regional roads victoria

4 Project description

VICTORIA'S BIG BUILD

VICTORIA State Government

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4.1 Overview

This chapter describes the project elements for RRV's preferred C2 alignment for the Beaufort Bypass. The functional design has considered the project objectives, as well as risks and impacts identified in the development of the EES, and includes the following key elements:

- the physical footprint of the alignment
- major infrastructure elements
- relevant design elements
- indicative construction methodology.

4.2 Preferred alignment

The RRV preferred alignment option for the bypass of the township of Beaufort (within the C2 alignment corridor) is shown in Figure 4.1. It is located approximately 160 km west of Melbourne's Central Business District and 50 km west of Ballarat in the Pyrenees Shire Council. The bypass would be an 11 km dual carriageway and link completed sections of the Western Highway duplication to the east and west of Beaufort. It is expected that each carriageway would have two 3.5 m-wide lanes, with a 3 m-wide outside shoulder and 2.4 m-wide verge. A typical cross section in cut and fill is shown in Section 4.9.3.

From the western tie-in point, approximately 3 km from the Beaufort township, the alignment leaves the existing Western Highway and deviates east then north-east, following the northern side of a gully formed by a tributary of Yam Holes Creek. The alignment then passes over Back Raglan Road and heads in a south-east direction across the Yam Holes Creek floodplain, to the north of the Beaufort Trotting Track. Crossing Main Lead Road, the alignment ascends into the southern extent of Camp Hill State Forest, then descends to form a full diamond interchange at Beaufort-Lexton Road. The alignment crosses Yam Holes Creek and Racecourse Road, before bearing south, south-east and crossing the Melbourne-Ararat rail line. The bypass then re-joins the existing Western Highway at an interchange approximately 4.5 km to the east of Beaufort. Half-diamond interchanges would be constructed at the eastern and western tie-ins to connect to the existing Western Highway.

The project would also construct:

- fire access within Camp Hill State Forest
- road safety barriers
- culverts and bridges over waterways
- culvert realignment and road drainage requirements
- utility service relocations (as required)
- noise attenuation barriers (as required)
- lighting at interchanges
- aerial and terrestrial fauna passage
- road and town signage.

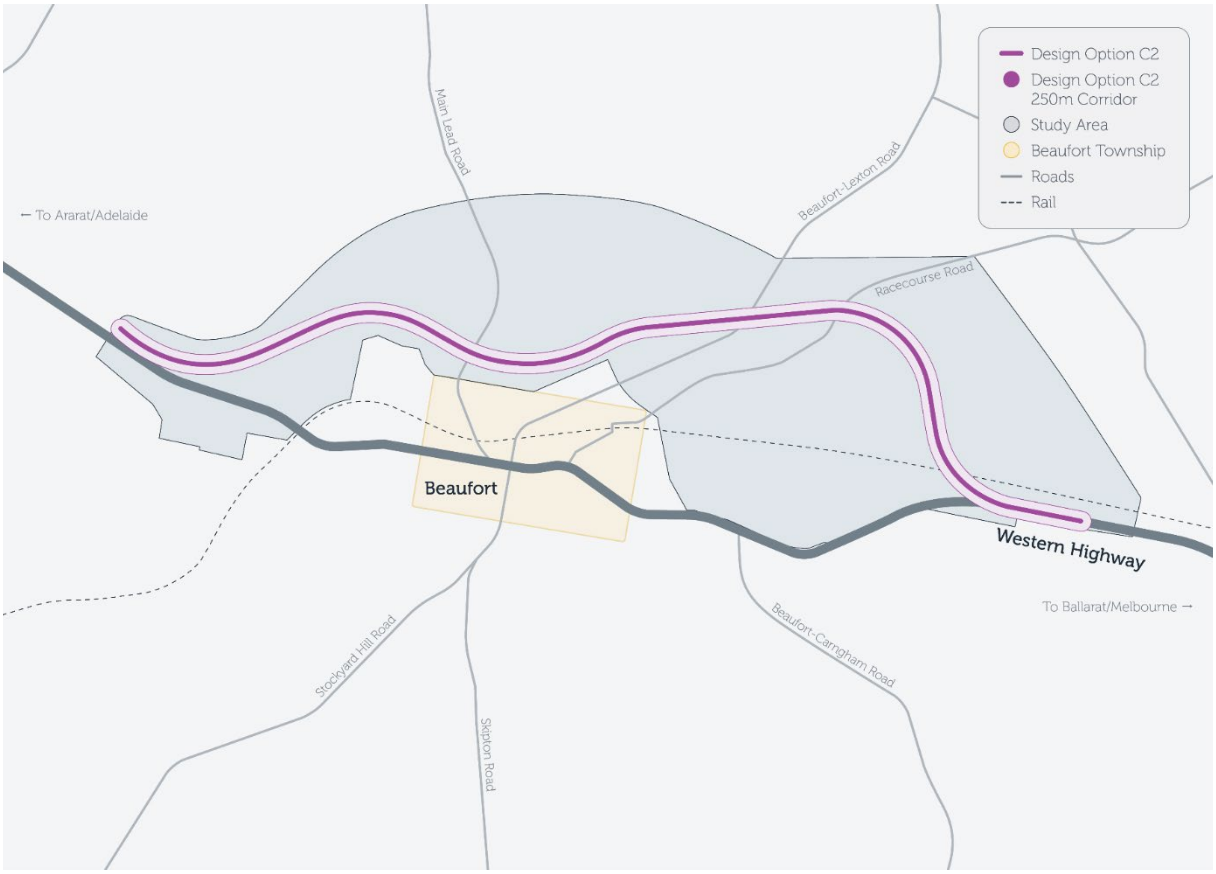

Figure 4.1 Beaufort Bypass C2 alignment corridor

The study area for the project includes approximately 1,800 ha of land north of the Beaufort township. During the development stages of the alignment alternatives, the study area (shown in Figure 4.2a to Figure 4.2d below) was assessed to determine potential environmental impacts and constraints to individual alignment alternatives.

The topography of the study area is characterised by lower elevations in the floodplains to the west of Main Lead Road and east of Beaufort-Lexton Road, and the higher elevations of Camp Hill State Forest. These elevations were considered in the development and placement of the functional road design for the C2 alignment, with respect to minimising the requirements for cut and fill to construct the bypass.

Land use within the study area is predominately broadacre farming, interspersed with native forested woodland including Camp Hill State Forest. Other land uses include the former Beaufort Trotting Track, sewage treatment plant irrigation ponds and motorcycle track. Current land use is described in EES Chapter 13: *Land use and economics*. Historic land use is described in EES Chapter 10: *Cultural heritage*.

4.4 Project area

The project area is the footprint for the permanent and temporary construction and ancillary facilities for the project. The project area will be defined by a Specific Controls Overlay, shown in Figure 4.2a to Figure 4.2d, which is being sought within the draft Planning Scheme Amendment (refer to Beaufort Bypass EES Attachment V: *Draft Planning Scheme Amendment*).

Permanent impacts for the project are based on the impacts defined within the construction footprint (refer to Section 4.5). The siting of ancillary construction infrastructure and activities outside of the construction footprint will be defined during the detailed design phase. Indicative locations for haul roads, site offices and laydown areas are detailed in Figure 4.2a to Figure 4.2d. Indicative haul roads are located within the construction footprint. The indicative site office and laydown areas are all located outside of the Yam Holes Creek floodplain, and areas of identified native vegetation and habitat. Within these indicative areas, approximately 28 ha of land has been identified as available for ancillary construction facilities (refer to Figure 4.2a to Figure 4.2d). Identified environmental values outside of the construction footprint but within the project area will be protected through the defined no-go zones (refer to Figure 4.2a to Figure 4.2d) and mitigations listed within EES Chapter 17: *Environmental management framework*.

RRV consider the project area adequate for all permanent and temporary works. Activities that will occur within the project area include:

- site offices
- stockpiles
- laydowns
- access and haulage routes
- no-go zones.

These activities have been considered in the assessment of the potential environmental impacts of the project.

4.5 Construction footprint

A subset construction footprint will lie within the project area (refer to Figure 4.2a to Figure 4.2d). The construction footprint is the area of permanent disturbance required for the construction of the ultimate freeway bypass. The footprint has been created by applying a buffer of the extents of the functional design and has been used to calculate vegetation impacts within EES Chapter 9: *Biodiversity and habitat*. The approach is based on similar recent major transport projects. Construction activities that would occur within the construction footprint include:

- access and haulage routes
- carriageways and medians
- intersections and roundabouts
- road drainage, swales and culvert realignments
- service and access roads
- service relocations
- noise barriers
- clear zones extending a minimum of 13 m either side of the edge of the traffic lanes (except where environmental constraints are located)
- construction buffers beyond the clear zone, which have been included to accommodate the potential need for widened batter slopes, provision of drainage and relocation of services.

