CHAPTER 07

Proposal description—operation

ILLABO TO STOCKINBINGAL ENVIRONMENTAL IMPACT STATEMENT

ARTC | INLAND RAIL
An Australian Government Initiative

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7. Proposal description—operation

This chapter provides a description of the Inland Rail—Illabo to Stockinbingal project's (the proposal) features and operation for the purposes of the EIS. It includes a description of the infrastructure proposed, land acquisition likely to be required and how the proposal would operate. The proposed approach to construction of the proposal is described in Chapter 8: Proposal description—construction.

7.1 Overview

The key features of the proposal (which would be confirmed during detailed design) are listed in Table 7-1.

TABLE 7-1 OPERATIONAL OVERVIEW

Element	Description	EIS reference
Operation		
Track design	A single-track standard-gauge railway between the towns of Illabo and Stockinbingal in NSW. Extent of around 42.5 kilometres (km) including a 39 km new, greenfield section. Alignment occurs on a combination of existing ground level, embankments and in cuttings. Accommodates freight trains of up to 1,800 metres (m) long and 6.5 m high. Tie-ins (locations where the proposal joins the existing rail network), including: ▸ upgrades of about 3 km of existing track to the existing Main South Line at Illabo ▸ 1.7 km of new and upgraded track to maintain the existing connection of the Lake Cargelligo rail line. A crossing loop and maintenance siding of around 2.2 km long. Track turn-outs at eight locations.	Sections 7.2.1–7.2.4 Figure 7-1 – Figure 7-8
Permanent land requirement	Approximately 489 hectares (ha) for the proposal's functional and operational infrastructure.	Section 7.4 Appendix D: Preliminary land requirements
Bridges and culverts	Eight new watercourse bridges. Two rail-over-road bridges around 5.5 m high at Dirnaseer Road and Old Cootamundra Road (around 70 and 60 m long, respectively). One road-over-rail bridge at 7.1 m high and around 20 m long at Burley Griffin Way at Stockinbingal. Around 88 new and existing cross drainage culverts below the rail formation and 27 longitudinal drainage culverts below level crossings across drainage lines.	Section 7.2.5 and section 7.2.6 Table 7-2
Road–rail interfaces	Installation of six new level crossings at public roads. Alteration of 20 existing private accesses requiring 11 stock underpasses and 9 occupational (private) crossings.	Section 7.2.7 Table 7-3 and Table 7-4
Road modifications	Realignment of 1.4 km of Burley Griffin Way to provide road-over-rail bridge, as above Realignment works at Ironbong Road associated with the new level crossing.	Section 7.2.8 Figure 7-9 to Figure 7-12
Ancillary works and infrastructure	Permanent ancillary features include: ▸ track 'cess' drainage either side of the track ▸ rail maintenance access roads on one side ▸ signalling and communications ▸ new utility connections to facilitate the operation of flashing lights, boom barriers and turnouts and enable control tie-ins to the wider Inland Rail network ▸ rail corridor boundary fencing and fauna fencing at some locations ▸ fauna crossings ▸ retaining walls ▸ signage.	Section 7.3

The proposal would link the Albury to Illabo section of Inland Rail with the Stockinbingal to Parkes section of Inland Rail.

The location of key features of the proposal have been described based on their chainage, which is the distance measured along the proposal from its starting point on the Main South Line (refer to Figure 7-1).

The Main South Line, Lake Cargelligo Line and the Stockinbingal to Parkes Line, are existing operational rail lines that join the proposal. These lines would continue to operate following construction of the proposal. Accordingly, only the relevant direct impacts on these existing lines, as described in sections 2.5 and 7.5, form part of the proposal. Any associated maintenance works and other minor works, undertaken by ARTC in accordance with existing ARTC procedures and processes, and under relevant state legislative requirements on these existing lines, do not form part of the proposal.

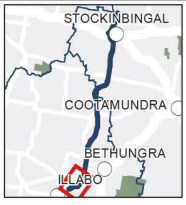
Furthermore, while the new infrastructure required for operation of the proposal does not extend further north than the tie-in point at approximately chainage 39250, there are minor construction activities required between chainage 39250 and 42480, including siting of a construction compound and utility tie-in points. These are described in Chapter 8: Proposal description—construction). Accordingly, for the purposes of the EIS, chainage 42480 is considered to be the northern limit of the proposal.

Key features of proposal

- New track/track upgrade
- Road realignment
- Earthworks
- 40950 Chainage (distance in metres from southern limit of the proposal)
- Bridge (watercourse crossing)
- Culvert
- Ocupational (private) crossings
- Public level crossing
- Stock crossing (underpass)

Existing features

- Local road
- Sub-arterial road
- Arterial road
- Major Watercourse
- Minor Watercourse
- Existing Rail



7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 1 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

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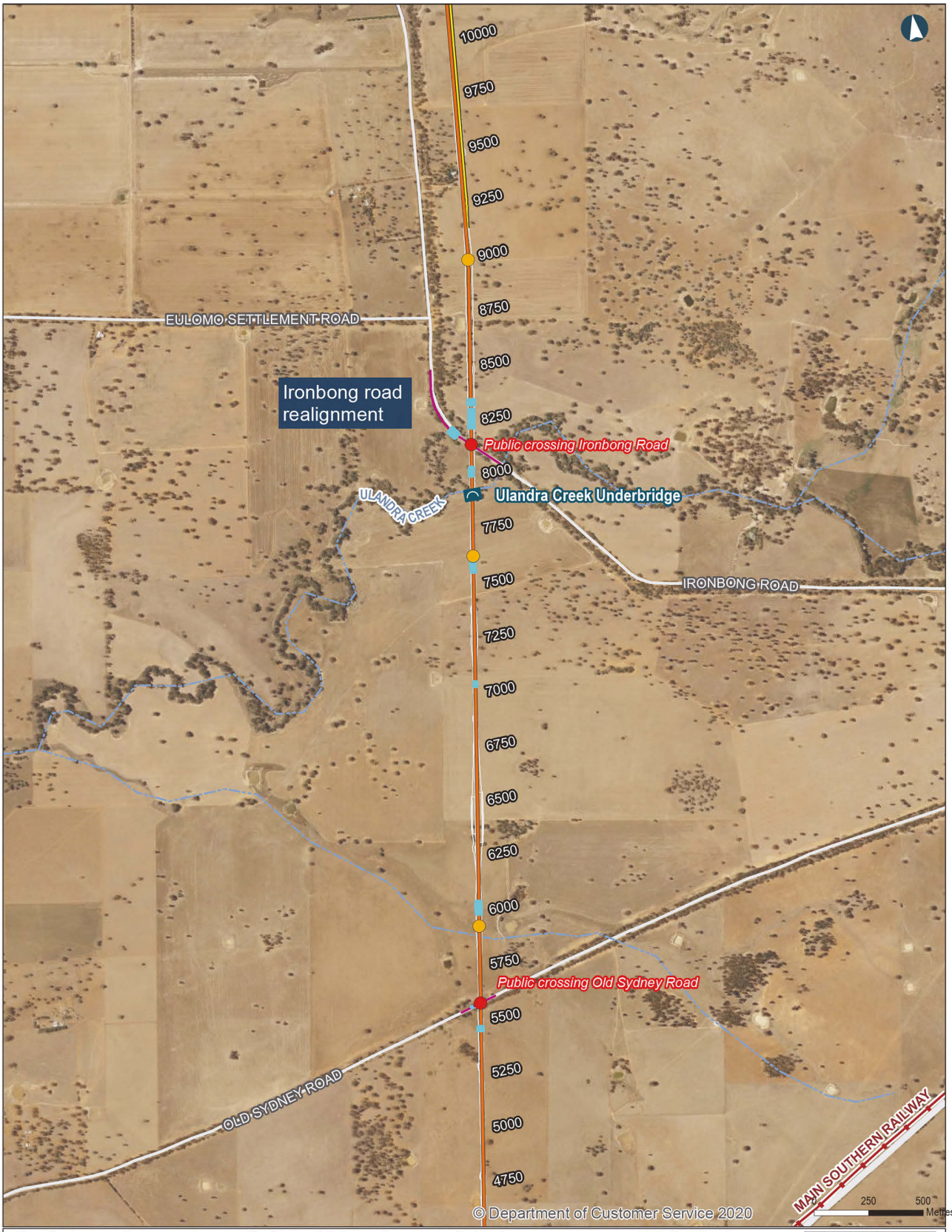

