and elements, which minimise maintenance — achieve a simple palette of highway details, elements and components consistent throughout the corridor, which meet safety requirements and minimise ongoing maintenance costs.

Achieving high quality urban and landscape design outcomes and minimising impacts on flora, fauna and Aboriginal cultural heritage have been integral considerations in the development of the concept design. In addition, providing easy access into Holbrook has been an important consideration to encourage some through traffic and support the ongoing economic viability of the town.

Section 10.4 presents the draft urban design and landscape strategy that has been developed for the project. This strategy is based on the above-mentioned urban design objectives, and the assessment of the visual amenity and landscape impacts of the project. The strategy would be finalised during detailed design.

## 5.3 Design elements

### 5.3.1 Detailed design development

The concept design addresses and responds to the constraints and principles identified during the investigations undertaken to date. The concept design is intended to define a buildable concept that provides for:

- A clear description of the proposal.
- A definition of property acquisition requirements sufficient to allow impacts to affected landowners to be clearly identified and for acquisition to proceed.
- Defining the extent of impacts and impact minimisation and management requirements.
- A clear basis for development of the detailed design to a standard required to support project delivery.

The design of the project would continue to be refined during the detailed design phase and would be guided by the key principles developed during the concept design and environmental assessment phase. The development of the design would:

- Consider the principles of ESD.
- Be consistent with key design parameters as described in this environmental assessment and any subsequent RTA response to submissions or preferred project report.
- Address any issues arising during development of the detailed design proposed in this environmental assessment, including further environmental assessment where required as a result of design changes, and any subsequent RTA response to submissions or preferred project report.
- Meet any conditions of approval arising from the approval process under Part 3A of the *Environmental Planning and Assessment Act 1979.*
- Incorporate community and government agency requirements by implementing a consultation plan to identify and resolve further concerns raised by the community and other stakeholders.
- Avoid identified environmentally sensitive areas and significant species wherever possible.
- Further develop and refine mitigation measures.
- Appropriately develop and incorporate the urban design and landscape strategy.
- Establish detailed proposals for construction delivery method, addressing buildability, traffic capacity and safety during construction, geotechnical issues, all relevant RTA specifications and design requirements, current guidelines and policies, and practicality/cost effectiveness.
- Address risk management during construction and operation.
- Provide a level of definition sufficient to support a construction contract that will meet all of the RTA's requirements for the completed project.
- Ensure that the detailed design allows for safe and cost-effective maintenance of the project during operation in accordance with occupational health and safety requirements and relevant RTA specifications.

### 5.3.2 Route alignment and corridor width

The overall corridor width of the alignment would depend on environmental and design requirements, with wide medians in some locations to retain median trees and narrowed medians to reduce the project footprint in other locations, for example where cuttings are required, to reduce potential impacts. Corridor widths would vary between approximately 90 and 100 metres and up to 300 metres around interchanges.

For ease of identification, the project has been divided into three sections: northern, middle and southern. This division separates three of the key elements of the project: the Wagga Wagga Road interchange, the bridges over Ten Mile Creek and Culcairn Road and the southern interchange. The division of the three sections is shown in Figure 5-2. The horizontal and vertical alignments of the project are described below from north to south and are shown in Figures 5-3 to 5-5.

#### Northern section

This section would extend from the northern connection with the existing Hume Highway to the Wagga Wagga Road interchange. This section is approximately 3.3 kilometres long. The terrain in this northern section includes two small hills, the two most elevated points on the alignment.

The project would commence approximately five kilometres north of Holbrook, at the southern end of Hume Highway duplication works currently under construction. The horizontal alignment would follow the existing highway for about the first 500 metres, with the northbound carriageway matching the existing two-lane highway. A median of about 12 metres would separate the northbound from the southbound carriageway.

The project starts to deviate west from the existing alignment about 4.5 kilometres to the north of Holbrook (at approximately chainage 110200). Over the next kilometre, the alignment passes through a cut, reaching a maximum depth of about 10 metres (at approximately chainage 111000).

After exiting the cut, the project traverses cleared agricultural land on embankment ranging between one and two metres in height. The alignment follows a gentle descent, falling about 15 metres in elevation as it approaches Wagga Wagga Road. The median gradually narrows to pass under Wagga Wagga Road at the edge of the former Town Common.

A new full diamond interchange would be provided at the junction with Wagga Wagga Road. This would include an upgrade of approximately two kilometres of the Wagga Wagga Road, including modifications to the intersection with the existing Hume Highway. Northbound and southbound access from the project to Holbrook would be via Wagga Wagga Road, which will continue to connect with the existing highway.