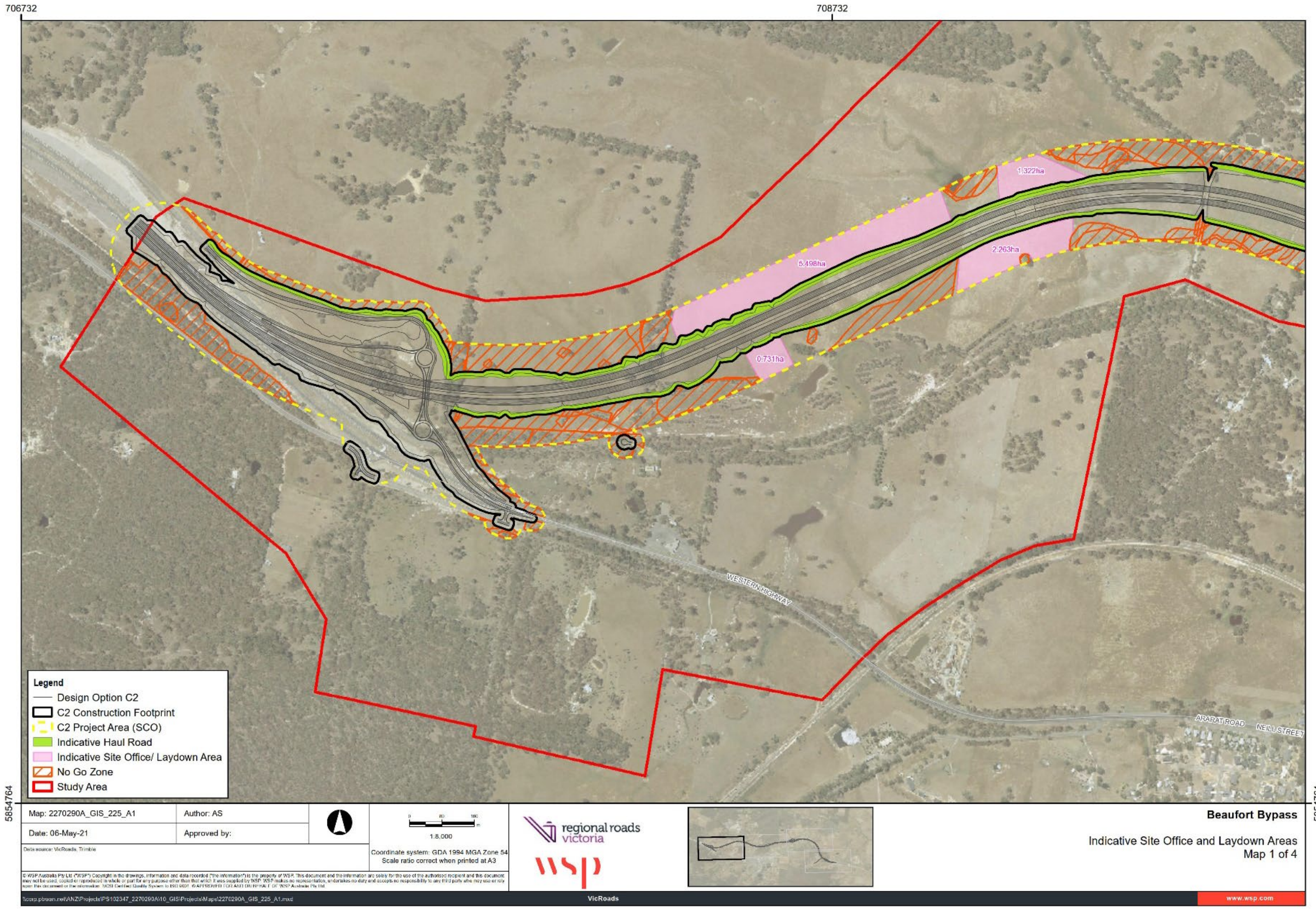

Figure 4.2a Project Area (Specific Controls Overlay) and Construction Footprint

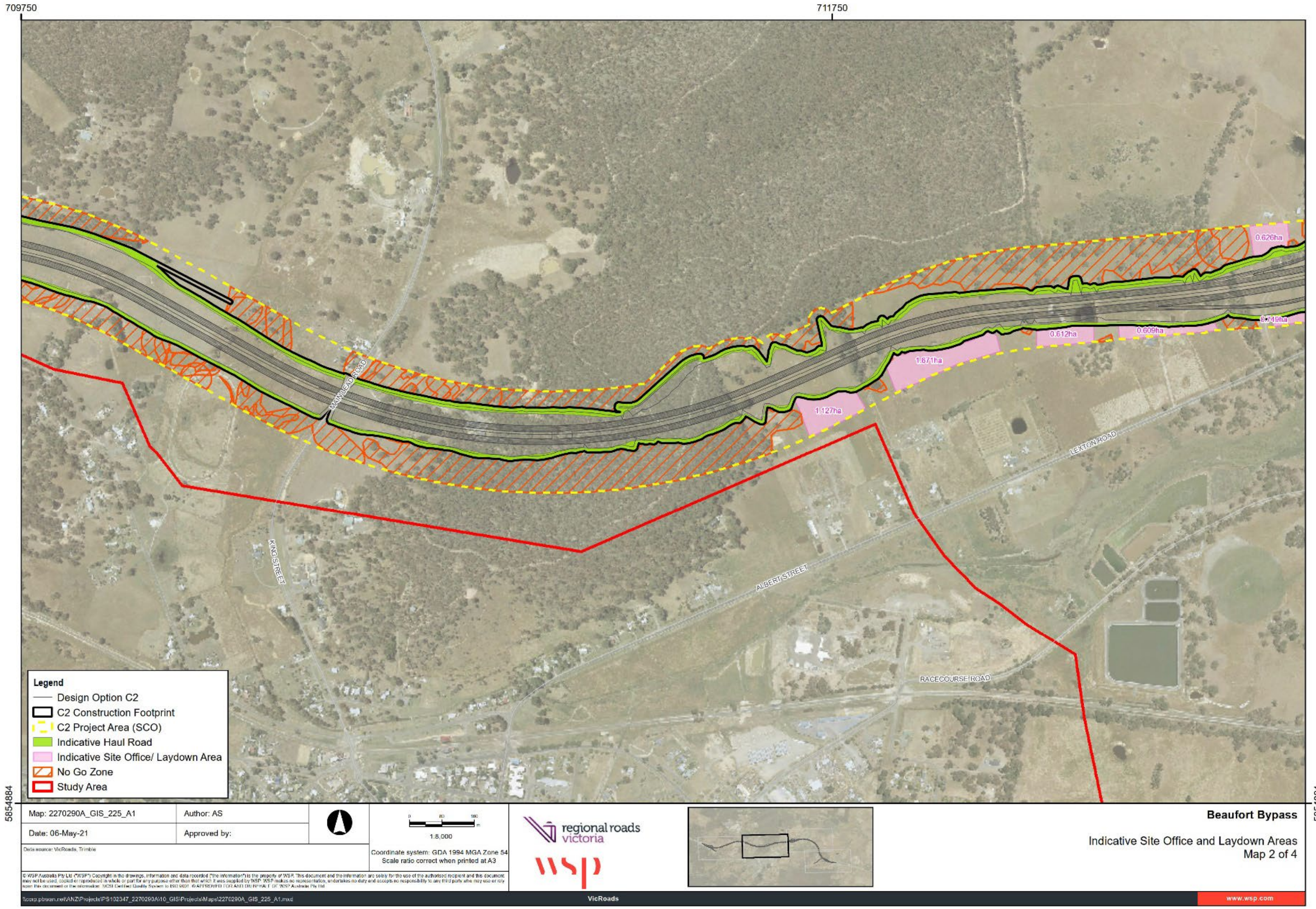

Figure 4.2b Project Area (Specific Controls Overlay) and Construction Footprint

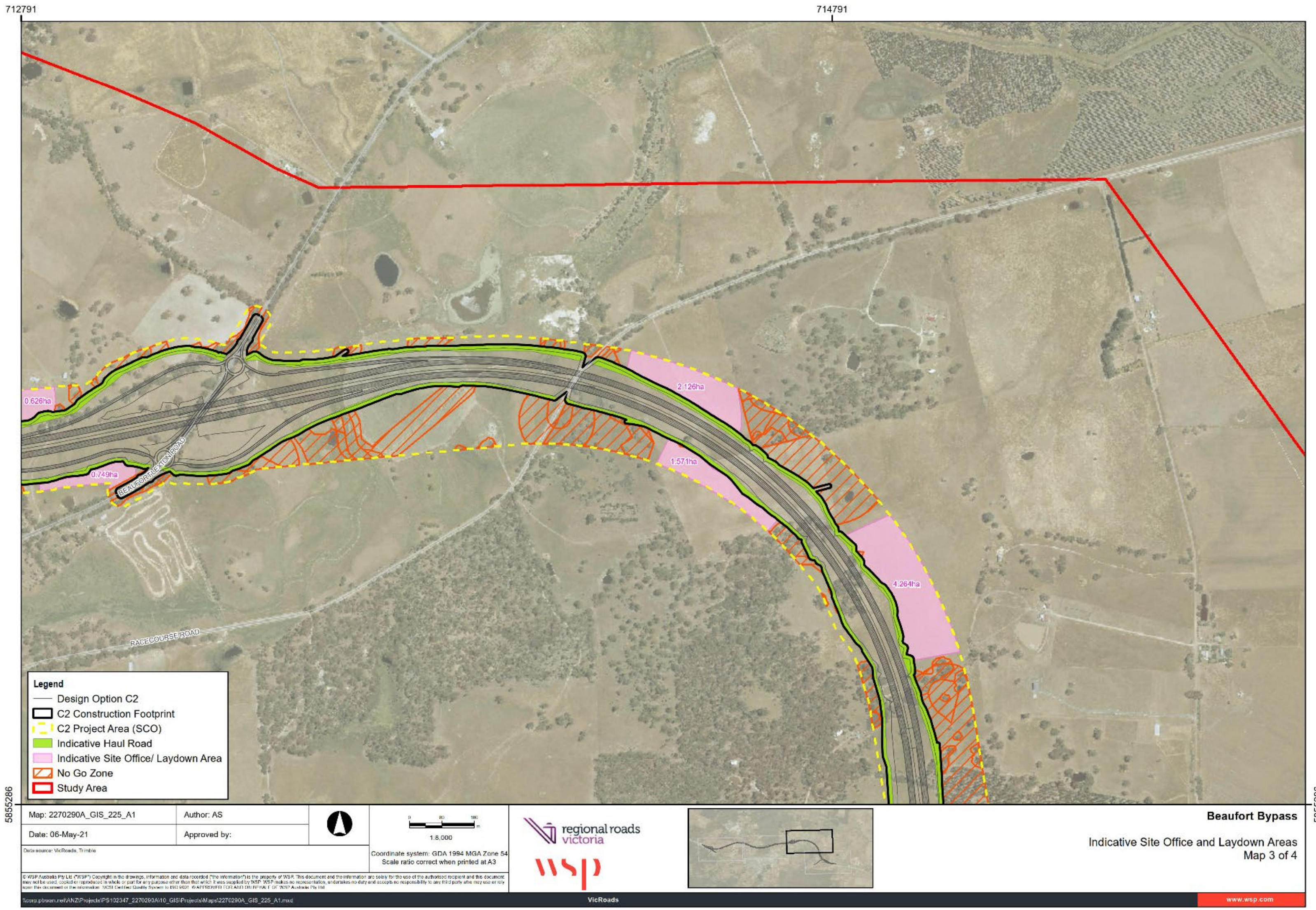

Figure 4.2c Project Area (Specific Controls Overlay) and Construction Footprint

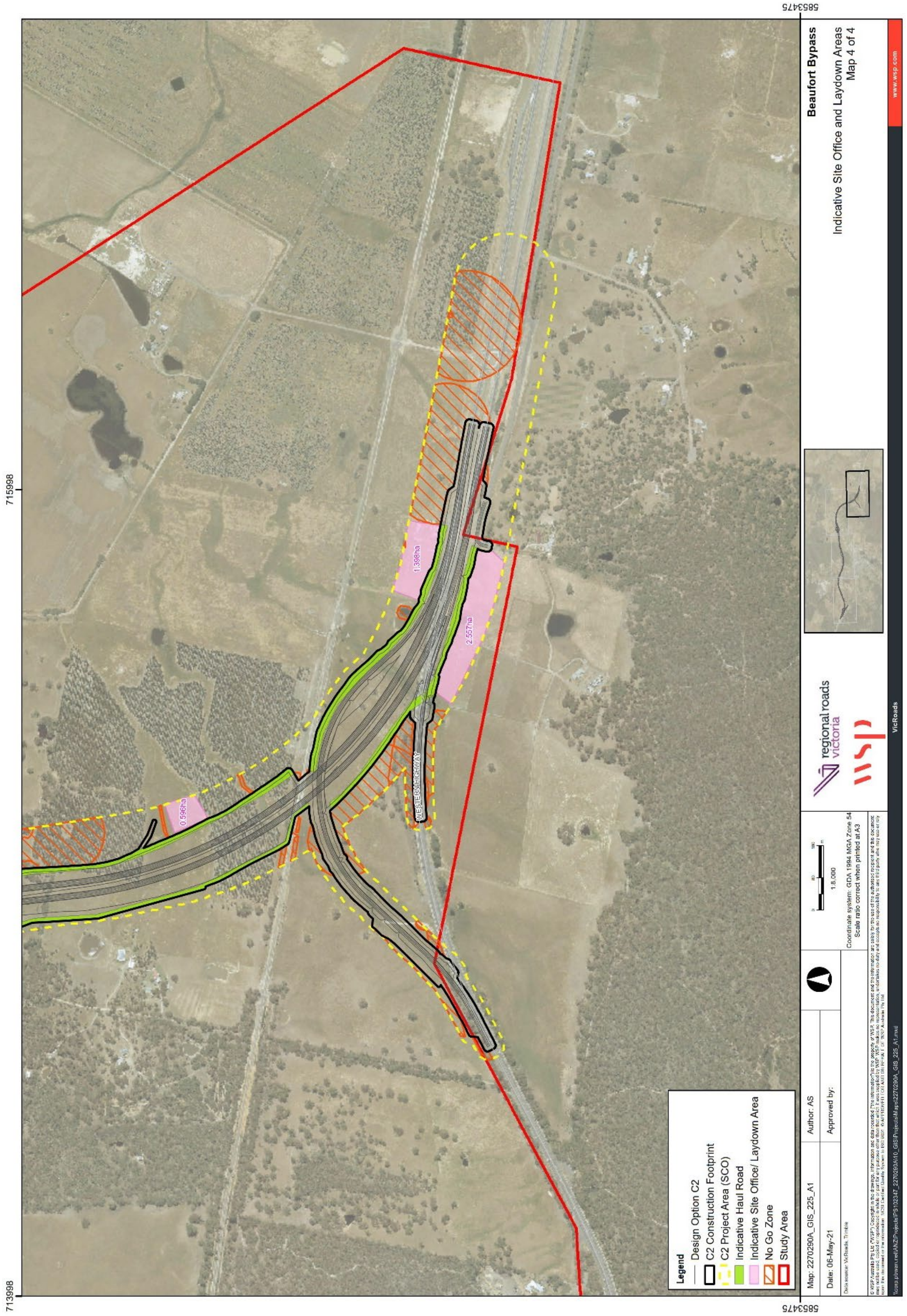

Figure 4.2d Project Area (Specific Controls Overlay) and Construction Footprint

4.6 Public Acquisition Overlay

The Public Acquisition Overlay area for the project facilitates the project by ensuring that changes to the use or development of the land do not prejudice the purpose for which the land is to be acquired.