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MAP 2 of 10

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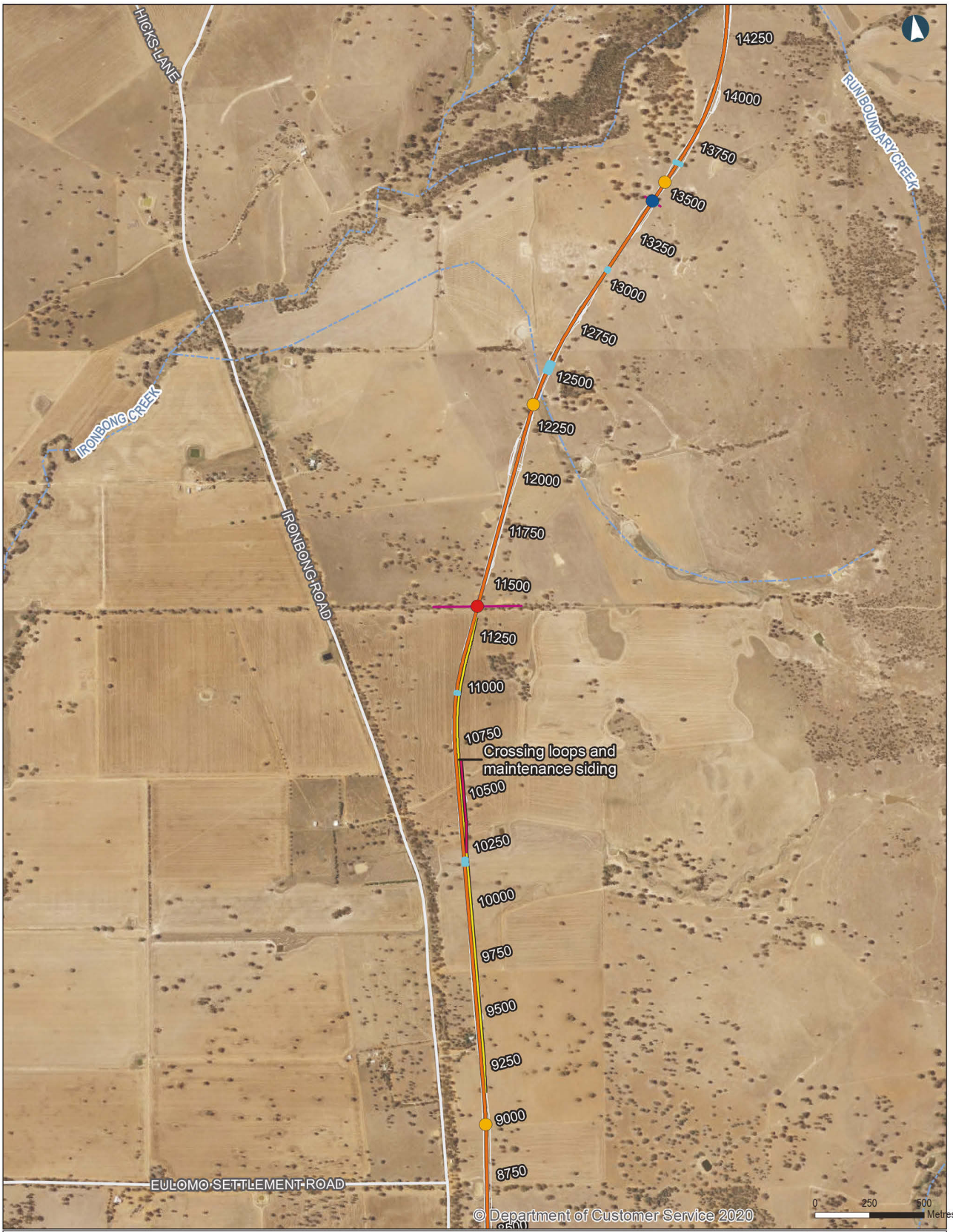

Key features of proposal
- New track/track upgrade
- Maintenance Siding
- Crossing Loop
- Road realignment
- Earthworks

40950 Chainage (distance in metres from southern limit of the proposal)

Bridge (watercourse crossing)

- Culvert
- Ocupational (private) crossings
- Public level crossing
- Stock crossing (underpass)

Existing features
- Local road
- Sub-arterial road
- Arterial road
- Minor Watercourse

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 3 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd

Key features of proposal
- New track/track upgrade
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- Arterial road
- Minor Watercourse

7.1 Overview of proposal features

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MAP 4 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd

Key features of proposal

- New track/track upgrade
- Road realignment
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- Culvert
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Existing features

- Local road
- Sub-arterial road
- Arterial road
- Minor Watercourse

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
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Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd

Key features of proposal

- New track/track upgrade
- Road realignment
- Earthworks

40950 Chainage (distance in metres from southern limit of the proposal)

- Culvert
- Ocupational (private) crossings
- Public level crossing
- Stock crossing (underpass)

Existing features

- Local road
- Sub-arterial road
- Arterial road
- Minor Watercourse

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
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Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

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7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 7 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

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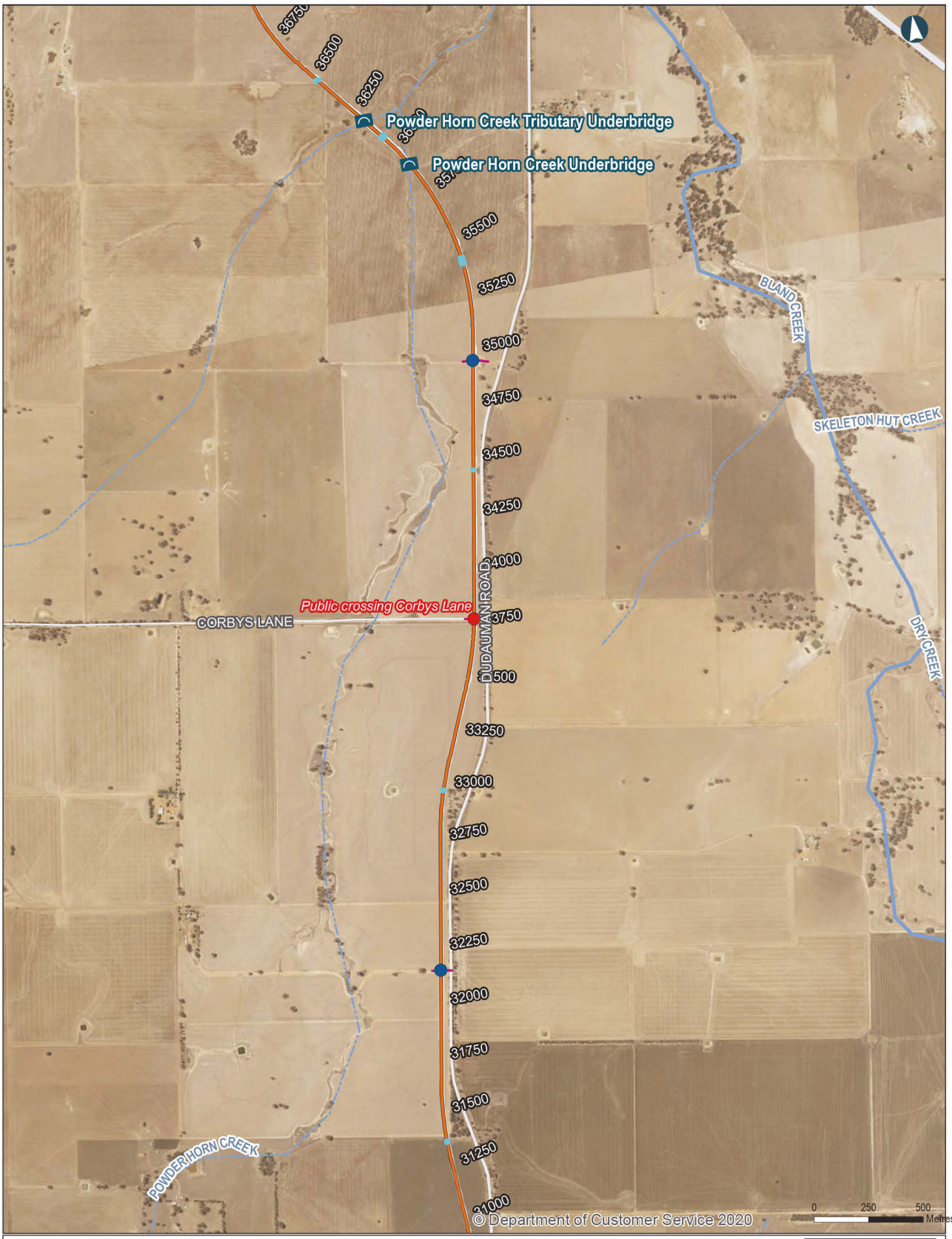