#### Middle section

This section would extend from south of the Wagga Wagga Road to south of Ten Mile Creek. This section is approximately 3.2 kilometres long. The middle section traverses the lowest and flattest terrain of the route and includes Ten Mile Creek and its associated floodplain.

Over this section the horizontal alignment follows a large sweeping bend with a minimum curve radius of approximately 1500 metres. The northbound and southbound carriageways are divided by a median of about 12 metres over this section. The route traverses the former Town Common, passing to the west of a cemetery, sewage treatment works and industrial land, and to the east of the Holbrook tip. The alignment is on embankment averaging two metres in height.

The route crosses the non-operational Culcairn to Holbrook rail line and passes through the eastern edge of the Culcairn Road Travelling Stock Reserve. The embankment height gradually increases to about 7.5 metres on the approach to Culcairn Road. The intersection of Culcairn Road and the unnamed road accessing the Holbrook Tip (hereafter referred to as Tip Road) would be relocated to the west of its current position. The route crosses Culcairn Road on twin bridges, passes through Greater Hume Shire Council depot and then crosses Ten Mile Creek on twin bridges.

The total length of the twin bridges over Ten Mile Creek and its floodplain is likely to be about 120 metres, including an approximate 30 metre span over the watercourse. The final configuration of the bridge structure would be confirmed during detailed design.

### Southern section

The southern section would extend from south of Ten Mile Creek to the southern tie-in with the existing Hume Highway. This section is approximately three kilometres long and includes the southern interchange. The terrain is generally flat through this section.

The vertical alignment falls slightly from the Ten Mile Creek bridges to the lowest point of elevation (at approximately chainage 116800). Over the remainder of this section, the alignment climbs gradually over about 15 metres in elevation. The project would generally be on embankments of between one and three metres in height through this section.

The horizontal alignment follows a slight curve as the project converges with the existing highway. A full-diamond interchange is provided at the intersection of the existing highway and the project, providing access to Holbrook on the east and access to properties on the west.

From about two kilometres south of Holbrook (at approximately chainage 117200) the project follows the existing highway alignment for about two kilometres. The existing Hume Highway would become the northbound carriageway for this section. The existing pavement may require some rehabilitation. This section would include the provision of two at-grade property accesses with median crossover to accommodate turning of an articulated vehicle of up to 26 metres long (ie a B-double). The northbound and southbound carriageways would be separated by a wide median of up to 50 metres in order to retain remnant vegetation alongside the existing Hume Highway. The project would connect with existing dual carriageway.