The draft Planning Scheme Amendment (EES Attachment V) seeks to apply Clause 45.01 Public Acquisition Overlay to the project area to reserve land for the future construction of the project. The procedure for acquisition and compensation will comply with the *Land Acquisition and Compensation Act 1986* and once the Public Acquisition Overlay has been applied to the affected areas of the alignment.

The area where the Public Acquisition Overlay is to be applied for the project is shown in Figure 4.3a to Figure 4.3f.

4.7 Land acquisition

There are 66 land parcels intersected by the RRV preferred C2 corridor. These parcels are predominately freehold land in private ownership, with the remaining land in Crown land titles including the land of the former Beaufort Trotting Track, Camp Hill State Forest and the Melbourne-Ararat rail line.

Sections of the western tie-in and Melbourne-Ararat rail line are subject to an existing Public Acquisition Overlay. For the land parcels requiring acquisition not included under the existing Public Acquisition Overlay, a Planning Scheme Amendment is required to apply the Public Acquisition Overlay to these land parcels. A draft Planning Scheme Amendment with Public Acquisition Overlay is exhibited with the EES (refer to EES Attachment V: *Draft Planning Scheme Amendment*). Acquisition of private land would be undertaken in accordance with the *Land Acquisition and Compensation Act 1986*. Land tenure is discussed further in EES Chapter 13: *Land use and economics*. Figure 4.3a to Figure 4.3f provides a map of the existing Public Acquisition Overlay and the parcels requiring full and partial acquisition.

4.8 Project timing

Construction staging would be determined by RRV / MRPV and the construction contractor(s), and would depend on project approvals, seasonal weather conditions, procurement timing, environmental and social considerations, and external factors (e.g. nearby events or projects). Timing of the detailed road design will depend on funding and the final alignment selected by the EES process, and the method of construction delivery (e.g. construct only, or design and construct).

Construction of the project is expected to take around two years, commencing as soon as future funding is secured.