Key features of proposal

- New track/track upgrade
- Road realignment
- Earthworks
- 40950 Chainage (distance in metres from southern limit of the proposal)
- Bridge (watercourse crossing)
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- Public level crossing
- Stock crossing (underpass)

Existing features

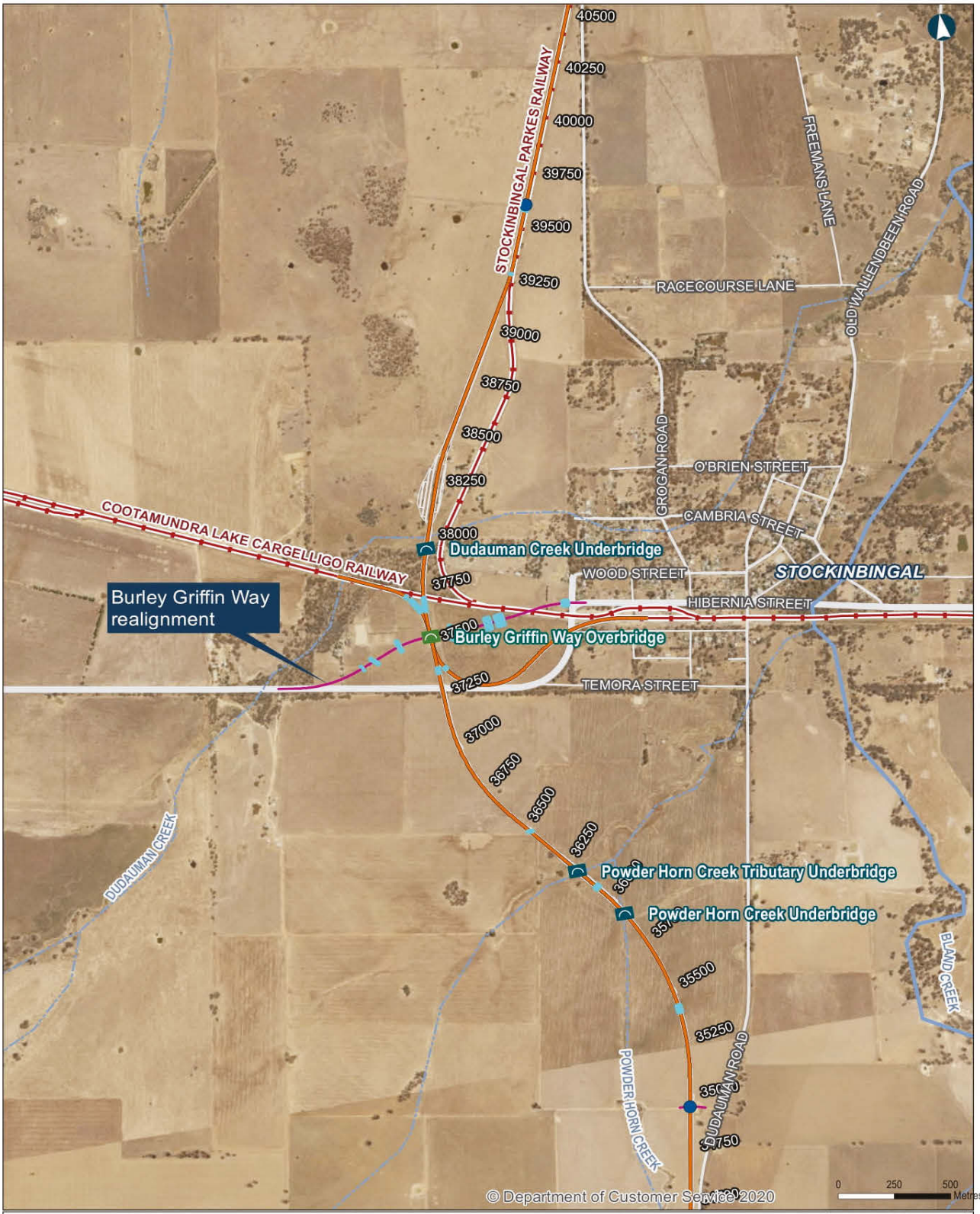
- Local road
- Sub-arterial road
- Arterial road
- Major Watercourse
- Minor Watercourse

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 8 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd



Key features of proposal
- New track/track upgrade
- Road realignment
- Earthworks

40950 Chainage (distance in metres from southern limit of the proposal)

- Bridge (watercourse crossing)
- Bridge (road crossing)
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- Ocupational (private) crossings
- Public level crossing
- Stock crossing (underpass)

Existing features
- Local road
- Sub-arterial road
- Arterial road
- Major Watercourse
- Minor Watercourse
- Existing Rail

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 9 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd

Key features of proposal

- New track/track upgrade
- Road realignment
- Earthworks

40950 Chainage (distance in metres from southern limit of the proposal)

- Culvert
- Ocupational (private) crossings
- Public level crossing
- Stock crossing (underpass)

Existing features

- Local road
- Sub-arterial road
- Arterial road
- Major Watercourse
- Minor Watercourse
- Existing Rail

7.1 Overview of proposal features

Coordinate System: GDA 1994 MGA Zone 55
Date: 11/10/2021 Paper size: A4 Scale: 1:25,000
MAP 10 of 10

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0115_EIS_7_1_OverviewProposalFeatures_r1v3.mxd

7.2 Description of key proposal features

7.2.1 New track

The proposal involves the construction of about 39 km of new, single-track standard-gauge railway between Illabo and Stockinbingal. Generally, the maximum grade for new track is 1:100. An indicative design and cross-sections of the proposal are provided in Figure 7-2 to Figure 7-4.