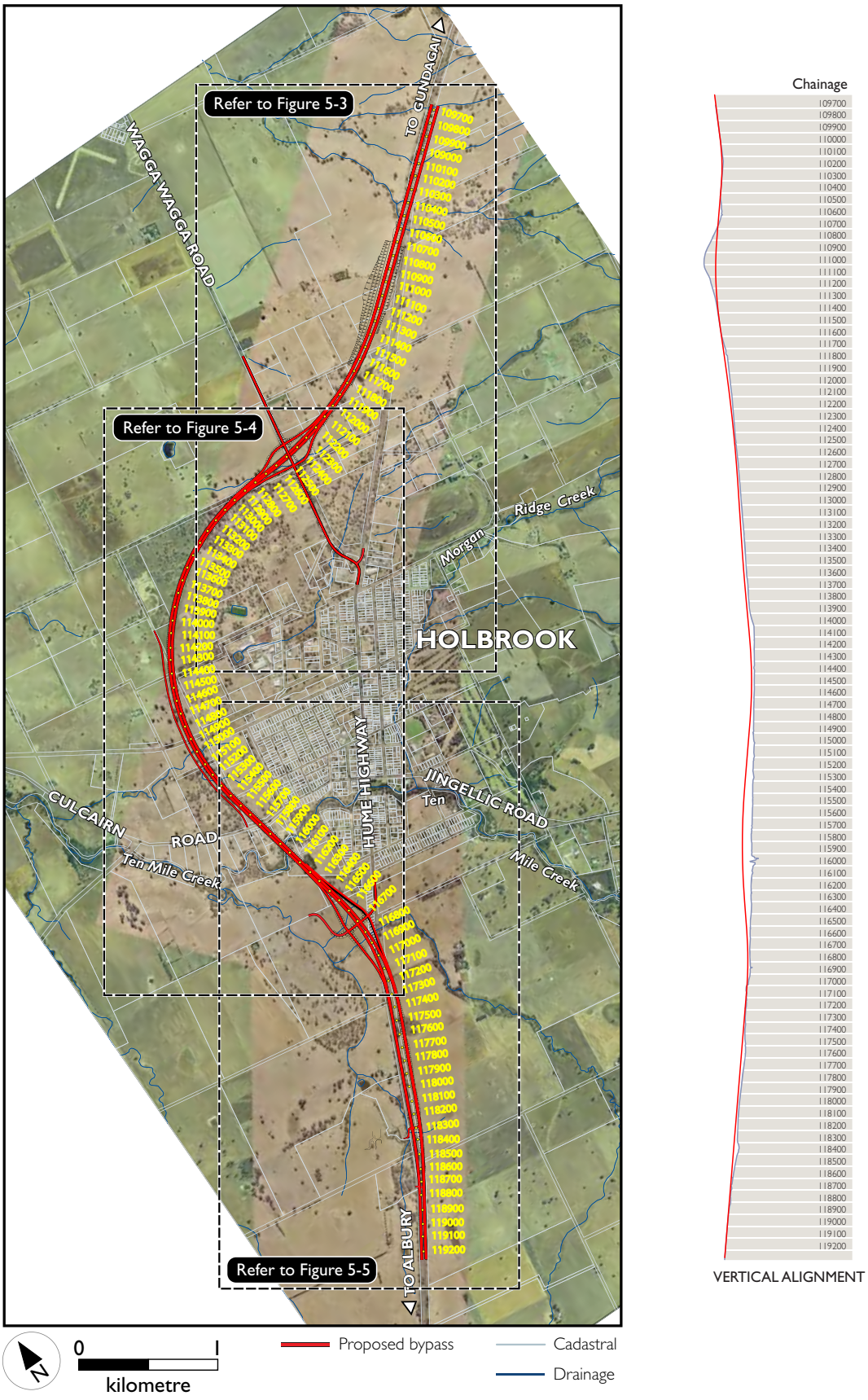


Figure 5-2 **Proposed bypass design – key plan**

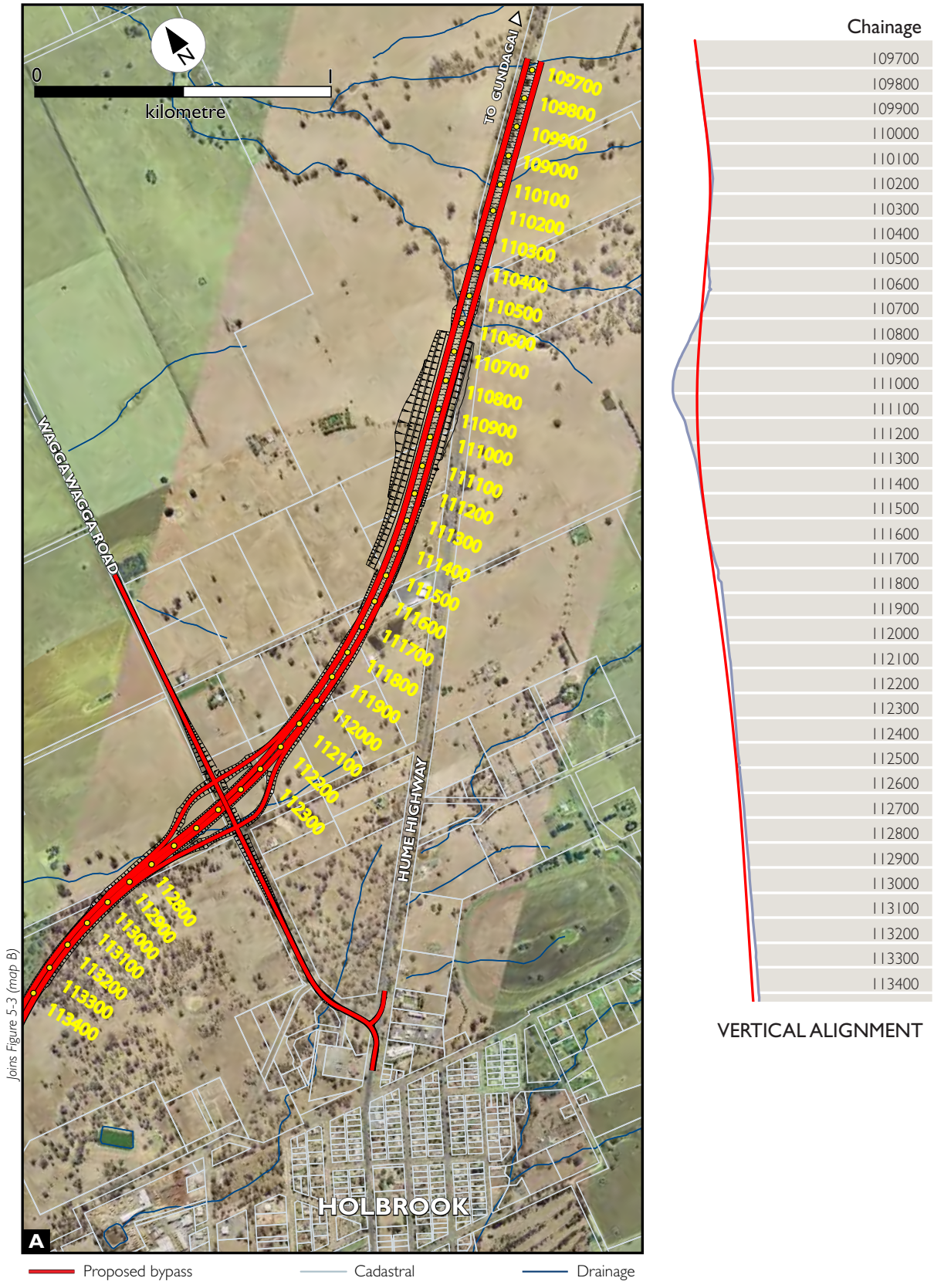


Figure 5-3 **Proposed bypass horizontal