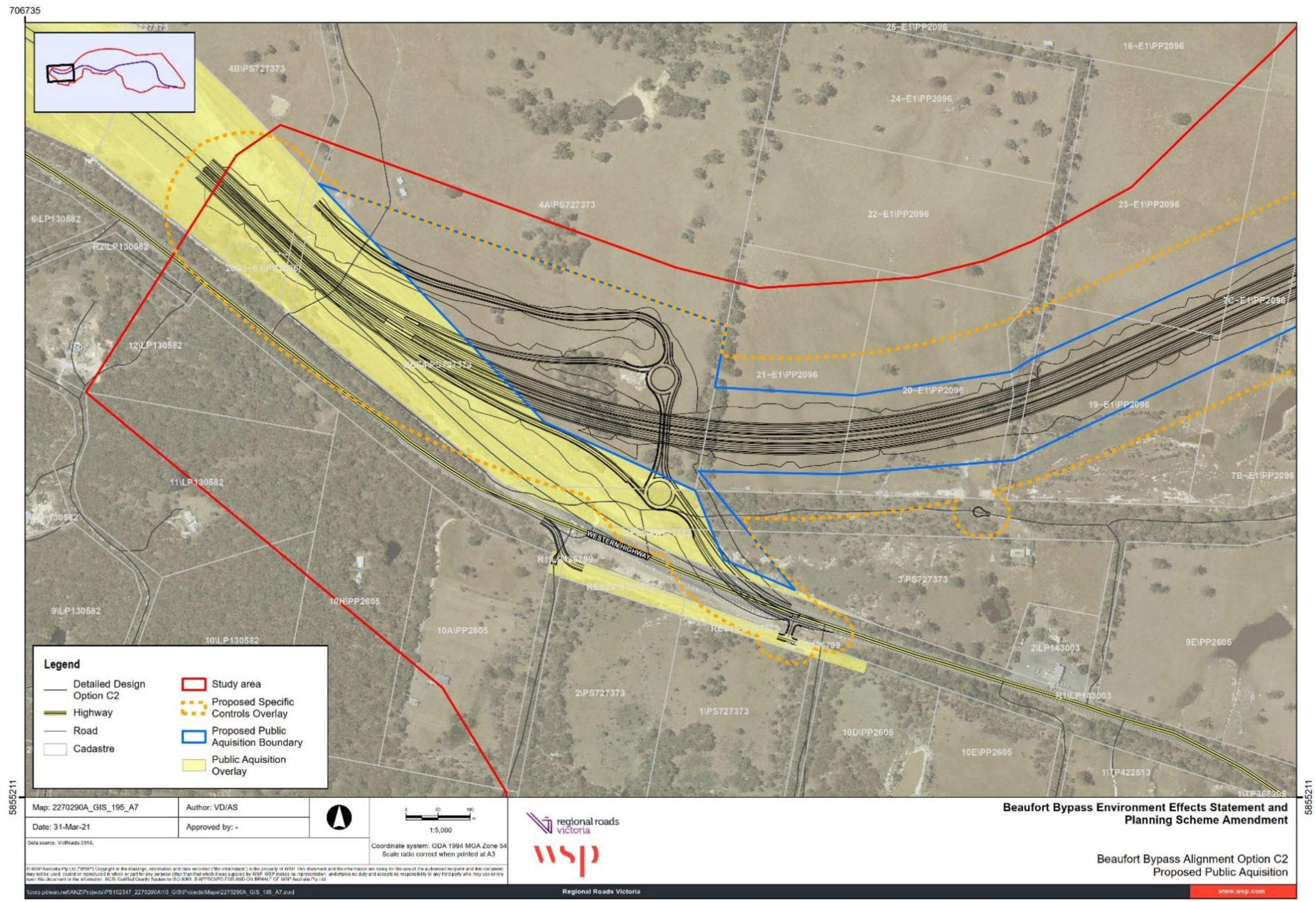

Figure 4.3a Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

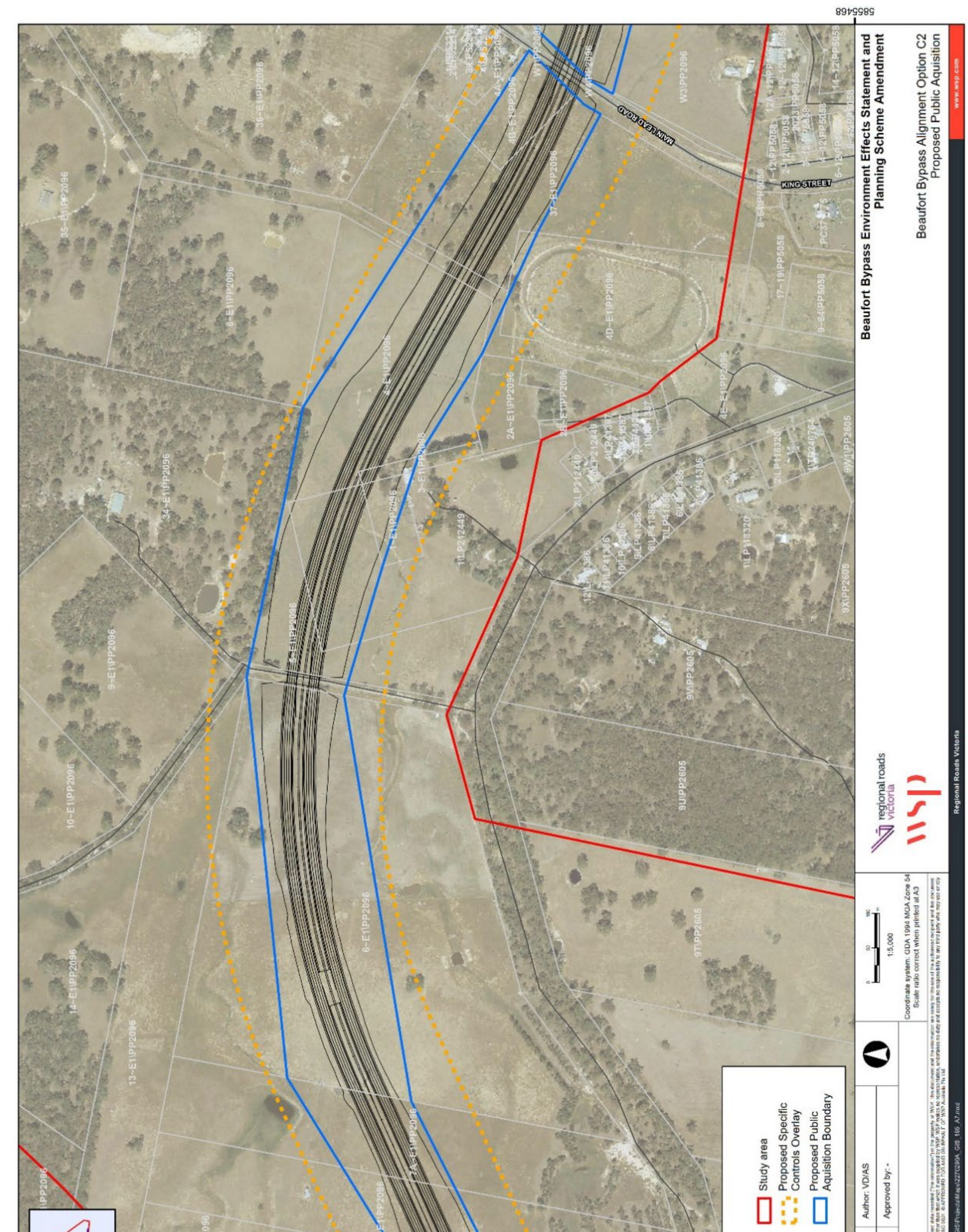

Figure 4.3b Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

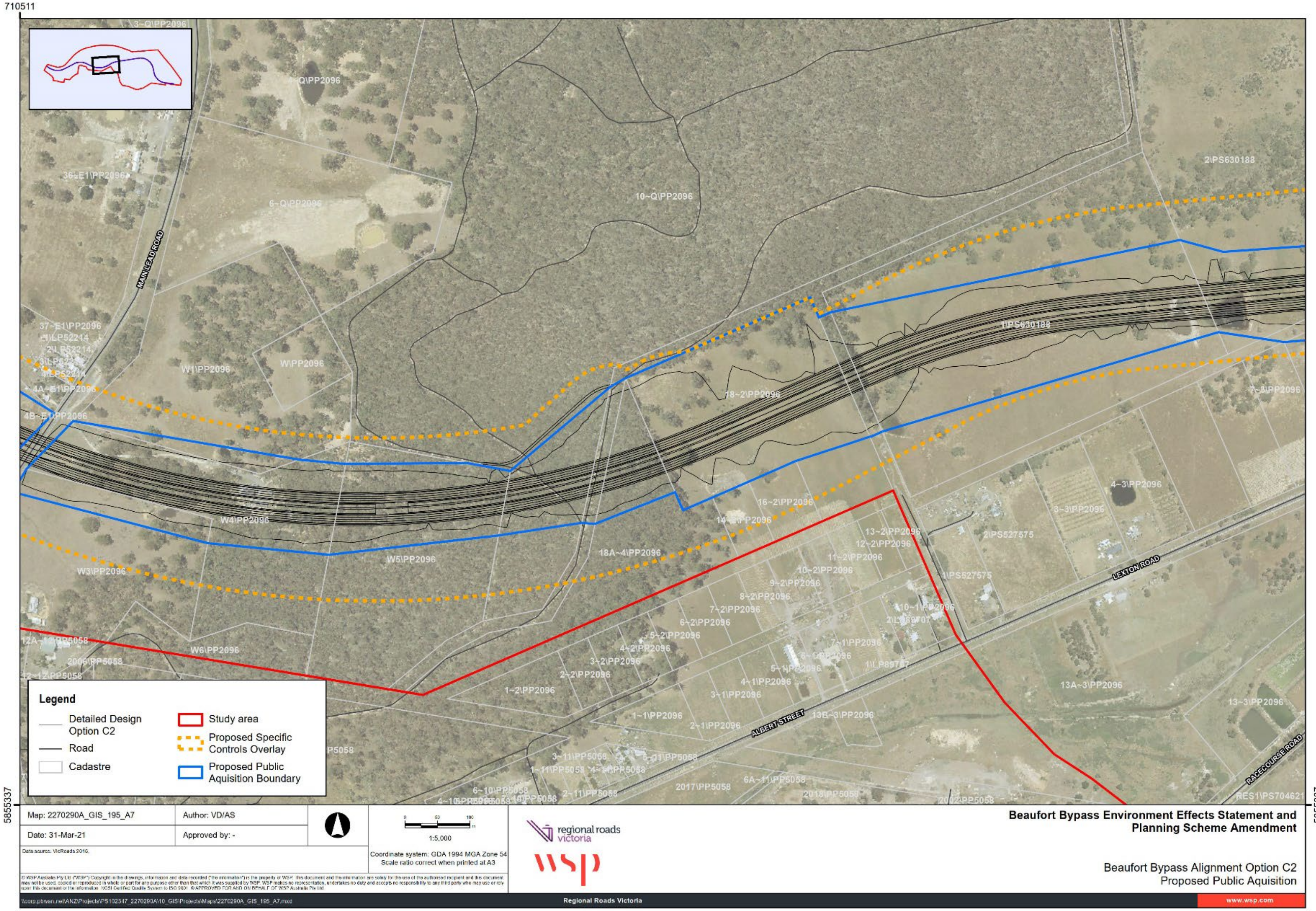

Figure 4.3c Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

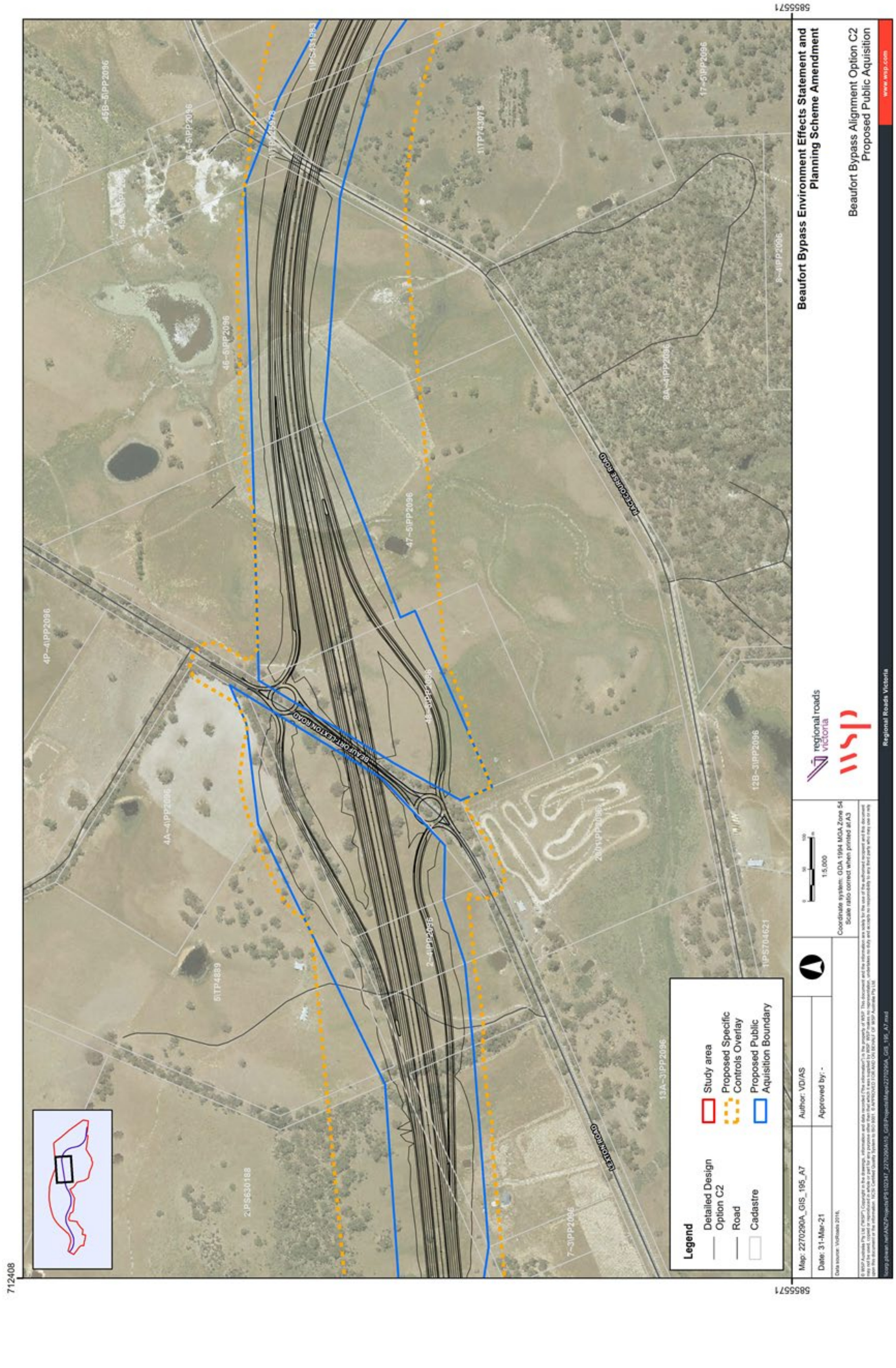

Figure 4.3d Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

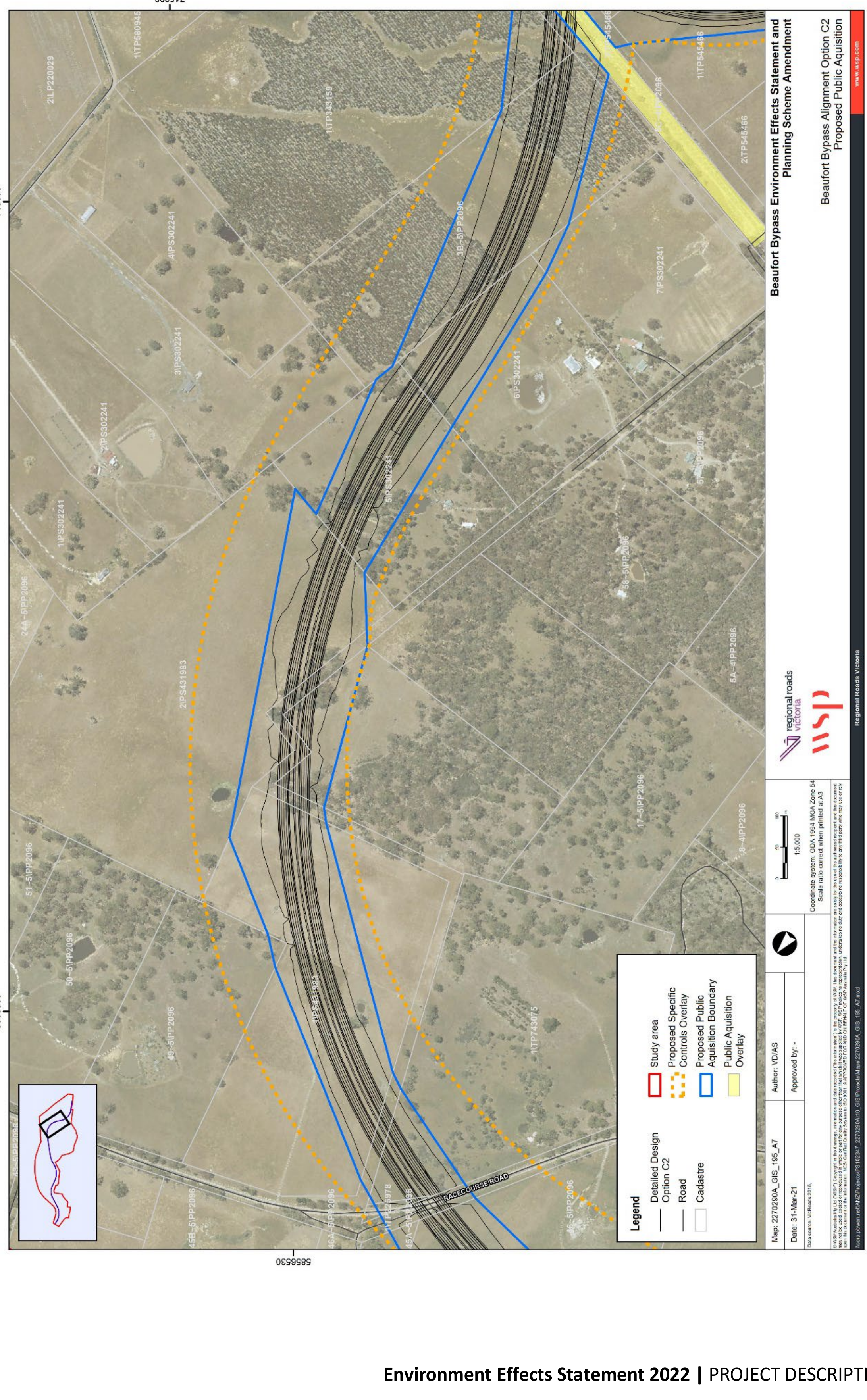

Figure 4.3e Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

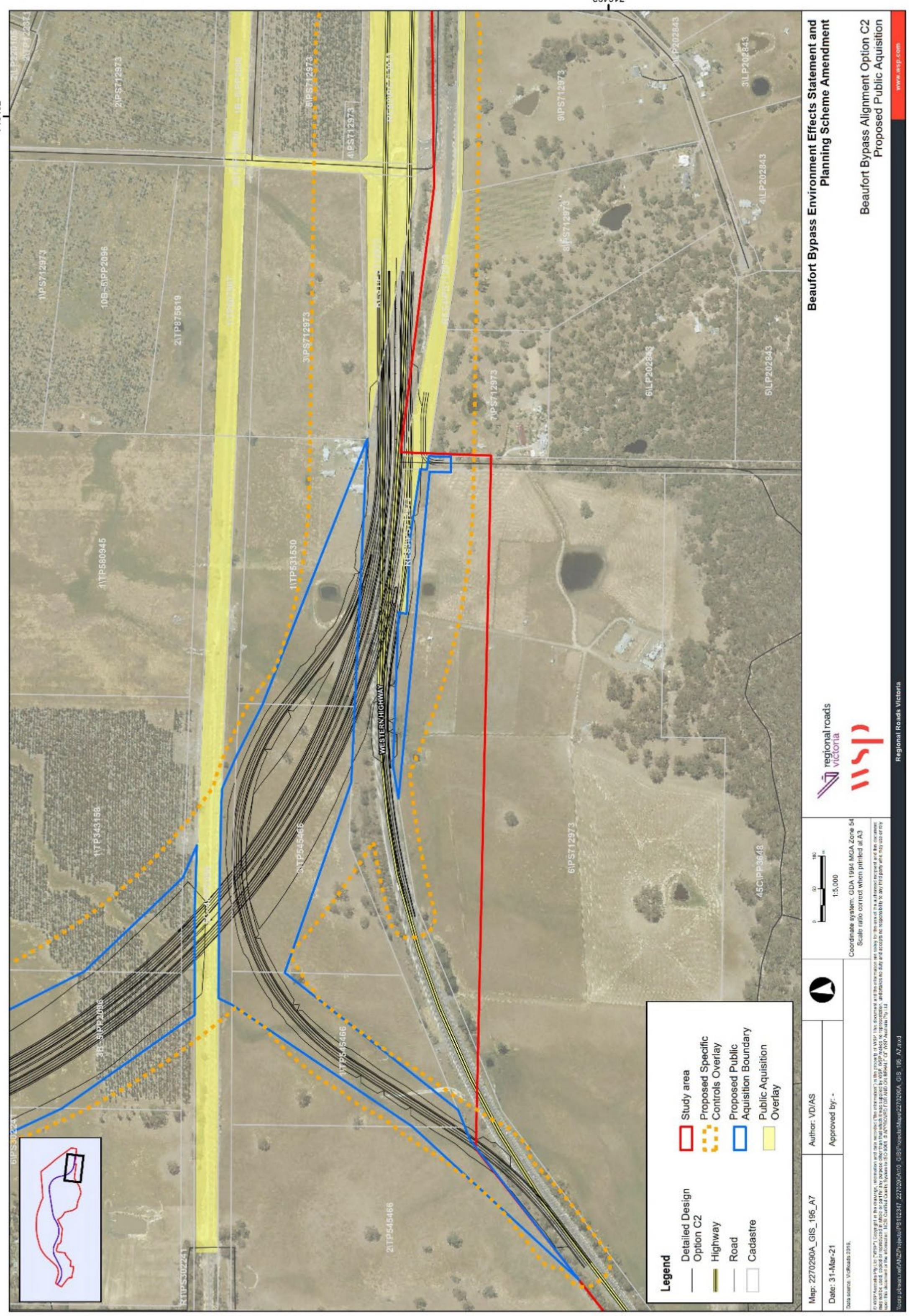

Figure 4.3f Proposed Specific Controls Overlay (project area) and Public Acquisition Overlay

4.9 Alignment C2 functional road design

4.9.1 Design guidelines and key design parameters

The functional road design has been developed in accordance with the Austroads *Guide to Road Design*, adopted by VicRoads/RRV, and VicRoads' supplementary documents and design notes developed to assist road design.