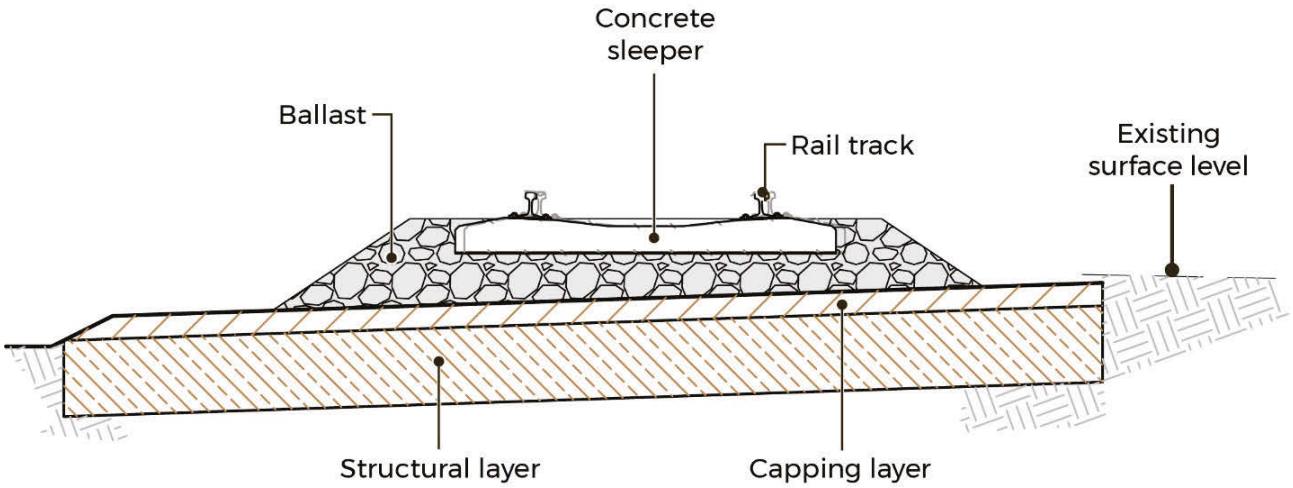


FIGURE 7-2: NEW TRACK

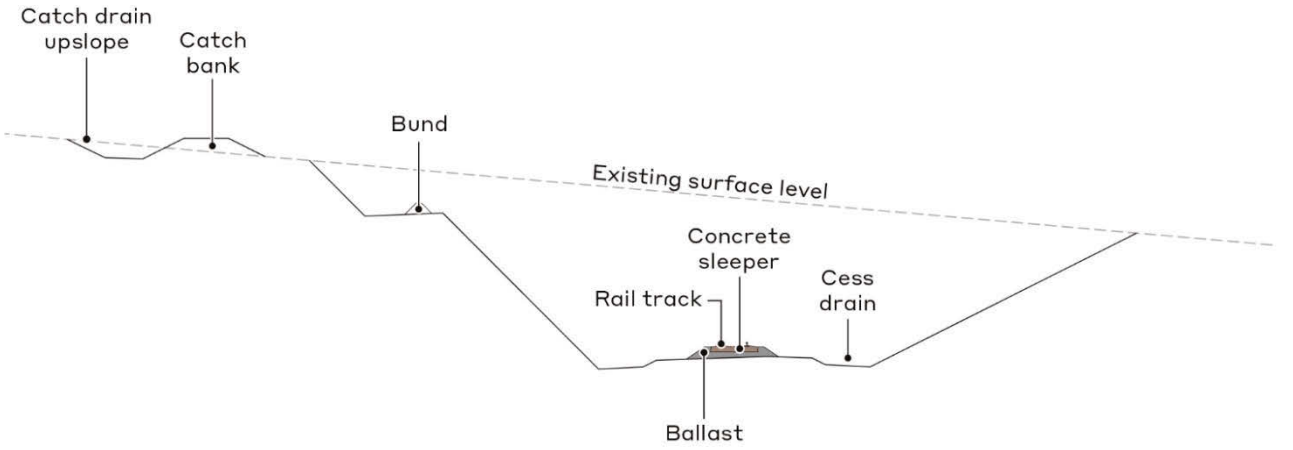


FIGURE 7-3: TYPICAL CROSS-SECTION IN CUTTING

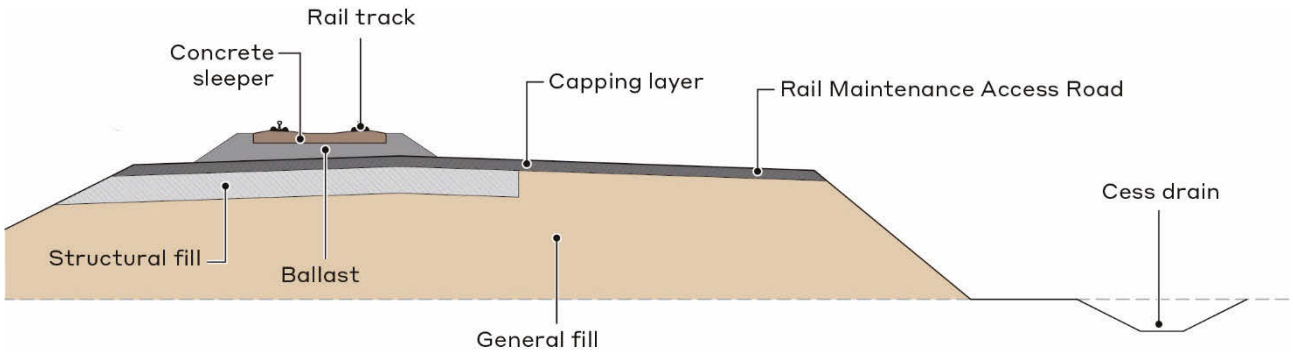


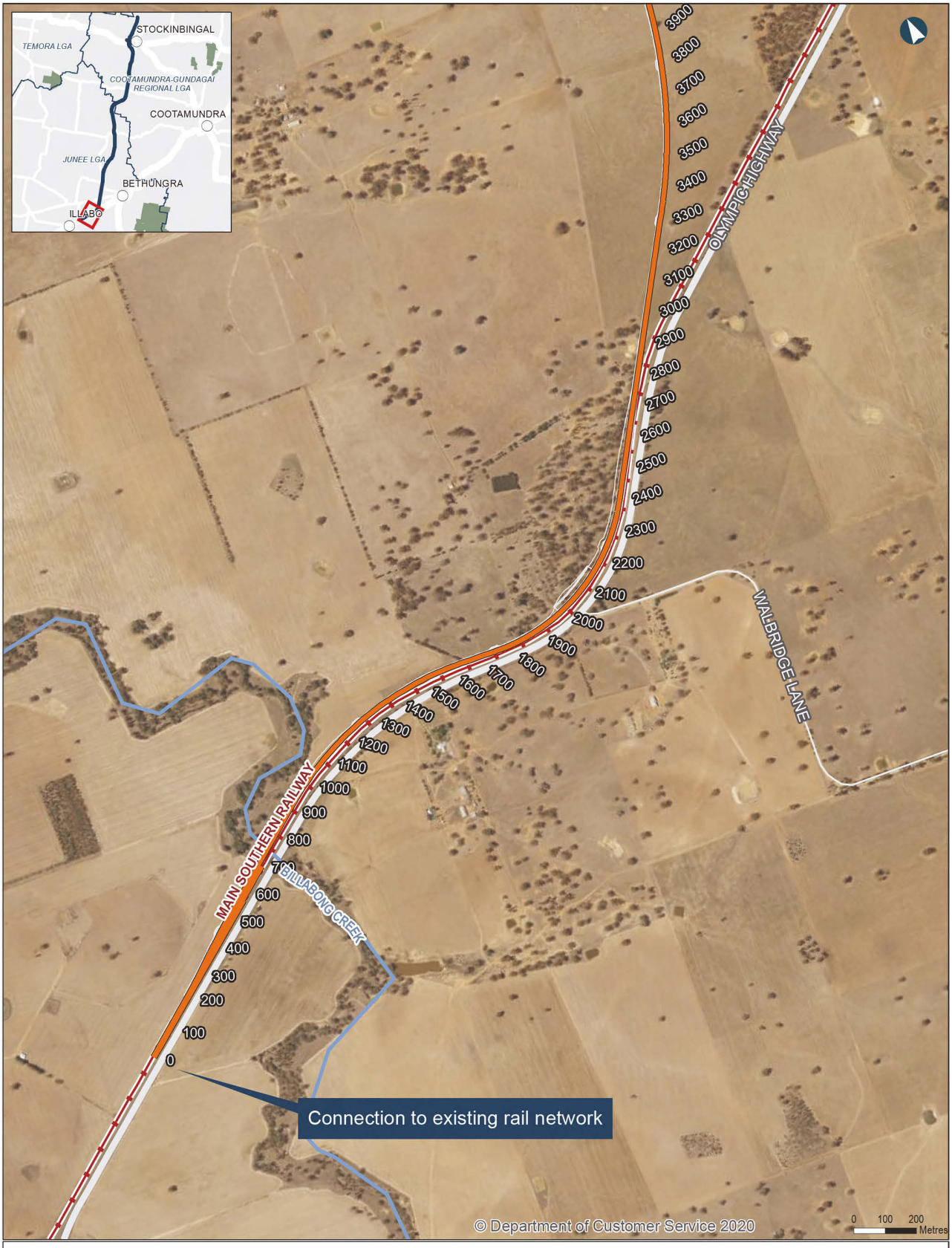
FIGURE 7-4: TYPICAL CROSS-SECTION ON EMBANKMENT

7.2.2 Tie-in and track upgrades

Within the existing rail corridor at Illabo (Main South Line) and Stockinbingal (Stockinbingal to Parkes Line and Lake Cargelligo Line), the existing track and formation would need to be upgraded for the new tie-ins (locations where the project joins the existing rail network). In addition, rail crossovers would be required at the tie-in points along the Main South Line that allow the train to change tracks in different directions. Track upgrades would be required at the following locations:

- connection to the Main South Line at Illabo and connection to the Stockinbingal to Parkes Line at Stockinbingal. This would require about 3 km of track to be upgraded to suit the new tie-ins (refer to Figure 7-5 and Figure 7-6)
- construction and upgrades of about 1.7 km of track to maintain the existing connection of the Lake Cargelligo Line (refer to Figure 7-6).