and vertical alignments (northern section)**

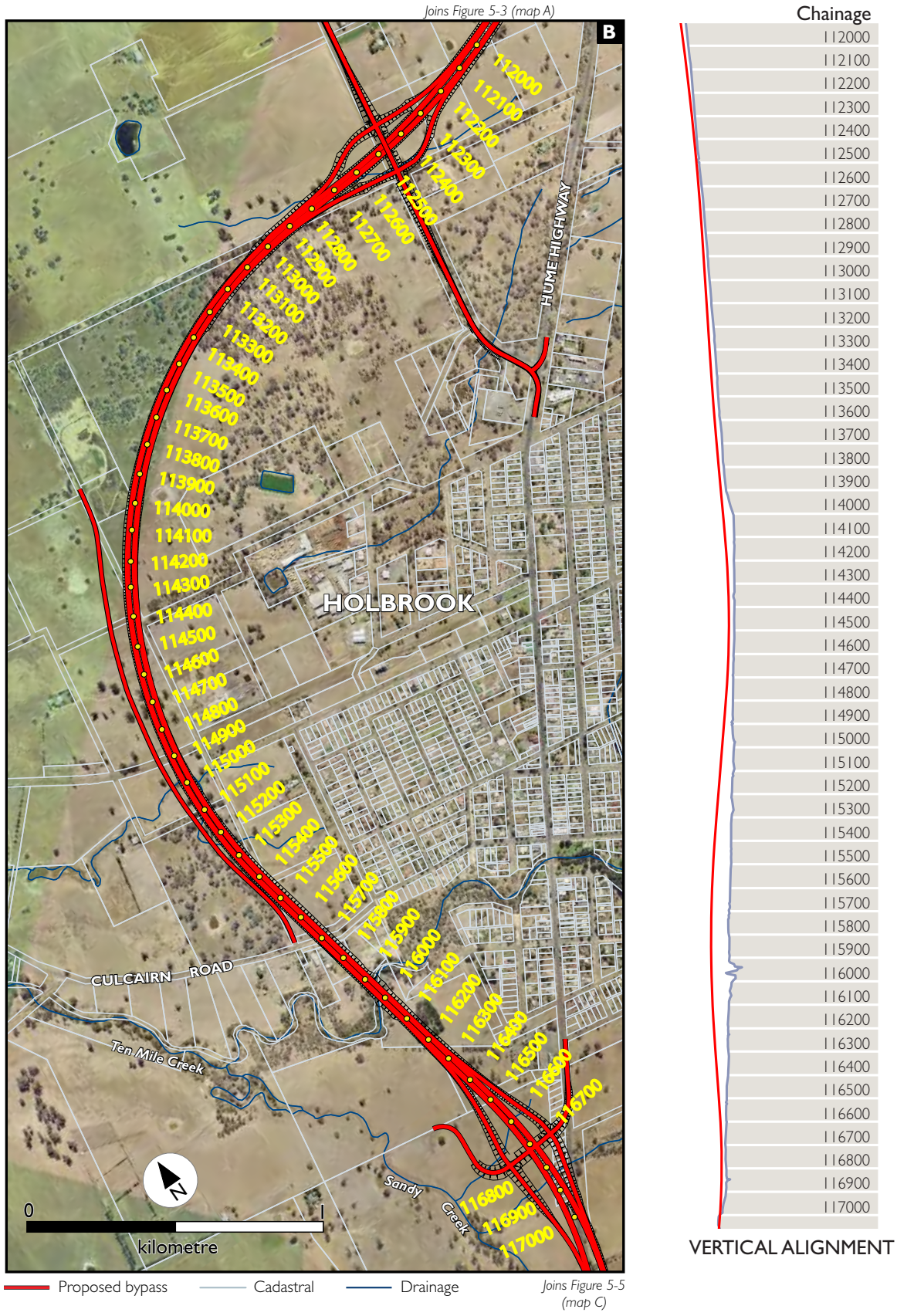


Figure 5-4 **Proposed bypass horizontal and vertical alignments (middle section)**