4.9.2 Posted speed limits

The bypass would be designed to 120 km per hour standards and would have a posted speed limit of 110 km per hour for the entire length of the bypass. The functional road design and posted speed limits for ramps and connecting roads, in accordance with the Austroads *Guide to Road Design*, are outlined in Table 4.1 below.

Table 4.1 Speed limits – posted and design

Section	Posted speed limit (km per hour)	Design speed limit (km per hour)
Bypass	110	120
Bypass ramps	80	90
Other local roads	As per current posted speed	As per current posted speed

4.9.3 Design for vehicle movements

The functional road design intersections and turning movements are designed to cater for all vehicles legally allowed to use the bypass. Access to local roads from the bypass, where permitted, would include sufficient turning provision for a standard B-double truck configuration (i.e. a vehicle consisting of a prime mover and two trailers linked together approximately 25 m long).

It is not anticipated that High Productivity Freight Vehicles over 30 m in length would need to access the local road network from the bypass.

Each carriageway would include two 3.5 m-wide traffic lanes, a 3 m-wide outer sealed shoulder and a 3 m-wide inner sealed shoulder. The carriageways would be separated by a central median. A typical cross-section of the bypass is shown at Figure 4.4 (in fill) and Figure 4.5 (in cut). The cross section at Camp Hill is shown in Figure 4.6.

The functional design has conservatively adopted a 19 m central median between shoulders with no central median barrier, in line with Austroads Standards. Opportunities for reductions to the central median to 7 m between shoulders would be available during the detailed design phase to further reduce impacts to vegetation values and adjoining land use. The narrow median configuration would need to incorporate a wire rope safety barrier or equivalent to meet VicRoads/RRV safety standards (*VicRoads Supplement – Part 6 – Roadside Design, Safety and Barriers*).

Other opportunities where design dispensations could be sought from the Department of Transport through the detailed design phase to further reduce assessed impacts include:

- reducing cut and fill requirements by maintaining the design road level as close as possible to the natural surface level
- consideration of alternative roadside drainage systems with a smaller footprint (kerb and channel).

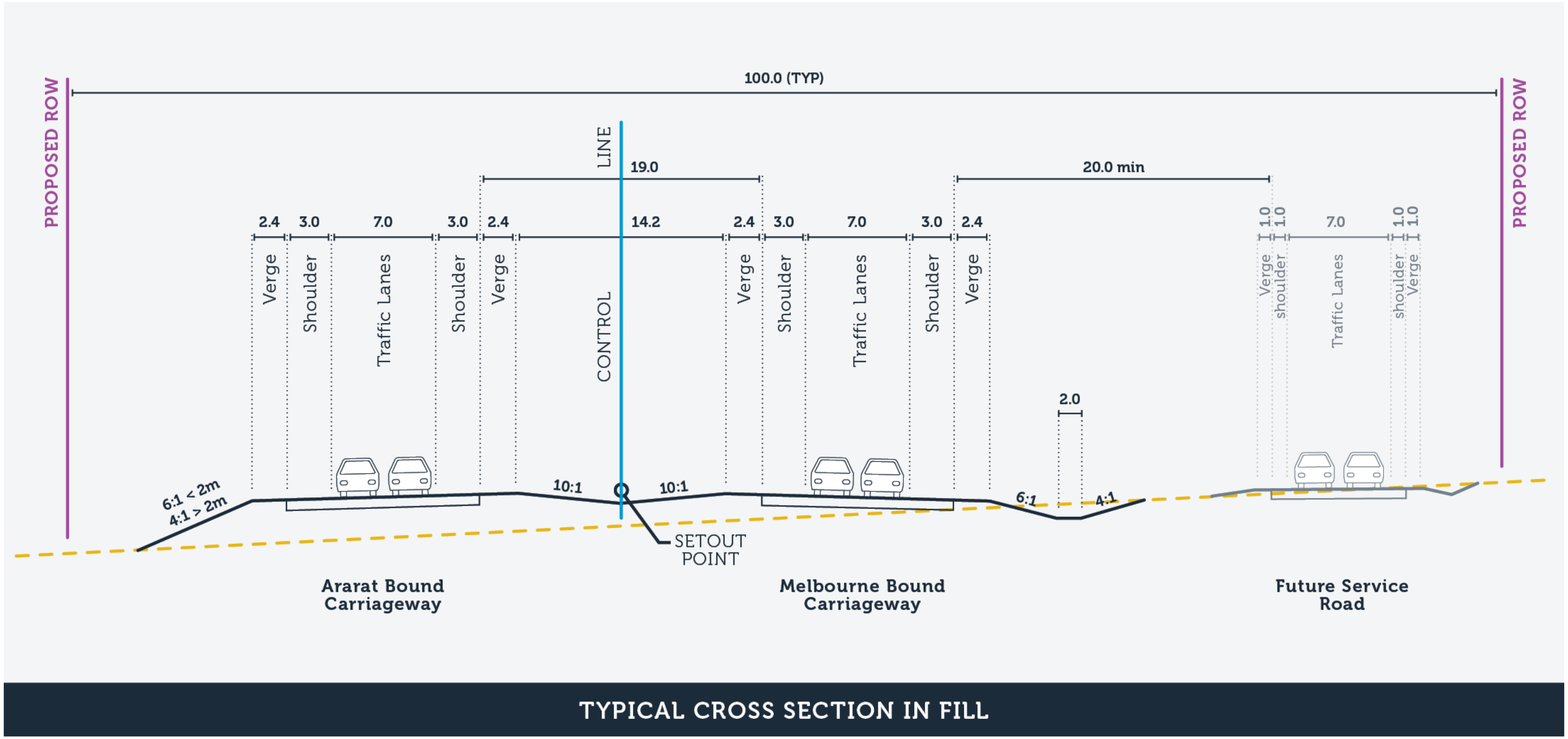

Figure 4.4 Typical cross section in fill

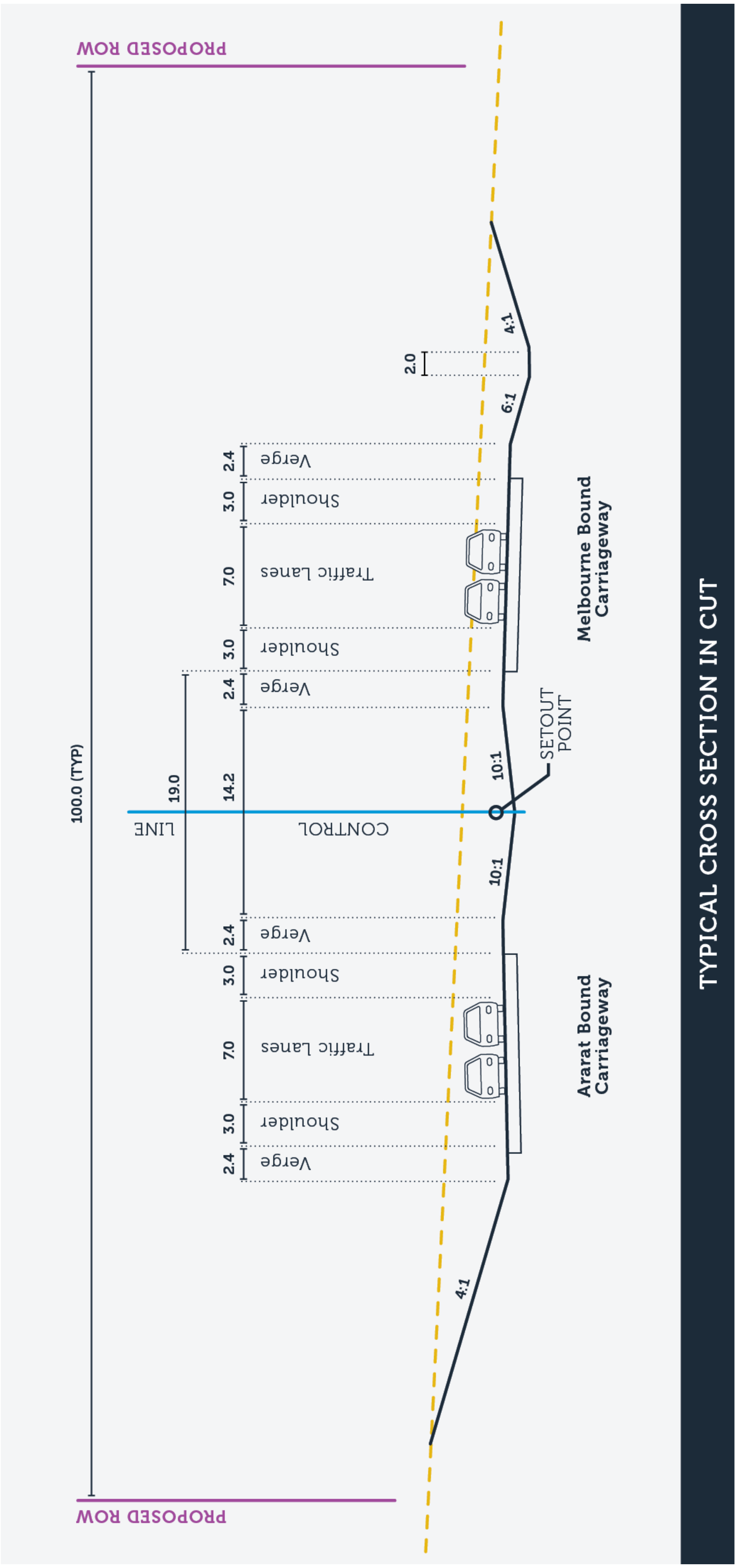

Figure 4.5 **Typical cross section in cut**

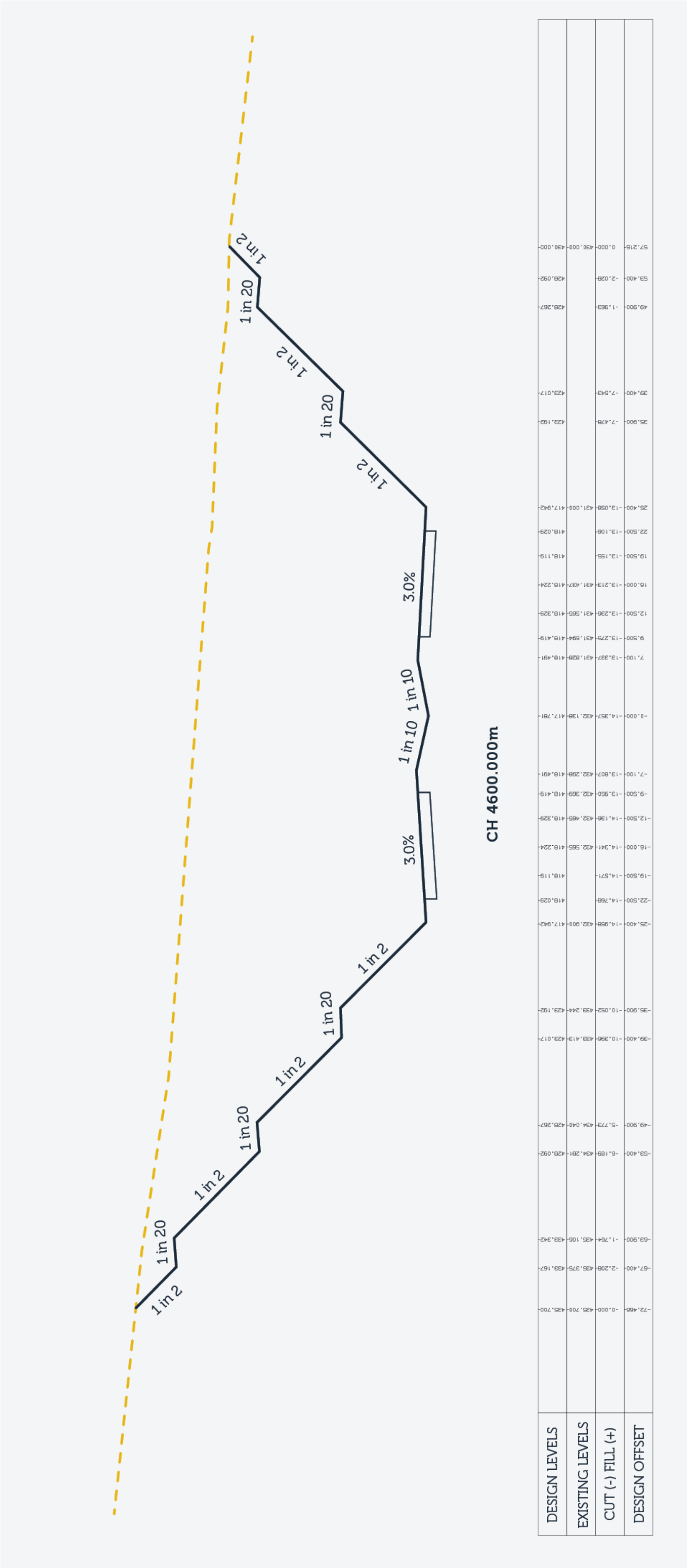

Figure 4.6 Cross section at Camp Hill

4.9.4 Road network access

The functional design provides access to the local roads through a full diamond interchange at Beaufort-Lexton Road. Half diamond interchanges will also be provided at the east and west tie-ins to the Western Highway. At the western extent of the project, Caulfield Lane would be realigned to tie into the new half diamond interchange. Driver Lane would be realigned and existing access to the highway removed, with a new highway access point to be established at McKinnon Lane. Existing access from Martins Lane to the highway will also be removed and a cul-de-sac established.