As part of the interface works with the existing rail network, approximately 2.6 km of existing track will be decommissioned, comprising approximately 1 km of the Lake Cargelligo Line and 1.6 km of the Stockinbingal to Parkes Line (refer Figure 7-6). Works required to decommission this line are discussed in Section 8.8.4 of Chapter 8: Proposal description—construction.



Key features of proposal

- New track/track upgrade
- Earthworks

40950 Chainage (distance in metres from southern limit of the proposal)

Existing features

- Local road
- Sub-arterial road
- Arterial road
- Major Watercourse
- Existing Rail

7.5 Connection to existing rail network at Illabo

Coordinate System: GDA 1994 MGA Zone 55
Date: 5/19/2021 Paper size: A4 Scale: 1:17,500

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0110_EIS_7_5_TieInIllabo_r1v1.mxd

Key features of proposal

- New track/track upgrade
- Burley Griffin Way realignment
- 40950 Chainage (distance in metres from southern limit of the proposal)
- Earthworks
- Redundant sections of rail to be decommissioned
- Burley Griffin Way road closure

Existing features

- Sub-arterial road
- Arterial road
- Major Watercourse
- Minor Watercourse
- Existing Rail

7.6 Road and rail connections and Stockinbingal

Coordinate System: GDA 1994 MGA Zone 55
Date: 5/19/2021Paper size: A3 Scale: 1:20,000

Data Sources: LPI. IRDJV. ARTC

220_0110_EIS_7_6_TieInStockinbingal_r1v1.mxd

7.2.3 Crossing loop and maintenance siding

As the proposal comprises a single-line track, a crossing loop is proposed, which will allow trains travelling in the opposite direction to pass each other. The crossing loop is an approximately 2,200 metres (m) section single track standard gauge running roughly parallel to the main track with a minimum 4.5 m offset from the main alignment. The crossing loop can accommodate trains up to 1,800 m long. It is connected to the main track at both ends via low-speed (80km/hr) turn outs.

The crossing loop and associated maintenance siding would be constructed east of Ironbong Road between Chainage 9200 and 11400. An indicative crossing loop design and location is shown in Figure 7-7 and Figure 7-8.

A one-ended, single-line, standard-gauge siding will be incorporated into the crossing loop for maintenance purposes. It will be used to stable rail-mounted track maintenance plant and equipment (e.g. tampers, regulators, rail grinders, 'hi-rail' plant, etc.) during track-maintenance activities, or for unscheduled maintenance or repair of trains. The siding is approximately 250 m long and will be connected to the crossing loop via a low-speed (40km/hr) turn out.

Operation of the crossing loop is described in section 7.5.3.

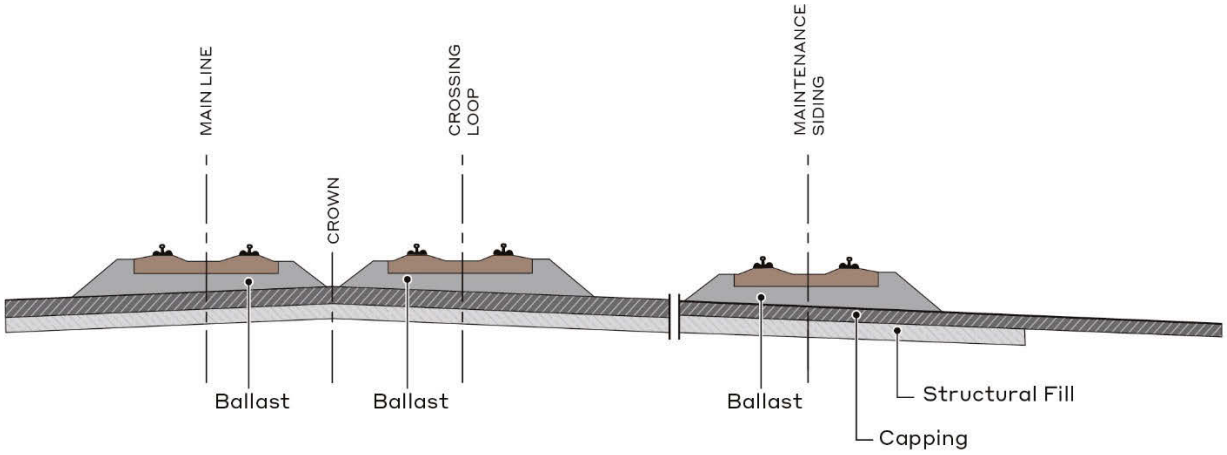


FIGURE 7-7: INDICATIVE CROSSING LOOP DESIGN

Key features of proposal

- Central alignment
- Maintenance Siding
- Crossing Loop

40950 Chainage (distance in metres from southern limit of the proposal)

Existing features

- Sub-arterial road
- Arterial road

7.8 Crossing loop

Coordinate System: GDA 1994 MGA Zone 55
Date: 5/23/2021 Paper size: A4 Scale: 1:8,500

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0110_EIS_7_8_CrossLoopLocation_r1v1.mxd

7.2.4 Turnouts

Turnouts allow the train to be guided from one track to another. The proposal involves providing turnouts at the following locations:

- connection from Main South Line to new track (Chainage 30)
- crossover on Main South Line—Down Main end (Chainage 180)
- crossover on Main South Line—Up Main end (Chainage 220)
- southern end of crossing loop (Chainage 9180)
- maintenance siding connection (Chainage 10245)
- northern end of crossing loop (Chainage 11320)
- connection to western branch of Lake Cargelligo Line (Chainage 37515)
- connection to eastern branch of Lake Cargelligo Line (Chainage 37560).

7.2.5 Bridges

The proposal requires the installation of 11 new bridges ranging in length from 20 to 70 m, which includes eight watercourse crossings, two rail-over-road crossings and one road-over-rail bridge.

Details of the new bridges, including the approximate length, are summarised in Table 7-2 with the locations shown in Figure 7-1.

TABLE 7-2: PROPOSED NEW BRIDGES

Bridge name	Chainage location	Approximate length (metres)	Additional details
Billabong Creek Bridge	711	60	Positioned adjacent to existing bridge on Main South Line.
Ulandra Creek Bridge	7904	60	
Run Boundary Creek Bridge	14422	90	Design of the bridge allows for stock movement beneath the structure.
Dirnaseer Road Bridge	18441	70	Design of the bridge allows for stock movement beneath the structure.
Isobel Creek Bridge	20111	70	
Isobel Creek Tributary Bridge	20460	70	
Old Cootamundra Road Bridge	28232	60	Design of the bridge allows for stock movement beneath the structure.
Powder Horn Creek Bridge	35902	40	
Powder Horn Creek Tributary Bridge	36189	40	
Burley Griffin Way Bridge	37531	20	Burley Griffin Way road over rail bridge would be realigned to pass over the proposed rail line. Further detail is provided in section 7.2.8.
Dudauman Creek Bridge	37930	30	

Depending on geotechnical conditions, a combination of friction piles, rock socketed piles, and shallow pads are proposed for the bridge structures' foundations, all of which have been designed to be made of reinforced concrete. All bridge piers consist of reinforced concrete cast insitu headstock supported on circular reinforced concrete columns or blade piers.

The height of the bridges has been determined with consideration of the existing topography and the following design considerations:

- road-over-rail at the Burley Griffin Way rail crossings is 7.1 m
- creek crossing is typically above the 100-year flood level
- public road crossings are 5.5 m (from the surface of road to underside of bridge), which was determined based on consultation with the NSW Farmers Association to enable the local movement of farm plant and machinery.

7.2.6 Culverts

Culverts are structures that allow water (in a watercourse or drain) to pass under the rail line.