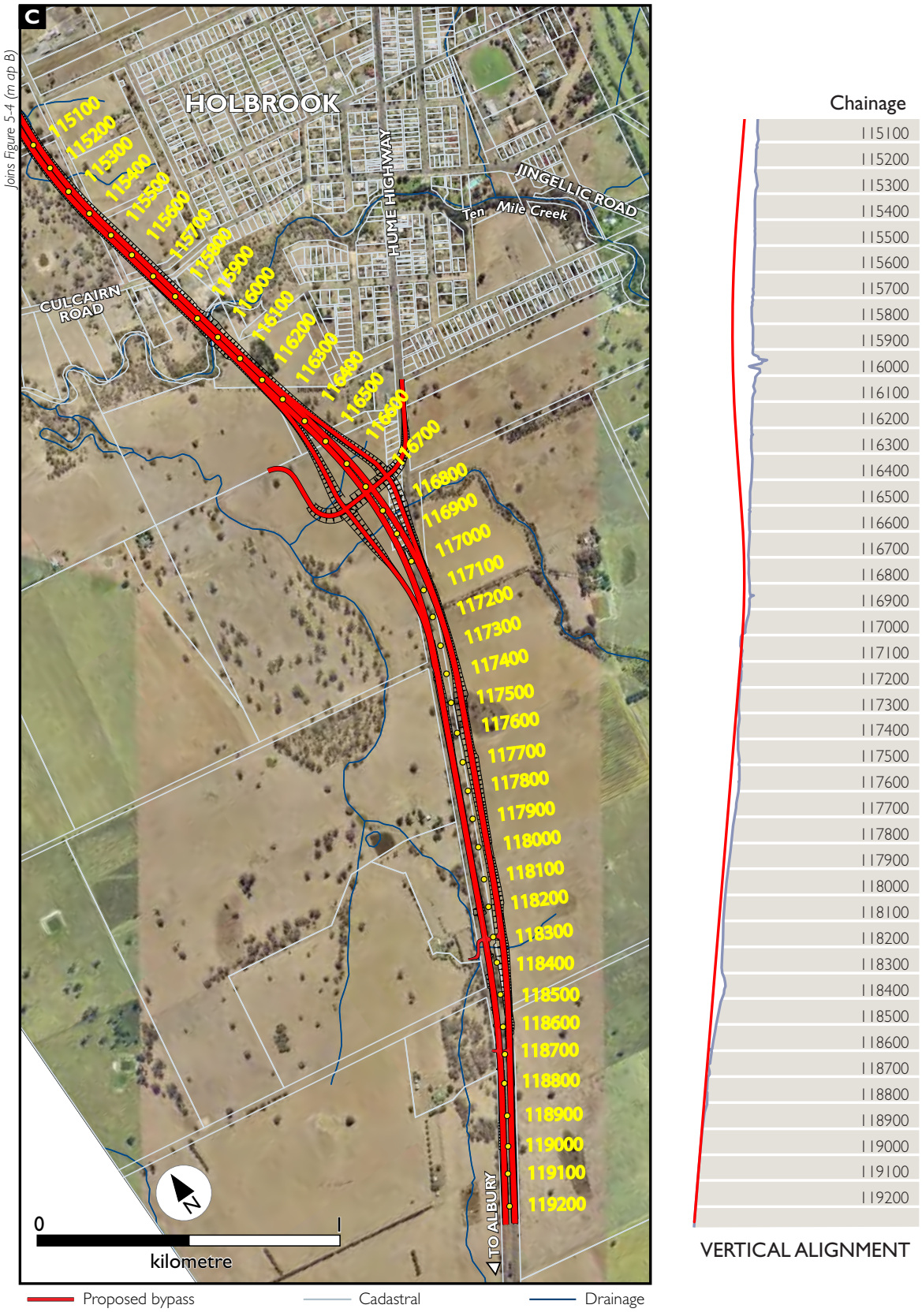


Figure 5-5 **Proposed bypass design horizontal and vertical alignments (southern section)**