Figure 4.7, Figure 4.8 and Figure 4.9 show proposed access arrangements for traffic movements to and from the project, as well as where the intersection treatments are located.

Figure 4.7 Project access arrangement – western tie in

Figure 4.8 Project access arrangements – Beaufort-Lexton Road interchange

Figure 4.9 Project access arrangement – eastern tie in

4.9.5 Gradelines and clearances to structures

The project would be developed to comply with sight distance requirements for 120 km per hour design speed and design grades of 0.5% up to 3.0%.

For the major waterway crossing of Yam Holes Creek, the bridge structure clearances would be designed in consultation with the local water authority, Glenelg Hopkins Catchment Management Authority.

4.10 Bridge and structure design

4.10.1 Railway crossings

One new road over rail crossing of the Melbourne-Ararat rail line is proposed. Access arrangements regarding construction work over and near the rail line would be agreed between RRV and VicTrack. This agreement would identify when construction activities can occur, which would predominantly be between train movements or after hours. The road over rail crossing would provide a minimum 7.1 m clearance (or alternative clearance as agreed with V-Line from an operational viewpoint) to the rail line for the crossing of the Melbourne-Ararat rail line at 37.42724 (lat), 143.41242 (long).

Gradeline

The gradeline provides a measure of the vertical slope or grade of the road and is expressed as a percentage value of the height change compared to the horizontal distance travelled.

To provide a safe and economic road configuration, the design grade should not be steeper than 3.0% and not exceed 1,350 m, in accordance with the Austroads *Guide to Road Design*.

4.10.2 Bridges

The major structural elements of the project are:

- western interchange bridge
- Back Raglan Road bridge
- Main Lead Road bridge
- Beaufort-Lexton Road bridge
- Racecourse Road bridge
- Melbourne-Ararat rail bridge.

In the functional road design, all bridges are twin structures with a width between barriers of 13 m for all freeway bridges and 14.4 m for the western interchange bridge.

During the detailed design stage, all structures shall be designed to withstand loads in accordance with the requirements of AS 5100 – *Bridge Design* and criteria specified in Table 4.2.

Table 4.2 Bypass structures design criteria

Criteria	Value
Bridges and major culverts	100% of SM1600
Retaining walls and major sign support structures	In accordance with AS5100-2017 and VicRoads Bridge Technical Notes
Design Life	100 years
Pier Collision Loading	In accordance with AS5100-2017
Seismic Loading	New bridges as per Austroads Technical Report AP-T200-12
Anti-throw screens	As per VicRoads' *Policy on Reducing Risk of Throwing Objects from Overpass Structures*, Document No. N821411
Public Safety Barriers	As per *VicRoads Bridge Public Safety Barriers Policy*, Document No. 1390055
Clearance	7.1 m over Melbourne-Ararat rail line 5.9 m over local roads designated over-dimensional routes 5.4 m over other local roads
Barriers	Medium containment
Width between barriers	13.0 m for all freeway bridges 14.4 m for western interchange bridge

Figure 4.10 provides a schematic of the standard bridge structure design from abutment to abutment, while Figure 4.11 provides a cross-section at piers (multi-span bridges).

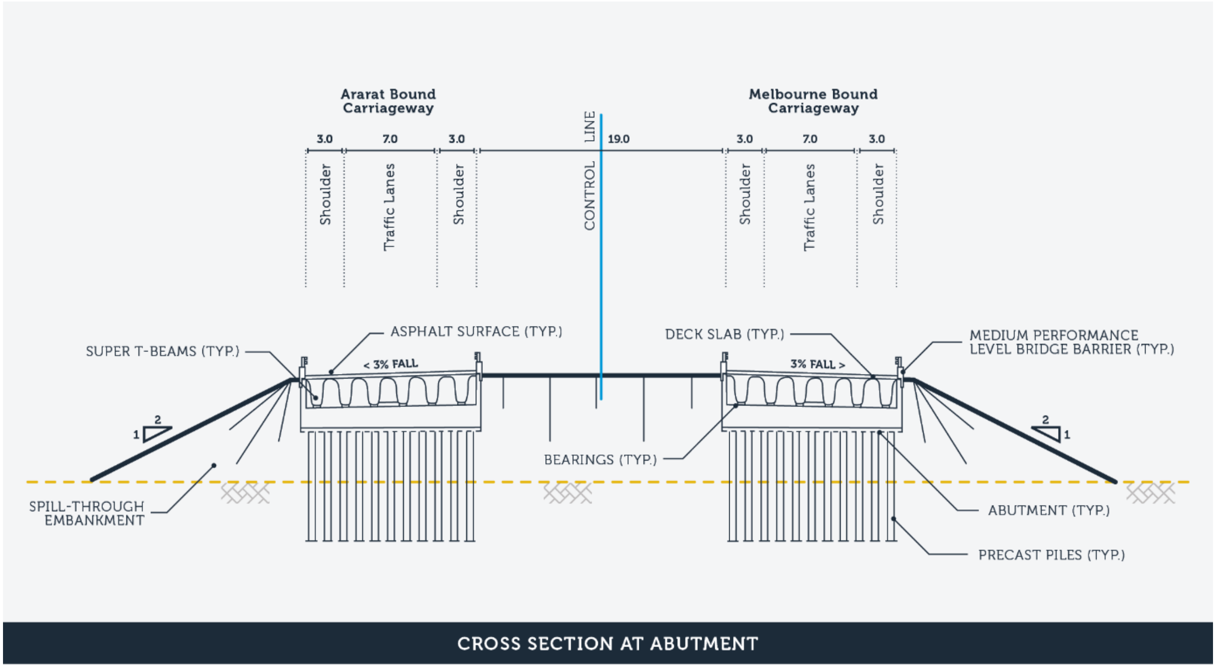

Figure 4.10 Cross section of proposed bridge structure spanning local roads

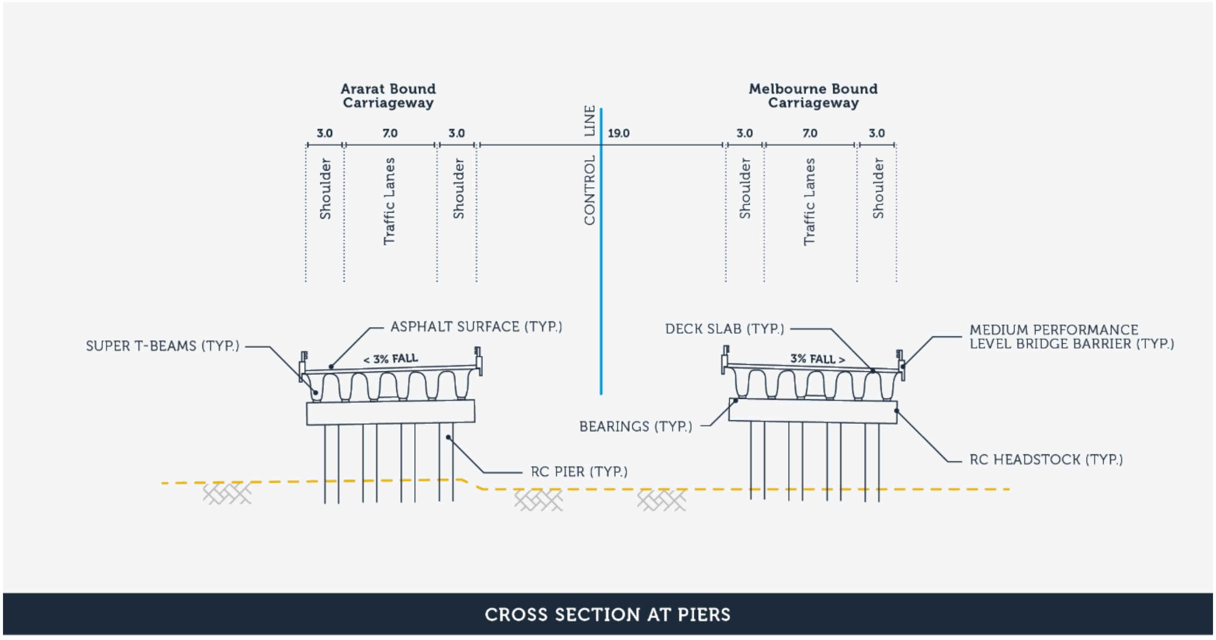

Figure 4.11 Cross section of proposed bridge structure spanning waterways

4.11 Waterways and drainage design

The preferred C2 alignment includes three crossings of the main waterway Yam Holes Creek and its tributaries. The cross-drainage infrastructure proposed to maintain waterflows for the main waterway includes a combination of box drainage and bridge structures at 14 locations. The functional drainage design arrangement has been selected to cater for both peak flood events and accommodate fauna passage in consultation with project ecologists. In addition to the main waterway cross drainage, 10 minor watercourse realignments will also be required to maintain waterflows of Yam Holes Creek tributaries (Figure 4.12). Minor watercourse realignments would be incorporated through the construction of swale drains within the road corridor, maintaining existing flow velocities in accordance with VicRoads' *Integrated Water Management Guidelines* (VicRoads 2013) (refer to Figure 4.12 and Figure 4.13 for realignment locations).

The project would also be designed to meet the water quality objectives described in CSIRO's *Best Practice Environmental Management Guidelines for Urban Stormwater* (CSIRO 1999). A combination of swale drains, bioretention systems, basins and wetlands will be incorporated as required following development of the detailed drainage design to meet the water quality objectives. RRV have allowed space in the functional design for these aspects to be constructed. It is RRV's preference that water sensitive road design should retain runoff from rainfall in the road reserve to increase groundwater recharge and evaporation from the road reserve, in line with integrated catchment management principles.

Surface water modelling was undertaken to determine the existing flow conditions and analyse potential flood impacts. The results of the modelling will inform the design of bridge and culvert crossings, with more detailed flood modelling assessments to be undertaken as part of the detailed design stage. Specific design criteria for each structure would be defined in consultation with Glenelg Hopkins Catchment Management Authority.

A spill risk assessment will be conducted during detailed design for each drainage outfall based on the likelihood of spill, which is estimated based on the road characteristics (geometry) of the drainage outfall catchment, and its proximity to the downstream water sensitive receptors (i.e. consequence of the spill).

Further details on the project's impacts on surface water are outlined in EES Chapter 11: *Catchment values and hydrology*.