Based on flood modelling undertaken to date as described in Chapter 12: Hydrology and flooding, the proposal would require around 88 new and existing cross-drainage culverts below the rail formation and 27 longitudinal drainage culverts below level crossings across drainage lines (which would be confirmed during detailed design) of varying types and sizes along the proposal site. The number of culverts and design would be confirmed through further flood modelling during detailed design.

The indicative design of new/replacement culverts has been informed by a ground-truthed hydrologic and hydraulic assessment of the proposal site, a geotechnical assessment, and a preliminary assessment of the existing structures. An assessment of flooding events has been undertaken for each structure. The target design condition for the new structures is the one per cent annual exceedance probability (1% AEP) flood event, where reasonably practicable.

The culverts would be constructed of concrete and have been designed to:

- take into account local constraints and flooding/hydrological conditions
- permit an appropriate flow and minimise the potential for adverse flooding impacts
- meet vertical alignment criteria and embankment configurations
- meet ARTC design standards.

7.2.7 Road–rail interfaces

7.2.7.1 Public crossings

As mentioned in Chapter 6: Alternatives and proposal options, road–rail interfaces were assessed throughout the proposal and to determine the preferred crossing type. The proposal would cross the public road network at nine locations, as summarised in Table 7-3.

TABLE 7-3: PUBLIC ROAD CROSSINGS IN THE PROPOSAL

Road crossing	Road type	Chainage	Crossing type
Unnamed Road	Crown Road	2794	Level crossing (Active)
Old Sydney Road	Council (Local) road	5592	Level crossing (Passive)
Ironbong Road	Council (Local) road	8157	Level crossing (Active)
Unnamed Road	Crown Road	11380	Level crossing (Active)
Unnamed Road	Council (Local) road	15940	Level crossing (Passive)
Dirnaseer Road	Council (Local) road	18474	Grade separated (Rail over road)
Old Cootamundra Road	Council (Local) road	28268	Grade separated (Rail over road)
Corbys Lane	Council (Local) road	33773	Level crossing (Passive)
Burley Griffin Way	State Road	37531	Grade separated (Road over rail)

7.2.7.2 Private crossings

The proposal would interface with 75 private roads including six primary access tracks and 58 existing farm tracks. In addition to potentially severing these tracks, the introduction of the rail corridor across agricultural land has the potential to inhibit the movement of livestock and farm vehicles more generally across properties. The impacts of the proposal on land use and property are addressed in Chapter 18: Land use and property.

Extensive consultation with landowners has been undertaken as part of development of the proposal to address this issue, as generally outlined in Chapter 4: Engagement. As a result, a number of stock underpasses (to allow for the save movement of livestock and vehicles) under the rail line (comprising suitable opportunities for stock crossings under a bridge span or dedicated culvert structure), and occupational (private) crossings for vehicular access (generally across the rail tracks for the purpose of vehicular movements) have been proposed. These are detailed in Table 7-4 and shown on Figure 7-1.

TABLE 7-4: SUMMARY OF CROSSINGS

Chainage	Crossing type
3825	Stock underpass
5944	Stock underpass
7644	Stock underpass
9004	Stock underpass
12359	Stock underpass
13437	Occupational (private) crossings
13544	Stock underpass
17478	Stock underpass
19843	Occupational (private) crossings
19904	Stock underpass
21202	Occupational (private) crossings
22428	Occupational (private) crossings
23404	Stock underpass
25201	Occupational (private) crossings
25889	Stock underpass
27784	Stock underpass
30855	Occupational (private) crossings
32147	Occupational (private) crossings
34948	Occupational (private) crossings
39588	Occupational (private) crossings

Where occupational (private) crossings are proposed, ARTC would work with landowners to develop a design that takes into account their requirements. For example, in areas where landowners use large farm machinery and run livestock, the design of the level crossing would include stock-proof fencing, secured gates and suitable approach grades.

Both the State and National Rail Safety guidelines and policies are safety focused and would be used. ARTC would consult with each landowner to find solutions that minimise the number of level crossings across the alignment.

Consultation to identify potential occupational (private) crossing solutions is further described in Chapter 4: Engagement.

Design and layout of occupational (private) crossing solutions would be based on the following:

- feedback from consultation with landowners on specific property requirements
- safety standards (criteria for minimum sight distances for trains and vehicles)
- alternative access arrangements
- rail design and landform
- stock movements
- vehicle access requirements (e.g. farm machinery, frequency of use).

7.2.8 Road modifications

7.2.8.1 Burley Griffin Way realignment

Burley Griffin Way (B94) is a NSW state highway, which links Canberra and Griffith via Yass and the Barton Highway. The current Burley Griffin Way arrangement runs east–west through Stockinbingal and includes an active level crossing of the Stockinbingal to Parkes Line south of West Street (see Figure 7-9).

The existing Burley Griffin Way would be crossed by the proposal near Stockinbingal. This crossing provides for a road-over-rail grade separation, which would result in the removal of the level crossing and improve road safety with the realignment. The Burley Griffin Way realignment would be located between the existing Stockinbingal to Parkes Line and Burley Griffin Way, connecting with Hibernia Street west of Stockinbingal.

The grade separation would have increased safety benefits by eliminating the existing level crossing in Stockinbingal and reducing travel times for residents and other road users. The proposed design of the Burley Griffin Way realignment is shown in Figure 7-9, with the proposed cross-section and long section at the road–rail interface shown in Figure 7-10 and Figure 7-11.

The proposed design of the Burley Griffin Way realignment comprises of two 3.5-m lanes, with 1.5-m shoulders and 1-m verges. To mitigate rail collision issues, a single-span deck configuration with reinforced soil wall abutments has been adopted for this structure. The bridge length over the proposed alignment is about 20 m with a width of 13 m. The structure includes a 7.1 m height allowance for the rail maintenance access road to pass under the structure, as well as a provision for a future track (see Figure 7-11). Medium performance barriers would be installed on either side of the bridge structure with throw screens.

The current posted speed for this portion of Burley Griffin Way varies between 100 km/h and 60 km/h. The Burley Griffin Way realignment has been designed to a posted and design speed of 100 km/h and 110 km/h, respectively.

Ongoing consultation with Transport for NSW would be undertaken throughout detailed design to discuss the design and posted speed, the tie-in to the existing roads, and arrangements for maintaining effective service during construction (discussed further in section 8.2.6).

Once operational, there would be a redundant section of the Burley Griffin Way south of Hibernia Street due to the realignment (see Figure 7-9). Consultation with Transport for NSW and Cootamundra–Gundagai Council would be undertaken to confirm any potential treatment or use of this section of road corridor.

The realignment would also result in the removal of access for Troy Street to the Burley Griffin Way, resulting in the streets becoming a no-through road (see Figure 7-9).

Key features of proposal

- New track/track upgrade
- Burley Griffin Way realignment
- 40950 Chainage (distance in metres from southern limit of the proposal)
- Burley Griffin Way road closure
- Burley Griffin Way Road embankment

Existing features

- Existing Rail
- Local road
- Sub-arterial road
- Arterial road

7.9 Burley Griffin Way realignment

Coordinate System: GDA 1994 MGA Zone 55
Date: 5/19/2021Paper size: A3 Scale: 1:8,000

Data Sources: LPI, IRDJV, ARTC

220_0110_EIS_7_9_BGWRealignment_r1v2.mxd

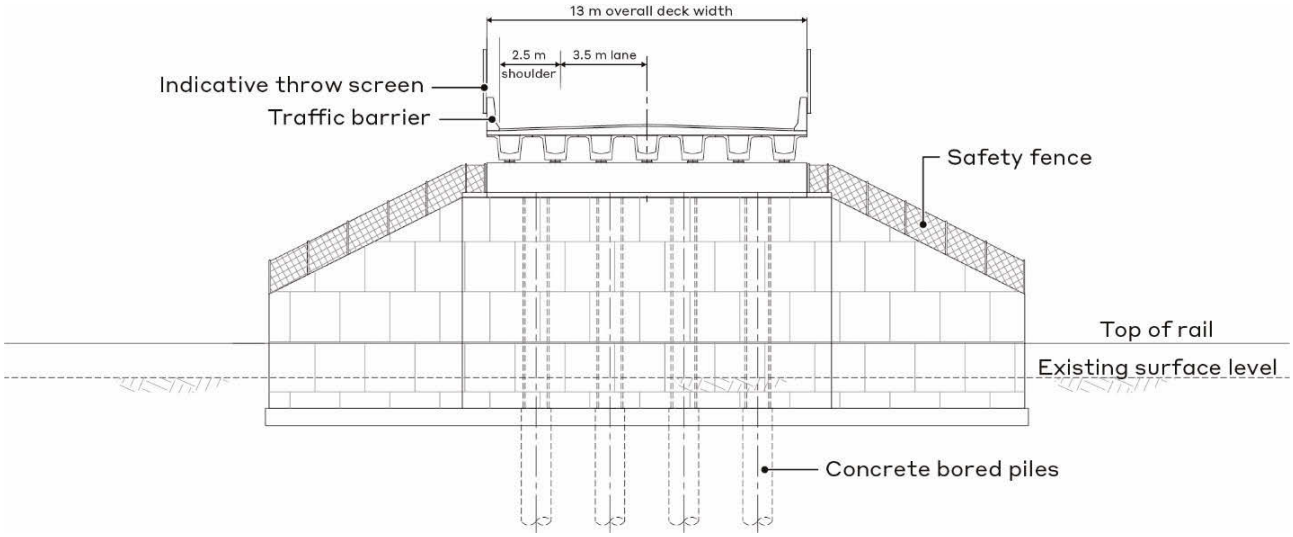


FIGURE 7-10: BURLEY GRIFFIN WAY REALIGNMENT CROSS-SECTION

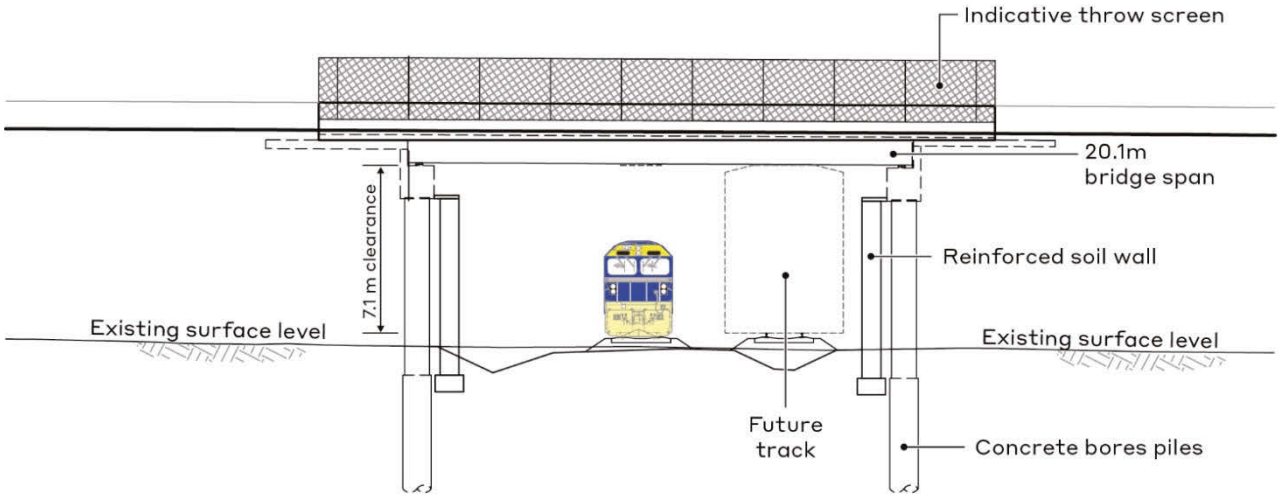


FIGURE 7-11: BURLEY GRIFFIN WAY REALIGNMENT LONG-SECTION

7.2.8.2 Ironbong Road modifications

Ironbong Road is a local road with a sign-posted 100 km/h speed limit, which runs in a north–south direction predominantly parallel to the proposal, apart from where the proposal interfaces with Ironbong Road at Chainage 8152 (see Figure 7-12).

Due to poor sight lines and curve of the existing road alignment, an activated level crossing would be provided as well as realignment of the road to provide a safe crossing for vehicles. This would result in a reduced design speed of 90 km/h from the default rural road speed of 100 km/h. Advisory speed signage, in conjunction with the curve warning sign, has been proposed to reduce vehicle approach speeds. In addition, chevron alignment marker signage and guideposts have been provided for improved delineation.

The realignment of Ironbong Road as well as the location of the level crossing is shown in Figure 7-12.

Key features of proposal

- New track/track upgrade
- Earthworks
- 40950 Chainage (distance in metres from southern limit of the proposal)
- Public level crossing
- Road realignment
- Road embankment

Existing features

- Sub-arterial road
- Arterial road
- Minor watercourse

7.12 Ironbong Road modifications

Coordinate System: GDA 1994 MGA Zone 55
Date: 5/23/2021 Paper size: A4 Scale: 1:5,000

Illabo to Stockinbingal Data Sources: LPI, IRDJV, ARTC

220_0110_EIS_7_12_IronbongRdModifications_r1v1.mxd

7.3 Ancillary works and infrastructure

Ancillary works and related infrastructure are detailed below.

7.3.1 Track drainage

Drainage in the form of a cess drain would be installed within the rail corridor adjacent to the track. Cess drains are surface drains located to the side of the tracks, used to remove water that percolates through the ballast and flows along the capping layer towards the outside of the track formation. Cess drains are used to protect the track formation by keeping it dry.

The proposal would require surface and/or subsurface cess drains on both sides of the rail corridor along cuttings and some embankments. The cess drains would be positioned towards the outer limit of the rail corridor, with the surrounding earthworks shaped to shed water towards its location.

7.3.2 Rail maintenance access road

The rail maintenance access road would run the length of the proposal in various locations within the proposal site. The rail maintenance access road would consist of a pavement material. An indicative cross-section of the typical layout of the track, including the rail maintenance access road, is shown in Figure 7-13.

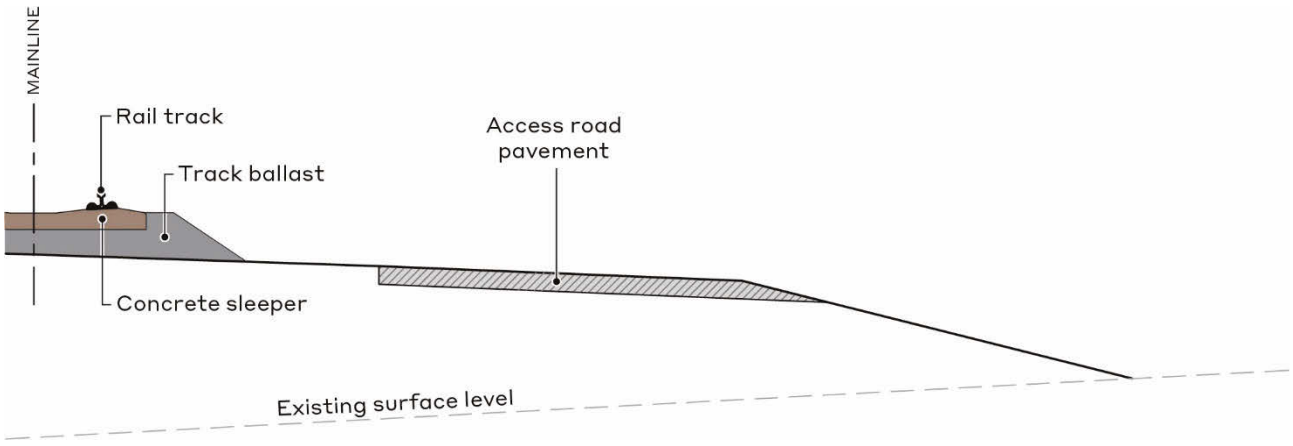


FIGURE 7-13: RAIL MAINTENANCE ACCESS ROAD

7.3.3 Signalling and communications

The existing signalling provisions at Stockinbingal and Illabo would be reconfigured to suit the new track and operational arrangements. The final locations and required changes to the signalling system along the existing rail lines would be determined in detailed design.