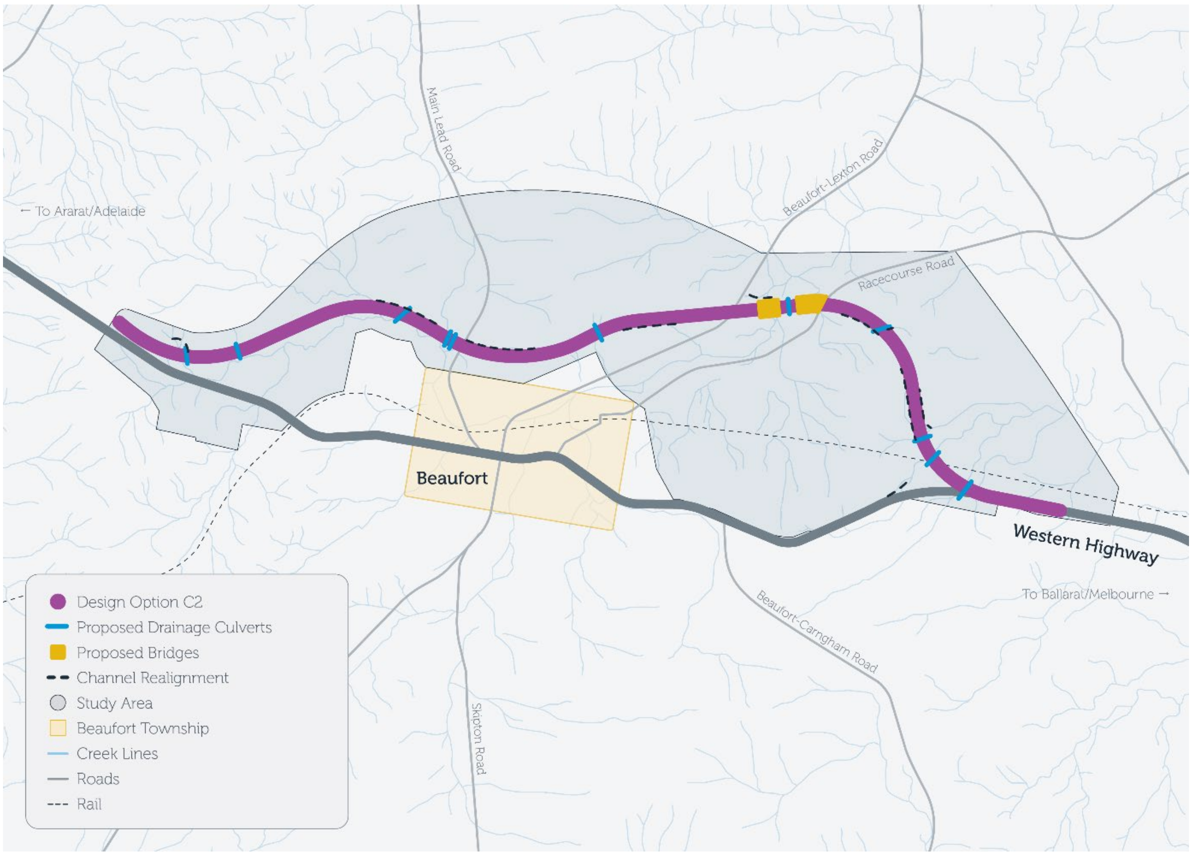

Figure 4.12 Proposed culverts, bridge, and channel realignments layout

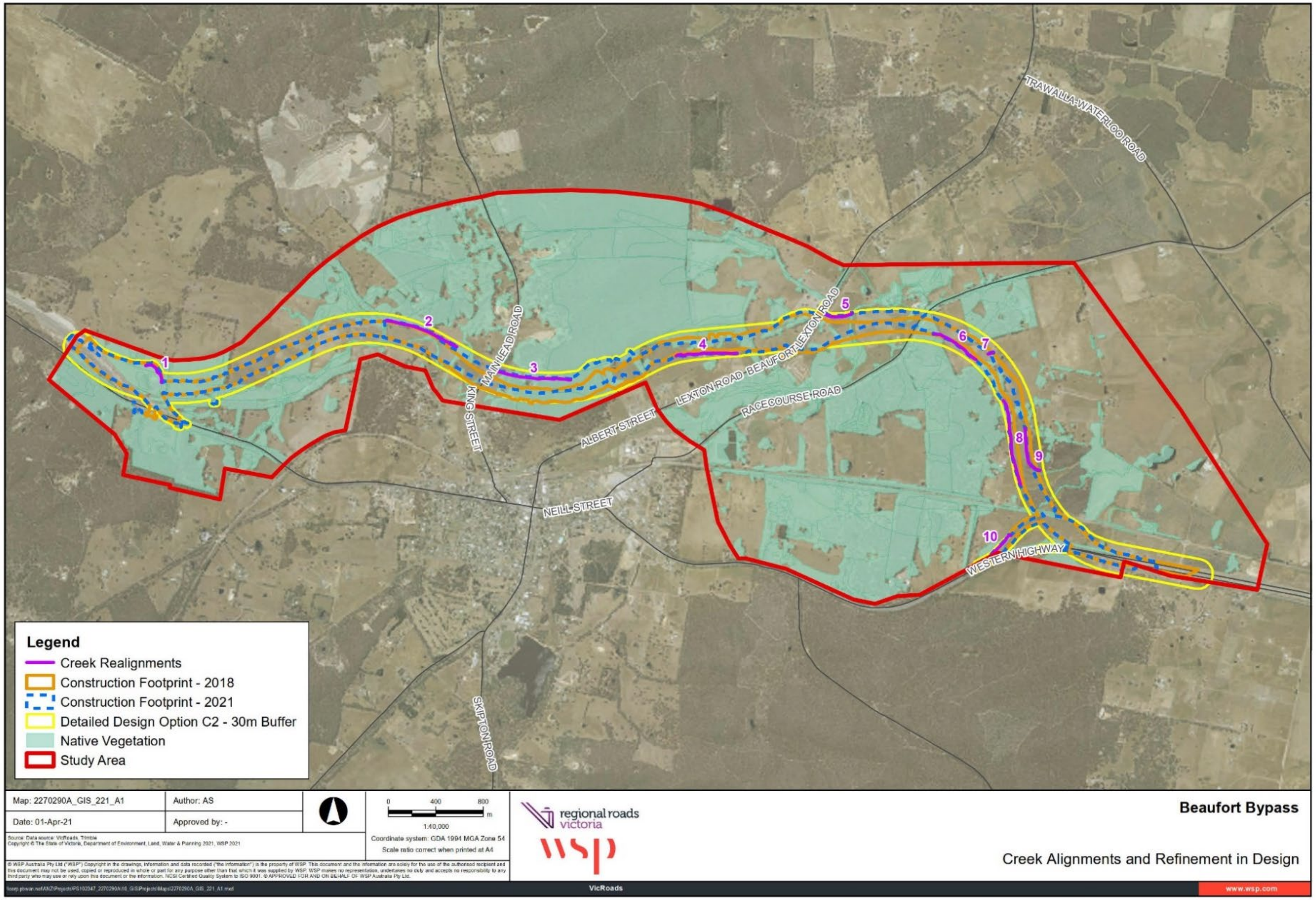

Figure 4.13 Channel realignment locations

4.12 Bicycle and pedestrian use

Provision for bicycle use would be made in each direction of the bypass through the 3 m sealed shoulders, which would be extended over bridge structure sections. VicRoads *Supplement to Austroads Guide to Road Design Part 6A* outlines design options for bicycle lanes on rural arterials and freeways.

Further details on the project's impacts on bicycle and pedestrian use are outlined in EES Chapter 12: *Social effects*.

4.13 Noise attenuation

VicRoads *Traffic Noise Reduction Policy* (2005) describes situations in which noise attenuation measures are required. Location and heights of noise walls have been determined for the functional design based on the noise modelling work outlined in EES Chapter 14: *Amenity*. In accordance with the *Traffic Noise Reduction Policy*, the project would require one, or a combination, of low noise pavement, earth mounding or noise barriers to achieve compliance with the policy. Noise barriers are typically proposed over earth berms for mitigation treatment as they are a more effective means of mitigating road traffic noise and utilise less space.

The use of 2 m high noise barriers in selected locations would be incorporated into the detailed design and landscape strategy for the project. The visual impacts of noise barriers, as well as the functional design for these structures, are discussed in EES Chapter 15: *Landscape and visual amenity*. The proposed locations of noise barriers and receivers requiring off-reservation treatment are shown in Figure 4.14.

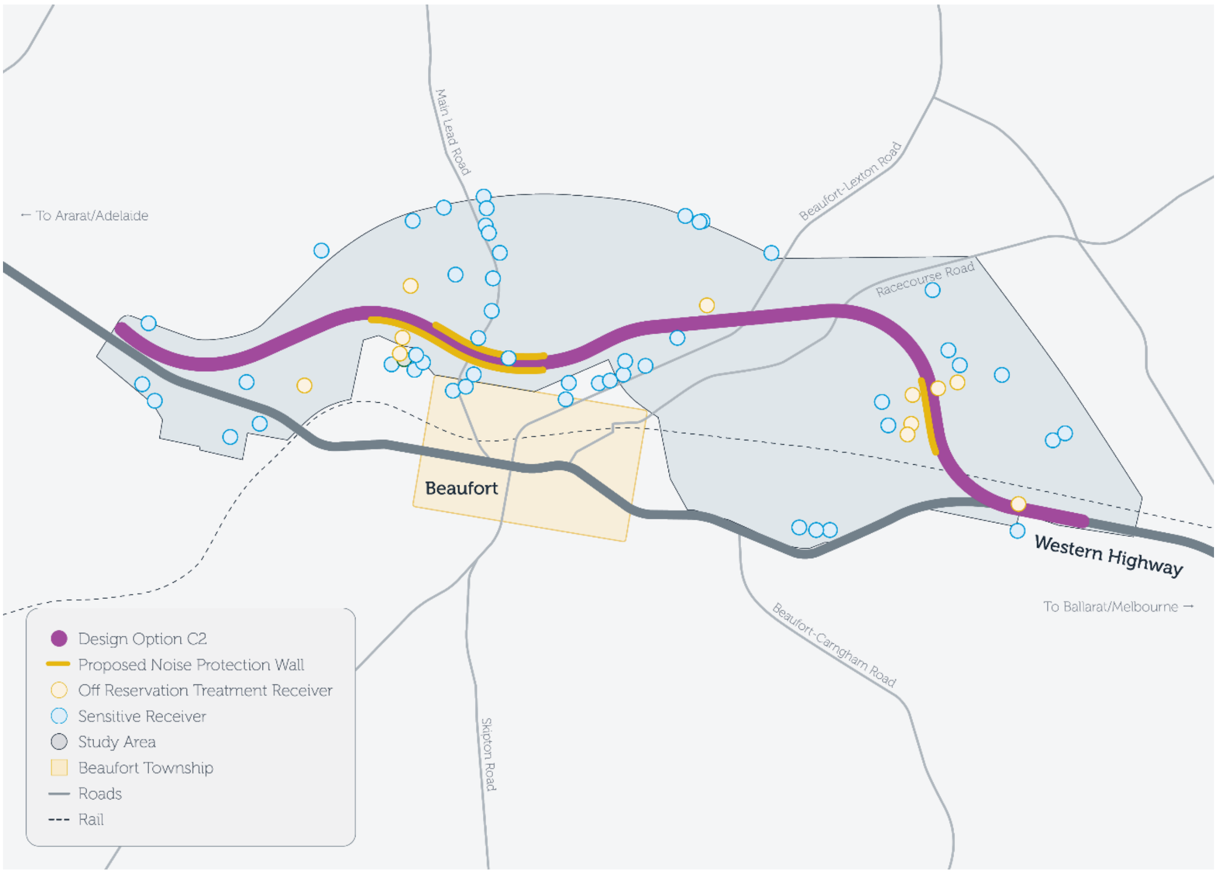

Figure 4.14 Proposed noise barrier locations along the project alignment

4.14 Lighting and traffic signals

The project would include lighting consistent with Chapter 6 of the VicRoads *Traffic Engineering Manual Volume 1 – Traffic Management.* Lighting is to be provided at the ramp intersections with Beaufort-Lexton Road, and the eastern and western interchanges.

4.15 Protection and relocation of utilities

Protection and/or relocation of utilities, such as electricity, gas and telecommunications services, have been considered in the development of the project. A detailed service protection and relocation plan will be prepared as a part of the detailed design in consultation with the relevant utility asset owners. RRV are currently undertaking investigations in partnership with Central Highlands Water to understand the towns future capacity requirements for treated sewage irrigation ponds, which the project will impact. A memorandum of understanding is in place with Central Highlands Water and RRV to identify appropriate locations for irrigation of treated sewage.