On opening, Train Order Working (TOW) would be used for operational train management between the junctions for Inland Rail I2S at Illabo and Stockinbingal. In the longer term, ARTC's Advanced Train Management System (ATMS) would be implemented to manage signalling and communications for the wider rail network. ATMS is a communication-based train management system, which communicates via both voice and data between network control centres and locomotives operating on ARTC's rail network. Connections for the aforementioned signalling infrastructure and communications to the electricity network, would also be installed via new connections to power lines where required along the proposal site.

7.3.4 New utility connections

The two active level crossings, the crossing loop as well as turnouts at northern and southern ends of the proposal, require new electrical and communications connections to facilitate operation of flashing lights, boom barriers and turnouts, and to allow active controls to tie into the wider Inland Rail network.

Supply points (i.e. existing utility infrastructure) for the new electrical and communications connections have been identified with local connections readily available adjacent to the proposal (refer to Appendix F). The criteria for identifying potential supply points were:

- ease of access—supply points located on public land were preferred. This reduces or eliminates access requirements and minimises the operational interface between asset owners and ARTC.
- shortest route with the fewest road and service crossings—this reduces the costs and time associated with new connections and minimises disruptions to residents.

Potential supply points will be refined during the detailed design phase, in consultation with the relevant utility owners.

7.3.5 New fencing

Fencing would be constructed along the rail corridor, where it is located on, or adjoins, private land to prevent unauthorised access to the rail corridor. Where the rail corridor abuts an existing public road with stock movements, fencing would be provided on both sides of the proposed rail corridor.

The type of fencing would be discussed with landholders and road managers and refined during detailed design. In general, unless other agreed, fencing would consist of a standard stock fence (1.2 m high), with gates provided in locations aligning with the access roads and other key access points to the rail corridor from public and private roads.

Fencing would be constructed to a district standard and where practicable, would account for any specific livestock requirements and consideration would be given for specific types of fencing, e.g. across a floodway. Given the nature of the proposal, ARTC intends to provide fencing of a sufficient standard to prevent livestock from straying onto the rail corridor.

Mitigation measure commits to providing livestock fencing in agricultural areas (as required) to minimise the risk of livestock–train collisions. The preferred fencing arrangements would be confirmed in consultation with landholders.

Fencing would provide physical separation of the railway corridor from the adjoining land. The intention with a boundary fence is to protect the rail corridor and to mitigate the risks associated with individuals and livestock accessing the rail corridor.

7.3.5.1 Fauna fencing

Fauna fencing can be an effective way of preventing fauna species from accessing rail corridors, minimising potential mortality. Fencing could be used in conjunction with other crossing structures to exclude animals from sections of infrastructure corridors and to direct animals towards a safe crossing location.

Typically, fauna fencing suitable to deter medium-sized mammals (e.g. kangaroos) would generally be about 2 m in height and buried 30 centimetres (cm) to prevent fauna species from digging under the fence. A floppy top could also be added to the fence to prevent fauna climbing over.

Based on the results of the Biodiversity Development Assessment Report (Technical Paper 1, Volume 2), fauna fencing is likely to be required. The potential location of fauna fencing and design would be confirmed during detailed design.

Further information is provided in Chapter 10: Biodiversity.

7.3.6 Fauna crossings

Fauna crossings can provide connectivity of the canopy for arboreal species, including possums and gliders. Fauna crossings could include:

- rope structures (although they could be steel cable or pipe)—suspended on vertical poles to connect habitat on opposite sides of road or rail infrastructure
- canopy bridges—elevated structures that pass over the project and provide crossing points for fauna that utilise the tree canopy for movement, and are generally a combination of rope tunnels and ladders
- glider poles—vertical poles placed in on the road verge and median strip to provide immediate landing points and/or multiple launch opportunities. Primary use is to provide a launching pad for glider species.
- fauna underpasses—a structure that would facilitate the movement of fauna species beneath the rail line.

Opportunities to install fauna crossings and potential locations would be investigated during detailed design.

7.3.7 Retaining walls

Other than the retaining walls structures that form part of the bridge structures (i.e. reinforced soil walls) no other retaining wall structures have been identified at this stage of the design; however, it is anticipated that some low-level retaining walls may be required at some of the creek bridges to mitigate embankment encroachment into the creek. These requirements would be investigated during detailed design.

7.3.8 Signage

Typical signage within the rail corridor would include kilometre posts, creep markers, and track geometry and control markers, and would be provided where required. Signage required as part of the road modifications is discussed in section 7.2.8.

7.4 Land acquisition

The proposal would require a series of full property acquisitions and partial property acquisitions to allow construction activities, and for the proposal's functional and operational infrastructure.

It is estimated that about 489 hectares (ha) of land would be permanently required. These requirements are anticipated to include approximately:

- 476.4 ha of land from 26 private landowners
- 12.6 ha of publicly owned land (Crown land, Crown roads and Transport for NSW roads).

All property acquisitions would be managed in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). The preference is to achieve a negotiated agreement with the affected landowner with the compulsory acquisition used as a last resort. The compensation payable is pursuant to Section 55 of the *Land Acquisition (Just Terms Compensation) Act 1991*, which includes provisions for market value and disturbance items such as associated legal costs, valuation fees, relocation and removal expenses, and mortgage costs.

The extent of property impacts would be refined and confirmed during detailed design in consultation with property owners. For partial acquisitions, property adjustment plans would be developed in consultation with the property owner. A summary of the proposed property acquisition is provided in Appendix D.

7.5 Operation of the proposal

7.5.1 Train operations

The proposal will be managed and maintained by ARTC; however, train services will be provided by a variety of operators. Trains will be double stacked (up to 6.5 m high) and operate on a 24/7 basis. While Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2027, the Illabo to Stockinbingal section of Inland Rail is expected to be operational from late 2026 for use by other regional freight movements.

The proposal would provide a north–south through service via the Main South Line and Stockinbingal–Parkes Line as well as an east–west connection via the Lake Cargelligo Line. The existing operation of the Main South Line, Lake Cargelligo Line and the Stockinbingal to Parkes Line (described in section 2.5.2) would continue prior to, during and following construction of the proposal.

Based on current demand forecasting, it is estimated that the Illabo to Stockinbingal section of Inland Rail would be trafficked by an average of 6 trains per day (both directions) from the commencement of operations in late 2026, increasing to about 11 trains per day (both directions) in 2040. The new rail line would be a faster, more efficient route that bypasses the Sydney rail network and would enable the use of double-stacked trains along its entire length. Train speeds would vary according to axle loads and range from 80 to 115 km/h.

The Inland Rail trains would be a mix of grain, bulk freight and other general transport trains, including predominantly double stacking of containerised freight. Total annual freight tonnages would be about 12 million tonnes in the early years of operation, increasing to about 19 million tonnes in 2040.

No passenger services are planned to run between Illabo and Stockinbingal. Current passenger services, such as the Melbourne–Sydney express passenger train (XPT), would continue to operate along the Main South Line.

7.5.2 Road network

There would be a permanent modification of the road network as a result of the Burley Griffin Way and Ironbong Road realignments (refer to section 7.2.8). Access for maintenance of the realigned sections (refer to section 7.5.4) would be via the road network and would be infrequent. Neither of these road modifications are anticipated to result in a change in traffic volumes.

7.5.3 Operation of the crossing loop

A crossing loop is a section of track off to the side of the main track that allows a train to move to the side so that another train can pass along the main track. In operation, one train enters the crossing loop through one of the turnouts and idles at the other end, while the opposing train continues along the mainline track to pass the now stationary train. The time required to complete the crossing is typically about 10–15 minutes. During this time the stationary train remains with its engines running.

A crossing loop is proposed at chainage 9200 and 11400 (see Figure 7-8), with further detail provided in section 7.2.3.

7.5.4 Maintenance activities

Standard ARTC maintenance activities would be undertaken during operations. Typically, these activities include minor maintenance works, such as bridge and culvert inspections, rail grinding and track tamping, through to major maintenance, such as reconditioning of track and topping up of ballast as required.

Maintenance of other infrastructure associated with the proposal, including fencing and access tracks, would also be required.

The maintenance siding would be used to stable rail mounted track maintenance plant and equipment, (e.g. tampers, regulators, rail grinders, 'hirail' plant, etc.) during track maintenance activities. The siding can also be used for the storage of trains requiring repairs/servicing.