4.16 Construction methodology

4.16.1 Working hours

Construction work for the project would be undertaken during the standard construction work hours as dictated in Environment Protection Authority publication 1834: *Civil construction, building and demolition guidelines*, which include:

- Monday to Friday: 7 am to 6 pm
- Saturday: 7 am to 1 pm.

Construction work outside the standard hours may occur at stages to safely or more efficiently undertake certain tasks. If the contractor(s) proposed to undertake evening or night work, prior approval would be required from the RRV / MRPV superintendent. All relevant stakeholders and nearby residents would need to be consulted as a condition of any approval to proceed.

4.16.2 Key construction activities

Construction activities would be undertaken in accordance with the contractor(s) Environmental Management System and associated Construction Environmental Management Plan/s.

These documents would incorporate all the measures described in EES Chapter 17: *Environmental management framework*, and any other measures identified in the conditions of approvals for the project.

4.16.3 Site preparation, pavement and road construction

Preparation of the site, and construction of the pavement and road, would include:

- delineation of project boundaries with suitable fencing and signage
- installation of traffic management measures, as required
- establishment of the contractor’s site office and compound, and stockpile sites, as required
- progressive installation of erosion and sediment controls
- installation of additional environmental management controls, such as fencing and signage to protect sensitive areas, as required
- removal of vegetation and tree stumps in the construction area, excluding specified and fenced protected areas
- stripping of topsoil, which would be stored on-site for later reinstatement, and protected with silt fencing and seeded to minimise erosion
- relocation and protection of utilities, as required
- completion of stormwater drainage works, including construction of water sensitive road design measures. These may be consolidated with temporary sediment basins
- earthworks and pavement preparation using graders, dozers, scrapers and other equipment
- compaction of surface using compaction equipment (e.g. various types of rollers – vibrating, padfoot or smooth-drum – and compactors)

- excavation of cut material to the necessary level, as required. Blasting may be required in some locations depending on ground and rock conditions. Suitable cut material would be recycled and incorporated in earthworks wherever possible, while unsuitable cut material would be transported and disposed of (on-site where possible)
- importing additional fill material, as required, for the permanent works to reach subgrade level. Material would be compacted and tested to confirm if it meets the specified requirements
- construction of verges, batters, roadside drainage elements, including kerbs and channels where required
- importing, placing and compacting any granular pavement materials
- application of flexible asphalt pavement by pavers and rollers, or sprayed seal treatment, as applicable
- installation of lighting, line markings, signage and other road furniture (i.e. safety barriers and guide posts)
- progressive landscaping and re-vegetation of the construction site, including reinstatement and topping up of topsoil, seeding, planting trees and shrubs, and installing weed mats and mulch.

4.16.4 Structural works

Activities associated with construction of structures such as bridges, culverts and retaining walls would include:

- installation of bored or driven piles for structural elements, as required. Some may also incorporate spread or pad footings
- completion of all footings works for the various structures, including casting pile caps for major structures, pad footings for some structure, foundation slabs for major culvert structures
- construction of piers and abutments *in situ* up to the underside of the deck or other superstructure elements (precast options may also be viable)
- completion of structural fill and abutment work, including construction of approach slabs
- construction of bridge headstocks would be cast and precast beams placed and deck constructed. Precast parapets and rails would be installed and kerb infill/deck connection constructed. A thin asphalt wearing course would be placed on the completed bridge deck/superstructure and line marking and associated infrastructure would be installed
- for retaining walls, typically once a strip footing (or similar) is in place, wall units would be placed and structural fill in layers built up to tie all elements together. Once at the required level, handrails and other protective mechanisms would be installed
- installation of any gantries, cantilevers or other major sign supports or crown units (which have previously been manufactured off-site) would be installed and connected so as they are integral with the completed works
- installation of any off-structure bridge barriers would be constructed, including footing details and precast barrier units. This would require material to be brought on site and connected to each other, as well as any other wire rope safety barrier or guard fence to protect end terminals
- post construction, site clean-up and disposal of waste materials would occur.

4.16.5 Plant and equipment

Plant and equipment for the construction of the project would be determined by the contractor(s) during the construction planning phase. An indicative list of plant and equipment likely to be used on site for the project would include:

- scrapers, dozers, excavators, backhoes, graders, paving and other earth moving equipment
- kerbing machine, profiler, trenching machine, line marking machine and concrete trucks and pumps
- compaction equipment such as rollers, vibrating rollers and compactors
- piling rig, cranes, crane trucks (truck with a mounted crane on the rear), and associated equipment
- trucks and trailers, water carts, dump trucks and associated equipment
- light vehicles, pneumatic hand or power tools, and general tradesmen equipment
- pavement profiler and pavers for asphalt and/or crushed rock pavements
- traffic management gear such as safety barriers and variable message boards
- bitumen sprayers, rollers and aggregate loaders for spray seal surfacing works.

4.16.6 Earthworks

Earthworks for the project are expected to be dominated by the need for cutting into hillsides to achieve adequate grades and for fill above the natural surface in other areas. Much of the carriageway would be built on low level fills to achieve satisfactory drainage to protect the road pavement.

Functional design estimates forecast 2,786,500 m^3 of fill material would be required to build up the road in certain areas, while 1,438,400 m^3 of material would be removed from cut areas. Unsuitable cut material for subgrade would be used during construction for flattening batters, noise mounding or land forming, where this is possible. Cut material considered unsuitable for these purposes would be disposed of where possible. Disposal of material onsite would be within the identified project area and outside of environmentally sensitive 'no-go' areas. Unsuitable cut material would be stockpiled within the project area in non-environmentally sensitive areas until reuse or disposal of material off-site is determined in line with statutory requirements.

4.16.7 Source and quantity of materials

Fill material would be sourced primarily from cut areas wherever possible, however, additional sources will be required and would need to be identified. These could potentially be from a combination of sources, including local quarries and gravel pits near the works.

The precise quantities of fill required cannot be determined until the detailed design phase, at which time the precise nature and quantity of materials on site or nearby would also be available. The sourcing of fill is to be the responsibility of the construction contractor(s).

The road pavement material would be sourced from appropriately licensed facilities that meet the quality requirements of the required material. Exact material quantities are unknown at this stage but materials may include concrete, steel, crushed rock, aggregate, sand and other quarry materials. These materials would be sourced from local quarries and commercial suppliers wherever possible.

Surplus material that cannot be used on site would be re-used or disposed of at accredited materials recycling or waste disposal facilities.

Quantities of water required during construction are unknown at this stage and would depend on material sources and methodologies applied by the contractor(s). Water would be required for earthworks and pavement construction as well as part of dust suppression measures. Water would be sourced locally through the re-use of water captured on site or other non-potable supplies. In accordance with VicRoads *Water Use Policy*, recycling of wastewater would also be considered where possible.

4.16.8 Construction site drainage

Prior to construction, a Construction Environmental Management Plan would be required in accordance with Environment Protection Authority publications 275: *Construction Techniques for Sediment Pollution Control*) and 1834: *Civil construction, building and demolition guide*. Sedimentation basins may need to be provided during construction, along with other similar treatment and measures, to capture and treat any sediment laden runoff from the site and prevent it from being discharged into nearby waterways. Water quality would be monitored by water monitoring stations, established in accordance with VicRoads Standard Specification Section 177 *(Environmental Management (Major) – Part B Water Quality)*, to identify any changes in water quality during construction of the project.

4.16.9 Construction traffic

The project construction would require heavy vehicle movements associated with the works, transport of workers, transport of construction machinery and equipment to and from site, as well as the import and disposal of materials.

Construction vehicles and machinery would be restricted to the freeway and arterial roads, wherever possible, in accordance with VicRoads/RRV practices, the Worksite Safety Traffic Management Code of Practice and the *Road Management Act 2004*.

The project would likely be constructed on a six-day working week basis. The volume of construction traffic would depend on the program and staging of construction.

Worker transport would primarily occur within one hour prior to and post completion of work each day. Deliveries to site may occur during the day (or night for oversized equipment). Spoil haulage would be undertaken during normal working hours. This would result in short-term effects on intersection and network capacity as these vehicles enter/exit the existing road network. The effects of these entries/exits would dissipate with distance from the construction site. Designated site entry and exit points would be developed by the construction contractor(s) which would include consideration of speed, sight distances to ensure safe access/egress and capacity of existing intersections.

Evening and night works are unlikely to be required on a regular basis, however, night works would be considered where they may mitigate effects on the community or travelling public or where the works cannot be safely carried out during the daytime. Some examples would include:

- the delivery of oversized construction or infrastructure components which, for safety reasons, cannot use the road network during daytime hours
- lifting and installation of major infrastructure components over existing infrastructure where safety risks are significant
- constructing road tie-ins to existing carriageways.

Construction traffic and potential safety impacts would be managed through means such as implementing maximum speed limits on any temporary roads, providing appropriate construction signage for motorists on through roads, and providing necessary measures to manage safety and/or capacity at intersections during construction.

Detailed Traffic Management Plans would outline the arrangements for managing all potential construction impacts (refer to EES Chapter 8: *Traffic and transport*).

4.16.10 Site compounds

Site compounds would be used to stockpile materials, store plant and equipment, and provide site offices, parking and amenities for construction staff. Chemical and fuels for construction would be stored in appropriate storage areas within the compound site.

RRV / MRPV would require the contractor(s) to identify suitable locations within the project area to establish and locate temporary construction compounds. If the contractor's preferred location is outside the project and activity areas, it would not be authorised by the incorporated document and the contractor(s) would need to obtain necessary statutory approvals. Additionally, the contractor(s) would need to ensure it met performance standards that resulted in no impacts to the environment and social values identified in this EES and undertake appropriate consultation.

The contractor(s) Construction Environmental Management Plan would be required to contain provisions excluding the locations of site compounds and laydown areas from sites that would:

- contain remnant native vegetation
- contain significant Ecological Vegetation Classes or known habitats for endangered species
- contain Aboriginal or historic cultural heritage sites
- within 30 m of waterways
- within 100 m of dwellings.

4.16.11 Utilities and services

Service relocation and protection activities would be required from utility asset owners impacted by the project. Relocation and/or protection of assets would be developed in consultation with asset owners prior to and during detailed design.

Dial-Before-You-Dig searches would be undertaken with the following service authorities:

- Central Highlands Water
- Telstra
- AusNet Services (electricity transmission and gas distribution)
- Powercor
- Public Transport Victoria
- VicTrack.

4.17 Landscaping and rehabilitation

Following completion of construction, landscaping and rehabilitation treatments would be applied to address visual amenity, water quality and biodiversity recommendations in the Environmental Management Framework. Rehabilitation treatments would include the formation of bioretention and swale drains, reinstating topsoil, seeding, planting trees and shrubs, and installing weed mats and mulch in line with the VicRoads *Integrated Water Management Guidelines* (2013), VicRoads *Roadside Management Strategy – A balanced approach* (2011) and VicRoads *Tree Policy* (2016). The design and species selection for landscaping would be sympathetic to the existing landscape and incorporate indigenous design elements in consultation with the Registered Aboriginal Party.

4.18 Operation and maintenance

The key maintenance activities would be the ongoing road maintenance requirements in accordance with current practices and standards. Assets to be maintained by RRV would include landscaped areas, stormwater drains, bridges and culverts, road pavement, signage, barriers and line marking.

4.18.1 Roadside management

RRV asset management (including roadsides) is defined in the VicRoads *Roadside Management Strategy – A balanced approach* (2011). The Strategy provides a framework for balanced consideration of the four key objectives of roadside management, to:

- enhance transport safety, efficiency and access
- protect environmental and cultural heritage values
- manage fire risk
- preserve and enhance roadside amenity.

The Strategy uses an asset management approach to balance the key objectives of roadside management and identify the most appropriate treatments to preserve roadside functions. Fire management is a cooperative approach between government agencies to ensure that fire management is strategic, effective and targeted. Actions associated with the Strategy are to assess all arterial roads for fire risk and identify a treatment program based on risk assessment. Road reserve fire hazards that have been identified by landowners through consultation would be assessed as part of the above Roadside Management Strategy for all roads RRV has the responsibility to maintain.